



RESEARCH REPORT

Women in Apprenticeships and Nontraditional Occupations in the United States

Apprenticeship Evidence-Building Portfolio

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May 2023



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Acknowledgments

This report was funded by the U.S. Department of Labor’s Chief Evaluation Office. We are grateful to them and to all our funders, who make it possible for Urban to advance its mission. We thank leadership and staff from the U.S. Department of Labor’s Chief Evaluation Office and Women’s Bureau for their review and comments on report drafts. We are especially grateful to Tiffany Boiman, Jennifer Daley, Reeba Daniel, Jeffrey Hayes, Liana Christin Landivar, and Gretchen Livingston. John Marotta of the Urban Institute also provided valuable comments on report drafts.

The views expressed are those of the authors and should not be attributed to the Urban Institute, its trustees, or its funders. Funders do not determine research findings or the insights and recommendations of Urban experts. Further information on the Urban Institute’s funding principles is available at urban.org/about/our-funding.

Executive Summary

In 1992, Congress passed the Women in Apprenticeship and Nontraditional Occupations (WANTO) Act to establish an outreach program through the U.S. Department of Labor (DOL) that would provide technical assistance to employers and unions to encourage employment of women in apprenticeable occupations and nontraditional occupations (A/NTOs). Nontraditional jobs are those where women make up 25 percent or less of the total number of workers in that occupation (Pub. L. 102-530, 29 U.S.C. 2501 et seq.).

Since 2020, DOL's Women's Bureau has awarded nearly \$10.8 million to community-based organizations (CBOs) across the country to provide job-related training, technical assistance, and supportive services to prepare women to succeed in apprenticeships and careers in nontraditional occupations.¹ Such industries include but are not limited to advanced manufacturing, construction, energy, health care, information technology, finance, and transportation.

This research report provides background on women's labor market experiences and opportunities in apprenticeships and nontraditional occupations in the United States to provide context for the forthcoming descriptive study of the 2020 and 2021 WANTO grants. The report also summarizes the planned activities of the grantees, the key features of their programs, and the main topic areas to be included in the descriptive study.

Women in Apprenticeships and Nontraditional Occupations

Although women have made great strides in the labor market since the WANTO Act passed 30 years ago, they still lag men in labor market opportunities and earnings. In 2019, before the COVID-19 pandemic disrupted labor markets, women's usual weekly earnings for full-time workers were 82 percent of men's earnings (table 17, U.S. Bureau of Labor Statistics 2020). Moreover, despite making up about half of the labor force, women comprised a relatively small percentage of workers in some of the highest-paid science, technology, engineering, and math (STEM) occupations. For example, women comprised only 15 percent of workers in architecture and engineering occupations (table 2, U.S. Bureau

¹ See "U.S. Department of Labor Awards \$4.1 Million to Increase Women Participation in Apprenticeship, Expand Job Opportunities," for the 2020 grants and "U.S. Department of Labor Announces \$3.3M in Grants to Expand Job Opportunities for Women in Apprenticeships, Nontraditional Occupations," for the 2021 grants, U.S. Department of Labor, accessed July 21, 2022. See "U.S. Department of Labor Announces \$3.4M in Grants to Expand Job Opportunities for Women in Apprenticeships, Nontraditional Occupations," for the 2022 grants, U.S. Department of Labor, accessed September 9, 2022.

of Labor Statistics 2020). Gender pay gaps are not always large in occupations with high occupational segregation. For example, women predominately made up health care support workers (86.6 percent), and these occupations paid women 91.5 percent of what they paid men; however, these were also among the lowest-paid occupations (table 2, U.S. Bureau of Labor Statistics 2020).

Apprenticeships could help increase the number of women in male-dominated occupations that tend to pay more than female-dominated occupations, particularly jobs in the skilled trades where a college degree is not required and apprenticeship provides an important entry point into the labor market. Apprenticeship training has the potential to increase women’s earnings in the short term and put them on a career path that includes future skills and long-term earnings growth. Despite its positive potential, apprenticeships have not been accessed by women at the same rate as men. Although women comprise nearly half of the labor force (U.S. Bureau of Labor Statistics 2022), recent administrative data from the Office of Apprenticeship’s Registered Apprenticeship Partners Information Data System (RAPIDS) reveals that women represented only 13.8 percent of active registered apprentices in fiscal year (FY) 2022.² Additionally, the majority of women in registered apprenticeships participated in female-dominated occupations (61 percent), such as health care support, educational instruction and library, and personal care and service occupations.³ These occupations typically have lower hourly wages, shorter training periods, and often fail to offer long-term, transferrable, career-enhancing skills (table 2, U.S. Bureau of Labor Statistics 2020). In contrast, women active in registered apprenticeships in 2021 comprised less than 5 percent of construction and extraction apprentices, and less than 5 percent of installation, maintenance, and repair apprentices⁴—occupations that are traditionally male-dominated and offer higher pay than many female-dominated occupations (table 2, U.S. Bureau of Labor Statistics 2020).

Women’s underrepresentation in apprenticeship and nontraditional occupations is influenced by the barriers they face to enter these careers and overlaps with the barriers they face in the overall labor market. Child care is a commonly cited challenge, including the lack of child care availability (especially during nonstandard hours), the cost of child care (Reed et al. 2021), and the disproportionate caregiving responsibilities women face compared with men (Drago 2009; Reinhard, Levine, and Samis 2012; Yavorsky, Qian, and Sargent 2021). In addition, women reported that discrimination and harassment in the workplace are other barriers, particularly for women who enter male-dominated fields (Hegewisch

² “[Women in Apprenticeship](#),” U.S. Department of Labor, accessed September 9, 2022.

³ Apprenticeship statistics are from the authors’ analysis of Registered Apprenticeship Partners Information Data System (RAPIDS) data. Occupation statistics are from table 2 in U.S. Bureau of Labor Statistics (2020).

⁴ Authors’ analysis of Registered Apprenticeship Partners Information Data System (RAPIDS) data.

and Mefferd 2021; Parker and Funk 2017). Women also faced exacerbated challenges during the COVID-19 pandemic (Yavorsky, Qian, and Sargent 2021).

Over the years, WANTO grantees have helped women break through these barriers by providing skills training and career guidance for A/NTOs, educating employers and unions on creating a more supportive environment and culture for women to succeed and providing supportive services to women to improve their retention. WANTO also exemplifies a model for strengthening women’s participation in nontraditional occupational skills training and employment through training cohorts exclusively (or predominantly) composed of women. The research literature on women-only training programs suggests that these programs can be particularly supportive of the needs of participants and provide positive same-sex role models (Chuang 2019; Rommes, Faulkner, and Slooten 2005). Some pre-apprenticeship programs supported by WANTO grantees may be gender exclusive. Grantees’ use of and experiences with any gender-exclusive pre-apprenticeship or nontraditional skills training will be documented in the descriptive study of the WANTO grants.

WANTO Grantees

In FY 2020 and FY 2021, DOL awarded 11 WANTO grants to CBOs to support women’s participation and success in industries in which women have been traditionally underrepresented or disproportionately concentrated in lower-wage occupations. WANTO grants support one or more of the following activities:⁵

- pre-apprenticeship, youth apprenticeship, registered apprenticeship, and nontraditional skills training programs⁶ to prepare women for A/NTO careers
- orientations and technical assistance for employers, unions, and workers on creating a conducive environment for women to succeed in A/NTO careers
- facilitation of support groups, networks, and supportive services to improve the retention of women in A/NTO careers

Eight of the eleven grantees focus their programs on helping women enter the construction trades, including welding, carpentry, plumbing, and the electrical trades. Other industries grantee programs focus on include information technology, advanced manufacturing, commercial truck driving,

⁵ A full description of WANTO grant requirements is provided in the funding announcements. See “FOA-WB-20-01 Women in Apprenticeship and Nontraditional Occupations (“WANTO”) Technical Assistance Grant Program,” for the 2020 grants and “FOA-WB-21-01 Women in Apprenticeship and Nontraditional Occupations (WANTO) Technical Assistance Grant Program,” for the 2021 grants, U.S. Department of Labor, accessed July 21, 2022.

⁶ See a more detailed discussion of the differences between these programs on page 2 of this report.

automotive, and transit. All grantees support women, but several target specific subpopulations of women, including those with low income, women of color, women with disabilities, women veterans, refugee women, and others. This report identifies several important issues and areas of interest that the WANTO descriptive study will focus on, which are based on the current experiences of women in apprenticeships and nontraditional occupations in the U.S., as well as a literature review and analysis of administrative data on women's experiences in apprenticeship and nontraditional occupations. These issues and areas of interest include documenting and describing potentially promising strategies for the following:

- training women to successfully transition into A/NTOs
- improving the recruitment and retention of women in training and in A/NTOs
- identifying and providing supportive services that women need to successfully train for and transition into A/NTOs
- engaging employers and unions to gain their support of women in A/NTOs

Introduction

Historically, women have been underrepresented in high-paying occupations and overrepresented in low-paying occupations (Gradín 2020; Nanda et al. 2018). Women are particularly underrepresented in the building trades, production occupations, and other skilled trades where registered apprenticeship is a widely used training strategy.⁷ Recognizing the barriers that women face in entering skilled trade occupations where they are underrepresented, Congress passed the Women in Apprenticeship and Nontraditional Occupations (WANTO) Act in 1992. The WANTO Act established an outreach program through the U.S. Department of Labor (DOL) to provide technical assistance to employers and unions to encourage employment of women in apprenticeable occupations and nontraditional occupations (A/NTOs), which are defined as jobs in which women make up 25 percent or less of the total number of workers in that occupation (Pub. L. 102-530, 29 U.S.C. 2501 et seq.). Although the earliest WANTO grantees (from 1994 to 2002) mainly produced training manuals and recruitment videos, grantees after fiscal year (FY) 2006 have focused more on training women and facilitating their successful placement into registered apprenticeship programs and employment (Federal Register Volume 72, Number 29 February 13, 2007). As a federally funded employment, training, and technical assistance program, WANTO is unique for its targeted focus on women. In a 2011 report examining the extent to which federally funded training programs are duplicative, the Government Accountability Office (GAO) determined that WANTO as one of only three programs providing services to populations not targeted by any other government training programs (GAO 2011, 2019).

This report informs the forthcoming descriptive study of the FY 2020 and FY 2021 WANTO grants,⁸ which is included under the broader DOL Apprenticeship Evidence-Building Portfolio. This is a DOL research initiative conducted by the Urban Institute and its partners to better understand several federal apprenticeship expansion efforts.⁹

The report begins by describing women in the labor market, including trends in labor force participation, earnings, and occupations using Current Population Survey (CPS) data from the Bureau of Labor Statistics (BLS). It then reviews the literature and data on women in apprenticeships. Data are from the Registered Apprenticeship Partners Information Data System (RAPIDS) administrative data.

⁷ Authors' analysis of Registered Apprenticeship Partners Information Data System (RAPIDS) data.

⁸ "WANTO Grant Program," U.S. Department of Labor, accessed September 9, 2022.

⁹ Other efforts in the evidence-building portfolio include the Scaling Apprenticeship and Closing the Skills Gap grant programs, the Veterans Employment Transition Services Apprenticeship Pilot, the Building State Capacity to Expand Apprenticeship through Innovation grants to states, and the Youth Apprenticeship Readiness grants.

These sections serve as a framework for understanding the WANTO grants. The report then describes the 11 WANTO grantees that are the focus of the descriptive study—6 grantees awarded in FY 2020 and 5 grantees awarded in FY 2021—including their goals, populations served, services provided, and partnerships. Information on the WANTO grantees is collected from grant documents. Subsequent reports under this descriptive study will use original data collected from interviews with WANTO grantees and their partners.

This report, and others produced as a part of the Apprenticeship Evidence-Building Portfolio, makes important distinctions between different types of apprenticeship training and uses the following definitions of different apprenticeship training models:

- A **registered apprenticeship program** meets federal and state standards and is registered with DOL or with a DOL-approved state apprenticeship agency (SAA). Both the DOL Office of Apprenticeship and SAAs register programs after approving their standards, which provide detailed plans for at least 2,000 hours of on-the-job training and a recommended minimum of 144 hours of related technical instruction. DOL or an SAA may periodically inspect the program to ensure that it follows apprenticeship standards and all health, safety, and equal employment opportunity regulations.¹⁰
- An **unregistered apprenticeship program** is a model that uses a similar earn-and-learn model as a registered apprenticeship but does not go through the same registration process or DOL review process for apprenticeship standards. Unregistered apprenticeships can include a wide variety of approaches for upskilling an employee with occupation-specific training. Nontraditional occupational skills training programs could be considered unregistered apprenticeship programs if they include some combination of classroom and on-the-job learning.¹¹
- A **pre-apprenticeship program** is designed to prepare individuals for entry into an apprenticeship program or, in some cases, into other job opportunities. It may last anywhere from a few weeks to a few months, and may or may not include a paid, work-based experience. Pre-apprenticeship programs have varied components; however, at the core, they place an individual on a pathway to employability that tends to include an apprenticeship program.¹²

¹⁰ For registered apprenticeship, standards are presented in a document that specifies the details of the on-the-job training, related training instruction, wage progression as a part of the work-based experience, and credentials to be awarded. DOL or a state apprenticeship agency then approves the document for the program to be considered “registered.” See “[Registered Apprenticeship Program](#),” U.S. Department of Labor, accessed July 21, 2022.

¹¹ Unregistered apprenticeships are, by definition, not registered or managed by DOL, so DOL does not maintain a webpage with information on these programs. For more information, see Lerman and Jacoby (2019).

¹² “[What is Pre-Apprenticeship?](#)” U.S. Department of Labor, accessed July 21, 2022.

Women in the Labor Market, 1950 to 2021

This section describes women in the labor market, including trends in labor force participation, earnings, and occupations, and differences between women and men in these labor market experiences. For tables and figures in this report that highlight a single year, we present statistics for 2019 before the COVID-19 pandemic because the pandemic disrupted labor markets and led to labor force participation rates and earnings that do not reflect periods before the public health emergency. The key takeaway from the data on women's participation in the labor market is that despite large improvements since the WANTS Act was passed 30 years ago, women still lag men in labor market opportunities and earnings. Moreover, the trends and patterns described below are also reflected in apprenticeship programs, which we discuss later in the report.

Employment and Earnings

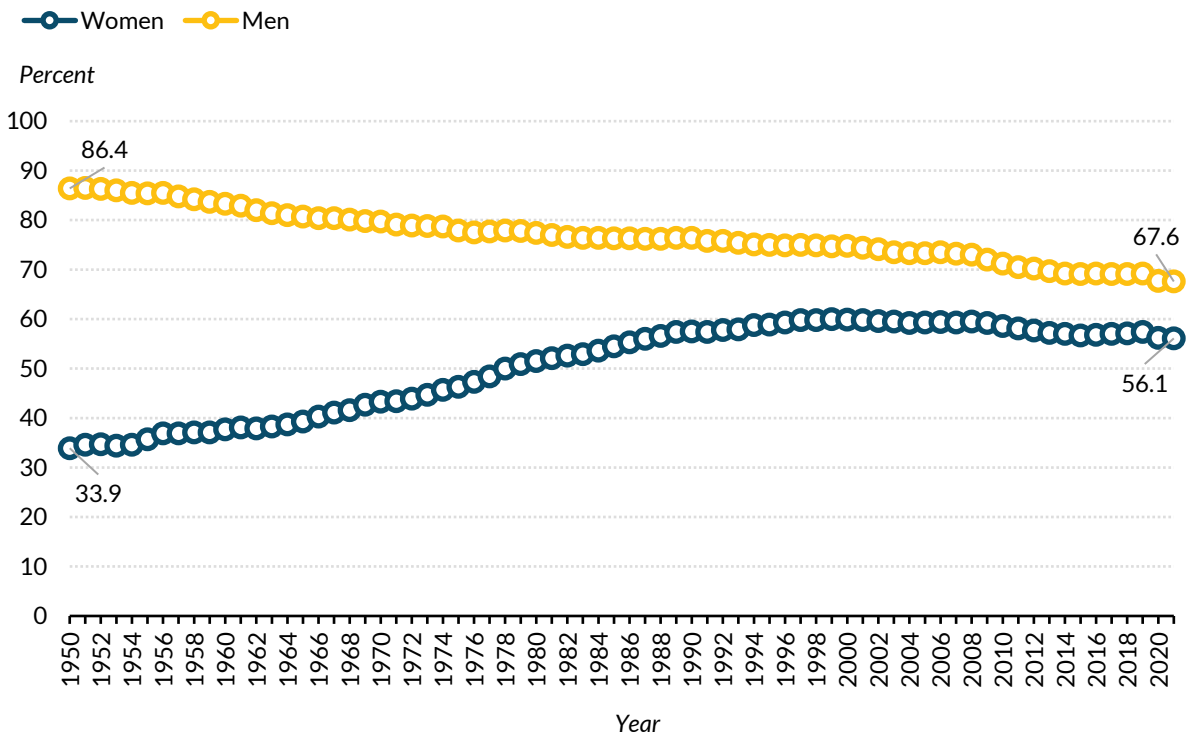
The 1950s and 1960s marked an era when many women, particularly mothers of young children, did not engage in paid labor (Bowen and Finegan 1969; Goldin 1990, 2006). However, women's participation in the labor force was not uniform across racial and ethnic groups. Historically, Black women have had higher labor force participation rates than white women, with a 14 percentage point gap in participation between the two groups in 1950 in U.S. decennial census data (Boustan and Collins 2014).

By the 1980s and 1990s, most women worked, including mothers of young children (Albanesi and Prados 2021; Blau 1998; Blau and Winkler 2018; Goldin 2006; Hayghe and Bianchi 1994). According to the U.S. Bureau of Labor Statistics (2022), beginning in 1979 and for every year afterwards more than 50 percent of women participated in the labor force (figure 1). Since the late 1990s, growth in the percentage of women working has slowed considerably (Albanesi and Prados 2021; Blau and Kahn 2013). Overall, between 1950 and 2021, female labor force participation rates¹³ for those ages 16 and older increased 65 percent (22 percentage points) from 34 to 56 percent (figure 1). In contrast, male labor force participation rates declined 21 percent (18 percentage points) from 86 to 68 percent (U.S. Bureau of Labor Statistics, 2022).

¹³ The labor force participation rate is the share of the population that is in the labor force, either working or unemployed and looking for work.

FIGURE 1

Labor Force Participation Rates of Individuals Ages 16 and Older from 1950 to 2021, by Gender



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Source: U.S. Bureau of Labor Statistics. 2022. "Labor Force Statistics from the Current Population Survey." Washington, DC: U.S. Department of Labor.

Women’s labor force participation rate is observed to vary by race and ethnicity, as well as by age and educational attainment. In 2019, women’s labor force participation was highest for those ages 25 to 34 (76.7 percent) and for college graduates (70.2 percent). Within racial and ethnic groups, Black women had the highest labor force participation rates (60.5 percent) followed by Hispanic and Asian women (57.7 and 57.1 percent, respectively), and white women (56.8 percent). Across all racial and ethnic groups, labor force participation rates increased between ages 16 and 34 and declined for those ages 55 and older. Participation rates peaked at ages 25 to 34 for white women, 35 to 44 for Black women, and 45 to 54 for Asian women. In contrast, labor force participation rates remained fairly constant between ages 25 and 54 for Hispanic women, staying between 68 and 71 percent across these age categories. Between ages 25 to 54, Black women had the highest rates of labor force participation and Hispanic women had the lowest (except at ages 25 to 34). At ages 55 to 64, Black and Hispanic women had higher labor force participation rates (56.4 and 55.4 percent, respectively) than white and Asian women (60.2 and 60.0 percent, respectively). Among those ages 65 and older, Asian women had the highest labor force participation rates and Hispanic women had the lowest (table 1).

Among women, college graduates had the highest labor force participation rates of any educational attainment level: 1.8 (for Hispanic women) to 2.3 times (for Black women) higher participation rates than women without diplomas.

TABLE 1
Labor Force Participation Rates Among Women Ages 16 and Older in 2019

	All (%)	White (%)	Black or African American (%)	Asian (%)	Hispanic (%)
All	57.4	56.8	60.5	57.1	57.7
Age					
16-19	35.7	37.6	32.7	21.1	30.6
20-24	70.4	71.4	70.0	57.3	68.8
25-34	76.7	77.1	78.1	68.9	70.7
35-44	75.7	75.6	78.9	71.6	68.0
45-54	75.7	75.9	76.0	74.6	69.7
55-64	59.6	60.2	56.4	60.0	55.4
65+	16.4	16.2	17.2	18.1	14.9
Educational Attainment^a					
No HS Diploma	33.5	33.7	32.4	30.4	40.9
HS Diploma, No College	48.0	46.3	54.5	48.9	58.3
Some College	55.6	53.4	63.8	58.5	67.5
College Graduate	70.2	69.5	75.7	67.7	74.2

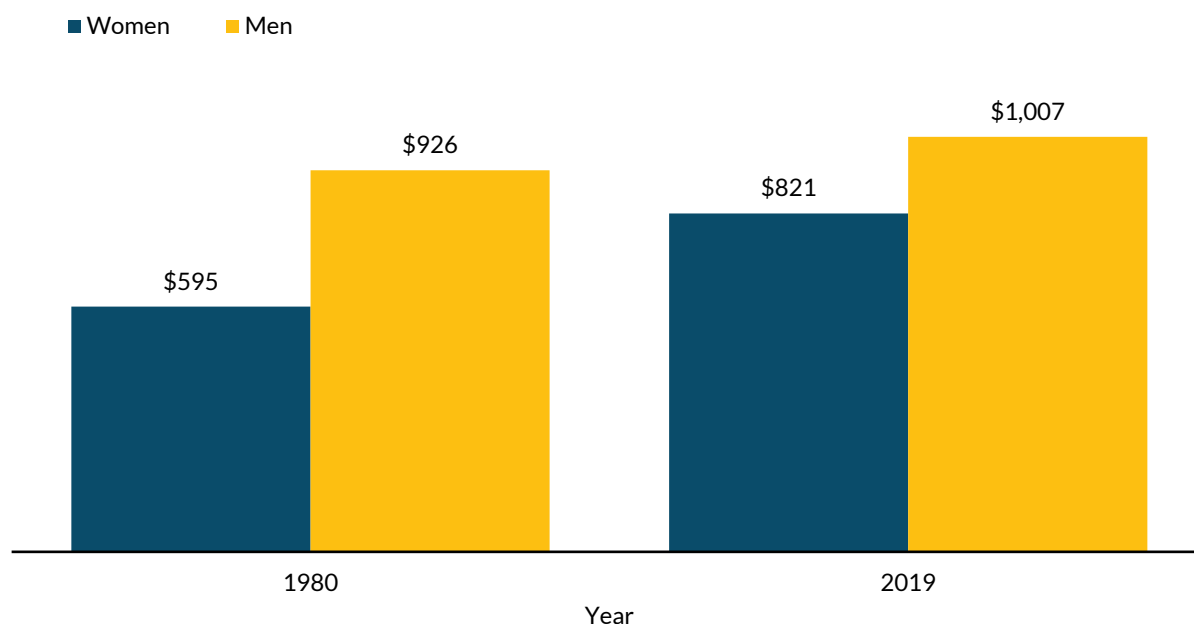
Source: U.S. Bureau of Labor Statistics. 2022. "Labor Force Statistics from the Current Population Survey." Washington, DC: U.S. Department of Labor.

Notes: HS = high school. Race categories of white, Black, and Asian may include Hispanics and Latinas, and persons whose ethnicity is identified as Hispanic or Latina may be of any race.

^a Educational attainment is only available for women ages 25 and older.

Women's earnings have also increased over time. Between 1980 and 2019, median weekly earnings of full-time wage and salary workers increased 38 percent from \$595 to \$821 (in 2019 dollars) for women, but only 9 percent for men (figure 2). As a result, the female-to-male earnings gap has declined over time. Still, women earned only 82 percent of what men earned in 2019.

FIGURE 2
Median Usual Weekly Earnings for Full-Time Wage and Salary Workers Ages 16 and Older in 1980 and 2019, by Gender



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Source: U.S. Bureau of Labor Statistics. 2020. "Highlights of Women's Earnings in 2019." Table 17, Report 1089. Washington, DC: U.S. Department of Labor.

Note: Respondents to the Current Population Survey are asked to report their "usual" earnings to account for the fact that the survey response week may not be typical. The term "usual" is determined by each respondent's own understanding of the term. If the respondent asks for a definition of "usual," interviewers are instructed to define the term as more than half the weeks worked during the past four or five months. Earnings are in 2019 dollars.

Figure 3 compares median usual full-time weekly earnings in 2019 for men and women and shows how they differed by race and ethnicity. Asian women had the highest median usual weekly earnings (\$1,025) followed by white women (\$840), Black women (\$704), and Hispanic and Latina women (\$642). Despite their comparatively higher earnings, Asian women earned only 77 percent of what Asian men earned. Black women had the smallest relative earnings compared with Black men (92 percent) followed by Hispanic and Latina women (86 percent) and white women (81 percent). However, Black and Hispanic men earned substantially less (\$769 and \$747) than white men (\$1,036). Comparing women's usual earnings with those of white men, women's relative earnings were 62 percent for Hispanic and Latina women, 68 percent for Black women, 81 percent for white women, and 99 percent for Asian women.¹⁴

¹⁴ Calculations are made using the usual median weekly earnings in figure 3, although these percentages are not presented in figure 3.

FIGURE 3

Median Usual Weekly Earnings for Full-Time Wage and Salary Workers Ages 16 and Older in 2019, by Gender and Race and Hispanic or Latino Ethnicity



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Source: U.S. Bureau of Labor Statistics. 2020. "Highlights of Women's Earnings in 2019." Table 1, Report 1089. Washington, DC: U.S. Department of Labor.

Note: Race categories of white, Black, and Asian may include Hispanics and Latinos, and persons whose ethnicity is identified as Hispanic or Latino may be of any race. Earnings are in 2019 dollars.

The gender wage gap has also been well-documented in academic literature (see Blau and Kahn 2017, Chamberlain 2016, Foster et al. 2020, Goldin 2014, 2015, and Hodges 2021 for a few of these studies). Unequal caregiving responsibilities, occupational segregation, and employment discrimination can all negatively impact women's earnings and contribute to the gender wage gap. We discuss each of these topics below.

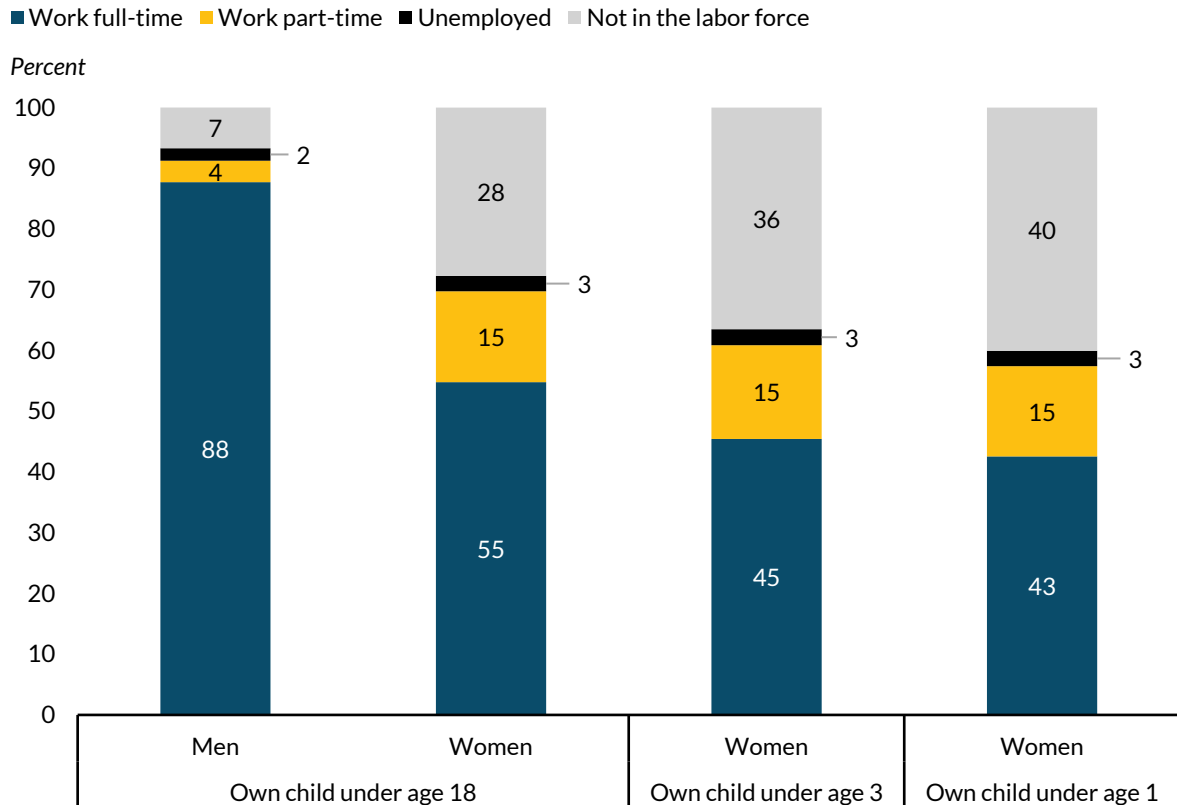
Caregiving

Women often have more caregiving responsibilities than men—both for children (Drago 2009; Yavorsky, Qian, and Sargent 2021) and other family members, as in the case of women who provide elder care (Reinhard, Levine, and Samis 2012). Stay-at-home mothers and working fathers represented 26 percent of married couples with children in 2017 and 2018, while working mothers and stay-at-

home fathers represented only 6 percent according to American Time Use Survey data (Alon et al. 2020). Even among married couples where both spouses worked full time in 2017 and 2018, women provided close to 60 percent of the child care hours (Alon et al. 2020). In addition, women comprised around two-thirds of adults who provided unpaid care to their elderly parents between 2011 and 2017 according to National Study on Caregiving data (Mudrazija et al. 2021).

Some women leave the labor force to provide care; however, other women juggle both paid work and unpaid caregiving responsibilities (Alon et al. 2020). In 2019, 28 percent of women with children under age 18 did not participate in the labor force (figure 4). Over half (55 percent) of women with children under age 18 worked full time and another 15 percent worked part time. In contrast, only 7 percent of men with children under age 18 were not in the labor force, 88 percent worked full time, and only 4 percent worked part time.

FIGURE 4
Employment Status of Adults Ages 18 and Older in 2019, by Gender and Age of Youngest Child



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Source: U.S. Bureau of Labor Statistics. 2021. "Employment Characteristics of Families—2020." Tables 5 and 6, News Release. Washington, DC: U.S. Department of Labor.

Note: Unemployed workers are looking for work but not currently employed and are therefore considered to be in the labor force. Individuals who are not working and not looking for work are considered not in the labor force. Includes the civilian noninstitutional population. Full-time is defined as usually working 35 or more hours and part-time is defined as usually working less than 35 hours per week at all jobs. Percentages are rounded so totals may not add up to 100 percent.

Most mothers work full or part time even when their children are very young. Labor force participation rates in 2019 were 64 percent for women with children under age 3 and 60 percent for women with children under age 1, with full-time employment rates of 45 and 43 percent, respectively, for these mothers (figure 4).

Like parents of young children, a large percentage of family caregivers also work. An analysis of data from the National Study of Caregiving found that around 60 percent of people who provided unpaid care to their elderly parents worked (Mudrazija et al. 2021).

Studies have documented the motherhood wage gap and the negative relationship between wages and caregiving.¹⁵ Most studies find evidence of such a motherhood wage penalty; however, evidence of wage penalties for family caregivers is less conclusive. For example, Butrica and Karamcheva (2014) and Lilly, Laporte, and Coyte (2010) find no wage penalty.¹⁶ Different conclusions are often explained by differences in data sources, caregiver characteristics, and care recipient characteristics. In addition to work schedules and workforce interruptions, occupational segregation, which is well-documented in the literature, also contributes to the gender wage gap (Blau, Brummund, and Liu 2013a, 2013b; Blau and Kahn 2017; Foster et al. 2020; Goldin 2014, 2015).

Occupational Segregation

Occupational segregation by gender, which is the exclusion of women and men from certain occupations and “crowding” of women and men into other occupations (Bergmann 1971, 1974; Bui, Famighetti, and Hamilton 2021; Nanda et al. 2018), shapes how women and men experience the labor market. Patterns of occupational segregation are not benign, with women consistently disproportionately represented in low-wage occupations (Gradín 2020; Nanda et al. 2018).

¹⁵ For studies on the motherhood wage gap see Anderson, Binder, and Krause (2003), Budig (2014), Budig and England (2001), Jee, Misra, and Murray-Close (2019), Mincer and Polachek (1974), Pal and Waldfogel (2016), Waldfogel (1997), Wilde, Batchelder, and Ellwood (2010), and Yu and Kuo (2017). For studies on the negative relationship between wages and caregiving see Heitmueller and Inglis (2007), Skira (2015), Van Houtven, Coe, and Skira (2013), and Wakabayashi and Donato (2005).

¹⁶ Butrica and Karamcheva (2014) investigate the U.S. context with Health and Retirement Study (HRS) data. Lilly, Laporte, and Coyte (2010) use Statistics Canada’s General Social Survey (GSS). Both studies use an instrumental variable approach to correct for endogenous caregiving decisions.

Occupational segregation by gender has declined over the last five decades, potentially reflecting many factors including an increase in women’s educational attainment and work experience, and changing societal norms (Blau, Brummund, and Liu 2013a, 2013b). Moreover Gradín (2020) provides some evidence suggesting that occupational stratification¹⁷ by gender has also declined using census and American Community Survey data from 1960 to the present. However, occupational segregation by gender remains high today even among newer occupations, such as those in the information technology industry. For example, among full-time wage and salary workers in 2019, nearly a fifth of women worked in office and administrative support occupations (19 percent) compared with only 6 percent of men (figure 5). After this, the most common occupations for women were management occupations (12 percent), health care practitioners and technical occupations (11 percent), and education, training, and library occupations (10 percent). Except for management occupations, a much smaller share of men (less than half the share of women) worked in these occupations compared with women. After management, the most common occupations for men were construction and extraction and production occupations. Less than 1 percent of women full-time employees worked in construction and extraction, 2 percent in transportation, and only about 4 percent in production occupations. This is consistent with Blau, Brummund, and Liu (2013a, 2013b) who found little progress in occupational integration¹⁸ for women with less education, which the authors attribute to the difficulty women have in obtaining jobs in male-dominated skilled trades.

Figure 6 shows the share of workers who were women (dark blue bar) and the ratio of women’s earnings to men’s earnings (yellow bar) by occupation. In several of the highest-paying occupations, including computer and mathematical, architecture and engineering, and management occupations, women comprised fewer than half of the workers. For example, women only comprised 15 percent of workers in architecture and engineering (table 2, U.S. Bureau of Labor Statistics 2020).

Within-occupation earnings gaps reported in figure 6 could be because of pay discrimination within the same jobs or the crowding out of women from relatively higher-paid roles within the broad occupational category (Blau and Kahn 2017; Foster et al. 2020). Gender pay gaps are not always large in occupations with high occupational segregation. For example, health care support workers were

¹⁷ Occupational stratification occurs when one group is segregated into the least valued or prestigious jobs. This phenomenon is different from occupational segregation, which could segregate workers into jobs of comparable value or prestige. Gradín (2020) notes that when occupation stratification exists, any negative effects of occupational segregation are exacerbated.

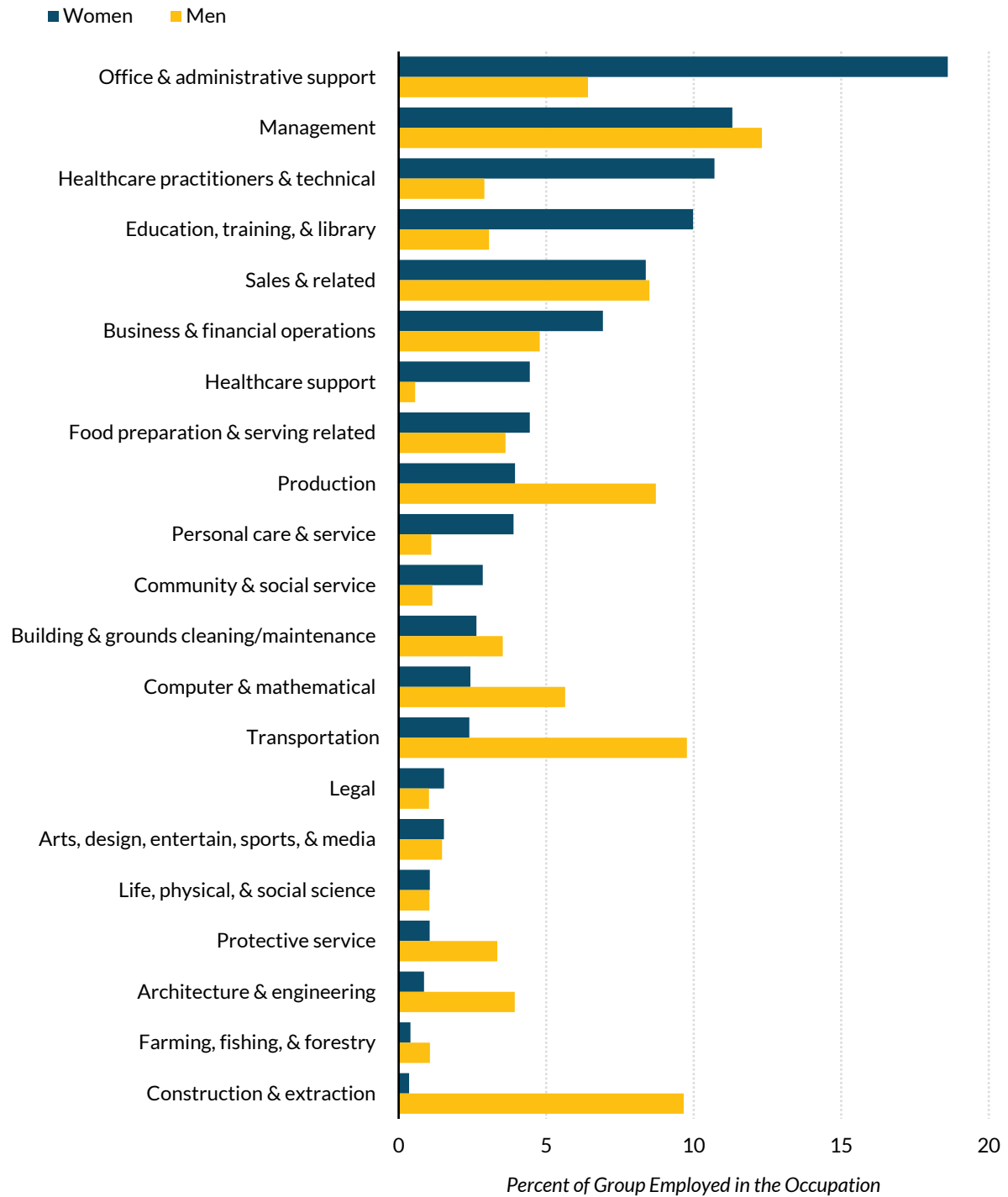
¹⁸ Blau, Brummund, and Liu (2013a, 2013b) use the traditional segregation index, defined as the proportion of women (or men) that would have to change occupations for the occupational distribution of men and women to be the same.

predominantly women (86.6 percent) and these occupations paid women 91.5 percent of what they paid men; however, these jobs were also among the lowest-paid occupations (table 2, U.S. Bureau of Labor Statistics 2020).

Using the WANTO Act's definition, nontraditional occupations in figure 6 would include construction and extraction; installation, maintenance, and repair; architecture and engineering; transportation; protective service; and farming, fishing, and forestry occupations. Computer and mathematical occupations and production occupations could also be considered nontraditional occupations because only 25.9 and 26.8 percent, respectively, of their workers were women. Of these, only in the case of protective service occupations and transportation occupations did women's earnings relative to men's fall well below the overall level of 81.5 percent. The others, especially installation, maintenance, and repair occupations (90.1 percent), had average or above average relative earnings for women.

FIGURE 5

Distribution of Occupations Among Full-Time Wage and Salary Workers in 2019, by Gender



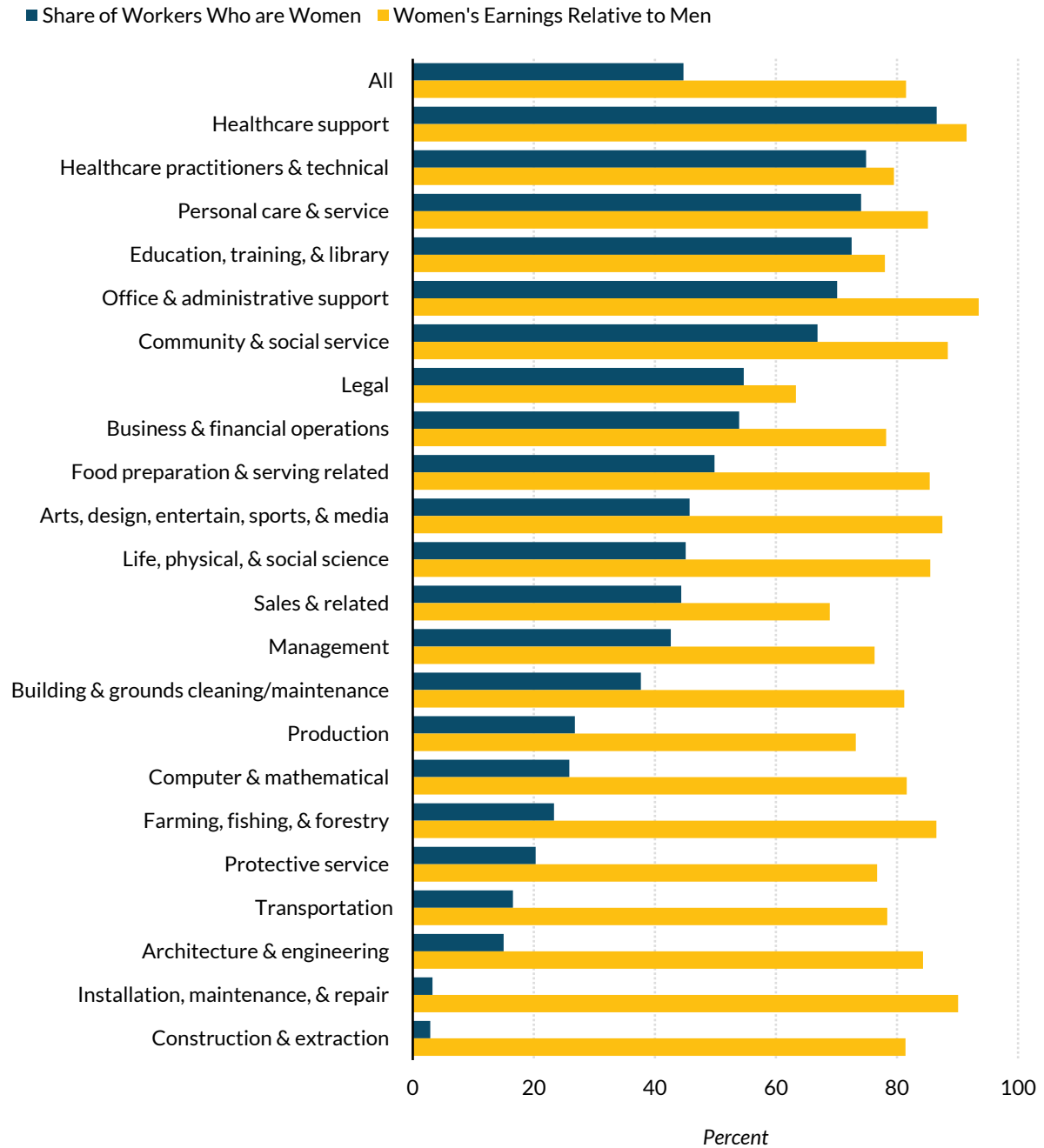
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Source: U.S. Bureau of Labor Statistics. 2020. "Highlights of Women's Earnings in 2019." Table 2, Report 1089. Washington, DC: U.S. Department of Labor.

Note: Percentages are the share of individuals in the relevant group (men or women) employed in each occupation.

FIGURE 6

Share of Full-Time Wage and Salary Workers Who Were Women and Women’s Earnings as a Percentage of Men’s Earnings in 2019, by Occupation



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Source: U.S. Bureau of Labor Statistics. 2020. “Highlights of Women’s Earnings in 2019.” Table 2, Report 1089. Washington, DC: U.S. Department of Labor.

Differences in work schedules and interruptions in work histories explain a portion of the gender wage gap; however, studies find that differences in occupation and industry drive most of the measurable difference in earnings between men and women (Blau and Kahn 2017; Chamberlain 2016; Foster et al. 2020; Goldin 2014, 2015). There remains a portion of the gender wage gap that many studies cannot statistically explain (even after controlling for demographic characteristics, human capital, work hours, work history, industry, occupation, and other factors) because it is based on unidentified or unmeasurable factors. Estimates of the size of the unexplained portion of the gap vary by data year, data source, and estimation models. Using survey data, Blau and Kahn (2017) estimate the unexplained portion to account for 38 percent of the overall gender wage gap. Combining survey and administrative data, and using detailed occupation codes, Foster and colleagues (2020) estimate the unexplained portion to be much higher—around 60 to 70 percent of the overall gender wage gap.

Discrimination is one of the factors often attributed to the unexplained portion of the gender wage gap (Blau and Kahn 2017; Foster et al. 2020), and this is discussed in the next section. However, discrimination can also be an important cause of the portion of the gender wage gap that is statistically correlated with occupation, industry, work histories, and work interruptions.

Discrimination and Harassment

Beyond pay differences, other types of gender discrimination can occur in the workplace, including gender-based differences in work assignments, promotions, and harassment. About 4 in 10 women surveyed in a nationally representative sample of 4,914 employed adults said they experienced discrimination in the workplace, including earning less, being treated as incompetent, receiving less support from senior leaders, being passed over on important assignments, and being denied promotions and turned down for jobs (Parker and Funk 2017). In a survey of 2,635 tradeswomen by Hegewisch and Mefferd (2021), 44 percent of respondents reported that they left or considered leaving the trades. Women most commonly left or wanted to leave the trades because of harassment or a lack of respect (47 percent). Of those with children under age 18 who considered leaving the industry, 69 percent cited difficulties with child care, and 63 percent cited lack of pregnancy accommodations as reasons for leaving.

Although Federal law prohibits unequal pay¹⁹ and workplace discrimination,²⁰ it still occurs. The Equal Opportunity Employment Commission (EEOC) reports that among complaints filed with the Commission in FY 2021, 35 percent were harassment allegations, 9 percent were sexual harassment, 31 were sex discrimination, 4 percent were pregnancy discrimination, and about 1 percent were related to equal pay (EEOC 2021). However, these statistics undercount the number of incidents to the extent that not everyone files official complaints.

Proving unequal pay and workplace discrimination is difficult. Only about 3 percent of harassment cases, for example, had enough evidence or “reasonable cause” to pursue reconciliations (EEOC 2021). One reason discrimination may be a difficult challenge to tackle is that it appears to intersect with other personal characteristics (and other types of biases). The theory of intersectionality recognizes that people are often disadvantaged by several sources of discrimination, such as their race and gender, and these different dimensions of identity compound and interact in different ways (Crenshaw 1989). Although its focus was on age discrimination, one report found an increase over the past 20 years in the number of age discrimination charges in EEOC charge data that also alleged race, gender, or disability discrimination (Lipnic 2018).

¹⁹ According to the Equal Opportunity Employment Commission, equal pay and compensation is protected under several federal laws. Those enforced by the EEOC are the [Equal Pay Act of 1963](#), [Title VII of the Civil Rights Act of 1964](#), the [Age Discrimination in Employment Act of 1967](#), and [Title I of the Americans with Disabilities Act of 1990](#), accessed September 9, 2022.

²⁰ Workplace discrimination is illegal under several federal laws, including Title VII of the Civil Rights Act of 1964, the Age Discrimination in Employment Act of 1967 (ADEA), the Pregnancy Discrimination Act (PDA) of 1978 (an amendment to Title VII of the Civil Rights Act of 1964), and Title I of the Americans with Disabilities Act of 1990.

Women in Apprenticeships

An apprenticeship is a form of sectoral training that combines classroom learning with paid on-the-job training (OJT) from experienced mentors and provides an industry-recognized credential upon completion (Lerman, Loprest, and Kuehn 2020). Evidence suggests that apprenticeships can substantially increase career earnings (Hollenbeck and Huang 2016; Reed et al. 2012). Analysis of earnings trends for apprentices supported by the AAI grant program finds that women in apprenticeship programs experienced faster earnings gains (62 percent growth over 14 quarters) than men (36 percent growth) in apprenticeship programs (Katz et al. 2022). However, numerous studies document that women are less likely than men to participate in apprenticeships (Berik, Bilginsoy, and Williams 2011; Gardiner et al. 2021; Reed et al. 2012).

Past research found that women have lower registered apprenticeship completion rates than men (Berik, Bilginsoy, and Williams 2011; Reed et al. 2012). Berik, Bilginsoy, and Williams (2011) examine Oregon apprenticeship completion rates, duration of completed apprenticeships, and completed on OJT hours for white women, white men, and men of color from 1991 through 2007.²¹ The authors found that white women were less likely than white men to complete apprenticeships. Among those who dropped out, women completed fewer OJT hours but averaged longer apprenticeships than men. Among those who completed their apprenticeships, women had shorter programs than men. The authors also found that joint sponsorship programs (i.e., programs that are sponsored by a joint labor-management organization) were associated with higher completion rates—especially for white women and men of color.

Women apprentices also train for different occupations than men. Reed and colleagues (2012) find that most women in registered apprenticeship programs at the time were in social services, while most men were in the building trades. The authors describe how social services apprenticeships differ from skilled trades apprenticeships—including the relative lack of opportunities for career progression and wage gains.

Apprenticeships have the potential to increase the number of women in nontraditional occupations because they provide employers with a strategy for hiring and training workers who otherwise might not have been hired. Greater inclusion of women in traditionally male-dominated occupations through apprenticeships could also reduce discrimination among employers and coworkers by challenging stereotypes and biases. Moreover, many male-dominated occupations pay more than female-

²¹ Oregon had an insufficient number of women of color for separate analysis.

dominated occupations. Access to these higher-paying male-dominated occupations through apprenticeships and the skills that apprenticeships provide could increase women’s earnings and put them on a career path that includes future training and earnings growth. Early evidence from the evaluation of the AAI grants suggests that registered apprenticeships may help close the gender pay gap. Using wage records on AAI apprentices, Katz and colleagues (2022) find that women experienced faster wage growth than men, which was also faster than a comparable group of nonapprentice workers. However, women have historically been underrepresented in apprenticeship. The next section describes women’s recent experiences in registered apprenticeship programs.

Trends in Women’s Participation in Apprenticeship

This section analyzes trends in women’s participation in apprenticeship using public-use data from the RAPIDS updated through the second quarter of 2022. RAPIDS is the administrative data used by the Office of Apprenticeship (OA) in the 25 states where apprenticeship programs register with OA and in 18 additional states where apprenticeship programs register with a state apprenticeship agency that either reports to RAPIDS or provides data on apprentices to the DOL Office of Apprenticeship.²²

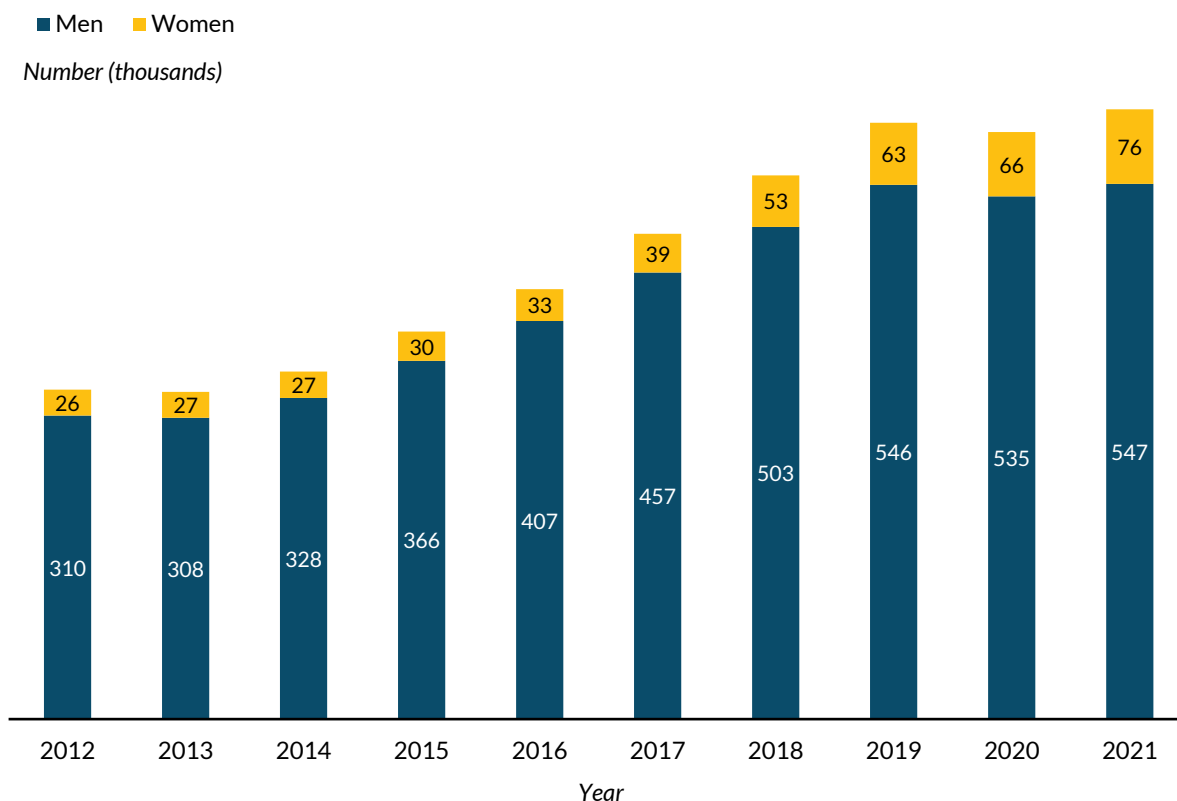
The number of active registered apprentices (i.e., apprentices who are currently registered in an apprenticeship program and have not completed or canceled their program) in RAPIDS increased from around 336,000 in 2012 to 609,000 in 2019 (figure 7). It declined slightly in 2020, possibly because of the COVID-19 pandemic, but increased further to nearly 624,000 in 2021. The number of women apprentices (shown in yellow, figure 7), also increased over time from over 26,000 in 2012 to 76,000 in 2021. The share of new, active, and completing apprentices who were women also increased during this period (figure 8). Between 2012 and 2017, just under 8 percent of active registered apprentices were women (shown in blue, figure 8). This share increased steadily after 2017 and reached 11.6 percent in 2021.²³

²² Washington state, Oregon, Minnesota, Vermont, and the District of Columbia were not included in RAPIDS at the time that these data were accessed. Accessed September 9, 2022, from “FY 2021 Data and Statistics,” U.S. Department of Labor. Currently RAPIDS data is no longer posted to the U.S. Department of Labor website. Several current and past WANTO grantees have operated in some of these states.

²³ The Office of Apprenticeship reported that women’s share of active apprenticeships increased to 13.8 percent for FY 2022, which is based on a point in time estimate of women’s participation in apprenticeship in August 2022. See “Women in Apprenticeship,” U.S. Department of Labor, accessed September 9, 2022. For this report, RAPIDS data was only publicly available through the end of the second quarter of 2022.

The experience of new apprentices is similar. Between 2012 and 2021, the share of new apprentices who were women (shown in yellow, figure 8) increased from 7.9 to 17.0 percent. More women need to start apprenticeships to increase the share of active apprentices who are women. Although enrollment rates are increasing, women’s representation in apprenticeship also depends on their retention and completion. Women accounted for 7.3 percent of all completed apprenticeships in 2012 (shown in black, figure 8), similar to their share of active apprentices. After 2012, women’s share of completed apprenticeships fluctuated before rising steadily over the last five years from 8.5 percent in 2017 to 13.6 percent in 2021.

FIGURE 7
Number of Active Apprentices, by Gender and Year, 2012 to 2021



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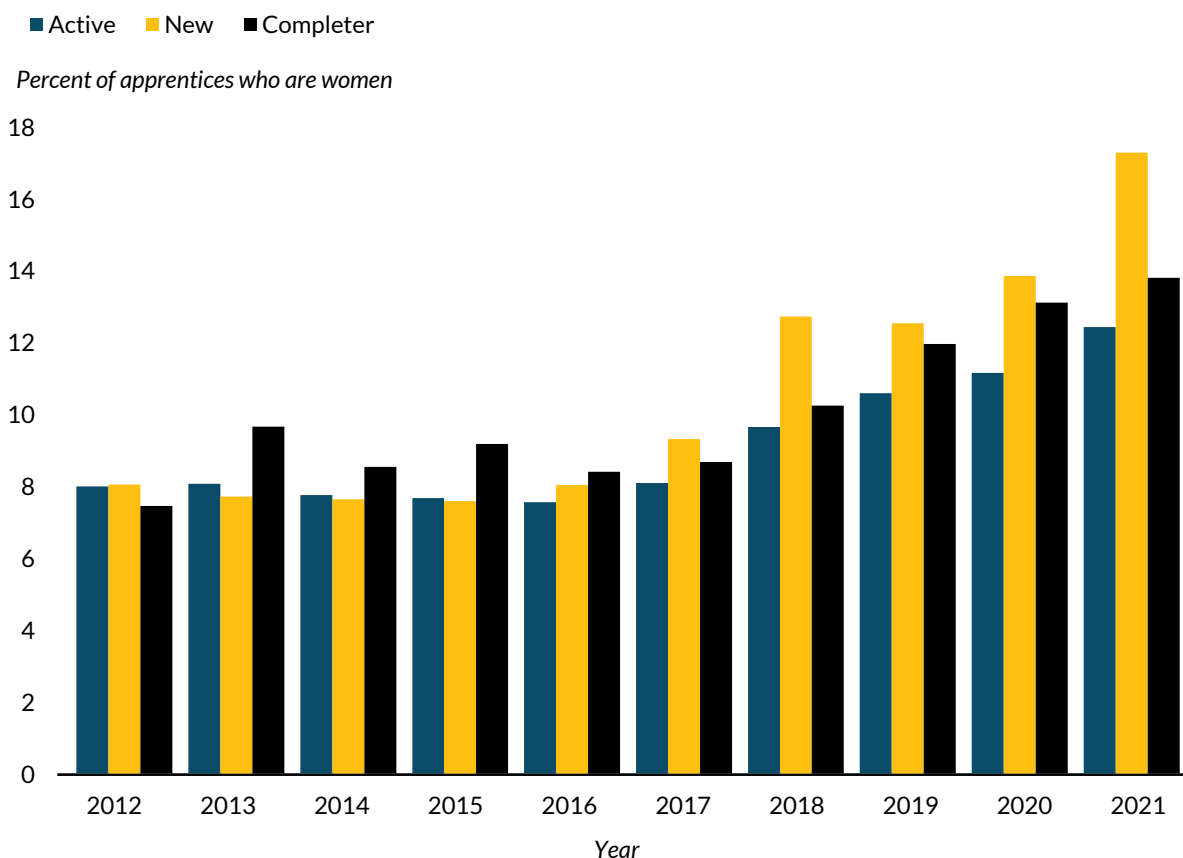
Source: Authors’ analysis of the Registered Apprenticeship Partners Information Data System (RAPIDS) data.

Notes: Apprentices are restricted to those in programs in states that report to the RAPIDS database or nationally registered programs. Active apprentices are defined as apprentices who were registered at some point during the year, including those who started or ended their apprenticeship during the year.

Women’s share of completed apprenticeships generally tracks their share of new apprenticeships (figure 8), but it is also important to compare program completion rates. Apprenticeship programs can

take several years to complete, so completion rates can only be assessed for cohorts of apprentices that have had sufficient time to complete their programs. Women who registered as apprentices in 2015, and therefore had at least six years to complete their program, had a 48.3 percent completion rate, compared with a 44.7 percent completion rate for their male counterparts (not shown), suggesting the possibility of an improvement in the years since Berik, Bilginsoy, and Williams (2011) and Reed and colleagues (2012) found lower completion rates for women.

FIGURE 8
Share of All Active, New, and Completing Apprentices Who Were Women, by Year, 2012 to 2021



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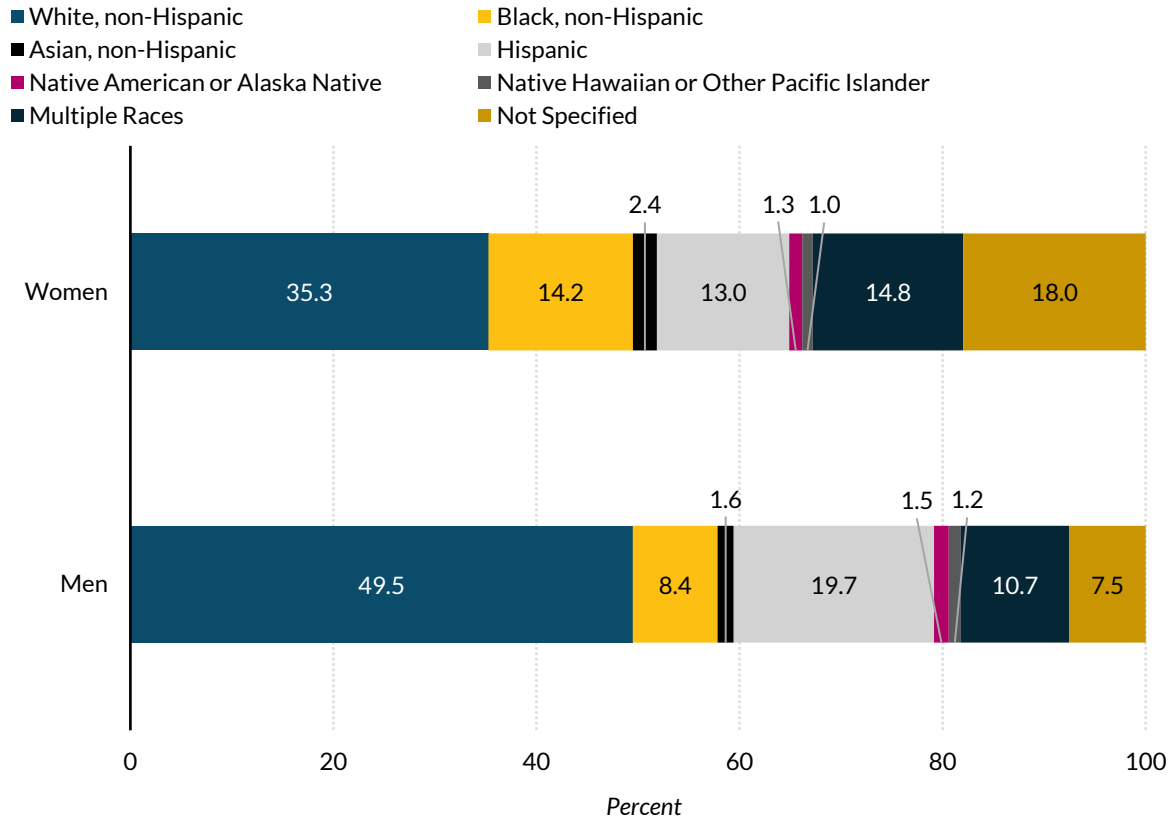
Source: Authors' analysis of Registered Apprenticeship Partners Information Data System (RAPIDS) data.

Notes: Apprentices are restricted to those in programs in states that report to the RAPIDS database or nationally registered programs. Active apprentices are defined as apprentices who were registered at some point during the year, including those who started or ended their apprenticeship during the year. New apprentices are apprentices who register during the year. Completers are apprentices who completed their apprenticeships during the year.

The racial and ethnic composition of active apprentices differs for women and men (figure 9). In 2021, the share of women apprentices who were Black (14.2 percent) was 1.69 times higher than the

share of men apprentices who were Black (8.4 percent). Asians comprised a small percentage of apprentices but made up a slightly larger share of women apprentices (2.4 percent) than men apprentices (1.6 percent). In contrast, whites comprised a smaller share of women apprentices (35.3 percent) than men apprentices (49.5 percent). Hispanics also comprised a smaller share of women apprentices (13.0 percent) than men apprentices (19.7 percent).

FIGURE 9
Race and Ethnicity of Active Apprentices in 2021, by Gender



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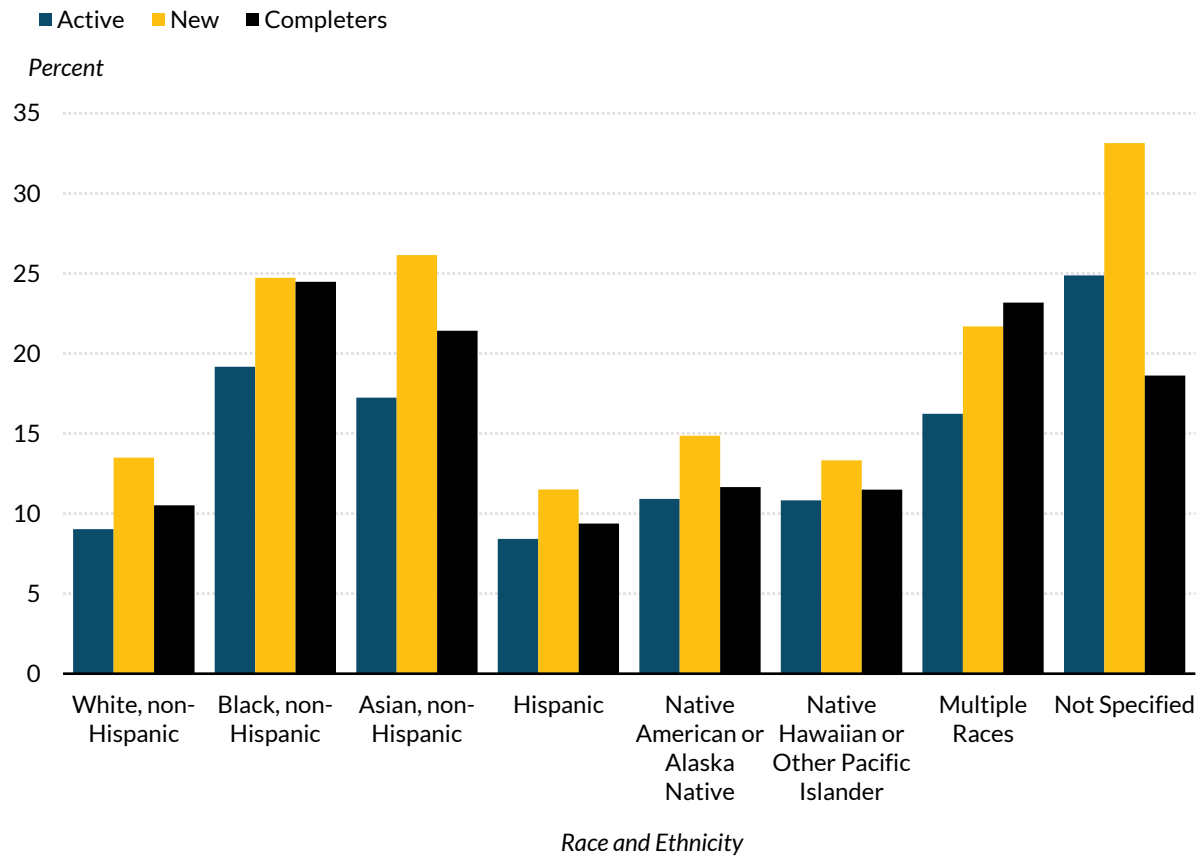
Source: Authors' analysis of Registered Apprenticeship Partners Information Data System (RAPIDS) data.

Notes: Apprentices are restricted to those in programs in states that report to the RAPIDS database or nationally registered programs. Active apprentices are defined as apprentices who were registered at some point during the year, including those who started or ended their apprenticeship (through either completion or cancellation) at some point during the year.

Among those who provided a race or ethnicity in RAPIDS in 2021, active Black apprentices and Asian apprentices had the largest shares of women (19.2 percent and 17.2 percent, respectively, figure 10). Similarly, a higher share of newly registered Black and Asian apprentices were women compared with apprentices of other races and ethnicities (24.7 and 26.1 percent, respectively). Women comprised

only 13.5 percent of new white apprentices, 11.5 percent of new Hispanic apprentices, 14.9 percent of new Native American or Alaska Native apprentices, and 13.3 percent of new Native Hawaiian or Other Pacific Islander apprentices.

FIGURE 10
Share of Apprentices in 2021 Who Were Women, by Apprenticeship Status and Race and Ethnicity



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Source: Authors' analysis of Registered Apprenticeship Partners Information Data System (RAPIDS) data.

Notes: Apprentices are restricted to those in programs in states that report to the RAPIDS database or nationally registered programs. Active apprentices are defined as apprentices who were registered at some point during the year, including those who started or ended their apprenticeship during the year. Active apprentices are defined as apprentices who were registered at some point during the year, including those who started or ended (through either completion or cancellation) their apprenticeship at some point during the year. New apprentices are apprentices who register during the year. Completers are apprentices who completed their apprenticeships during the year.

Among apprentices active in 2021, who provided their age at the start of their program,²⁴ the average starting age was 29.3 years (table 2). Women apprentices were older on average (32 years old) at the start of their program than men (28.9 years old). The share of women apprentices between the ages of 16 and 24 was smaller than the share of apprentices who were men (30.3 percent compared with 38 percent). The DOL OA considers apprentices in this age range to be “youth apprentices” and is investing in these younger apprentices through the Youth Apprenticeship Readiness Grants (YARG) program, awarded in June 2020 and continuing for 48 months.²⁵ The share of women apprentices was lower than men for the age group 16 to 34 but was higher than men's share for the age groups older than 35 years old, including 5 percent of women apprentices ages 55 and older.

TABLE 2
Distribution of Starting Age for Apprentices Active in 2021, by Gender

	All Active Apprentices	Active Women Apprentices	Active Men Apprentices
Average starting age (years)	29.3	32.0	28.9
Starting age categories (% of total)			
Total	100.0	100.0	100.0
16–19	8.5	6.9	8.7
20–24	28.6	23.4	29.3
25–34	40.0	36.6	40.4
35–44	15.1	18.2	14.7
45–54	5.8	10.0	5.3
55–64	1.9	4.3	1.5
65+	0.2	0.7	0.2

Source: Authors' analysis of Registered Apprenticeship Partners Information Data System (RAPIDS) data.

Notes: Apprentices are restricted to those in programs in states that report to the RAPIDS database or nationally registered programs. Rows may not add up to 100 percent due to rounding.

Apprenticeship Occupations

Fewer women held apprentices registered in major occupational categories²⁶ where most apprentices active in 2021 were women (29,183 women apprentices) compared with occupations where the majority of apprentices were men (44,864 women apprentices, table 3). This seems counterintuitive,

²⁴ For registered apprentices active in 2021 and reporting to the Registered Apprenticeship Partners Information Data System (RAPIDS) data, 7.5 percent did not report an age at the start of their apprenticeship program.

²⁵ “Youth Apprenticeship Readiness Grant,” U.S. Department of Labor, accessed July 21, 2022.

²⁶ This analysis uses two-digit Standard Occupational Classification (SOC) codes to define major occupational categories.

but the reason that the number of women apprentices in male-dominated occupations is higher than in female-dominated occupations is that male-dominated occupations are much more prevalent in the apprenticeship system compared with other occupations. For example, approximately two-thirds of all apprentices are registered in the building trades. Thus, although women made up a small share of all apprentices in construction, because so many construction apprentices exist, over one in four women apprentices registered in these programs.

TABLE 3

Number and Share of Active Apprentices Who Were Women in 2021, by Occupation

Major Occupation	Women Apprentices as a Share of All Apprentices in Each Occupation	Women Apprentices in Each Occupation as a Share of All Women Apprentices	Number of Women Apprentices
All Occupations	12	100	76,233
Health care support	91	12	9,280
Health care practitioners and technical	81	13	10,238
Educational instruction and library	79	1	593
Legal	79	0	15
Sales	65	1	1,134
Community and social service	61	1	908
Personal care and service	59	9	7,015
Food preparation and serving	49	2	1,794
Management	49	4	2,868
Office and administrative support	48	2	1,154
Business and financial operations	46	1	987
Computer and mathematical	32	3	2,066
Life, physical, and social science	29	0	187
Arts, design, entertainment, sports, and media	29	0	344
Protective service	19	5	3,805
Farming, fishing, and forestry	19	0	39
Architecture and engineering	16	2	1,233
Building and grounds cleaning/maintenance	14	1	707
Transportation and material moving	14	4	2,834
Production	11	4	3,030
Construction and extraction	5	27	20,342
Installation, maintenance, and repair	5	5	3,474
Not identified	13	3	2,186

Source: Authors' analysis of Registered Apprenticeship Partners Information Data System (RAPIDS) data.

Notes: Percentages are rounded to the nearest whole number. Apprentices are restricted to those in programs in states that report to the RAPIDS database or nationally registered programs. Occupations are defined using the two-digit standard occupational classification (SOC) codes.

Women apprentices are well represented in occupations that are traditionally female-dominated. In health care support occupations, for example, women comprised 91 percent of registered apprentices in 2021. In contrast, women comprised only 14 percent of transportation and material moving apprentices, 11 percent of production apprentices, 5 percent of construction and extraction apprentices, and 5 percent of installation, maintenance, and repair apprentices (table 3)—occupations that are traditionally male-dominated (Nanda et al. 2018). Table 4 compares the top 10 detailed apprenticeship occupations for the number of women and men apprentices in 2021 and their median wages. Those shaded in gray are among the top 10 occupations both for women and for men. Nursing assistants and pharmacy technicians ranked first and second for women and comprised 9 and 6 percent, respectively, of all female apprentices. The median starting wage for women in nursing assistant and pharmacy technician apprentices was \$13.50 and \$12.00, respectively. The top four detailed occupations for male apprentices were among the top 10 occupations for female apprentices, but for women, they ranked third, fifth, sixth, and eighth respectively, and these occupations comprised far fewer women than men. For example, electrician was the top occupation for men, but the third for women. There were 96,945 male electrician apprentices, but only 4,114 female electrician apprentices. Among all apprentices, electricians comprised 18 percent of men, but only 6 percent of women. Women in electrician apprenticeship programs had a median starting wage of \$15.00 compared with \$14.30 for men. The top 10 occupations for women with the highest median starting wage was \$26.50 for registered nurses, with 2,909 women registered in 2021. The top 10 occupations for women with the lowest median starting wage was \$9.09 for child care workers, with 2,508 women registered in 2021.

TABLE 4

Top 10 Detailed Occupations Among Active Apprentices in 2021, by Gender

Detailed Occupation	Number of Apprentices within Gender in Occupation	Percent of Apprentices within Gender in Occupation	Median Wage within Gender in Occupation
Women			
<i>Nursing assistants</i>	6,568	9	\$13.50
<i>Pharmacy technicians</i>	4,517	6	\$12.00
<i>Electricians</i>	4,114	6	\$15.00
<i>Registered nurses</i>	2,909	4	\$26.50
<i>Carpenters</i>	2,878	4	\$17.46
<i>Plumbers, pipefitters, and steamfitters</i>	2,747	4	\$17.10
<i>Child care workers</i>	2,508	3	\$9.09
<i>Heavy and tractor-trailer truck drivers</i>	2,470	3	\$10.70
<i>Hairdressers, hairstylists, and cosmetologists</i>	2,030	3	\$15.00
<i>Construction laborers</i>	1,987	3	\$18.78
Men			
<i>Electricians</i>	96,945	18	\$14.30
<i>Plumbers, pipefitters, and steamfitters</i>	64,149	12	\$16.75
<i>Carpenters</i>	48,269	9	\$18.17
<i>Construction laborers</i>	26,915	5	\$19.12
<i>Electrical power-line installers and repairers</i>	17,323	3	\$24.64
<i>Heavy and tractor-trailer truck drivers</i>	15,486	3	\$12.50
<i>Sheet metal workers</i>	14,637	3	\$16.96
<i>Structural iron and steel workers</i>	13,858	3	\$18.53
<i>Heating, air conditioning, and refrigeration mechanics installers</i>	11,837	2	\$16.00
<i>Roofers</i>	9,332	2	\$17.93

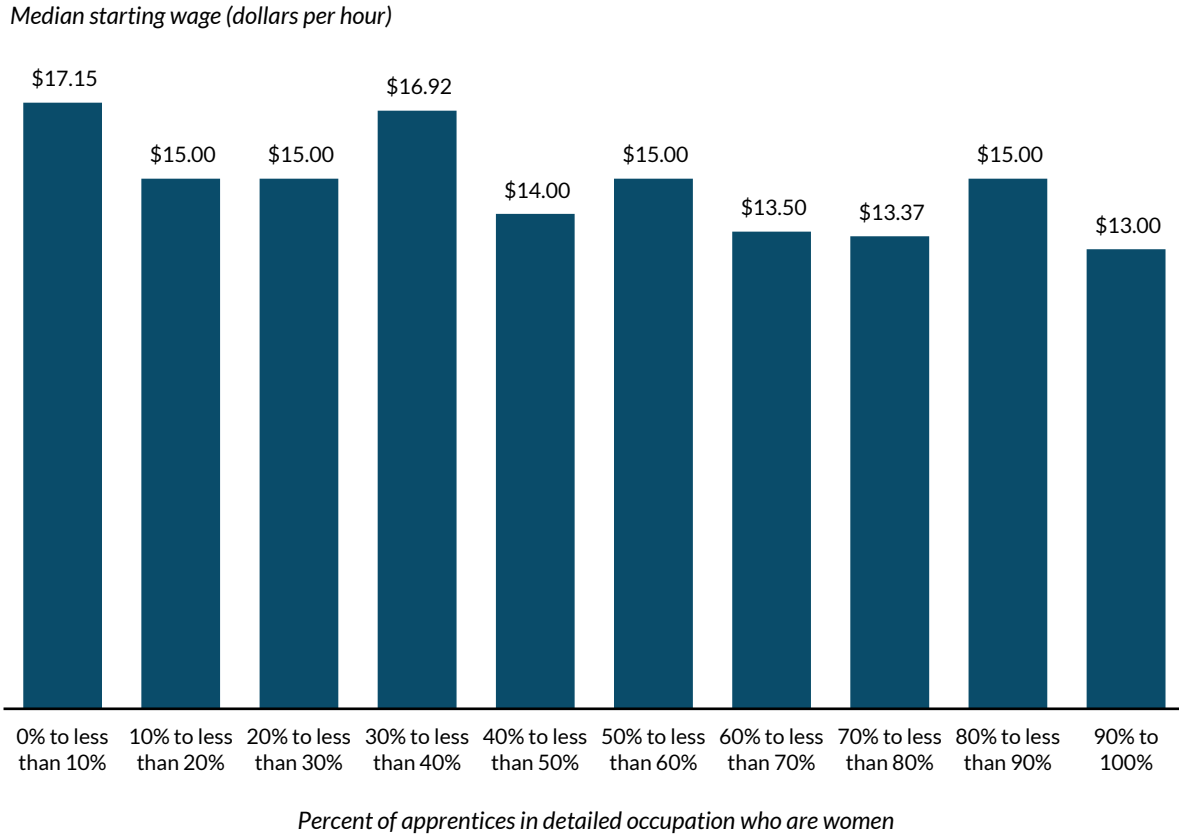
Source: Authors' analysis of Registered Apprenticeship Partners Information Data System (RAPIDS) data.

Notes: Apprentices are restricted to those in programs in states that report to the RAPIDS database or nationally registered programs. Occupations are defined using the six-digit standard occupational classification (SOC) codes. The shaded occupations are those that overlap between women and men. Median wages are nominal dollars.

In the national labor market, occupations with a higher percentage of women pay less than those with a lower share of women (Gradín 2020; Nanda et al. 2018). This occupational segregation explains as much as half of the gender pay gap (Bayard et al. 2003). In addition to being crowded into low-paying occupations, Levanon and colleagues (2009) find that as these occupations become more feminized, pay in the occupation declines as the labor market devalues feminized skills and jobs. In the registered apprenticeship system, starting wages are also lower for occupations that include a higher share of women (figure 11). Median starting wages in 2021 for detailed occupations where 90 to 100 percent of apprentices were women were \$13.00, compared with a median starting wage of \$17.15 for detailed occupations where 0 to 10 percent were women.

FIGURE 11

Median Starting Wages for all Active Apprentices by Percent of Apprentices in Detailed Occupation Who Were Women, 2021



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Source: Authors' analysis of Registered Apprenticeship Partners Information Data System (RAPIDS) data.

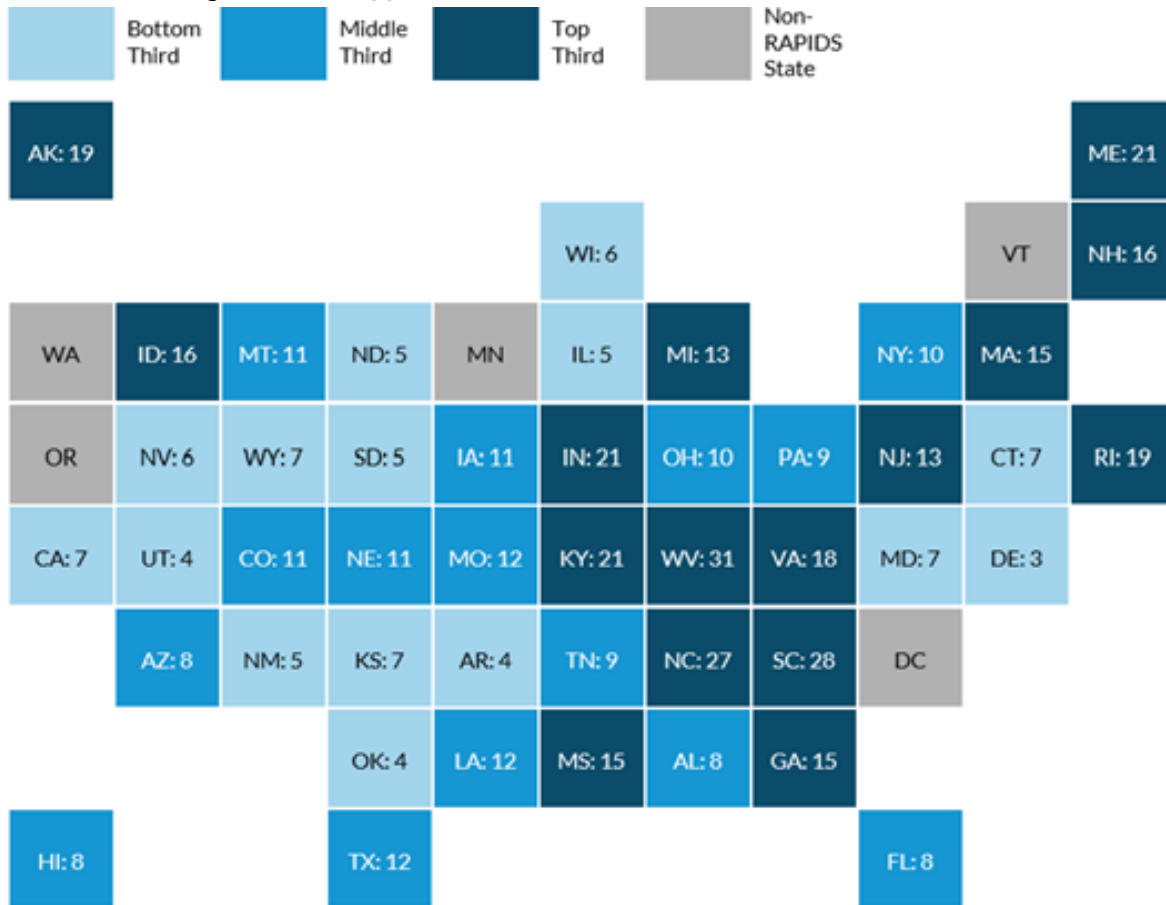
Notes: Apprentices are restricted to those in programs in states that report to the RAPIDS database or nationally registered programs. Occupations are defined using the six-digit standard occupational classification (SOC) codes.

State Variation in Women in Apprenticeships

Across the U.S. in 2021, substantial variation existed in the share of apprenticeships held by women (figure 12). Ranking states by the share of apprentices who were women, states in the top third are shown in dark blue, those in the middle are in lighter blue, and those in the bottom third are shown in light blue. Even within these terciles, large variation existed. West Virginia, South Carolina, and North Carolina had the largest share of apprentices who were women (31, 28, and 27 percent, respectively). Also in the top third were Michigan and New Jersey with 13 percent of apprentices who were women. The bottom third included Arkansas, Oklahoma, and Utah with 4 percent of apprentices who were women, as well as Delaware with only 3 percent of apprentices who were women.

FIGURE 12

States' Percentage of Active Apprentices Who Were Women, 2021



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Source: Authors' analysis of Registered Apprenticeship Partners Information Data System (RAPIDS) data.

Notes: Apprentices are restricted to those in programs in states that report to the RAPIDS database or nationally registered programs. The percentage of active apprentices in 2021 who are women are indicated for each state in the map.

In some cases, a state's apprenticeship expansion strategy is related to the share of apprentices who are women. For example, Kuehn (2017) notes that South Carolina's high share of women apprentices is associated with efforts by the state agency responsible for apprenticeship expansion to register new programs in occupations without a strong history of apprenticeship. Many of these occupations, such as pharmacy technicians, traditionally employ women at high rates (Kuehn 2017).

Addressing Barriers to Women in Apprenticeships

Consistent with previous studies, the above statistics show that women are underrepresented in apprenticeships even though their numbers continue to increase over time. Many of the barriers

women face in entering and completing apprenticeships are similar to those they face in other employment opportunities. Reed and colleagues (2012) find that women participating in registered apprenticeship programs reported that lack of child care, cost of child care, and disproportionate child care responsibilities, especially those resulting in tardiness or absenteeism, made participating in the program a challenge. In addition, when surveyors asked apprentices in a recent survey of tradeswomen how often they are treated equally to men, 11 percent reported that they were never or rarely treated equal in the classroom. Women also reported never or rarely experiencing equal treatment in other aspects of their apprenticeship, including safety (13 percent), hours of work (13 percent), access to overtime (16 percent), use of tools (16 percent), hiring (18 percent), respect (19 percent), OJT (19 percent), work assignments (22 percent), layoffs (26 percent), leadership development (30 percent), and promotions (31 percent). Additionally, the survey revealed that 43 percent of apprentices left or considered leaving the trades and that more than half of these women cited harassment and lack of respect as their reason (Hegewisch and Mefferd 2021).

Pre-apprenticeships are one way to increase women's access to apprenticeships. Wagner and Kulwicz (2020) interviewed women in trades and found that pre-apprenticeship programs were key to their entry into trades occupations. Kelly, Wilkinson, and Nuñez (2019) evaluated two construction pre-apprenticeship programs for Oregon and found that pre-apprenticeships had a significant effect on supporting racial equity in the construction workforce, especially for women. The authors found that 22 percent of white women apprentices and 32 percent of women of color apprentices entered construction via a pre-apprenticeship. Kelly and colleagues (2022) evaluated Oregon's Highway Construction Workforce Development program and find that pre-apprenticeships improved the recruitment of women into the trades. In their evaluation of the AAI grant program, Gardiner and colleagues (2021) find that a larger proportion of pre-apprentices than apprentices include those from underrepresented populations and that pre-apprentices represented greater diversity in gender and race and ethnicity than apprentices. In particular, the authors reported that women comprised 36 percent of AAI pre-apprentices, compared with only 26 percent of AAI apprentices.

Kelly, Wilkinson, and Nuñez (2019) find that pre-apprenticeships offer support to retain workers through apprenticeships and beyond. Pre-apprenticeships provide skills and knowledge to help students succeed in the construction trades. The authors also emphasize the importance of ongoing support that pre-apprenticeship programs can provide (e.g., mentoring) to promote retention. Kelly and colleagues (2022) find in a study of 5,457 apprentices that apprenticeship supportive services had a

positive association with apprenticeship completion.²⁷ Gardiner and colleagues (2021) found that most AAI apprenticeship programs (69 percent) and AAI pre-apprenticeship programs (76 percent) provided supportive services to apprentices and pre-apprentices—including, among other things, dependent care assistance for primary caretakers. Given their importance for increasing the number and retention of tradeswomen, Wagner and Kulwiec (2020) suggest that pre-apprenticeships should be embraced by unions, contractors, and nonprofit organizations to strengthen their existing apprenticeship programs and provide a pipeline for women into construction apprenticeship programs.

Barriers to creating a more equal labor market for women, and other underrepresented groups, exists at all stages of the career pathway—education, training, pre-apprenticeships, hiring into apprenticeships and other jobs, promotion, and retention (Hegewisch and Mefferd 2021). In addition to pre-apprenticeships and supportive services, addressing bias in career materials and classroom curriculum, mentoring, and targeted recruitment are some of the education and workplace strategies identified in the literature by Nanda and colleagues (2018) for increasing women’s enrollment, retention, and graduation rates in STEM fields and women’s employment, retention, and advancement in nontraditional occupations. Additionally, Ng and Acker (2020) note that increasing women’s representation in unions and their role in the collective bargaining process can help shape hiring and retention strategies that address the needs of women. For example, Vicki O’Leary, an ironworker and member of the Ironworkers International union, led successful campaigns to provide paid leave benefits for pregnant women and new mothers and to encourage coworkers to not be bystanders to workplace harassment.²⁸ Women in the labor movement also lead efforts to influence the behavior of their male colleagues to combat harassment on the job. O’Leary also spearheaded the “Be That One Guy,” which teaches and encourages men in the trades to speak up when they see other men harassing women on the job. The premise of “Be That One Guy” is that women in the trades face professional and personal risks when they confront harassment and can benefit from being backed up by their male colleagues.²⁹

Activities by WANTO grantees can help women break through these barriers. Hegewisch and Mefferd (2021) cite a recent survey of female apprentices where nearly a third of respondents

²⁷ Supportive services included nonfinancial services (such as a budget class, mentoring, and referrals to other services), job readiness supplies (such as work tools, work clothing, and personal protective equipment for first-year apprentices), and child care subsidies).

²⁸ “ENR Honors Woman for Work in Preventing Workplace Harassment,” Cision Pr Newswire, accessed February 3, 2023.

²⁹ “Be That One Guy: Ironworkers Leading the Industry in Diversity and Inclusion,” The Ironworkers, September 2018 Issue, 4-6.

completed a woman-only pre-apprenticeship program, which some WANTO grantees also support.³⁰ Additionally, a study by Mastracci (2005) measures the effectiveness of WANTO grants and Nontraditional Employment for Women (NEW) grants on women's employment in nontraditional occupations.³¹ The author found that the grants increased the probability of women being employed in nontraditional occupations by 5 to 15 percent.

One potential model for strengthening women's participation in apprenticeship training and nontraditional occupations is to support training cohorts exclusively composed of women. Chuang (2019) argues that these women-only training programs can provide a "supportive and comfortable learning environment" for obtaining occupational skills and professional development. Rommes, Faulkner, and Slooten (2005) find that women-only training programs in information technology occupations can provide participants with same-gender role models, mutual support between training participants, and an increased willingness to speak openly about barriers and concerns. Although some qualitative research has been conducted on the design and experiences of women who participate in women-only training programs, no rigorous impact studies of the effect of this training model on outcomes for women exist. Some pre-apprenticeship programs supported by WANTO grantees may be gender exclusive. Grantees' utilization of and experiences with any gender exclusive pre-apprenticeship or apprenticeship training will be documented in the descriptive study of the WANTO grants.

³⁰ The descriptive study of the WANTO grants will quantify how many WANTO grantees use this strategy.

³¹ The Nontraditional Employment for Women Act (NEW) offered states incentives to provide training to low-income women (Nanda et al. 2018).

WANTO Grantees for 2020 and 2021

The goal of the WANTO program is to support women’s participation and success in industries and occupations in which women have been traditionally underrepresented or disproportionately concentrated in lower-wage jobs. Such industries include but are not limited to advanced manufacturing, construction, energy, information technology, finance, and transportation.³² Some apprenticeship expansion efforts at the state and federal level, such as targeted expansion in nontraditional occupations in South Carolina, have improved women’s participation in apprenticeship by actively registering programs in female-dominated occupations (Kuehn 2017). WANTO is unique in its focus on making all jobs accessible and inclusive of women, including those in male-dominated industries that tend to be higher paid. To this end, WANTO grants support one or more of the following activities:

- pre-apprenticeship, youth apprenticeship, registered apprenticeship, and nontraditional skills training programs to prepare women for A/NTO careers
- orientations and technical assistance for employers, unions, and workers on creating a conducive environment for women to succeed in A/NTO careers
- facilitation of support groups, networks, and supportive services to improve the retention of women in A/NTO careers

Unlike other DOL investments in apprenticeship, only CBOs are eligible to be WANTO grantees. Grantees in the 2020 and 2021 cohorts can spend no more than 15 percent of their grant funds on supportive services, such as child care, housing, transportation, job-related equipment and gear, and job-related tuition costs, to ensure women’s participation in technical assistance activities.³³ Depending on the total funding available, DOL awards WANTO grants annually to varying numbers of grantees and for varying award amounts. In a given year, most grantees receive similar amounts of funding. In FY 2020, the WANTO grant program awarded a total of \$4,100,000 to six grantees:³⁴

- Apprenticeship and Nontraditional Employment for Women (ANEW)
- Center for Employment Training (CET)
- Chicago Women in Trades (CWIT)

³² “FOA-WB-22-15 Women in Apprenticeship and Nontraditional Occupations (WANTO) Technical Assistance Grant Program,” U.S. Department of Labor, accessed July 21, 2022.

³³ The 2022 WANTO grants will permit grantees to spend up to 25 percent of their budget on supportive services. See U.S. Department of Labor, accessed July 21, 2022.

³⁴ “U.S. Department of Labor Awards \$4.1 Million to Increase Women Participation in Apprenticeship, Expand Job Opportunities,” U.S. Department of Labor, accessed July 21, 2022.

- Gang Alternatives, Inc.
- Goodwill Industries of East Texas, Inc. (GIET)
- Workforce Development Board of Herkimer, Madison, and Oneida Counties (WDB)

In FY 2021, the WANTO grant program awarded \$3,349,936 to five grantees:³⁵

- Moore Community House, Inc.
- Per Scholas, Inc.
- SERJobs for Progress of the Texas Gulf Coast, Inc. (SERJobs)
- Tradeswomen, Inc. (TWI)
- Wisconsin Regional Training Partnership, Inc. (WRTP)

In August 2022, DOL announced that the award of five WANTO grants totaling \$3,400,000 to address the underrepresentation of women in registered apprenticeships and in high-growth, high-wage STEM occupations. DOL awarded four grants to organizations that have been prior WANTO grant recipients, including two FY 2020 WANTO grantees (Chicago Women in Trades and Apprenticeship and Nontraditional Employment for Women) and two grantees from FY 2019 and prior (Hampton Roads Workforce Council and Nontraditional Employment for Women). DOL awarded one grant to a new organization (Fresh Start Women’s Foundation).³⁶

Grantee Industries, Target Populations, and Geography

Most of the FY 2020 and 2021 grantees (8 out of 11) focus their programs on helping women enter construction trades, including welding, carpentry, plumbing, and electrical (table 5). Three grantees, Goodwill Industries of East Texas, Inc. (GIET), Per Scholas, Inc., and Workforce Development Board of Herkimer, Madison, and Oneida Counties (WDB), have programs dedicated to information technology, which, according to past awards, is a relatively new focus. In addition to the construction trades, grantee programs will focus on other industries that include advanced manufacturing (Moore Community House, Inc.), truck driving (CET), commercial driving (SERJobs), automotive specialists (CET), and transit (CWIT).

Four grantees indicated low-income women as their target population (CET, GIET, Per Scholas, Inc., and WRTP). Other grantees specified women of color as their target population (Moore Community

³⁵ “U.S. Department of Labor Announces \$3.3M in Grants to Expand Job Opportunities for Women in Apprenticeships, Nontraditional Occupations,” U.S. Department of Labor, accessed July 21, 2022.

³⁶ “U.S. Department of Labor Announces \$3.4M in Grants to Expand Job Opportunities for Women in Apprenticeships, Nontraditional Occupations,” U.S. Department of Labor, accessed September 9, 2022.

House, Inc., Per Scholas, Inc., SERJobs, TWI, and WRTP). Apprenticeship and Nontraditional Employment for Women (ANEW) identified Native American women as a target population. Other target populations include women in rural areas (ANEW), women with disabilities (Moore Community House, Inc., Per Scholas, Inc., SERJobs, and TWI), women veterans (ANEW, Moore Community House, Inc., and TWI), refugee women (WDB), formerly incarcerated women (Moore Community House, Inc. and TWI), and single mothers (Moore Community House, Inc.).

TABLE 5

WANTO Grantee Profiles

Grantee	Grant Year	Focal Industry or Occupation	Target Populations among Women	Funding
Apprenticeship and Nontraditional Employment for Women (ANEW)	FY 2020	Construction	Veterans, Native Americans, women in rural areas	\$724,998
Center for Employment Training (CET)	FY 2020	Welding, HVAC, Construction, Electrician, Automotive Specialist, Truck Driver	Low-income women	\$724,998
Chicago Women in Trades (CWIT)	FY 2020	Construction, Manufacturing, Transit (Philadelphia)	Women	\$724,998
Gang Alternative Inc.	FY 2020	Construction	Underrepresented communities	\$724,998
Goodwill Industries of East Texas, Inc. (GIET)	FY 2020	Information Technology	Low-income women	\$483,332
Moore Community House, Inc.	FY 2021	Construction, Advanced Manufacturing	Single mothers, women of color, women with disabilities, English language learners, formerly incarcerated women, veterans/spouses of veterans, women over 40 years old in need of upskilling	\$750,000
Per Scholas, Inc.	FY 2021	Information Technology	Women of color, women with disabilities, low- to moderate-income women, single mothers	\$350,000
SER Jobs for Progress of the Texas Gulf Coast, Inc. (SERJobs)	FY 2021	Welding, Carpentry, Plumbing, Sheet Metal, Commercial Driving	Women of color, women with disabilities	\$750,000
Tradeswomen, Inc. (TWI)	FY 2021	Construction	Women of color, formerly incarcerated women, veterans, foster youth, women with disabilities	\$749,942
Wisconsin Regional Training Partnership, Inc. (WRTP)	FY 2021	Construction, Manufacturing, Information Technology, Energy, Commercial Food Production and Transportation	Low-income, women of color in urban centers	\$749,994
Workforce Development Board of Herkimer, Madison, and Oneida Counties (WDB)	FY 2020	Information Technology	Underrepresented communities, refugee women	\$716,676

Source: WANTO grant applications.

Note: FY = fiscal year.

Grantees and their service areas are located throughout the country (table 6). Most grantees (6 out of 11) will serve participants in multiple counties within a single state. Two grantees will serve parts of Texas. SERJobs will serve the Houston metropolitan area and GIET will serve 13 counties outside of Houston. Five grantees will provide services in multiple states. ANEW will operate in Alaska, Idaho, Oregon, and Washington. CWIT, which is based in Chicago, will serve Chicago, Detroit, Philadelphia, and Columbus, Lima, and Lorain in Ohio. Per Scholars, Inc will serve Maryland, Virginia, and Washington DC. TWI will serve California as well as Nevada and Arizona. WRTP will operate in parts of California, Illinois, Kentucky, Louisiana, North Carolina, Tennessee, Washington, and Wisconsin.

TABLE 6
WANTO Grantee Geography

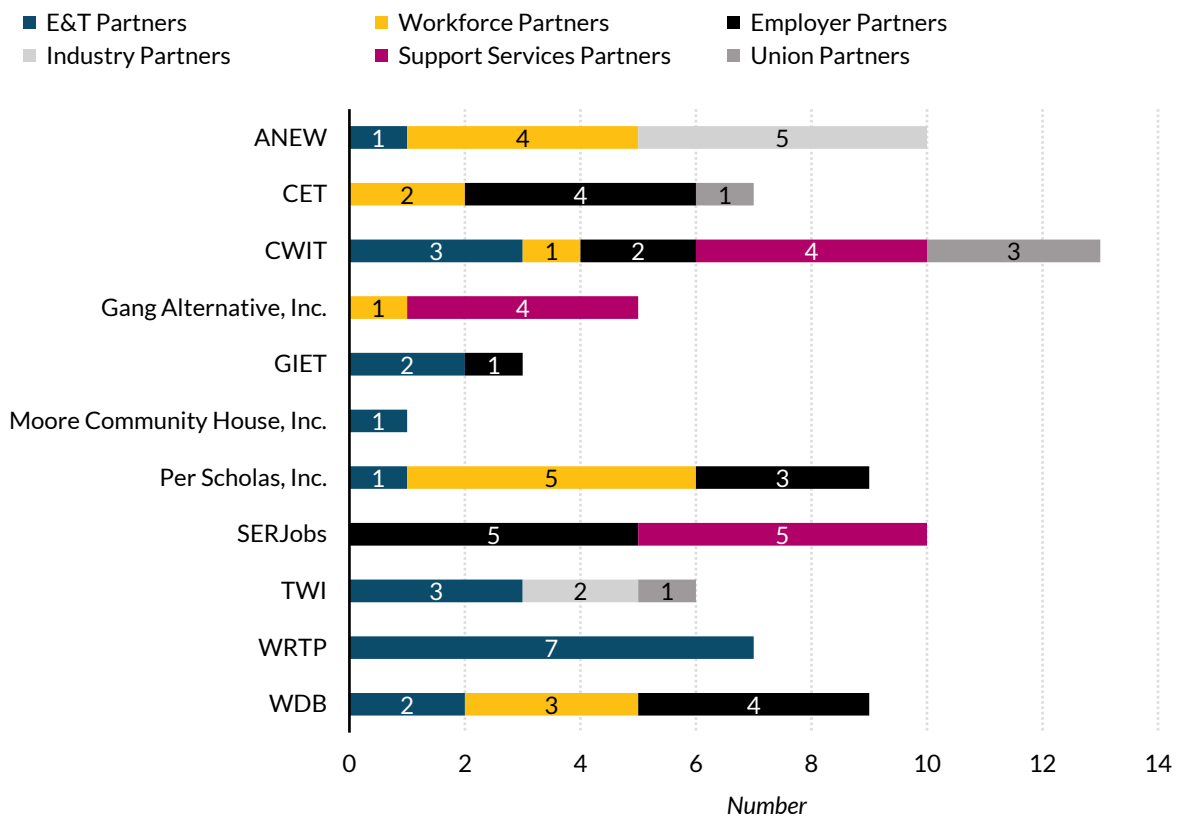
Grantee	City of Lead Grantee	Geography Covered by Grant
Apprenticeship and Nontraditional Employment for Women (ANEW)	Renton, WA	AK, ID, OR, WA
Center for Employment Training (CET)	San Jose, CA	Counties of San Diego, Riverside, Imperial, Monterey, San Benito, San Bernardino, Santa Clara, and Santa Cruz, CA
Chicago Women in Trades (CWIT)	Chicago, IL	Chicago, Detroit, Philadelphia, plus Columbus, Lima, and Lorain OH
Gang Alternative Inc.	Miami, FL	Counties of Miami-Dade and Broward, FL
Goodwill Industries of East Texas, Inc. (GIET)	Tyler, TX	Counties of Anderson, Cherokee, Gregg, Harrison, Henderson, Marion, Panola, Rusk, Shelby, Smith, Upshur, Van Zandt and Wood, TX
Moore Community House, Inc.	Biloxi, MS	Gulf Coast region (predominantly Hancock, Harrison, and Jackson counties), MS
Per Scholas, Inc.	New York, NY	National Capital Region including Washington, DC, southern Maryland, and northern Virginia
SER Jobs for Progress of the Texas Gulf Coast, Inc. (SERJobs)	Houston, TX	Greater Houston metro area, TX
Tradeswomen, Inc. (TWI)	Oakland, CA	CA and parts of AZ and NV
Wisconsin Regional Training Partnership, Inc. (WRTP)	Milwaukee, WI	Los Angeles and surrounding Orange County, CA; Oakland, CA; Chicago, IL; Louisville, KY; New Orleans, LA; Charlotte, NC; Memphis, TN; Seattle, WA and surrounding counties; Yakima, WA; Milwaukee, Kenosha, and Racine, WI; Madison, WI and surrounding 4 counties
Workforce Development Board of Herkimer, Madison, and Oneida Counties (WDB)	Utica, NY	Counties of Oneida, Herkimer, Fulton, Schoharie, Onondaga, Chenango, Delaware, Otsego, Broome, and St. Lawrence, NY

Source: WANTO grant applications.

Grantee Partners

In their grant applications, 10 out of 11 grantees report multiple partners in implementing their programs, including partners that are education and training providers, workforce intermediaries, employers, industry associations, supportive services providers, and unions (figure 13). Some grant partners may not be listed in their grant application and others may be added as partners as the grantees continue to undertake their work.

FIGURE 13
Number of Identified 2020 and 2021 WANTO Grantee Partners, by Partner Type



URBAN INSTITUTE

Source: WANTO grant applications.

Notes: ANEW = Apprenticeship and Nontraditional Employment for Women, CET = Center for Employment and Training, CWIT = Chicago Women in Trades, E&T = Education and Training, GIET = Goodwill Industries of East Texas, Inc., SERJobs = SER Jobs for Progress of the Texas Gulf Coast, Inc., TWI = Tradeswomen, Inc., WDB = Workforce Development Board of Herkimer, Madison, and Oneida Counties, WRTP = Wisconsin Regional Training Partnership, Inc.

Key Findings and Areas of Interest for the Descriptive Study of WANTO Grants

This report identifies several key findings based on the current experiences of women in apprenticeship and nontraditional occupations in the U.S. These findings highlight critical issues and areas of interest that will help to frame the descriptive study of the WANTO grants.

- Studies identified the importance of pre-apprenticeship training for helping women enter apprenticeships and nontraditional occupations (Kelly, Wilkinson, and Nuñez 2019; Kelly et al. 2022; Wagner and Kulwiec 2020). The descriptive study of WANTO grants will document how grantees determine participant training needs, the extent to which pre-apprenticeship training is tailored to the specific individual needs of participants, and promising strategies for training women to successfully transition into apprenticeships and nontraditional occupations.
- The literature notes that pre-apprenticeship programs include a larger share of women than in apprenticeship programs. This suggests that pre-apprenticeship may provide a more open and representative pathway for women to access apprenticeship. The descriptive study of WANTO grants will document strategies for improving the recruitment and retention of women in pre-apprenticeship, apprenticeship, and nontraditional occupations. Attention will also be given to specific strategies for recruiting and retaining women from historically underrepresented communities, including but not limited to women of color, women with disabilities, women at or below the federal poverty line, formerly incarcerated women, immigrant women, transgender women, and women who live in rural geographic areas. The study will interview grantees to identify the major barriers to retaining women in apprenticeship and employment. It will document whether grantees provide employers and unions with diversity, equity, inclusion (DEI) or equal employment opportunity (EEO) technical assistance, and the importance of technical assistance for increasing retention. It will also document the importance of supportive services, including mentors and career navigators, for recruitment and retention.
- The literature identifies the importance of supportive services for women in pre-apprenticeship, apprenticeship, and employment (Gardiner et al. 2021, Kelly et al. 2022). The descriptive study will document the types of supportive services that WANTO grantees provide, which supportive services are considered most important for recruiting and retaining participants in skills training as well as in apprenticeship, and whether grantees continue to provide certain types of supportive services allowed by WANTO funding after participants are placed in apprenticeships or become employed.
- Increasing the number of women in apprenticeships and nontraditional occupations requires the support of employers and unions. Therefore, the descriptive study of WANTO grants will document strategies for engaging employers and unions, including providing technical assistance and establishing partnerships and talent pipelines.
- Given that both the FY 2020 and FY 2021 WANTO grant cohorts operated during the COVID-19 pandemic, the descriptive study will document promising practices of program service delivery that are expected to continue postpandemic.

Planned Training and Supportive Services of 2020 and 2021 WANTO Grantees

This section presents summaries for each WANTO grantee in FY 2020 and FY 2021, including their plans for training models technical assistance, and supportive services. This information is primarily drawn from their statements of work. Because all grantees are already undertaking work, some of their plans have already been realized. Our interviews with grantees will document their experiences.

Apprenticeship and Nontraditional Employment for Women (ANEW)

ANEW, together with Oregon Tradeswomen, prepares women for the construction trades. This program will expand its current pre-apprenticeship programs and assist in creating two new ones. The program targets women who are veterans, Native Americans, or those living in rural areas. The program aims to enroll 280 women in pre-apprenticeship training and place 200 women in apprenticeship programs.

- **Planned Training Model:** Training consists of pre-apprenticeship and registered apprenticeship programs in construction. The grantee will partner with registered apprenticeship programs in the Seattle area and help pre-apprentices and registered apprentices complete their training hours to obtain their journey-level status.
- **Planned Technical Assistance:** Technical assistance will include helping partners establish pre-apprenticeship programs and providing training to apprenticeship programs, employers, and unions (using the grantee's RISE UP—Respect, Inclusion, Safety and Equity in the Construction Trades) in equity and inclusion best practices to increase retention and reduce systemic barriers for women in the trades.
- **Planned Supportive Services:** Other services will include case management, employment navigation, as well as mentorship and support groups for women to improve retention in apprenticeships.

Center for Employment Training (CET)

CET prepares women for occupations including, but not limited to construction trades; welding; heating, ventilation, and air conditioning (HVAC); and truck driving. The program focuses on low-income women in the counties of San Diego, Riverside, Imperial, Monterey, San Benito, San Bernardino, Santa Clara, and Santa Cruz, California. It intends to enroll 75 women in training and anticipates that 60

women will complete the training and 48 will be placed in training-related employment or an apprenticeship program.

- **Planned Training Model:** Participants will go through the Multi-Craft Curriculum (MC3) Apprenticeship Readiness Program, a pre-apprenticeship training designed by the North American Building Trades Union (NABTU). The training varies in length, and includes occupational skills training, remedial education, computer literacy, customer service, and job preparedness.
- **Planned Technical Assistance:** Grantee staff will engage with employer partners to discuss practices and policies that can improve the outreach, recruitment, and retention of women in the construction trades.
- **Planned Supportive Services:** The grantee will provide financial, child care, and transportation assistance to support participant retention. Additionally, it will provide case management services that begin prior to enrollment, continue throughout the program, and extend into the follow-up period.

Chicago Women in Trades (CWIT)

CWIT will launch and support pre-apprenticeship programs in Michigan, Ohio, and Pennsylvania. Other program goals include working with the AFL-CIO Working for America Institute (WAI) to provide technical assistance to the manufacturing sector and partnering with employers to establish hiring pipelines and to ensure more equitable workplaces. The program's training enrollment target is 359 women, with 239 moving on to employment or apprenticeship placements.

- **Planned Training Model:** The grantee will support pre-apprenticeship programs sponsored by Ohio Women in Trades (pipefitters), Central Ohio Women in Trades (electricians), Michigan Women in the Skilled Trades (construction), and the Tradeswomen Readiness Program in Philadelphia (construction).
- **Planned Technical Assistance:** WAI will provide technical assistance to the manufacturing sector through employers, unions, Rhodes College in Ohio, the Minnesota and Chicago Federations of Labor, and the AFL-CIO Industrial Union Council.
- **Planned Supportive Services:** The program aims to identify policy recommendations to address child care needs, as well as provide financial assistance for pre-apprenticeship training, union fees, boots, transportation, and application fees.

Gang Alternative, Inc.

Gang Alternative, Inc. is a CBO that prepares underserved women in Miami-Dade and Broward counties in Florida for careers in construction. It aims to enroll 50 women in training and move 25 into apprenticeship, employment, or postsecondary education. The program's Project Encouraging Full

Female Engagement in Construction Training (EFFECT) will also provide technical assistance to employers and unions.

- **Planned Training Model:** Project EFFECT's construction training program will award participants a diploma in Basic Construction and prepare them for the grantee's Construction Apprenticeship program.
- **Planned Technical Assistance:** The Employer and Industry Advisory Committee (EIAC) will provide TA for the program, helping employers and unions to engage women in apprenticeships.
- **Planned Supportive Services:** The grantee will provide on-site child care for women in the pre-apprenticeship diploma course. It will also provide case management to connect participants to other supportive services offered by the grantee and its partners.

Goodwill Industries of East Texas, Inc. (GIET)

GIET's goal is to provide information technology training to low-income women and technical assistance to employers, tradeswomen's committees, and labor unions. The program aims to enroll 150 women in pre-apprenticeship or other preparatory training, and place 40 women in apprenticeships or nontraditional employment.

- **Planned Training Model:** Pre-apprenticeship training will include a work readiness assessment, work adjustment training, skills to succeed computer modules, financial literacy, job readiness training, as well as job search and placement assistance. The grantee will also sponsor an information technology generalist registered apprenticeship program.
- **Planned Technical Assistance:** The grantee will provide technical assistance to 15 partners including Workforce Investment Boards, employers, tradeswomen's committees, affiliated organizations, support groups and labor unions across its 13-county region. The goal of the technical assistance is to improve local employment infrastructure and support the advancement of women in the technology sector.
- **Planned Supportive Services:** The program will connect participants with regional women's support agencies to offer digital literacy skills development and provide one-to-one tutoring sessions to increase program completion.

Moore Community House, Inc.

Moore Community House, Inc. will provide training and technical assistance services to support women in construction and advanced manufacturing in the Gulf Coast region. Specifically, the program supports single mothers, women of color, women with disabilities, English language learners, formerly incarcerated individuals, veterans, spouses of veterans, and women over 40 years old in need of upskilling. The program aims to enroll 350 women in training and anticipates that 276 women will complete training and 144 will secure employment.

- **Planned Training Model:** Participants of Moore Community House’s Women in Construction program (WinC) will obtain industry-recognized credentials through classroom and hands-on skill building. WinC will also assist women with receiving training through approved partners. The curriculum is designed to prepare participants for available jobs with local employers and shipyards.
- **Planned Technical Assistance:** WinC will build relationships with local employers that lead to successful job placement referrals.
- **Planned Supportive Services:** The grantee will provide stipends, child care, and work-related clothing, tools, and personal protective equipment. When necessary, case managers will refer participants to partner agencies for additional resources relating to challenges such as mental health, financial wellness, and domestic violence. Support will extend past graduation with services including peer learning meetings, resume updates, interview coaching, and continued access to work-related clothing, tools, and personal protective equipment.

Per Scholas, Inc.

Per Scholas, Inc. serves women of color, women with disabilities, low-to-moderate-income women, and single mothers in the National Capital Region. Through software engineering training and TA services, the grantee aims to increase representation of women in IT. The program’s target is for 85 percent of learners to complete training and 90 percent to find employment or an apprenticeship.

- **Planned Training Model:** Participants will attend a 15-week hybrid software engineering training, with the option to earn up to 12 credits from Western Governors University (WGU). This training will include a capstone project, corporate engagement and campus visits, women in technology panels, weekly professional development, mock interviews, and more. The grantee will also offer a year-long apprenticeship and the option to earn up to 30 credits that transfer to a bachelor’s degree in computer science from WGU.
- **Planned Technical Assistance:** The program will provide technical assistance services to 15 employer partners to help improve diversity and inclusion in their workplaces in areas ranging from hiring and onboarding talent to cultural competency training for managers and executives.
- **Planned Supportive Services:** Each learner will be paired with a female mentor who is a professional software engineer. The program will provide mandatory tutoring sessions for learners with low grade point averages (GPAs). Financial capability coaches and licensed social workers will help learners identify and mitigate barriers to success. Many of these supports will extend for up to two years postgraduation.

SER Jobs for Progress of the Texas Gulf Coast, Inc. (SERJobs)

SERJobs prepares women of color and those with disabilities for welding, carpentry, plumbing, sheet metal, and commercial driving occupations. This program aims to enroll 120 women in job readiness and occupational skills training and place 54 in an apprenticeship.

- **Planned Training Model:** The program will begin with three weeks of job readiness and occupational skills training that emphasizes soft skills. This training is specific to participants' chosen field, providing them a foundation for the apprenticeship they will start upon satisfactory completion of the training. Those whose skills are not ready will be referred to individual coaching or a different SERJobs program before beginning an apprenticeship with an employer partner.
- **Planned Technical Assistance:** The program will provide each employer partner with an orientation and DEI training involving their mid- and upper-level management. Additionally, the program will conduct biweekly check-ins with an apprenticeship coach to help employer partners improve their work environment and address issues as they come up.
- **Planned Supportive Services:** The grantee will provide child care, transportation, and work-related clothing and tools, and address language barriers and accommodate disabilities. Apprentices will participate in biweekly meetings with coaches to help them budget and connect with outside services if needed. Program staff will facilitate a monthly peer support group and provide job placement assistance if a program graduate is not hired by their apprenticeship employer.

Tradeswomen, Inc. (TWI)

TWI provides training and technical assistance to support women of color, women with disabilities, justice-involved women, women veterans, and young foster girls to enter the construction trades. The program aims to enroll 400 women in training, with 100 ultimately completing an apprenticeship and 250 securing a job with a higher wage.

- **Planned Training Model:** Through the grantee's Rising Sun's pre-apprenticeship program, women will gain the skills and certifications needed for union careers in construction.
- **Planned Technical Assistance:** The grantee will provide technical assistance services to 60 employers and labor unions to help with recruiting, training, and hiring women. Workshops and webinars will address how to handle worksite harassment, domestic violence, and being transgender in the trades.
- **Planned Supportive Services:** Each pre-apprenticeship participant will be paired with a mentor based on their trade interests. The grantee will provide one-on-one retention and referral services for students, including individualized case management that extends for 12 months after initial placement.

Wisconsin Regional Training Partnership, Inc. (WRTP)

WRTP seeks to train women for employment or apprenticeship in the construction, manufacturing, information technology, energy, commercial food production, and transportation industries. The program will also engage and advise employers about retention strategies and the implementation of apprenticeships. The program targets low-income women of color in urban centers. It intends to enroll

185 women in pre-apprenticeship training and place 133 women in registered apprenticeships and 105 women in nontraditional occupations.

- **Planned Training Model:** The program will enhance pre-apprenticeship training programs by building on the capacity of seven organizations that are leading talent development specialists in their industries. It will enroll, coach, and provide trainings for women that lead to industry recognized credentials for a nontraditional occupation or prepare them for a registered apprenticeship.
- **Planned Technical Assistance:** The grantee and partners will provide technical assistance to workforce development boards, employers, training providers, and labor unions on how to build networks, improve workplace culture, and weave funding sources to better serve women.
- **Planned Supportive Services:** The program will support participants by facilitating networks and support groups to improve retention in apprenticeships and nontraditional occupations.

Workforce Development Board of Herkimer, Madison, and Oneida Counties (WDB)

WDB focuses on preparing women for information technology occupations. The program's pre-apprenticeship enrollment target is 200 women. The program anticipates that all 200 women will complete the program and that 150 will be hired and 125 placed in A/NTOs.

- **Planned Training Model:** Pre-apprenticeship training will be led by Mohawk Valley Community College and divided into online and hands-on components to promote flexibility. Lasting 10 to 15 weeks overall, technical training will be supplemented with Workplace Success modules that teach soft skills.
- **Planned Technical Assistance:** The grantee will provide technical assistance to employers to walk them through the process of creating and using registered apprenticeship programs in information technology jobs.
- **Planned Supportive Services:** The program will provide supportive services related to job placement assistance, career planning, resume development, support group meetings, and referrals to apprenticeship programs. The program will also follow-up with women postplacement.

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