

The Intersectionality of Sex, Race, and Hispanic Origin in the STEM Workforce¹

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¹ *This paper is released to inform interested parties of ongoing research and to encourage discussion of work in progress. All results have been reviewed to ensure that no confidential information is disclosed (Disclosure Review Board# CBDRB-ROSS-B0068). All comparative statements in this paper have undergone statistical testing and all comparisons are statistically significant at the 90% significance level. Any views expressed on methodological issues are those of the authors and not necessarily those of the U.S. Census Bureau.*

ABSTRACT

Women, Black and Hispanic workers have historically been underrepresented in science, technology, engineering, and mathematics (STEM) occupations. While, White men and Asians have been overrepresented within STEM. The research into STEM occupations often does not look at the intersectionality of sex, race, and Hispanic origin. Do racial and Hispanic minority women have the same pathways into STEM as White women? This study uses the 2012-2016 5-year American Community Survey to describe the demographic and labor force characteristics of the STEM workforce and workers with science and engineering bachelor's degrees. It examines the different occupational pathways for workers with science and engineering bachelor's degrees, and the difference in median earnings for each potential path. Findings indicate that women across race and Hispanic origin in STEM occupations were more likely to have advanced degrees than their male counterparts. There were higher proportions of Asian men and Asian women with science and engineering bachelor's degrees that were employed in STEM occupations. Lastly, White women, Black women, and Hispanic women saw their highest median earnings in STEM occupations, but those earnings were lower than their male counterparts employed in the STEM occupations.

I. INTRODUCTION

The science, technology, engineering, and mathematics (STEM) workforce represent about 6 percent of the civilian employed population (Landivar, 2013b). Projections by the Bureau of Labor Statistics (BLS) expect STEM occupations to grow at a faster rate when compared with all occupations (Vilorio, 2014). Along with the projected growth in STEM occupations, there continues to be significant interest in diversifying the STEM workforce by increasing the representation of women, Blacks, and Hispanics, which have been historically underrepresented in science and engineering degrees and STEM occupations (CEOSE, 2015, Landivar, 2013a, NCSES, 2017).

The National Center for Science and Engineering Statistics (NCSES) (2017) reports that women currently earn almost half of all science and engineering bachelor's degrees. Nevertheless, the proportion of women earning computer science degrees has declined over the last decade and a large disparity remains between men and women earning engineering degrees (Beede et al., 2011, Mann and DiPrete, 2013, NCSES 2017). Instead, women, as well as Blacks and Hispanics, have increased their representation among psychology, social sciences, and biological sciences degrees (NCSES 2017). Yet, social scientists only represent 4 percent of the STEM occupations, while the majority of STEM workforce are employed in computer occupations (50 percent) and engineering occupations (32 percent) (Landivar, 2013a).

About a quarter of employed college graduates with a science and engineering degree are

working in a STEM occupation (Census Bureau 2014, Landivar and Martinez, 2014). As such, science and engineering degrees do not necessarily follow the educational pipeline into STEM occupations (Berryman, 1983, National Science Board, 2015). The percentage of employed college graduates working in STEM does differ by science and engineering degree. Under 10 percent of the employed college graduates with a psychology, social science, or multidisciplinary studies degrees are employed in a STEM occupation (Census Bureau, 2014, Landivar, 2013b). In contrast, around half of employed college graduates with engineering degrees or computers, mathematics, and statistics degrees are employed in a STEM occupation (Census Bureau 2014, Landivar 2013b). This may be due to the varying educational requirements for STEM occupations. Engineering and computer occupations often require at least a bachelor's degree, while others such as life and physical scientists often require a master's or doctoral degree (Vilorio, 2014). Carnevale, Smith, and Melton (2014) find the demand of STEM competencies from non-STEM occupations often detract workers from STEM. In addition, Miller and Wai (2015) suggest analyzing the flow of workers with science and engineering bachelor's degrees as a network of multiple pathways, rather than a leaky pipeline. The connotation of the leaky pipeline metaphor portrays workers leaving STEM occupations in a negative light, when these workers could be pursuing fulfilling work outside of STEM (Miller and Wai 2015).

Collins (1999) stresses the importance of examining the intersectionality of sex, race and ethnicity, rather than independently exploring the effects of each. The intersectionality framework promotes analyzing the combined interaction of sex, race and ethnicity in order to gain a greater understanding of the barriers faced by racial and ethnic minority men and women. Reskin and Charles (1999) suggest that omitting race or sex from analyses assumes a neutral labor market and can obscure the ways they influence labor markets. The interaction between sex, race, and ethnicity creates unique advantages and disadvantages for each group, and the systematic analysis of the interaction can provide insight into understanding the differing experiences of people in the labor market (Browne and Misra 2003). For example, Yavorsky, Cohen, and Qian (2016) report that racial minority men are more likely to occupy female-dominated, often lower paying, jobs across all levels of education than White men.

Research into STEM occupations often focuses on sex or race and ethnicity, but not on both (Hanson, 2013). Hanson's research finds that minority men and women have differing

outcomes, as Latino males have greater odds than Black males of being in a STEM occupation. Micheltore and Sassler (2016) find a sizable wage gap for women in STEM compared to men. Additionally, they report that White males in STEM earn more than Hispanics and Black males in STEM, but less than Asian males. When considering sex, race and Hispanic origin, are minority men and women with science and engineering degrees more likely to be a part of those on a pathway out of STEM than White, not Hispanic men? Is there a potential impact on earnings for workers on the pathway out of STEM?

II. CONCEPTUAL FRAMEWORK

This paper builds off previous Census Bureau research that separately analyzed the STEM workforce by sex and by race and Hispanic origin. Through the intersectionality framework of sex, race and Hispanic origin, it profiles STEM workers and answers the following key questions:

- 1) Is the link between educational attainment and employment in a STEM occupation the same across sex, race and Hispanic origin?
- 2) Do the pathways out of STEM occupations affect workers with a science and engineering bachelor's degree the same across sex, race and Hispanic origin?
- 3) What are the differences in median earnings for full-time year-round workers, across sex, race and Hispanic origin, with science and engineering bachelor's degrees working in STEM, STEM-related, and non-STEM occupations?

This research focuses on the sex, race and Hispanic origin and the educational attainment of workers in the civilian labor force aged 25 and over working in STEM occupations. It also analyzes the different occupational paths for a worker with a science and engineering bachelor's degree (STEM, STEM-related, non-STEM occupations), while also looking at the difference in median earnings. This analysis lays the foundation for further analysis on the disparity of STEM occupations among non-Hispanic White women and underrepresented men and women from various racial and ethnic groups.

III. DATA and METHODS

This study used the 2012-2016 5-year American Community Survey (ACS) to compare the civilian employed labor force aged 25 and over working in STEM occupations across race

and Hispanic origin by sex to their overall civilian employed labor force representation ². The ACS 5-year serves as an ideal dataset since it provides a larger sample size and increased statistical reliability for analyzing the intersectionality of sex, race and Hispanic origin among the detailed STEM occupations.

The ACS asks respondents about their Hispanic origin and race in two separate questions. In addition, the ACS allows respondents to report multiple races. This study uses the race alone or single race concept, people who reported a single race and no other race, when grouping the different races. Hispanics may be any race, therefore overlap with racial groups. The racial groups analyzed refer to people who reported being non-Hispanic and reported only a single race. The study focuses on the following race and Hispanic origin grouping: the White alone, non-Hispanic population, the Black or African American alone, non-Hispanic population, and the Asian alone, non-Hispanic population, and Hispanics ³. Due to a small number of sample observations in STEM occupations, estimates for American Indian and Alaska Native, Native Hawaiian and Other Pacific Islander, Some Other Race, and Two or More Races populations were excluded from the study.

The occupational data in the 2012-2016 ACS was coded based on the 2010 Standard Occupational Classification (SOC). The use of the SOC is required by all federal agencies that produce occupational statistics to promote comparability across federal programs. The ACS collects occupational information based primarily on two write-in questions. Survey respondents were asked to describe the kind of work they performed and their most important duties. The write-in responses provided were then classified into 539 specific census occupations codes by the Census Bureau's industry and occupation autocoder and the clerical coders at the Census Bureau's National Processing Center. In order to remain consistent with federal guidelines on STEM occupations, this analysis follows the recommendation issued by the Standard Occupational Classification Policy Committee on the classification of the STEM occupations (see Table 1)⁴.

² The margin of error of the estimates used in the figures of this analysis can be found on the table package: Table 1 STEM Occupations by Sex, Race, and Hispanic Origin: 2012-2016 ACS 5-year table package: <http://www.census.gov/content/census/en/data/tables/time-series/demo/industry-occupation/stem.html>

³ The analysis will refer to the White alone, not Hispanic population as White, the Black or African American alone, not Hispanic population as Black, and the Asian alone, not Hispanic population as Asian.

⁴ The Standard Occupational Classification Policy Committee, consisting of representatives from 9 federal agencies, convened throughout 2011 to create guidelines for the classification of STEM workers. The final recommendations

Table 1. Classification of STEM, STEM-Related, and Non-STEM Occupations

Occupation Description
STEM
Computer occupations (including computer and information systems managers) Mathematical occupations Engineering occupations (including architectural and engineering managers and sales engineers) Life, physical, and social science occupations (including natural sciences managers) Life, physical, and social science technicians
STEM-related
Architects, except naval ⁵ Healthcare practitioners and technical occupations (including medical and health services managers)
Non-STEM
Management occupations Business and financial operations occupations Community and social service occupations Legal occupations Education, training, and library occupations Arts, design, entertainment, sports, and media occupations Healthcare support occupations Protective service occupations Food preparation and serving related occupations Building and grounds cleaning and maintenance occupations Personal care and service occupations Sales and related occupations Office and administrative support occupations Farming, fishing, and forestry occupations Construction and extraction occupations Installation, maintenance, and repair occupations Production occupations Transportation occupations Material moving occupations

In addition to an analysis of the educational attainment differences among those employed in STEM occupations, the study also conducts an analysis of the civilian employed population aged 25 and over with a science and engineering bachelor’s degree. The ACS asks respondents, with a bachelor’s degree and above, to write in any specific field(s) of degrees for any bachelor’s degree earned. These write-in responses were then coded into 188 majors and

are available online at www.bls.gov/soc/#crosswalks. Based on this classification, STEM includes computer and mathematical occupations, engineers, engineering technicians, life scientists, physical scientists, social scientists, science technicians, and STEM managers.

⁵ Naval architects and marine engineers are coded to single a census occupation code. Therefore, naval architects were classified to the STEM category of engineering occupations.

then categorized into five broad fields including science and engineering degrees (see Table 2)⁶. This allows for the exploration of the different occupational pathways for science and engineer bachelor’s degrees. Lastly, this study looks at the differences in median person earnings of workers with science and engineering bachelor’s degrees in STEM, STEM-related, and non-STEM occupations.

Table 2. Classification of Bachelor’s Field of Degree

Science and Engineering Degrees
Computers, mathematics, and statistics
Biological, agricultural, and environmental sciences
Physical and related science
Psychology
Social sciences
Engineering
Multidisciplinary studies
Science- and Engineering-related Degrees
Science- and engineering-related (e.g., nursing, architecture, mathematics teacher education)
Business Degrees
Business (e.g., business management, accounting)
Education Degrees
Education (e.g., elementary education, general education)
Arts, Humanities, and Other Degrees
Literature and languages
Liberal arts and history
Visual and performing arts
Communications
Other (e.g., criminal justice, social work)

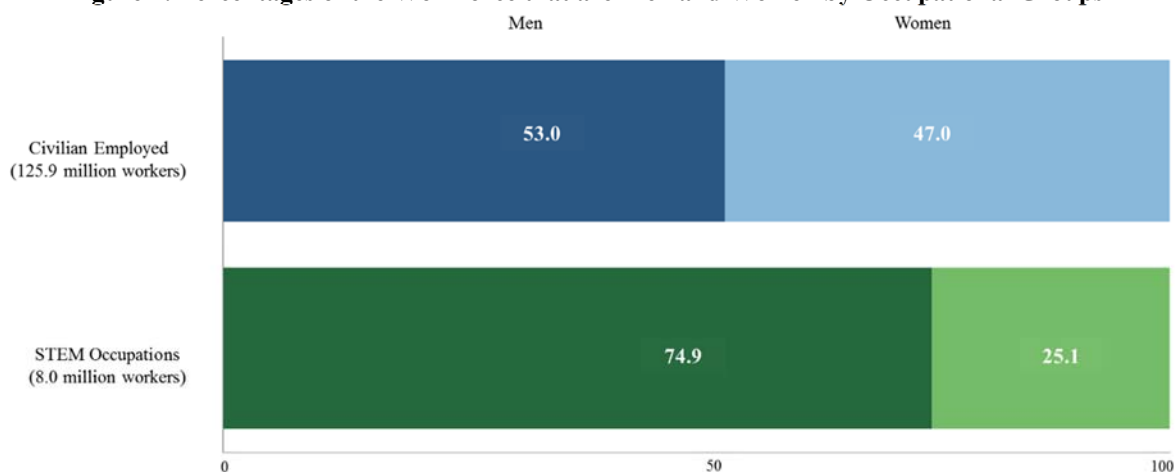
IV. RESULTS

STEM Employment by Sex, Race, and Hispanic Origin

The civilian employed workforce consisted of 125.9 million people, with about 8 million people working the STEM occupations in 2012-2016 ACS 5-year dataset. The results in Figure 1 show that men constitute 53.0 percent of all civilian employed workers, while women comprised the remaining 47.0 percent. However, within the STEM workforce, men represented 74.9 percent of workers compared with 25.1 percent for women.

⁶ Field of degree corresponds to the bachelor’s degree major, or first-listed major among double-majors, for respondents aged 25 and over who have completed a bachelor’s or higher degree.

Figure 1: Percentages of the Workforce that are Men and Women by Occupational Groups



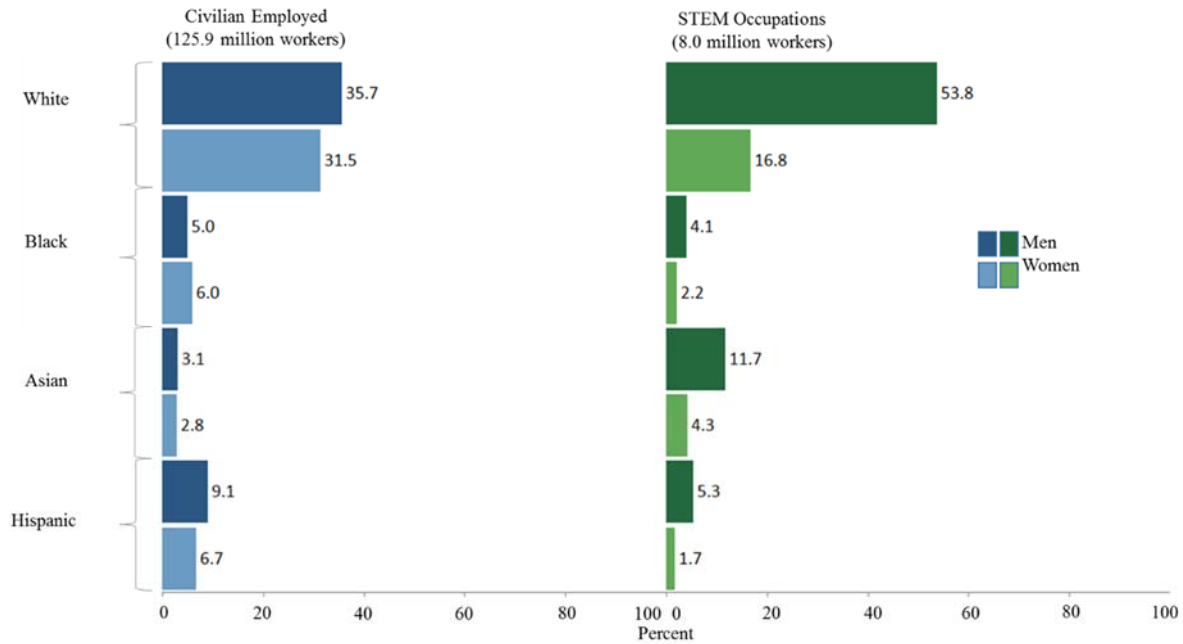
Universe: Civilian employed population age 25 and over.

Note: The American Indian and Alaska Native, Native Hawaiian and Other Pacific Islander, Some Other Race, and Two or More Races populations were excluded from the estimates because each of these populations had a small number of sample observations.

Source: U.S. Census Bureau, 2012-2016 American Community Survey (ACS) 5-Year Estimates

Figure 2 shows the distribution of STEM occupations by both the race and Hispanic origin groupings and sex. About 36 percent of the total civilian employed workforce were White men, but they represented the majority (53.8 percent) of STEM workforce. White women represented about 32 percent of the total civilian workforce, but only about 17 percent of STEM occupations. Black men made up 5.0 percent of the workforce, but only 4.1 percent of STEM occupations. Black women constituted 6.0 percent of the civilian employed workforce and 2.2 percent of STEM occupations. Asian men comprised about 12 percent of STEM occupations, compared with about 3 percent of the total civilian employed workforce. Asian women constituted 4.3 percent of STEM occupations compared with 2.8 percent of the civilian employed workforce. Hispanic men made up 9.1 percent of the workforce, compared with only 5.3 percent of STEM occupations. Lastly, Hispanic women represented 6.7 percent of the civilian employed workforce, but the lowest percentage (1.7 percent) of STEM occupations.

Figure 2: Distribution of the Civilian Employed Population and the STEM workforce by sex, race, and Hispanic origin



Universe: Civilian employed population age 25 and over.

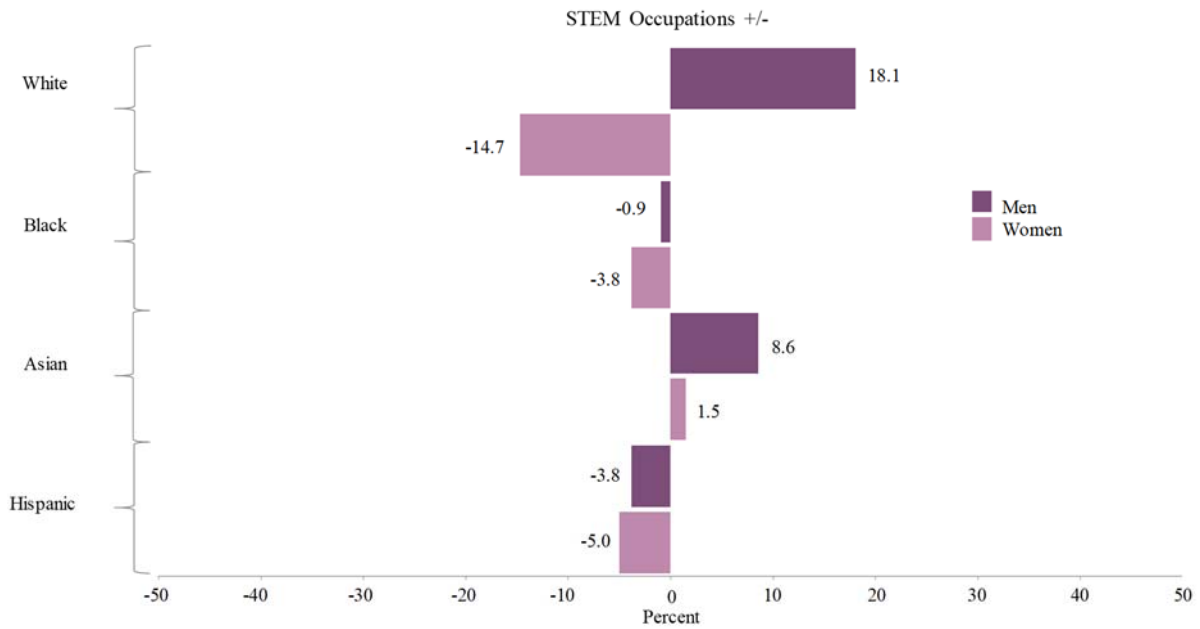
Note: Estimates for the American Indian and Alaska Native, Native Hawaiian and Other Pacific Islander, Some Other Race, and Two or More Races populations are not included because each of these populations had a small number of sample observations.

Source: U.S. Census Bureau, 2012-2016 American Community Survey (ACS) 5-Year Estimates

Figure 3 looks at the difference in STEM occupations relative to their representation in the civilian employed workforce. There were three groups that were overrepresented in STEM occupations: White men, Asian men, and Asian women. White men had the highest overrepresentation in STEM occupations (+18.1 percentage points). Asian men had the second highest overrepresentation in STEM occupations (+8.6 percentage points), while Asian women had the smallest overrepresentation (+1.5 percentage points).

Five racial and Hispanic origin and sex combinations were each underrepresented in STEM occupations relative to their representation in the civilian workforce: White women, Hispanic women, Black women, Hispanic men, and Black men. White women had the largest underrepresentation (-14.7 percentage points) in STEM occupations. Hispanic women had the second largest underrepresentation (-5.0 percentage points). Black women and Hispanic men had a underrepresentation of -3.8 percentage points even though both groups had different proportions in the civilian workforce and in STEM occupations. Black men had the smallest underrepresentation of any group (-0.9 percentage points).

Figure 3: Difference in Representation between the Civilian Employed Workforce and STEM Occupations



Universe: Civilian employed population age 25 and over.

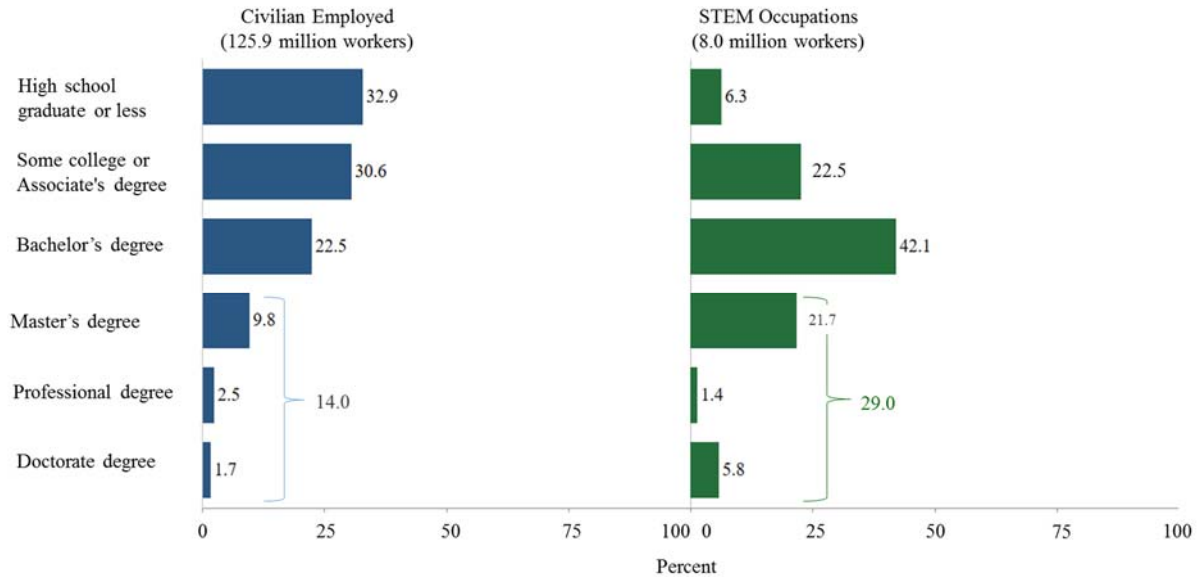
Note: Estimates for the American Indian and Alaska Native, Native Hawaiian and Other Pacific Islander, Some Other Race, and Two or More Races populations are not included because each of these populations had a small number of sample observations.

Source: U.S. Census Bureau, 2012-2016 American Community Survey (ACS) 5-Year Estimates

Educational Attainment

Figure 4 shows the distribution of educational attainment for the civilian employed workforce and STEM occupations. STEM workers are more likely to have a bachelor’s degree, compared with the overall civilian workforce. The proportion of people employed in STEM occupations with bachelor’s degrees (42.1 percent) was higher than the proportion of people in the civilian workforce with bachelor’s degrees (22.5 percent). Additionally, a higher proportion of people employed in STEM occupations (29.0 percent) had advanced degrees, compared with employees in the civilian workforce (14.0 percent). The civilian employed population had a higher percentage of workers with an educational attainment below a bachelor’s degree compared with workers in STEM occupations.

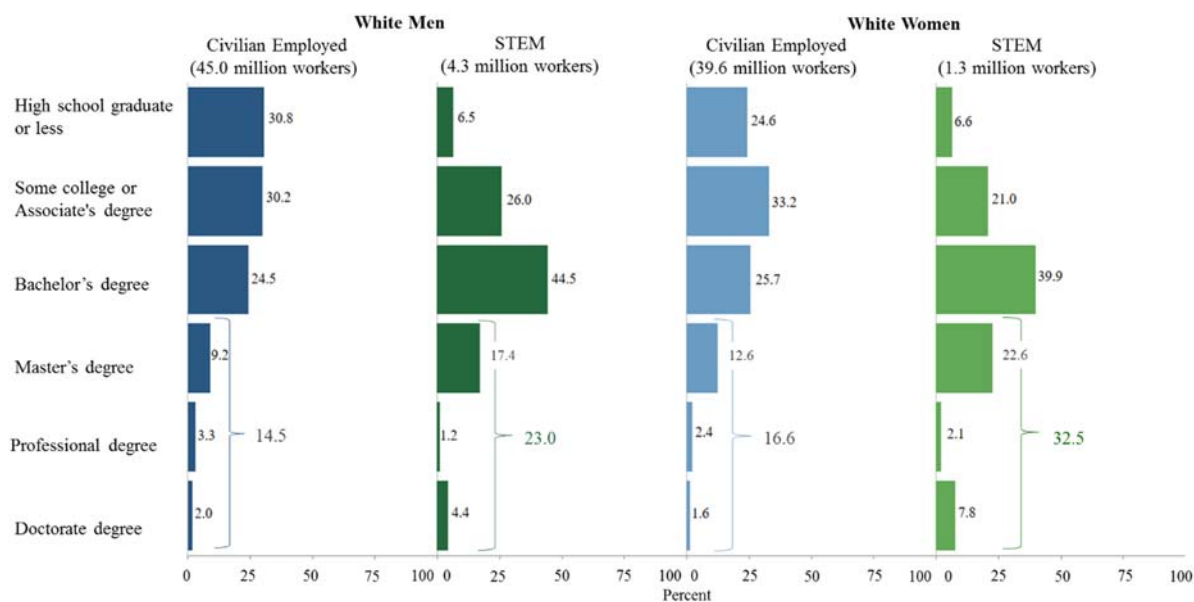
Figure 4: Distribution of Educational Attainment for the Civilian Employed Population and STEM Occupations



Universe: Civilian employed population age 25 and over.
 Note: The American Indian and Alaska Native, Native Hawaiian and Other Pacific Islander, Some Other Race, and Two or More Races populations were excluded from the estimates because each of these populations had a small number of sample observations.
 Source: U.S. Census Bureau, 2012-2016 American Community Survey (ACS) 5-Year Estimates

Within each sex, race, and Hispanic origin group, the distributions of educational attainment show a higher percentage of STEM workers had an advanced degree than the civilian employed population. Additionally, female STEM workers within each race and Hispanic origin group were more likely to have an advanced degree than their male counterparts. Figure 5 shows that White women in STEM occupations were more likely to have an advanced degree (32.5 percent) compared with White men in STEM occupation (23.0 percent). A similar pattern of women in STEM occupations with higher proportions of advanced degrees was present with Black, Asian, and Hispanic women compared to their male counterparts (see Figures A-1, A-2, and A-3 in appendix).

Figure 5: Distribution of Educational Attainment for the Civilian Employed Population and STEM Occupations by Sex - White alone, not Hispanic population age 25 and over

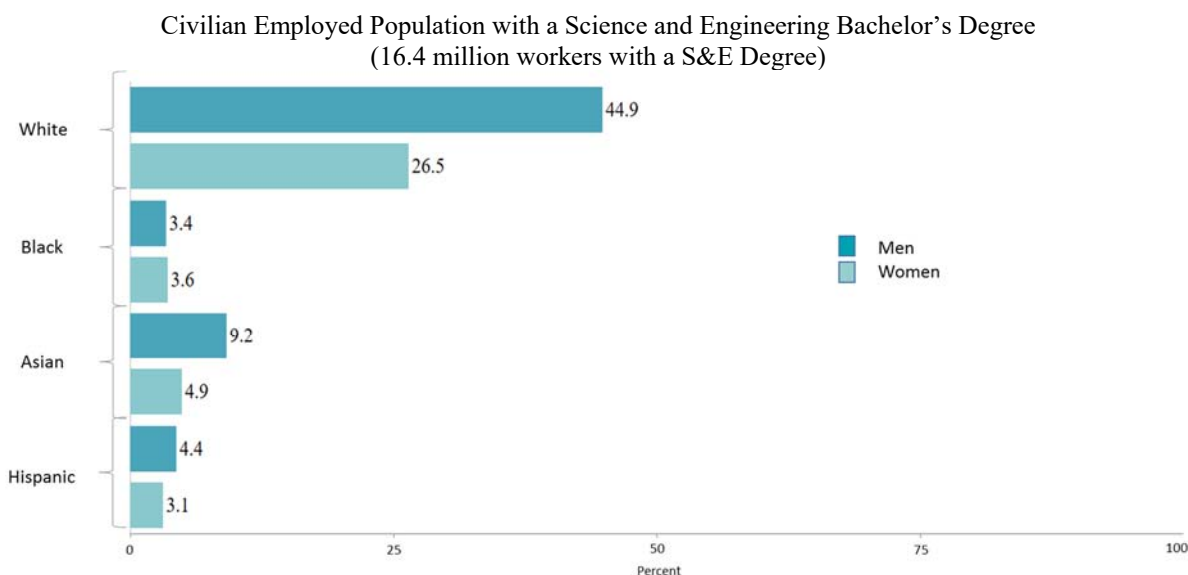


Universe: White alone, not Hispanic civilian employed population age 25 and over.
 Source: U.S. Census Bureau, 2012-2016 American Community Survey (ACS) 5-Year Estimates

Field of Degree

Among college graduates employed in STEM occupations, about 73 percent had a science and engineering bachelor's degree (Landivar 2013b). Figure 6 shows the distribution, by sex, race, and Hispanic origin, of the civilian employed population with a science and engineering bachelor's degree. White males made up the largest proportion of employed civilians in the workforce with bachelor's degrees in science and engineering (44.9 percent), followed by White women (26.5 percent) and Asian men (9.2 percent). Hispanic women constituted lowest percentage of civilian employed worker with a science and engineering bachelor's degree (3.1 percent).

Figure 6: Distribution of the Civilian Employed Population with a Science and Engineering Bachelor’s Degree by sex, race, and Hispanic origin



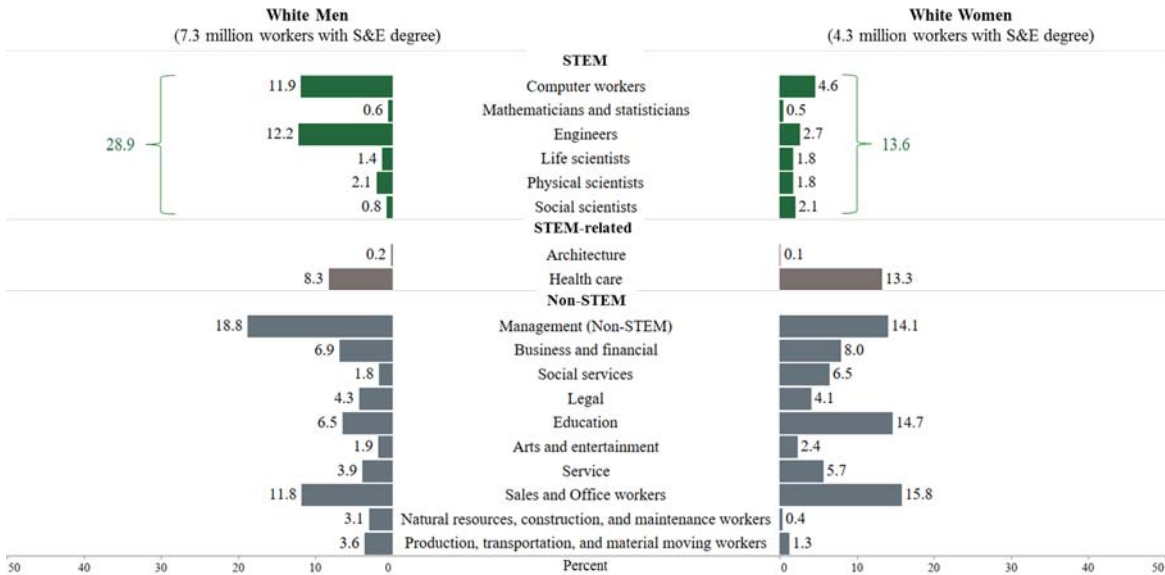
Universe: Civilian employed population age 25 and over with a Science and Engineering Bachelor’s Degree.

Note: The American Indian and Alaska Native, Native Hawaiian and Other Pacific Islander, Some Other Race, and Two or More Races populations were excluded from the estimates because each of these populations had a small number of sample observations.

Source: U.S. Census Bureau, 2012-2016 American Community Survey (ACS) 5-Year Estimates

Although White men accounted for the largest segment (44.9 percent) of the civilian workforce with science and engineering degrees, less than one-third (28.9 percent) of those workers were employed in STEM occupations (Figure 7). Within STEM occupations, the largest areas of employment for White males with science and engineering bachelor’s degrees was engineers (12.2 percent) and computer workers (11.9 percent). Outside of STEM occupations the highest concentration of White males with science and engineering bachelor’s degrees was in non-STEM management occupations (18.8 percent). The percentage of White women with a science and engineering degree employed in STEM occupations was only 13.6 percent. The largest area of employment for White women with science and engineering bachelor’s degrees was outside of a STEM occupation in sales and office workers (15.8 percent). For White women with science and engineering bachelor’s degrees, the largest STEM occupation was computer workers (4.6 percent).

Figure 7: Occupational Distribution for the Civilian Employed Population with a Science and Engineering Bachelor’s degree - White alone, not Hispanic population age 25 and over



Universe: White alone, not Hispanic civilian employed population age 25 and over with a science and engineering bachelor's degree.
 Source: U.S. Census Bureau, 2012-2016 American Community Survey (ACS) 5-Year Estimates

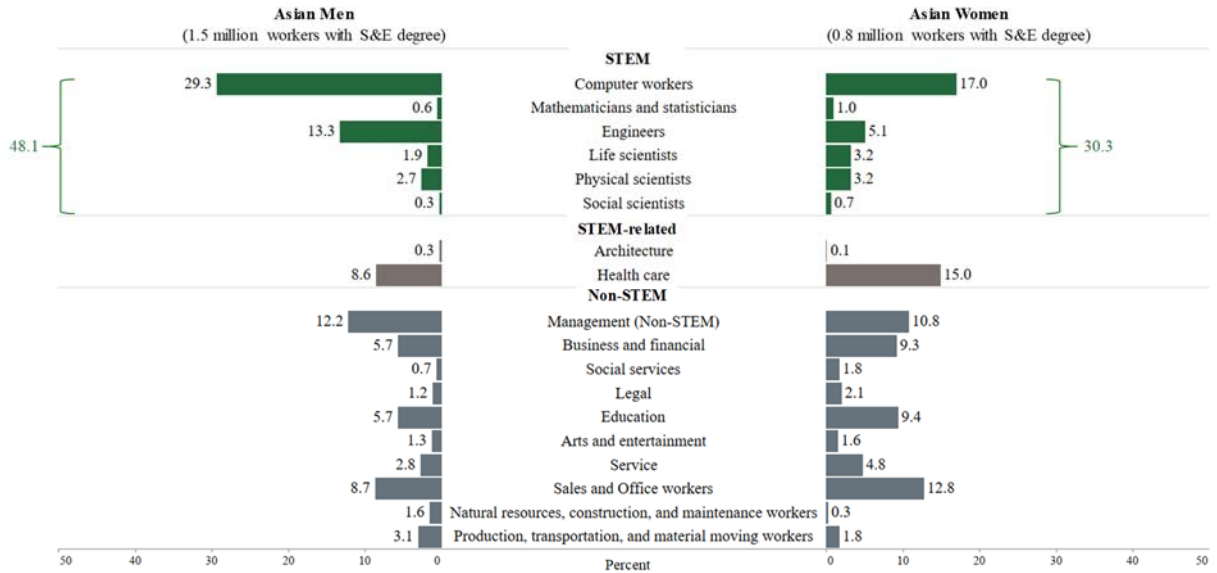
Figure 8 shows the occupational distribution of Asian men and women with a science and engineering bachelor’s degree in the civilian employed workforce. About 48 percent of Asian men and 30.3 percent of Asian women with science and engineering bachelor’s degrees were employed in STEM occupations. Asian men and Asian women had the first and second highest proportions of people employed in STEM occupations that attained science and engineering bachelor’s degrees. This was higher than the 28.9 percent of White males and 13.6 percent of White females with science and engineering bachelor’s degrees who were employed in STEM occupations ⁷.

Additionally, even though Asian men and women had the highest proportion of science and engineering degree holders who stay on the STEM pathway, there are differences among the occupations that Asian men and Asian women hold. The highest proportions of Asian men with science and engineering degrees were employed in both computer (29.3 percent) and Engineering (13.3 percent) occupations within STEM, while Asian women were employed in computer workers (17.0 percent). The second highest occupation category for Asian women with

⁷ The proportion science and engineering bachelor’s degree holders working in STEM occupations was not significantly different between Black and Hispanic men nor between Black and Hispanic women.

science and engineering degrees, behind computer workers, was the STEM-related occupation of health care (15.0 percent).

Figure 8: Occupational Distribution for the Civilian Employed Population with a Science and Engineering Bachelor’s degree - Asian alone, not Hispanic population age 25 and over



Universe: Asian alone, not Hispanic civilian employed population age 25 and over with a science and engineering bachelor's degree.
 Source: U.S. Census Bureau, 2012-2016 American Community Survey (ACS) 5-Year Estimates

About 24 percent of Black men and about 11 percent of Black women with a science and engineering bachelor’s degree were employed in a STEM occupation (Figure A-4 in appendix). Computer workers were the largest STEM occupation for both Black men (13.2 percent) and women (5.3 percent). The largest occupational group of employment for Black women with science and engineering bachelor’s degrees was sales and office workers (18.2 percent). While for Black men, the difference between computer workers (13.2 percent), non-STEM management (13.5 percent), and sales and office workers (13.2 percent) was not significantly different.

Civilian employed Hispanic men with science and engineering bachelor’s degrees were employed in a STEM occupation (24.4 percent) at a higher proportion than their female counterparts (11.0 percent) (Figure A-5 in appendix). Within STEM occupations, the largest occupational group for Hispanic men with science and engineering bachelor’s degrees was computer workers (10.5 percent) and engineers (10.3 percent)⁸. The occupational group with the

⁸ The difference between computer workers and engineers for Hispanic men was not significantly different.

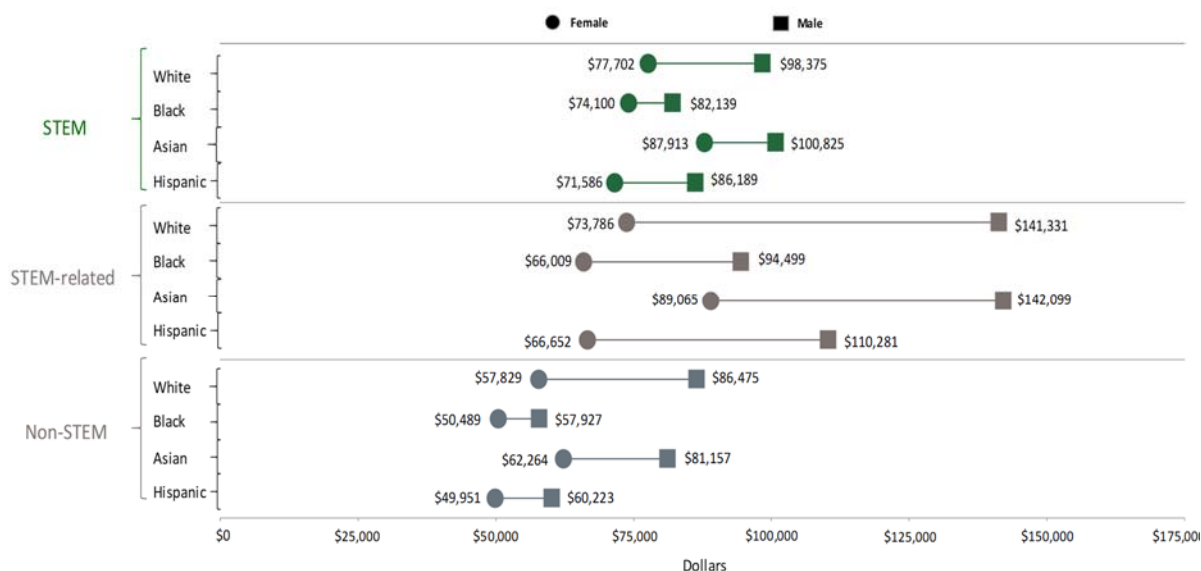
highest proportion of Hispanic women with science and engineering bachelor's degrees overall was sales and office positions (17.8 percent) and computer workers (3.4 percent) within STEM occupations.

Median Earnings

Figure 9 shows the median earnings for civilian employed full-time workers of every sex, race, Hispanic origin, and occupational group with a science and engineering bachelor's degree who are currently employed in each of the three occupational categories. The occupational group with the highest median earnings varied by race and Hispanic origin and sex. White men (\$141,331), Asian men (\$142,099), Hispanic men (\$110,281), and Black men (\$94,499) had their highest median earnings in the STEM-related occupations⁹. White women (\$77,702), Black women (\$74,100), and Hispanic women (\$71,586) had their highest median earnings in STEM occupations. There was no significant difference in the median earnings for Asian women in STEM (\$87,913) and STEM-related (\$89,065) occupations. Within race and Hispanic origin, men and women in non-STEM occupations had lower median earnings than their STEM and STEM-related counterparts.

⁹ The difference in median earnings between White men and Asian men in STEM-related occupations was not significantly different.

Figure 9: Median Earnings for Civilian Employed Full-Time Year-round Workers with a Science and Engineering Bachelor’s Degree by Sex, Race, Hispanic origin, and Occupational Group



Universe: Civilian employed full-time year-round workers age 25 years and over with earnings and a science and engineering bachelor's degree

Note: Estimates for the American Indian and Alaska Native, Native Hawaiian and Other Pacific Islander, Some Other Race, and Two or More Races populations are not included because each of these populations had a small number of sample observations.

Source: U.S. Census Bureau, 2012-2016 American Community Survey (ACS) 5-Year Estimates

Regardless of race and Hispanic origin or occupational grouping, men had higher median earnings than their female counterparts. Table 3 shows women's earnings as a percentage of men's earnings. Overall, White women employed in STEM-related occupations had one of the largest earnings gap, earning only 52.2 percent of their White male counterparts. Within race and Hispanic origin, the earnings gap in STEM-related occupations for Black women (69.9 percent), Asian women (62.7 percent), and Hispanic women (60.4 percent) was higher than their STEM and non-STEM counterparts. Conversely, the earnings gap for White (79.0 percent) and Asian women (87.2 percent) employed in STEM occupations was lower than the earnings gap in their non-STEM counterparts. The earnings gap between STEM and non-STEM workers was not statistically significant for Black women nor Hispanic women.

Table 3: Women's earnings as a percentage of men's earnings for civilian employed full-time year-round workers age 25 years and over with earnings and a science and engineering bachelor's degree

Race and Hispanic Origin	Women's earnings as a percentage of men's earnings					
	STEM Occupations		STEM-related Occupations		non-STEM Occupations	
	Estimate	MOE	Estimate	MOE	Estimate	MOE
White	79.0	0.5	52.2	0.7	66.9	0.3
Black	90.2	2.3	69.9	5.0	87.2	1.7
Asian	87.2	0.9	62.7	2.9	76.7	0.7
Hispanic	83.1	2.3	60.4	4.5	82.9	1.1

Universe: Civilian employed full-time year-round workers age 25 years and over with earnings and a science and engineering bachelor's degree

Note: Estimates for the American Indian and Alaska Native, Native Hawaiian and Other Pacific Islander, Some Other Race, and Two or More Races populations are not included because each of these populations had a small number of sample observations.

Source: U.S. Census Bureau, 2012-2016 American Community Survey (ACS) 5-Year Estimates

V. Conclusion

This study profiles civilians employed in the STEM workforce in the 2012–2016 ACS 5-year file. It builds on previous Census Bureau research that separately examined outcomes by sex, or race and Hispanic origin of STEM workers by employing an intersectional framework. Using this framework allowed us to determine and compare the outcomes for women and men of all races, rather than simply looking at outcomes along a single axis of identity or for a single demographic group. The study focused on how race and Hispanic origin combined with sex creates different outcomes in employment and earnings for workers who are employed in STEM occupations and who obtained science and engineering bachelor’s degrees. STEM occupations are projected to grow faster than any segment of the civilian workforce, but research indicates that access to these jobs is not equal. Additionally, research suggests that disadvantages faced by those attempting to enter or currently employed in the STEM workforce differ for people of different sexes, and race and ethnicities. This paper is an attempt to contribute a quantitative look at this issue and to also encourage further research into STEM occupations using an intersectional framework.

The analysis presented in this paper supports the idea that looking at sex in combination with race and Hispanic origin when examining employment in STEM occupations shows a different perspective than just looking at race and Hispanic origin or sex. This investigation of the relationship between educational attainment and employment in STEM occupations, indicates that the relationship is not only different for men and women, and people of different races, but also different for men and women of the same race or Hispanic origin. For instance,

women in STEM occupations were more likely to have advanced degrees than men, but the gap in advanced degree attainment was smaller between Asian women and men and higher for White women, Black women, and Hispanic women.

Another example that reinforces this idea is seen in the analysis of the attainment of STEM bachelor's degrees, particularly science and engineering bachelor's degrees, and the pathways of workers to STEM occupations. A majority of people who obtained science and engineering bachelor's degrees were not currently employed in STEM occupations, however the percentage of those with science and engineering bachelor's degrees working outside of STEM occupations varied by both race and sex. While there were higher proportions of White men and women who earned science and engineering bachelor's degrees, there were higher proportions of Asian men and Asian women with science and engineering bachelor's degrees that were employed in STEM occupations. But Asian men and Asian women differ in what STEM occupations they hold.

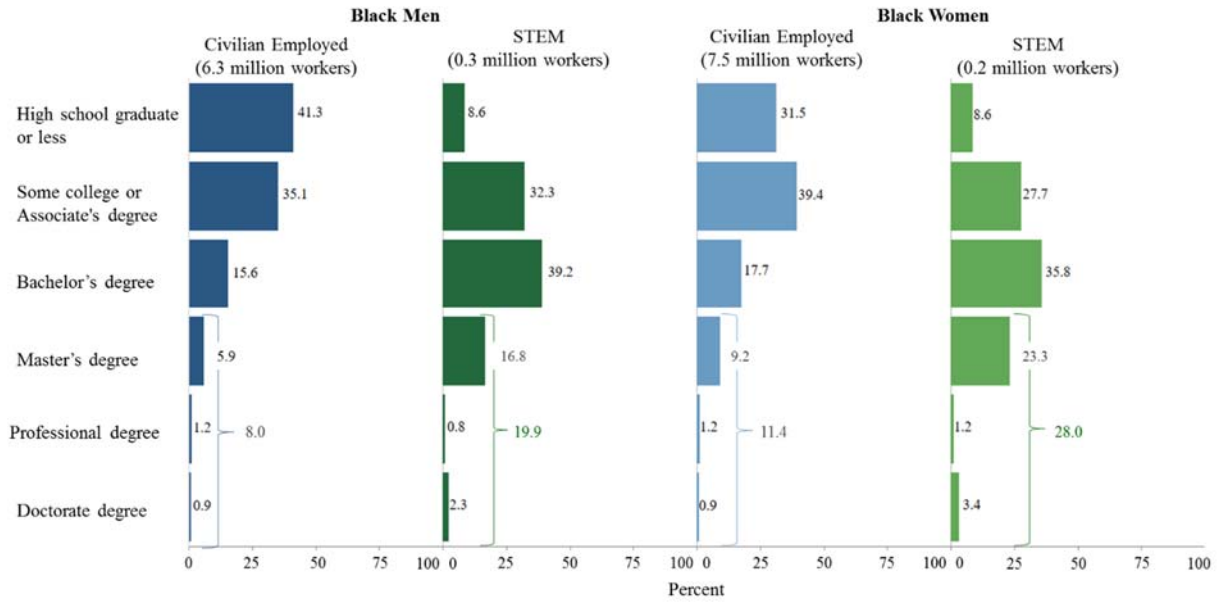
Finally, support for this idea is also evident in the examination of the median earnings for workers who earned a science and engineering bachelor's degree and are currently employed in STEM, STEM-related, or non-STEM occupations. Median earnings varied by sex, race and Hispanic origin, and occupation group. Men of all races and Hispanic origin had their highest median earnings in the STEM-related occupations while White women, Black women, and Hispanic women saw their highest median earnings in STEM occupations. However, those earnings were still lower than their male counterparts employed in the STEM occupations.

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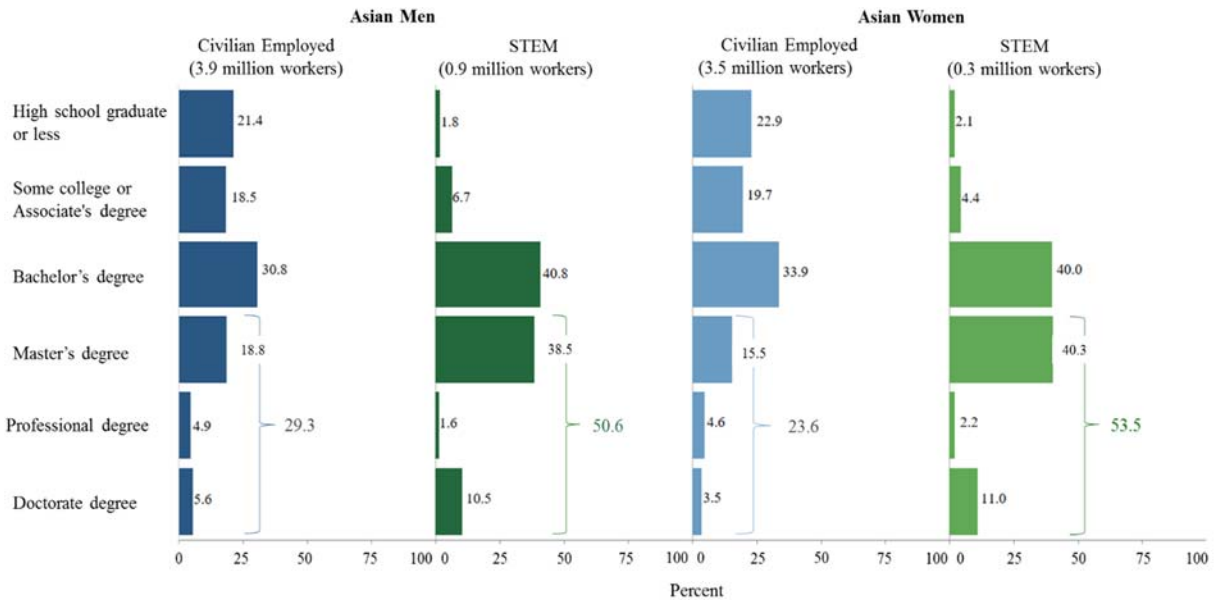
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Figure A-1: Distribution of Educational Attainment for the Civilian Employed Population and STEM Occupations by Sex – Black or African American alone, not Hispanic population age 25 and over



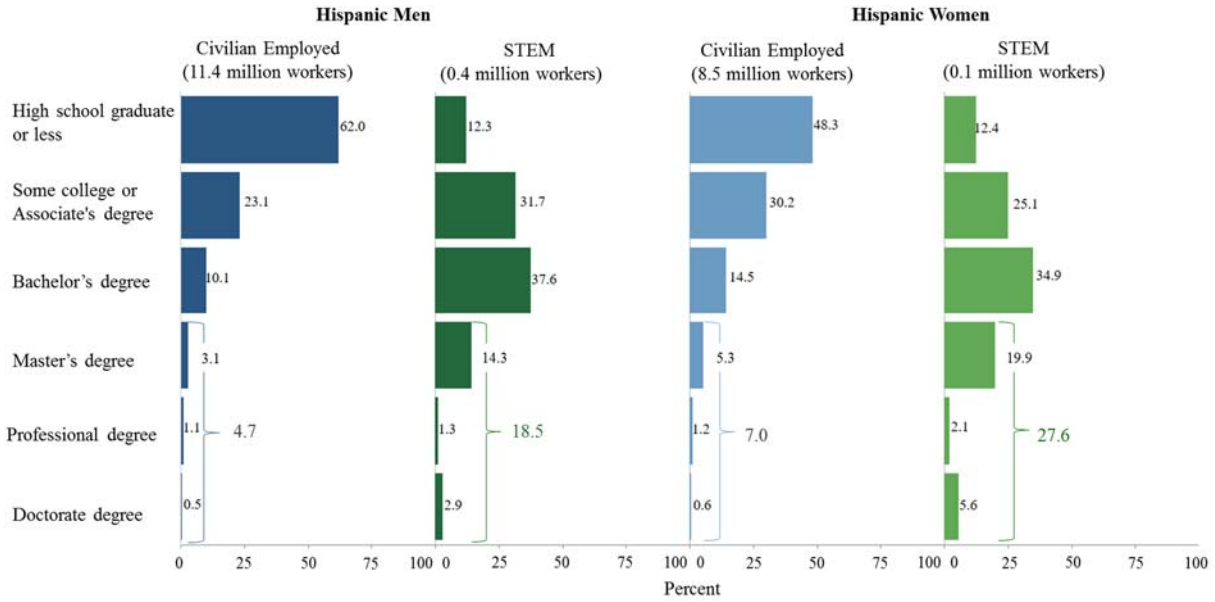
Universe: Black or African American alone, not Hispanic civilian employed population age 25 and over.
 Source: U.S. Census Bureau, 2012-2016 American Community Survey (ACS) 5-Year Estimates

Figure A-2: Distribution of Educational Attainment for the Civilian Employed Population and STEM Occupations by Sex - Asian alone, not Hispanic population age 25 and over



Universe: Asian alone, not Hispanic civilian employed population age 25 and over.
 Source: U.S. Census Bureau, 2012-2016 American Community Survey (ACS) 5-Year Estimates

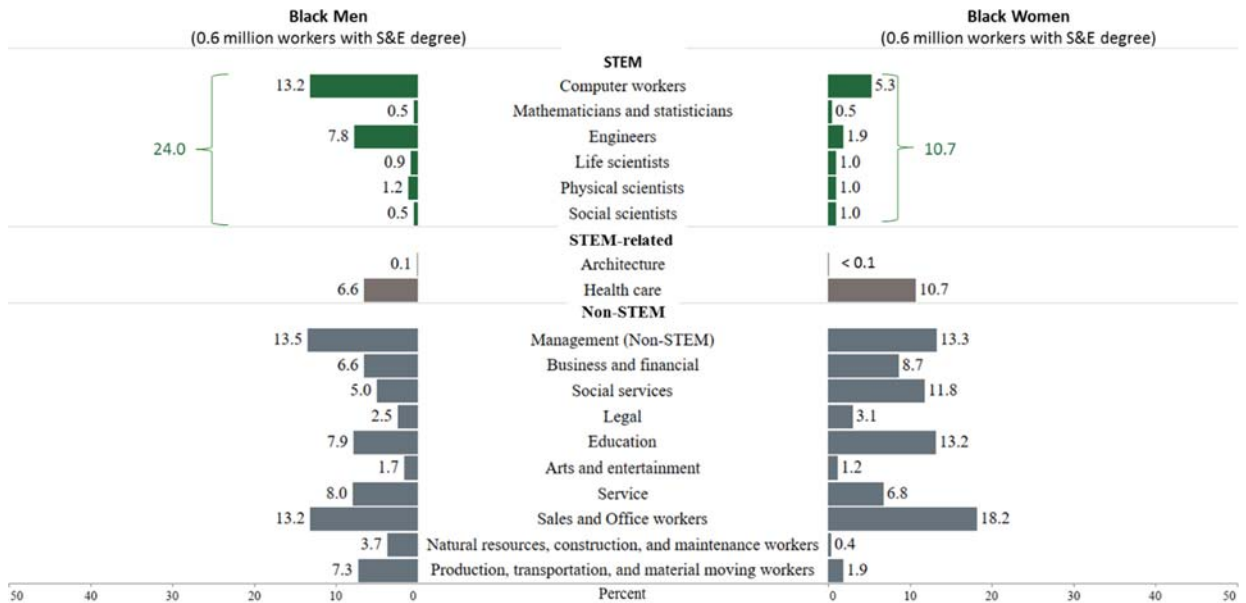
Figure A-3: Distribution of Educational Attainment for the Civilian Employed Population and STEM Occupations by Sex - Hispanic population age 25 and over



Universe: Hispanic civilian employed population age 25 and over.

Source: U.S. Census Bureau, 2012-2016 American Community Survey (ACS) 5-Year Estimates

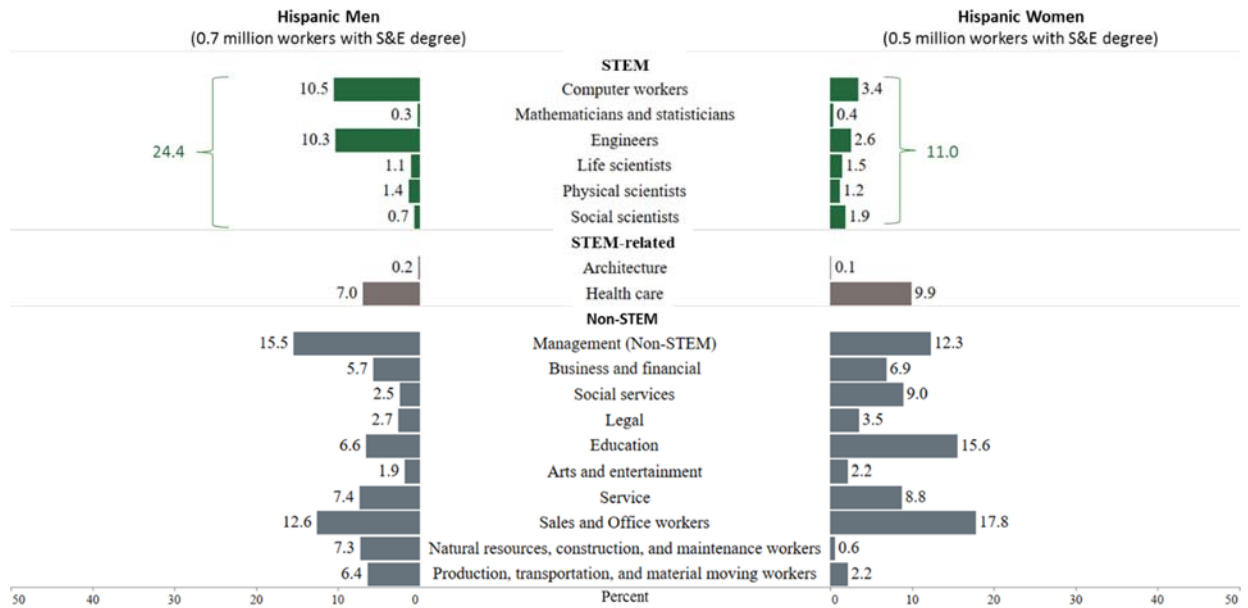
Figure A-4: Occupational Distribution for the Civilian Employed Population with a Science and Engineering Bachelor's degree – Black or African American alone, not Hispanic population age 25 and over



Universe: Black or African American alone, not Hispanic civilian employed population age 25 and over with a science and engineering bachelor's degree.

Source: U.S. Census Bureau, 2012-2016 American Community Survey (ACS) 5-Year Estimates

Figure A-5: Occupational Distribution for the Civilian Employed Population with a Science and Engineering Bachelor's degree –Hispanic population age 25 and over



Universe: Hispanic civilian employed population age 25 and over with a science and engineering bachelor's degree.
 Source: U.S. Census Bureau, 2012-2016 American Community Survey (ACS) 5-Year Estimates