Journal of Applied Psychology
2015, Vol. 100, No. 1, 128–161

0021-9010/15/$12.00 http://dx.doi.org/10.1037/a0036734

A Meta-Analysis of Gender Stereotypes and Bias in Experimental Simulations of Employment Decision Making

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Gender bias continues to be a concern in many work settings, leading researchers to identify factors that influence workplace decisions. In this study we examine several of these factors, using an organizing framework of sex distribution within jobs (including male- and female-dominated jobs as well as sex-balanced, or integrated, jobs). We conducted random effects meta-analyses including 136 independent effect sizes from experimental studies ($N = 22{,}348$) and examined the effects of decision-maker gender, amount and content of information available to the decision maker, type of evaluation, and motivation to make careful decisions on gender bias in organizational decisions. We also examined study characteristics such as type of participant, publication year, and study design. Our findings revealed that men were preferred for male-dominated jobs (i.e., gender-role congruity bias), whereas no strong preference for either gender was found for female-dominated or integrated jobs. Second, male raters exhibited greater gender-role congruity bias than did female raters for male-dominated jobs. Third, gender-role congruity bias did not consistently decrease when decision makers were provided with additional information about those they were rating, but gender-role congruity bias was reduced when information clearly indicated high competence of those being evaluated. Fourth, gender-role congruity bias did not differ between decisions that required comparisons among ratees and decisions made about individual ratees. Fifth, decision makers who were motivated to make careful decisions tended to exhibit less gender-role congruity bias for male-dominated jobs. Finally, for male-dominated jobs, experienced professionals showed smaller gender-role congruity bias than did undergraduates or working adults.

Keywords: gender bias, gender stereotypes, employment discrimination, personnel evaluation, employment decisions

Substantial progress toward gender equality in the United States continues to be made. Today, women are more likely than men to complete high school, attain bachelor's degrees, and earn advanced degrees, and this gap between men and women has been steadily increasing over the past 30 years (Aud et al., 2011). However, educational progress has not always translated into equality in the workplace for women. Their salaries and organizational ranks continue to lag behind those of men (Aud et al., 2011), suggesting the possibility of continued gender discrimination.

There is a long history of research on gender bias in workplace decisions. Exemplifying the classic trade-off between experimental control and concerns for realism, one research tradition focuses on true experiments, typically in settings that simulate employment decisions (e.g., Nieva & Gutek, 1980; Rosen & Jerdee, 1974). In this research, decision makers are presented with information about job applicants (e.g., résumés, performance evaluations) in which applicant gender and other features are manipulated. In contrast, a second research tradition examines differences in employment evaluations in field settings, such as job performance and promotability ratings. In meta-analyses of field studies, both Bowen, Swim, and Jacobs (2000) and Roth, Purvis, and Bobko (2012) reported small overall effect sizes for male–female differences (overall d values of $-.01$ and $-.11$, respectively, with females receiving higher scores than males), but gender differences varied across moderators such as gender stereotypicality of the rating measure, rater gender, and type of rating. One advantage of these meta-analyses of field studies assessing gender differences in ratings is the use of actual employee evaluations, allowing for increased confidence in the generalizability of findings. However, one drawback is the inability to unambiguously attribute gender differences in field studies to any particular cause, such as gender bias or true gender differences in performance. As Bowen et al. (2000) noted, "One of the primary limitations of this meta-analysis is that differences in ratings of women and men could have

This article was published Online First May 26, 2014.

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We thank Adam Beatty and Phil Walmsley for helpful comments on drafts of this article.

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occurred because of actual performance differences between the two genders" (pp. 2207–2210). Similarly, Roth et al. (2012) noted, "We did not have access to 'true scores' for job performance. . . . We did not directly address ratings bias (as might be possible in the laboratory)" (p. 733).

The current study reports meta-analyses of the experimental literature on gender bias in work-related decisions, with the goal of comparing and integrating findings with those from the above-mentioned meta-analyses of field studies. Although there have been other meta-analytic investigations of gender bias in experimental settings (most recently Davison & Burke, 2000), the present study makes several important and novel contributions. First, we conduct moderator analyses within different categories of sex distributions within jobs. Given the possibility of changes in the direction of bias based on the sex distribution within a job (e.g., higher ratings for males when jobs are male dominated and higher ratings for females when jobs are female dominated), it is important to examine moderator effects separately for each job type. Although others have studied gender bias for jobs with different stereotypes as well as for moderators such as rater gender and individuating information (e.g., Davison & Burke, 2000; Eagly, Makhijani, & Klonsky, 1992; Tosi & Einbender, 1985), they have not examined these moderators within each category of job stereotype. Second, we examine contextual variables that have not been examined meta-analytically in a gender bias context, including ambiguity of individuating information, response scale, and motivation to make careful decisions. Finally, the present meta-analyses are the most comprehensive quantitative analysis of gender bias in experimental contexts to date, with more than twice as many independent samples as the most recent meta-analysis on the topic by Davison and Burke (2000).

Background and Hypotheses

Gender Stereotypes

Stereotypes are category-based traits or attributes that are often applied to a group of people as a result of accepted beliefs about the members of the group (Agars, 2004; Welle & Heilman, 2007). Group stereotypes lead to expectations about how members of the group should and do behave. Although they can be functional, automatic, unintentional, and accurate in the aggregate (e.g., Devine, 1989; Goodwin, Gubin, Fiske, & Yzerbyt, 2000; Macrae, Milne, & Bodenhausen, 1994), stereotypes can result in bias, an inaccurate evaluation reflecting a generalization rather than an individual's true qualities.

As a social category that is easily observed, gender is a common cue for stereotypical thinking, with gender stereotypes being quickly and automatically activated (e.g., Banaji & Hardin, 1996; Banaji, Hardin, & Rothman, 1993; Blair & Banaji, 1996). Factor analytic research has revealed that the majority of stereotypic gender beliefs tend to fall into two categories: communal and agentic (e.g., Broverman, Vogel, Broverman, Clarkson, & Rosenkrantz, 1972; Eagly & Steffen, 1984). Communal attributes are associated more with females and relate to concern for others, such as being helpful, kind, nurturing, emotionally expressive, and affectionate (Eagly & Karau, 2002). Agentic attributes are more strongly associated with males and express a tendency to be assertive and controlling, such as being dominant, ambitious, independent, and confident (Eagly & Karau, 2002). Stereotypes can be descriptive and describe how men and women are, but they can also be prescriptive and describe how men and women should be (Eagly, 1987).

Job Stereotypes and Sex Distributions Within Jobs

Gender bias at work can arise when people judge men and women differently as a result of the use of gender stereotypes. One proposed explanation for gender bias in the workplace is a role congruity theory (Eagly & Karau, 2002), which explains bias in terms of the congruence between stereotypes held about job requirements and stereotypes held about gender groups. The greater the incongruence between stereotypical gender traits and the gender stereotype of a job, the greater the gender bias. For example, the characteristics seen as necessary to succeed as a CEO may include agentic traits such as dominance, aggression, and emotional toughness, which are more strongly associated with males than with females (e.g., Schein, 2001). Heilman's (1983, 2001, 2012) lack-of-fit model makes similar predictions, for example, that a lack of fit between stereotypical gender characteristics and stereotypical job requirements leads to the conclusion that certain individuals will be unable to succeed in jobs in which gender stereotypes of jobs are at odds with the individual's gender.

In a similar vein, some propose a backlash effect that causes bias against those who deviate from gender norms (e.g., Kark & Eagly, 2010; Rudman & Fairchild, 2004). The social category of gender induces norms against which the ratee is judged, and when the ratee does not align with the norm, he or she may be viewed as inadequate (Kobrynowicz & Biernat, 1998). This perception of inadequacy to meet gender norms can lead to bias (Heilman & Okimoto, 2007). For example, agentic female job applicants, who are diverging from the communal, nonagentic stereotype of women, may be seen as highly qualified for a masculine-stereotyped job but also as deviant and unlikable, leading to penalties such as hiring discrimination. This leads to a dilemma, as women must exhibit some traditionally masculine traits to appear qualified for masculine-stereotyped jobs, yet they may be penalized for doing so. Backlash may have different effects on gender bias when different outcomes are used. Highly qualified women may be judged to be just as competent as men, but these women still may be less liked and less likely to be hired than men (Rudman, Moss-Racusin, Phelan, & Nauts, 2012).

Whereas the previous explanations for gender bias at work focus on the stereotypes associated with job requirements or with groups of people, another explanation for employment bias focuses on sex segregation in the labor force. Although sex segregation has been found to be declining over time, particularly in professional occupations (see Pettit & Hook, 2009), there continues to be a disproportionate distribution of men and women in various occupations (U.S. Department of Labor, 2011). It is reasonable to believe that people hold stereotypes about workers in certain jobs based not only on job requirements but also on the sex of the typical incumbent. Even if there is no mismatch between a ratee's gender and the gender stereotype of job requirements, bias can result due to an unbalanced proportion of males and females in a job (Glick, 1991). For example, if a person is making a hiring decision for a job that is typically held by men but does not necessarily require masculine or agentic characteristics, the image of a successful worker that comes to mind still may be of a male worker, leading the decision maker to see a male applicant as a better fit for the job than a female applicant. Although the perceived gender stereotype of job requirements and the sex distribution within a job are conceptually distinct, they are often highly related (Cejka & Eagly, 1999). In the present study, we use sex distribution within a job as an indicator of the gender stereotypes of the job, recognizing that sex distribution may represent gender stereotypes of job requirements as well as gender-based stereotypes based on the sex of typical incumbents.

All of these explanations for employment bias lead to the same prediction: People who are pursuing jobs that have stereotypes consistent with their own gender will be evaluated more positively than those whose gender is inconsistent with job stereotypes. Meta-analyses consistently reveal higher ratings for men than for women in masculine jobs (e.g., Davison & Burke, 2000; Eagly et al., 1992; Swim, Borgida, Maruyama, & Myers, 1989). Due to the finding that females are underrepresented in certain occupations that confer high status, power, and pay (Carli & Eagly, 2001), much research has focused on bias against females in high-status, male-dominated jobs (e.g., leadership positions; Eagly et al., 1992). However, a female advantage for feminine-stereotyped jobs has also been documented (e.g., Davison & Burke, 2000). Regarding jobs without clear gender stereotypes or without extreme sex imbalances, previous meta-analyses have found a small pro-male bias (Swim et al., 1989) or a small pro-female bias (Eagly et al., 1992). The employment discrimination theories we discussed do not address these jobs that have no strong gender stereotypes. Thus, we take an exploratory approach regarding gender bias in sex-balanced, or integrated, jobs.

> *Hypothesis 1:* Gender-role congruity bias will be found, with men being rated more favorably than women for male-dominated jobs and women being rated more favorably than men for female-dominated jobs.

Rater Gender

Some have found that compared to women, men are more likely to hold traditional stereotypes about women (e.g., passive, timid; Massengill & DiMarco, 1979), have less favorable attitudes toward gender egalitarianism (e.g., Eagly & Mladinic, 1989; Spence & Hahn, 1997), endorse hostile sexism (Glick et al., 2000), and view leadership positions as more masculine and less feminine (e.g., Brenner, Tomkiewicz, & Schein, 1989; Koenig, Eagly, Mitchell, & Ristikari, 2011; Schein, 2001). Thus, men may be more likely than women to see women as incompatible with male-dominated or masculine roles. A meta-analysis of experimental studies requiring evaluation of leaders was consistent with this prediction, with male decision makers exhibiting a pro-male bias and female decision makers exhibiting minimal bias (Eagly et al., 1992). Men's views on gender equality and gender stereotypes also lead us to believe that male raters, compared to female raters, will show larger gender-role congruity bias for female-dominated jobs (i.e., male raters will exhibit a larger pro-female bias than female raters for female-dominated jobs). Perhaps due to a stronger desire to maintain a segregated occupational system where women do not challenge men for male-dominated high-status jobs, men may have a stronger preference than women for selecting women into female-dominated jobs, creating less competition from women in male-dominated jobs. Therefore, we expect male raters to exhibit stronger gender-role congruity bias than female raters for both male- and female-dominated jobs.

> *Hypothesis 2:* Male raters will exhibit stronger gender-role congruity bias than female raters.

Individuating Information

Some argue that stereotyping against women may be likely when there is little to no other information available to differentiate among candidates but that stereotyping effects disappear when decision makers have access to individuating information (e.g., Landy, 2008). That is, the more a decision maker has access to information about credentials, skills, relevant experience, and the like, the less the decision maker relies on gender as the basis for decision. Based on findings that people ignore base rates when making judgments (Kahneman & Tversky, 1973), some have proposed that stereotypes, like prior probabilities, are often ignored when decisions are made (Locksley, Borgida, Brekke, & Hepburn, 1980). Similarly, expectation states theory (EST; Berger, Rosenholtz, & Zelditch, 1980; Correll & Ridgeway, 2006), which describes how performance expectations are formed, has been used to specify situations in which individuating information should outweigh stereotypes based on gender. According to EST, *diffuse* status cues, such as gender, age, or race, carry broad expectations for competence in a wide variety of situations. On the other hand, *specific* status cues, such as skills or abilities needed for a particular task, carry expectations for competence in a small number of clearly-defined situations where the information is relevant. When specific, job-relevant status cues are available to a decision maker, they may be given more weight than the beliefs associated with diffuse status cues because of their relevance to the decision. For example, the presence of specific status cues indicating that a woman earned an MBA and has received excellent performance reviews in her current leadership role are likely to be seen as more relevant and salient to a decision about promotion into upper-level management than is the diffuse cue of gender. As a result, diffuse cues are expected to become less influential as the number of specific status cues (i.e., individuating information) increases. If individuating information decreases bias, many workplace decisions that happen after long periods of interaction between raters and ratees (e.g., performance appraisals, promotion decisions) should be nearly bias-free. Therefore, there are important practical implications concerning the effects of individuating information on bias.

Evidence regarding the relationship between the amount of individuating information and gender bias is mixed. An early meta-analysis containing 21 experimental studies (Tosi & Einbender, 1985) supported the proposition that when organizational decision makers have more job-relevant information about a job applicant, they make less biased decisions. Some support was also offered by Swim et al. (1989), who found in their meta-analysis of experimental studies that gender bias was slightly greater when participants were provided with no individuating information (i.e., a ratee's name only) than when they had additional information. In more recent meta-analyses, Eagly et al. (1992) found no relationship between the amount of information and gender bias and

Davison and Burke (2000) found negative but nonsignificant effects. However, these meta-analyses did not differentiate between male-dominated, female-dominated, and integrated jobs when examining the effects of the amount of individuating information on gender bias. We hypothesize that as more job-relevant information becomes available, gender-role congruity bias will decrease.

The content of the information can also affect the size of gender bias in decision making. Numerous studies have shown that when individuating information is ambiguous regarding a trait or role in question, decision makers rely heavily on stereotypes (see Kunda & Thagard, 1996). Unambiguous information reduces the need for inference, as the "correct" decision is more obvious (e.g., if a job applicant is obviously qualified for a position, there is less need for conjecture about the applicant's future performance in the role). In an organizational context, individuating information that does not clearly indicate a ratee's competence for a particular role may not change the size of gender bias that results when decisions are made about that person for that role (e.g., Heilman, 1984). Because of people's tendency to seek information that confirms expectations (Nickerson, 1998), information that is ambiguous can be distorted to confirm gender stereotypes (Kunda & Thagard, 1996). Additionally, a backlash effect could lead to gender bias in cases where individuating information clearly indicates that ratees do not conform to typical gender stereotypes, leading to penalties for deviating from gender norms (see Rajecki, De Graaf-Kaser, & Rasmussen, 1992). Therefore, we do not expect gender-role congruity bias to be completely eliminated when individuating information is indicative of competence for the job in question. Rather, we predict that gender-role congruity bias will be larger when individuating information is mixed or ambiguous regarding ratees' competence or ability to succeed in a position than when individuating information is highly diagnostic of success.

Hypothesis 3: As more job-relevant information becomes available, gender-role congruity bias will decrease.

Hypothesis 4: Gender-role congruity bias will be largest when individuating information is ambiguous or not clearly diagnostic of success in the job.

Type of Evaluation

Although meta-analytic research findings indicate that gender bias results when a person's gender and the gender stereotype of a job are incongruent, some researchers have found that the reverse is true in some cases. For example, a reverse-stereotyping effect of pro-female bias for masculine jobs has been found under certain conditions (e.g., Biernat & Kobrynowicz, 1997; Biernat & Manis, 1994). One explanation for this effect is provided by the shifting standards model (Biernat, 2003, 2012), which suggests that people make within-category comparisons (e.g., within-gender comparisons) when making subjective judgments. That is, gender stereotypes serve as standards against which individuals are evaluated. As a result, a "good" rating for a woman may mean something different from a "good" rating for a man. A more lenient standard for women in a masculine-stereotyped job may lead to a qualified appraisal of a woman as being "good . . . for a woman" in a nontraditional role. One key point to make about the shifting standards model is that reverse-stereotyping does not imply that stereotypes are not influencing decisions; reverse effects occur because of the differing gender expectations represented by stereotypes (e.g., Biernat & Manis, 1994; Heilman, Martell, & Simon, 1988).

The present study examines the propositions of the shifting standards model by examining the type of comparisons that raters make. In some cases, a rater is asked to make decisions about ratees without explicitly comparing them to other ratees (e.g., rating each candidate's competence on several dimensions). Alternatively, decision makers may make direct comparisons of ratees, for example, rank ordering a group of candidates for hiring. Because comparative judgments are common-rule ratings that require decision makers to use a scale that has the same meaning for both male and female ratees (e.g., choosing to hire a person has the same meaning if that person is a man or a woman), they may be more likely than individual ratings to show gender-role congruity stereotyping effects. For example, when rating the competence of an individual, a decision maker may rate a female applicant high on an individual rating scale because she is competent for a woman, but the same rater may still select a male when asked to choose between a male and female candidate for the job; the female candidate may be good for a woman, but she still may not be as good as the male candidate when they are directly compared. We expect a reduction in pro-female bias for female-dominated jobs and a reduction in pro-male bias for male-dominated jobs when individual (compared to comparative) ratings are made.

Hypothesis 5: Gender-role congruity bias will be larger for comparative than for individual ratings.

Motivation to Make Careful Decisions

Although the use of stereotypes is often described as being automatic and unintentional, there are certain conditions that may reduce the likelihood that decision makers will rely on stereotypes. When people are motivated to make accurate decisions, they invest more time in information processing, pay attention to a wider range of potentially useful information, and engage in deeper processing of information, which can reduce or eliminate the influence of cognitive biases (Kunda, 1990; Lerner & Tetlock, 1999). One situation in which decision makers are motivated to make accurate, careful judgments occurs when they are held accountable for their decisions. A feeling of accountability can be created when decision makers are encouraged to be accurate, are told they will have to justify their decisions, or expect their decisions to affect other people's lives (Kunda, 1990). Another situation that may motivate decision makers to make careful judgments occurs when they become aware of or are reminded of fairness norms. Making decision makers aware of organizational or personal values regarding equity can motivate them to spend more time on decision making and to avoid stereotyping (see Fiske, 1993). Therefore, we expect to find smaller gender-role congruity bias in studies with conditions that increase decision makers' motivation to make careful decisions.

Hypothesis 6: Gender-role congruity bias will be smaller for studies in which (a) decision makers feel accountable for their decisions, (b) decision makers believe their decisions will have consequences that affect others, or (c) decision makers are informed of equity norms.

Additional Study Characteristics

In an exploratory manner, we examine several characteristics of studies as potential moderators of the magnitude of gender-role congruity bias. First, when evidence from experimental gender bias studies is used to make inferences about workplace discrimination, some question whether this type of research reveals anything about actual workplace discrimination (e.g., Landy, 2008). One of the criticisms of experimental research on gender bias is that studies are often conducted with undergraduate samples with little to no training or experience in making workplace decisions. It is argued that in actual employment settings, decision makers have training and experience that should reduce the amount of gender bias exhibited in workplace decisions. On the other hand, given the automatic, unintentional, and pervasive nature of stereotypes (e.g., Devine, 1989), it may also be the case that gender bias is not reduced with additional experience. Because these are both reasonable possibilities, we take an exploratory approach to examining gender bias exhibited by different types of samples.

Second, due to advances in women's rights and changes in the approval of traditional gender roles over time (e.g., Spence & Hahn, 1997), we chose to examine publication year as a moderator. It may be that as opportunities for women in the workplace increase over time, gender bias against women in masculine jobs decreases. However, in their meta-analysis, Eagly et al. (1992) found that anti-female bias was actually larger in more recent studies, but when included in a meta-regression with other variables, publication year was not a significant predictor of bias. Although it seems reasonable to assume that gender-role congruity bias has decreased as women's participation in the labor force has increased, some research suggests that this is not necessarily the case.

Finally, we examine study design as a potential moderator. Ratee gender as a between-person versus within-person variable (i.e., a rater evaluates one target versus multiple targets of both genders) could be a moderator for a few reasons, although the expected direction of the effect is unclear. On one hand, one might expect gender to be more salient for within-person designs, especially when the amount of individuating information is low, making raters aware of the study's gender focus and less likely to exhibit bias. On the other hand, the amount of information to review may be greater for participants in studies with within-person designs, as those raters are rating multiple candidates, and these higher information processing requirements may lead to increased reliance on stereotypes. Additionally, within-person designs may lead to comparisons of candidates of different genders, making the evaluations more likely to occur on the same scale and to lead to greater bias. Therefore, we do not have hypotheses regarding study design.

Method

Literature Search

We searched several online databases (Academic Search Premier, Business Source Premier, Google Scholar, Index to Theses, JSTOR, Proquest Dissertations and Theses, PsycINFO, Social Science Citation Index, Sociological Abstracts, Web of Science) using combinations of the following key words: *gender differences, gender bias, gender stereotypes, sex discrimination, job application, employment discrimination, personnel recruitment, hiring decisions, performance appraisal, employment selection, management decision making, personnel selection, performance ratings, performance evaluation,* and *résumé evaluation.* We searched reference lists from previous meta-analyses on gender bias (e.g., Davison & Burke, 2000). We also examined references in review articles and meta-analyses that focused on different variables in experimental decision-making studies, such as physical attractiveness (Hosoda, Stone-Romero, & Coats, 2003), weight (Rudolph, Wells, Weller, & Baltes, 2009), and age (Morgeson, Reider, Campion, & Bull, 2008). Our search was limited to studies published in English. The first two authors performed the literature searches, examining study titles and abstracts and retaining those that could possibly be included in the meta-analyses. After generating an initial list of potentially eligible studies, the same two authors examined the full text of each study to decide whether it could be included. Disagreements about study inclusion were settled through discussion with all three authors.

Inclusion Criteria

Several criteria for inclusion were adopted. First, the studies had to be experimental. Most studies were simulations of employment contexts, with the typical paradigm being the evaluation of résumés that were identical or very similar other than the gender of the applicants. Studies in which the ratees were intended to differ systematically by gender (e.g., the female applicant was always more qualified) were excluded. Thus, any differences in ratings of hireability, salary, promotion, and so on, could be attributed to the applicant's gender. Although most studies were conducted in laboratory settings, audit studies in which résumés or job applications were sent to actual employers were also included if job applicants were matched on all characteristics besides gender. Second, studies had to include job-related ratings about a ratee (e.g., hireability, salary, competence, promotion). Participant evaluations of non-job-related variables such as liking, attraction, or attributions for behavior were excluded. Also excluded were direct ratings of stimulus materials (e.g., evaluations of the quality of essays), as these did not involve decisions about the ratees themselves. Third, studies had to provide enough data to allow for the computation of Cohen's d (e.g., means, standard deviations, and sample sizes for repeated-measures or independent groups designs; correlations or t values for independent group designs). Studies that reported results only for subsamples or treatment conditions with statistically significant values were excluded to avoid an upward bias in effect sizes. Fourth, studies were excluded if their samples consisted of participants from nonnormal populations (e.g., prisoners). Participants included students, working adults, managers, and personnel specialists. No constraints were placed on the time period or on the geographical locations in which the studies were conducted.

Coding

The first two authors coded the studies on characteristics of interest. Initially, 20 studies were coded by both raters; agreement between raters was 65% for calculated d values and 100% for all other variables. This disagreement was found to result from using different decision rules (e.g., choosing the single most relevant dependent variable versus computing a composite of all relevant dependent variables). Discussion easily reconciled all differences. Both raters coded all variables of interest in the remaining studies. Agreement between raters was 97% for the remaining studies. Any coding differences were discussed and agreed upon by the first two authors, and any remaining disagreements were settled through discussions with all authors.

Sex distribution within job. Each job used in a study was coded as *male-dominated, female-dominated,* or *integrated* based on the proportion of men and women who held that job in the country and during the time period in which the study was conducted. National labor statistics were acquired from census data, government publications, and online databases with national employment statistics (Australian Bureau of Statistics, 2012; Central Bureau of Statistics, 2012a, 2012b; Destatis Federal Statistics Office, 2012; International Labour Organization, 2012; Ontario Network of Women in Engineering, 2012; Statistics Canada, 2012; Statistics Sweden, 2012; U.S. Census Bureau, 2012a, 2012b; U.S. Department of Labor, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011). We located annual employment statistics ranging in date from 1960 to 2010 for the countries in our database, and each job's sex distribution was derived from the available national labor statistics that preceded the article's publication date by as few years as possible. Job titles used in original studies were matched as closely as possible to job titles in the labor statistics publications and databases, according to the specificity of the job title in the original article. For example, the sex distribution of a job in a study specifying a role of "Manager" was based on labor statistics for the category of "Management Occupations," whereas a study specifying a role of "Corporate Training Manager" was based on labor statistics for "Human Resources Managers." When a job listed in a study did not have an exact or near-exact match in a labor statistics database, the first two authors independently chose the best match for the job, and differences were reconciled through discussion. Because we did not expect the impact of sex distribution to be a linear phenomenon (e.g., a change from 40% to 60% female was not expected to have the same effect as a change from 60% to 80% female), we put all jobs into three categories. Based on Kanter's (1977) classification of skewed and tilted proportional representation in groups, we classified jobs as *female-dominated* if the percentage of women in the job was greater than 65%, *integrated* if the percentage of women was between 35% and 65%, and *male-dominated* if the percentage of women was less than 35% (see Appendix A for a list of job titles in each sex distribution category).

Rater gender. When possible, we coded d values for male and female rater groups. In cases where separate d values were not provided by rater gender, the sample was labeled as *mixed/not specified* and was not included in rater gender moderator analyses.

Individuating information. The amount of individuating information was coded as the number of pieces of information provided to a decision maker, with the categories of pieces of information being résumé or job application, recommendation letter, videotape or transcript of interview, work sample or simulation, and performance appraisal (e.g., résumé plus recommendation letter = 2). Studies that provided single pieces of information that contained substantially less information than one would find in a résumé, recommendation letter, and so on, were coded as *limited,* indicating that no sizable pieces of information were provided. No study had more than three sources of information, and because only four studies had three pieces of information, we combined these four studies with the studies providing two pieces of information for analyses.

The content of individuating information was coded as indicating *high competence, ambiguous or average competence,* or *low competence.* To be labeled as high or low competence, studies had to provide consistent information about ratees that clearly indicated their level of qualifications or competence. Examples of information indicating *high competence* included an excellent grade point average in college, job-related awards, high ratings on performance reviews, and positive letters of recommendation. Studies with information indicating poor or below average performance on all job-related attributes were labeled as *low competence.* When studies provided different pieces of information, some indicating high competence and some indicating low competence, they were labeled as *ambiguous.* Studies were labeled as *average competence* when the individuating information indicated that the ratee was average in all job-related ways. We combined *ambiguous* and *average competence* into one category because in neither case did the information clearly indicate whether the ratee would be successful in the position. Some studies did not provide enough details about study materials to determine the content of the individuating information; these studies were not included in these moderator analyses.

Type of evaluation. We coded two moderators related to the type of evaluation: type of comparison and type of employment rating. Type of comparison was coded as *comparative* or *individual.* Decisions that required a direct comparison of ratees, such as choosing one of several candidates to hire or making a short list for hiring, were coded as *comparative.* Decisions that required evaluations of a single ratee, without any explicit reference to other ratees, were coded as *individual.* Types of employment ratings were *hiring, promotion, compensation, reward* (e.g., allocation of desirable training), *penalty* (e.g., termination), *job performance,* and *competence.*

Motivation to make careful decisions. We coded each study for contextual variables that would increase participants' motivation to make careful decisions. These contextual variables were (a) whether participants expected to justify or explain their decisions during the study, increasing accountability (k = 4); (b) whether participants believed their decisions had real consequences outside of the research study (k = 16); and (c) whether participants were informed of organizational equity norms or were instructed to make fair or meritocratic decisions (k = 5). Because of the small number of studies in each of these categories, we combined them into one *motivation to make careful decisions* category for analyses. Due to some studies including more than one of these conditions, a total of 23 samples had conditions representing increased motivation to make careful decisions.

Type of participant. The type of participant was coded as *undergraduate, working adult,* or *experienced professional. Experienced professional* samples consisted of people with experience relevant to the decision-making task in the study. For example, everyone in the sample had experience making hiring decisions when the study outcome was hiring, or everyone had experience evaluating job performance when the study outcome was job performance ratings. *Working adult* samples were not specified as having this relevant experience.

Research design. Studies were coded as *between-* or *within-person,* based on whether gender was manipulated between participants (i.e., each participant evaluated a ratee of only one gender) or within participants (i.e., each participant evaluated ratees of both genders) for the calculation of *d* values.

***d* value.** We obtained *d* values for all samples, either by taking them directly from articles or by computing them when articles reported other statistics that could be converted to *d* values. When means, sample sizes, and standard deviations were provided, we computed Cohen's *d* values (Cohen, 1969) using the following formula:

$$d = \frac{M_M - M_F}{\sqrt{\frac{(N_M - 1)SD_M^2 + (N_F - 1)SD_F^2}{N_M + N_F - 2}}},$$

where M_M is the mean rating of the male ratee, M_F is the mean rating of the female ratee, N_M is the number of participants who rated the male ratee, N_F is the number of participants who rated the female ratee, SD_M is the standard deviation of the ratings of the male ratee, and SD_F is the standard deviation of the ratings of the female ratee. We chose to use the type of *d* value that uses ratee as the unit of analysis and represents a between-units design (i.e., what Hönekopp, Becker, & Oswald, 2006 label as d_1) due to its relevance to the research question, its clarity and familiarity, and its usefulness both in describing the strength of effects and in moderator analyses (see Hönekopp et al., 2006). This *d* value represents the difference, in standard deviation units, between ratings of a male ratee and a female ratee. When multiple ratees of the same gender were used in a study, we verified that ratees of both genders were matched on other characteristics of interest in the study (e.g., race, competence) for *d*-value computations to avoid ambiguity in the meaning of *d* values (e.g., *d* values were computed for differences between ratings of Black female ratees and Black male ratees, not for differences between Black female ratees and White male ratees). For studies using between-person designs, we used formulas provided by Hunter and Schmidt (2004, pp. 278–279) and by Lipsey and Wilson (2001, pp. 172–189) to obtain the appropriate *d* values from correlations, *t* values, and *F* ratios. For studies using within-person designs, we intended to convert *t* values and *F* ratios to the preferred type of *d* value (as described by Morris & DeShon, 2002, p. 111) but were unable to do so because the primary studies with repeated measure *t* values and *F* ratios lacked information (i.e., correlations between groups) required to convert to *d* values that would be in the same metric as the ratee-based, between-group *d* values. As a result, we included only those within-person studies that provided means, standard deviations, and sample sizes for ratees in order to maintain a common, raw-score, between-ratee metric across study designs (see Hönekopp et al., 2006).[1]

Some samples made multiple types of ratings (e.g., both individual and comparative, both salary and hiring ratings) or rated multiple types of jobs (e.g., both female- and male-dominated). We included multiple ratings from the same sample only when they were categorized into different values of a moderator. When a study contained more than one measure of the same value of a moderator, the measures were combined into a composite. If information was not available to create a composite (e.g., correlations between measures), *d* values were averaged to obtain one study *d* value to enter into the meta-analyses. For example, a sample that made both comparative and individual ratings for a male-dominated job would contribute two effect sizes when the moderator being examined was type of comparison (one for comparative and one for individual) but only one effect size when the moderator being examined was sex distribution (the composite *d* value from the study). Thus, each sample contributed no more than one *d* value to any value of a moderator.

Correlation between ratings of male and female ratees. To compute sampling error variance for within-person studies, we needed an estimate of the correlation between ratings of male and female ratees in studies where participants rated both male and female ratees (see Morris & DeShon, 2002). Two research assistants searched all of the within-person studies included in the meta-analyses to code for this correlation. However, none of the within-person studies provided the correlation between ratings of male and female ratees. We instead assumed a correlation of zero between ratings of male and female ratees when computing sampling error variance for within-person studies, resulting in the use of the same sampling error variance formula as for between-person studies. Conceptually, we find it reasonable to assume that the correlation between ratings of male and female ratees is close to zero, as the manipulation of ratee gender should be the major source of rating differences.

Analyses

We used Hunter and Schmidt's (2004) random effects meta-analytic method to conduct our meta-analyses. Bare-bones meta-analyses were conducted with a Microsoft Excel macro based on Hunter and Schmidt's *d* value meta-analysis program. No corrections were made for artifacts such as range restriction or measurement error because we were interested in actual decisions made, analogous to how decisions would be used operationally (i.e., operational decisions are based on uncorrected ratings; however, we do not know whether ratings made in simulated settings are consistently more or less reliable than those made in operational settings). Mean sample size weighted *d* values were computed overall and for moderator variables. Confidence and credibility intervals were calculated with formulas provided by Hunter and Schmidt. To examine publication bias, we used the "meta" package in R statistical software (Schwarzer, 2012) to apply random effects trim and fill methods (Duval & Tweedie, 2000a, 2000b).

[1] In two samples, it was unclear whether the means and standard deviations represented the preferred ratee-based, between-person *d* value or a rater-based, between-person *d* value (i.e., what Hönekopp et al., 2006, label as d_2), and in two samples, it was unclear whether the means and standard deviations represented the preferred type of *d* value or a ratee-based, within-person *d* value (i.e., what Hönekopp et al. label as d_3). Based on the recommendation by Hönekopp et al. to conduct separate meta-analyses for different types of *d* values, we excluded these four samples and reran our primary analyses, finding that all *d* values changed by less than .01. Because the results did not change when including these potentially different *d* values, we chose to include them in further analyses.

Results

Our initial literature searches in various search engines (conducted in May 2012) identified several thousand potential sources. Review of the titles and abstracts reduced this number to over 500, and review of the full publications further reduced the number to 111 sources that met the inclusion criteria. This usable database included 18 dissertations and 93 journal articles published between 1970 and 2012. Because of multiple independent samples within studies (e.g., different populations, multiple experiments reported in one article), the 111 journal articles and dissertations provided 136 independent samples and a total sample size of 22,348 (see Appendix B). Studies that were considered but did not meet the inclusion criteria are listed in Appendix C. The average overall *d* value (across all moderators) was .08, indicating bias in favor of males. We found no evidence of publication bias based on a funnel plot or the trim and fill procedure (Duval & Tweedie, 2000a, 2000b).

Sex Distributions Within Jobs

First, we examined the sex distribution of the job as a moderator (see Table 1), finding a small but positive average effect size for male-dominated jobs ($\bar{d}$ = .13), indicating males received higher ratings than females. We found near zero effect sizes for female-dominated and integrated jobs ($\bar{d}$s of −.02 and .02, respectively). The pro-male bias for male-dominated jobs supported Hypothesis 1, whereas the lack of a pro-female bias for female-dominated jobs did not support this hypothesis.

Rater Gender

Next, we examined rater gender. Across all job types, female raters exhibited a near-zero bias ($\bar{d}$ = .04), and males exhibited a larger pro-male bias ($\bar{d}$ = .21). However, we found different patterns when examining jobs with different sex distributions separately (see Table 2). For male-dominated jobs, male raters showed a stronger gender-role congruity bias (i.e., pro-male bias) than female raters, in support of Hypothesis 2. Both male and female raters exhibited a pro-male bias for female-dominated jobs, contrary to our expectations. However, it should be noted that *k* and *n* for female-dominated job analyses were quite small. For integrated jobs, bias did not differ for male and female raters (i.e., confidence intervals were overlapping).

Individuating Information

Overall, we did not find a consistent linear pattern in mean *d* value changes when adding additional pieces of information. For male-dominated jobs, the mean *d* value decreased when going from limited information to one piece of information (from .45 to .09) but increased to .22 for two or more pieces of information (see Table 3). Nevertheless, pro-male bias was smaller when participants had one or more pieces of information than when information was limited, providing some support for Hypothesis 3 for male-dominated jobs. There was no consistent trend for female-dominated jobs, with a mean *d* value that changed from a slight pro-female bias with limited information ($\bar{d}$ = −.03) to a slight pro-male bias with one piece of information ($\bar{d}$ = .05) and back to a small pro-female bias with two or more pieces of information ($\bar{d}$ = −.09); all confidence intervals were overlapping, so Hypothesis 3 was not supported for female-dominated jobs. Similarly, the mean *d* value for integrated jobs switched signs from limited information ($\bar{d}$ = .14) to one piece of information ($\bar{d}$ = −.05) and then returned to its original direction and approximate size for two or more pieces of information ($\bar{d}$ = .17). Across all job types, Hypothesis 3 received only partial support and only in the male-dominated job sample, where the large pro-male bias associated with limited information decreased when decision makers had additional information.

Regarding the content of the individuating information, our results for male- and female-dominated jobs supported Hypothesis 4. That is, we found the largest gender-role congruity bias when individuating information was ambiguous, compared to when information was unambiguous and signaled high or low competence. For male-dominated jobs, the pro-male bias found when information was ambiguous ($\bar{d}$ = .29) decreased to near zero when information indicated high competence ($\bar{d}$ = .02). For female-dominated jobs, the gender-role congruity bias that was found when information was ambiguous ($\bar{d}$ = −.12) turned into a pro-male bias when information indicated high competence ($\bar{d}$ = .16). For integrated jobs, bias was larger when individuating information signaled high competence ($\bar{d}$ = .18) than when it was ambiguous ($\bar{d}$ = −.02).

Type of Evaluation

The findings regarding type of comparison did not confirm our expectations in Hypothesis 5 (see Table 4). Instead of finding larger gender-role congruity effects for comparative ratings than for individual ratings, we found no significant differences in gender bias for the two types of comparisons for any job type. Although our results followed the expected pattern for male-dominated jobs, confidence intervals were overlapping. For female-dominated jobs, mean *d* values were near zero for individual and comparative ratings ($\bar{d}$s of .01 and −.01, respectively). We found a similar pattern for integrated jobs ($\bar{d}$ = .03 for individual ratings and $\bar{d}$ = −.06 for comparative ratings, with overlapping confidence intervals). Thus, none of our results supported Hypothesis 5.

When examining various types of employment ratings, we found different patterns of results for female-dominated, male-dominated, and integrated jobs. For male-dominated jobs, the largest gender-role congruity bias resulted for hiring decisions ($\bar{d}$ = .26), followed by evaluations of competence ($\bar{d}$ = .16) and compensation ($\bar{d}$ = .13). For female-dominated jobs, the largest bias resulted for job performance ratings ($\bar{d}$ = −.32), followed by competence ratings ($\bar{d}$ = −.22) and hiring decisions ($\bar{d}$ = −.14). For integrated jobs, there was no significant bias for hiring, compensation, or job performance ratings and a pro-male bias for competence ratings ($\bar{d}$ = .08) and promotion ratings ($\bar{d}$ = .28).

Motivation to Make Careful Decisions

As predicted in Hypothesis 6, contextual variables that were expected to increase participants' motivation to make careful decisions did reduce gender-role congruity bias for male-dominated

Table 1
Overall Analyses

Variable	k	n	$\bar{d}$	SD	SD_d	80% CV lower	80% CV upper	90% CI lower	90% CI upper
All samples	136	22,348	0.08	0.29	0.25	−0.24	0.40	0.06	0.11
Sex distribution									
Male-dominated	80	12,900	0.13	0.31	0.27	−0.21	0.48	0.10	0.16
Female-dominated	28	2,772	−0.02	0.43	0.38	−0.50	0.47	−0.08	0.05
Integrated	46	7,486	0.02	0.32	0.28	−0.33	0.38	−0.02	0.06
Rater gender									
Male raters	49	3,499	0.21	0.42	0.34	−0.23	0.65	0.16	0.27
Female raters	38	3,025	0.04	0.38	0.31	−0.35	0.43	−0.02	0.10
Amount of information									
Limited	14	2,279	0.24	0.33	0.29	−0.13	0.61	0.17	0.31
1	97	16,393	0.05	0.27	0.22	−0.24	0.33	0.02	0.07
2 or more	28	3,676	0.16	0.35	0.31	−0.24	0.55	0.10	0.21
Content of information									
High competence	49	5,231	0.12	0.37	0.32	−0.29	0.52	0.07	0.16
Ambiguous or average competence	51	6,494	0.12	0.37	0.32	−0.29	0.53	0.08	0.16
Low competence	15	1,012	0.06	0.25	0.07	−0.03	0.15	−0.05	0.16
Type of comparison									
Comparative	48	5,327	0.10	0.44	0.40	−0.41	0.60	0.05	0.14
Individual	102	18,267	0.08	0.27	0.22	−0.21	0.36	0.05	0.10
Type of employment rating									
Hiring	98	14,261	0.11	0.32	0.28	−0.25	0.46	0.08	0.13
Promotion	10	1,165	0.05	0.32	0.26	−0.28	0.38	−0.04	0.15
Compensation	20	3,656	0.06	0.20	0.14	−0.11	0.24	0.01	0.12
Reward	3	454	0.07	0.21	0.13	−0.09	0.23	−0.08	0.23
Penalty	4	619	0.04	0.29	0.24	−0.27	0.36	−0.09	0.18
Job performance	25	6,182	0.04	0.28	0.25	−0.28	0.35	−0.01	0.08
Competence	38	4,954	0.08	0.23	0.15	−0.12	0.27	0.03	0.12
Motivation to make careful decisions									
Yes	23	2,538	−0.05	0.26	0.18	−0.27	0.18	−0.11	0.02
No	115	19,513	0.10	0.30	0.26	−0.23	0.43	0.08	0.12
Type of participant									
Undergraduates	81	12,112	0.13	0.29	0.25	−0.18	0.45	0.10	0.16
Working adults	15	2,376	0.05	0.34	0.30	−0.34	0.44	−0.01	0.12
Experienced professionals	34	6,720	0.03	0.23	0.18	−0.20	0.26	−0.01	0.07
Year of publication									
1970s	24	5,431	0.03	0.19	0.13	−0.14	0.20	−0.02	0.07
1980s	29	4,345	0.14	0.35	0.30	−0.25	0.53	0.09	0.19
1990s	33	4,774	0.13	0.32	0.28	−0.23	0.48	0.08	0.18
2000s	50	7,798	0.06	0.30	0.25	−0.26	0.39	0.03	0.10
Study design									
Between	68	14,551	0.07	0.27	0.24	−0.23	0.38	0.05	0.10
Within	68	7,797	0.11	0.33	0.27	−0.24	0.46	0.07	0.14

Note. k = number of effect sizes; n = sample size; $\bar{d}$ = average sample size weighted effect size (positive values indicate bias in favor of males and negative values indicate bias in favor of females); SD = standard deviation of observed effect sizes; SD_d = estimated standard deviation of corrected effect sizes; 80% CV = lower and upper limits of 80% credibility interval; 90% CI = lower and upper limits of 90% confidence interval.

jobs, with an average d value of .01 for studies where participants were motivated to make careful decisions and an average d value of .15 for studies without any of the motivating characteristics. We did not discover the same trend for female-dominated or integrated jobs (see Table 5). However, for both of these job types, very few studies included the characteristics expected to increase decision accuracy (k = 5 for female-dominated jobs and k = 4 for integrated jobs).

Table 2
Moderator Analyses for Rater Gender

Variable	k	n	$\bar{d}$	SD	SD_d	80% CV lower	80% CV upper	90% CI lower	90% CI upper
Male-dominated jobs									
Male raters	33	1,927	0.30	0.47	0.39	−0.20	0.80	0.22	0.38
Female raters	22	1,112	0.01	0.45	0.34	−0.43	0.45	−0.09	0.11
Female-dominated jobs									
Male raters	6	394	0.18	0.48	0.41	−0.34	0.70	0.01	0.35
Female raters	7	624	0.32	0.53	0.49	−0.31	0.94	0.19	0.45
Integrated jobs									
Male raters	14	1,281	0.14	0.39	0.33	−0.28	0.56	0.04	0.23
Female raters	12	1,498	−0.03	0.19	0.08	−0.13	0.07	−0.11	0.06

Note. k = number of effect sizes; n = sample size; $\bar{d}$ = average sample size weighted effect size (positive values indicate bias in favor of males and negative values indicate bias in favor of females); SD = standard deviation of observed effect sizes; SD_d = estimated standard deviation of corrected effect sizes; 80% CV = lower and upper limits of 80% credibility interval; 90% CI = lower and upper limits of 90% confidence interval.

Additional Study Characteristics

When comparing bias exhibited by undergraduate, working adult, and experienced professional samples, we found some support for the notion that with increased experience and training of raters, gender-role congruity bias tends to be reduced (see Table 6). For male-dominated jobs, undergraduates and working adults exhibited a larger pro-male bias ($\bar{d}$s = .19) than experienced professionals ($\bar{d}$ = .04). This trend was reversed for female-dominated jobs, with experienced professionals showing the largest pro-female bias, though the sample of experienced professionals was small (n = 167, k = 5). Undergraduates and experienced professionals exhibited similar levels of bias when making decisions about integrated jobs ($\bar{d}$s = .07 and .05, respectively). Thus, findings on bias exhibited by different types of participants were mixed.

Table 3
Moderator Analyses for Individuating Information

Variable	k	n	$\bar{d}$	SD	SD_d	80% CV lower	80% CV upper	90% CI lower	90% CI upper
Amount of information									
Male-dominated jobs									
Limited	6	852	0.45	0.40	0.36	−0.02	0.91	0.33	0.56
1	57	9,932	0.09	0.26	0.21	−0.18	0.35	0.05	0.12
2 or more	20	2,086	0.22	0.43	0.38	−0.27	0.71	0.15	0.30
Female-dominated jobs									
Limited	4	400	−0.03	0.16	0.00	−0.03	−0.03	−0.19	0.13
1	17	1,348	0.05	0.38	0.31	−0.34	0.44	−0.04	0.14
2 or more	8	1,024	−0.09	0.56	0.53	−0.77	0.59	−0.19	0.01
Integrated jobs									
Limited	6	1,227	0.14	0.25	0.20	−0.12	0.40	0.05	0.24
1	30	4,877	−0.05	0.30	0.25	−0.37	0.27	−0.10	0.00
2 or more	10	1,382	0.17	0.37	0.33	−0.26	0.59	0.08	0.26
Content of information									
Male-dominated jobs									
High competence	29	2,223	0.02	0.41	0.34	−0.41	0.45	−0.05	0.09
Ambiguous or average competence	35	3,492	0.29	0.43	0.38	−0.19	0.78	0.24	0.35
Low competence	13	710	0.10	0.28	0.05	0.03	0.16	−0.03	0.22
Female-dominated jobs									
High competence	6	753	0.16	0.38	0.33	−0.26	0.59	0.04	0.28
Ambiguous or average competence	12	1,375	−0.12	0.49	0.46	−0.70	0.47	−0.21	−0.03
Low competence	0	—	—	—	—	—	—	—	—
Integrated jobs									
High competence	17	2,304	0.18	0.35	0.30	−0.21	0.56	0.11	0.25
Ambiguous or average competence	15	2,673	−0.02	0.22	0.16	−0.23	0.19	−0.08	0.04
Low competence	2	150	−0.08	0.27	0.14	−0.25	0.10	−0.34	0.19

Note. k = number of effect sizes; n = sample size; $\bar{d}$ = average sample size weighted effect size (positive values indicate bias in favor of males and negative values indicate bias in favor of females); SD = standard deviation of observed effect sizes; SD_d = estimated standard deviation of corrected effect sizes; 80% CV = lower and upper limits of 80% credibility interval; 90% CI = lower and upper limits of 90% confidence interval. Dashes indicate that values are not reported for any moderator with a k of 0 or 1.

Table 4
Moderator Analyses for Type of Evaluation

Variable	k	n	$\bar{d}$	SD	SD_d	80% CV lower	80% CV upper	90% CI lower	90% CI upper
				Type of comparison					
Male-dominated jobs									
Comparative	31	3,113	0.19	0.40	0.35	−0.26	0.63	0.13	0.25
Individual	58	10,424	0.12	0.28	0.23	−0.18	0.42	0.09	0.15
Female-dominated jobs									
Comparative	12	856	−0.01	0.29	0.17	−0.22	0.20	−0.12	0.10
Individual	19	2,095	0.01	0.47	0.43	−0.54	0.56	−0.06	0.08
Integrated jobs									
Comparative	13	1,820	−0.06	0.51	0.48	−0.68	0.56	−0.14	0.02
Individual	37	6,096	0.03	0.31	0.27	−0.31	0.37	−0.01	0.07
				Type of employment rating					
Male-dominated jobs									
Hiring	55	6,987	0.26	0.38	0.33	−0.17	0.68	0.22	0.30
Promotion	7	829	−0.04	0.31	0.24	−0.35	0.27	−0.16	0.07
Compensation	12	1,725	0.13	0.22	0.15	−0.07	0.32	0.05	0.20
Reward	3	454	0.07	0.21	0.13	−0.09	0.23	−0.08	0.23
Penalty	3	566	−0.03	0.17	0.08	−0.13	0.07	−0.17	0.11
Job performance	14	4,704	0.09	0.33	0.31	−0.31	0.49	0.04	0.14
Competence	21	2,647	0.16	0.29	0.23	−0.13	0.45	0.10	0.23
Female-dominated jobs									
Hiring	21	2,022	−0.14	0.50	0.46	−0.72	0.45	−0.21	−0.07
Promotion	0	—	—	—	—	—	—	—	—
Compensation	3	678	0.04	0.43	0.41	−0.48	0.57	−0.08	0.17
Reward	0	—	—	—	—	—	—	—	—
Penalty	0	—	—	—	—	—	—	—	—
Job performance	7	736	−0.32	0.41	0.36	−0.78	0.14	−0.44	−0.20
Competence	10	911	−0.22	0.35	0.28	−0.58	0.15	−0.33	−0.11
Integrated jobs									
Hiring	39	6,384	0.00	0.30	0.26	−0.33	0.33	−0.04	0.04
Promotion	3	336	0.28	0.22	0.10	0.16	0.41	0.10	0.47
Compensation	8	1,745	0.00	0.15	0.05	−0.07	0.07	−0.08	0.08
Rewards	0	—	—	—	—	—	—	—	—
Penalty	1	—	—	—	—	—	—	—	—
Job performance	9	1,416	0.05	0.43	0.40	−0.46	0.57	−0.03	0.14
Competence	16	2,212	0.08	0.29	0.23	−0.22	0.37	0.01	0.15

Note. k = number of effect sizes; n = sample size; $\bar{d}$ = average sample size weighted effect size (positive values indicate bias in favor of males and negative values indicate bias in favor of females); SD = standard deviation of observed effect sizes; SD_d = estimated standard deviation of corrected effect sizes; 80% CV = lower and upper limits of 80% credibility interval; 90% CI = lower and upper limits of 90% confidence interval. Dashes indicate that values are not reported for any moderator with a k of 0 or 1.

We did not find a consistent trend for changes in bias over time. The average effect size for male-dominated jobs in the 1970s was quite small, .05, but increased to .24 in the 1980s and to .26 in the 1990s before decreasing to .08 in the 2000s. The pro-female bias for female-dominated jobs increased from −.14 in the 1970s to −.32 in the 1980s before changing to a pro-male bias of .33 in the 1990s and a near-zero bias of .03 in the 2000s. Bias for integrated jobs remained close to zero throughout all decades, with the largest average effect size being .09 in the 1980s. For all job types, bias was quite small, .08 or smaller, in studies published during the 2000s. Overall, findings did not indicate a clear trend in gender bias by study year.

We found that effect sizes were similar when ratee gender was manipulated between- and within-person. Mean effect sizes for within- and between-person designs differed by only .01 for male-dominated jobs, by .03 for female-dominated jobs, and by .08 for integrated jobs. Confidence intervals for between- and within-person designs were overlapping for all job types. Findings did not support a difference in gender bias for different types of study designs.

Discussion

Summary of Findings

Findings regarding all hypotheses and research questions are summarized in Table 7. Our results supported the predictions made by role congruity theory (Eagly & Karau, 2002; Kark & Eagly, 2010), which suggests that the greater the incongruence between stereotypical gender traits and the gender stereotype of a job, the greater the gender bias, particularly for masculine jobs (represented by male-dominated jobs in our study). Our findings suggest that women may be more likely to face discrimination in male-dominated environments, whereas, on average, neither gender has an advantage in female-dominated or integrated environments. The extent to which a job is female dominated is negatively related to occupational salary and prestige (Glick, 1991; Lyness, 2002), so women may tend to face the most discrimination in jobs that generally produce the highest pay and status.

Table 5
Moderator Analyses for Motivation to Make Careful Decisions

Variable	k	n	$\bar{d}$	SD	SD_d	80% CV lower	80% CV upper	90% CI lower	90% CI upper
Male-dominated jobs									
Yes	15	1,518	0.01	0.30	0.22	−0.27	0.29	−0.07	0.09
No	68	11,382	0.15	0.31	0.27	−0.20	0.50	0.12	0.18
Female-dominated jobs									
Yes	5	176	0.22	0.34	0.03	0.19	0.26	−0.03	0.47
No	24	2,596	−0.03	0.44	0.40	−0.54	0.48	−0.10	0.03
Integrated jobs									
Yes	4	910	−0.21	0.18	0.12	−0.36	−0.05	−0.32	−0.10
No	41	6,279	0.04	0.33	0.28	−0.32	0.40	0.00	0.08

Note. *Yes* indicates one of the following conditions was present: participants felt accountable for their decisions, participants believed their judgments had real consequences, or participants were aware of equity norms. *No* indicates none of those three conditions was present in the study. k = number of effect sizes; n = sample size; $\bar{d}$ = average sample size weighted effect size (positive values indicate bias in favor of males and negative values indicate bias in favor of females); SD = standard deviation of observed effect sizes; SD_d = estimated standard deviation of corrected effect sizes; 80% CV = lower and upper limits of 80% credibility interval; 90% CI = lower and upper limits of 90% confidence interval.

In our examination of rater gender, we found that male raters tended to favor males, regardless of the sex distribution within the job. The finding that male raters exhibited stronger gender-role congruity bias than female raters for male-dominated jobs is consistent with the idea that men may be sensitive to changes in the traditional gender hierarchy and may disapprove of women working in male-dominated, high-status occupations. Because the workplace has historically been the male domain, males may feel as though their roles are being threatened by women entering the workforce, especially when women seek male-dominated jobs. It may also be that males, compared to females, tend to see male-dominated positions as more masculine or tend to adhere more strongly to gender stereotypes. Our results show that female raters did not exhibit a large bias for male-dominated jobs. This finding could have resulted partially from the tendency of women (compared to men) to hold less traditional stereotypes about women, to see women as having more masculine traits, and to view some traditionally masculine jobs as more feminine (e.g., Brenner et al., 1989; Koenig et al., 2011; Massengill & DiMarco, 1979; Schein, 2001), leading women to be more likely than men to believe that women are compatible with masculine or male-dominated roles. Rater gender analyses also revealed a surprising pro-male bias by both male and female raters for female-dominated jobs. This finding is consistent with a "glass escalator" effect, where men in female-dominated professions enjoy advantages such as being more likely to be hired, to be promoted, and to earn pay raises than women in the same occupations (see Williams, 1992). Explanations for this effect include men being steered toward more masculine positions or specialties within female-dominated occupations, which include managerial and administrative roles that tend to be higher paying and more prestigious.

Our results offer limited support for the claim that providing more individuating information decreases gender bias in workplace decisions (e.g., Landy, 2008). Compared to when information was limited, one or more substantial pieces of information decreased bias, particularly for male-dominated jobs. However, mean effect sizes for the number of pieces of information suggested that bias did not always decrease when adding each additional piece of information. Perhaps more information leads to a higher cognitive load, resulting in the decision maker failing to consider the information and relying on stereotypes. The findings on the content of individuating information may also shed light on why we did not discover the expected pattern of bias for the amount of information. If information was ambiguous regarding a ratee's potential for success in a job, it did not tend to reduce gender-role congruity bias. Even if a decision maker had a large amount of information about a ratee, if that information was ambiguous, gender-role congruity bias did not decrease. This supports the idea that individuating information must be highly diagnostic to counteract stereotypes.

These results do not support predictions about a backlash effect where highly competent ratees are punished for violating traditional stereotypes. In the case of female-dominated jobs, males were rewarded rather than punished for being highly competent in gender-incongruent jobs. This appears consistent with what Kunda and Thagard (1996) called a contrast effect, in which unambiguous information indicating a counterstereotypical trait of a ratee leads the ratee to be viewed as extreme on that trait. For male-dominated jobs, neither gender was favored when ratees were highly competent. This appears to be an encouraging sign for competent women wishing to enter male-dominated professions.

Our findings failed to provide support for the shifting standards model (Biernat, 2003), which predicts smaller gender-role congruity bias for individual ratings than for comparative ratings. We found no substantial differences between individual and comparative ratings. It appears that the within-gender comparisons for individual, subjective rating scales thought to induce the shifting standards pattern (e.g., "this person is competent . . . for a woman") are not consistently made.

One encouraging finding from our study comes from the moderator analyses on characteristics expected to increase participants' motivation to make careful decisions, particularly for male-dominated jobs. When participants felt accountable for their decisions, believed their decisions had real-life consequences, or were reminded of equity norms, they tended to make less biased decisions about male-dominated jobs than when none of these features were present. This finding provides support for the idea that when held accountable, decision makers are more careful and thorough about processing information, leading to more accurate decisions. Our findings suggest that increasing feelings of accountability or

Table 6
Moderator Analyses for Study Characteristics

Variable	k	n	$\bar{d}$	SD	SD_d	80% CV lower	80% CV upper	90% CI lower	90% CI upper
Type of participant									
Male-dominated jobs									
Undergraduates	50	6,543	0.19	0.31	0.26	−0.13	0.52	0.15	0.24
Working adults	10	1,187	0.19	0.43	0.39	−0.31	0.70	0.10	0.29
Experienced professionals	18	4,970	0.04	0.24	0.21	−0.23	0.30	−0.01	0.08
Female-dominated jobs									
Undergraduates	20	2,436	0.02	0.42	0.38	−0.47	0.51	−0.05	0.09
Working adults	1	—	—	—	—	—	—	—	—
Experienced professionals	5	167	−0.32	0.56	0.43	−0.88	0.23	−0.58	−0.07
Integrated jobs									
Undergraduates	24	3,871	0.07	0.30	0.26	−0.27	0.40	0.01	0.12
Working adults	4	1,142	−0.09	0.08	0.00	−0.09	−0.09	−0.19	0.00
Experienced professionals	14	1,655	0.05	0.33	0.27	−0.30	0.40	−0.03	0.13
Year of publication									
Male-dominated jobs									
1970s	20	4,871	0.05	0.24	0.20	−0.21	0.31	0.00	0.09
1980s	22	3,169	0.24	0.39	0.35	−0.21	0.69	0.18	0.30
1990s	15	1,919	0.26	0.33	0.28	−0.09	0.61	0.18	0.33
2000s	23	2,941	0.08	0.23	0.15	−0.11	0.28	0.02	0.15
Female-dominated jobs									
1970s	4	266	−0.14	0.33	0.22	−0.42	0.14	−0.34	0.06
1980s	6	764	−0.32	0.28	0.22	−0.60	−0.04	−0.44	−0.20
1990s	10	613	0.33	0.47	0.39	−0.17	0.83	0.20	0.47
2000s	8	1,129	0.03	0.35	0.31	−0.36	0.43	−0.06	0.13
Integrated jobs									
1970s	6	466	−0.03	0.31	0.22	−0.31	0.24	−0.18	0.12
1980s	8	1,356	0.09	0.34	0.30	−0.30	0.48	0.00	0.18
1990s	10	1,738	−0.07	0.21	0.15	−0.26	0.12	−0.15	0.01
2000s	22	3,926	0.05	0.34	0.31	−0.35	0.44	−0.01	0.10
Study design									
Male-dominated jobs									
Between	38	8,781	0.13	0.28	0.24	−0.18	0.44	0.10	0.17
Within	42	4,119	0.14	0.37	0.31	−0.26	0.54	0.09	0.19
Female-dominated jobs									
Between	13	1,712	−0.03	0.51	0.48	−0.64	0.59	−0.11	0.05
Within	15	1,060	0.00	0.25	0.09	−0.11	0.12	−0.10	0.10
Integrated jobs									
Between	26	4,628	−0.01	0.32	0.28	−0.36	0.35	−0.05	0.04
Within	20	2,858	0.07	0.32	0.27	−0.28	0.42	0.01	0.13

Note. k = number of effect sizes; n = sample size; $\bar{d}$ = average sample size weighted effect size (positive values indicate bias in favor of males and negative values indicate bias in favor of females); SD = standard deviation of observed effect sizes; SD_d = estimated standard deviation of corrected effect sizes; 80% CV = lower and upper limits of 80% credibility interval; 90% CI = lower and upper limits of 90% confidence interval. Dashes indicate that values are not reported for any moderator with a k of 0 or 1.

highlighting equity norms in an organization may help to reduce gender bias in decision making, specifically for male-dominated jobs.

We found some evidence indicating that professionals with experience and/or training in organizational decision making exhibit less bias than untrained working adults or undergraduate students. For male-dominated jobs, experienced professionals tended to show smaller gender-role congruity bias than working adults or undergraduates, providing some support for ideas expressed by those who question the generalizability of findings from laboratory studies with undergraduate participants to real-life employment settings (e.g., Landy, 2008). It may be that experienced decision makers have learned to avoid stereotypical thinking or are more aware of norms that discourage them from appearing biased.

Experimental Simulations Versus Field Studies

In the introduction we noted the tension between the experimental control gained in simulations versus the realism of field studies. Some argue that laboratory studies using "paper people" are not similar enough to actual organizational scenarios to allow one to generalize laboratory findings to the workplace. On the other hand, the lack of experimental control of field-based studies leaves one unable to rule out other plausible explanations when it is found that one gender receives higher ratings than the other (e.g., are there true gender differences?). Therefore, it is useful to note points of convergence between the present study and meta-analyses of field studies of gender bias. Both Bowen et al. (2000) and Roth et al. (2012) reported small overall gender differences in measures of job performance and

Table 7
Summary of Findings

Hypothesis	Support for hypothesis
H1: Gender-role congruity bias will be found, with men being rated more favorably than women for male-dominated jobs and women being rated more favorably than men for female-dominated jobs.	Only for male-dominated jobs; not for female-dominated jobs.
H2: Male raters will exhibit stronger gender-role congruity bias than female raters.	Only for male-dominated jobs; not for female-dominated jobs.
H3: As more job-relevant information becomes available, gender-role congruity bias will decrease.	Only for limited information compared to one or more pieces of information for male-dominated jobs; not for female-dominated jobs.
H4: Gender-role congruity bias will be largest when individuating information is ambiguous or not clearly diagnostic of success in the job.	Yes, for both male- and female-dominated jobs.
H5: Gender-role congruity bias will be larger for comparative than for individual ratings.	No, not for male- or female-dominated jobs.
H6: Gender-role congruity bias will be smaller for studies in which (a) decision makers feel accountable for their decisions, (b) decision makers believe their decisions will have consequences that affect others, or (c) decision makers are informed of equity norms.	Only for male-dominated jobs; not for female-dominated jobs.
Research question	**Finding**
Does gender-role congruity bias vary by sample type (i.e., undergraduates vs. working adults vs. experienced professionals)?	For male-dominated jobs, experienced professionals exhibited less gender-role congruity bias than undergraduates and working adults; this pattern did not hold for female-dominated or integrated jobs.
Does gender bias vary by publication year?	No support for a difference in gender bias by publication year.
Does gender bias vary by study design (i.e., when ratee gender is manipulated between-person vs. within-person)?	No support for a difference in gender bias by study design.

promotability, consistent with overall effect sizes in the present study. Roth et al. and Bowen et al. also identified moderators that influenced the size of gender differences in evaluations. For example, like the present study, Bowen et al. found that pro-male bias on measures of job performance was larger when raters were males. Although overall gender differences may be small in both field-based and laboratory studies, both types of research have identified similar moderator variables that can have an impact on the size of gender differences in employment evaluations. Because of the inherent ambiguity in explaining gender differences in field studies, laboratory studies are critical for isolating gender bias as a cause of gender differences in evaluations.

Study Limitations

One limitation is that we are unable to test many of the proposed mechanisms underlying the effects reported here. For example, although we can document that female raters give lower ratings to women than to men in female-dominated jobs, intervening causal mechanisms cannot be tested meta-analytically unless those mechanisms are systematically explored in primary studies. We view this as reflecting the state of our knowledge rather than as a failing of the present study. Our hope is that highlighting various effects via meta-analysis will motivate research that explores the mechanisms underlying the effects, thus informing subsequent meta-analyses.

Another limitation is that we cannot draw strong conclusions about some moderator analyses, especially for female-dominated jobs, due to a lack of studies and small sample sizes. Because of women's later entry into the labor force and their disproportionate segregation into lower paying and lower status jobs, it is not surprising that researchers typically choose to focus on gender discrimination in male-dominated rather than female-dominated jobs. Nevertheless, the smaller literature on female-dominated jobs limits the conclusions we can draw about them.

Finally, there are multiple ways to identify gender stereotypes of jobs. We chose to determine job stereotypes based on the sex distribution within jobs, but in some cases the gender stereotype associated with a job's requirements may not align with the sex distribution in that job. For example, human resource positions in the United States were male dominated in the 1970s but integrated (i.e., filled by roughly equal numbers of men and women) in the 1980s, and they have been female-dominated since the 1990s (International Labour Organization, 2012). It is not necessarily the case that the requirements for human resource jobs have changed in terms of the masculine or feminine attributes required to be successful in the job. Rather, there could be a mismatch between the sex distribution and the gender stereotype of the job requirements. If we had classified jobs based on the gender stereotypes associated with job requirements (e.g., whether jobs require incumbents to exhibit agentic or communal behaviors), some jobs may have been placed into different job stereotype categories. Nevertheless, job stereotypes based on the sex distributions of incumbents and those based on stereotypes of job requirements are often the same, and both are related to gender bias exhibited by decision makers (e.g., Glick, 1991).

Future Research

These results suggest several avenues that should be addressed in future research. First, further understanding the conditions under which different stereotyping effects occur would be practically and theoretically useful. For many analyses, credibility intervals were quite wide, indicating that bias varied substantially across studies, and additional moderator variables may help to explain this variation. For example, identifying other contextual variables that reduce reliance on stereotypes would be worthwhile. Trying to explain why competent men may be preferred over competent women in female-dominated jobs is another interesting topic.

Second, our finding that males exhibit pro-male bias for all job types is worrisome, and it is certainly no easy task to change negative evaluations of women. However, the processes responsible for male raters' biases could be illuminated further, for example, by examining the effects of gender differences in perceived job stereotypes, perceived gender stereotypes, and perceived fit between the person and the occupation, organization, and/or job. Additionally, the effect sizes for the male rater samples had large credibility intervals that often included zero, so trying to identify conditions under which these raters exhibit pro-male, pro-female, or near-zero bias for different job types is worthwhile. Because people belong to many social categories associated with stereotypes (e.g., race, gender, age), a deeper understanding of bias in employment settings requires the study of the intersection of multiple categories.

Third, whereas most studies present estimates of individuals' gender biases at one time point, it would be informative to examine how the impact of gender stereotypes change over time for individuals (e.g., how initial impressions of people are revised over time, whether gender bias increases or decreases after certain amounts of time or following certain events). Along the same lines, the content of individuating information should be examined in more detail in terms of both personal and job-related information. Managers may have non-job-related personal information about their employees (e.g., family situations, financial need) that could impact decisions about outcomes such as raises or promotions. With regard to job-related information, our findings suggest diagnostic information demonstrating high levels of competence is most likely to result in less bias. More specific résumé information should be systematically manipulated in future laboratory studies to better pinpoint the optimal type of information that should be gathered by employers in order to reduce bias.

Finally, in addition to the above substantive research issues, we wish to highlight the finding of reduced gender bias in settings where raters are motivated to make effective decisions. We suggest that future studies, even if in simulated settings, carefully attend to this finding. Various design features merit consideration, including the use of designs in which raters believe that the ratings they provide are actually consequential or the use of designs in which raters believe they will have to justify their decisions to others. Motivation to rate carefully can be designed into laboratory studies of gender bias.

Practical Implications and Conclusions

Identifying specific contextual variables that both individuals and organizations may alter to reduce gender bias is an important avenue of study, and our findings provide such evidence. We focus specifically on implications for male-dominated jobs, because we found the largest gender bias for these jobs and because they tend to be the highest paying and most prestigious jobs. Although stereotyping is a complex cognitive process, the extent to which decision makers rely on stereotypes rather than on individuating information appears to depend on several contextual variables under the control of an organization. When decision makers are motivated to make careful decisions, they are better able to avoid stereotyping. Organizations can try to increase decision makers' motivation to make accurate decisions by imposing certain conditions, including making sure decision makers (a) expect to justify their judgments to others, (b) have a vested interest in the outcome such that their own success depends on the decision (e.g., they will have to work with a new hire), (c) expect their decisions to be made public, (d) are aware of organizational values regarding equity, or (e) expect their judgments to be evaluated (Fiske, 1993; Kunda, 1990). Finally, there is evidence that professionals with training and/or experience make less biased decisions than undergraduates or working adults without relevant decision-making experience. Providing decision makers with training or practice in making particular types of decisions may help to reduce gender bias.

Our findings also have implications for women in male-dominated occupations. Gender bias does not necessarily decrease with additional individuating information, but it does tend to decrease when the individuating information unambiguously indicates a woman's competence for a job. It is not simply the quantity of information but the quality of information that can reduce bias. By providing unequivocal, job-related information about their qualifications for a job, women can try to counteract the biasing effects of gender stereotypes. Organizations can also use this research finding when gathering information about job applicants. Using standardized selection tools and procedures that elicit job-relevant information about candidates (e.g., job knowledge tests, structured interviews) may help organizations to gather clear evidence about candidates' qualifications and to reduce any reliance on gender stereotypes in decision making.

In conclusion, our study explores the magnitude and direction of gender bias under various conditions. We highlight the importance of considering the gender stereotypes or sex distributions within jobs when examining gender bias and challenge the assumption that additional information will decrease or remove gender bias. Additionally, our findings support rater gender, content of individuating information, and motivation to make careful decisions as important variables that impact bias. We hope these findings will lead to further investigation of situational variables that can help to reduce gender bias in the workplace.

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(*Appendices follow*)

Appendix A

Job Titles by Sex Distribution Within Job

Male-dominated jobs	Study year
Executive position at a clothing manufacturing company	1974
Stock worker in a grocery store	1974
Engineer at a chemical company active	1975
Head of a furniture department in a large department store[a]	1975
Management trainee	1975
Personnel technician	1975
Stock person in a grocery store	1976
Assistant director of child daycare center	1977
Automobile salesperson	1977
General management trainee	1977
Life insurance agent	1977
Management trainee in mechanical engineering	1977
Manager in a public utility	1977
Managerial position	1977
Semiskilled positions such as machine operator, working on a production line, inspection operations, setup operations, feeding equipment, or handling materials	1977
Trainee in sales management	1977
Wholesale hardware shipping and receiving clerk	1977
Beginning management position	1978
Electrician	1978
Management trainee	1978
Managerial position in claims department of an insurance company	1979
Sales management trainee	1980
Accounting and financial positions	1982
Business partner for a new export/import business	1982
Entry-level management trainee	1983
Teaching position at a junior college in the department of accounting	1983
Third-level manager at a commercial bank	1983
Supermarket manager	1984
Automobile salesperson[a]	1985
Electrician assistant[a]	1985
Head of a furniture department in a department store	1985
Middle-level manager in a technological manufacturing organization	1986
Petroleum engineer	1986
Computer analyst-programmer	1987
Computer operator	1987
Computer programmer	1987
Entry level management position in materials management area	1987
Gardener	1987
Management accountant	1987
Division manager in the sales division of a marketing firm	1988
Managerial trainee at a department store	1988
Photographer	1988
Assistant district attorney	1989
Police officer	1989
Computer science graduate student	1990
Director at children's daycare center	1991
Police officer	1991
Administrative officer	1992
Store manager at a computer products company	1993
Employee in the stock-trading division of a financial corporation	1994
Staff photographer for a sports magazine	1994
Systems analyst	1994
Engineering intern	1995
National yacht racing teams	1996
Police officer	1996
Sales position at a brokerage firm	1996
Firefighter	1997

(*Appendices continue*)

Appendix A (*continued*)

Male-dominated jobs	Study year
Senior architect	1997
Regional director of a real estate company	1999
Short order cook	1999
University computer lab manager	1999
Mechanichal engineering intern	2001
University computer lab manager	2001
Assistant vice president of an operations department in a consumer goods company	2004
Assistant vice president of sales in an aircraft company	2004
Line supervisor at an industrial company	2004
Chairperson of a district doctors' association	2005
Employee in software manufacturing firm	2005
Police chief	2005
Police chief[a]	2006
Factory manager	2007
Police officer	2007
Computer lab manager	2008
Development staff member	2008
Junior position in civil/environmental engineering	2008
Vice president of development[b]	2008
Vice president of operations[a]	2008
Factory worker	2009
CEO of a supermarket chain	2010
Research and information technology consultant working in a product development unit	2010
Leadership position	2011
Assistant vice president of sales	2012
Junior position in civil/environmental engineering	2012
Junior position in geological/civil engineering	2012

Female-dominated jobs	Study year
Government documents director at a regional research library[a]	1976
Office receptionist	1977
Telephone operator	1977
Secretary	1978
Campus library worker	1980
Teaching position at a junior college in the department of nursing	1983
Office receptionist[a]	1985
Switchboard operator[a]	1985
Administrative assistant in the sales division of a marketing firm	1988
Second grade teacher	1989
Social worker	1989
Teacher at children's daycare center	1991
Entry-level administrative assistant[a]	1993
Retail sales representative	1994
Nurse	1996
Waiter/waitress at high-priced restaurant	1996
Waiter/waitress at low-priced restaurant	1996
Waiter/waitress at medium-priced restaurant	1996
Secretary	1997
Bank clerk	1998
Personnel management project manager at a consulting company	2004
School social worker[a]	2005
Women's studies professor	2006
College student summer intern at a commercial bank	2007
Nurse	2007
Human resources position at a toy company	2008
Corporate training manager	2011

Integrated jobs	Study year
Psychology professor	1970

(*Appendices continue*)

Appendix A (*continued*)

Female-dominated jobs	Study year
School counselor	1970
Editorial assistant	1975
Assistant copy editor of a city newspaper	1977
Salesperson	1978
Nonmanagerial position in claims department of an insurance company	1979
Newswriter for local newspaper	1981
Position at a school that requires travel and principal	1982
School psychologist	1985
Shoe salesperson[a]	1985
Telephone solicitor[a]	1985
Counselor in an employee assistance program	1987
Director of counseling in an employee assistance program	1987
Industrial relations officer	1987
Payroll clerk	1987
Benefits officer at a men's shoe company	1991
Finance officer at a men's shoe company	1991
Loan counselor at a bank	1991
Loan officer at a bank	1991
Benefits officer at a men's clothing company	1994
Finance officer at a men's clothing company	1994
Entry-level marketing associate	1995
Journalist	1996
Management trainee in a financial organization	1996
Personnel analyst	1997
Entry-level accountant	1998
Mutual fund manager	1999
Research assistant at a consumer research organization	1999
Accountant	2001
Assistant bank manager	2001
Dean of a business school	2001
Insurance salesperson	2001
Office supervisor for an insurance company	2001
Entry-level accountant	2002
Mail sorting intern	2003
Marketing intern	2003
Preparatory school teacher	2003
Technical writer	2003
Intern at U.S. Senator's office	2005
Position requiring creation of an investment portfolio	2005
Position requiring development of an appropriate budget for a computer software company[a]	2005
Retail pharmacist	2005
Sales supervisor[a]	2005
Management position[a]	2007
Personal trainer for a fitness organization	2007
Associate editor	2008
Community organization manager	2008
Mail superintendent	2008
Technical writer	2008
Project manager	2009
Personal trainer for a fitness organization	2010
Marketing director	2011

[a] Two samples rated this job. [b] Three samples rated this job.

(*Appendices continue*)

Appendix B

Studies Included in Meta-Analyses

Author (year)	n[a]	d[b]	Sex distribution[c]	Rater gender[d]	Amount of information[e]	Content of information[f]	Type of comparison[g]	Type of employment rating[h]	Motivation[i]	Type of participant[j]	Study design[k]	Publication source[l]	Country
Alksnis (2001)	311	−0.17	I	Yes	1	A	I	1, 3, 7	No	U	B	D	Canada
Ashkanasy (1994)	252	0.07	F, M	No	1	H, L	I	3	No	U	W	J	Australia
Behr (2001)	171	0.11	I	No	1	A	I	1	No	U	B	D	United States (US)
Bell & Klein (2001)	186	−0.11	I	No	2	A	I	1, 3, 7	No	E	B	J	US
Bieber (1988)	90	0.93	M	No	1	A	C	1	No	U	W	D	US
Biernat & Fuegen (2001)	64	0.05	M	Yes	2	No	C	1	Yes	U	W	J	US
Bigoness (1976)	60	−0.41	M	Males	1	H, L	I	6	No	U	W	J	US
Bonds (1980)	32	0.16	M	Males	1	H, L	I, C	1	No	E	W	D	US
Bosak & Sczesny (2011)	102	0.02	M	Yes	1	H, A	I	1	No	U	B	J	Germany
Bowles et al. (2007), Study 1	119	0.16	F	No	2	H	I	1	No	U	B	J	US
Bowles et al. (2007), Study 2	236	−0.08	I	No	1	H	I	1	No	W	B	J	US
Bowles et al. (2007), Study 3	247	−0.24	I	Yes	1	H	I	1	No	W	B	J	US
Brief & Wallace (1976), undergraduate sample	113	0.06	F	No	L	No	I	6, 7	No	U	B	J	US
Brief & Wallace (1976), working adult sample	47	0.06	F	No	L	No	I	6, 7	No	W	B	J	US
Bruckmüller & Branscombe (2010)	118	0.04	M	No	L	No	C	1	No	U	W	J	US
Bundens (1986)	165	−0.13	M	No	2	H, L	I	2, 3	No	W	B	D	US
Butler & Skattebo (2004)	96	−0.08	M	No	1	No	I	3, 6	No	W	B	J	US
Cash et al. (1977)	72	0.11	F, M	No	2	A	I	1, 7	No	E	B	J	US
Cash & Kilcullen (1985)	64	0.16	M	Yes	1	H, L	C	1	No	U	W	J	US
Castilla & Benard (2010)	229	−0.05	M	No	1	H	I, C	1, 2, 3, 5	No	W	W	J	US
Cohen & Bunker (1975)	150	0.02	M, I	Males	3	No	I	1	Yes	E	B	J	US
Crow et al. (1998)	548	−0.05	I	No	L	No	C	1	No	W	W	J	US
Cunningham et al. (2010)	106	0.18	I	No	1	H	I	1	No	U	B	J	US
Devlin (1997)	86	0.61	M	Yes	1	No	I	1	No	W	B	J	US
Dipboye et al. (1977)	96	0.79	M	Yes	1	H, L	C	1	No	U	W	J	US
Dipboye et al. (1975), undergraduate sample	30	0.35	M	Males	1	H, A, L	I, C	1	No	U	W	J	US
Dipboye et al. (1975), professional sample	30	0.25	M	Males	1	H, A, L	I, C	1	No	E	W	J	US
Drogosz & Levy (1996)	180	−0.05	F, M, I	No	1	A	I	6	No	U	W	J	US
Etaugh & Kasley (1981)	368	0.38	I	Yes	2	No	I	6	No	U	B	J	US
Etaugh & Riley (1983)	160	−0.07	F, M	Yes	1	No	I	7	No	U	B	J	US
Fidell (1970)	147	0.12	I	No	1	No	I	1	No	E	W	J	US
Firth (1982)	146	0.50	M	No	1	No	C	1	Yes	E	W	J	United Kingdom
Foschi et al. (1995)	96	−0.02	M	Yes	1	H, A	I	3	Yes	U	B	J	Canada
Foschi & Valenzuela (2008)	49	−0.23	M	Yes	1	A	I, C	1, 7	Yes	U	W	J	Canada
Foschi & Valenzuela (2012)	53	0.11	M	Yes	1	H, L	I, C	1, 7	Yes	U	W	J	Canada
Foster et al. (1996)	80	−0.11	M	Yes	1	H, A	C	1	No	U	W	J	US
Francesco (1978)	102	0.07	F, M, I	No	2	A	I, C	1, 7	No	U	W	D	US

(*Appendices continue*)

Appendix B (*continued*)

Author (year)	n[a]	d[b]	Sex distribution[c]	Rater gender[d]	Amount of information[e]	Content of information[f]	Type of comparison[g]	Type of employment rating[h]	Motivation[i]	Type of participant[j]	Study design[k]	Publication source[l]	Country
Frank & Drucker (1977)	55	−0.07	M	Yes	1	A	I	6	No	U	B	J	US
Frasher et al. (1982)	113	0.77	I	No	L	H	I	1, 2	No	E	B	J	US
Fusilier & Hitt (1983)	523	0.02	M	No	1	No	I	1	No	U	B	J	US
Gallois et al. (1992)	56	−0.28	M	No	1	A	I	1	Yes	E	W	J	Australia
Ghumman & Jackson (2008)	412	−0.14	I	Yes	1	A	I	1		U	B	J	US
Gill (2004)	43	−0.04	F	No	1	No	C	1	Yes	U	W	J	US
Gordon & Owens (1988)	96	0.23	F, M	No	1, 2	No	I	1, 7	No	E	B	J	US
Gully (1993)	256	0.00	M	No	1	No	I	2, 3	No	U	B	D	US
Güngör & Biernat (2009)	115	0.43	M	No	1	No	C	1	No	U	B	J	US
Haefner (1977)	286	0.41	M	No	L	H, A	I	1	No	E	W	J	US
Hamner et al. (1974)	36	−0.43	M	Yes	1	H, L	I	6	No	U	W	J	US
Hardin et al. (2002)	159	0.09	I	Yes	L	H	I	1, 3	No	E	B	J	US
Heilman & Guzzo (1978)	23	−0.13	M	No	1	H, A	I	2	No	W	B	J	US
Heilman & Haynes (2005), Study 1	60	0.69	I	No	2	H	I	6, 7	No	U	B	J	US
Heilman & Haynes (2005), Study 2	61	0.71	I	No	2	H	I	6, 7	No	U	W	J	US
Heilman & Haynes (2005), Study 3	90	0.93	I	No	2, 3	H	I	6, 7	No	U	B	J	US
Heilman et al. (1993), Study 1	76	0.25	F	Yes	1	No	I, C	1, 7	No	U	W	J	US
Heilman et al. (1993), Study 2	69	0.35	F	Females	1	No	I, C	1, 7	No	U	W	J	US
Heilman et al. (1988)	233	0.21	M	No	1	H, A	I	7	No	U	B	J	US
Heilman & Saruwatari (1979)	41	−0.09	M, I	No	1	No	C	1	No	U	W	J	US
Heilman et al. (2004), Study 1	48	0.94	M	No	1, 2	H, A	I, C	7	No	U	W	J	US
Heilman et al. (2004), Study 3	131	0.22	M	No	2	H, A	I	3, 4, 7	No	W	B	J	US
Heneman (1977)	144	0.24	M	No	1	H, A, L	I	1, 3	No	U	B	J	US
Hmurovic (2012)	287	−0.03	M	No	2	A	I	4, 5, 6, 7	No	U	B	D	US
Horvath & Ryan (2003)	236	0.26	I	No	1	H	I	1	No	U	W	J	US
Hosoda et al. (2003)	196	−0.88	I	No	1	No	I, C	1	No	E	W	J	US
Jackson (1999), Study 1	116	0.17	I	No	1	A	I	1	No	U	W	D	Canada
Jackson (1999), Study 2	130	0.28	M	Yes	1	A	I, C	1	No	U	W	D	Canada
Jawahar & Mattsson (2005), Study 1	213	0.08	F, I	No	1	H	C	1	No	E	W	J	US
Jawahar & Mattsson (2005), Study 2	61	−0.04	F, I	No	1	H	C	1	No	E	W	J	US
Jones (1970)	90	0.17	I	Males	1	No	I, C	1, 7	No	E	B	D	US
Judd & Oswald (1997)	80	0.22	F, M	No	L	No	I	1	No	U	B	J	US
Juodvalkis et al. (2003)	68	0.10	I	No	1	No	I	1, 7	No	U	B	J	US
Katz (1987)	152	0.13	M	Males	1	No	I	1, 3	Yes	E	B	J	US
Kawakami et al. (2005)	70	0.23	M	No	1	No	C	1	No	U	W	J	Netherlands
Knez & Enmarker (1998)	80	0.24	F	No	1	A	I	6	No	U	W	J	Sweden
Koenig (1989)	217	−0.07	F, M	Yes	1	A	C	1	No	U	W	J	US
Kryger & Shikiar (1978)	75	−0.45	M	Males	1	H, L	I	1, 7	No	E	B	J	US
Kushnir (1982)	133	1.24	M	Yes	L	A	C	1	No	W	W	J	Israel
Lee et al. (1997)	78	0.25	I	Yes	1	No	I	7	No	U	B	J	US
Levin et al. (2005), Study 1	153	0.06	M	Yes	L	No	C	1, 5	No	U	W	J	US
Levin et al. (2005), Study 2	104	0.40	I	Yes	L	A	C	1, 5	No	U	W	J	US
Liberman & Okimoto (2008), Study 1	76	−0.03	M	No	2	H	I	7	No	U	W	J	US

(*Appendices continue*)

Appendix B (*continued*)

Author (year)	n[a]	d[b]	Sex distribution[c]	Rater gender[d]	Amount of information[e]	Content of information[f]	Type of comparison[g]	Type of employment rating[h]	Motivation[i]	Type of participant[j]	Study design[k]	Publication source[l]	Country
Liberman & Okimoto (2008), Study 2	64	−0.05	M	No	2	H	I	7	No	U	W	J	US
Liberman & Okimoto (2008), Study 3	120	−0.16	M	No	2	H, A	I	7	No	U	W	J	US
London & Stumpf (1983)	72	−0.62	M	No	3	H	C	2	Yes	E	W	J	US
Manshor et al. (2003)	156	0.26	I	Yes	L	No	C	1	No	E	W	J	Malaysia
Marlowe et al. (1996)	112	0.31	I	No	1	H	I, C	1, 2	No	E	W	J	US
Martell (1991)	202	0.57	M	No	1	A	I	6	No	U	B	J	US
Mayer & Bell (1975)	150	0.12	M	Yes	1	No	I	7	No	U	W	J	US
McGovern (1977)	52	−0.23	M	Males	2	A	I	7	No	E	B	D	US
McRae (1991)	134	0.07	I	No	2	No	I	1	No	E	B	J	US
McRae (1994)	131	−0.12	I	No	1	No	I	1, 7	No	E	B	J	US
Mettrick & Cowan (1996)	122	0.39	M	No	L	H	I	6	No	U	B	J	US
Miller & Routh (1985)	152	−0.50	I	No	1	No	I	1	No	E	B	J	US
Moore (1984)	69	0.43	M	No	1	H, L	I	6	No	W	W	J	US
Muchinsky & Harris (1977)	100	−0.05	M, I	Yes	1	H, A, L	I	1	No	U	W	J	US
Musumeci (1995)	111	−0.01	I	Yes	1	H	I	1, 2, 3, 7	No	W	W	D	US
Neumark (1996), low-price restaurants	21	−0.43	F	No	1	A	C	1	Yes	E	W	J	US
Neumark (1996), medium-price restaurants	21	0.39	F	No	1	A	C	1	Yes	E	W	J	US
Neumark (1996), high-price restaurants	23	0.75	F	No	1	H	C	1	Yes	E	W	J	US
Ng & Wiesner (2007)	201	−0.21	F, M	No	1	No	C	1	Yes	U	W	J	US
Nicklin & Roch (2008)	244	−0.06	F	No	2	A	I	1	No	U	B	J	US
Norton et al. (1977)	3,261	−0.04	M	No	1	No	I	6	No	E	B	J	US
Pazy (1986)	48	0.99	M	No	1	A	C	2, 3, 6	No	E	W	J	Israel
Phelan et al. (2008)	428	0.32	M	No	1	No	I	1	No	U	B	J	US
Pingitore et al. (1994)	320	0.95	F, M	Yes	2	A	I	1	No	U	B	J	US
Plake et al. (1987)	85	−0.15	I	No	1	A	I	1, 6, 7	No	E	B	J	US
Riach & Rich (1987), computer programmer	115	−0.07	M	No	1	No	C	1	Yes	E	W	J	Australia
Riach & Rich (1987), computer operator	99	0.04	M	No	1	No	C	1	Yes	E	W	J	Australia
Riach & Rich (1987), management accountant	211	0.08	M	No	1	No	C	1	Yes	E	W	J	Australia
Riach & Rich (1987), gardener	148	0.14	M	No	1	No	C	1	Yes	E	W	J	Australia
Riach & Rich (1987), computer analyst-programmer	152	0.15	M	No	1	No	C	1	Yes	E	W	J	Australia
Riach & Rich (1987), industrial relations officer	94	−0.04	I	No	1	No	C	1	Yes	E	W	J	Australia
Riach & Rich (1987), payroll clerk	172	−0.01	I	No	1	No	C	1	Yes	E	W	J	Australia
Riegelhaupt (1985), Study 1	68	0.32	F, M, I	No	2	A	I	1, 3, 6, 7	No	U	B	D	US
Riegelhaupt (1985), Study 2	304	−0.03	F, M, I	No	2	A	I	1, 3, 6, 7	No	U	B	D	US
Robbins & DeNisi (1993)	70	0.02	F, M	No	1	A	I	6	No	U	W	J	US
Rosen & Jerdee (1974)	235	0.25	M	Males	1	No	I	1	No	U	B	J	US

(*Appendices continue*)

Appendix B (*continued*)

Author (year)	n[a]	d[b]	Sex distribution[c]	Rater gender[d]	Amount of information[e]	Content of information[f]	Type of comparison[g]	Type of employment rating[h]	Motivation[i]	Type of participant[j]	Study design[k]	Publication source[l]	Country
Rudman & Glick (1999)	234	0.33	M	No	1	No	I	1, 7	No	U	B	J	US
Rudman & Glick (2001)	179	0.18	M	No	1	No	I	1, 7	No	U	B	J	US
Sartore & Cunningham (2007)	96	−0.15	I	No	1	H, L	I	1	No	U	B	J	US
Schalm (2001)	324	−0.13	I	Yes	1	A	I	1	Yes	U	B	D	Canada
Schmitt & Lappin (1980)	64	0.07	F	Yes	1	No	I	6	No	U	W	J	US
Shahani-Denning et al. (2011)	297	0.29	I	No	1	H	I	1, 3, 7	No	E	W	J	US
Snipes et al. (1998)	246	0.06	F, M	Yes	1	No	I	1	No	U	B	J	US
Stockdale (1990)	44	−0.05	M	No	2	H, A	I	1	No	E	W	D	US
Terborg & Ilgen (1975)	36	0.38	M	Males	2	H	I	1, 2, 3, 4, 6	No	U	B	J	US
Triana (2011)	306	0.52	F	No	1	H	I	3	No	U	B	J	US
Tyler & McCullough (2009)	240	0.38	I	Yes	1	A	I	1, 7	No	U	B	J	US
Uhlmann (2006), Study 1	112	−0.47	F	Yes	1	A	I	1	No	U	B	D	US
Uhlmann (2006), Study 2	114	0.21	M	Yes	1	A	I	1	No	W	B	D	US
Uhlmann (2006), Study 4	34	0.36	M	Males	1	A	I	1	No	U	B	D	US
Uhlmann & Cohen (2005)	72	0.43	M	Yes	1	A	I	1	No	U	B	J	US
Uhlmann & Cohen (2007)	141	−0.18	M	Yes	1	A	I	1	No	W	B	J	US
White & White (1994)	288	−0.02	M	No	1, 2, 3	H, A	I	1, 7	No	U	B	J	US
Wood (1999)	320	−0.44	I	No	1	H, A	I	3, 6	Yes	U	B	D	US
Zebrowitz et al. (1991), Study 1	64	0.12	F, M	No	1	No	C	1	No	U	W	D	US
Zebrowitz et al. (1991), Study 2	128	−0.10	I	No	1	No	C	1	No	U	W	D	US

[a] Sample size. [b] Overall effect size from the article. Positive d values indicate bias in favor of males and negative d values indicate bias in favor of females. [c] F = female-dominated, M = male-dominated, I = integrated. [d] No = effect sizes were provided for a mixed or unknown gender group, Yes = separate effect sizes were provided for male and female raters, Males = sample was all male, Females = sample was all female. [e] Number of pieces of information provided to participants: L = limited information, 1 = 1 piece of information, 2 = 2 pieces of information, 3 = 3 pieces of information. [f] Competence of ratee indicated by individuating information: H = high competence, A = average or ambiguous competence, L = low competence. [g] C = comparative, I = individual. [h] Rating made by study participants: 1 = hiring, 2 = promotion, 3 = compensation, 4 = reward, 5 = penalty, 6 = job performance, 7 = competence. [i] Motivation to make careful decisions: Yes = provided d value for one of the motivating conditions, No = did not provide d value for a motivating condition. [j] U = undergraduates, W = working adults, E = experienced professionals. [k] B = between-person design, W = within-person design. [l] D = dissertation, J = journal.

(*Appendices continue*)

Appendix C

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Reason for Exclusion

1. Experimental design was not appropriate (e.g., study did not have matched male and female ratees).

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Received February 20, 2013
Revision received February 11, 2014
Accepted March 18, 2014 ■