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# Where are the women deans? The importance of gender bias and self-selection processes for the deanship ambition of female and male professors

Levke Henningsen<sup>1</sup>  | Alice H. Eagly<sup>2</sup> | Klaus Jonas<sup>1</sup>

<sup>1</sup>Department of Psychology, Social and Business Psychology, University of Zurich, Zurich, Switzerland

<sup>2</sup>Department of Psychology, Northwestern University, Evanston, IL, USA

## Correspondence

Levke Henningsen, Department of Psychology, Social and Business Psychology, University of Zurich, Binzmuehlestrasse 14/Box 13, 8050 Zurich, Switzerland.  
Email: l.henningsen@psychologie.uzh.ch

## Abstract

The study addressed the underrepresentation of women in university leadership by focusing on the middle management role of dean. This research set forth two processes that may affect female and male professors' ambition to become a dean: (a) gender bias whereby stakeholders are more likely to recommend men than women for deanships, and (b) self-selection bias whereby men may find deanships more appealing than women do. A multisource, time-lagged study of 278 professors from Germany, Austria, and Switzerland found that both being recommended by stakeholders for a deanship and finding the position appealing related positively to deanship ambitions for female and male professors. In contrast to the gender bias perspective, female and male professors were equally likely to be recommended for deanships, with recommendations reflecting prior administrative leadership experience. Consistent with the self-selection perspective, female professors' perception of more women among deans and their greater endorsement of communal career goals (e.g., serving the community) related to the appeal of the position, which in turn related to their own ambition to become a dean. In contrast, male professors' endorsement of agentic career goals (e.g., receiving recognition) related to the appeal of deanships, which in turn related to their own ambition to become a dean. Overall, these findings suggest that policies to increase the number of women in university deanships should make salient the presence of other women in these roles and also the potential of these roles to fulfill communal career goals.

## 1 | INTRODUCTION

In many nations, institutions of higher education have made considerable progress toward gender equality in academic careers. Nevertheless, very little is known about the representation of women in midlevel administrative roles, such as deans, who have responsibility for managing an entire group of academic departments and institutes, known as a faculty. These roles are ordinarily a step

along the path to higher university management positions such as university headships, or presidencies, where women are now poorly represented: 19% at the top 200 universities in world rankings (Bothwell, 2020) and 14% at European doctorate-granting universities (European Commission, 2019).

Research on challenges to women's advancement in managerial hierarchies has typically addressed the private sector. Evidence has supported both discriminatory recruitment to

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managerial roles and self-selection that limits women's ambition to advance (e.g., Hogue & Lord, 2007; Lyness & Grotto, 2018). In contrast to this abundant research on women in business management, university management is understudied. Despite a few analyses of the role of university dean and its challenges (e.g., de Boer & Goedegebuure, 2009; Montez et al., 2003; Wolverson et al., 1999), we located only one empirical study that tested hypotheses concerning the causes of women's underrepresentation in this role (Lavigne, 2020). Therefore, to begin to rectify this lack of research, the present study investigates factors that may influence gender bias and self-selection, which, in turn, may affect professors' ambitions to become a dean.

As midlevel administrators, deans have gained recognition as important for universities' success. These midlevel managers "are not just implementers of organizational policies but play a key role in agenda setting, organizational strategy development and policy design" (de Boer & Goedegebuure, 2009, p. 2). Having more women in these positions can affect these policies and agendas, for example, by their stronger support for universities' diversity objectives (e.g., Williams et al., 2017). Yet, in universities in the Western European "DACH region," encompassing Germany, Austria, and Switzerland, which is the site of the current research, women are rarer as deans than tenured professors. For example, the respective dean and full professor percentages of women are 12.9 and 19.3 in Switzerland, 15.2 and 20.3 in Austria, and 12.2 and 18.0 in the German state of North Rhine Westphalia (Kortendiek et al., 2016; for deans, universities' website data, December 2017; for professors, European Commission, 2016). To promote the understanding of these disparities, we first describe the selection processes for deans.

In DACH countries, as elsewhere, deans are aptly described as "non-professional expert-leaders" (Backes-Gellner et al., 2018, p. 2), who rarely have managerial training but are experts in various academic disciplines. These individuals are professors who voluntarily occupy the position of dean, usually for a set term of 2–4 years (and can be re-elected). In most universities, selection for deanships follows an informal procedure. Typically, various stakeholders (search committee members, administrators, or faculty members) informally recommend suitable candidates, who may or may not agree to candidacy. An official faculty meeting then elects a professor for the position from the candidates who emerged. Therefore, key factors relevant to professors' deanship ambitions include whether they have received recommendations for the position (enabling stakeholder gender bias) and whether they perceive the position as appealing (enabling self-selection).

In line with this selection process, the present study draws from and extends role congruity theory (Eagly & Karau, 2002) as its overarching theoretical framework to explain female and male professors' ambition for deanships. According to this theory, the incongruity between the cultural understanding of leadership as predominantly masculine, or agentic, and the cultural stereotype of women as predominantly feminine, or communal, places women at a disadvantage in attaining leadership roles. In this framework, incongruity between gender and leader stereotypes can affect others'

perceptions of a woman's leadership potential as well as her own perceptions of fit with a leadership role (see also Heilman, 1983, 2012). This incongruity becomes more extreme the more agentic or culturally masculine the requirements of the leader role or the more communal or culturally feminine the image of a woman as a potential candidate for the role (e.g., Koenig et al., 2011).

To apply role incongruity theory to university managerial roles, the study took both gender discrimination by others and self-selection processes into account. Specifically, from a gender discriminatory perspective, the study proposes contextual influences that increase the agentic connotations of the dean role (e.g., its male dominance) or the communal connotations of female professors (e.g., domestic care responsibilities) and examines these influences' links with professors receiving recommendations for deanships. Simultaneously, from a self-selection perspective, the study proposes individual influences that increase professors' perceptions of the masculinity of the dean role (e.g., perceived male dominance) or increase professors' individual perception of fit with the dean role (e.g., according to their career goals) and examines these influences' links with the appeal of the deanship. The study thus considers, as precursors of professors' ambition to become a dean, both the receipt of recommendations for the deanship and the role's intrinsic appeal.

The study thereby yields novel theoretical and empirical insights concerning the processes that affect professors' ambition to attain administrative leadership. Ambition, which generally refers to the motivation to strive for promotion and recognition (Peters et al., 2013), is central to professors' transitions to administrative management, such as deanships, particularly because these transitions are voluntary. Although some studies focused on the lesser career ambition of women than men (e.g., van Vianen & Keizer, 1996), other research sought to reveal organizational practices and social norms that foster or suppress women's career ambition (Benschop et al., 2013). To further this effort, this study draws from role congruity theory (Eagly & Karau, 2002) to elucidate the social psychological mechanisms underlying the ambition of women and men to voluntarily undertake university managerial roles. As elaborated in the next sections, the study's theoretical model sets forth specific influences that should affect either stakeholders' gender bias or professors' self-selection, which in turn link to professors' ambition to become a dean. The study's findings offer insight concerning how universities can increase the representation of women in administrative leadership.

## 2 | GENDER BIAS IN RECOMMENDATION FOR DEANSHIP

Potential causes of stakeholder gender bias in deanship recommendation, which is our first influence on professors' ambition, follow from role congruity theory (Eagly & Karau, 2002), which indicates that prejudice against women's leadership potential arises from the incongruity between gender and leadership stereotypes. Gender stereotypes are general beliefs about the typical and desirable attributes of women and men, which emerge from people's

observations of women and men in their typical roles, especially women in societies' paid and unpaid caretaking roles and men in societies' higher status and leadership roles (Eagly et al., 2020; Eagly & Wood, 2012). People spontaneously infer traits that explain the usually role-bound behaviors they observe (Uleman et al., 2008), typically without giving much weight to situational pressures. Based on the observed behaviors of women and men in these typical roles, people infer that women are more other-oriented or communal (e.g., cooperative and warm), whereas men are more self-oriented or agentic (e.g., ambitious and competitive; Eagly et al., 2020; Hentschel et al., 2019). Because people in the same society tend to have similar observations, such beliefs are shared in the culture and become consensual (Eagly & Wood, 2012).

Leadership stereotypes arise, not only from the typical job requirements of these roles (e.g., to perform agentic behaviors; Luthans, 1988), but also from the typical gender of job holders (e.g., male dominance conveying agentic qualities; Cejka & Eagly, 1999). These culturally shared beliefs about women and leaders produce an incongruity between the attributes ascribed to women and the anticipated demands of successful leaders (Schein, 1973). As a consequence, women seem less qualified than men for leadership and are less likely to be considered for such roles. This finding is consistent with the results of two meta-analyses of simulation experiments that presented identical job applicants differing only in their gender (Davison & Burke, 2000; Koch et al., 2015). In general, pro-male bias was present for male-dominated positions, which included many leadership positions. Such findings are also congenial to expectation states theory (Berger et al., 1977), which argues that women's generally lower status, which follows from their lower position in societal hierarchies of wealth and power, conveys lesser skill and ability, which disadvantage them in relation to occupations that confer prestige and high earnings.

Of particular relevance for this research, a core assumption of role congruity theory is that the greater the incongruity between stereotypes of women and leaders, the greater the bias (Eagly & Karau, 2002). Therefore, characteristics that increase or make salient the masculinity of a leadership role (e.g., higher occupancy by men; Cheryan & Markus, 2020) or the femininity of women (e.g., their domestic care responsibilities; Grummell et al., 2009) can increase the prejudice against women as candidates for leader roles, which in this study would manifest as stakeholders being less likely to recommend women for deanships. To test these features of the theory, the next subsections propose three influences on receiving recommendations: women's representation among professors and administrators, professors' administrative leadership experience, and their domestic care responsibilities.

## 2.1 | Women's representation among professors and administrators

Women's underrepresentation among professors and administrators is a common feature of universities that should augment the

perceived masculinity of the deanship and thus limit women's likelihood of being recommended for the role. Consistent with role congruity theory (Eagly & Karau, 2002), a meta-analysis of the similarity of leader and gender stereotypes found that the perceived incongruity between women and leadership increased for higher status roles, where women were rarer (Koenig et al., 2011). This enhanced incongruity should intensify bias against selecting women for higher-level management positions.

Aside from this cultural incongruity of leaders and women, a scarcity of women in a social organization such a university faculty, in and of itself, would produce bias against selecting them for leadership. Specifically, according to the social identity theory of leadership, individuals who are more prototypical in a social context are more likely to emerge as leaders because they embody a group's identity, values, and interests. (Hogg, 2001). In support of this argument, a large study of 441 mainly U.S. firms from high-tech sectors examined the firms' archival personnel data to examine the relationship between the gender composition of the candidate pool and gender disparities in being invited for an interview. The results revealed that a predominance of the other gender among candidates for a position predicted hiring disadvantage for the poorly represented group (Campero & Fernandez, 2019).

In contrast to such evidence of pro-male bias in selection for male-dominated roles, Powell and Butterfield (1994) found preferential selection of women for promotion to executive positions in a large agency of the U.S. federal government. In addition, a U.S. panel study of archival data on business executives found that the women were promoted faster than the men and earned higher compensation (Gayle et al., 2012; but see Gupta et al., 2018). Similarly, in both a field study surveying employees and an experimental simulation study, Leslie et al. (2017) showed that the gender pay gap reversed among high potential, but not low potential, women, particularly in the presence of strong diversity goals. Female advantage has also emerged in the actual hiring of professors in STEM (science, technology, engineering, and mathematics) fields in U.S. research universities (National Research Council, 2010) and in a series of simulation experiments of STEM faculty hiring (Williams & Ceci, 2015), although this bias disappeared in these experiments when the women possessed weaker qualification than the men (Ceci & Williams, 2015).

Providing further evidence of bias findings' variability, the Koch et al. (2015) meta-analysis of hiring simulation experiments found that pro-male bias for male-dominated positions lessened or disappeared in many contexts. Specifically, this prejudice was reduced when the raters were women or professionals with experience in personnel decision making, or when the candidates' application materials contained more information or clear information on job competence (see also Eaton et al., 2020).

As shown by our brief review, the evidence concerning male advantage in attaining male-dominated positions is decidedly mixed. The emergence of female advantage in some contexts raises the issue of whether responsible and thorough personnel selection procedures along with governmental and public pressures to end discrimination may have lessened selection biases favoring men, at least under some conditions (e.g., Sojo et al., 2016). Nevertheless, for university deans,

we suggest that the very informal selection practices and the lack of publicity for women's representation among deans would have mitigated pressures to affirmatively select women. We, therefore, assess whether bias disfavors women for deanships, especially to the extent that they are rare in the professional environment. In particular, based on the role congruity principle that high status and male-dominated roles seem more agentic and the social identity principle that more prototypical professors would emerge as leaders, women would appear less qualified for academic management than men. We, therefore, assess whether women's share among professors and among deans is associated with deanship recommendation.

*Hypothesis 1a.* The representation of female professors in the faculty has a stronger positive relationship to the likelihood of female than male professors receiving deanship recommendations.

*Hypothesis 1b.* The representation of female deans in the faculty has a stronger positive relationship to the likelihood of female than male professors receiving deanship recommendations.

## 2.2 | Administrative leadership experience

A lack of prior administrative leadership experience among women is a consideration that may enhance the perceived incongruity between female professors and the dean role. Therefore, successful performance of one or more prior administrative roles may be critical to accord a woman the agency to carry out the role of dean. Moreover, in expectation states theory (Berger et al., 1977), occupancy of specific competence-demanding roles can counter the lower status generally accorded to women. Because women have to overcome the suspicion that they are not qualified for leader roles in particular, they are, in effect, assessed by stricter standards requiring stronger evidence of their abilities than required of men (Foschi, 2000). For example, given the prevailing masculine construction of leadership (Koenig et al., 2011), which deems agency as critical to leadership, the standards for judging women as agentic enough to take charge and exert authority may be stricter than for men.

Consistent with this proposition, analyses of archival organizational performance evaluations have found that women had to meet stricter performance standards than men to be promoted as managers (Lyness & Heilman, 2006) and suffered less favorable evaluations on the criteria most relevant for promotion (Biernat et al., 2012). Similarly, scientific qualifications (e.g., journal publications) were more strongly associated with women's than men's membership on scientific advisory boards (Ding et al., 2013). Thus, given their lower status within universities, women may have to provide more evidence (e.g., experiences as institute director, vice dean) than men do for potential recommenders to regard them as qualified for administrative leadership.

*Hypothesis 2.* Administrative leadership experience has a stronger positive relationship to the likelihood of female than male professors receiving deanship recommendations.

## 2.3 | Domestic care responsibilities

The domestic responsibilities that are commonly greater for women than men may enhance the salience of female stereotypes and thus increase the perceived incongruity between female professors and deanships. Women's frequent occupancy of caretaking roles in the family (OECD Family Database, 2016) and the labor force (European Commission, 2009) promotes the belief that women are more communal than men (Eagly, 1987; Eagly & Wood, 2012). Given this widely endorsed gender stereotype and women's actual higher share of home responsibilities, the resulting salience of their communal qualities may lower gatekeepers' perceptions of their availability, commitment, and qualifications for administrative leadership.

Consistent with this argument and Ginther and Kahn's (2006) review, findings from studies of promotion and tenure of academic faculty in U.S. universities have usually found that women's domestic responsibilities are correlated with their lesser success. Also, in simulation experiments of hiring, motherhood diminished women's success for male-dominated positions (e.g., Heilman & Okimoto, 2008; Henle et al., 2020) although not for academic positions (Williams & Ceci, 2015). In addition, an audit study with resumes sent to actual employers advertising for entry- and midlevel marketing and business job openings found a hiring penalty against mothers, but not fathers (Correll et al., 2007). Finally, a survey of holders of the MBA degree from a top U.S. business school found that the women's lesser success was associated with motherhood (Bertrand et al., 2010).

In view of this evidence, the present study hypothesizes a stronger negative effect of domestic care responsibilities on women's than men's possibilities for deanships. The characterization of academic deanship as a highly responsible, time-consuming position that is hard to balance with other obligations provides a rationale for this prediction (e.g., Gmelch & Wolvertson, 2002). Also, in view of the informal selection procedures and the voluntary nature of deanship, care responsibilities in the private domain should lower stakeholders' belief that women will be appropriate or available for deanships.

*Hypothesis 3.* Care responsibilities in the household have a stronger negative relationship to the likelihood of female than male professors receiving deanship recommendations.

## 3 | SELF-SELECTION ACCORDING TO THE JOB APPEAL OF DEANSHIPS

Our model of professors' ambition for deanships proposes job appeal as a motivator of self-selection that can favor or disfavor their interest

in becoming a dean. Research on self-selection explains gender differences in career outcomes as influenced by gender-specific goals, needs, and preferences (e.g., Gati & Perez, 2014). Thus, women's own preferences affect their career decisions along with others' beliefs about their qualifications. In view of the incongruity that women themselves can experience in male-dominated occupations (e.g., Karelai & Guillén, 2014), the present study considers whether the lesser appeal of deanships for women than men lowers their ambition for the role.

Self-selection into gender-congruent jobs is consistent with social role theory (Eagly, 1987; Eagly & Wood, 2012), as well as its role congruity extension (Eagly & Karau, 2002, see also Heilman, 1983, 2012). Thus, culturally shared gender roles not only influence others' beliefs about women and men but also guide their social behavior through self-regulatory processes. That is, people ordinarily internalize societal gender roles as personal gender identities, which can function as self-standards against which they judge their own behavior, including their fit to a male-dominated work role (Wood & Eagly, 2015). Self-ascribed incongruity can lessen the appeal of a role. Based on these considerations, the study postulates contextual and individual influences on deanship job appeal, which in turn links to ambition. Specifically, as discussed in the next sections, these influences include perceptions of the gender balance among professors and administrators and professors' own communal and agentic career goals.

### 3.1 | Perceived representation of women among professors and administrators

The perceived representation of women among professors and administrators in the faculty is a contextual factor that may alter the deanship appeal for women. Organizations with a high prevalence of men can signal a masculine workplace climate that threatens women's sense of being valued. Thus, in line with role congruity theory, the rarity of women in occupational roles reflects situational cues that can increase the accessibility of women's sense of being nonfitting and thereby decrease their interest in these roles.

In fact, studies have shown that women are less likely to identify with occupational and high-status roles to the extent that they are male dominated (Ely, 1994; Peters et al., 2012). Furthermore, women professors and administrators serve as role models and often as mentors who promote other women's leadership ambitions. Considerable empirical evidence has shown that role models can positively affect women's career aspirations, particularly when their success seemed attainable and when they disconfirmed negative stereotypes about female leaders (e.g., Asgari et al., 2012; Hoyt & Simon, 2011; see review by Olsson & Martiny, 2018). Therefore, the study tested whether professors' perceptions of the representation of women among professors and deans increases the deanship job appeal for women, but not for men.

*Hypothesis 4a.* The perceived representation of female professors in the faculty has a stronger positive

relationship with the job appeal of deanships for female than male professors.

*Hypothesis 4b.* The perceived representation of female deans in the faculty has a stronger positive relationship with the job appeal of deanships for female than male professors.

### 3.2 | Career goals

Career goals are a self-selection variable that may contribute to women's low representation among deans. In support of this principle, Diekmann et al.'s (2017) goal congruity perspective explains how personal career goals motivate individuals to pursue social roles that they believe fulfill these goals. From this viewpoint, women's emphasis on fulfilling communal, other-oriented goals may discourage them from pursuing leader roles if they regard them as not fulfilling such goals (Brown et al., 2015).

In support of this viewpoint, research revealed that communal goal endorsement, which was higher in women, suppressed students' interest in male-dominated STEM careers, which they believed would not afford communal goals (Diekmann et al., 2011). In contrast, students' endorsement of agentic, self-oriented career goals, which was slightly higher in men, was positively associated with interest in STEM careers. Also, Konrad et al.'s (2000) meta-analysis of job attribute preferences showed that, overall, women were more likely than men to value communal attributes of jobs (e.g., helping others). Men, in contrast, were more likely than women to value agentic job attributes (e.g., earnings, power) although women in male-dominated occupations rated most agentic job attributes as highly or even higher than men.

Following these goal congruity principles, our research examined whether the career goals afforded by deanships influence the appeal of the position. Thus, to the extent that dean roles, like other leadership roles, are stereotypically more agentic than communal, greater endorsement of communal goals among female than male professors should suppress their deanship ambitions, whereas agentic goal endorsement among both male and female professors would enhance their ambitions.

*Hypothesis 5a.* Communal career goal endorsement has a stronger negative relationship with the job appeal of deanships for female than male professors.

*Hypothesis 5b.* Agentic career goal endorsement has a positive relationship with the job appeal of deanships for male and female professors.

In sum, this study assessed potential precursors of gender bias in professors' receiving deanship recommendations and of the appeal of the dean role. These two considerations, recommendations and job

appeal, should facilitate their ambition to become a dean. The next section elaborates this last stage of the sequence: the influence of recommendations and job appeal on ambition (see Figure 1).

#### 4 | RECOMMENDATIONS AND JOB APPEAL RELATED TO DEANSHIP AMBITION

First, recommendations for a deanship should foster ambition by enhancing individuals' confidence and self-efficacy (Conger & Kanungo, 1988). A recommendation should increase a professor's belief that she or he possesses the qualifications to be a successful dean.

*Hypothesis 6.* Receiving a recommendation for a deanship is positively related to female and male professors' deanship ambitions.

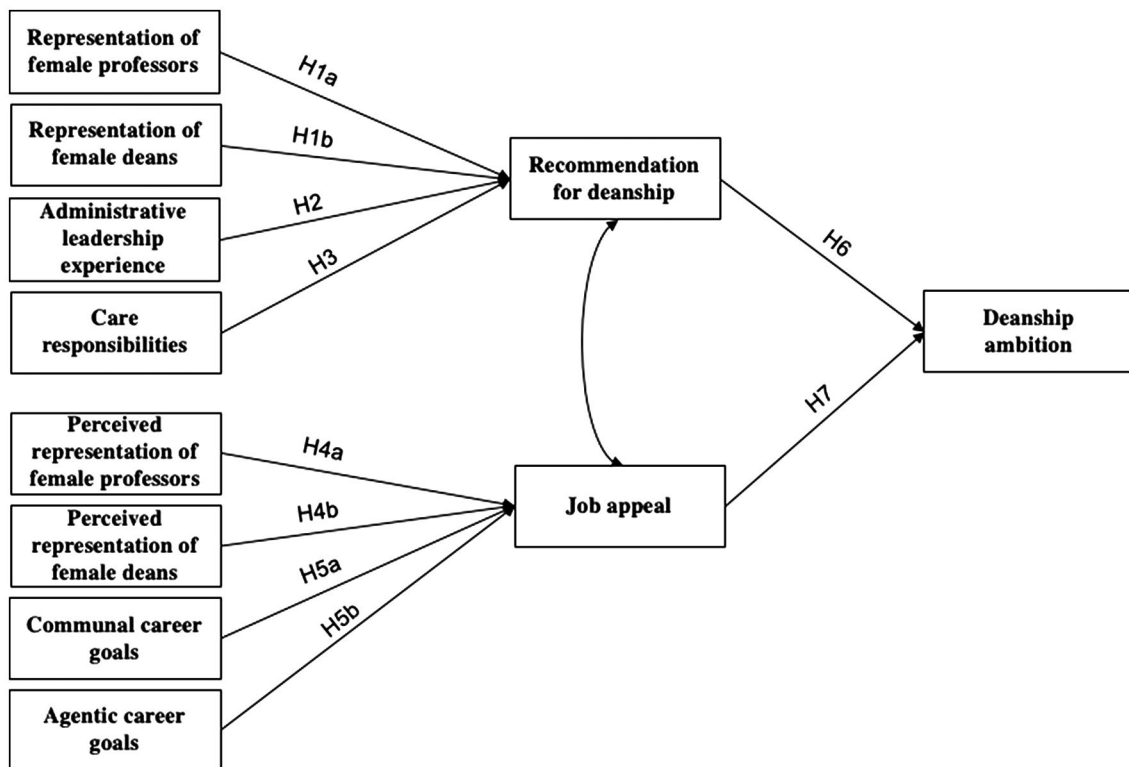
Second, the job appeal of the dean position should facilitate ambition to occupy this role. Consistent with expectancy–value theories of behavior (e.g., Ajzen, 1991; Ajzen & Fishbein, 1977), positive attitudes toward a given behavior, such as assuming a deanship, induce behavioral intentions, which in turn predict behavior. Thus, also consistent with research linking applicants' job attraction to job acceptance intentions and job choice (e.g., Chapman et al., 2005), job appeal should link to deanship ambition.

*Hypothesis 7.* Job appeal is positively related to female and male professors' deanship ambitions.

### 5 | METHOD

#### 5.1 | Sample and procedure

A time-lagged study with two measurement occasions collected survey data online from 278 full professors (67.6%) and associate professors (32.4%) in social sciences (34.2%), natural sciences (38.9%), economics (16.2%), and technical sciences (10.8%) at Swiss, German, and Austrian universities. At Time 1 (T1), 278 professors (43.9% female) without prior deanship experience completed the survey. Their ages ranged from 34 to 71 ( $M = 50.08$ ,  $SD = 7.66$ ), with an average length of employment at the current university of 10.32 years ( $SD = 7.96$ ). To attenuate common method bias, participants completed self-selection predictors and mediator variables at T1 and the outcome variable 2 months later at T2 (Podsakoff et al., 2012). Among the T1 participants, 75.9% ( $N = 211$ ; 40.8% female) completed the survey at T2. This drop-out of participants between T1 and T2 of data collection was not statistically associated with demographics (e.g., gender) or perceptions of the deanship position (for further information, see results section).



**FIGURE 1** Conceptual multigroup model of the associations between bias and self-selection factors and deanship ambition across female and male gender groups. Hypotheses 1a–5b (H1a–H5b) represent relationships hypothesized to differ between female and male participants. Hypothesis 6 and 7 (H6–H7) represent relationships without hypothesized interaction of gender

In DACH countries, the dean's administrative unit, known as a "faculty," comprises schools or departments from related fields (e.g., faculty of natural sciences, faculty of social sciences; with faculties usually consisting of a multitude of departments). In line with de Boer and Goedegebuure (2009), the term "faculty dean" refers to the person who is formally presiding over the administrative unit and responsible and accountable for its academic and administrative operations.

To administer study invitations, 193 deans' offices in Germany, Austria, and Switzerland were initially called and then received an invitation by e-mail to forward to their professors. This invitation included a registration link, a description of the study as assessing the attractiveness of administrative midlevel leadership positions, an assurance of anonymity and voluntariness of study participation, and a fact sheet with details about the study. Participants chose between German and English study materials and surveys, with the English created by translation and back-translation procedure (Brislin, 1986).

Initially, 350 professors completed the online survey at T1. However, based on their information, 51 were excluded as unlikely to be considered for deanships: 17 held time-limited professorships or did not specify the status of their professorship, 14 held assistant professorships with tenure-track, and 20 held junior professorships. Also, 21 professors were excluded because, in their faculties, all professors were automatically rotated into deanships. With these exclusions, the final sample consisted of 278 professors. The sample size was thus determined by the limited population of professors from DACH countries eligible to participate although the final sample met minimum sample size recommendations to assess model fit (e.g., Hu & Bentler, 1999; see also Fritz & MacKinnon, 2007).

The relevant deans' offices ( $N = 161$ ) were contacted to obtain administrative data, for example, on women's representation among professors and deans in each faculty from 2000, 2005, 2010, and the years 2016/2017, aided by data obtained from equal opportunity offices, web searches, and annual reports. The total number of professors at the faculties (faculty size) ranged from 7 to 133 ( $M = 41.87$ ,  $SD = 26.62$ , with 11 faculties missing). The share of female professors ranged from 0.0% to 58.0% ( $M = 22.12$ ,  $SD = 14.19$ , with 11 faculties missing). Furthermore, for prior female deans, 79 (49.1%) of the faculties had none, 31 (19.3%) had one, 25 (15.4%) had between two and five, and 26 (16.1%) had missing data. As an incentive for study participation, deans' offices, equal opportunity offices, and professors were promised and received a report on the study's findings.

## 5.2 | Measures

### 5.2.1 | Measures relevant to gender bias

These measures differed depending on whether a participant had been previously recommended for deanship. For participants not previously recommended, data from the time of data collection provided the relevant indicators. For participants previously recommended, survey questions pertained retrospectively to the year when they were recommended.

#### *Representation of female professors*

Dean's offices provided the percentage of female professors in their faculties for 2000, 2005, 2010, and for the years 2016/2017. Representation of female professors thus indicated the percentage of female professors in the faculty before participants were recommended for deanship or at the time of data collection (if not previously recommended for deanship).

#### *Representation of female deans*

Dean's offices provided the total number of female deans (i.e., only faculty deans, excluding lower administrative positions such as vice deans) in their faculties for 2000, 2005, 2010, and for the years 2016/2017 as well as the lengths and years of their terms. Representation of female deans thus indicated the total number of female current and previous deans in the faculty before participants were recommended for deanship or at the time of data collection (if not previously recommended for deanship).

#### *Administrative leadership experience*

Participants indicated the total number of years during which they had occupied administrative leadership positions (e.g., as institute director, vice dean) before they were recommended for deanship or at the time of data collection (if not previously recommended).

#### *Care responsibilities*

Participants indicated how many care-dependent persons lived in their household (e.g., children under 18 years, care-dependent grandparents or parents) before they were recommended for deanship or at the time of data collection (if not previously recommended).

### 5.2.2 | Measures relevant to self-selection

These measures referred to the time of data collection. If not otherwise stated, participants responded on 11-point rating scales ranging from 1 *strongly disagree* to 11 *strongly agree*. For all self-reported measures, we report the Cronbach's alpha coefficient of internal consistency ( $\alpha$ , Cronbach, 1951).

#### *Perceived representation of female professors*

Two items adapted from Horvath et al. (2016) assessed participants' estimates of the sex distribution: "What is your perception of the proportion of women and men in professorships at your faculty?" and "For whom is the professorship at your faculty more typical?" Participants responded on 11-point bipolar rating scales with 10% intervals (ranging from 100% men to 100% women, with higher values indicating greater representation of female professors;  $\alpha = .68$ ).

#### *Perceived representation of female deans*

Participants responded to the same two items with the word "professorship" substituted by the word "the deanship position." Participants responded on 11-point bipolar rating scales with 10%



intervals (ranging from 100% men to 100% women, with higher values indicating greater representation of female deans;  $\alpha = .67$ ).

#### *Agentic and communal career goals*

These measures, derived from Diekmann et al. (2010) and Schneider et al. (2016), presented 14 items on career goals ("How important is each of the following goals to you personally in your work context?") with 11-point rating scales ranging from 1 *strongly disagree* to 11 *strongly agree*, with higher values indicating greater importance. The agentic career goals were *power, recognition, achievement, self-promotion, independence, status, financial rewards, and competition* ( $\alpha = .77$ ), and the communal career goals were *helping others, serving humanity, serving community, working with people, attending to others' needs, and caring for others* ( $\alpha = .87$ ).

### 5.2.3 | Measures assessing mediators and the outcome

#### *Recommendation*

Participants indicated whether they had ever been suggested for or offered the deanship position at their faculty in their current university on a dichotomous measure (0 *not recommended*; 1 *recommended*). Additionally, to create measures relevant to gender bias, participants indicated each individual year when such an event occurred.

#### *Job appeal*

Participants completed 6 items adapted from Gaucher et al. (2011) on 11-point rating scales (1 *strongly disagree* to 11 *strongly agree*), coded with higher values indicating greater job appeal. Sample items were "The deanship position is appealing" and "I think I could enjoy the deanship position" ( $\alpha = .81$ ).

#### *Deanship ambition*

At T2, participants completed 3 items adapted from Schneider et al. (2016) on 11-point rating scales, with higher values indicating greater ambition. The items and respective rating scales were "Have you ever thought about running for deanship? (1 *No, I have not thought about it* to 11 *Yes, I have seriously considered it*)," "Which best characterizes your attitudes toward running for deanship in the future (1 *It is something I would absolutely never do* to 11 *It is something I definitely would like to undertake in the future*)," and "At some point in your life, how likely is it that you would ever run for deanship (1 *Not at all likely* to 11 *very likely*)" ( $\alpha = .84$ ).

## 5.3 | Control variables

The two mediator variables and the outcome variable were statistically controlled for the number of years of participants' employment by their current university (because deanship is more likely

with longer service) and faculty size (because deanship is more likely among a small number of professors).

## 5.4 | Analytic procedure

The statistical environment R (Version 3.5.1; R Development Core Team, 2018) and the R package *lavaan* (Version 0.6-1; Rosseel, 2012) provided the tools for data analyses. To establish the appropriateness of the measurement model (construct validity), a series of five confirmatory factor analyses (CFAs) of the full sample first tested the postulated measurement model with the postulated relations between the observed indicators and the underlying factors (Kline, 2016). In a next step, the analyses compared the hypothesized measurement model with alternative measurement models in which the indicators of theoretically similar but distinct factors were allowed to load on the same factor (Byrne, 2010). Specifically, an analysis estimated the hypothesized measurement model by modeling the six subjective factors, namely (a) deanship ambition, (b) job appeal, (c) perceived representation of female professors, (d) perceived representation of female deans, (e) communal career goals, and (f) agentic career goals. Subsequent analyses tested the hypothesized six-factor model against three alternative five-factor models and against a one-factor model. The five-factor models specified factors in which either all indicators of women's perceived representation in the faculty (perceived representation of female professors and of deans), or attitudes toward deanship (job appeal and deanship ambition), or career goals (agentic and communal) loaded onto one factor.

To reduce the complexity of the measurement model, the construct-to-item-balance approach (Little et al., 2002) aggregated indicators of latent constructs to item parcels. This approach allows the derivation of item parcels that are balanced in terms of difficulty and discrimination by pairing the three items with the highest factor loadings with items with the next highest factor loadings in an inverted order (see also Brown, 2015). The result was three item parcels for job appeal, agentic career goals, and communal career goals. Furthermore, two established measures, each with only two indicators, assessed the perceived representation of female professors and of female deans. Nonetheless, to allow for model identification, estimations of residual variances followed Hayduk and Littvay's (2012) approach (see also Kline, 2016), resulting in estimates of 32% residual variance of the total variance in perceptions of women's representation in professorships and 33% residual variance of the total variance in perceptions of women's representation in deanship positions.

Furthermore, given the measurement model that best fit the full sample data, a multigroup CFA tested for measurement invariance across female and male samples (Brown, 2015; Vandenberg & Lance, 2000). Multigroup CFA determines the model fit separately for each group and thereby enables assessment of whether participants from different groups interpret measures similarly. The multigroup model fit indicates the possibility for valid comparisons

across women and men. More precisely, the multigroup CFA first tested the hypothesized measurement model in each gender group. Subsequently, the analyses tested whether (a) the factor structure was equal across groups (configural invariance), (b) factor loadings were equal across groups (metric invariance), and (c) the intercepts of the indicators were equal across groups (scalar invariance). That is, the analytic procedure first estimated the least restricted model and tested increasingly constrained models against it in a stepwise procedure (Brown, 2015; Vandenberg & Lance, 2000).

Finally, a multigroup path analysis tested the study hypotheses by simultaneously estimating the patterns of relationships between study variables across female and male participants. Accordingly, the analysis fit a baseline model for both gender groups and compared it with other models using chi-square difference tests (Brown, 2015). This analytic procedure allows tests for equivalence of parameter estimates across groups by an ordered and prespecified sequence of constraining a set of parameters in accordance with the respective hypothesis tests (e.g., Brown, 2015; Raykov, 1997). In that regard, tests of the interaction effects of participant gender compared the model to a constrained model in which the parameter estimates of the four gender bias and the four self-selection factors were constrained to be equal across women and men. Next, tests for interaction effects on specific paths individually specified parameter estimates to be invariant across groups. Models fitting the data significantly worse when parameters were constrained to be equal across groups imply interaction effects.

## 6 | RESULTS

First, examining missing data patterns, a multiple logistic regression assessed whether the 24.1% drop out of the participants between T1 and T2 of data collection was statistically associated with demographics (e.g., gender, university tenure) or experiences with and perceptions of the deanship position (e.g., deanship recommendation, job appeal). The absence of statistically significant associations ( $p \leq .05$ ) justified treating the data as missing completely at random and implementing the full information maximum likelihood estimation (FIML) to obtain parameter estimates (Kline, 2016). Second, the Henze-Zirkler test (Henze & Zirkler, 1990; R package *MVN*, version 5.5; Korkmaz et al., 2014) revealed that the assumption of multivariate normality did not hold in our data,  $HZ = 1.05$ ,  $p < .001$ . Accordingly, all subsequent models used the robust maximum likelihood estimator (MLR; Yuan & Bentler, 1998).

### 6.1 | Descriptive statistics and preliminary analyses

Table 1 shows the means, standard deviations, internal consistencies, and zero-order correlations for the variables. Table 2 shows the descriptive differences between the female and male participants with their *t*-tests and effect sizes (Cohen's *d*). Regarding objective

factors, no gender differences were significant on administrative leadership experience or care responsibilities at home. In addition, the representation of female deans in the faculties did not differ prior to any of the study participants receiving a deanship offer. However, the female participants held positions in faculties with a higher representation of women in the professorate than did male participants. Regarding subjective factors, female participants reported a lower perceived representation of female deans than male participants did but did not differ from them in the perceived representation of female professors in the faculties. Furthermore, no gender differences were significant for agentic or communal career goals. Regarding mediators and outcome variables, female participants did not differ from male participants in recommendation rates for deanship or their deanship ambition at T2 but reported a higher deanship job appeal.

#### 6.1.1 | Confirmatory factor analyses and measurement invariance across groups

Five CFAs with the full sample tested the appropriateness of the measurement model. The hypothesized six-factor measurement model displayed an acceptable fit to the data,  $\chi^2(64) = 152.61$ ,  $p < .001$ , CFI = .95, TLI = .93, RMSEA = .07 [90% CI: .06–.09], SRMR = .06. All indicators loaded significantly on each corresponding latent construct (standardized factor loadings ranged from .61 to .92). Chi-square difference tests compared the hypothesized six-factor model with three alternative five-factor models as well as with a one-factor model (see analytic procedure). The hypothesized six-factor model was superior in model fit to these other models (Table 3).

Against the background of this best fitting model, tests for measurement invariance enabled valid comparisons across the women and men. First, a multigroup confirmatory factor analysis simultaneously evaluated the fit of the hypothesized six-factor model for female ( $n = 122$ ) and male ( $n = 156$ ) participants. The results displayed an acceptable fit to the data,  $\chi^2(128) = 238.65$ ,  $p < .001$ , CFI = .94, TLI = .91, RMSEA = .08 [90% CI: .06–.09], SRMR = .07. All indicators loaded significantly on the hypothesized latent factors for the gender groups (standardized factor loadings ranged from .57 to .96 for the female participants and from .64 to .93 for the male participants). Next, with increasing constraint of the parameters, multiple group models compared the baseline model and the previous model. The results of these model comparisons confirmed configural and metric invariance across the gender groups (Table 4). Specifically, the results showed that the factor model fit the data and that the factor structure and factor loadings, but not the intercepts of the indicators, were equal across groups. These results supported the assumption that the constructs had the same content meaning and that relations between constructs allowed for valid comparisons across women and men.

TABLE 1 Means, standard deviations, internal consistencies, and zero-order correlations among study variables

Variable	M	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Gender	.44	.50	(-)													
2. University tenure	10.32	7.96	-.10 <sup>†</sup>	(-)												
3. Faculty size	49.34	29.56	.03	.03	(-)											
4. Representation of female professors	21.87	14.78	.31 <sup>***</sup>	-.18 <sup>**</sup>	.09	(-)										
5. Representation of female deans	.63	.94	.06	-.09	.11 <sup>†</sup>	.62 <sup>***</sup>	(-)									
6. Administrative leadership experience	2.88	3.81	-.04	.33 <sup>***</sup>	-.05	.05	.02	(-)								
7. Care responsibilities	1.00	1.17	-.09	-.09	.01	-.11 <sup>†</sup>	-.09	-.01	(-)							
8. Perceived representation of female professors	3.67	1.55	.04	-.05	.09	.68 <sup>***</sup>	.45 <sup>***</sup>	.03	-.07	(.68)						
9. Perceived representation of female deans	2.80	1.74	-.14 <sup>*</sup>	-.06	-.05	.33 <sup>***</sup>	.46 <sup>***</sup>	-.03	-.14 <sup>*</sup>	.51 <sup>***</sup>	(.67)					
10. Communal career goals	7.43	2.05	-.02	.10	.00	.05	.02	.13 <sup>*</sup>	.02	.04	.01	(.87)				
11. Agentic career goals	6.59	1.61	.06	-.03	-.10	-.05	-.09	.03	.11 <sup>†</sup>	-.17 <sup>**</sup>	-.15 <sup>***</sup>	.26 <sup>***</sup>	(.77)			
12. Recommendation	.28	.45	-.06	.20 <sup>***</sup>	-.23 <sup>***</sup>	-.14 <sup>*</sup>	.16 <sup>**</sup>	.25 <sup>***</sup>	.03	-.01	.01	-.13 <sup>*</sup>	-.08	(-)		
13. Job appeal	5.33	2.15	.14 <sup>*</sup>	.15 <sup>**</sup>	-.04	-.02	-.01	.14 <sup>*</sup>	.03	.04	.03	.18 <sup>**</sup>	.16 <sup>**</sup>	.10 <sup>†</sup>	(.81)	
14. Deanship ambition (T2)	4.23	2.61	.03	-.11 <sup>†</sup>	-.08	-.04	-.01	.11 <sup>†</sup>	.05	.02	.03	.13 <sup>*</sup>	.09	.28 <sup>***</sup>	.57 <sup>***</sup>	(.84)

Note:  $N = 278$ . T2 = Time 2; all other measures are T1; gender is 0 = male, 1 = female; Cronbach's alpha appears on the diagonal in parentheses. Means are on rating scales ranging from 1 to 11 on which higher numbers indicate greater perceived extremity of measures, with the exception of representation of female professors in percentages; representation of female deans, administrative leadership experience, and care responsibilities in total numbers, and recommendation is 0 not recommended, 1 recommended.

<sup>†</sup> $p < .10$ ;

\* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$  (two-tailed).

**TABLE 2** Descriptive gender differences for study variables

	Gender						<i>d</i>	<i>p</i>
	Male			Female				
	<i>M</i>	<i>SD</i>	<i>n</i>	<i>M</i>	<i>SD</i>	<i>n</i>		
Representation of female professors	17.94	13.07	150	27.17	15.36	111	-.65	<.001
Representation of female deans	.58	.93	141	.70	.95	105	-.13	.348
Administrative leadership experience	3.02	3.54	156	2.72	4.14	122	.08	.518
Care responsibilities	1.10	1.17	156	.89	1.17	122	.18	.136
Perceived representation of female professors	3.61	1.41	156	3.75	1.70	122	-.09	.472
Perceived representation of female deans	3.02	1.64	156	2.52	1.83	122	.29	.018
Communal career goals	7.47	2.05	156	7.39	2.06	122	.04	.775
Agentic career goals	6.51	1.57	156	6.69	1.67	122	-.11	.356
Recommendation	.30	.46	156	.25	.43	122	-.06 <sup>a</sup>	.306
Job appeal	5.05	2.00	156	5.68	2.30	122	-.29	.018
Deanship ambition (T2)	4.16	2.60	125	4.34	2.63	86	-.07	.628

Note: *N* = 278. T2 = Time 2, all other measures are T1. Results of *t* tests by participants' gender. As Levene's test indicated unequal variances for representation of female professors, the perceived representation of female professors, and job appeal, these degrees of freedom were adjusted. Means are on rating scales ranging from 1 to 11 on which higher numbers indicate greater perceived extremity of measures, with the exception of representation of female professors in percentages; representation of female deans, administrative leadership experience, and care responsibilities in total numbers, and recommendation is 0 *not recommended*, 1 *recommended*.

<sup>a</sup>As recommendation was categorical, a chi-square test instead of a *t*-test was conducted and the  $\phi$ -coefficient reported.

## 6.2 | Test of hypotheses

A multigroup path analysis tested the hypothesized relationships between the study variables across the participant groups of female and male participants in one analytical model (see Figure 2 and Table 5). In tests of potential mediator effects (Table 6), the mediator variables, recommendation and job appeal, as well as the outcome variable of deanship ambition were statistically controlled for university tenure and faculty size. The unconstrained multigroup path model displayed an acceptable fit to the data,  $\chi^2(32) = 42.15$ ,  $p = .108$ , CFI = .95, TLI = .89, RMSEA = .05 [90% CI: .00–.08], SRMR = .03.

Tests of the interaction effects of participant gender estimated an unconstrained model that allowed all path coefficients to vary freely across groups and compared it with a model that constrained the four discriminatory and the four self-selection path coefficients to be equal across women and men. Because of the nested nature of the constrained and the unconstrained model, a chi-square difference test determined if the equality constraints held across the two groups. The analysis,  $\chi^2(40) = 57.05$ ,  $p = .039$ , CFI = .91, TLI = .85, RMSEA = .06 [90% CI: .01–.09], SRMR = .04, revealed that the hypothesized model fit the data marginally better,  $\Delta\chi^2(8) = 15.05$ ,  $p = .058$ , suggesting potential differences in the path coefficients for women and men. Subsequently, a stepwise approach tested each path coefficient for an interaction effect by successively constraining

single coefficients to be equal across groups and by comparing each of the resulting constrained and unconstrained models. The standardized coefficients of the direct and mediator effects appear in the next subsection.

### 6.2.1 | Direct and mediator effects

Hypotheses 1a and 1b stated that female (but not male) participants would be proportionally more often recommended for a deanship the higher the representation of women in the professorates and deaneries. In contrast to these hypotheses, the representation of female professors in the faculty was not significantly associated with recommendation rates of female participants,  $b^* = .06$ ,  $SE = .10$ ,  $p = .564$ , or of male participants,  $b^* = -.07$ ,  $SE = .11$ ,  $p = .510$ , nor did these coefficients differ,  $\Delta\chi^2(1) = .72$ ,  $p = .396$ . Similarly, the representation of female deans in the faculty was not significantly associated with recommendation rates of women,  $b^* = -.09$ ,  $SE = .10$ ,  $p = .360$ , or of men,  $b^* = -.09$ ,  $SE = .09$ ,  $p = .316$ , nor did these coefficients differ,  $\Delta\chi^2(1) = .00$ ,  $p = .988$ .

Hypothesis 2 stated that administrative leadership experience would have a stronger relationship with the likelihood of female than male participants being recommended for deanships. As expected, administrative leadership experience was positively related to deanship recommendation for female participants,  $b^* = .21$ ,  $SE = .09$ ,

**TABLE 3** Comparisons of measurement models based on five confirmatory factor analyses

Model	Factors	$\chi^2$	df	p	CFI	TLI	RMSEA	90% CI		SRMR
								LL	UL	
1	Six factors: Deanship ambition (T2), job appeal, perceived representation of female professors, perceived representation of female deans, agentic career goals, and communal career goals.	152.61	64	<.001	.95	.93	.07	.06	.09	.06
2	Five factors: Perceived representation of female professors and perceived representation of female deans combined into one factor.	182.33	69	<.001	.94	.91	.08	.06	.09	.06
3	Five factors: Deanship ambition (T2) and job appeal combined into one factor.	357.27	69	<.001	.85	.80	.12	.11	.13	.07
4	Five factors: Agentic career goals and communal career goals combined into one factor.	602.55	69	<.001	.70	.60	.17	.16	.18	.11
5	One factor: All variables combined into one factor.	2,244.00	79	<.001	.05	-.09	.28	.27	.29	.19

Note:  $N = 278$ .

Abbreviations: 90% CI, 90% confidence interval of the RMSEA; CFI, comparative fit index; LL, lower limit; RMSEA, root mean square error of approximation; SRMR, standardized root mean square residual; TLI, Tucker-Lewis index, UL, upper limit.

**TABLE 4** Test of measurement invariance across female and male professors

Model	Factors	AIC	BIC	$\chi^2$	df	$\Delta\chi^2$	$\Delta df$	p
1	Configural invariance (factor structure)	14672	15071	238.24	128			
2	Metric invariance (factor loadings)	14662	15032	243.74	136	5.20	8	.736
3	Scalar invariance (intercepts of indicators)	14662	15003	260.24	144	17.42	8	.026

Note:  $N = 278$  professors (men = 156; women = 122).

Abbreviations: AIC, Akaike information criterion; BIC, Bayesian information criterion.

$p = .018$ . Although male participants' prior service was not significantly associated with recommendation rates,  $b^* = .17$ ,  $SE = .09$ ,  $p = .073$ , the path coefficients did not differ between the groups,  $\Delta\chi^2(1) = .00$ ,  $p = .982$ . Therefore, Hypothesis 2 did not receive support.

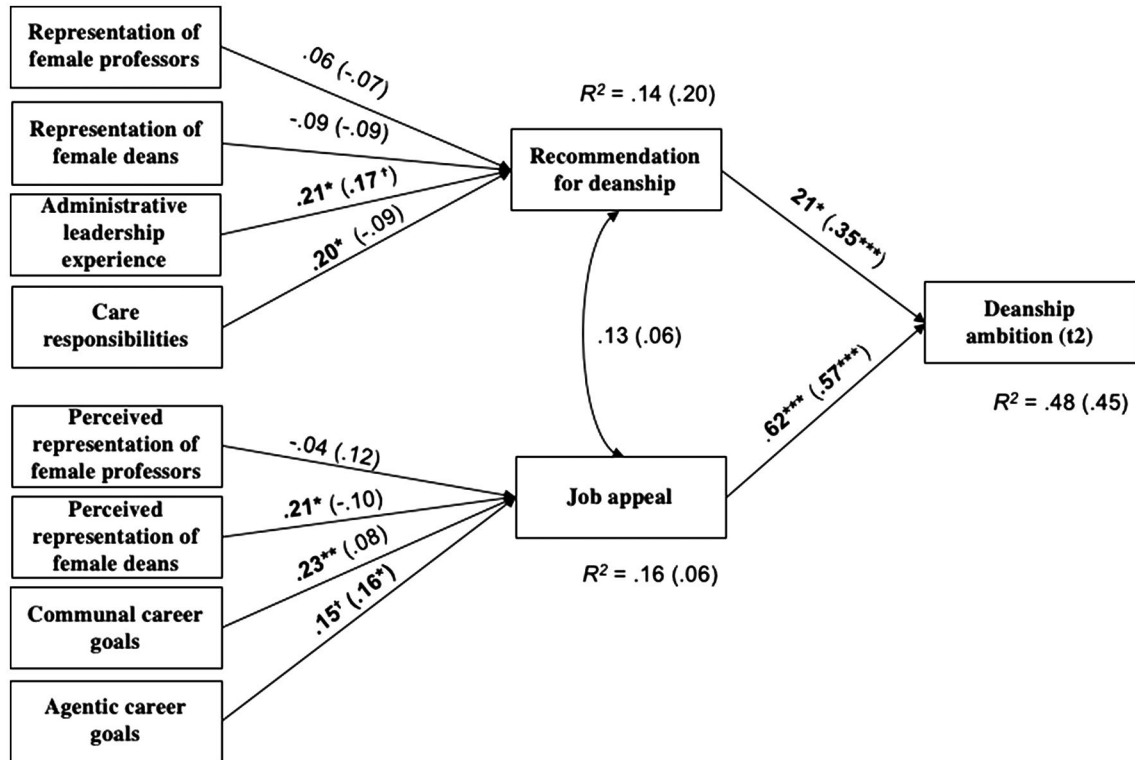
Hypothesis 3 predicted a negative relationship between female participants' care responsibilities at home and deanship recommendation, whereas no such relationship was predicted for male participants. Although, as expected, the association between care responsibilities and deanship recommendation was not statistically significant for male participants,  $b^* = -.09$ ,  $SE = .07$ ,  $p = .241$ , female participants' care responsibilities were, in contrast to the hypothesis, positively associated with deanship recommendation,  $b^* = .20$ ,  $SE = .09$ ,  $p = .034$ , and the coefficients were significantly different,  $\Delta\chi^2(1) = 5.80$ ,  $p = .016$ . Therefore, the results did not support Hypothesis 3.

Additional tests examined the 95% confidence intervals (CIs) of the mediator effects of the gender discriminatory factors on deanship ambition via recommendation rates (Table 6). Although recommendation rate was positively associated with deanship ambition for female and male participants, the CIs of these mediator effects included zero for both gender groups. Therefore, none of

the mediator effects reached statistical significance. Overall, the study results did not support the predictions based on the bias explanation of the underrepresentation of women in deanship positions.

Hypotheses 4a and 4b stated that to the extent that female participants perceived a higher representation of women among professors and deans in the faculty, they would find the dean position more appealing, whereas men's perceptions of the gender ratio would not relate to job appeal. In contrast to Hypothesis 4a, there was no gender difference,  $\Delta\chi^2(1) = 1.12$ ,  $p = .290$ , in the association between the perceived representation of female professors at the faculty and job appeal (women:  $b^* = -.04$ ,  $SE = .10$ ,  $p = .722$ ; men:  $b^* = .12$ ,  $SE = .10$ ,  $p = .241$ ). However, in line with Hypothesis 4b, the perceived representation of female deans in the faculty was positively associated with job appeal for female participants,  $b^* = .21$ ,  $SE = .10$ ,  $p = .031$ , but not for male participants,  $b^* = -.10$ ,  $SE = .10$ ,  $p = .282$ , and these coefficients were significantly different,  $\Delta\chi^2(1) = 6.81$ ,  $p = .009$ .

Hypothesis 5a stated that women's endorsement of communal career goals would show a negative relationship with the job appeal of the deanship position. In contrast to the hypothesis, results revealed a positive association between communal career



**FIGURE 2**  $N = 278$ . Standardized path coefficients of the multigroup path models across gender groups. Path coefficients appear without parentheses for female participants and with parentheses for male participants. Faculty size and professors' years of employment at the university (university tenure) were control variables for the mediator variables and the outcome variable. Path coefficients for the control variables are shown in Table 5. † $p < .10$ , \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$  (two-tailed), significant relations are bolded

goal endorsement and job appeal for female participants,  $b^* = .23$ ,  $SE = .09$ ,  $p = .007$ , but not for male participants,  $b^* = .08$ ,  $SE = .08$ ,  $p = .330$ , although these coefficients did not differ,  $\Delta\chi^2(1) = 2.04$ ,  $p = .154$ . In support of Hypothesis 5b, the relation of agentic career goal endorsement to job appeal was nonsignificant for female participants,  $b^* = .15$ ,  $SE = .09$ ,  $p = .083$ , but significantly positive for male participants,  $b^* = .16$ ,  $SE = .07$ ,  $p = .024$ . However, these coefficients did not differ,  $\Delta\chi^2(1) = .00$ ,  $p = .987$ .

Additional tests of mediator effects for female participants indicated significant positive relationships of the perceived representation of female deans in the faculty ( $b^* = .19$ ,  $SE = .10$ ,  $p = .046$ ) and of communal career goal endorsement ( $b^* = .19$ ,  $SE = .08$ ,  $p = .020$ ) with deanship ambition through job appeal (Table 6). Also, for female participants, the mediator effect of agentic work endorsement on deanship ambition through job appeal was nonsignificant ( $b^* = .15$ ,  $SE = .09$ ,  $p = .087$ ), whereas for male participants this mediator effect was significantly positive ( $b^* = .15$ ,  $SE = .07$ ,  $p = .032$ ). Overall, these results provided stronger support for predictions based on the self-selection than the gender bias perspective for women's underrepresentation in deanship positions.

As expected, there were positive associations between the mediator variables, deanship recommendation and job appeal, and deanship ambitions for female and male participants. Thus, in line with Hypothesis 6, female participants,  $b^* = .21$ ,  $SE = .09$ ,  $p = .018$ , and male participants,  $b^* = .35$ ,  $SE = .08$ ,  $p < .001$ , who had been

recommended for deanships indicated greater ambition to assume a deanship, and these coefficients did not differ,  $\Delta\chi^2(1) = .92$ ,  $p = .336$ . Also, in line with Hypothesis 7, female participants,  $b^* = .62$ ,  $SE = .07$ ,  $p < .001$ , and male participants,  $b^* = .57$ ,  $SE = .06$ ,  $p < .001$ , who perceived the deanship position as more appealing showed higher deanship ambition, and these coefficients did not differ,  $\Delta\chi^2(1) = .03$ ,  $p = .871$ .

## 7 | DISCUSSION

The present study investigated theoretically derived explanations of women's underrepresentation in the administrative role of university dean. The hypotheses pertained to women's disadvantage following from male-favoring recommendations of professors for deanships and professors' self-selection according to the job appeal of an agentic leadership role. In line with informal selection processes for deans as stated in the study's introduction, deanship recommendations and job appeal were considered as precursors of professors' ambition to become a dean (see Table 7 for an overview of the hypotheses and findings).

On recommendations for deanships, female and male professors in this study sample were equally likely to receive recommendations for deanship, thus failing to confirm male advantage. The study further assessed whether gender biases in recommendations were

**TABLE 5** Path coefficients of female and male professors for the mediator variables and the outcome variable

	Unstandardized estimate		SE		Standardized estimate	
	Female	Male	Female	Male	Female	Male
<b>Deanship recommendation</b>						
Faculty size	-.00**	-.00***	.00	.00	-.20	-.24
University tenure	.00	.01 <sup>†</sup>	.00	.01	.02	.20
Representation of female professors	.00	-.00	.00	.00	.06	-.07
Representation of female deans	-.04	-.04	.05	.04	-.09	-.09
Administrative leadership experience	.02 <sup>†</sup>	.02 <sup>†</sup>	.01	.01	.21	.17
Care responsibilities	.07 <sup>†</sup>	-.03	.04	.03	.20	-.09
<b>Job appeal</b>						
Faculty size	-.00	-.00	.01	.01	-.03	-.05
University tenure	.06**	.03	.02	.02	.20	.12
Perceived representation of female professors	-.05	.16	.13	.14	-.04	.12
Perceived representation of female deans	.26 <sup>†</sup>	-.12	.12	.12	.21	-.10
Communal career goals	.26**	.07	.10	.08	.23	.08
Agentic career goals	.21 <sup>†</sup>	.21 <sup>†</sup>	.12	.09	.15	.16
<b>Deanship ambition (T2)</b>						
Faculty size	-.01	.00	.01	.01	-.09	.04
University tenure	-.09***	-.08***	.03	.02	-.27	-.24
Deanship recommendation	1.29 <sup>†</sup>	2.00***	.56	.47	.21	.35
Job appeal	.72***	.74***	.10	.09	.62	.57

Note:  $N = 278$ . Unstandardized and standardized path coefficients of the multigroup path model. Faculty size and professors' years of employment at the university (university tenure) were control variables for the mediators and the outcome variable.

Abbreviations: SE, standard error; T2, Time 2.

<sup>†</sup> $p < .10$ ;

\* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$  (two-tailed).

more likely to occur because of factors that emphasize the masculinity of the deanship position, the salience of the female stereotype, or both.

In contrast to our hypotheses, the representation of women among professors or deans in the faculties, conditions presumed to decrease the masculinity of the leader role, was unrelated to female and male professors receiving recommendations for deanships. Furthermore, in contrast to the assumption that bias against women would manifest in judging them by a stricter standard, the relation between prior administrative leadership experience and recommendations did not differ for female and male professors, although this relation attained significance only among the female professors. Finally, female professors' domestic care responsibilities, conditions presumed to disadvantage them by increasing the salience of their communal qualities, were positively related to the women's (but not the men's) recommendations for deanship—a significant finding opposite to our predictions.

The results yielded stronger support for theoretically derived self-selection explanations influencing women's representation in deanship positions. As hypothesized, the perceived representation of female deans in the faculties was positively related to the deanship appeal for female professors, a condition presumed to increase

women's perceived fit with the leader role. The absence of the analogous relation for the perceived representation of female professors suggests that female deans' role modeling of leadership was critical to enhancing deanship job appeal for female professors.

Also relevant to self-selection, communal and agentic career goals related differently to deanship ambition for female and male professors even though they did not differ in their average endorsements of either of these two types of goals (see Table 2). For female professors, communal career goal endorsement was positively related to deanship ambition through job appeal, whereas for male professors, agentic goal endorsement was positively related to deanship ambition through job appeal. This positive effect of female professors' communal career goal endorsement was in contrast to our reasoning that communal goals would deter women from deanships. These findings are in general consistent with findings, suggesting that on average communal goals tend to guide women's career ambitions, whereas agentic goals tend to guide men's ambitions (Diekmann et al., 2017). Moreover, professors evidently can construe deanships as affording communal or agentic goals, thus allowing the dean role to appeal to women and men.

Overall, these results from the bias perspective are somewhat surprising in relation to previous research showing that gender bias

**TABLE 6** Mediation effects for female and male professors

	Standardized estimate	SE	95% CI	
			LL	UL
<b>Female Professors</b>				
Representation of female professors—recommendation—deanship ambition	.00	.00	-.01	.01
Representation of female deans—recommendation—deanship ambition	-.06	.07	-.19	.07
Administrative leadership experience—recommendation—deanship ambition	.03	.02	-.01	.06
Care responsibilities—recommendation—deanship ambition	.10	.06	-.02	.21
Perceived representation of female professors—job appeal—deanship ambition	-.03	.10	-.22	.16
Perceived representation of female deans—job appeal—deanship ambition	.19	.10	.00	.37
Communal career goals—job appeal—deanship ambition	.19	.08	.03	.35
Agentic career goals—job appeal—deanship ambition	.15	.09	-.02	.32
<b>Male Professors</b>				
Representation of female professors—recommendation—deanship ambition	-.01	.01	-.02	.01
Representation of female deans—recommendation—deanship ambition	-.09	.08	-.25	.08
Administrative leadership experience—recommendation—deanship ambition	.04	.03	-.01	.10
Care responsibilities—recommendation—deanship ambition	-.07	.06	-.18	.05
Perceived representation of female professors—job appeal—deanship ambition	.12	.10	-.08	.32
Perceived representation of female deans—job appeal—deanship ambition	-.09	.09	-.26	.08
Communal career goals—job appeal—deanship ambition	.06	.06	-.05	.16
Agentic career goals—job appeal—deanship ambition	.15	.07	.01	.29

Note:  $N = 278$ . Faculty size and professors' years of employment at the university (university tenure) were used as control variables for the mediation variables and the outcome variable. Abbreviations: CI, confidence interval; LL, lower limit; SE, standard error; UL, upper limit.

limits women's access to male-dominated management positions (e.g., Campero & Fernandez, 2019; Koch et al., 2015). In contrast to our hypotheses, neither female nor male professors' recommendation rates were significantly associated with the gender ratio in faculties' professorates and deanships. A close examination of the specific circumstances of university dean appointments reveals several plausible explanations for these findings.

One important consideration is that deanship appointments occur in settings in which faculty members and administrative leaders typically possess abundant information about one another, often reflecting years of collegueship in a university. The Koch et al. (2015) meta-analysis of simulation studies found that bias against selecting women for male-dominated jobs decreased

when evaluators were experienced professionals rather than non-professional, as well as when evaluators possessed more information and competence-relevant evidence about job candidates. Although the professors who select deans are not trained as personnel specialists, they likely have gained knowledge about the qualifications for university administration. Also, professors and administrators are likely to have information about their colleagues in general, including their competence in administrative matters, as shown by the professors in this study typically having served approximately 3 years in administrative roles (see Table 2).

In line with these considerations, the study results revealed that the amount of professors' administrative leadership experience related positively to receiving deanship recommendations,



**TABLE 7** Summary of findings

Hypothesis	Support for hypothesis
<i>H1a</i> : The representation of female professors has a stronger positive relationship to the likelihood of female than male professors receiving deanship recommendations	No significant relationship for female and male professors
<i>H1b</i> : The representation of female deans has a stronger positive relationship to the likelihood of female than male professors receiving deanship recommendations	No significant relationship for female and male professors
<i>H2</i> : Administrative leadership experience has a stronger positive relationship to the likelihood of female than male professors receiving deanship recommendations	Positive relationship for female professors, marginal relationship for male professors, coefficients did not differ between genders
<i>H3</i> : Care responsibilities in the household have a stronger negative relationship to the likelihood of female than male professors receiving deanship recommendations	Positive relationship for female professors, no significant relationship for male professors
<i>H4a</i> : The perceived representation of female professors has a stronger positive relationship with the job appeal of deanships for female than male professors	No significant relationship for female and male professors
<i>H4b</i> : The perceived representation of female deans has a stronger positive relationship with the job appeal of deanships for female than male professors	Positive relationship for female professors, no significant relationship for male professors
<i>H5a</i> : Communal career goal endorsement has a stronger negative relationship with the job appeal of deanships for female than male professors	Positive relationship for female professors, no significant relationship for male professors, coefficients did not differ between genders
<i>H5b</i> : Agentic career goal endorsement has a positive relationship with the job appeal of deanships for male and female professors	Marginal positive relationship for female professors, positive relationship for male professors, coefficients did not differ between genders
<i>H6</i> : Receiving a recommendation for a deanship is positively related to female and male professors' deanship ambitions	Positive relationship for female and male professors
<i>H7</i> : Job appeal is positively related to female and male professors' deanship ambitions	Positive relationship for female and male professors
<b>Additional analyses</b>	
Mediation of gender bias factors on deanship ambition via recommendation	No mediation for female and male professors
Mediation of self-selection factors on deanship ambition via job appeal	For female professors, significant mediation effects of perceived presence of female deans and communal career goals on deanship ambition through job appeal  For male professors, significant mediation effects of agentic career goals on deanship ambition through job appeal (marginal for female professors)

equally for women and men. Although in contrast to our hypothesis and to prior findings on leadership (e.g., Ding et al., 2013; Lyness & Heilman, 2006), the results yielded no support for the assumption that women had to provide stronger evidence of their potential than men to be perceived as competent for deanship. Consistent with social role theory's emphasis on the expectations associated with specific roles (Eagly, 1987; Eagly & Wood, 2012), women and men who have already provided clear evidence of their abilities by successfully achieving professorates, as well as by occupying administrative roles, may be accorded equal competence. Gendered expectations may recede in importance.

Furthermore, the information-rich circumstances in our study context are in contrast to the typical studies included in the simulation studies that we presented as evidence for the plausibility of our

hypotheses. In such studies, evaluators typically have only access to written information, usually from resumes, and not any face-to-face interaction. Particularly in the information-poor situations of the studies that showed discrimination against women in lower stages of their careers (e.g., Knobloch-Westerwick et al., 2013; Moss-Racusin et al., 2012; Steinpreis et al., 1999), gender stereotypes may have allowed evaluators to "fill in the blanks" in predicting job candidates' future performance (Heilman, 2012, p. 121). As suggested also by Eaton et al.'s (2020) study showing pro-male bias in selecting post-doctoral physicists, given mixed competence information, we suggest that the abundant information demonstrating candidates' high competence, as exists in the selection of professors for deanships, likely is critical to erasing male advantage. Thus, the present study results do not refute prior findings of gender biases toward research

assistants and young scholars who can provide fewer records of their competence than established scholars (e.g., Knobloch-Westerwick et al., 2013; Moss-Racusin et al., 2012; Steinpreis et al., 1999).

Concerning possible biases against parents (e.g., Correll et al., 2007; Heilman & Okimoto, 2008), care responsibilities were, as expected, not associated with male professors receiving recommendations for deanships. However, in contrast to our hypothesis, care responsibilities were positively related to female professors' deanship recommendations. Possibly, mothers who competently fulfill their academic duties might signal especially high competence and career commitment. However, research should examine whether national or institutional support of family friendly policies is a necessary condition for such findings. Furthermore, in the current study, we assessed the actual number of care-dependents as a cue for decision makers' perceived incongruity between women and deanship. However, the present study did not assess the actual time spending in care responsibilities. In line with previous research on motherhood penalties (e.g., Heilman & Okimoto, 2008) and the maybe baby effect (Gloor et al., 2017), the study does not allow generalization of these findings to women in general, particularly women lower in hierarchy, with young children, or in their childbearing phase.

Overall, the study results yielded stronger support for self-regulatory factors as explanations for women's low share in deanship positions. Specifically, the perceived presence of female deans at the academic unit was positively associated with job appeal of the deanship position for female but not male professors. These findings are in line with prior research on positive effects of role models on individuals' leadership self-concept (e.g., Asgari et al., 2012; Dasgupta & Asgari, 2004; Hoyt & Simon, 2011) and explain why the share of female deans, but not of female professors in the academic unit, was positively associated with the job appeal of the deanship position for female professors. That is, based on social comparison theory (Festinger, 1954), role models are assumed to positively affect self-perceptions through social comparison processes, particularly through self-enhancing upward comparisons, which likely occur in relation to female administrative leaders.

Finally, the study did not yield significant gender differences in agentic career goal endorsement (e.g., power, recognition, achievement). Overall, these findings were not surprising given that the female and male professors occupied occupational roles of similar constraints, expectations, and status (Eagly, 1987; Eagly & Wood, 2012). Furthermore, these results are in line with meta-analytical findings showing that women in male-dominated occupations rated most agentic job attributes as equally or more desirable than did men (Konrad et al., 2000). However, the mediator effects of agentic career goal endorsement on deanship ambitions through job appeal were significant only among male professors. These findings indicate that men value the status and leadership aspects of deanship more favorably than women. However, in contrast to our theoretical assumptions, there was a positive mediator effect of female (but not male) professors' communal career goal endorsement (e.g., serving community, working with people, attending to others' needs) on deanship ambition through job appeal. These findings indicate

that women value the people- and community-serving aspects of the deanship position more favorably than men.

## 7.1 | Limitations and practical implications

Although the study makes important contributions, it also has some limitations. First, among the study's strengths is its use of data from different sources to implement a time-lagged research design assessing explanations for women's prevailing low share in deanship positions. However, this design cannot completely rule out common method variance that may have inflated relationships among its self-reported measures (e.g., Podsakoff et al., 2012). Nevertheless, self-report measures were necessary to assess self-selection processes.

Second, although our study design is multisource and time-lagged, the interval between the two data collections was only 8 weeks. Future research would benefit from a longitudinal design that assesses recommendations and self-selection over several years. A much longer time period would also be required to allow assessment of whether professors proceed to occupy the dean role. Such an assessment was not possible in our study because of the very few deanships that became open in any year.

Third, beyond the individual and contextual factors that the study considered, other factors may be relevant, such as monetary incentives, teaching relief, personnel resources for research labs, as well as professors' scientific and publication success. In particular, future research should investigate the opportunity costs that may affect the administrative engagement of women and men (see Backes-Gellner et al., 2018). Thus, deanship is a time-consuming and complex role that ordinarily precludes deans pursuing substantial scholarly and scientific goals during their term of service. Success in these other domains of professors' activities may deter them from assuming administrative responsibilities.

Fourth, although the study does not support gender bias explanations for professors' transitions into deanships, bias could have operated in other phases of their academic careers, which entail past successful transitions between lower and higher professor ranks. Moreover, discriminatory processes could have operated in the education and training that preceded becoming a professor.

A fifth limitation is the more than occasional omissions of administrative data on women's share among professorships and deanships. Universities should systematically collect such statistics, given that they enable the monitoring of progress toward equal opportunity objectives.

Despite these limitations, the study's findings have important practical implications for universities' efforts to enhance gender diversity in administrative leadership roles. From a discriminatory perspective, the study results did not reveal that recommendations for deanships were weighted against women. Even if equal opportunity does prevail for administrative roles, it cannot increase women's share of administrative leaders, which typically is an institutional objective. Progress toward this objective would require preferential selection of women. As an example,

affirmative selection of women for professorships in U.S. STEM fields has resulted in an overall increase of women in science faculties (National Research Council, 2010).

The finding that female and male professors' prior experience in administrative positions was similarly associated with deanship recommendation suggests another route to increasing the representation of women: Gatekeepers could particularly encourage female professors to undertake administration (e.g., department head, vice dean) as a route to augmenting women's share at higher levels (e.g., dean, university head). Leadership development programs that recruit female professors can be successful tools in this regard.

Furthermore, if equal treatment prevails, another possibility would be to increase the pool of female professors interested in administrative positions. From a self-selection perspective, the findings suggest that women's ambition to pursue administrative leadership can be fostered by the presence of women in administrative roles, which enhances deanship job appeal for female professors and consequently leads to higher deanship ambitions. Given that perceptions of fewer men and more women in deanship enhanced the job appeal for female but not male professors, the appointment of role models such as female administrative leaders can itself bring in other women to administrative roles.

A related consideration is that agentic goal affordances were particularly relevant for men's deanship ambitions, whereas communal goal affordances were particularly relevant for women's deanship ambitions. Thus, consistent with goal congruity theory (Diekmann et al., 2017), another way to foster job appeal for women is to provide job profiles that make salient the possibilities of these positions for meeting communal goals (e.g., serving the community, fostering students' success) as well as agentic goals (e.g., status, power).

In summary, this study assessed the relative effects of discriminatory and self-selection processes on the ambition of women and men to undertake the administrative role of dean in universities. Contributing to the ongoing discussions of achieving more equal representation of women and men as professors and university administrative leaders, the study provided novel insights into individual and contextual influences that affect differences and similarities in the ambitions of women and men to rise into deanships. Consistent with our findings, increasing women's overall share in administrative leadership is likely to occur when universities make salient the presence of other women in these roles, implement preferential recommendation of women for administrative service, and communicate the communal rewards that can follow from these roles.

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#### CONFLICT OF INTEREST

The authors report no conflict of interest.

#### DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author, [L. H.], upon reasonable request.

#### ORCID

Levke Henningsen  <https://orcid.org/0000-0002-0236-804X>

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