

Are Leader Stereotypes Masculine? A Meta-Analysis of Three Research Paradigms

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This meta-analysis examined the extent to which stereotypes of leaders are culturally masculine. The primary studies fit into 1 of 3 paradigms: (a) In Schein's (1973) *think manager–think male paradigm*, 40 studies with 51 effect sizes compared the similarity of male and leader stereotypes and the similarity of female and leader stereotypes; (b) in Powell and Butterfield's (1979) *agency–communion paradigm*, 22 studies with 47 effect sizes compared stereotypes of leaders' agency and communion; and (c) in Shinar's (1975) *masculinity–femininity paradigm*, 7 studies with 101 effect sizes represented stereotypes of leadership-related occupations on a single masculinity–femininity dimension. Analyses implemented appropriate random and mixed effects models. All 3 paradigms demonstrated overall masculinity of leader stereotypes: (a) In the think manager–think male paradigm, intraclass correlation = .25 for the women–leaders similarity and intraclass correlation = .62 for the men–leaders similarity; (b) in the agency–communion paradigm, $g = 1.55$, indicating greater agency than communion; and (c) in the masculinity–femininity paradigm, $g = 0.92$, indicating greater masculinity than the androgynous scale midpoint. Subgroup and meta-regression analyses indicated that this masculine construal of leadership has decreased over time and was greater for male than female research participants. In addition, stereotypes portrayed leaders as less masculine in educational organizations than in other domains and in moderate- than in high-status leader roles. This article considers the relation of these findings to Eagly and Karau's (2002) role congruity theory, which proposed contextual influences on the incongruity between stereotypes of women and leaders. The implications for prejudice against women leaders are also considered.

Keywords: leadership, management, gender stereotypes, gender roles, meta-analysis

The characteristics that people commonly ascribe to women, men, and leaders contribute to the challenges that women face in obtaining leadership roles and performing well in them.¹ Cultural stereotypes can make it seem that women do not have what it takes for important leadership roles. This cultural mismatch, or *role incongruity*, between women and the perceived demands of leadership underlies biased evaluations of women as leaders (Eagly & Karau, 2002). Fueling this mismatch is an inconsistency between the predominantly communal qualities (e.g., nice, compassionate) that people associate with women and the predominantly agentic

qualities (e.g., assertive, competitive) that they believe are required for success as a leader (Eagly & Carli, 2007). Given that agentic qualities are ascribed more to men than women (e.g., Gallup News Service, 2001; Spence & Buckner, 2000), leadership is generally associated with masculinity. This article reports a meta-analysis of research that has assessed the cultural masculinity of leader stereotypes and explores the conditions under which this masculinity is more or less pronounced.

The Importance of Stereotypes to Women's Access to Leadership

Stereotypes often are a potent barrier to women's advancement to positions of leadership. This assertion is the consensus view not

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¹ In this article, we use the terms *leader* and *manager* interchangeably. Although a distinction between leadership and management is useful in some contexts (e.g., Bennis, 1989), the research that we review does not allow leader and managerial roles or functions to be separated. Also, we use the terms *sex* and *sexes* to denote the grouping of people into female and male categories. The term *gender* refers to the meanings that societies and individuals ascribe to these female and male categories. We do not intend to use these terms to give priority to any class of causes that may underlie sex and gender effects (see Wood & Eagly, 2010).

only of social and organizational psychologists (e.g., Glick & Fiske, 2007; Heilman & Parks-Stamm, 2007; S. K. Johnson, Murphy, Zewdie, & Reichard, 2008), but also of women who have substantial experience as leaders. For example, a survey of 705 women at the vice president level and above in Fortune 1,000 corporations found that 72% agreed or strongly agreed that “stereotypes about women’s roles and abilities” are a barrier to women’s advancement to the highest levels (Wellington, Kropf, & Gerkovich, 2003).

The damaging effects of stereotypes for women as leaders do not stem from beliefs about women that are mainly negative. On the contrary, consistent with the women-are-wonderful effect (Eagly & Mladinic, 1994; Langford & MacKinnon, 2000), women are regarded as the nicer, kinder sex and thus have a cultural stereotype that is in general more positive than that of men. Nevertheless, women often experience workplace discrimination (Heilman & Eagly, 2008). Theorists have resolved this paradox by reasoning that it is not the evaluative content of the stereotype of women but its mismatch with many desirable work roles that underlies biased evaluations in many employment settings (e.g., Eagly & Karau, 2002; Heilman, 2001; Hogue & Lord, 2007; Lyness & Heilman, 2006).

In Eagly and Karau’s (2002) *role congruity model*, the mismatch that produces biased evaluation is between stereotypes of women (e.g., Spence & Buckner, 2000) and stereotypes of leaders (e.g., Epitropaki & Martin, 2004; Lord & Maher, 1993; Offermann, Kennedy, & Wirtz, 1994). In this model, stereotype content is framed in terms of agency and communion, with communion the more important theme in the female stereotype and agency the more important theme in both leader and male stereotypes. Men are therefore seen as more similar to the leader stereotype than women are, producing disadvantage for women. In Heilman’s (1983, 2001) broader lack-of-fit model, to the extent that a workplace role is inconsistent with the attributes ascribed to an individual, she or he would suffer from perceived lack of fit, producing increased expectations of failure and decreased expectations of success. The incongruity between construals of women and leaders is thus one type of lack of fit.

These communal and agentic meanings ascribed to women and men form a constant backdrop to social interaction, coloring the judgments made about people encountered in organizations and other contexts (Wood & Eagly, 2010). In both the role congruity (Eagly & Karau, 2002) and the lack-of-fit models (Heilman, 2001), these beliefs comprise two kinds of expectations or norms: *descriptive beliefs* (or stereotypes), which are consensual expectations about what members of a social group actually do, and *injunctive* (or *prescriptive*) *beliefs*, which are consensual expectations about what group members ought to do or ideally would do (Cialdini & Trost, 1998). Therefore, women are the targets of two forms of prejudice against them as leaders: a deficit in the ascription of leadership ability to them and, compared to that of men, a less favorable evaluation of their agentic leadership behavior. In other words, descriptively, women seem less usual or natural in most leadership roles; and prescriptively, women often seem inappropriate or presumptuous when they display the agentic behavior often required by these roles (see also Burgess & Borgida, 1999).

Because individuals are commonly assimilated to group stereotypes (e.g., von Hippel, Sekaquaptewa, & Vargas, 1995), an eval-

uative penalty is exacted from women leaders or potential leaders regardless of whether they possess the qualities appropriate for leadership roles. This penalty consists of unfavorable performance expectations, which in turn enable biased judgments and less favorable evaluations (Eagly, Makhijani, & Klonsky, 1992; Lyness & Heilman, 2006). Discrimination is the behavioral outcome of these processes (Eagly & Diekmann, 2005).

How strong is the evidence for the masculinity of leader stereotypes? Partial reviews of research on this question have substantiated the claim about leaders’ cultural masculinity (e.g., Duehr & Bono, 2006; Heilman, Block, Martell, & Simon, 1989; Powell, Butterfield, & Parent, 2002; Schein, 2001). However, these reviews have not identified all of the relevant research paradigms or accessed all of the available studies within each paradigm or estimated the magnitude of the effects. Our integration of the research literature remedies these omissions and tests the propositions of role congruity theory concerning the conditions under which incongruity between the leader and female gender stereotype is stronger or weaker (Eagly & Karau, 2002).

Three Paradigms for Examining the Masculinity of Leader Roles

Research in three separate paradigms has addressed the cultural masculinity of leader stereotypes. Best known is the think manager–think male paradigm, which was created by Schein (1973). This method provides a direct test of the similarity of leader stereotypes to male and female stereotypes. In these studies, separate groups of participants rated a leader category (e.g., successful middle managers), women, or men on a large number of gender-stereotypical traits. The researchers correlated the mean ratings of managers or leaders with the mean ratings of men and, separately, with the mean ratings of women. These correlations represent the similarity of stereotypes of men and women to cultural concepts of leadership. The think manager–think male effect occurs when men and leaders are similar and women and leaders are not similar. Although these studies typically provide only these correlations and not information on the content of the stereotypes of men, women, or leaders, the method yields a direct test of the central assumptions of Eagly and Karau’s (2002) role congruity model and Heilman’s (1983, 2001) lack-of-fit model as applied to leader roles.

A second method, the agency–communion paradigm, consists of studies that examined the gender-stereotypical content of the leader stereotype (Powell & Butterfield, 1979). In these studies, participants rated a leader category (e.g., good manager) on separate masculine (i.e., agentic) and feminine (i.e., communal) gender stereotyping scales. Comparison of participants’ mean ratings on the two scales determined whether the stereotype of leaders was more masculine than feminine. By directly addressing the content of leader roles, this method complements but differs from the similarity comparisons yielded by the think manager–think male paradigm.

A third method, the masculinity–femininity paradigm, consists of studies that appeared in the research literature as a test of the masculine versus feminine content of occupational stereotypes (Shinar, 1975). A substantial minority of the occupations chosen for these studies were leader roles (e.g., university president, mayor). Participants rated each of these leader roles, among other

occupational groups, on a single bipolar masculine versus feminine rating scale. This paradigm became less popular subsequent to critiques pointing out that bipolar masculinity–femininity scales do not allow masculinity and femininity to vary independently but force them to function as opposites (e.g., Constantinople, 1973). Nonetheless, these data are informative in part because researchers investigated various specific types of leaders rather than merely leaders (or managers) in general. If the mean ratings of most categories of leaders were on the masculine side of a masculinity–femininity scale, the studies would provide a conceptual replication of the basic tendency for leader roles to be stereotyped as masculine.

Our project separately meta-analyzed studies in these three paradigms because their distinctively different study designs and measuring instruments precluded combination across the paradigms (see Borenstein, Hedges, Higgins, & Rothstein, 2009, pp. 359–363). The think manager–think male studies correlate (a) ratings of men with ratings of managers and (b) ratings of women with ratings of managers. In this think manager–think male paradigm, participants are randomly assigned to rate one of the three groups (women, men, or leaders). In contrast, in the much simpler agency–communion and masculinity–femininity paradigms, studies obtain ratings only of leaders in general or specific leader roles (and not women or men) on gender-stereotypical traits or scales. Although the agency–communion and masculinity–femininity studies are similar in presenting only a leader group (or groups) to participants, these two paradigms feature different types of measuring instruments. The masculinity–femininity studies use a single bipolar masculine versus feminine rating scale, whereas the agency–communion studies use two separate scales, one assessing agency (or masculinity) and the other assessing communion (or femininity). Therefore, in the masculinity–femininity paradigm, the effect sizes are based on a point estimate (in relation to the scale midpoint). In the agency–communion paradigm, the effect sizes are based on a comparison between ratings on the two scales. For these reasons, the data are noncomparable across the three paradigms and analyzed separately. Yet all three types of studies test the correspondence between gender and leader stereotypes, and the studies are methodologically quite homogenous within each paradigm.

Variation in Stereotypes About Men, Women, and Leaders

Eagly and Karau (2002) hypothesized that the incongruity between leader stereotypes and the female gender stereotype is not fixed but varies with change in either stereotype. This meta-analysis examines several factors hypothesized to influence this incongruity.

Change in Stereotypes Over Time

Cultural change over historical time is one of these factors, given that stereotypes may have changed in a manner that reduces women's role incongruity in relation to leadership. Although some hints of the decreasing masculinity of leadership have appeared in prior reviews (e.g., Duehr & Bono, 2006; Eagly & Sczesny, 2009; Powell et al., 2002; Schein, 2001), generalizations have remained uncertain. Temporal comparisons of relevant studies based on their

dates of publication, which extend back to 1973, allow our meta-analysis to clarify whether the cultural representation of leadership has changed. A shift in an androgynous direction would ease women's role incongruity problem in relation to leader roles.

Why might role incongruity have lessened? Organizational experts have often argued that definitions of good managerial practices have changed in response to features of the contemporary organizational environment, such as fast social and technological change and unprecedented complexity of organizations' missions and contexts (e.g., Avolio, 1999; Kanter, 1997; Lipman-Blumen, 2000). According to such analyses, these changed conditions compromise the efficacy of top-down command-and-control leadership and foster democratic relationships, participatory decision-making, delegation, and team-based leadership skills (e.g., Gergen, 2005; Kanter, 1997; Lipman-Blumen, 2000; McCauley, 2004). Such descriptions are manifestly less masculine than many traditional models of good leadership.

Another possibility is that the increase of women leaders might produce less masculine and more androgynous beliefs about leadership. Evidence of the increase of women leaders abounds, including growth over time in women's emergence as leaders in field and laboratory studies of leader emergence in initially leaderless groups (Eagly & Karau, 1991). In the United States, women now constitute 25% of chief executives when all organizations are considered and 43% of all employees in management, business, and financial operations occupations (vs. 31% in 1983; U.S. Department of Labor, 2007, 2010b). Women have also become more numerous in highly visible political leader roles, now constituting 17% of the U.S. Congress (vs. 2% in 1950; Center for American Women and Politics, 2011) and 12% of governors (vs. 0% in 1950; Center for American Women and Politics, 2010). Women have increased in leadership roles in many other nations as well (see European Commission, 2010; Inter-Parliamentary Union, 2010).

Evidence that the mere presence of more women leaders can change perceptions of leader roles emerged in research on women's occupancy of the chief village councilor role in West Bengal (Beaman, Chattopadhyay, Duflo, Pande, & Topalova, 2009). People in the villages that were mandated (vs. not mandated) by the government to elect a woman for this leader role not only perceived their current women leaders and women leaders in general as more effective but also reduced their implicit bias toward associating men with leadership and elected more women to leadership positions in the next election. As additional evidence that the presence of women leaders changes perceptions of leadership, female college students with more women professors as role models reduced their implicit associations of leadership qualities with men and communal qualities with women (Dasgupta & Asgari, 2004). Empirical research thus has demonstrated that an increase in the number of women leaders can produce a more androgynous concept of leadership and thereby reduce bias toward current and potential women leaders.

What about change in gender stereotypes? If gender stereotypes reflect the differing placements of men and women into social roles (Wood & Eagly, 2010), women's increase in labor force participation (to 61% vs. 33% in 1950; U.S. Department of Labor, 2010a) and in leader roles might predict change in the female stereotype. However, women still perform the majority of domestic work (e.g., Bianchi, Robinson, & Milkie, 2006), and the majority of employed women have remained concentrated in tradi-

tional occupations. The six most common in the United States are secretary and administrative assistant; registered nurse; elementary and middle school teacher; cashier; retail salespersons; and nursing, psychiatric, and home health aides (U.S. Department of Labor, 2011). Therefore, it is not surprising that the partial reviews of gender stereotyping conducted so far have not yielded evidence of decreased stereotyping over time (e.g., Lueptow, Garovich-Szabo, & Lueptow, 2001). Nonetheless, the masculinity of leader roles could be changing without much change in stereotypes about men and women in general.

In sum, leader stereotypes may have become less masculine over time. If the change in leader stereotypes is related to increases of women in leadership roles, then the number of women leaders should be related to the masculinity of leadership. Because stereotype change presumably reflects the updating of impressions based on new observations (e.g., Weber & Crocker, 1983), leader stereotypes at any one time point should correspond best to contemporaneous observations of women in leader roles.

Other Influences on the Masculinity of Leader Roles

A priori moderators. As Eagly and Karau (2002) argued, men may have a more masculine leader stereotype than women do. There is some existing evidence that men, more than women, believe that good leaders have masculine qualities (e.g., Atwater, Brett, Waldman, DiMare, & Hayden, 2004; Schein, 2001) and manifest prejudice against female leaders (Eagly et al., 1992). Such effects are understandable, given that men are less likely than women to have experience with female managers (McTague, Stainback, & Tomaskovic-Devey, 2009; Stainback & Tomaskovic-Devey, 2009) and that men's group interest favors retaining these roles for men. As a result, women leaders, particularly as newcomers entering male-dominated roles, can encounter resistance, especially from men (Eagly & Carli, 2007). Our meta-analysis offers quantitative tests of the extent to which the incongruity between women and leaders is greater in men than women.

Role incongruity should also reflect organizational contexts and the level of leader roles in organizational hierarchies (Eagly & Karau, 2002). Leadership may be less masculine, for example, in female-dominated fields such as elementary education, nursing, or librarianship (U.S. Department of Labor, 2010b). Because these fields are thought to require traditionally feminine skills, such as warmth, compassion, and caring for others (Cejka & Eagly, 1999; Glick, 1991), the characteristics that people associate with leadership roles in these occupations are likely to incorporate more communal attributes. Also, consistent with the preponderance of men in executive positions in many organizations (e.g., 84% of corporate officers in Fortune 500 companies; Catalyst, 2010), construals of leadership are likely to be more masculine for higher status leader positions, thereby increasing role incongruity for women. Our inclusion of studies examining various types of leadership positions allows comparisons of leader stereotypes between different organizational contexts and levels of leadership within organizations.

Comparisons of leader stereotypes across nations are also important, as Eagly and Karau (2002) also argued. Narrative reviewers have suggested that leader roles are less masculine in the United States than in other nations (e.g., Schein, 2001), but there has been no quantitative analysis across nations. Variation in the

percentages of women (vs. men) in leader roles could underlie any national differences as well as temporal differences. The participation of women in leader roles and the overall status of women are considerably greater in Western than Eastern nations (Hausmann, Tyson, & Zahidi, 2009). Thus, there is reason to believe that role incongruity for women leaders is greater in Eastern than Western nations.

In summary, consistent with role congruity theory, we predicted that this meta-analysis would show a robust tendency for leader roles to be perceived as masculine. However, based on this theory and the other evidence outlined above, we expected that the relationship between perceptions of leadership and masculinity would be moderated by several factors. Masculinity of leadership should decrease over time. In addition, men should have a more masculine construal of leadership than women. Also, leadership may be more masculine in domains with few women managers and higher status leader roles. People in different nations may also diverge in their construals of leadership, with the presence of fewer women in leader roles associated with more masculine stereotypes. These a priori moderators of the gender typing of leadership are examined within this meta-analysis.

Exploratory Moderators. Several other variables were also investigated as potential moderators of the masculinity of leadership on an exploratory basis. For example, because employment generally entails some experience with women managers, older participants might have a less masculine concept of leadership. However, older people's more traditional attitudes about gender (e.g., Howell & Day, 2000) might foster a more masculine concept of leadership. Therefore, we could not predict whether age would be positively or negatively associated with the masculinity of leadership but address the issue with an exploratory analysis.

Also, in research on gender, authors of one sex have occasionally obtained different findings than authors of the other sex (e.g., Eagly & Carli, 1981; Leaper, Anderson, & Sanders, 1998). In addition, originators of research paradigms sometimes obtained stronger data than other researchers (e.g., B. T. Johnson & Eagly, 1989; Wood, Lundgren, Ouellette, Busceme, & Blackstone, 1994). Because originators' stronger findings might partially be due to their choice of stereotype measure in the case of the masculinity of leadership, we also explored whether the differing measures used in each paradigm were associated with different effects. Although these variables have influenced other meta-analyses, we had no specific reason to expect they would also influence the masculinity of leadership, so we tested their effects as exploratory moderators.

Method

Sample of Studies and Criteria for Inclusion and Exclusion

Three paradigms of research. The search located studies that fit into the three different paradigms, whose defining characteristics are the following:

1. In the Schein (1973) think manager–think male paradigm, participants rated a leader category, men (typically “men in general”), or women (typically “women in general”) on various traits in a between-subjects design (with only two studies having a within-subjects design). In most of these studies, the ratings were completed using the Schein Descriptive Index, which consists of

92 traits, including many agentic or communal personality traits (e.g., adventurous, submissive, aggressive, intuitive, ambitious, modest, kind). Studies collected for this meta-analysis reported internal consistency coefficients ranging from .71 to .92 for the Schein Descriptive Index. Researchers reported intraclass correlations, computed across the traits, for relating the mean ratings of leaders and men and of leaders and women.² Studies were accepted even if they reported only a men–leader or women–leader correlation, but the great majority of studies reported both correlations.

2. In the Powell and Butterfield (1979) agency–communion paradigm, participants rated leaders (or managers) on two multi-item scales, typically the masculine and feminine scales of the Bem Sex Role Inventory (Bem, 1974). One scale contains stereotypically masculine (i.e., agentic) personality traits, such as assertive, forceful, dominant, and competitive; the other scale contains stereotypically feminine (i.e., communal) personality traits, such as affectionate, compassionate, warm, and gentle. Studies collected for this meta-analysis reported internal consistency coefficients for the Bem Sex Role Inventory from .74 to .90 for the agency scale and .79 to .90 for the communion scale. Researchers usually reported means and standard deviations on the two scales but sometimes presented item-level data that included a representation of agentic and communal traits or classified respondents' leader ratings into the four quadrants of a two-dimensional agency–communion space. The researchers other than Powell and Butterfield whose studies fit this paradigm usually did not cite the precedent of the Powell and Butterfield study, but nonetheless reported participants' ratings of a leader category on agency and communion.

3. In the Shinar (1975) masculinity–femininity paradigm, participants rated one or more leader categories on a single bipolar 7-point scale that ranged from *very masculine* to *very feminine*. Researchers reported means and standard deviations of these ratings and compared means to the midscale value, which represents the gender-neutral or androgynous point on the scale. The meta-analysis includes only those occupations from each study that have a clear leadership focus (most commonly managerial roles, such as office manager).

The studies selected for all three of these paradigms presented participants with a general leader category, such as managers or executives, or with occupations or job titles denoting managerial authority, such as personnel directors, head librarians, academic administrators, military officers, or political office holders. For all paradigms, data were excluded if they provided ratings of leader behaviors rather than personality traits (e.g., Gutek & Stevens, 1979), of specific people in a leadership position (e.g., Petty & Miles, 1976), or of leader groups identified by sex (e.g., "successful female managers"; Dodge, Gilroy, & Fenzel, 1995). Studies in the agency–communion paradigm were eliminated if the majority of the items in their two scales did not pertain to agentic or communal personality traits or if the two types of items were very unequally represented (e.g., Buttner & Rosen, 1988).

The abstract of each identified document was evaluated by at least one of the authors; if the study potentially fit the inclusion criteria, the full document was obtained. In total, 78 documents were rejected based on their abstracts and 134 documents were rejected after reading the document. In addition, 11 documents met the inclusion criteria but did not report the appropriate statistics to

calculate an effect size, and when contacted, the authors could not supply the needed information (e.g., Couch & Sigler, 2001; Gerstner & Day, 1994).

Studies from any participant population or nation were included if they fit the above criteria. When documents included data from different nations or different participant samples within a nation, they were treated as separate studies if the results were reported separately. Some documents included data for more than one type of leader category (e.g., company president, head librarian). If separate groups of participants rated each category, the leader categories were treated as separate studies. If the same participants rated more than one leader category, these effect sizes were averaged prior to calculating study-level mean effect sizes but retained as separate effect sizes for moderator analyses. In two documents in the think manager–think male paradigm (Dodge et al., 1995; Karau, 2005), separate groups of participants rated different types of leaders. These ratings were correlated with the same ratings of women and men, provided by two other groups of participants. In our analyses, we treated these semi-independent leader conditions as separate studies.

Some data qualified in more than one paradigm. For example, we extracted only the leader condition of think manager–think male studies for use in the agency–communion paradigm if the report contained item-level data that allowed us to separate agentic and communal items into subscales (i.e., van Engen, 2006). Also, parts of the same study that were published separately sometimes qualified for different paradigms. For example, some authors presented intraclass correlation coefficients in one publication but grouped the data into agentic and communal scales in another (Fullagar, Sverke, Sverke, Sümer, & Slick, 2003; Sümer, 2006) or presented the intraclass correlation coefficients in one publication but the mean for a specific masculine–feminine bipolar scale in another (Koch, Luft, & Kruse, 2005; Luft, 2003).

Search for studies. Computer-based information searches were conducted in the following databases: ABI/INFORM, Academic Press/Ideal, Business Source Elite, Proquest Digital Dissertations, Educational Resources Information Center (ERIC), Emerald Full Text, PAIS International, Proquest Business Databases, PsycINFO, ScienceDirect, Sociological Abstracts, Web of Science, WilsonWeb, and Worldwide Political Science Abstracts.

In these searches, the keywords *leader** (-s, -ship), *manager** (-s, -ial), *educator*, *executive*, *candidate*, *public office*, *political office*, *principal*, or *occupation* were combined with (a) *stereotyp** (-e, -es, -ical), *traits*, *characterization*, *attribute inventory*, *image*,

² The design of the studies in this paradigm appears similar to that of a study by Broverman, Broverman, Clarkson, Rosenkrantz, and Vogel (1970), whose participants rated a "mature, healthy, socially competent" man, woman, or adult person. Broverman et al. found greater similarity between an adult person and men than between an adult person and women, but this finding has been criticized as artifactual (see Kelley & Blashfield, 2008; Widiger & Settle, 1987, for details). However, the similarity of the Broverman et al. study to the think manager–think male studies is only superficial because Schein's (1973) method offers superior item selection and statistical analysis. Specifically, (a) the typical think manager–think male items (in the Schein Descriptive Index) are moderately balanced between agentic and communal qualities (see Duehr & Bono, 2006), and (b) the statistical analysis with an intraclass correlation is more appropriate to the data.

expectation, and *perce** (-*ption*, -*tive*) or (b) gender terms, such as *man*, *men*, *woman*, *women*, *male*, *female*, *masculinity*, *femininity*, *sex*, *sex role*, *sex-typing*, *gender*, *gender role*, and *androg** (-*ny*, -*nous*). Additional searches paired the two most common dependent measures (the Schein Descriptive Index and the Bem Sex Role Inventory) with *manage** or *leader**, *think manager–think male*, or *requisite management characteristics*. Web of Science citation searches were also performed for the seminal articles in each paradigm (Powell & Butterfield, 1979; Schein, 1973; Shinar, 1975). All obtained studies' reference sections were also searched for relevant studies.

Several foreign psychological and academic databases were searched with the limited keywords *leader** (-*s*, -*ship*) or *manager** (-*s*, -*ial*) paired with (a) *stereotyp** (-*e*, -*es*, -*ical*), *traits*, or *similarities* or (b) gender terms, such as *masculinity*, *femininity*, *gender*, and *sex* (translated, as appropriate). The foreign databases were from Finland (University of Joensuu database, Forum of Science database, Finnish Social Science Achieve, University of Rovaniemi database, University of Tampere database); Germany (Datenbank, PSYINDEX, PSYINDEXalert, PSYTKOM); Great Britain and Ireland (Index to Theses); Norway (National Library of Norway, BIBSYS Library); Spain (Psicodoc); and Sweden (Chalmers University of Technology database, the Center for Research Libraries). Documents in languages other than English were translated by appropriately skilled individuals who assisted the two coders.

To locate unpublished studies, messages asking for relevant data were sent to the e-mail distribution lists of several organizations: European Association of Social Psychology, European Association of Work and Organizational Psychology, Interamerican Society of Psychology, Society for the Psychology of Women, Social Issues in Management Division of the Academy of Management, Society for Personality and Social Psychology, and Society for the Psychological Study of Social Issues. Data were also sought from the originators of each of the paradigms, but they had no additional data to offer. Finally, when the authors of this article gave several talks on the meta-analysis in progress, they asked the audience to contribute their own data or to provide leads about relevant sources of data. Both unpublished and published studies meeting the inclusion criteria were included in the meta-analysis.

The initial search extended from the beginning of each paradigm through the end of 2002. The search was then updated in June 2007 by consulting the databases that had yielded studies in 2002, with the addition of Google and Google Scholar, and updated once more in March 2009 with PsycINFO, Google, and Google Scholar.

Variables Representing Each Study in All Paradigms

The coded variables represent the a priori moderators as well as other variables that we investigated on an exploratory basis. The included studies, their codings, and effect sizes appear in Tables 1, 2, and 3 for the think manager–think male, agency–communion, and masculinity–femininity paradigms, respectively.

A priori moderators. Year of publication (or year of data collection for unpublished data) was recorded as well as the percentage of male participants. Effect sizes were also calculated separately by participant sex when possible. If data were not reported separately for male and female participants, we contacted the authors and requested this information.

For each paradigm, we recorded the exact description of the leader group and coded its domain: (a) In the think manager–think male paradigm, the leader domains were nearly all designated as managerial, and those few not so designated were heterogeneous (e.g., leader, educational administrator), so no moderator variable was tested; (b) in the agency–communion paradigm, the domains were managerial (e.g., manager, middle-level manager), political (e.g., mayor, state senator), or educational (e.g., elementary school principal, school superintendent); and (c) in the masculinity–femininity paradigm, the domains, or economic sectors, of the occupations were business (e.g., company president, marketing manager), education (e.g., educational administrator, school principal), politics (mayor, politician), judicial (e.g., federal judge, Supreme Court justice), arts (orchestra conductor, theatrical director), or other (boat captain, farm manager, park manager). For all three paradigms, leader status was coded as high (defined as prestigious political roles such as president or governor or organizational positions higher than middle manager such as upper-level managers or executives) or moderate (e.g., managers, middle-level managers, all other leader occupations).

Participant nationality was coded by the nation where the study was conducted and classified as Western (United States, Great Britain, Germany, Canada, New Zealand, Australia, Sweden, South Africa, Netherlands, Denmark, and Portugal) or Eastern (China, Japan, Hong Kong, Egypt, Saudi Arabia, and Turkey). Other exploratory classifications (e.g., North American vs. other Western vs. Eastern) did not improve prediction of the effect sizes.

To interpret cross-temporal and cross-national comparisons of studies, we imported data on the percentage of female managers, defined as the percentage of managers who are women, based on the likely time of data collection for the nations in which the studies were conducted, defined as 2 years prior to studies' dates of publication. When available, these data came from the *Human Development Reports* of the United Nations Development Programme (e.g., 2006) and otherwise from the *Yearbooks of Labour Statistics* of the International Labour Organization (e.g., 1985). Aggregate indexes of the status of women available from the United Nations Development Programme or other sources were not appropriate for this meta-analysis because they are available only for more recent years.

Exploratory moderators. Average participant age was either provided in each research report or estimated from sample characteristics. The distributions of the effect sizes across the types of participant populations were as follows: (a) for the think manager–think male paradigm, 55% undergraduate students, 18% managers, 8% MBA students, 6% nonmanagerial employees, and 14% other or mixed; (b) for the agency–communion paradigm, 62% undergraduate students, 13% nonmanagerial employees, 9% managers, 9% MBA students, and 9% other or mixed; and (c) for the masculinity–femininity paradigm, 86% undergraduate students and 14% other or mixed.

The percentage of male authors was coded. Research group was coded as originators of paradigm (Schein, Powell and Butterfield, or Shinar) or other. Stereotype measure was coded based on the use of the originators' versus other measures: (a) In the think manager–think male paradigm, Schein Descriptive Index or other (e.g., task vs. person-orientation scales); (b) in the agency–communion paradigm, Bem Sex Role Inventory or other (e.g., initiating structure vs. consideration scales); and (c) in the masculinity–femininity paradigm, always a masculinity–femininity 7-point scale.

Table 1
All Included Studies (k = 51) With Moderator Values and Effect Sizes for the Think Manager–Think Male Paradigm

Report	Sample ^a	Sep. by sex ^b	Pub. source ^c	% male authors	Stereotype measure ^d	Nation ^e	% female mgr.	Age	Leader role ^f	Leader status ^g	n	% male part.	Item n	Leader sim. ^h	ICC ⁱ	Variance
Booyens & Nkomo (2006)	1	Y	1	0	1	ZA	30	32	SMM	1	391	69	92	W	.46	0.01
Boyce & Herd (2003)	1	Y	1	0	1	US	46	20	SMM	1	404	69	92	M	.70	0.01
Brenner et al. (1989)	1	Y	1	67	1	US	35	42	SMM	1	508	82	92	W	-.03	0.01
Byler (2000)	1	Y	2	0	1	US	44	44	EAD	1	501	82	92	M	.39	0.01
Cohen-Kaner (1992)	1	Y	2	0	1	US	37	36	SMM	1	407	72	92	W	.15	0.01
Dion & Schuller (1990)	1	Y	1	50	2	US/CA	36	32	SMM	1	395	69	92	M	.68	0.01
Dion & Schuller (1991)	1	Y	1	50	2	US/CA	37	33	SMM	1	85	78	92	M	.23	0.01
Dodge et al. (1995)	1	Y	1	33	1	US	40	31	SMM	1	119	39	92	W	.26	0.01
Duehr & Bono (2003)	1	Y	2	0	1	US	42	30	SMM	1	119	39	92	M	.53	0.01
Duehr & Bono (2006)	2	Y	1	0	1	US	42	47	SMM	1	53	45	51	M	.58	0.02
Fernandes & Cabral-Cardoso (2003)	1	Y	1	50	2	PT	32	21	M	1	43	48	22	M	.66	0.05
Foster (1994)	1	Y	1	0	1	GB	32	42	SMM	1	48	59	92	W	.15	0.01
Fullager et al. (2003)	2	Y	1	50	1	TR	8	21	SMM	1	48	59	92	M	.50	0.25
Heilman et al. (1989)	1	M	1	50	1	US	35	41	SMM	1	48	59	92	W	.02	0.01
Karau (2005)	1	Y	2	100	1	US	42	22	SMM	1	48	59	92	M	.59	0.01
Karau & Elsaid (2005)	2	Y	2	100	1	US	42	22	SMM	1	76	39	92	W	.54	0.01
Karau & Hansen (2005)	2	Y	2	100	1	EG	9	21	SMM	1	74	31	92	M	.56	0.01
Kent (1984)	1	Y	2	0	1	US	28	47	SSA	1	178	60	92	W	.67	0.01
											169	57	92	M	.56	0.01
											203	33	92	W	.28	0.01
											199	46	42	W	-.01	0.03
											199	46	42	M	.40	0.03
											160	50	92	W	.11	0.01
											160	50	92	M	.46	0.01
											536	58	92	W	.21	0.01
											536	58	92	M	.58	0.01
											182	27	92	W	.15	0.01
											182	27	92	M	.68	0.01
											78	100	92	W	-.24	0.01
											78	100	92	M	.54	0.01
											112	59	92	W	.01	0.01
											104	63	92	M	.39	0.01
											113	58	92	W	.19	0.01
											105	63	92	M	.93	0.01
											217	58	92	W	.31	0.01
											220	59	92	M	.40	0.01
											371	75	92	W	-.24	0.01
											357	73	92	M	.43	0.01
											47	55	92	W	.44	0.01
											47	57	92	M	.33	0.01
											61	51	92	W	.28	0.01
											61	56	92	M	.39	0.01
											240	47	92	W	.58	0.01
											247	52	92	M	.59	0.01

Table 1 (continued)

Report	Sample ^a	Sep. by sex ^b	Pub. source ^c	% male authors	Stereotype measure ^d	Nation ^e	% female mgr.	M age	Leader role ^f	Leader status ^g	n	% male part.	Item n	Leader sim. ^h	ICC ⁱ	Variance
Kunkel et al. (2003)	1	Y	1	33	1	US	46	21	CEO	2	41	46	92	W	.18	0.01
Luft (2003)	1	Y	2	0	2	DE	27	28	L	1	42	46	92	M	.80	0.01
Marmenout (2008)	1	Y	2	0	1	SA	31	21	SMM	1	202	47	25	W	-.27	0.04
Massengill & DiMarco (1979)	1	Y	1	100	1	US	22	44	SM	1	144	40	92	W	.68	0.04
Mook (2005)	1	Y	2	0	1	NL	26	39	SM	1	171	37	92	M	.18	0.01
Neergaard et al. (2007)	1	Y	2	33	1	DK	25	43	MSC	1	89	60	92	W	.15	0.01
Norris & Wylie (1995)	1	Y	1	0	2	US/CA	40	21	SMM	1	83	57	92	M	.64	0.01
Orser (1994) ^j	2	Y	1	0	1	CA	41	21	SM	1	85	48	92	W	.24	0.01
Paradine et al. (1995)	1	Y	2	66	2	CA	41	21	SM	1	96	45	92	M	.58	0.01
Ryan et al. (in press)	2	Y	2	25	1	AU	37	22	MSC	1	119	85	92	W	.44	0.01
Sauers et al. (2002)	1	Y	1	67	1	NZ	38	21	SMM	1	113	82	92	M	.72	0.01
Schein (1973)	1	M	1	0	1	US	18	43	SMM	1	613	48	24	W	.44	0.05
Schein (1975)	1	F	1	0	1	US	17	44	SMM	1	605	48	24	M	.81	0.05
Schein & Davidson (1993) ^k	2	Y	1	0	1	GB	32	21	SMM	1	198	0	92	W	.31	0.01
Schein & Mueller (1992)	2	Y	1	50	1	GB	32	21	SMM	1	198	0	92	M	.46	0.01
Schein et al. (1989)	1	Y	1	33	1	US	35	21	SMM	1	198	50	92	W	.18	0.01
Schein et al. (1996)	2	Y	1	50	1	JP	9	21	SMM	1	198	50	92	M	.49	0.01
Szeszsy (2003a)	1	Y	1	0	2	DE	27	24	L	1	204	55	40	W	.15	0.03

(table continues)

Table 1 (continued)

Report	Sample ^a	Sep. by sex ^b	Pub. source ^c	% male authors	Stereotype measure ^d	Nation ^e	% female mgr.	M age	Leader role ^f	Leader status ^g	n	% male part.	Item n	Leader sim. ^h	ICC ⁱ	Variance
Szczesny (2003b)	1	Y	1	0	2	DE	27	45	L	1	60	58	40	W	.87	0.03
Sylvan (1983)	1	Y	2	0	1	US	27	38	SM	1	60	53	92	W	.11	0.01
van Engen (2006)	1	Y	2	0	1	NL	26	22	SMM	1	70	23	92	W	.29	0.01
Yim & Bond (2002)	1	Y	1	50	2	HK	25	19	SMM	1	142	49	32	W	.44	0.03
											142	49	32	M	.72	0.03

Note. In each sample, separate groups of participants rated a leader category, women, or men on gender-stereotypical traits. The effect sizes are the intraclass correlations between the mean ratings of managers (or leaders) and (a) the mean ratings of men or (b) the mean ratings of women across all the traits. Sep. = separated; pub. = publication; mgr. = managers; part. = participants; sim. = similarity; ICC = intraclass correlation coefficient.

^a The number of different samples (e.g., from different populations or countries) reported within the article. ^b Separated samples by sex: N = no; Y = yes; M = sample was all male; F = sample was all female. ^c Publication source: 1 = published; 2 = unpublished. ^d 1 = Schein Descriptive Index; 2 = other. ^e AU = Australia; CA = Canada; CN = China; DK = Denmark; EG = Egypt; DE = Germany; GB = Great Britain; HK = Hong Kong; JP = Japan; NL = Netherlands; NZ = New Zealand; PT = Portugal; SA = Saudi Arabia; ZA = South Africa; SE = Sweden; TR = Turkey; US = United States; X = included data from several countries. ^f EAD = effective athletic directors; L = leadership; M = managers; MSC = managers of successful companies; CEO = successful CEOs; SM = successful managers; SMM = successful middle managers; SMO = successful school administrators; SSA = successful school administrators; SUM = successful upper level managers. ^g 1 = moderate; 2 = high. ^h M = men-leaders similarity; W = women-leaders similarity. ⁱ Effect size (ICC) computed using a one-way single rater random effects model, related the mean ratings of the leader role to the ratings of men or women. These correlations represent the similarity of stereotypes of men or women to stereotypes of leaders; higher correlations indicate a greater similarity. ^j The sample with 50% male participants was composed of business students, and the sample with 0% male participants was composed of nonbusiness students. ^k The sample with 54% male participants was from North Great Britain, and the sample with 48% male participants was from South Great Britain.

Lastly, the source of publication was coded as published or unpublished (including dissertations, master's theses, and other unpublished documents) to provide one estimate of possible publication bias (Sutton, 2009; see the subsection "Publication Bias").

Two of the authors, who had successfully completed a course on meta-analysis, independently coded the studies, with high agreement across the variables. The mean kappas for intercoder agreement were .90, .90, and .97 for the think manager-think male, agency-communion, and masculinity-femininity paradigms, respectively. Disagreements were resolved by discussion.

Computation of Effect Sizes and Data Analysis

Effect sizes were calculated with a hand calculator or DSTAT software and then entered into Comprehensive Meta-Analysis (Version 2.2.050) and Statistical Package for the Social Sciences (SPSS). Subgroup analyses were conducted using Comprehensive Meta-Analysis, and meta-regressions were conducted with SPSS macros provided by D. Wilson (see <http://mason.gmu.edu/~dwilsonb/ma.html>). For all analyses, *p* values less than .05 were considered significant and values between .05 and .10 were defined as marginal.

Calculation of effect sizes. In the think manager-think male paradigm, researchers reported intraclass correlation coefficients (ICCs) for the men-leaders and women-leaders relationships. In all cases in which ICCs were not reported, the researchers provided additional information that allowed us to produce intraclass correlations. The ICCs used in the primary data reports were computed using a one-way, single-rater, random effects model, which assesses absolute agreement among measurements (Case 1 in McGraw & Wong, 1996). However, the more appropriate ICC would have been the 2-way ICC(A,1), which is also a measure of absolute agreement but which takes the fixed column factor (leaders vs. women; leaders vs. men) into account. Thus, the ICC provided by researchers in the primary studies would be biased downward somewhat but quite close to the calculations for ICC(A,1) (K. O. McGraw, personal communication, January 8, 2003). We used the one-way, single-rater, random effects ICC because it was available for all data sets, providing a common metric for the studies. The men-leaders and women-leaders similarities, or ICCs, were analyzed separately as Fisher's *Z*, using the conversion $.5 * \log\left(\frac{1 + [(k - 1) * r]}{1 - r}\right)$, where *k* is the number of observations made on each object of measurement, and given an inverse variance within-study weight of $1/\{k/[2 * (n - 2)(k - 1)]\}$, where *n* is the number of items (see formulas in Appendix B of McGraw & Wong, 1996). The *Z*s were transformed back to ICCs for presentation of the results.³ In the random-effects models, the variances in these study weighting terms consisted of the sum of the within-study variance and the between-studies variance (see Borenstein et al., 2009, p. 72).

In the agency-communion paradigm, researchers reported means and standard deviations separately on the agentic and communal scales, allowing the computation of a *d* effect size comparing the

³ Because the women-leaders and men-leaders correlations are dependent in that they share the data for leaders, we did not compare the two effects statistically. These types of comparisons would require information about the correlation between male and female targets, which is not available in the primary studies.

Table 2
All Included Studies (k = 48) With Moderator Values and Effect Sizes for the Agency-Communion Paradigm

Report/leader role	Sample ^a	Sep. by sex ^b	Pub. source ^c	% male authors	Stereotype measure ^d	Nation ^e	% female mgr.	M age	Leader domain ^f	Leader status ^g	n	% male part.	g ^h	Variance
Butterfield & Powell (1981) Good president	1	N	1	100	1	US	25	20	2	2	128	59	2.36	0.03
Cann & Siegfried (1987) Manager	1	Y	1	100	2	US	33	21	3	1	110	53	0.79	0.02
Huddy & Terkildsen (1993) Good Congress member	1	Y	1	0	2	US	37	21	2	2	133	54	0.48	0.02
Good local council member					2				2	1	149	50	0.20	0.01
Good mayor					2				2	2	153	51	0.75	0.01
Good president					2				2	2	139	56	1.00	0.02
Average of roles													0.61	0.02
Inderfield & Powell (1979) Good manager	4	Y	1	50	1	US	22	43	3	1	41	63	2.65	0.09
Good manager					3			37	3	1	51	0	2.14	0.06
Good manager					3			28	3	1	154	69	1.41	0.02
Good manager					3			22	3	1	259	58	1.22	0.01
Maier (1993) Typical manager	1	Y	1	100	1	US	37	20	3	1	60	50	0.72	0.04
Average of roles					3				3	1	59	50	1.79	0.05
Ideal manager													1.25	0.04
Marongiu & Ekehammar (2000) Manager	1	Y	1	50	1	SE	27	41	3	1	87	48	0.65	0.02
Powell (1992) Good manager	2	Y	1	100	1	US	37	21	3	1	87	47	1.46	0.03
Typical American manager					3				3	1	79	44	1.63	0.03
Powell & Butterfield (1979) Good manager	2	Y	1	100	1	US	22	20	3	1	110	82	2.35	0.20
Good manager					3			27	3	1	574	70	1.98	0.05
Powell & Butterfield (1984) Good manager	1	N	1	100	1	US	28	20	3	1	627	62	2.47	0.01
Powell & Butterfield (1987) Good president of the U.S.	2	Y	1	100	1	US	33	20	2	2	50	46	1.53	0.05
Good vice-president					2				2	2	44	46	0.81	0.05
Powell & Butterfield (1989) Good manager	2	Y	1	100	1	US	35	20	3	1	199	43	2.56	0.15
Good manager					3			27	3	1	126	60	1.97	0.23
Powell et al. (2002) Good manager	2	Y	1	67	1	US	45	32	3	1	123	65	1.49	0.13
Good manager					3			21	3	1	206	57	1.08	0.04
Powell & Kido (1994) Good manager	2	Y	1	10	1	JP	8	21	3	1	88	77	-1.18	0.03
Typical Japanese manager					3			21	3	1	86	23	0.27	0.02
Rosenwasser & Dean (1989) City council member	9	N	1	0	1	US	35	21	2	1	14	54	2.44	0.25
Governor					2				2	2	14	54	2.66	0.27
Mayor					2				2	2	14	54	2.31	0.24

(table continues)

Table 2 (continued)

Report/leader role	Sample ^a	Sep. by sex ^b	Pub. source ^c	% male authors	Stereotype measure ^d	Nation ^e	% female mgr.	M age	Leader domain ^f	Leader status ^g	n	% male part.	g ^h	Variance
President														
School board member													1.40	0.18
State representative													1.01	0.16
State senator													2.40	0.25
U.S. representative													1.59	0.19
U.S. senator													2.55	0.26
Rustemeyer & Thrien (1989)	2	Y	1	0	1	DE	19						1.98	0.21
Good manager								23	3	1	109	64	3.11	0.25
Good manager								45	3	1	54	100	1.84	0.23
Stoker (2007)	1	Y	1	0	1	NL	26	36	3	1	3229	67	1.07	0.001
Ideal manager														
Stümer (2006)	1	Y	1	0	2	TR	8	21	3	1	369	55	1.29	0.01
Successful middle manager														
van Engen (2006)	1	Y	2	0	2	NL	26	22	3	1	40	28	1.00	0.06
Successful middle manager														
Vinnicombe & Cames (1998)	1	Y	1	0	2	LU	9	43	3	1	66	50	1.02	0.03
Successful manager at their bank														
Vinnicombe & Singh (2002)	1	Y	1	0	2	GB	33	43	3	2	363	33	1.71	0.01
Successful managers who reached the top team														
Willemssen (2002)	1	Y	1	0	2	NL	27	22	3	1	139	52	1.19	0.02
Successful manager at their bank														
Williams (1989)	1	N	2	0	1	US	35	50	1	1	54	43	1.00	0.04
Academic dean of students														
Assistant principal													0.76	0.04
Elementary school principal													0.28	0.04
School superintendent													0.34	0.04
Secondary school principal													1.20	0.04
Average of roles													0.71	0.04

Note. In each sample, participants rated a leader role on separate masculine (i.e., agentic) and feminine (i.e., communal) gender stereotyping scales. Comparison of participants' mean ratings on the two scales determined whether the stereotype of leaders was more masculine than feminine. The effect size for the average of the roles is presented for studies using a within-subjects design. Sep. = separated; pub. = publication; mgr. = managers; part. = participants.

^aThe number of different samples (e.g., from different populations or countries) reported within the article. Some studies with multiple samples reported participant characteristics across all samples. ^bSeparated samples by sex: N = no; Y = yes. ^cPublication source: 1 = published; 2 = unpublished. ^d1 = Bem Sex Role Inventory; 2 = other. ^eDE = Germany; GB = Great Britain; JP = Japan; LU = Luxembourg; NL = Netherlands; SE = Sweden; TR = Turkey; US = United States. ^f1 = educational; 2 = political; 3 = managerial. ^g1 = moderate; 2 = high. ^hEffect size (*g*) computed by subtracting the mean rating on the feminine scale from the mean rating on the masculine scale and dividing by the pooled standard deviation, adjusted for small sample bias. If only frequencies or percentages in a 2 × 2 table created by splitting the scales at the medians were reported, agency and communion were treated as dichotomous, and *g* was estimated from *d*_{Corr}. Larger *g*s indicate a more masculine concept of leadership.

Table 3
All Included Studies (k = 101) With Moderator Values and Effect Sizes for the Masculinity-Femininity Paradigm

Report/leader role	Sample ^a	Sep. by sex ^b	% male authors	Nation ^c	% female mgr.	M age	Leader domain ^d	Leader status ^e	n	% male part.	g ^f	Variance
Beggs & Doolittle (1993)	1	Y	0	US	37	21	6	1	139	50	2.44	0.007
Boat captain												
Company president							2	2	138	49	1.22	0.007
Dean/educational administrator							1	1	140	50	0.61	0.007
Director, labor relations							2	1	141	50	0.88	0.007
Director, operations							2	1	141	50	1.11	0.007
Farm manager							6	1	140	50	1.64	0.007
Federal judge							5	1	141	50	1.46	0.007
Head librarian							1	1	141	50	-1.66	0.007
Manager, credit union							2	1	141	50	0.87	0.007
Manager, procurement services							2	1	141	50	0.72	0.007
Managing editor							6	1	139	50	0.85	0.007
Mayor							4	1	141	50	1.40	0.007
Motel manager							2	1	141	50	0.45	0.007
Office manager							2	1	141	50	0.26	0.007
Orchestra conductor							3	1	140	50	1.35	0.007
Park manager							6	1	141	50	1.10	0.007
Personnel director							2	1	139	50	0.30	0.007
Politician							4	1	140	51	1.40	0.007
Public relations director							2	1	141	50	0.06	0.007
Sales manager							2	1	140	50	0.60	0.007
Sales president							2	2	140	50	1.35	0.007
School principal							1	1	141	50	0.92	0.007
Theatrical director							3	1	141	50	0.01	0.007
University president							1	2	140	50	1.44	0.007
U.S. Supreme Court justice							5	1	139	50	1.51	0.007
Average of roles											0.89	0.007
Gatton et al. (1999)	1	Y	33	US	44	21	2	1	175	47	0.84	0.006
Accounting manager							2	1	175	47	0.67	0.006
Computer operations manager							2	1	175	47	-0.16	0.006
Data processing manager							2	1	175	47	1.46	0.006
Engineering manager							2	1	175	47	0.76	0.006
Financial manager							2	1	175	47	-0.31	0.006
Human resources manager							2	1	175	47	0.20	0.006
Marketing manager							2	1	175	47	0.27	0.006
Office manager							2	1	175	47	0.27	0.006
Plant manager							2	1	175	47	1.77	0.006
Quality control manager							2	1	175	47	0.84	0.006
R & D director							2	1	175	47	0.45	0.006
Sales manager							2	1	175	47	0.38	0.006
Average of roles											0.60	0.006
Koch et al. (2005)	1	Y	0	DE	27	28	2	1	202	47	0.63	0.005
Leadership											(table continues)	

Table 3 (continued)

Report/leader role	Sample ^a	Sep. by sex ^b	% male authors	Nation ^c	% female mgr.	M age	Leader domain ^d	Leader status ^e	n	% male part.	g ^f	Variance
Mahoney & Blake (1987)	1	Y	100	US	33	26	6	1	29	52	1.52	0.036
Farm manager							2	1	34	50	0.48	0.030
Financial manager							2	1	29	52	0.58	0.035
Sales manager											0.86	0.033
Average of roles												
Muñoz Sastre et al. (2000)	2	N	20	FR	9	21	6	1	234	45	2.35	0.004
Boat captain							2	2	234	45	0.98	0.004
Company president							1	1	234	45	0.92	0.004
Dean/educational administrator							6	1	234	45	1.97	0.004
Farm manager							5	1	234	45	0.53	0.004
Federal judge							1	1	234	45	-1.03	0.004
Head librarian							2	1	234	45	0.52	0.004
Managing editor							4	1	234	45	0.78	0.004
Mayor							2	1	234	45	0.80	0.004
Motel manager							3	1	234	45	1.22	0.004
Orchestra conductor							6	1	234	45	0.93	0.004
Park manager							2	1	234	45	0.49	0.004
Personnel director							4	1	234	45	1.15	0.004
Politician							2	1	234	45	0.28	0.004
Public relations director							2	2	234	45	0.30	0.004
Sales manager							2	2	234	45	0.72	0.004
Sales president							1	1	234	45	0.07	0.004
School principal							5	1	234	45	0.60	0.004
Supreme Court justice							3	1	234	45	0.53	0.004
Theatrical director							1	2	234	45	0.87	0.004
University president											0.75	0.004
Average of roles				ES	32	21						
Boat captain							6	1	126	41	2.03	0.008
Company president							2	2	126	41	0.75	0.008
Dean/educational administrator							1	1	126	41	0.74	0.008
Farm manager							6	1	126	41	1.25	0.008
Federal judge							5	1	126	41	0.59	0.008
Head librarian							1	1	126	41	-0.09	0.008
Managing editor							2	1	126	41	0.74	0.008
Mayor							4	1	126	41	0.61	0.008
Motel manager							2	1	126	41	0.68	0.008
Orchestra conductor							3	1	126	41	1.30	0.008
Park manager							6	1	126	41	0.78	0.008
Personnel director							2	1	126	41	0.70	0.008
Politician							4	1	126	41	0.62	0.008
Public relations director							2	1	126	41	0.07	0.008
Sales manager							2	1	126	41	0.51	0.008
Sales president							2	2	126	41	0.45	0.008
School principal							1	1	126	41	0.40	0.008
Supreme Court justice							5	1	126	41	0.88	0.008

Table 3 (continued)

Report/leader role	Sample ^a	Sep. by sex ^b	% male authors	Nation ^c	% female mgr.	M age	Leader domain ^d	Leader status ^e	n	% male part.	g ^f	Variance
Theatrical director	1	N	0	US	18	21	6	1	120	50	3.91	0.009
University president							2	2	120	50	9.06	0.011
Average of roles							1	1	120	50	0.99	0.008
Shinar (1975)							6	1	120	50	2.09	0.008
Boat captain							5	1	120	50	1.76	0.008
Company president							1	1	120	50	-1.59	0.008
Dean/educational administrator							2	1	120	50	0.68	0.008
Farm manager							4	1	120	50	1.73	0.008
Federal judge							2	1	120	50	1.08	0.008
Head librarian							3	1	120	50	2.73	0.009
Managing editor							6	1	120	50	3.03	0.009
Mayor							2	1	120	50	0.50	0.008
Motel manager							4	1	120	50	0.96	0.008
Orchestra conductor							2	1	120	50	0.68	0.008
Park manager							2	1	120	50	1.13	0.008
Personnel director							2	2	120	50	1.62	0.008
Politician							1	1	120	50	0.67	0.008
Public relations director							3	1	120	50	1.09	0.008
Sales manager							1	1	120	50	3.94	0.009
Sales president							1	2	120	50	7.08	0.010
School principal							5	1	120	50	2.16	0.009
Theatrical director												
University president												
U.S. Supreme Court justice												
Average of roles												

Note. In each sample, participants rated leader roles on a single bipolar masculinity-femininity scale. Comparison of these ratings to the midpoint of the scale determined whether the stereotype of leaders was masculine or feminine. The effect size for the average of the roles is presented for studies using a within-subjects design. All studies were published and used a 1-7 masculine-feminine rating scale. Sep. = separated; mgr. = managers; part. = participants.

^a The number of different samples (e.g., from different populations or countries) reported within the article. ^b Separated samples by sex: N = no; Y = yes. ^c FR = France; DE = Germany; ES = Spain; US = United States. ^d 1 = education; 2 = business; 3 = arts; 4 = political; 5 = judicial; 6 = other. ^e 1 = moderate; 2 = high. ^f Effect size (g) computed by subtracting the midpoint of the scale from the leader rating, divided by the standard deviation and corrected for small sample bias.

ratings on the two scales: $(M_1 - M_2)/s_p$. The effect sizes were converted to g with the correction for small sample bias: $1 - [3/(4N - 9)]$ (Borenstein et al., 2009). Some authors split their sample at the median on both scales and reported the frequencies or percentages in each quadrant of the resulting 2×2 table. If only this report was available, agency and communion were treated as dichotomous, and g was estimated from d_{Cox} , which is a logistic transformation of the odds-ratio (Sánchez-Meca, Marín-Martínez, & Chancón-Moscoso, 2003, Formula 18). The within-study weighting term was the conventional inverse variance for standardized comparisons of means (Lipsey & Wilson, 2001, p. 72) or d_{Cox} (Sánchez-Meca et al., 2003, Formula 19), with the random-effects models also incorporating the between-studies variances in the study weight.

In the masculinity–femininity paradigm, authors reported means and standard deviations on a 7-point masculinity–femininity scale, which yielded a d as a comparison with the scale's midpoint $[(M - \text{midpoint})/SD]$. The effect sizes were then corrected for small sample bias with the formula $1 - [3/(4N - 5)]$ to create a g (Borenstein et al., 2009). The within-study weighting term for these effect sizes was $(1/n) + \{(d * d)/[2n(n - 1)]\}$ (B. Becker, personal communication, June 19, 2008), and the random-effects models included the between-studies variance in the study weight.

Mean and distribution of effect sizes. Within each paradigm, the presentation first considers the mean weighted effect size (with within-subjects effect sizes combined prior to averaging), calculated by a random-effects model because the studies' effect sizes were not assumed to be consistent with a single underlying mean value. We tested for outliers, as defined by more than 1.5 times the interquartile range beyond the upper quartile (i.e., the upper inner fence, Tukey, 1977). We used Cohen's (1988) benchmarks for d and r to describe the magnitude of the effect sizes g and ICC, under which a g of .20 or an ICC of .10 is considered small, a g of .50 or an ICC of .30 is considered medium, and a g of .80 or an ICC of .50 is considered large. Along with the overall mean, we present several distributional statistics recommended by Borenstein et al. (2009): (a) T (or tau, the estimated standard deviation of the true effect sizes); (b) 95% confidence interval (CI; a measure of the accuracy of the mean; 95% of mean effect sizes would fall inside this interval); (c) 90% prediction interval (PI; a measure of the dispersion of effect sizes; 90% of true effects in new studies with a sample selected at random would fall inside this interval); (d) Q (a measure of uncertainty, or whether heterogeneity is genuine); and (e) I^2 (a measure of the magnitude of heterogeneity, defined as the proportion of the observed dispersion that is real rather than spurious on a 1 to 100% scale). An I^2 near zero indicates that almost all of the observed variance in the effects is spurious and that there is no variance to explain, whereas a large I^2 indicates that investigation of the reasons for this variance is warranted.

Publication bias. Analyses of the distribution of effect sizes checked for potential biases in publication or our retrieval of studies (see Borenstein et al., 2009). We first examined the funnel plot of the effect sizes plotted by the standard error and assessed whether Egger's test of the plot's asymmetry was significant. We next implemented the trim-and-fill procedure, which estimates the number of studies that should be removed to create a more symmetric funnel plot. This procedure assesses the impact of removing these studies on the mean effect size, then fills these studies back in and imputes a mirror image for each such study to correct the

variance. In addition, a small studies analysis using cumulative meta-analysis was used to calculate the mean effect as each study was added, starting with those with the largest sample sizes. This analysis determines whether the mean effect size estimate has stabilized with the larger studies and does not shift when smaller studies are added (see Borenstein et al., 2009). Finally, a mixed-effects subgroup analysis tested whether published and unpublished studies differed in their mean effect size.

Moderator analyses. We present subgroup analyses and meta-regressions to examine whether moderators accounted for variability among effect sizes (using each effect size as a separate sample). For each subgroup analysis, we present the overall mean and tau for each subgroup. Within each paradigm, we first examined the effect sizes as moderated by the theory-relevant, a priori variables (i.e., publication year, participant sex, leader domain, leader status, participant nationality, and percentage of female managers) and then as moderated by the other, exploratory variables. In each paradigm, all coded variables were tested as single predictors. However, although the results for all a priori variables are presented for each paradigm, only exploratory variables that produced significant moderation as single predictors are reported.

The subgroup analyses used mixed-effects models because these subgroups involve specific grouping (such as males and females) that are fixed across studies (Borenstein et al., 2009; Lipsey & Wilson, 2001). These mixed models consisted of a random-effects model within subgroups and a fixed-effect model across subgroups, with appropriate inverse variance weights (Borenstein et al., 2009). Meta-regressions were calculated as random-effects models, with appropriate inverse variance weights (Borenstein et al., 2009). These calculations were simple meta-regressions for each centered continuous moderator (e.g., year of publication) and a multiple meta-regression for the moderators that were individually significant in the subgroup analyses or simple meta-regressions. The categorical moderators were recoded into two groups for entry into each multiple meta-regression based on maximizing the differences between the subgroup categories, as determined by the single-variable moderator analyses. The random- and mixed-effects models were calculated using the method of moments (Borenstein et al., 2009).

Results

Think Manager–Think Male Paradigm

Mean and distribution of effect sizes. Table 1 lists the 40 studies with their characteristics and 51 effect sizes. A more masculine stereotype is indicated by (a) a greater men–leaders similarity, as indexed by a larger men–leaders ICC; and (b) a lesser women–leaders similarity, as indexed by a smaller women–leaders ICC. The weighted mean effect for the 51 men–leaders ICCs was .62 ($T = 0.26$; 95% CI [.57, .66]; 90% PI [.27, .82]). There was a large amount of variability within the effect sizes, $Q(50) = 321.65$, $p < .001$; $I^2 = 84.46$. The weighted mean effect for the 49 women–leaders ICCs was .25 ($T = 0.22$; 95% CI [.19, .32]; 90% PI [−.12, .56]). There was also a large amount of variability within these effect sizes, $Q(48) = 241.77$, $p < .001$; $I^2 = 80.15$. Thus, consistent with an overall think manager–think male effect, the men–leaders similarity was large and the women–leaders similarity was small. Although the variability in each of these two types

of effect sizes was large, as indicated by T and the confidence and prediction intervals, a high proportion of the variability reflected real differences, as indicated by I^2 .⁴

Publication bias. Analyses checked for potential biases in publication or our retrieval of studies for both the women–leaders similarity and the men–leaders similarity. Egger’s test of the plot’s asymmetry was not significant for either of the two sets of effect sizes, suggesting no asymmetry. For the men–leaders similarity, under the assumption that biases would hinder the publication of studies with small effects, the trim-and-fill procedure suggested that no studies be trimmed. For the women–leaders similarity, under the assumption that biases would hinder the publication of studies with large effects (because they would be contrary to the hypothesis of low similarity between women and leaders), the trim-and-fill procedure suggested that four studies with small effect sizes should be trimmed to make the plot more symmetric, increasing the mean effect size from .25 to .29. Computing these analyses with the effect size weights based on the number of participants rather than the number of items also revealed no significant asymmetry in the funnel plots, and no studies were trimmed. In addition, using either the number of items or the number of participants to order the data, cumulative meta-analyses from large to small studies showed very little movement of the effect size with the addition of small studies. Finally, a mixed-effects subgroup analysis comparing published and unpublished studies yielded no difference for the women–leaders similarity, $Q_B(1) = 0.28$, $p = .60$, or the men–leaders similarity, $Q_B(1) = 1.00$, $p = .32$. Thus, overall, there appears to be little publication bias, and the bias that may exist would only slightly increase the women–leaders similarity.

Analyses for each moderator. These analyses report the impact of each moderator on the women–leaders similarity and the men–leaders similarity, as shown in Table 4 for the subgroup analyses and Table 5 for the simple meta-regressions. Models are presented for both women–leaders and men–leaders effect sizes for each theory-relevant variable, but they are presented for other exploratory variables only when the model yielded a p value of .05 or less for either type of similarity.

Publication year (ranging from 1973 to 2010) was marginally related to the women–leaders similarity, with earlier years associated with a weaker women–leaders similarity, but was not significantly related to the men–leaders similarity. Male (vs. female) participants were associated with a weaker women–leaders similarity, but this variable was not significantly related to the men–leaders similarity. With participant samples not divided by sex, greater percentages of male participants were associated with a marginally weaker women–leaders similarity but not significantly related to the men–leaders similarity.⁵

High-status (vs. moderate-status) leaders were associated with a stronger men–leaders similarity but not significantly related to the women–leaders similarity. Eastern (vs. Western) participant nationalities were associated with a marginally weaker women–leaders similarity but not significantly related to the men–leaders similarity. Smaller percentages of female managers in participants’ nations were not significantly related to the women–leaders or men–leaders similarity.

Among the exploratory moderators, older participant age was associated with a stronger women–leaders similarity but not significantly related to the men–leaders similarity. Greater percent-

ages of male authors were associated with a weaker women–leaders similarity but not significantly related to the men–leaders similarity.

Multiple meta-regression analyses. Given some confounding between the predictors, it is important to examine each moderator controlled for the effects of the other moderators. Table 6 shows models that regressed both sets of effect sizes onto the predictors that were at least marginally significant in any of the subgroup or simple meta-regression models. However, this analysis omitted participant sex because it was created by splitting studies’ participant samples. In the resulting model, the women–leaders similarity was stronger in later publication years, with a lower percentage of male participants, and with older participants. The men–leaders similarity was stronger for higher status leaders.

Agency–Communion Paradigm

Mean and distribution of effect sizes. Table 2 lists the 22 studies with their characteristics and 48 effect sizes. Larger g s indicate a more masculine stereotype, as defined by the agency minus communion difference. One sample (Powell & Kido, 1994; ratings of “good manager”) was removed from further analyses as an outlier ($g = -1.18$). The weighted mean effect for the 39 remaining samples (merging the data within each of the three studies that used within-subjects designs) was $g = 1.55$ ($T = 0.55$; 95% CI [1.36, 1.75]; 90% PI [0.61, 2.49]). Thus, the overall effect was strongly in the masculine direction, with participants rating leader groups (e.g., managers) as higher in agentic than communal traits, with the lower bounds of the confidence and prediction intervals remaining above zero. Although there was a large amount of variability in the effect sizes, $Q(38) = 615.79$, $p < .001$, I^2 was 93.83, showing that a high proportion of the variability reflected real differences, not random error.⁶

Publication bias. The funnel plot of the effect sizes plotted by the standard error was asymmetric by Egger’s test of asymmetry, with smaller studies clustering to the right (masculine direction) of the mean effect size. The trim-and-fill procedure suggested that 14 studies with large effect sizes should be trimmed to make the plot more symmetric, decreasing the mean effect size from 1.55 to 1.15. A cumulative meta-analysis from large to small studies indicated very little change in the overall effect when the smallest studies

⁴ We also recomputed the analyses using the number of participants as the weight with generally similar results. The overall effects and associated statistics were nearly identical, although the Q and I^2 were larger for both the women–leaders and men–leaders similarities. Subgroup analyses and meta-regressions produced findings similar to those obtained with item n used to compute the weights.

⁵ Schein (2001; Schein, Mueller, & Jacobson, 1989) maintained that the think manager–think male effect has decreased over time only for female participants. However, although the women–leaders similarity was weaker for female than male participants and increased over time, there was no evidence of greater increase for female than male participants.

⁶ The weighted mean effect including the outlier was 1.49 ($T = 0.64$; 95% CI [1.27, 1.71]; 90% PI [0.40, 2.58]). $Q(39) = 835.88$, $p < .001$; $I^2 = 95.33$. We also computed the same moderator analyses including the outlier. The effects were similar to those reported here, although the leader domain model was only marginal and the models for percentage of male participants, percentage of male authors, and research group were nonsignificant.

Table 4
Subgroup Analyses for the Think Manager–Think Male Paradigm

Variable and class	Women–leaders similarity					Men–leaders similarity				
	Q_B	p	k	ICC	T	Q_B	p	k	ICC	T
Participant sex	30.38	<.001				1.43	.23			
Male			47	.11	0.20			48	.63	0.26
Female			47	.37	0.24			49	.58	0.27
Leader status	0.82	.37				8.72	.003			
Moderate			46	.26	0.23			48	.60	0.22
High			3	.13	0.00			3	.82	0.48
Participant nationality	2.88	.09				0.95	.33			
Western			42	.27	0.22			44	.60	0.24
Eastern			6	.09	0.18			6	.68	0.38

Note. Q_B = between-classes effect with degrees of freedom equal to the number of moderator levels minus one; p = probability; k = number of samples; ICC = mean weighted effect size represented by the intraclass correlation coefficient; T = tau, estimated standard deviation of the true effect sizes.

were included. Finally, a mixed-effects subgroup analysis comparing published and unpublished studies (albeit limited by the small number of unpublished studies) indicated that the mean effect was marginally larger for published studies ($g = 1.59, T = 0.56, k = 37$) than unpublished studies ($g = 0.86, T = 0.00, k = 2$), $Q_B = 2.91, p = .09$. Thus, the impact of publication bias was not trivial; nevertheless, the finding that leader stereotypes were more agentic than communal remains valid.

Analyses for each moderator. Table 7 presents the subgroup analyses, and Table 8 presents the simple meta-regression models (left columns). Moderation by participant nationality was not tested because there were only two non-Western samples. Among the a priori moderators, publication year (ranging from 1979 to 2007) was significant, with earlier years associated with larger agency–communion differences. Greater percentages of male participants were associated with larger differences, although dividing the sample by participant sex (leaving only 25 of 47 reports) did

not yield a significant model. Leader domains that were managerial or political were associated with larger differences than the educational domain, but leader status did not significantly moderate the effect. Percentage of female managers also did not significantly moderate the difference. Among the exploratory moderators, the originators’ (i.e., Powell or Butterfield) research group (vs. others) was associated with larger differences, as was the originators’ stereotype measure (vs. others).

Multiple meta-regression analysis. Table 8 (right columns) shows a model that regressed the agency–communion differences onto the variables that were significant predictors in the subgroup or simple meta-regression models. In this model, the agency–communion difference was larger for managerial and political (vs. educational) domains and with the originators’ stereotype measure and marginally larger in earlier years.

Masculinity–Femininity Paradigm

Mean and distribution of effect sizes. Table 3 lists the seven studies with their characteristics and 101 effect sizes. Larger g s indicate a more masculine stereotype in relation to the 0.00 that denotes the androgynous midpoint of the scale. If we regard all of the occupations within each study as separate samples, nine samples were outliers. Above the mean (i.e., masculine direction), the outlier occupations were company president, U.S. Supreme Court justice, university president, boat captain, park manager, and orchestra conductor. Below the mean (i.e., feminine direction), the outlier occupations were three instances of head librarian. All of these effect sizes were retained in the analyses because their large distances from the mean were due to the understandable tendency for very male-dominated or female-dominated managerial occupations to yield extreme means and small standard deviations.

The weighted mean effect of the seven studies, produced by first averaging across the ratings of different leadership roles within each study was $g = 0.94 (T = 0.51; 95\% CI [0.56, 1.32]; 90\% PI [-0.15, 2.03])$. Thus, the overall effect is strongly in the masculine direction, with participants rating occupations entailing leadership as quite masculine. There was a large amount of variability in the effect sizes, $Q(6) = 223.09, p < .001$. Nevertheless, I^2 was 97.31,

Table 5
Simple Meta-Regressions for the Think Manager–Think Male Paradigm

Predictor	k	b	β	p
Year of publication				
Women–leaders similarity	49	0.01	0.22	.09
Men–leaders similarity	51	0.00	0.04	.77
% Male participants				
Women–leaders similarity	49	–0.00	–0.22	.09
Men–leaders similarity	51	0.00	0.06	.66
% Female managers				
Women–leaders similarity	48	0.00	0.18	.18
Men–leaders similarity	50	–0.00	–0.16	.27
Participant age				
Women–leaders similarity	49	0.01	0.28	.03
Men–leaders similarity	51	–0.00	–0.04	.75
% Male authors				
Women–leaders similarity	49	–0.00	–0.29	.02
Men–leaders similarity	51	0.00	0.08	.56

Note. Models are random-effects weighted linear regressions calculated with weights equal to the reciprocal of the variance for each effect size plus a random-effects component. k = number of samples; p = probability; b = unstandardized regression coefficient; β = standardized regression coefficient.

Table 6
Multiple Meta-Regressions for the Think Manager–Think Male Paradigm

Variable and class	Women–leaders similarity			Men–leaders similarity		
	<i>b</i>	β	<i>p</i>	<i>b</i>	β	<i>p</i>
Year of publication	0.01	0.47	<.001	–0.00	–0.05	.75
% Male participants	–0.00	–0.27	.03	0.00	0.07	.62
Leader status	–0.11	–0.10	.37	0.49	0.43	.002
Participant nationality	–0.11	–0.13	.27	0.17	0.19	.18
Participant age	0.01	0.47	.001	0.00	0.02	.90
% Male authors	–0.00	–0.13	.31	–0.00	–0.02	.91

Note. Models are random-effects weighted linear regressions calculated with weights equal to the reciprocal of the variance for each effect size plus a random-effects component. *b* = unstandardized regression coefficient; β = standardized regression coefficient; *p* = probability. *k* = 48 for women–leaders similarity and *k* = 50 for men–leaders similarity. Codes were as follows: leader status: 1 = high, 0 = moderate; participant nationality: 1 = Eastern, 0 = Western.

showing that a high proportion of the variability reflected real differences, not random error.⁷

Publication bias. It is unclear how publication bias would operate for this paradigm because the participants rated a heterogeneous set of occupations and the researchers did not compare managerial occupations to other types of occupations. Thus, there would be no bias against publication depending on whether managerial occupations were rated as more or less masculine. Nonetheless, we analyzed the distribution of effect sizes for potential biases in publication or study retrieval. With the funnel plot of the effect sizes plotted by the standard error with each occupation represented separately, Egger’s test was significant, but the trim-and-fill procedure did not suggest that any effect sizes be trimmed. When we first averaged the occupations within each study, Egger’s test was not significant, and the trim-and-fill method did not suggest that any studies be trimmed. A cumulative meta-analysis

from large to small studies indicated very little change in the overall effect when the smallest study was included. Published and unpublished studies could not be compared because all studies were published. Overall, there is thus little evidence of publication bias.

Analyses for each moderator. Table 9 presents the subgroup analyses, and Table 10 presents the simple meta-regression models (left columns). Limited sample variability on many study characteristics precluded testing all but a few as potential moderators. For example, there were no non-Western samples, all but one sample had young (i.e., student) participants, and all studies used the same dependent measure.

Among the a priori moderators, publication year (ranging from 1975 to 2005) was significant, with earlier years associated with stronger masculinity. Greater percentages of male participants were also associated with stronger masculinity, although dividing the samples by participant sex (leaving only 41 of 101 effect sizes) did not yield a significant model. In terms of leader domain, other leader roles (boat captain, farm manager, park manager) and judicial roles were associated with stronger masculinity, followed by political, arts, and business roles, and finally by educational roles. High-status (vs. moderate-status) leaders were associated with stronger masculinity. Smaller percentages of female managers in participants’ nations were associated with marginally stronger masculinity. Among the exploratory moderators, smaller percentages of male authors were associated with stronger masculinity.

Table 7
Subgroup Analyses for the Agency–Communion Paradigm

Variable and class	Q_B	<i>p</i>	<i>k</i>	<i>g</i>	<i>T</i>
Participant sex	0.00	.99			
Male			25	1.20	0.33
Female			25	1.20	0.52
Leader domain	7.69	.02			
Educational			6	0.75 _b	0.33
Political			15	1.48 _a	0.74
Managerial			26	1.51 _a	0.54
Leader status	0.43	.51			
Moderate			39	1.43	0.57
High			8	1.27	0.60
Research group	10.13	.001			
Originator			18	1.68	0.64
Other			29	1.17	0.37
Stereotype measure	7.48	.006			
Originator’s			37	1.55	0.64
Other			10	0.95	0.48

Note. Q_B = between-classes effect with degrees of freedom equal to the number of moderator levels minus one; *p* = probability; *k* = number of samples; *d* = mean weighted effect size; *T* = tau, estimated standard deviation of the true effect sizes. Leader domain *d*s not sharing subscripts are significantly different from each other at *p* < .05 when entered into a mixed-effects model.

⁷ Removing the nine outlying effect sizes still resulted in a significantly masculine mean weighted effect size of 0.82 (*T* = 0.19; 95% CI [0.67, 0.97]; 90% PI [0.41, 1.23]), $Q(6)$ = 35.44, *p* < .001; I^2 = 83.07. The moderator analyses were similar to those reported here, although the models for leader status and percentage of female managers were nonsignificant. In addition, we computed the effect sizes based on a mean metric, using the *M* on the 1–7 scale as the effect size. We estimated the standard error of each effect from the standard deviation divided by the square root of the sample size, yielding a weight of one divided by the squared standard error (see Lipsey & Wilson, 2001). Using this metric, the mean-weighted effect size was masculine (*M* = 4.91; *T* = 0.58; 95% CI [4.48, 5.35]; 90% PI [3.65, 6.17]), $Q(6)$ = 4647.70, *p* < .001; I^2 = 99.87. The moderator analyses were also very similar using this metric.

Table 8
Meta-Regressions for the Agency–Communion Paradigm

Predictor	<i>k</i>	Simple meta-regressions			Multiple meta-regression		
		<i>b</i>	β	<i>p</i>	<i>b</i>	β	<i>p</i>
Year of publication	47	−0.04	−0.38	.004	−0.02	−0.26	.08
% Male participants	47	0.01	0.27	.05	0.01	0.11	.41
Leader domain	47				0.91	0.43	.004
% Female managers	47	−0.01	−0.09	.47			
Research group	47				−0.01	−0.01	.97
Stereotype measure	47				0.54	0.32	.03

Note. Models are random-effects weighted linear regressions calculated with weights equal to the reciprocal of the variance for each effect size plus a random-effects component. Blank cells indicate data that are not applicable to that analysis. *k* = number of samples; *b* = unstandardized regression coefficient; β = standardized regression coefficient; *p* = probability. Codings were as follows: leader domain: 1 = managerial and political leaders, 0 = educational leaders; research group: 1 = originator, 0 = other; stereotype measure: 1 = originator's, 0 = other.

Multiple meta-regression analysis. Table 10 (right columns) shows a multiple meta-regression model that regressed the masculinity–femininity effect sizes onto the variables that were at least marginally significant predictors in the subgroup and simple meta-regression models. In this model, leader occupations were more masculine in earlier publication years, in judicial or other domains, and with high-status roles.

Discussion

All three paradigms showed that stereotypes of leaders are decidedly masculine. Specifically, people viewed leaders as quite similar to men but not very similar to women, as more agentic than communal, and as more masculine than feminine. These findings are minimally invalidated by publication bias. Only the agency–communion findings appeared somewhat susceptible to exaggeration of the masculinity of the leader stereotype, but this weak bias

does not compromise the strong overall masculinity of the leader stereotype.

In addition to this large and highly robust masculinity effect, our analyses revealed considerable variability in the extent to which stereotypes of leaders are masculine versus more androgynous, although the rarity of negative effect sizes in the agency–communion and masculinity–femininity paradigms indicates that conceptions of leadership hardly ever strayed into feminine territory. This moderation for the most part was consistent with our predictions. To examine the extent to which the findings supported this theory, we briefly review and discuss them across the three paradigms.

A Priori Moderators

Year of publication. Evidence of the increasing androgyny of the leader stereotype over publication years emerged in all three paradigms, including in the multiple regression equations that controlled for other moderator variables (albeit as a marginal effect in the agency–communion multiple meta-regression). In the think manager–think male paradigm, the increasing similarity of leaders and women that emerged in our analyses could be due to change in women or leader stereotypes or both. Because participants rated only leaders (and not men or women) in the agency–communion and the masculinity–femininity paradigms, the effects of moderators on these effect sizes could be due only to differing beliefs about leaders. Given that all three paradigms showed increasing androgyny of leadership over time and that previous research indicates little change in stereotypes of women toward greater masculinity (see Lueptow et al., 2001), the most appropriate conclusion appears to be that the popular conception of leadership has changed over time. In addition, the think manager–think male paradigm indicated that change over time took the form of increasing similarity between leaders and women without change in the similarity between leaders and men. Thus, our conclusion is that leadership now, more than in the past, appears to incorporate more feminine relational qualities, such as sensitivity, warmth, and understanding, thus adding them to the masculine dominance and strength qualities traditionally associated with leadership.

Table 9
Subgroup Analyses for the Masculinity–Femininity Paradigm

Variable and class	Q_B	<i>p</i>	<i>k</i>	<i>g</i>	<i>T</i>
Participant sex	2.53	.11			
Male			41	0.92	0.73
Female			41	0.67	0.70
Leader domain	18.81	.002			
Education			16	0.49 _a	1.21
Business			48	0.84 _a	1.02
Arts			8	1.07 _{a,b}	0.77
Political			8	1.08 _{a,b}	0.37
Judicial			8	1.80 _{b,c}	1.87
Other ^a			13	1.93 _c	0.85
Leader status	8.36	.004			
Moderate			89	0.92	0.96
High			12	1.91	1.97

Note. Q_B = between classes effect with degrees of freedom equal to the number of moderator levels minus one; *p* = probability; *k* = number of samples; *d* = mean weighted effect size; *T* = tau, estimated standard deviation of the true effect sizes. Leader domain *d*s not sharing subscripts are significantly different from each other at *p* < .05 when entered into a mixed-effects model.

^a Other occupations were boat captain, farm manager, park manager.

Table 10
Meta-Regressions for the Masculinity–Femininity Paradigm

Predictor	<i>k</i>	Simple meta-regressions			Multiple meta-regression		
		<i>b</i>	β	<i>p</i>	<i>b</i>	β	<i>p</i>
Year of publication	101	–0.06	–0.42	<.001	–0.05	–0.39	<.001
% Male participants	101	0.08	0.22	.01	–0.01	–0.02	.85
Leader domain	101				1.17	0.36	<.001
Leader status	101				1.20	0.30	<.001
% Female managers	101	–0.02	–0.16	.06	0.00	0.00	.98
% Male authors	101	–0.01	–0.19	.02	–0.00	–0.02	.76

Note. Models are random-effects weighted linear regressions calculated with weights equal to the reciprocal of the variance for each effect size plus a random-effects component. Blank cells indicate data that were not applicable to that analysis. *k* = number of samples; *b* = unstandardized regression coefficient; β = standardized regression coefficient; *p* = probability. Codings were as follows: leader domain: 1 = judicial and other, 0 = education, business, arts, and political; leader status: 1 = high, 0 = moderate.

Consistent with existing research (Beaman et al., 2009; Dasgupta & Asgari, 2004), this change may reflect people's increasing exposure to women among organizational managers and political leaders. Yet this change may also reflect the increasing failure of traditionally masculine, command-and-control styles of leadership to meet the complex challenges involved in contemporary management and political leadership (Kanter, 1997; Lipman-Blumen, 2000). If so, men leaders may be under pressure to enlarge their behavioral repertoire to include a greater measure of culturally feminine relational skills (Eagly & Carli, 2007). Men appear to be succeeding, given that they are not perceived as any less similar to leaders than they were in the past, according to our analysis that separated the role incongruity of men and leaders from that of women and leaders in the think manager–think male paradigm. These findings of increased femininity of leadership without decreased masculinity suggest that women leaders would be well advised to retain elements of a masculine leadership style to avoid a mismatch with leader roles, even if they now have greater flexibility to incorporate elements of a feminine leadership style.

Participant sex. An additional prediction was that men would have a more masculine construal of leadership than women. Only the think manager–think male paradigm allowed all of the findings to be separated or identified by participant sex, and the resulting analyses yielded smaller women–leaders correlations for male than female participants. Although this finding was not replicated in the other paradigms, a related analysis that did not rely on separating female and male participant samples showed that a greater proportion of male participants yielded marginally smaller women–leaders correlations in the think manager–think male paradigm as well as significantly larger masculine leader stereotypes in both the agency–communion and the masculinity–femininity paradigms. In sum, evidence that men construe leadership as more masculine than women is present in all three paradigms and strongest for men's stereotyping of leaders as not very similar to women.

This finding is consistent with meta-analytic research showing that men, but not women, devalued women's leadership in experimental studies that held constant all leader characteristics other than their sex (see Eagly et al., 1992). Also, men's failure to accord women many of the qualities of leaders is consistent with their greater social dominance (e.g., Pratto, Sidanius, & Levin, 2006)

and sexism (e.g., Glick & Fiske, 1996). The implications of men's reservations about women's leadership abilities are important. Because men are the more typical holders of decision-making power in organizations, their beliefs that women lack the qualities of leaders can limit women's access to positions of authority and slow their progress into leadership positions.

Leader status. Consistent with the rarity of women in top positions, higher status leadership positions were expected to have a more masculine stereotype. Both the think manager–think male and the masculinity–femininity paradigms found greater masculinity of high-status leadership positions (e.g., upper-level managers) than moderate-status positions (e.g., middle-level managers or managers in general). The think manager–think male studies suggested that this effect appears mainly because higher status leaders are stereotypically more similar to men rather than less similar to women. Although these effects remained significant in the multiple meta-regressions, they should be interpreted cautiously because the studies offered relatively few instances of especially high-status leader roles. In addition, the effects may be constrained to certain types of high-status roles, as the agency–communion paradigm, which contained a greater number of political high-status leadership positions than the other two paradigms, did not yield this moderation.

According to role congruity theory, women entering higher status positions should encounter more prejudice because of the greater stereotypical mismatch between women and leadership. Our think manager–think male findings suggest instead that men gain greater congruity as status increases, thereby contributing to their increasing numerical dominance at higher levels. Yet women who do manage to be successful in very high-status roles may be perceived as highly competent, because people assume a double standard whereby such women had to overcome especially difficult challenges (Rosette & Tost, 2010).

Other a priori variables. Our ability to test the remaining a priori moderators—leader domain, nationality of participants, and percentage of female managers—was compromised by the limitations of the available studies. Because the three paradigms used different types of leader groups, the effects of leader domain were not comparable across the paradigms, and the think manager–think male paradigm did not present sufficient variability in domain to allow a test of this variable. In the agency–communion and

masculinity–femininity paradigms, educational positions were the least masculine, consistent with the female domination of the education administrator job category (63% women; U.S. Department of Labor, 2010b). In the masculinity–femininity paradigm, the judicial domain and the category of “other” leaders were the most masculine. Judicial occupations (supreme court justice and federal judge) are highly male dominated: Only four women have ever served as Supreme Court Justices, and only 9% of federal judges serving since 1789 have been women, including 30% of currently active sitting judges (U.S. Courts, 2011). However, the “other” leader domain, consisting of boat captain, farm manager, and park manager, deserves comment. These heterogeneous roles are likely also male dominated, as men constitute 82% of farm, ranch, and other agricultural managers and 79% of people in farming, fishing, and forestry occupations in general (U.S. Department of Labor, 2010b). In addition, these are outdoor occupations that often require physical strength as well as leadership abilities, which likely increased their perceived masculinity (Cejka & Eagly, 1999). Future research should systematically investigate stereotypes in leader domains that vary in the representation of women and other attributes.

Comparisons of effects across nations were limited by the overrepresentation of the United States and the rarity of studies from non-Western nations. Nevertheless, consistent with national data on the status of women (e.g., Hausmann et al., 2009) and on attitudes toward women as leaders (P. Norris & Inglehart, 2001), participants from Eastern nations showed a marginally weaker women–leaders similarity than participants from Western nations (although this effect was nonsignificant in the multiple regression). The percentage of female managers in participants’ nations was a more informative variable, which was associated with marginally weaker masculinity in the masculinity–femininity paradigm (although a nonsignificant predictor in the multiple meta-regression). Yet this variable was not significantly related to masculinity in the think manager–think male and agency–communion paradigms. A more systematic global representation of nations would provide a better test of the impact of women in management on leader stereotypes.

Exploratory Moderators

The exploratory variables yielded a few findings of interest. In the think manager–think male paradigm, older participants, who were a mix of managerial and nonmanagerial employees, showed a stronger women–leaders similarity than younger participants, who were business or other undergraduate students. Although these results support the conclusion that students and others with little workplace experience hold more masculine stereotypes of leaders, the nonreplication in the agency–communion paradigm renders these findings ambiguous.

The originators of the agency–communion paradigm produced more masculine stereotypes, although this effect was no longer significant in the multiple regression and not replicated in the other paradigms. The originator’s measure may have produced greater masculinity in the agency–communion paradigm, because this measure, the Bem Sex Role Inventory, had better psychometric properties than many of the other measures, which were often more casually constructed without a factor or item analyses. Yet the rarity of reporting measures’ internal consistencies in the

primary studies precluded a statistical test of the idea that the Bem Sex Role Inventory provided more coherent measures of agency and communion. The percentage of male authors had inconsistent effects across the paradigms and was not a significant predictor the multiple meta-regressions. In general, the lack of consistent moderation of these paradigms by variables related to the authors of the primary studies and to stereotype measures used in the studies indicates that the effects revealed in this meta-analysis are not limited to certain research groups or dependent measures.

Strengths and Limitations of the Paradigms

Our three-part meta-analysis demonstrates the advantages of examining leader stereotypes from the perspective of differing research paradigms. The fact that the paradigms conceptually replicate one another lends confidence to results that are similar across the paradigms. However, each paradigm has its own strengths and limitations.

The think manager–think male paradigm has the advantage of comparing the cultural construal of leadership to that of men and women separately, thus allowing for leadership to be seen as similar to men, women, both, or neither. The ICC also provides a direct measure of the similarity between female and male stereotypes and leader stereotypes, yielding a clear-cut test of role congruity theory (Eagly & Karau, 2002). The downside of this method is that changes in intraclass correlations associated with moderators such as publication year do not indicate whether gender or leader stereotypes (or both) have changed.

The agency–communion paradigm, on the other hand, assesses only leader stereotypes. The scales used in the paradigm consist of agentic and communal traits and thus assess the perceived masculinity of leadership relative to its perceived femininity, given that agency is stereotypically masculine and communion is stereotypically feminine (Wood & Eagly, 2010). Any changes in the content of gender stereotypes are not taken into account in this assessment.

The masculinity–femininity paradigm is the most limited of the paradigms because its bipolar measure does not allow for leader stereotypes to be both masculine and feminine. In addition, the fact that the effect sizes within most samples were dependent is a limitation in relation to the moderator analyses, which treated these effect sizes as independent to take account of the wide variation in the types of leader roles but lessened the accuracy of these analyses. However, because participants rated a wide variety of occupations in most samples, only some of which involved leadership, the method mirrors natural settings in which people observe many different types of occupational roles.

A consideration for all three paradigms is the extent to which participants’ responses might have been contaminated by self-presentational pressures or studies’ demand characteristics. Fortunately, the think manager–think male paradigm is relatively subtle, because with very few exceptions, participants rated only women, men, or leaders in a between-subjects design. Participants could not have discerned that the study had to do with the correspondence of gender and leader stereotypes. In contrast, in the agency–communion studies, participants rated leaders on masculine and feminine attributes, and in the masculinity–femininity studies, participants rated leaders on an explicit masculinity–femininity scale. These more obvious de-

signs might foster self-presentational pressures to appear tolerant of female leaders by downplaying the masculinity of leader roles. Yet such pressures would have been mitigated in the masculinity–femininity studies by the presentation of a wide range of occupations within which only relatively few pertained to leadership. Nevertheless, future research should include more subtle measures that assess implicit associations between gender and leadership. In one study that included implicit measures, Rudman and Kilanski (2000) found that participants, especially men, more quickly paired male names with authority roles and female names with subordinate roles and were quicker to respond to positive words after seeing a male than a female authority figure (see also Beaman et al., 2009; Dasgupta & Asgari, 2004). Although these findings are consistent with the masculine construal of leadership found in our meta-analysis, additional research incorporating implicit measures would be informative.

The current meta-analysis also highlights other areas for future research that are not well addressed by the current primary studies. For example, more studies in Eastern nations would help to address questions about the masculinity of leadership roles across cultures. Also, although research has examined role incongruity based on race (Sy et al., 2010), it has not addressed *intersectionality*, whereby the role incongruity of women in relation to leadership may depend on other group memberships (e.g., race, ethnicity, sexual orientation) as well as their gender (Cole, 2009). In addition, expanding the domain of research beyond managerial leadership positions would be useful in understanding the contextual nature of stereotypes of leadership. More primary research on the impact of leader status is also needed, and greater variation of research designs and measures would be appropriate. Finally, additional meta-analyses should assess future changes and contextual variation in the cultural construal of leadership.

Implications of the Masculinity of Leadership

This meta-analysis establishes that the masculinity of the cultural stereotype of leadership is a large effect that is robust across variation in many aspects of leaders' social contexts. According to role congruity theory (Eagly & Karau, 2002), this representation of leadership poses a problem for women because female stereotypes do not match expectations for leaders. Even women who possess outstanding qualifications for leadership may have the burden of overcoming preconceptions that they are not well equipped to lead. Not only do the descriptive aspects of stereotyping make it difficult for women to gain access to leader roles, but the prescriptive aspects of stereotyping could produce conflicting expectations concerning how female leaders should behave—that is, that they should be agentic to fulfill the leader role but communal to fulfill the female gender role. Thus, although women leaders may be seen as competent, women who disregard their communal gender role are often disliked and therefore still the recipients of prejudice even though they fulfill their leader role (Rudman & Glick, 1999, 2001).

These cross-pressures are likely to produce a double bind that discourages women from presenting themselves in ways that others consider too masculine or too feminine (Eagly & Carli, 2007), constraining their behavior to an androgynous middle

ground. The tendencies for women leaders, compared with men leaders, to manifest a somewhat more transformational leadership style and to wield rewards as incentives (Eagly, Johannesen-Schmidt, & van Engen, 2003), which are not distinctively masculine or feminine behaviors, may reflect one way for women to satisfy both their leader role and their gender role. Because some of the elements of transformational leadership, especially the mentoring and empowering of subordinates, appear to be aligned more with the feminine than the masculine gender role, findings suggest that transformational leadership is in general androgynous or even slightly feminine (Duehr & Bono, 2006; Hackman, Furniss, Hills, & Paterson, 1992). Given the demonstrated effectiveness of these aspects of leadership style (Judge & Piccolo, 2004), the relatively androgynous behavioral repertoire that is common in women leaders should ironically facilitate their success in leader roles. Thus, consistent with this meta-analysis, women's inclination toward an androgynous leadership style should often help them fulfill both their gender role and their leader role, given that the conception of leadership has incorporated more feminine qualities in more recent years, in moderate-status leader roles, in certain occupational domains, and in the minds of women.

Although role congruity theory describes how the masculinity of leadership influences prejudice toward women leaders, other research suggests that these stereotypes may also affect women themselves, sometimes decreasing their performance as leaders and their identification with leadership. Evidence of such outcomes has emerged in research on stereotype threat. Specifically, when women were reminded of general female stereotypes by watching gender-stereotypical (vs. neutral) commercials, they were less likely to express interest in being a leader on a subsequent group task unless they were also told that research had found no sex differences in leadership (Davies, Spencer, & Steele, 2005). Nonetheless, activation of a masculine leader stereotype can also cause women to react against the stereotype by showing greater confidence and better leader performance (Hoyt & Blascovich, 2007; Hoyt, Johnson, Murphy, & Skinnell, 2010). However, positive responses of this type tended to change to lower self-appraisals and poorer leadership performance for women who lacked confidence in their capability as leaders (Hoyt & Blascovich, 2007) or who were exposed to a double threat from, for example, stereotype activation combined with solo status in an otherwise all-male group (Hoyt et al., 2010).

In conclusion, this meta-analysis establishes a strong and robust tendency for leadership to be viewed as culturally masculine across three paradigms that use different methods. The implications of the masculinity of leader roles for prejudice against female leaders are straightforward: Men fit cultural construals of leadership better than women do and thus have better access to leader roles and face fewer challenges in becoming successful in them. Despite some overall change toward more androgynous beliefs about leadership, stereotyping continues to contribute to the labyrinthine challenges that women encounter in attaining roles that yield substantial power and authority. Given the strongly masculine cultural stereotype of leadership quantified by this meta-analysis, these challenges are likely to continue for some time to come.

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