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Stereotypes at work: Occupational stereotypes predict race and gender segregation in the workforce☆

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ABSTRACT

The current research set out to understand the stereotypes individuals hold about occupations, and to 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 classification 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 classification 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 and 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 the understanding of how individuals perceive occupations in society, provides researchers 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.

In 2013, the Ontario Bar Association launched a campaign to combat 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). Although 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 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), suggesting that these images of occupations emerge early in development.

In a world overwhelmingly full of stimuli, human observers with finite cognitive resources must resort to categorical thinking to simplify and structure incoming information (Allport, 1954; Macrae & Bodenhausen, 2000). Categorical thinking in person

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perception manifests in the tendency for perceivers to group individuals on the basis of social categories including but not limited to race, gender, and age. Social categories are often imbued with associations and expectations, otherwise known as stereotypes, which perceivers use to process and interpret incoming social information and to form impressions and judgments of others. As such, stereotypes reflect images or ideas about group members that help structure perception of the social world and come to represent a unified image of individuals within a social category (Fiske, 1998; Macrae & Bodenhausen, 2000).

Likewise, when we think about occupations, an image or prototypical exemplar the occupational group may come to mind. Indeed, 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). An occupational stereotype has been defined as "a preconceived attitude about a particular occupation, about people who are employed in that occupation or about one's suitability for that occupation (King, Mendoza, Madera, Hebl, & Knight, 2006, p. 1145; cf. Lipton, O'Connor, Terry, & Bellamy, 1991; Shinar, 1975). In a recent review of literature on occupations, Anteby, Chan, and Dibenigno (2016a, 2016b) similarly define occupations as encompassing multiple categories that are deeply intertwined. They suggest that "occupations are socially constructed entities that include (i) a category of work; (ii) the actors understood—either by themselves or others—as members and practitioners of this work; (iii) the actions enacting the role of occupational members; and (iv) the structural and cultural systems upholding the occupation" (p. 187). Here, we apply these definitions of occupations and refer to occupational stereotypes as stereotypes about the specific professions or jobs that people hold, as well as the individuals who are employed in those occupations. Social role theory (Eagly, 1987) posits that stereotypes and beliefs about social groups are formed by observing group members in their typical social roles (Eagly & Steffen, 1984; Koenig & Eagly, 2014). As such, occupational stereotypes may be formed when individuals observe occupation incumbents performing their typical occupational roles.

Understanding the stereotypes that individuals hold of occupations has important implications for vocational behavior and for other more widespread societal outcomes. At the vocational level, occupational stereotypes can have important consequences for career choice, such that people are more likely to seek out an occupation with stereotyped attributes that 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. Further, based on Allport's (1954) distinction of stereotypes, prejudice, and discrimination, stereotypes can lead to preconceived notions about individuals and social groups that are not based on reason or reality, and can lead to unjust and differential treatment of individuals on the basis of those preconceived notions. As such, occupational stereotypes may have more widespread effects on the distribution of workers across different kinds of jobs, a phenomenon otherwise known as occupational segregation.

Although researchers agree that occupational stereotypes exist and have important consequences, there is currently a lack of consensus regarding the content of 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), whereas other studies have focused on status or prestige (Bose & Rossi, 1983; Oswald, 2003; Smith, 1943), and others on likability (e.g. Loosemore & Tan, 2000). Other studies have proposed occupational stereotypes that lie along dimensions such as Holland's six personality types (Holland, 1985; Hollander & Parker, 1972). Further, the most frequently used occupational stereotype dimensions, gender and prestige, limit the ability to directly compare occupational stereotypes to stereotypes based on other demographic categories (e.g., race, socio-economic status, mental health) in order to understand occupational segregation along these demographic dimensions (King et al., 2006; Workman & Freeburg, 1997).

Although there appear to be separate lines of research on occupational stereotypes that reach discrepant conclusions about the content of these occupational stereotypes, we argue that these conclusions are not so discrepant after all. In this paper, we argue and show that research on occupational stereotypes has examined the content of these stereotypes along many different dimensions, yet there are commonalities to the underlying stereotype dimensions, which can be comprehensively and parsimoniously captured by warmth and competence. It is both theoretically and practically important to develop a unified and integrated theory of occupational stereotypes. Theoretically, the separate dialogues on the contents of occupational stereotypes must be in conversation with one another for the field to advance. Methodologically, without a unified model of occupational stereotype dimensionality, it is difficult to comprehensively examine the consequences of such stereotypes for important outcomes like occupational segregation.

The objective of the current paper is to advance the understanding of occupational stereotypes and their consequences by first showing that individuals hold occupational stereotypes along fundamental stereotype content dimensions. We develop a comprehensive yet parsimonious classification 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 classification 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 classification developed in Study 1, we then examine U.S. national labor statistics to test whether the congruency between occupational and demographic stereotypes affects occupational segregation (Study 2), or the distribution of individuals from various demographic categories across different occupations. 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 classification of occupational stereotypes exists to facilitate

the testing of this question. In the present research, we use the classification that we create in our first study to examine in our second study whether occupational stereotypes help to 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.

1. Developing a classification 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 like electrician and engineer are perceived as masculine, whereas occupations such as nurse and teacher 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). Occupational stereotypes are even held by children from a young age (Miller & Budd, 1999; O'Keefe & Hyde, 1983; Wilbourn & Kee, 2010), suggesting that these stereotypes may have long-lasting consequences on development and subsequent vocational choice.

Other occupational stereotypes that have received considerable attention in the literature are based on 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 et al., 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).

Research on occupational stereotypes has also explored 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). Other researchers have demonstrated that people can classify occupations on theoretically derived dimensions based on Holland's six personality types (Holland, 1985; Hollander & Parker, 1972).

This literature suggests that although there is agreement that occupational stereotypes exist, there is a lack of agreement about the content of these occupational stereotypes. This lack of consensus arises in part due to the lack of conversation between separate streams of work examining different dimensions of occupational stereotypes. As a result, different researchers have identified different dimensions of occupational stereotypes that theoretically fall under similar constructs. For example, Loosemore and Tan (1969) examined intelligence stereotypes, which overlap with dimensions proposed by O'Dowd and Beardslee (1967) such as responsible, traditional, and intelligent, and also overlap with stereotypes related to prestige (Glick et al., 1995). Similarly, Anderson's (1968) stereotype dimensions of likability and honesty overlap with dimensions such as good-bad (Thielbar & Feldman, 1969).

We extend and integrate this past work by proposing that the content of occupational stereotypes can be parsimoniously summarized and subsumed under 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 group is; competence refers to being perceived as competent, confident, independent, competitive, and intelligent, and generally reflects how “respected” a target group is (Fiske et al., 2002). We propose that people also hold stereotypes of occupations along these two dimensions, and that previous work on occupational stereotypes (along the dimensions of gender, status, likability, etc.) can be subsumed under warmth and competence. 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.

Although the idea that people hold stereotypes of occupations along two orthogonal dimensions (e.g., agency and communion (Koenig & Eagly, 2014), gender and prestige (Glick et al., 1995; Gottfredson, 1981) has received some support in the literature, we argue that conceptualizing occupational stereotypes along warmth and competence is distinct. Agency and communion have theoretical roots in literature on gender and correspond to masculinity and femininity respectively (Abele, 2003; White, 1979), whereas gender and prestige explicitly measure the gender-type (masculine vs. feminine) and socio-economic associations of jobs (Glick et al., 1995; Gottfredson, 1981). Although warmth and competence have gendered associations, the SCM dimensions explain variance beyond gender (Abele, Cuddy, Judd, & Yzerbyt, 2008; Cuddy et al., 2008). Further, agency implies control and direction of action, whereas competence describes the possession and potential of skills and abilities. As such, warmth and competence have overlaps in definition with communion/agency and gender/prestige; however, they are not theoretically synonymous but are more fundamental dimensions that may underlie these distinctions (Abele et al., 2008; Cuddy et al., 2008). A classification based on the SCM can more comprehensively capture the underlying dimensions on which people stereotype occupations, and will allow for the integration of gendered and non-gender-related occupational stereotypes, which to date have remained separate.

Classifying occupations on dimensions of the SCM also bridges the literature on occupational stereotypes with the broader

literature on stereotypes and person perception. The definition of occupations has evolved in the literature over time, most recently defined as "first and foremost social entities…socially constructed as 'reality' through patterns of human interaction over time" (Anteby, Chan, & DiBenigno, 2016, p. 187). Indeed, Anteby et al. (2016) argue against the use of occupational codes to think about occupations, stating that "while precise occupational codes (e.g., automotive body and related repairer") … might at first glance appear to define an occupation, these codes represent only a particular construction of an occupation, imposed over time by a governmental body" (p. 187). Based on these definitions of occupations and occupational stereotypes as social groups and social categories, applying a person perception framework to understanding occupational stereotypes is an appropriate fit and is a novel contribution to theory on occupational stereotypes that aligns well with recent understanding of occupations more generally. However, we recognize that occupations have underlying institutional logics and formal classifications that may distinguish them from a purely social category. Our theoretical approach and interest in this paper is to examine occupational stereotypes held by society, or laypeople and non-experts outside the institutions, and thus may tap more into perceptions of occupations as social entities.

The SCM in particular is a well-established theory in the field of person perception, 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). The SCM captures fundamental assumptions and processes of stereotyping, such as the primacy of warmth and competence perceptions and unique affective and behavioral consequences. As such, it is an appropriate theory to draw from when developing a classification of occupational stereotypes, allowing occupational stereotypes to be positioned within the larger person perception and stereotyping literature.

Classifying occupational stereotypes using the SCM has utility beyond extending the current understanding of how individuals see occupations. Below, we describe how using the SCM to classify occupational stereotypes has utility in terms of predicting occupational segregation.

2. 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 a variety of other social groups including 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). Although 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 (e.g., women) and the expected characteristics of certain occupations (e.g., 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 prestige) limit the ability to directly compare occupational stereotypes to other categories (e.g., race, socio-economic status, mental health). Further, 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 development of a comprehensive classification of occupational stereotypes based on the SCM (Study 1) allows us to take the first steps toward directly and systematically examining whether the mismatch between occupational stereotypes and any other demographic stereotypes is associated with occupational segregation. 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. Compared to men, women are stereotyped as warmer but less competent (Fiske et al., 2002), so we expect more

women to be represented in occupations characterized as highly warm and fewer women to be represented in occupations characterized as highly competent. Asian people are defined in the SCM as being stereotyped as high on competence and mid-level on warmth (Fiske et al., 2002), so we expected to observe greater representation in occupations classified as highly competent. The stereotype content of the Black racial group is more complex and nuanced. Whereas some studies show that subcategories of Black people are stereotyped as hostile and aggressive (Devine, 1989; Devine & Elliot, 1995; Devine, Monteith, Zuwerink, & Elliot, 1991), stereotypes which may be directed primarily toward Black people who are perceived as "criminal" or "militant", or "poor Blacks" (Fiske et al., 2002), modern prejudice scales have categorized Blacks as being ambivalently perceived as lazy but disadvantaged (i.e., incompetent but deserving sympathy; Katz, Wackenhut, & Hass, 1986). Although this past work shows mixed arguments for the stereotype content of Blacks, there is a consistent stereotype that Blacks tend to be stereotyped as being low in competence overall. As such, we expected higher numbers of Black workers to be found in occupations classified in lower competence. Hispanic people, on the other hand, tend to be classified as lower on both warmth and competence (Fiske et al., 2002), so we expected greater numbers of Hispanic workers to be found in occupations also classified as low on both warmth and competence.

We theorize that our model of stereotype incongruence may be perpetuated both by job seekers and decision makers through their own stereotype matching process. Job seekers may avoid choosing occupations associated with the opposite sex or a different racial group because choosing those occupations would create a sense of identity loss (Akerlof & Kranton, 2000). Women in stereotypically male jobs tend to be less satisfied with the work and the work climate (Janssen & Backes-Gellner, 2016), which may negatively impact their performance (Gadassi & Gati, 2009). Consequently, they may be more likely to leave those occupations. Simultaneously, decision makers are less likely to select from demographic groups whose stereotypical traits do not fit the stereotypical requirements of a given occupation. As social role theory argues in the context of gender stereotypes (Cejka & Eagly, 1999; Eagly & Steffen, 1984), demographic stereotypes are not necessarily the antecedents of occupational segregation – instead, demographic stereotypes can be the result of occupational segregation. It should be noted that our stereotype incongruence hypothesis does not make claims about which form of stereotyping occurs first, but merely suggest that when there is a mismatch between the stereotypes, the stereotyped demographic groups are less likely to be represented in the mismatched occupations.

In Study 1 below, we describe the development of a new classification of occupational stereotypes based on the SCM's dimensions of warmth and competence. In Study 1, we first develop our new classification 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 provided by O*NET (National Center for O*NET Development, 2013) that are related to warmth and competence. Thus, the goal of Study 1 is to develop a novel classification of occupations along the dimensions of warmth and competence, and to test the convergent validity with an existing occupation classification system.

3. Study 1

In order to develop a classification 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 min, following the method employed in developing the SCM (Fiske et al., 2002), and were compensated according to the standard rate suggested by Amazon ($6/h). 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.

3.1. Method

3.1.1. 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 were 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-min questionnaire.

3.1.2. 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.

3.1.3. 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"[1]). 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 (Fiske et al., 2002). These instructions were chosen to reduce social desirability concerns and to tap into preconceived cultural stereotypes, which are *widely-held* and oversimplified representations of social groups (Fiske et al., 2002).

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

3.2. Results

3.2.1. Competence and warmth stereotypes

All analyses were conducted in SPSS Version 24.0. 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 ($\alpha = 0.93$) and warmth ($\alpha = 0.91$). 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. The observed halo bias is problematic because: a) one of the fundamental assumptions of the SCM is that warmth and competence are treated as orthogonal factors (Fiske et al., 2007, 2002), and b) it threatens our ability to meaningfully distinguish the variance associated with each of these dimensions (Cooper, 1981; Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). This is especially critical in Study 1 as we develop a classification of occupations, and similarly critical as we examine how warmth and competence uniquely predict occupational segregation in Study 2. Cooper (1981) recommends reducing halo bias by statistically removing the global impression, for example regressing the separate ratings against each other to obtain the residuals, which are less subject to global bias than the original ratings. Feldman (1986) and Podsakoff et al. (2003) similarly suggest multiple regression analyses as a viable means of attenuating halo bias (i.e., by controlling for or removing the variance associated with another variable), which in our case is statistically equivalent to obtaining the standardized residuals and correlating those with outcomes. Thus, in order to obtain purified measurements of warmth and competence as orthogonal 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 due to halo bias.

3.2.2. 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 classification) 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 (Fig. 1) and standard deviations (Fig. 2). These values are also reported in Table 1.

Looking first to Fig. 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), whereas 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 Fig. 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

[1] We used the titles of occupations (e.g., dentists) rather than asking about "people who are dentists", or "people employed as dentists" to tap into stereotypes about occupations.

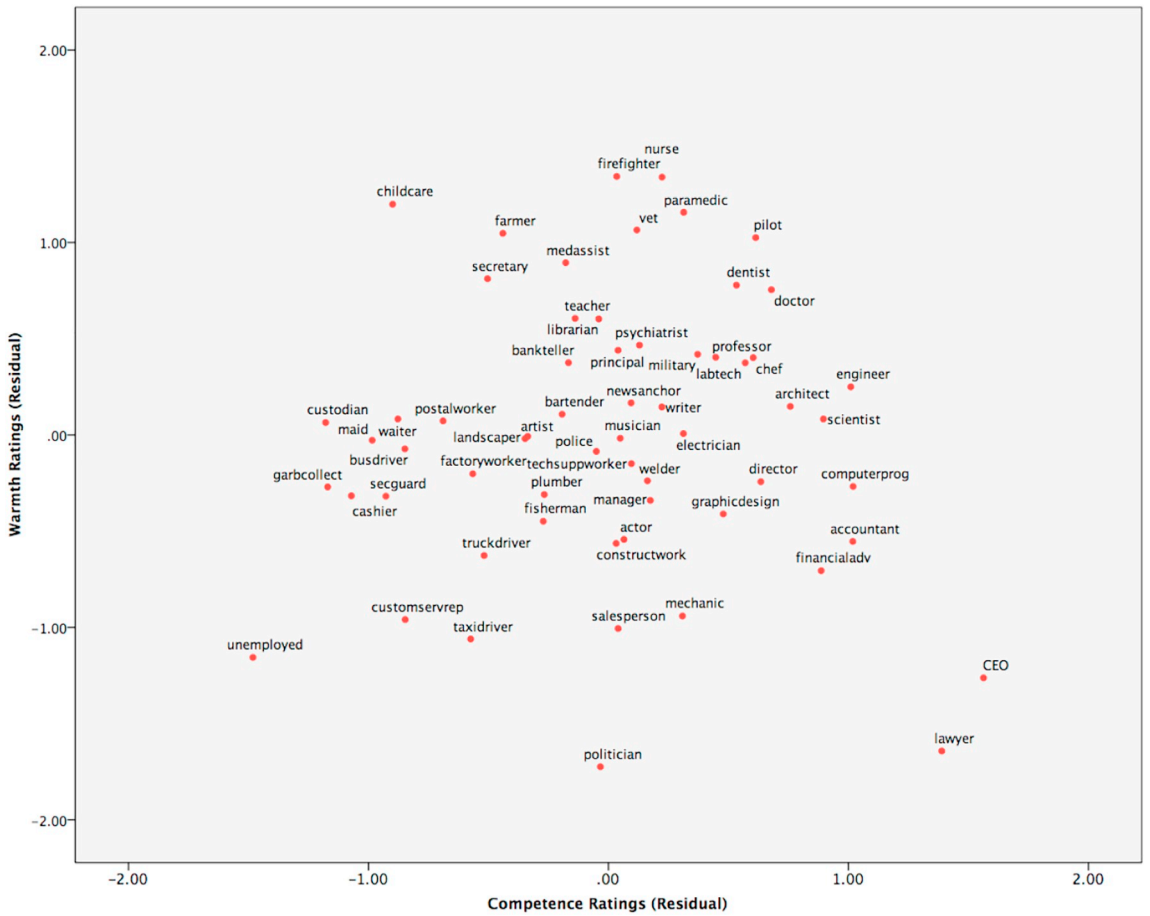

Fig. 1. Occupations displayed on a warmth × competence two-dimensional array. Values were calculated using residual competence and warmth means for 61 occupations.

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 classification corresponds with common job classification metrics used by the Occupational Information Network (O*NET).

*3.2.3. 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 classification 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.

3.2.4. 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

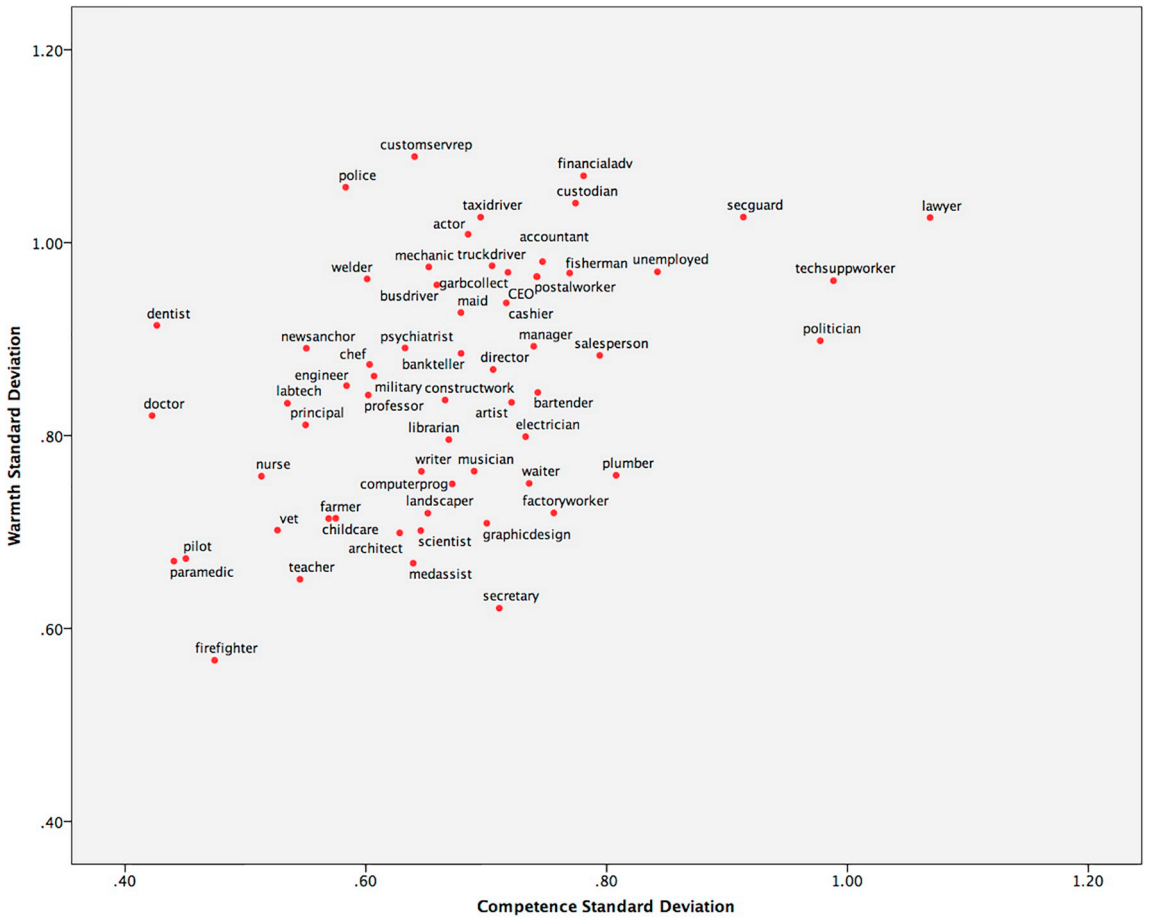

Fig. 2. Variance (standard deviation) in warmth and competence ratings of occupations. Lower values reflect more agreement (less variance) in ratings across participants.

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.

Out of the Interest codes, jobs rated as Investigative seemed most related to perceptions of competence, as Investigative occupations (e.g., computer programmer, dentist, doctor) are task-oriented and mentally challenging, requiring cognitive ability and analytical skills, which overlap with definitions of competence. Indeed, ratings of competence were positively correlated with jobs characterized as Investigative ($r = 0.50$, $p < .001$; 95% CI = 0.30 to 0.68). 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.

Perceptions of warmth by definition overlapped with Social professions (e.g., nurse, teacher, waiter), which are highly interpersonal and other-oriented. Indeed, ratings of warmth were positively correlated with jobs characterized as Social ($r = 0.31$, $p < .05$; 95% CI = 0.04 to 0.56). 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), whereas jobs requiring leadership and persuasion are seen as less warm (e.g., politician, lawyer).

There were other notable but non-significant relations between occupational Interest Codes and ratings of competence and warmth. Ratings of competence trended negatively 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), suggesting that occupations that required physical exertion or jobs that emphasize structure and order were seen as less competent than jobs that required more analytical and abstract cognition. There was a negative trend between ratings of warmth with jobs characterized as Enterprising ($r = -0.23$, $p < .10$; 95% CI = −0.45 to 0.02), and a positive trend between ratings of warmth with jobs characterized as Realistic ($r = 0.25$, $p < .10$; 95% CI = −0.01 to 0.47). These results suggest that jobs requiring leadership and persuasion are seen as less warm (e.g., politician,

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

Occupation	Stereotype dimension	
	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)
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)

lawyer), whereas occupations perceived as highly warm involve a concrete approach to problem solving (e.g., nurse, firefighter).

3.2.5. 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, whereas 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 positive trend 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.

3.3. Discussion

Overall, Study 1 allowed us to create the first classification of occupational stereotypes, situating occupations according to the SCM dimensions of warmth and competence. Our classification 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 classification based on warmth and competence allows for an assessment of incongruence between occupational and demographic stereotypes. Below, we use the newly developed classification to examine the link between occupational stereotypes and the occupational segregation of gender and racial minority groups.

4. Study 2

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

4.1. 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 54 occupations examined in Study 1 (data were not available for actor, graphic designer, fisherman, psychiatrist, principal; U. S. Bureau of Labor Statistics, 2018a). Rates of unemployment for each demographic group were obtained from a separate report from the U.S. Bureau of Labor Statistics, but the unemployment composition was not available (U. S. Bureau of Labor Statistics, 2018b). 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.

4.2. Results and discussion

All analyses were conducted in SPSS Version 24.0. Occupational warmth and competence ratings derived from Study 1 were correlated with representativeness data for each of the four demographic groups.[2] Bootstrapped confidence intervals for each

[2] Analyses using the raw scores of occupational warmth and competence yielded an identical pattern of results, except the correlation between occupational competence and representation of women in occupations became non-significant.

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
Garbage 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
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.

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)

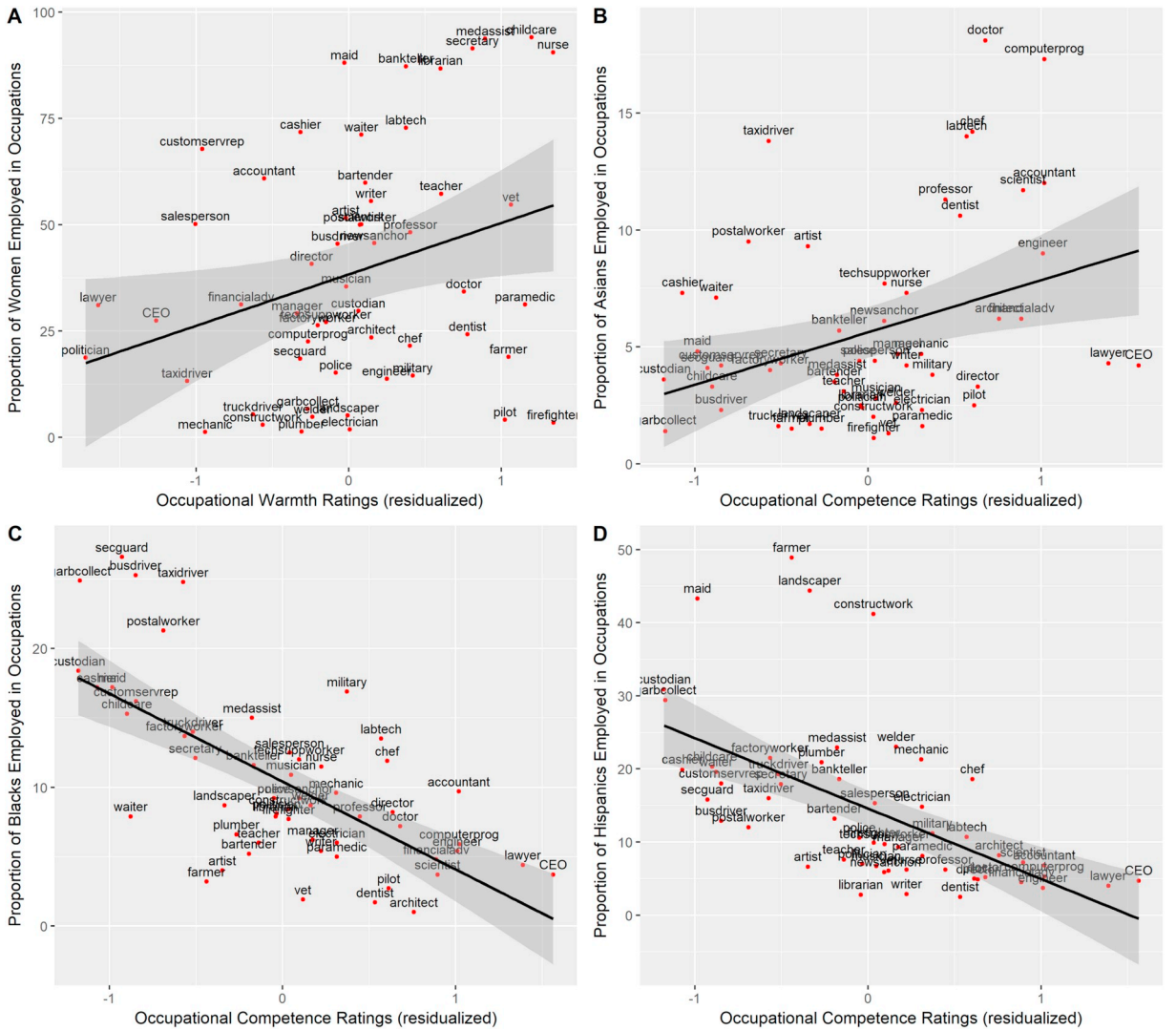

Fig. 3. Relationship between occupational warmth and competence ratings and proportion of demographic groups in occupations. Fig. 3A displays the positive relationship between occupational warmth ratings and representation of women in occupations; Fig. 3B displays the positive relationship between occupational competence ratings and representation of Asians in occupations; Fig. 3C displays the negative relationship between occupational competence ratings and representation of Blacks in occupations; Fig. 3D displays the negative relationship between occupational competence ratings and representation of Hispanics in occupations.

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; Fig. 3A). Additionally, jobs more commonly held by women were trending to be perceived as 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 were better represented in occupations that were rated higher on warmth and lower on competence (Fiske et al., 2007, 2002).

Turning next to racial groups, Asian people, perceived as highly competent and mid-level in terms of warmth (Fiske et al., 2002), were more highly represented in occupations related to science and math, which are also perceived as higher in competence and lower in warmth (e.g., scientist, computer programmer, engineer). Indeed, the percentage of Asian employees within an occupation was positively correlated with the stereotyped competence of the occupation ($r = 0.44$, $p < .01$; 95% CI = 0.24 to 0.61; Fig. 3B). Black people, who tend to be rated low on competence according to the literature on ambivalent stereotypes of Blacks (Fiske et al., 2002; Katz, Wackenhut, & Hass, 1986), were more highly represented in occupations located on the lower end of both warmth *and* competence (e.g., security guard, bus driver, taxi driver). This may reflect the match between those occupations and stereotypes of "poor Blacks", who are low on competence and warmth (Fiske et al., 2002). Overall, we observed a strong negative correlation between the representation of Black workers and the perceived competence of an occupation ($r = -0.62$, $p < .001$; 95% CI = -0.75 to -0.45; Fig. 3C). Black people also had the highest unemployment rate in the U.S. (U. S. Bureau of Labor Statistics,

2018b), and "unemployed" was found to be the 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 (Fiske et al., 2002), 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; Fig. 3D).

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, whereas 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 $ps > 0.12$). These results support our prediction that incongruence between occupational and demographic stereotypes is related to occupational segregation in today's workplace.

5. General discussion

In the current research, we sought to apply a well-established model of stereotype content, the SCM, to occupational stereotypes. 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 classify occupational stereotypes on a two-dimensional classification based on the SCM. Convergent validity of this classification 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 groups along 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 the understanding of occupations and occupational segregation in both theoretical and practical ways. First, classifying occupational stereotypes using the two-dimensional classification of warmth and competence helps us to more systematically understand how individuals perceive occupations in society. We develop a comprehensive yet parsimonious classification 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 understand 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 theoretical framework. 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 classifying occupational stereotypes on warmth and competence, we are able to test a stereotype incongruence account to help explain the persistence of occupational segregation. Although previous research has argued that cultural beliefs about occupations lead 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 concretely defining occupational stereotype content, 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.

Our research has important implications for both researchers and practitioners. For researchers, we demonstrate that people hold occupational stereotypes along the dimensions of warmth and competence. By developing this classification 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 classification to predict under- or over-representation of individuals such as those of lower socio-economic status, those with mental health issues, or from a specific social group (e.g., 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 and parsimonious model of social perception, the future research possibilities are endless.

Independent from the utility of this classification in explaining occupational segregation, the classification also has direct practical implications for career development, in particular career education and career counseling. Past research on occupational stereotypes suggest that occupational stereotypes influence vocational choices, such that a mismatch between one's identity and the image of an occupation may deter students and potential jobseekers from entering that occupation (Gadassi & Gati, 2009; Gupta et al., 2009; Hollander & Parker, 1972). Our findings suggest that one way that career counselors and career educators can make occupations attractive to all jobseekers is to identify any sources of stereotype incongruence and highlight different aspects of the profession to make them less congruent. For instance, if a female jobseeker who is interested in pursuing a career in engineering endorses the stereotype that engineers tend to be highly competent and lacking warmth, she may feel deterred from entering that occupation. However, career counseling can make use of these results by emphasizing the warmth-related aspects of engineering—for instance, highlighting the fact that engineers make important contributions to society and regularly work closely in teams.

Beyond career development, organizations that are interested in understanding or improving their public image can also make use of these results. 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 classification 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.

Future research is also needed to elaborate upon the implications of stereotype congruence at each stage of the segregation process—attraction, selection, promotion, and attrition. Interventions by career counselors and educators 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. These interventions around stereotype congruence may target multiple stages of the segregation processes. For example, an intervention to increase the number of women in engineering at the recruitment stage may emphasize stereotypes around warmth rather than competence in marketing campaigns or job descriptions. Another possible intervention to increase selection of men and Asians for occupations in childcare is to provide selection criteria that emphasize requirements related to competence in additional to warmth. Finally, at the promotion and performance appraisal stages, there could be interventions that emphasize warmth stereotypes and downplay the dominance of competence stereotypes in performance appraisal instruments and tools to increase the promotion and retention of women.

6. Limitations and future directions

A central limitation of our approach is the top-down application of the SCM to understand occupational stereotypes—a concern might be that we are forcing the dimensions of the SCM onto the occupations. Indeed, we note that the occupations are relatively similar on ratings of warmth, and that ratings of warmth and competence do not necessarily fall cleanly into the four quadrants of the original SCM model. Although we recognize these concerns and limitations, we note that our goal is to apply the core theoretical tenets of the SCM to better understand occupational stereotypes, not to use occupational stereotypes as a vehicle for learning more about or confirming the validity of the dimensions of the SCM. In particular, we advance the understanding of occupational stereotypes by showing evidence that people do think about occupations along the fundamental dimensions of warmth and competence, and that the content of the stereotypes is often mixed. For instance, our results suggest that the reason people may hold negative views about lawyers and politicians (low warmth) is very different from the reason why people may hold negative views about garbage collectors or custodians (low competence).

Further, we contend that the fact that there is not clean sorting of the occupations into separate types is theoretically interesting and novel. Occupations represent a sub-group of all social groups, so should not necessarily have the same range as the stereotypes we hold of all social groups. The fact that the individuals within these occupational categories are by definition working implies certain baseline levels of warmth and competence that are already activated in comparison to other social groups measured in the SCM. For instance, employed individuals as a major category are likely to be viewed as higher on warmth and competence compared to groups characterized as low on warmth or competence in the original SCM, namely, the homeless, welfare recipients, retarded, elderly, and disabled (Cuddy et al., 2007). The original SCM sample involved a much wider range of all social groups, which is why its mapping revealed more variation and clearly distinguishable factors that fell into the four distinct quadrants. Our paper examines how the dimensions of the SCM map onto occupational stereotypes, which we acknowledge may be restricted in their range, and how the differences in stereotype content within occupations predict occupational segregation. We did not rely on or force any form of stereotype clustering in our analyses.

Nonetheless, in recognizing this top-down approach as a limitation, we encourage future research to examine stereotypes of a fuller range of groups, including occupations and other social groups in the original SCM, to directly examine how occupational stereotypes compare to the stereotypes of other social groups. Further, future research on occupational stereotypes can take a more bottom-up and inductive approach to confirm the current findings. For instance, one potential future direction is to have participants generate words that describe each occupation and factor analyze those words to see if the same two dimensions, warmth and competence, emerge.

A related concern and limitation of our work is that we apply a person perception framework to occupation perception. Although we noted that recent understanding of occupations has evolved from perceptions of certain tasks and institutions to perceptions of groups and social entities (Anteby et al., 2016a, 2016b), occupations nonetheless have underlying institutional logics and formal classifications that may distinguish them from a purely social category. In this work, our results provide support that individuals seem to perceive occupations in similar ways to how they perceive other social groups, along the dimensions of warmth and competence. However, future work is needed to establish whether occupational stereotyping processes mirror person perception processes as proposed by the SCM framework. In particular, future research can examine whether the affective and behavioral consequences of occupational stereotypes mirror those proposed by the SCM in the context of person perception (Cuddy et al., 2007).

Future research may also build on our model of occupational stereotypes to test how the stereotype incongruence hypothesis

extends to social category groups within and beyond gender and race. Although we applied the stereotype dimensions of the SCM to a comprehensive list of occupations and showed that those stereotypes predict representation of certain social groups that match those stereotypes, we do not have adequate data to test how these occupational stereotypes predict representation of social groups beyond these specific gender and racial groups. The original SCM had differentiated between many sub-groups within demographic groups, for example differentiating between professional Blacks and poor Blacks, and businesswomen and housewives (Fiske et al., 2002). Issues of intersectionality may also change how demographic groups are stereotyped: for instance, stereotypes of Hispanic women likely differ from stereotypes of Asian women.

Another avenue for future research may be to examine the specific mechanisms for the stereotype incongruence hypothesis as well as moderating effects of age, occupation, and segregation stage. We provide explanatory mechanisms for how occupational stereotypes may lead to occupational segregation, but we are unable to test these mechanisms empirically in our work. For example, it is a question for research to what extent occupational stereotypes influence job seekers' and decision makers' actions, and to what extent those actions then contribute to occupational segregation. Further, it is a question for research how occupational stereotypes may influence occupational segregation depending on the stage of the segregation process. For example, occupational stereotypes may have more influence on school performance for children and vocational choices for individuals who know little about certain occupations because they hold relatively less detailed information about the occupation and are more likely to resort to stereotypical thinking. Occupational stereotypes, however, may have less of an influence on individuals who have more exposure to certain occupations because they have detailed, nuanced images of what those occupations actually entail.

Further, 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 overrepresented 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.

7. Conclusion

People hold stereotypes of occupations and this has implications for vocational choice, 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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