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Occupational Stereotypes Predict Race and Gender Segregation in the Workforce

Abstract

The current research set out to understand the stereotypes individuals hold about occupations, and to also examine how occupational segregation is related to incongruences between demographic and occupational stereotypes. In Study 1, we applied the Stereotype Content Model (SCM) to develop a novel taxonomy of occupational stereotypes based on the dimensions of warmth and competence. We found evidence that occupations are reliably stereotyped along the dimensions of warmth and competence, and that raters agreed more on certain occupational stereotypes than others. In Study 2, we mapped the occupational stereotype taxonomy onto demographic stereotypes from the SCM to predict occupational segregation in the United States. Supporting an occupational stereotype incongruence hypothesis, women were more represented in occupations characterized by high warmth, low competence, Asian people were more represented in occupations characterized by high competence, and Black and Hispanic workers were more represented in occupations characterized by low competence. This work contributes to our understanding of how individuals perceive occupations in society, provides us with a means for systematically comparing occupational stereotypes and demographic stereotypes by applying the same descriptive dimensions, and highlights the importance of occupational stereotypes for understanding and potentially alleviating occupational segregation.

Keywords: stereotypes; occupations; occupational segregation; gender; race.

Occupational Stereotypes Predict Race and Gender Segregation in the Workforce

In 2013, the Ontario Bar Association launched a campaign against the public image of lawyers as greedy, aggressive, dishonest, and manipulative. It attempted to change the perception of lawyers by stressing their qualities as problem-solvers and pillars of their communities (Makin, 2013). Indeed, the connection between lawyers and avarice has plagued the profession and smeared its prestige (Glover, 2017). While a potent example, law is not the only profession associated with negative stereotypes. People tend to think of computer scientists and tech developers as possessing immense knowledge and expertise, but lacking in social skills (Philbin, 2016). On the other hand, childcare workers are commonly perceived as being extremely caring to the point of being seen as lacking the assertiveness to be good leaders (Carsen, 2016). Even children hold stereotypes about occupational groups, for example viewing scientists as white, male, and eccentric (Barman, Ostlund, Gatto, & Halferty, 1995).

Stereotypes reflect images or ideas about group members that structure perception of the social world (Fiske, 1998; Macrae & Bodenhausen, 2000). Theorists dating back to 1950 have proposed the existence of occupational stereotypes—collections of traits or attributes with which individuals associate members of different occupations (Stagner, 1950; Triandis, 1959). These stereotypes can have important consequences for career choice, where people are more likely to seek out occupations whose stereotyped attributes match their own self-perceptions (Blocher & Schutz, 1961; Holland, 1959). Occupational stereotypes may also influence the experience of job-holders themselves by shaping the social expectations that are associated with their positions.

Despite the importance of occupational stereotypes, there is currently no unifying theory that identifies the dimensions on which individuals judge occupations. A number of studies have found that occupations are stereotyped according to gender (e.g., Anker, 1997; Cejka & Eagly,

1999; White, Kruczek, Brown, & White, 1989), while other studies have focused on status (Bose & Rossi, 1983; Oswald, 2003; Smith, 1943), and likability (e.g. Loosemore & Tan, 2000). Without a full model of occupational stereotype dimensionality, we cannot comprehensively examine the effects of such stereotypes on occupational segregation. It is often assumed, for instance, that the gendering of occupations arises from cultural beliefs about the femininity or masculinity of occupational tasks, even though such beliefs are seldom explicitly measured (Charles & Grusky, 2004; Correll, 2001; Levanon & Grusky, 2016). Even when occupational stereotypes are examined explicitly, they are usually focused on only a single dimension of stereotype content (i.e., gender or status), rather than being examined comprehensively.The objective of our study is to advance our understanding of occupational stereotypes and their consequences by showing that individuals hold occupational stereotypes along fundamental stereotype content dimensions. We develop a comprehensive yet parsimonious taxonomy based on an established model of stereotype attributes: The Stereotype Content Model (SCM; Cuddy, Fiske, & Glick, 2008; Fiske, Cuddy, Glick, & Xu, 2002). Specifically, we suggest that individuals hold stereotypes of occupations that can be defined along the dimensions of warmth and competence, the two fundamental stereotype content dimensions in the SCM. Using the same methodology and dimensional system employed in the development of the SCM, we generate a representative list of occupations and obtain ratings of competence and warmth for each occupation. We then test the convergent validity of our taxonomy by comparing how perceptions of occupational warmth and competence correspond with current job classification systems on interests and values that are related to warmth and competence (Study 1).

With the taxonomy developed in Study 1, we examine U.S. national labor statistics to test whether the congruency between occupational and demographic stereotypes affects occupational

segregation (Study 2). We propose that occupational stereotypes are not innocuous, and can have important consequences in sustaining and perpetuating segregation. Specifically, we extend the Lack of Fit model of gender bias (Heilman, 1983) to propose that when stereotypes of any demographic group, not only gender, do not match a given occupational stereotype (i.e., occupational stereotype incongruence), those groups will be less represented in those occupations, thus contributing to and reifying occupational segregation. Until now, no comprehensive taxonomy of occupational stereotypes exists to facilitate the testing of this question. In the present research, we use the taxonomy that we create in our first study to examine in our second study whether occupational stereotypes predict occupational segregation via the mismatch between occupational and demographic stereotypes. Specifically, we examine how ratings of occupational warmth and competence are associated with the representation of four traditionally-disadvantaged groups of people—women, Black, Asian, and Hispanic—within specific occupations.

Although we propose that occupational stereotypes may drive or shape occupation segregation, the reverse relationship is likely true as well; occupational stereotypes are not necessarily the antecedents of occupational segregation – instead, occupational stereotypes can be reinforced or even created by occupational segregation. Indeed, research has shown that individuals will form gendered expectations of an occupation after encountering just a single occupant of that role (Doering & Thébaud, 2017). Moreover, based on social role theory (Eagly & Steffen, 1984), research has found evidence that uneven distribution of demographic groups into different occupations can cause expectations about those occupations to influence the stereotype content of the overrepresented demographic group (Koenig & Eagly, 2014). As such, the relationship between demographic stereotypes, occupational stereotypes, and occupational

segregation is likely cyclical. In the present study, we focus on how occupational stereotypes may perpetuate occupational segregation for practical purposes: to understand how we can harness this knowledge to change occupational stereotypes as a potential means to reduce occupational segregation.

Developing a Taxonomy of Occupational Stereotypes

Researchers have found abundant evidence that gender is one frame that people use to think about occupations. Shinar (1975) was one of the first investigators to show that college students hold strong occupational stereotypes based on gender, such that occupations such as electrician and engineer are perceived as masculine, whereas occupations such as nursing and teaching are perceived as feminine (Shinar, 1975). Following this initial work, numerous studies have shown that people hold gender-stereotypic images of occupations (e.g., Cejka & Eagly, 1999; Oswald, 2003; White et al., 1989). Despite changing attitudes toward gender equality, these gendered stereotypes of occupations have persisted over time (Miller & Hayward, 2006; Pierre, Herendeen, Moore, & Nagle, 1994; Rice & Barth, 2017), and are even held by children from a young age (Miller & Budd, 1999; O'Keefe & Hyde, 1983; Wilbourn & Kee, 2010).

Other occupational stereotypes that have received considerable attention in the literature are status and prestige. These studies find that individuals make judgments about occupations based on their perceived prestige (Glick, Wilk, & Perreault, 1995; More & Suchner, 1976; Oswald, 2003) or status (King, Mendoza, Madera, Hebl, & Knight, 2006), and that these judgments are often related to gender stereotypes. For example, the research on occupational prestige finds that occupations that are perceived to be more masculine tend to be attributed higher status (Oswald, 2003). Supporting the notion that gender and prestige are salient stereotypes of occupations, research has found that when people were asked to generate as many

descriptors of occupations as possible, these traits primarily fell into clusters about sex and gender, followed by clusters of traits about prestige (Glick et al., 1995).

Although gender and prestige stereotypes have received a great deal of attention, research has also begun to explore other stereotype dimensions. For example, Loosemore and Tan (1999) assessed occupational stereotypes within the construction industry, drawing on Anderson's (1968) list of personality traits to assess a broad range of stereotypes dimensions including likability, intelligence, and honesty. Thielbar and Feldman (1969) created occupational profiles across ten different polarities (e.g., powerful-powerless, exciting-boring, good-bad). Another study examined occupational stereotypes based on personality descriptors such as ambitious, effective, emotional, intelligent, responsible, and traditional (O'Dowd & Beardslee, 1967).

We extend and integrate this past work by proposing that the content of occupational stereotypes can be defined by the dimensions of warmth and competence, the two fundamental stereotype dimensions in the Stereotype Content Model (SCM; Cuddy et al., 2008; Fiske et al., 2002). The SCM is an established model of stereotype attributes that describes warmth and competence as the universal dimensions of social perception. Warmth refers to being perceived as tolerant, warm, good-natured, and sincere, reflecting how "likable" a target is; competence refers to being perceived as competent, confident, independent, competitive, and intelligent, and generally reflects how "respected" a target is (Fiske et al., 2002). We propose that people also hold stereotypes of occupations along these universal dimensions. For example, the commonly held perception that scientists (e.g. mathematicians, physicists, engineers) are highly intelligent but lack social tact may correspond to perceptions of high competence and low warmth. Similarly, the perception that childcare workers are caring but lack ambition may be represented by perceptions of high warmth and low competence. In support of this notion, past research on

social role theory has found initial evidence that individuals hold stereotypes of segregated occupations (i.e., occupations that are overrepresented by a certain demographic group) along agency/competence and communion/warmth dimensions (Koenig & Eagly, 2014).

A taxonomy based on the SCM can more comprehensively capture the underlying dimensions on which people stereotype occupations. Past research has shown that the key dimensions of warmth and competence account for up to 82% of the variance in daily social perceptions (Abele, Cuddy, Judd, & Yzerbyt, 2008). As such, the SCM will allow us to integrate research on gendered and non-gender-related occupational stereotypes, which to date have remained separate. The SCM is also a well-established theory in the field of stereotyping and prejudice, with the universality of its two stereotype dimensions having been validated in a wide range of social groups (e.g., religions, ethnicities, gender) using international samples (Cuddy et al., 2008; Fiske et al., 2002). As such, it is an appropriate theory to draw from when developing a taxonomy of occupational stereotypes, allowing occupational stereotypes to be positioned within the larger stereotyping literature.

We describe below (Study 1) the development of a new taxonomy of occupational stereotypes based on the SCM's dimensions of warmth. In Study 1, we first develop our new taxonomy of occupational stereotypes by generating a representative list of occupations, then obtaining ratings of warmth and competence for each occupation, employing the same methodology used in the development of the SCM (Fiske et al., 2002). Next, we examine how these ratings of warmth and competence correspond with existing occupational taxonomies, focusing on interests and values that are related to warmth and competence. Thus, the goal of study 1 is to develop a novel taxonomy of occupations along the dimensions of warmth and competence, and to test the convergent validity with existing occupation classification systems.

Study 1

In order to develop a taxonomy of occupational stereotypes, we first needed to construct a representative array of common occupations. For this purpose, we recruited 55 U.S. residents (31 women; M_{age} = 35.1 years, *SD* = 13.6 years, range = 18-71 years) via Amazon's Mechanical Turk (Buhrmester, Kwang, & Gosling, 2011). Participants were asked to list as many jobs and professions as possible within 3 minutes, following the method employed in developing the SCM (Fiske et al., 2002), and were compensated according to the standard rate suggested by Amazon ($6/hour). We chose this method to identify the social categories of occupations that people hold in mind, rather than using an occupational classification system that may not reflect common perceptions. For example, computer support specialists and database administrators are listed as distinct occupations by the Bureau of Labor Statistics, but it is unlikely that people hold such specific social categories of occupations that distinguish them. Using this method, a total of 546 occupations were generated. We combined similar and related occupations to yield a smaller set of broad categories (e.g., sheriff, cop, sergeant, and policeman were all classified as "police officer"). Occupations were then categorized according to the nine job sectors defined by the Canadian National Occupational Classification system (Human Resources and Skills Development Canada, 2016), and we included occupations that were listed by 10 or more participants. Our final set of occupations consisted of 60 job titles diversified across the labor market. "Unemployed" was added to this list for comparison with the other occupations. We then proceeded with the main study to classify these occupations based on the SCM.

Method

Participants.

Participants were 1157 U.S. residents recruited via Amazon's Mechanical Turk; 111 participants were excluded from analyses either because they did not correctly complete instructional manipulation checks (e.g., "please select option 3 for this item"; Oppenheimer, Meyvis, & Davidenko, 2009) or because their data was incomplete. Our final sample consisted of 1046 participants (607 women; M_{age} = 33.8 years, *SD* = 11.26 years, range = 17-71 years) who were compensated $1.50 for completing a 15-minute questionnaire.

Occupation questionnaire.

Our questionnaire measured stereotypes about each occupation. To create the questionnaire, we used scales from Fiske et al. (2002) and Fiske, Cuddy and Glick (2007) replacing the original social groups with the occupations derived from our pilot study. The order of presentation of occupations and scale items was randomized.

Stereotypes.

We examined stereotypes using scales that asked participants to rate occupations on warmth and competence. For warmth (6 items: warm, good-natured, sincere, friendly, well-intentioned, trustworthy), and competence (6 items: competent, capable, intelligent, efficient, skillful, confident), participants were asked how well a given trait word described each occupation (e.g., "Please indicate how well the word describes dentists"). Participants were asked to select the option, using 7-point scales (1 = *not at all;* 7 = *extremely*), which best-represented how they thought most people view the occupations.

Procedure.

To prevent fatigue and order effects, we randomly divided the 61 occupations into 11 subsets of 5 occupations and one subset of 6 occupations, yielding 12 sets of occupations (Cuddy

et al. 2007; Fiske et al. 2002). Each participant was asked to rate one set of occupations after providing their informed consent.

Results

Competence and warmth stereotypes.

The first step in the analyses involved computing the warmth and competence ratings for each occupation. Good reliability was observed for measures of both competence ($\alpha = .93$) and warmth ($\alpha = .91$). Because not every participant rated every occupation, we first examined whether there were any significant effects of idiosyncratic rater bias. A multilevel model was employed, with individual ratings of warmth and competence nested within raters. This analysis revealed significant rater effects in the mean evaluations of both warmth ($ICC_{\text{warmth}} = 0.17$) and competence ($ICC_{\text{competence}} = 0.17$). Accordingly, we included a random intercept for each rater, thus controlling for individual differences in scale usage ($ICC_{\text{warmth}} = 0.04$; $ICC_{\text{competence}} = 0.05$).

Ratings of warmth and competence were strongly correlated ($r = 0.55$, $p < .001$), suggesting the presence of an overall halo bias when rating different occupations. In order to obtain purified measurements of these two dimensions, we calculated standardized residuals for both warmth and competence after regressing each one upon the other. These residual values were used in all subsequent analyses, allowing us to examine competence and warmth ratings independently from one another, without concern about cross-contamination.

Occupation mappings.

As the next step in our analysis, we sought to create a two-dimensional mapping of occupations by plotting them according to warmth and competence mean ratings (to examine the general taxonomy) and standard deviations (to examine relative agreement in ratings across participants). For each occupation, we averaged the residualized competence and warmth ratings

across participants. The resulting scores allowed us to plot each occupation on a two-dimensional grid reflecting warmth and competence means (Figure 1) and standard deviations (Figure 2). These values are also reported in Table 1.

Looking first to Figure 1, we can readily observe that occupations vary widely in terms of perceived warmth and competence. Some occupational groups are perceived to be warm, but not particularly competent (e.g., childcare, secretary, farmer), while others are perceived to be competent, but not particularly warm (e.g., lawyer, CEO). Unemployed individuals tend to be perceived as low on both warmth and competence, and other occupations fall in the middle when it comes to both dimensions (e.g., tech support worker, musician, police officer).

We can glean further insight into perceptions of warmth and competence by examining the variability of such ratings as displayed in Figure 2. From these data, we can observe that individuals tend to agree more about ratings of competence and warmth for some occupations (e.g., firefighter, paramedic, pilot), but vary more in their ratings when it comes to other occupations (e.g., lawyer, security guard, tech support worker). Additionally, it is interesting to observe that participants sometimes agreed in terms of one dimension but were more divergent in their ratings of the other. For example, participants tended to agree in their ratings of doctors and dentists in terms of competence, but vary more in rating those occupational groups on warmth.

These ratings represent the first comprehensive assessment of occupational stereotypes, extending a framework originally focused on demographic stereotypes to the context of the labor market in order to gain a better understanding of how various occupations are perceived. Our subsequent analyses aimed to examine the utility of this taxonomic approach. Specifically, in order to examine convergent validity, we investigated how our taxonomy corresponds with common job classification metrics used by the Occupational Information Network (O*NET).

Occupational Stereotypes and O*NET Classifications.

O*NET is a government funded program available to the general public, describing the attributes of hundreds of different jobs (National Center for O*NET Development, 2013). It is the primary source of data about occupations in the U.S. economy, and is created using survey-based occupational ratings. Given that O*NET provides well-established descriptions of occupations based on representative survey data, we expected to find that some of the occupational attributes identified within it would correspond with our taxonomy of occupational stereotypes. We were particularly interested in examining whether perceptions of an occupation's competence and warmth levels would be related to the Occupational Interests and Work Values associated with a given occupation on O*NET. Finding meaningful relationships with existing O*NET attributes would provide convergent validity for the application of the SCM to the occupational domain.

Occupational interests.

O*NET includes an Interest Code for each occupation, categorizing it according to six different work environments: Realistic, Investigative, Artistic, Social, Enterprising, and Conventional (RIASEC; Holland, 1959, 1985). Realistic occupations (e.g., electrician, farmer, security guard) require physical strength, hands-on problem solving, and situations that require little interpersonal communication. Investigative occupations (e.g., computer programmer, dentist, doctor) are task-oriented and often mentally challenging. Occupations that welcome self-expression (e.g., actor, musician, writer) are considered Artistic. Social professions (e.g., nurse, teacher, waiter) require strong communication skills and involve working closely with others. Occupations that require leadership and decision-making (e.g., CEO, manager, lawyer) are

considered Enterprising and involve risk-taking. Lastly, Conventional occupations (e.g., accountant, librarian, postal worker) follow a clear set of rules and procedures.

To examine our data alongside the O*NET Interests, we obtained Interest Codes for 58 of our occupations (data were unavailable for military, principal, and unemployed). We then coded the presence of the RIASEC domains for each occupation (1 = *present;* 0 = *not present*) and correlated these scores with the two stereotype dimensions. Bootstrapped confidence intervals for each correlation reported below were obtained with 5000 resamples.

Ratings of competence were positively correlated with jobs characterized as Investigative ($r = 0.50$, $p < .001$; 95% CI = 0.30 to 0.68), and marginally negatively correlated with jobs characterized as Realistic ($r = -0.22$, $p < .10$; 95% CI = -0.45 to 0.04) and Conventional ($r = -0.23$, $p < .10$; 95% CI = -0.48 to 0.01). Therefore, occupations that require employees to "think-through" and carefully analyze problems are considered more competent than occupations requiring physical exertion or jobs that emphasize structure and order.

Ratings of warmth were positively correlated with jobs characterized as Social ($r = 0.31$, $p < .05$; 95% CI = 0.04 to 0.56), marginally negatively correlated with jobs characterized as Enterprising ($r = -0.23$, $p < .10$; 95% CI = -0.45 to 0.02), and marginally positively correlated with jobs characterized as Realistic ($r = 0.25$, $p < .10$; 95% CI = -0.01 to 0.47). These results suggest that occupations perceived as highly warm involve close relationships with others or a concrete approach to problem solving (e.g., nurse, firefighter), while jobs requiring leadership and persuasion are seen as less warm (e.g., politician, lawyer).

Work values.

The O*NET database also provides a summary of the Work Values satisfied by the occupation. Modeled from the Minnesota Importance Questionnaire (MIQ; Rounds Jr., Henly,

Dawis, Lofquist, & Weiss, 1981), the six work values include: Achievement, Independence, Recognition, Relationships, Support, and Working Conditions (McCloy et al., 1999). O*NET provides the top three work values that are met by each occupation. Achievement occupations (e.g., actor, computer programmer, salesperson) are results oriented and satisfy a worker's need to utilize his or her strongest abilities. Occupations satisfying the Independence value (e.g., electrician, engineer, chef) allow for creativity and employees often work individually. Occupations that provide Recognition (e.g., lawyer, pilot, CEO) are considered prestigious and offer advancement and leadership opportunities. Positions that fulfill the Relationship work value (e.g., bartender, cashier, bus driver) provide service to others in a non-competitive environment. Occupations with supportive management fulfill Support needs, while positions offering job security (e.g., librarian, medical assistant, welder) satisfy the Working Conditions value.

Similar to our analysis of the occupational interests, we coded for the presence of each work value for the same 58 occupations. Bivariate correlations were performed to examine the association between the stereotype measures and the six work values. Ratings of competence were positively correlated with achievement ($r = 0.49$, $p < .001$; 95% CI = 0.58 to 0.67), independence ($r = 0.27$, $p < .05$; 95% CI = 0.05 to 0.48), and recognition ($r = 0.53$, $p < .001$; 95% CI = 0.34 to 0.68), and negatively correlated with work values related to relationships ($r = -0.50$, $p < .001$; 95% CI = -0.69 to -0.27) and support ($r = -0.56$, $p < .001$; 95% CI = -0.70 to -0.38). These findings demonstrate that occupations involving highly motivated and goal-oriented employees are seen as more competent than jobs requiring ongoing support or supervision.

Turning to ratings of warmth, the results indicated a marginally positive correlation with work values related to relationships ($r = 0.22$, $p < .10$; 95% CI = -0.01 to 0.46). Therefore, jobs that are seen as highly personable are also perceived to be warmer.

Discussion

Overall, Study 1 allowed us to create the first taxonomy of occupational stereotypes, situating occupations according to the SCM dimensions of warmth and competence. Our taxonomy is fairly comprehensive, characterizing 61 common occupational groups, and was developed using a large sample ($N > 1000$). Our results provide us with an understanding of how different occupations are perceived according to two fundamental dimensions of social perception, and how much variability exists in people's perceptions of these occupations. This first study also provided convergent validation for these stereotypes by relating perceptions of occupational warmth and competence to the interests and values associated with each job on O*Net. The size of these correlations suggest that occupational stereotypes do not perfectly map on existing classifications based on interests and values, suggesting that warmth and competence stereotypes are not simply drawn from task content or the inherent nature of the occupation.

Importantly, creating an occupational taxonomy based on warmth and competence allows for an assessment of incongruence between occupational and demographic stereotypes. Below, we use the newly developed taxonomy to examine the link between occupational stereotypes and the occupational segregation of gender and racial minority groups.

Linking Occupational Stereotypes to Occupational Segregation

Occupational segregation refers to a non-representative distribution of individuals from various demographic categories across different occupations. Although this phenomenon has been examined most often with regard to women and African Americans (Anker, 1997; Baron & Newman, 1990; Bergmann, 1974; Charles & Grusky, 2004; Jacobs, 1989), occupational segregation is also a reality for racial and ethnic minorities (Alonso-Villar, Del Rio, & Gradin, 2012; Maume, 1999; Oreopoulos, 2009; Queneau, 2009), older adults (Kasschau, 1977), and gay

and lesbian individuals (Tilcsik, Anteby, & Knight, 2015). While calls for gender and racial integration within the workplace have been voiced for over 40 years (Bielby & Baron, 1986; Jacobsen, 1994; Maume, 1999; Polachek, 1987), vast discrepancies continue to be the norm (Blau, Brummund, & Liu, 2013; del Río & Alonso-Villar, 2015; Hegewisch, Liepmann, Hayes, & Hartmann, 2010), with some scholars referring to the current landscape as one of "hypersegregation" (Charles & Grusky, 2004).

A large amount of research focus has been placed on the effects of gendered occupational stereotypes on vocational choice, finding that men and women tend to choose occupations with gender stereotypes that align with their own gender identity (Gupta, Turban, Wasti, & Sikdar, 2009; Lifschitz, 1983; Miller & Budd, 1999). At the most macro level, occupational gender stereotypes both reflect and perpetuate sex segregation of employment (Cejka & Eagly, 1999). According to the Lack of Fit model of sex bias (Heilman, 1983)and the role incongruity theory of female leadership (Eagly & Karau, 2002), the mismatch between the expectations people hold of certain social groups (i.e., women) and the expected characteristics of certain occupations (i.e., lawyers) leads to bias against women in those occupations. The abundance of research and theory on gendered occupational stereotypes has thus established that individuals indeed hold stereotypes of occupations based on gender, and that these stereotypes can drive behavior toward and away from occupations.

Research has also examined to some extent the consequences of other occupational stereotypes. Some initial work on this question has found evidence of a race-occupation fit hypothesis (Leong & Hayes, 1990; Sy et al., 2010; Watson, Appiah, & Thornton, 2011) in which certain racial minorities (e.g., Asians) are perceived to fit certain occupations (e.g., engineering and math) because the demographic stereotype matches the occupational stereotype (Leong &

Hayes, 1990; Sy et al., 2010). This suggests that the stereotype incongruence principles from the Lack of Fit model (Heilman, 1983) and role incongruity theory (Eagly & Karau, 2002) may extend to demographic groups beyond gender.

Although researchers have hypothesized that incongruence between occupational stereotypes and any social category can lead to bias and occupational segregation (e.g., race-fit hypotheses), the most frequently used occupational stereotype dimensions (i.e., gender and status) limit the ability to directly compare occupational stereotypes to other categories (e.g., race, socio-economic status, mental health). Many past studies have only implicitly assumed that people hold different images of occupations, without explicitly measuring those occupational stereotypes (Charles & Grusky, 2004; Levanon & Grusky, 2016). As such, to date, no direct test of these hypotheses about stereotype incongruence fit exist. A large scale test examining a wide range of occupations using a systematic classification of demographic and occupational stereotypes to directly examine the mismatch of stereotypes is needed to test these key hypotheses about stereotype incongruence (King et al., 2006; Workman & Freeburg, 1997).

The current study (Study 2) seeks to test the stereotype incongruence hypothesis. The development of a comprehensive taxonomy of occupational stereotypes based on the SCM (Study 1) allows us to directly and systematically examine whether the mismatch between occupational stereotypes and any other demographic stereotypes contributes to bias. Based on our model of stereotype incongruence, we predict greater representation of a given social-demographic group within occupations that have congruent stereotypes related to warmth and competence. Asian people are defined in the SCM as having high competence and mid-level warmth, so we expected to observe greater representation in occupations classified as highly competent. Black and Hispanic people, on the other hand, tend to be classified as lower on both

warmth and competence, so we expected greater numbers of Black and Hispanic workers to be found in occupations also classified as low on both warmth and competence. Compared to men, women are stereotyped as warmer but less competent, so we expect greater numbers of women to be represented in occupations characterized as highly warm and fewer women to be represented in occupations characterized as highly competent.

By suggesting that occupational stereotype incongruence contributes to and reflects occupational segregation, we recognize that the nature of the relationship between the two is cyclical. As social role theory argues in the context of gender stereotypes (Eagly & Steffen, 1984), demographic stereotypes are not necessarily the antecedents of occupational segregation – instead, demographic stereotypes can be reinforced or even created by occupational segregation. Consistent with this view, we acknowledge that occupational segregation may create and influence stereotypes about the occupation as well as the demographic groups over-represented in those populations. It should be noted that our stereotype incongruence hypothesis does not make claims about which form of stereotyping occurs first, but merely suggests that when there is a mismatch between occupational and demographic stereotypes, the stereotyped demographic groups are less likely to be represented in the mismatched occupations. Additionally, by describing occupational stereotypes, we also suggest that people can change and alter them, as the Ontario Bar attempted to do, which in turn offers one potential way to alleviate occupational segregation.

Study 2

To determine whether incongruence between occupational and demographic stereotype content predicts occupational segregation, we examined the composition of the United States labor force. We tested whether the ratings of warmth and competence of occupations in our

taxonomy would be positively associated with representativeness data of demographic groups (i.e., percentage employed in occupation), as obtained from U.S. national labor statistics, that are stereotypically congruent with those warmth and competence ratings. We expected that the congruence between demographic and occupational stereotypes along the dimensions of warmth and competence would be positively related to social representation within a given occupation.

Method

Using data collected from the Current Population Survey (CPS), conducted by the U.S. Bureau of Labor Statistics, we obtained the annual average employment composition for the 54 occupations examined in Study 1 (data were not available for actor, graphic designer, fisherman, psychiatrist, or principal; U. S. Bureau of Labor Statistics, 2018; "unemployed" was also not included). Employment statistics about the military were obtained from the U.S. Department of Defense (Office of the Deputy Under Secretary of Defense, 2017) and employment information about politicians was obtained from the Congressional Research Service (CRS; Manning, 2018). The representativeness data for each occupation are displayed in Table 2.

Results and Discussion

Occupational warmth and competence ratings derived from Study 1 were correlated with representativeness data for each of the four demographic groups. One-tailed statistical tests were used whenever a directional hypothesis was specified. Bootstrapped confidence intervals for each correlation were obtained with 5000 resamples.

Analyses revealed that each demographic group is better represented in occupations that are stereotypically congruent with their warmth and competence ratings. In terms of gender, jobs more commonly held by women (e.g., childcare worker, secretary, nurse) were perceived as warmer than jobs more commonly held by men (e.g., mechanic, plumber, pilot). Indeed,

occupational warmth ratings were positively correlated with the percentage of female workers within a position ($r = 0.32$, $p < .05$; 95% CI = 0.07 to 0.55). Additionally, jobs more commonly held by women were perceived as marginally less competent ($r = -0.24$, $p = .08$; 95% CI = -0.44 to -0.01). Based on the available labor statistics, and consistent with a stereotype incongruence explanation, women comprise the majority of the workforce in occupations that are rated as being low on competence and high on warmth.

Turning next to racial groups, Asian people, perceived as highly competent and mid-level in terms of warmth (Fiske et al., 2002), were highly represented in occupations related to science and math, which are also perceived as more competent than warm (e.g., scientist, computer programmer, engineer). Indeed, the percentage of Asian employees within an occupation was positively correlated with the perceived competence of the occupational stereotype ($r = 0.44$, $p < .01$; 95% CI = 0.24 to 0.61). Black people, rated low on competence and warmth according to the SCM, were also highly represented in occupations located on the lower end of both stereotype dimensions (e.g., security guard, bus driver, taxi driver). A strong negative correlation between the representation of Black workers and the perceived competence of an occupation was observed ($r = -0.62$, $p < .001$; 95% CI = -0.75 to -0.45). Black people also had the highest unemployment rate in the U.S. (U. S. Bureau of Labor Statistics, 2018b), an occupational group that is characterized as having the lowest warmth and competence levels. Although stereotypes about Hispanic people are also characterized by low scores on competence and warmth according to the SCM, they were represented in occupations situated more centrally on both stereotype dimensions compared to Black workers (e.g., landscaper, construction worker, welder). Nonetheless, there were significantly fewer Hispanic employees working within fields characterized by higher levels of competence ($r = -0.47$, $p < .001$; 95% CI = -0.65 to -0.27).

Overall, representativeness statistics for various minority groups could be predicted from ratings of occupational warmth and competence. Interestingly, warmth emerged as an important predictor for gender representativeness, while competence emerged as an important predictor for representation of Asian, Black, and Hispanic workers. Conversely, occupational warmth was not correlated with representativeness of the racial groups examined in this study (all *p*s > .12). These results support our prediction that incongruence between occupational and demographic stereotypes is related to occupational segregation in today's workplace.

General Discussion

In the current research, we sought to develop a taxonomy of occupational stereotypes by applying a well-established framework, the SCM. Specifically, we asked a large group of participants to rate a list of common occupations on the dimensions of warmth and competence, allowing us to develop a two-dimensional taxonomy of occupational stereotypes. Convergent validity of this taxonomy was provided by comparing it to commonly used occupational classification systems used by O*NET. Our dimensional system provides an important advantage over existing classification systems because it categorizes occupations using the two fundamental dimensions of social perception that are used to characterize social demographic categories like gender or race (Fiske et al., 2002) By placing occupational stereotypes and social group stereotypes on the same metric, we were able to demonstrate that incongruence between these two sets of stereotypes predicts the representation of four traditionally-disadvantaged groups of people—Black, Asian, and Hispanic, and women—within specific occupations.

This research contributes to our understanding of occupations and occupational segregation in both theoretical and practical ways. First, the development of this novel occupational stereotype taxonomy helps us to more systematically understand how individuals

perceive occupations in society. We develop a comprehensive yet parsimonious taxonomy of occupations that integrates and unifies past research on gender stereotypes of occupations with research on other stereotypes of occupations (e.g., likability, prestige, etc.). Applying the SCM to understanding how individuals hold stereotypes about occupations aligns with past research on gender stereotypes of occupations, but also theoretically extends past the scope of gender to propose a broader, more comprehensive theory about occupational stereotypes. As well, by drawing on the SCM to identify the contents of occupational stereotypes, we situate occupational stereotypes in the larger theoretical background of stereotyping and prejudice.

The second important theoretical contribution of this research is that in developing a taxonomy of occupational stereotypes, we tested a key principle that had been proposed in the past (i.e., stereotype incongruence) to help explain the persistence of occupational segregation. Although previous research had argued that cultural beliefs about occupations led to the unequal distribution of demographic groups within occupations (Charles & Grusky, 2004; Levanon & Grusky, 2016), no research had explicitly measured these beliefs (i.e., occupational stereotypes) to test key hypotheses around stereotype incongruence. By bringing these beliefs and stereotypes about occupations to light, we were able to examine the overlap between occupational and demographic stereotypes and found that occupational segregation is associated with stereotype congruence. Specifically, we found that women are segregated into occupations characterized as highly warm but less competent, and that Black and Hispanic people are segregated into occupations characterized as low competence. On the other hand, more positive stereotypes of Asian people as highly competent meant that they were segregated into occupations perceived as highly competent. Future research is needed to elaborate upon the implications of stereotype congruence at each stage of the segregation process—attraction, selection, promotion, and

attrition. Interventions aimed at strengthening the congruence between group stereotypes and desired occupations will be particularly important in increasing the representation of traditionally stigmatized groups in more positively perceived occupations. Our research can enable more focused interventions as it identifies where stereotype incongruence exists and what aspect of the stereotype needs to be addressed.

Our taxonomy of occupational stereotypes also has important implications for both researchers and practitioners. For researchers, we demonstrated that people hold occupational stereotypes along the dimensions of warmth and competence. By developing this taxonomy along these broad and universal dimensions, we open avenues of future research to examine hypotheses about stereotype congruence for other social groups. For example, researchers can utilize our taxonomy to predict under- or over-representation of individuals such as those from lower socio-economic status, those with mental health issues, or veterans. Furthermore, future research can examine more complex issues such as the effects of occupational stereotypes on issues of intersectionality (e.g., between race and gender) to examine if the same stereotype congruence hypothesis drives underrepresentation of those groups. Because the SCM is such a universal model of social perception, the future research possibilities are endless.

Independent from the utility of this taxonomy in explaining occupational segregation, the taxonomy should also be useful on a practical level for organizations that are interested in understanding or improving their public image. As noted in the introduction, in an effort to combat the negative stereotypes about lawyers, the Ontario Bar Association's marketing campaign has been focused on encouraging individuals to recognize lawyers' competence. Our data demonstrate that such a campaign should be focused instead on highlighting the warmth-related functions of the legal profession. Indeed, our data shows that lawyers have very little to

gain in perceptions of competence (they already score at the top of that dimension), but a great deal to gain in perceptions of warmth (where they score among the lowest of all professions). Indeed, such a shift toward emphasizing the warmth-related aspects of the legal profession could have the added benefit of increasing the representation of women in that occupation. Our taxonomy could be effectively applied to similar campaigns across occupations, providing specific information about the aspects of the occupational stereotype that could stand to be improved. This approach could be useful at the policy level whenever governments are seeking to increase enrolment in educational programs leading to careers with a projected labor shortage. Being aware of occupational stereotypes, how commonly they are held, and how they might be improved could help to alleviate labor shortages. An important goal for future research will be to identify strategies for changing occupational stereotypes at the individual and societal levels.

People hold stereotypes of occupations and this has implications for vocational choice, collaboration, recruitment, and selection. By understanding the structure of occupational stereotypes and their interaction with demographic stereotypes, we highlight how these seemingly innocuous stereotypes have important implications for occupational segregation.

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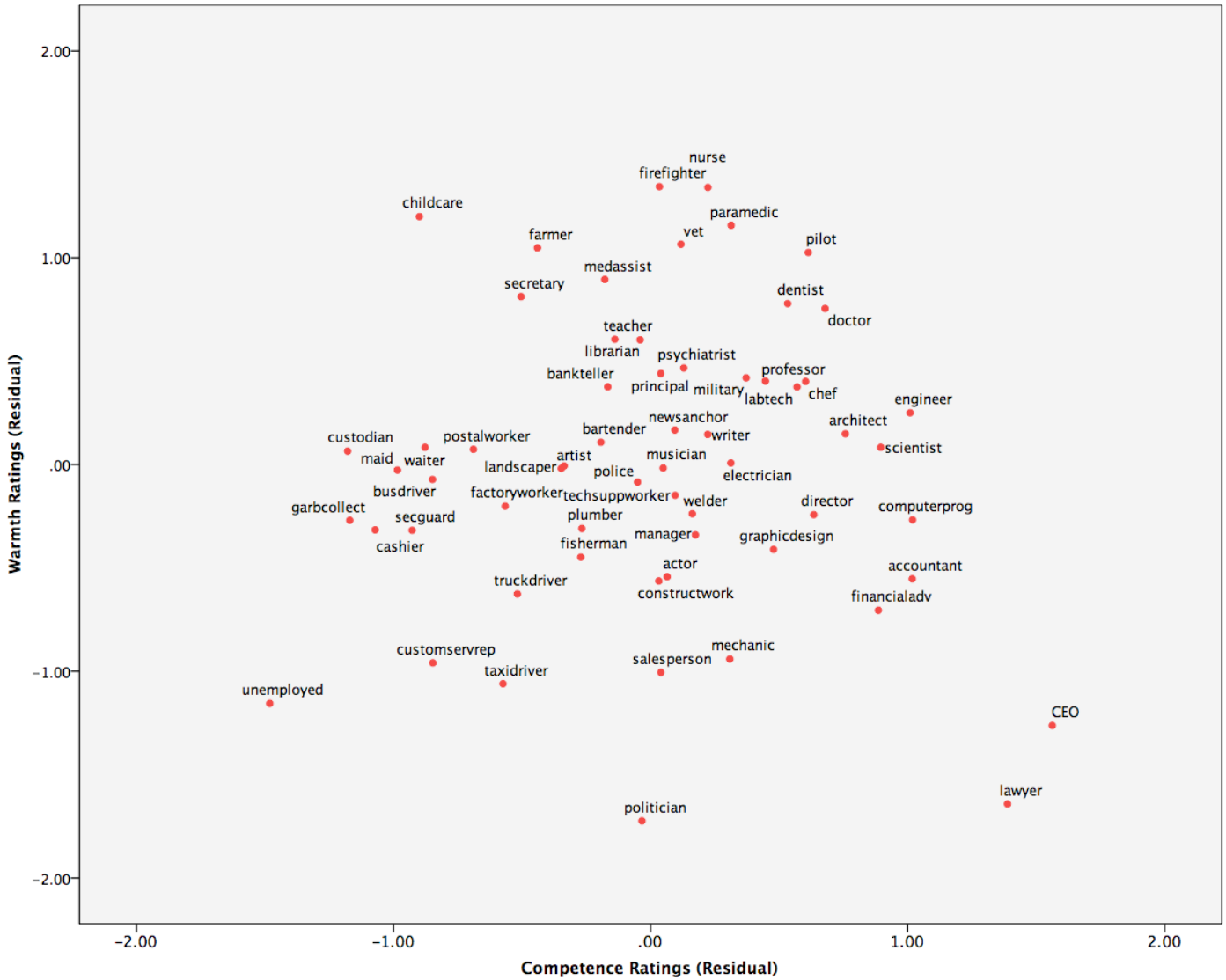

Figure 1. Warmth × Competence two-dimensional array. Values calculated using residual competence and warmth means for 61 occupations.

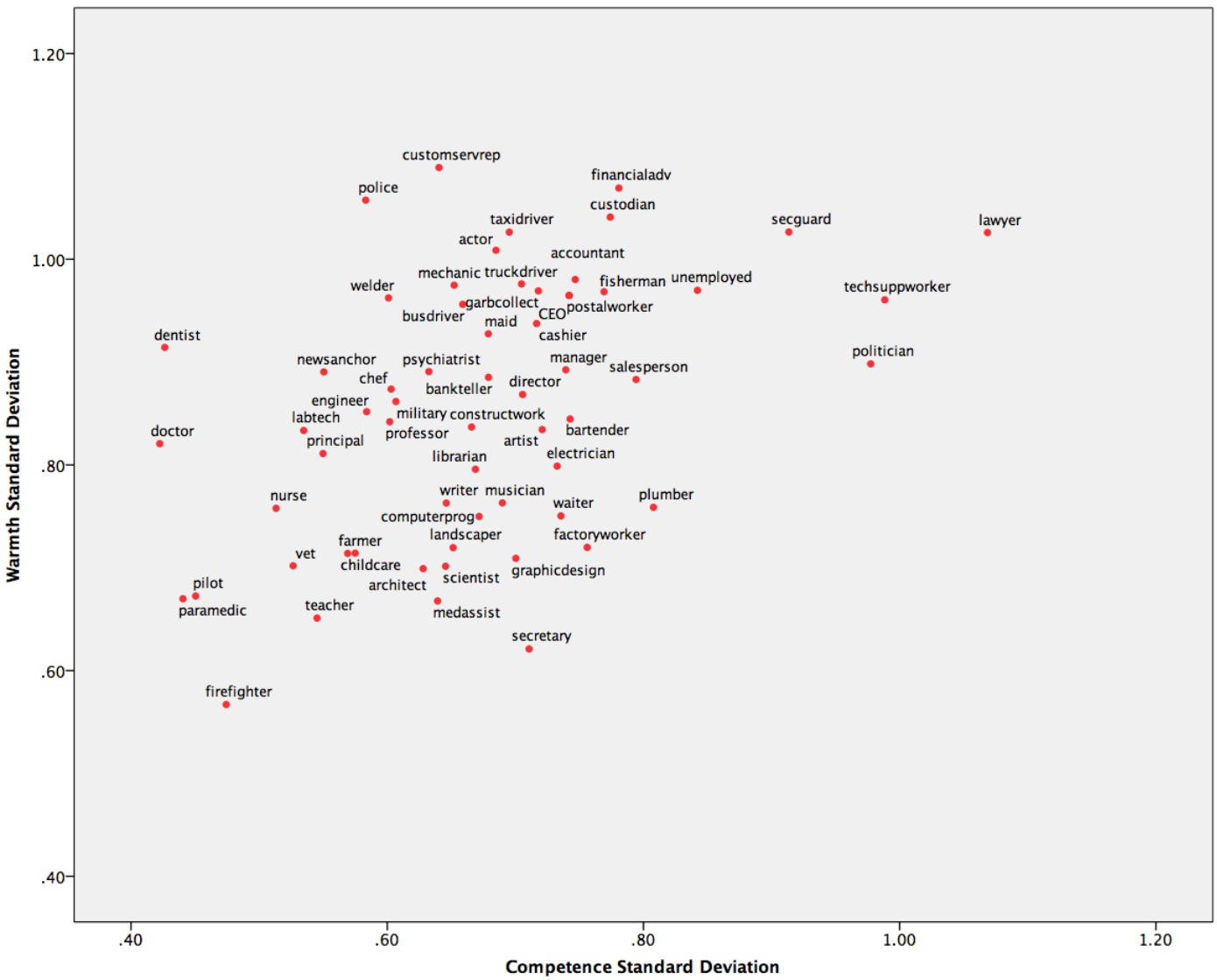

Figure 2. Variance (standard deviation) in warmth and competence ratings. Lower values reflect more agreement (less variance) in ratings across participants.

Table 1

Mean Competence and Warmth Ratings for Occupations in Study 1 (SD in Parentheses)

	Stereotype Dimension	
Occupation	Competence	Warmth
Accountant	1.02 (0.75)	-0.55 (0.98)
Actor	0.06 (0.68)	-0.54 (1.01)
Architect	0.76 (0.63)	0.15 (0.70)
Artist	-0.35 (0.72)	-0.02 (0.83)
Bank teller	-0.17 (0.68)	0.38 (0.89)
Bartender	-0.19 (0.74)	0.11 (0.84)
Bus driver	-0.85 (0.66)	-0.07 (0.96)
Cashier	-1.07 (0.72)	-0.32 (0.94)
C.E.O.	1.56 (0.74)	-1.26 (0.96)
Chef	0.60 (0.60)	0.40 (0.87)
Childcare Worker	-0.90 (0.57)	1.20 (0.71)
Computer programmer	1.02 (0.67)	-0.27 (0.75)
Construction worker	0.03 (0.67)	-0.56 (0.84)
Custodian	-1.18 (0.77)	0.06 (1.04)
Customer service representative	-0.85 (0.64)	-0.96 (1.09)
Dentist	0.53 (0.43)	0.78 (0.91)
Director	0.63 (0.71)	-0.24 (0.87)
Doctor	0.68 (0.42)	0.75 (0.82)
Electrician	0.31 (0.73)	0.01 (0.80)
Engineer	1.01 (0.58)	0.25 (0.85)
Factory worker	-0.57 (0.76)	-0.20 (0.72)
Farmer	-0.44 (0.57)	1.05 (0.71)
Financial Advisor	0.89 (0.78)	-0.71 (1.07)
Firefighter	0.03 (0.47)	1.34 (0.57)
Fisherman	-0.27 (0.77)	-0.45 (0.97)
Garbage Collector	-1.17 (0.72)	-0.27 (0.97)
Graphic Designer	0.48 (0.70)	-0.41 (0.71)
Lab Technician	0.57 (0.53)	0.37 (0.83)
Landscaper	-0.34 (0.65)	-0.01 (0.72)
Lawyer	1.39 (1.07)	-1.64 (1.03)
Librarian	-0.04 (0.67)	0.60 (0.80)

Table 1 (Cont.)

Mean Competence and Warmth Ratings for Occupations in Study 1 (SD in Parentheses)

	Stereotype Dimension	
Occupation	Competence	Warmth
Maid	-0.98 (0.68)	-0.03 (0.93)
Manager	0.17 (0.74)	-0.34 (0.89)
Mechanic	0.31 (0.65)	-0.94 (0.97)
Medical Assistant	-0.18 (0.64)	0.90 (0.67)
Military	0.37 (0.61)	0.42 (0.86)
Musician	0.05 (0.69)	-0.02 (0.76)
News Anchor	0.09 (0.55)	0.17 (0.89)
Nurse	0.22 (0.51)	1.34 (0.76)
Paramedic	0.31 (0.44)	1.16 (0.67)
Pilot	0.61 (0.45)	1.03 (0.67)
Plumber	-0.27 (0.81)	-0.31 (0.76)
Police	-0.05 (0.58)	-0.09 (1.06)
Politician	-0.03 (0.98)	-1.72 (0.90)
Postal Worker	-0.69 (0.74)	0.07 (0.96)
Principal	0.04 (0.55)	0.44 (0.81)
Professor	0.45 (0.60)	0.40 (0.84)
Psychiatrist	0.13 (0.63)	0.47 (0.89)
Salesperson	0.04 (0.79)	-1.01 (0.88)
Scientist	0.90 (0.65)	0.08 (0.70)
Security Guard	-0.93 (0.91)	-0.32 (1.03)
Secretary	-0.50 (0.71)	0.81 (0.62)
Taxi driver	-0.57 (0.70)	-1.06 (1.03)
Teacher	-0.14 (0.55)	0.61 (0.65)
Technical Support Worker	0.10 (0.99)	-0.15 (0.96)
Truck driver	-0.52 (0.70)	-0.63 (0.98)
Unemployed	-1.48 (0.84)	-1.16 (0.97)
Vet	0.12 (0.53)	1.07 (0.70)
Waiter	-0.88 (0.74)	0.08 (0.75)
Welder	0.16 (0.60)	-0.24 (0.96)
Writer	0.22 (0.65)	0.15 (0.76)

Table 2

Employed persons in the United States labor force by occupation, sex, race, and ethnicity

Occupation	Total Employed (in thousands)	Percent of Total Employed			
		Women	Black	Asian	Hispanic/Latino
Accountant	1732	59.7	9.5	11.3	7.4
Architect	203	25.7	5.8	7.6	5.7
Artist	222	56.9	2.7	4.1	9.4
Bank Teller	357	87.3	8.4	6.4	20.7
Bartender	451	59.8	4.4	3.3	13.2
Bus Driver	550	47.1	28.0	2.7	14.3
Cashier	3246	72.5	17.4	6.8	20.6
C.E.O.	1517	27.9	3.6	4.7	5.5
Chef	415	19.6	15.2	16.8	19.3
Childcare	1206	94.9	15.3	3.3	19.1
Computer Programmer	480	21.0	7.0	18.9	6.9
Construction Worker	1649	2.9	8.1	1.9	45.5
Custodian	2263	34.3	17.6	3.4	31.4
Customer Service Representative	2271	65.1	16.6	4.7	18.0
Dentist	196	25.9	2.9	16.8	8.6
Director	169	36.9	5.3	5.6	6.8
Doctor	1007	37.9	6.4	18.4	6.4
Electrician	773	2.3	8.8	1.9	19.3
Engineer	360	12.6	3.6	10.2	9.0
Factory Worker	944	25.5	14.4	4.9	24.9
Farmer	1052	23.9	0.9	0.6	4.3
Financial Advisor	498	37.9	7.6	7.4	9.4
Firefighter	293	5.9	8.4	1.1	7.8
ßGarbage Collector	97	10.4	19.1	2.1	30.8
Lab Technician	327	76.1	17.3	13.5	12.4
Landscaper	1349	6.4	7.9	0.9	44.5
Lawyer	1160	34.5	4.6	4.8	5.1
Librarian	166	83.0	8.5	2.8	4.8
Maid	1510	89.3	16.1	4.4	48.9
Manager	899	27.6	6.9	4.7	10.8
Mechanic	924	1.5	8.2	4.0	25.7
Medical Assistant	524	90.7	13.0	5.6	27.5
Military	1326	15.1	17.2	4.0	12.0
Musician	202	34.5	10.5	2.6	8.8
News Anchor	68	46.7	6.5	1.7	13.7
Nurse	2973	89.4	12.2	8.7	6.6
Paramedic	220	32.9	10.6	1.2	8.3
Pilot	140	9.4	2.6	0.7	5.7

Table 2 (Cont.)

Employed persons in the United States labor force by occupation, sex, race, and ethnicity

Occupation	Total Employed (in thousands)	Percent of Total Employed			
		Women	Black	Asian	Hispanic/Latino
Plumber	573	0.7	6.8	1.1	25.0
Police	688	13.6	13.5	2.0	15.5
Politician	541	20.0	8.9	2.6	7.0
Postal Worker	320	41.2	20.3	6.8	13.1
Professor	1341	46.5	5.1	12.6	7.6
Salesperson	3346	49.4	12.8	6.3	17.3
Scientist	133	40.5	5.3	17.9	6.6
Security Guard	869	22.0	28.8	4.0	18.6
Secretary	2870	94.5	10.4	3.5	11.9
Taxi Driver	446	14.6	27.0	15.1	17.0
Teacher (secondary)	1144	59.2	8.7	2.5	7.8
Technical Support Worker	475	26.4	12.5	9.6	8.4
Truck Driver	3469	5.1	15.1	2.7	21.5
Vet	90	60.5	3.4	4.7	2.5
Waiter	2057	70.1	8.2	6.9	21.1
Welder	615	4.2	7.1	3.3	23.1
Writer	208	59.4	4.9	3.5	5.3

Note. Adapted from "Employed Persons by Detailed Occupation, Sex, Race, and Hispanic or Latino Ethnicity," by The U.S. Bureau of Labor Statistics, 2018. Data for race and ethnicity groups do not sum to totals because data is not presented for all races/ethnicities. Data for scientist represent average totals for biological scientists, medical scientists, chemists and materials scientists, environmental scientists and geoscientists, physical scientists (all other). Employment statistics for the military adapted from "2016 Demographics: Profile of the Military Community," by Office of the Deputy Under Secretary of Defense, 2017. Employment data for politician adapted from "Membership of the 115th Congress: A Profile," by J. E. Manning, 2018. Data unavailable for actor, graphic designer, fisherman, psychiatrist, principal, or unemployed.