

Gender Differences in Leadership Role Occupancy: The Mediating Role of Power Motivation

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Abstract Although the proportion of women in leadership positions has grown over the past decades, women are still underrepresented in leadership roles, which poses an ethical challenge to society at large but business in particular. Accordingly, a growing body of research has attempted to unravel the reasons for this inequality. Besides theoretical progress, a central goal of these studies is to inform measures targeted at increasing the share of women in leadership positions. Striving to contribute to these efforts and drawing on several theoretical approaches, the present study provides a contemporary examination of (a) whether women and men differ in their levels of power motivation and (b) whether potential gender differences in this motivation contribute to the unequal distribution of women and men in leadership positions. Results from four studies provide converging support for these assumptions. Specifically, we found that women consistently reported lower power motivation than men. This in turn mediated the link between gender and leadership role occupancy. These results were robust to several methodological variations including samples from different populations (i.e., student samples and large heterogeneous samples of employee), diverse operationalizations of power motivation and leadership role occupancy (self- and other ratings),

and study design (cross-sectional and time-lagged designs). Implications for theory and practice, including ways to contribute to a more equal gender distribution in leadership positions, are discussed.

Keywords Gender differences · Gender gap · Glass ceiling · Leadership role occupancy · Power motivation

Even though statistics indicate that gender parity has nearly been achieved in important areas such as educational attainment and share of the workforce, women are still underrepresented in leadership positions (Joy 2008). This holds true across organizational settings (e.g., business, politics, and the military) and leadership levels (Hausmann et al. 2010). In the United States, for instance, 47 % of the workforce is female but women account for only 14 % of top management positions and 17 % of the seats in congress (Hausmann et al. 2010). Similar patterns can be found in Germany (female top managers: 13 %, female parliamentarians: 33 %), in the UK (female top managers: 14 %, female parliamentarians: 22 %), and in most other western societies (Hausmann et al. 2010). From an equity and fairness perspective, these statistics are disturbing because they indicate that women, despite some progress over the past decades, are still disadvantaged in the largely male-defined domain of leadership (Eagly et al. 1994; O’Neil et al. 2007). Accordingly, the gender gap in leadership is regarded as one of the more central topics that need to be addressed from a business ethics perspective (Oakley 2000).

Against this background, it appears to be an important ambition to understand the reasons behind the underrepresentation of women in leadership roles in order to inform theory and, importantly, also guide practical interventions

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(Eagly and Carli 2007; Ibeh et al. 2008). Recent years have witnessed strong research interest in this topic. Perhaps the central finding of this work is that women's advancement is significantly hampered by external discrimination including higher performance standards (Lyness and Heilman 2006), limited access to career development measures in organizations (Hoobler et al., in press), and the promotion of women to precarious leadership positions (Haslam and Ryan 2008). These and related studies have provided important insights for understanding the uneven distribution of male and female leaders and have indicated effective routes for rectifying several biases.

The present study seeks to add to these studies by taking a motivational perspective on gender differences in leadership role occupancy. Specifically, based on both social structural (Diekmann and Eagly 2008; Heilman 2001) and evolutionary theories (Buss 1999; Tooby and Cosmides 1992), we propose that men may possess a stronger motivation for power than women. This, in turn, may affect the aspiration and appointment for leadership positions and consequently contribute to the gender difference in leadership role occupancy (i.e., the proportions of women and men holding leadership positions; Arvey et al. 2007; Bass 2008). Importantly, at this early point, we want to emphasize that we *do not* propose that potential gender differences in power motivation may compete with or even substitute for explanations related to discrimination. Rather, we believe that examining the motivation for power may provide one additional building block in the quest to understand gender differences in leadership role occupancy and important insights for designing effective interventions to establish a more even proportion of women and men in leadership positions.

Our reasoning is based on three insights that can be found in the literatures on leadership and gender differences, which we will elaborate upon further below: First, power is inherently linked to leadership (Yukl 2010). Although the leadership role is undergoing gradual change, power is still regarded as one essential element of leading and guiding other people (Robbins et al. 2010). Second, social structural as well as evolutionary perspectives would argue for a difference in power motivation between men and women (Diekmann and Eagly 2008; Tooby and Cosmides 1992). A convergence between these two influential but largely different perspectives seems to provide a strong theoretical rationale to expect potential gender differences. Third, the theoretical literature on power motivation, including McClelland's (1985) and Miner's (1978) works, understands power motivation as being malleable. Supporting this view, experimental studies have provided evidence that the motivation for power can be enhanced through measures such as role modeling and training courses (Bass 2008; Miner 1978; Waldman et al. 2012).

However, despite these three insights, across the past decades, almost no research has gone into (or at least surfaced in journals on) the relations between gender, motivation for power, and leadership role occupancy.

Gender Differences in Power Motivation

Power motivation has been defined as an interpersonal difference in the desire to influence others (McClelland 1985; Miner 1978). Individuals who score high on this motivation strive to attain positions that provide them with impact and authority. Unsurprisingly, the idea of examining gender differences in power motivation as one reason for the underrepresentation of female leaders is thus not entirely new. However, the vast majority of *primary studies* on this topic was conducted between 1970 and 1985 and was rather atheoretical and explorative in nature. To our knowledge, there has been no recent examination of this topic (for reviews of the traditional studies, see Eagly et al. 1994; Winter 1988). Yet, it appears plausible to expect that during the past 30 years, the profound societal changes that have taken place (e.g., changes in upbringing, alterations and increased permeability of gender roles, transformations of the working world) may have altered patterns in power motivation (Diekmann and Eagly 2008). Supporting this argument, a recent meta-analysis demonstrates that in recent decades the overlap between the female gender role and the leadership role has increased (Koenig et al. 2011).

Moreover, previous research on gender differences in power motivation has also yielded inconsistent findings. Whereas some studies have found that men score significantly higher than women, others have reported no differences between women and men (Eagly et al. 1994; Winter 1988). One reason for these conflicting findings may be that almost all of these studies have relied on projective tests. Yet these measures have often been criticized for not meeting common psychometric standards (i.e., reliability and [construct] validity)—particularly when compared to modern scales (Brief et al. 1976; Latham et al. 2010). Additionally, recent findings suggest that projective measures are considerably less predictive of important criteria in the leadership domain (i.e., leadership role occupancy and leadership effectiveness) than questionnaire scales (Hoffman et al. 2011; Howard 2005).

Finally, none of the previous studies has examined whether potential gender differences in the motivation for power actually contribute to gender differences in leadership role occupancy—and if yes, to what extent. However, this appears to be an essential question given that potential gender differences in power motivation are relevant only insofar as they actually contribute to gender difference in leadership outcomes (e.g., leadership role occupancy).

Against this background, the purpose of the present study was to provide a contemporary examination of the links between gender, power motivation, and representation in leadership positions.

In trying to explain differences in the motivation for power, two perspectives are particularly informative: the social structural perspective (Eagly and Karau 2002) and the evolutionary framework (Buss 1999; Tooby and Cosmides 1992). The social structural perspective emphasizes the perceived match between gender roles and actual behavior. Gender roles are defined as socially shared beliefs about attributes of men and women (Biddle 1979). Besides a descriptive component (i.e., shared beliefs about what women and men actually do), they include a strong injunctive component (i.e., norms of appropriate conduct for women and men; Eagly and Karau 2002). As Eagly (1987) noted, “Many of these expectations are normative in the sense that they describe qualities or behavioral tendencies believed to be desirable for each sex” (p. 13). Well-documented evidence shows that gender roles still differ considerably (Bosak and Sczesny 2011). Communal attributes such as supportive, empathic, and gentle are more strongly ascribed to women. Agentic attributes, such as assertive, competitive, controlling, and dominant are more strongly associated with the male gender role.

The distinction between communal and agentic attributes is also of central importance in the domain of leadership. Recent work on leadership roles has confirmed that these are still mainly defined in masculine (i.e., agentic) terms—despite the growing number of female attributes that have become an integral part of the leadership role (Koenig et al. 2011). People’s expectations about successful leadership behavior are strongly associated with attributes such as competitive, assertive, and decisive, which are traditionally regarded as male characteristics. The result is a misfit between the female gender role and the perceived requirements of the leadership role (Heilman 2001). As previous research has shown, role-incongruent behavior often goes along with social sanctions and disapproval (Wood et al. 1997). Hence, women who strive to attain a leadership position are more prone to role conflict than their male counterparts (Eagly et al. 1994). They risk negative social reactions as their aspirations may be judged as violating conventions of appropriate female behavior (Eagly and Karau 2002). Moreover, female leaders tend to be judged as more hostile (e.g., devious, selfish, and bitter) than their male counterparts (Heilman et al. 1995). Given these unfavorable dynamics, it appears plausible to expect a lower power motivation among women compared to men.

Besides this social structural account, gender differences can also be discussed from an evolutionary perspective. The central assumption of this approach is that traits and preferences result from human adaption to the physical and social

environment (Buss 1999; Van Vugt 2006). Evolutionary theories maintain that human characteristics developed as responses to challenges faced in evolution. Gender differences are regarded as stemming from different adaptive problems that women and men encountered. These different traits and strategies emerged to ensure survival and to maximize reproductive success (Tooby and Cosmides 1992).

According to the evolutionary view, gender differences are largely influenced by male competition for and female choice of mating partners. Women are restricted in number of offspring, and their parental investment tends to be higher (Buss 1999). As a result, they are more cautious when selecting mates. Conversely, men compete with other men for sexual access to women, and they strive for status and resources to attract female mates (Buss 1999). In the course of evolution, this presumably fostered the development of assertive characteristics among men and preferences for power and leadership (Van Vugt 2006).

Female mating success and survival, on the other hand, were more strongly dependent on the ability to maintain supportive social networks (Silk 2007). It is assumed that men actively sought out these dispositions in women because these traits enhance the chances of offspring survival. As a consequence, women may have developed a stronger motivation to cooperate rather than to strive for power and leadership (Buss 1999). In support of this notion, there is consistent evidence that women and men differ in several traits that may explain gender differences in leadership. For instance, men tend to be more assertive, risk taking, and self-confident than women (Mezulis et al. 2004). Additionally, prior research has found that in mixed gender groups, men are more likely to take initiative and to emerge as leader (Aries 1976). Please note that the aim of the present study was not to test social structural and evolutionary perspectives in comparison. Rather, we suggest that there are several theoretical perspectives that, although fundamentally different, lead to very similar conclusions. In summary, we propose:

Hypothesis 1 Gender is related to power motivation such that the level of power motivation is lower for women than for men.

Power Motivation and Leadership Role Occupancy

It is a widely accepted notion that motivation is a primary driver of behavior. Human motivation theory (McClelland 1985) describes motivations as affectively laden anticipations of desired situations that guide human behaviors toward these situations. Individuals who score high on power motivation find gratification in roles that allow them to be influential. Accordingly, they are strongly represented

in positions that provide incentives for influencing others and that require power-related behaviors and skill in using power. For instance, power-motivated individuals show higher aspirations for managerial positions (McClelland and Boyatzis 1982), tend to be politically more active (McClelland and Burnham 1976), and are more likely to pursue careers that involve teaching others (Winter 1973).

Motivation shapes the direction, intensity, and persistence of behavior (Robbins et al. 2010). Building on this notion, previous research suggests a strong link between individuals' motivation and their efforts and investments in attaining leadership positions (Van Iddekinge et al. 2009). Individuals high in power motivation should be particularly likely to seek out opportunities that allow them to acquire the skills and qualifications that are necessary for attaining leadership positions. And indeed, they seem to participate more frequently in formal leadership trainings, seek opportunities to talk to leaders and coaches, and regard successful managers as attractive role models (Van Iddekinge et al. 2009). Moreover, individuals high in power motivation are likely to show greater persistence in pursuing leadership tasks (Chan and Drasgow 2001). Hence, they tend to make better use of developmental opportunities, which fosters the development of leadership-relevant skills, knowledge, and abilities (Colquitt et al. 2000).

Given these links between power motivation and development-related efforts, it appears plausible to expect that individuals scoring high on this motivation may be particularly likely to attain leadership positions. In support, past work on career development and demands-abilities fit suggests that employees' capabilities and goals are central for their selection and promotion by organizations (Kristof-Brown et al. 2005). This process works through selection from within organizations but also through self-selection (Schneider 1987). Hence, it can be expected that power motivation should be positively related to leadership role occupancy. In support of this notion, Miner (1978) summarized a series of studies, which found that power motivation was related to ratings of leadership potential scores and promotions into management positions. By the same token, McClelland and Boyatzis (1982) found that an assessment of power motivation predicted the management level attained 16 years later. Hence, we propose:

Hypothesis 2 Power motivation positively relates to leadership role occupancy.

Gender, Power Motivation, and Leadership Role Occupancy

As outlined at the beginning of the article, recent statistics indicate that women are still underrepresented in leadership

positions (Hausmann et al. 2010). Prior research has demonstrated that external obstacles, like discrimination, play an important role for this (Eagly and Carli 2007). However, as discussed in the previous sections, influential theories (i.e., social structural theories, evolutionary approaches, and theories of power motivation), consistently suggest that differences in power motivation may be one additional explanation for the relation between gender and leadership role occupancy. Yet previous studies have paid little attention to this link—despite the fact that power motivation may be one important starting point for developing programs to reduce this gender bias (Bass 2008). Hence, integrating the line of reasoning we described in the previous sections, we propose:

Hypothesis 3 Power motivation mediates the relation between gender and leadership role occupancy.

Study Overview

Figure 1 summarizes our theoretical model, which we examined across four studies. These studies were conducted across samples from different populations (i.e., student samples in Studies 1 and 2; large heterogeneous samples of employees in Studies 3 and 4) and applied different study designs (i.e., cross-sectional and lagged designs). To ensure that our findings are not the result of a specific measure but reflect true relations among variables, we applied several operationalizations of our focal concepts (i.e., power motivation and leadership role occupancy) including biographically based self-ratings and other ratings. As Cook and Campbell (1979) noted, using different operationalizations can provide additional evidence for the validity of empirical findings if these different procedures yield consistent results. This approach has repeatedly been applied in previous research (e.g., De Cremer et al. 2010).

Study 1

We conducted Study 1 to provide an initial test for the proposed gender differences in power motivation. We examined this hypothesis in a sample of business students. As Eagly et al. (1994) pointed out, a business student sample provides a rather conservative test. Indeed, women who self-select into this traditionally male field of study, which prepares for management positions in organizations, may score higher on power motivation than women who pursue other fields of study such as the humanities (Eagly et al. 1994).

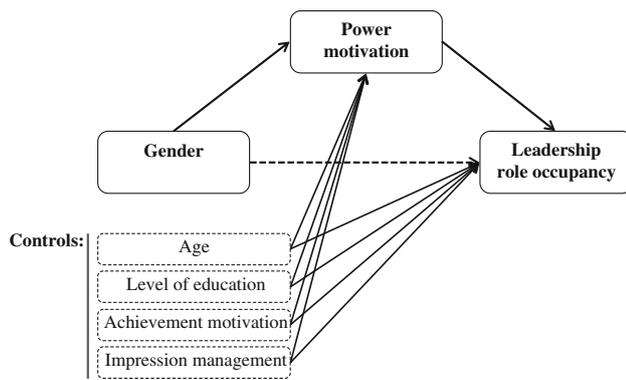


Fig. 1 Conceptual model linking gender, power motivation, and leadership role occupancy

Participants and Procedure

The sample was recruited in cooperation with a large German university. The sample consisted of 240 business students, 125 women and 115 men, with a mean age of 23.73 ($SD = 3.05$). Participants completed the Business-Focused Inventory of Personality (BIP; Hossiep et al. 2003; also see Hossiep and Paschen 2008), a widely applied questionnaire on work-relevant personality factors. The scale has been validated in Germany and the United Kingdom (Hossiep and Paschen 2008) and has been repeatedly applied in previous research (e.g., Bergner et al. 2010). Participation was voluntary and anonymous. In exchange for their participation, subjects received an individual feedback report regarding their BIP results. The report was automatically generated and sent exclusively to the individual participant.

Measures

Power Motivation

We measured participants' power motivation with the 15-item BIP scale (Hossiep et al. 2003). This measure had been developed based on McClelland's (1985) conceptualization of power motivation (Hossiep et al. 2003). All items were rated on a 6-point scale (1 = *strongly disagree* to 6 = *strongly agree*). Sample items are "I derive satisfaction from being able to influence others," "I don't like having to give people orders (reverse coded)," or "I am happy to take responsibility for important decisions" ($\alpha = .90$).

Control Variables

We controlled for the influence of several factors that may affect the relation between gender and power motivation. First, we controlled for achievement motivation because

previous research suggests a positive link to power motivation and the attainment of leadership positions (McClelland 1985). We assessed this variable with the 14-item achievement motivation scale of the BIP (Hossiep et al. 2003). Sample items are "Even after doing a very good job, I try to be better" and "I am very ambitious" (response scale: 1 = *strongly disagree* to 6 = *strongly agree*; $\alpha = .81$). Second, we controlled for participants' age (in years) because past research suggests that age can be positively related to power motivation (Chan and Drasgow 2001).

Results

Scale Analysis

We conducted confirmatory factor analyses (CFAs) to examine the distinctiveness of the applied scales. Because fitting models with large numbers of items can be problematic when the subject-to-item ratio undercuts the recommended ratio of 10:1, we formed item parcels (Bandalos 2002). For both scales (achievement and power motivation), items were randomly assigned to three parcels (i.e., three five-item parcels for power motivation; two five-item parcels; and one four-item parcel for achievement motivation; Little et al. 2002). The hypothesized two-factor model showed an acceptable fit to the data ($\chi^2 = 14.10$, $df = 8$; CFI = .99; RMSEA = .06). The alternative one-factor model combining both variables into one scale fit the data significantly worse ($\chi^2 = 192.55$, $df = 9$; CFI = .76; RMSEA = .29; $\Delta\chi^2 = 178.45$, $p < .001$).

Hypothesis Tests

Descriptive statistics and correlations are presented in Table 1. In line with Hypothesis 1, gender was significantly related to power motivation ($r = -.20$, $p < .01$). No other variable was correlated with gender. To further probe the relation between gender and power motivation, we conducted an ANCOVA controlling for age and achievement motivation. Again, we found the expected effect for gender, $F(1, 236) = 8.83$, $p < .001$. On average, men reported higher power motivation ($M = 4.06$, $SD = 0.77$) than women ($M = 3.74$, $SD = 0.82$). The size of this effect was moderately strong with $d = 0.40$ (Cohen 1988).

Discussion

This study provided an initial, straightforward test of the hypothesized relation between gender and power motivation. In line with our hypothesis, female students reported lower power motivation than their male counterparts. Taking this result as a starting point, we conducted the

Table 1 Summary statistics (Study 1)

Variables	<i>M</i>	<i>SD</i>	1	2	3	4
Controls						
1. Age	23.73	3.05	–			
2. Achievement motivation	4.10	0.67	.29**	(.81)		
Predictors						
3. Gender ^a	–	–	.05	–.08	–	
Dependent variables						
4. Power motivation	3.90	0.81	.20**	.44**	–.20**	(.90)

Note. *N* = 240. Internal consistency estimates (Cronbach's alphas) are displayed on the diagonal in parentheses

***p* < .01, two-tailed

^a Male = 0, female = 1

following studies to examine (a) whether we could replicate the findings in different samples and, if yes, (b) whether these effects were also related to gender differences in leadership role occupancy.

Study 2

Participants and Procedure

Sixty-one students from a German university participated voluntarily in this study in exchange for course credits. We conducted this study, which involved time-separated self- and other ratings, in a required one-term course for undergraduate psychology students. Out of 64 students who were invited to take part in the study, we received 61 complete data sets for a response rate of 95 %. During the course, students worked in 18 teams of three to five members to develop and conduct a research project. The teams worked together for 12 weeks and met several times per week. The results of the projects were graded and counted toward participants' bachelor degrees. The mean age of participants was 23.59 years (*SD* = 5.60). Eighty-two percent of the participants were female, which is in line with the average gender distribution of psychology students in Germany (Lindner 2003).

The first questionnaire assessing participants' gender, self-reported power motivation, and control variables was distributed at the beginning of the course. After 7 weeks, we distributed the second questionnaire, which assessed leadership role occupancy as rated by the other team members. At this time, the teams had completed those tasks that involved the strongest degree of interaction; afterwards, students spent more time working individually. Both questionnaires included several distractor items such as team identification and team efficacy to disguise the

purpose of this study. Participants completed the questionnaires anonymously. A coding scheme was used to match the individual data and team responses.

Measures

All construct measurements were taken from established research. We translated items into German and backtranslated them into English in line with the procedures outlined by Brislin (1980). All items were rated on 7-point scales (1 = *strongly disagree* to 7 = *strongly agree*).

Power Motivation

To assess participants' power motivation, we used Chan and Drasgow's (2001) 9-item scale measuring an individual's desire for leading others. The scale has been widely applied in previous studies (e.g., Lester et al. 2011). Sample items are "I am the type of person who likes to be in charge of others" and "I usually want to be the leader in the groups that I work in" ($\alpha = .85$).¹

Leadership Role Occupancy

Following previous research (e.g., Kellett et al. 2002; Sy et al. 2010), we measured this variable with the five-item global leadership scale by Lord et al. (1984). All participants rated every other group member on these five items. Sample items include "How much leadership did this member exhibit?" and "How much control over the group's activities did this member exhibit?" ($\alpha = .94$). We computed a leadership role occupancy score for every participant by aggregating the ratings of the other team members. The average interrater agreement was $r_{wg(j)} = .78$, indicating strong consensus among team members.²

Control Variables

As in Study 1, we controlled for the influence of several variables that may affect the relations among our study

¹ As noted earlier, we used three different scales of power motivation across our studies to ensure that our findings were not artifacts of the scales we applied. To provide further justification for this approach, we conducted a pilot study to examine the correlations among the scales (*N* = 57 students). Results revealed that the scales were highly related with correlations consistently $\geq .75$.

² Some groups did not include any male participants (yet no group included only men). To examine whether this had an effect on power motivation and leadership role occupancy, we compared the scores of female students with versus without male group members. ANOVAs showed no significant differences between the two groups on power motivation, $F(1, 48) = .00, p = .95$, or leadership role occupancy, $F(1, 48) = .85, p = .36$. Hence, the presence of male group members did not significantly affect the scores of female students.

variables but were not of direct theoretical interest. First, we controlled for subjects' prototypicality (i.e., the extent to which a team member is representative of a group) because prior studies have shown that prototypicality is positively related to leadership role occupancy (Ullrich et al. 2009). In our sample, male subjects may have stood out against the background of mainly female participants, which may have influenced the perception and attribution of leadership properties. We measured prototypicality with four items based on Ullrich et al. (2009). Sample items are: "I represent what most members of my team have in common" and "I am very similar to most members of my team" ($\alpha = .94$). Moreover, as in Study 1, we controlled for participants' age (Chan and Drasgow 2001).

Analytical Procedure

We tested our research model following Baron and Kenny's (1986) widely applied three-step approach for mediation analysis. To account for the nested nature of the data (participants were nested in teams), we conducted multi-level analyses (Raudenbush and Bryk 2002). Because all model and control variables resided at the individual level of analysis, we grand-mean centered all variables before entering them into the multilevel equations, following the recommendation by Preacher et al. (2010). The intraclass correlation (ICC 1) for leadership role occupancy was small with $ICC = .06$, which further corroborated group-mean centering (Preacher et al. 2010).

Scale Analysis

We conducted CFAs to examine the distinctiveness of the applied scales. Consistent with Study 1, we randomly assigned items to parcels (Little et al. 2002). We built three three-item parcels for power motivation and two two-item parcels for prototypicality. The hypothesized two-factor model showed an acceptable fit to the data ($\chi^2 = 6.95$, $df = 5$; $CFI = .99$; $RMSEA = .08$). The alternative model combining both scales into one factor fit the data worse ($\chi^2 = 104.64$, $df = 5$; $CFI = .48$; $RMSEA = .58$; $\Delta\chi^2 = 97.69$).

Hypothesis Tests

Descriptive statistics and correlations are presented in Table 2. Table 3 shows the multilevel equations as well as the results of the analyses. First and consistent with Hypothesis 1, participants' gender significantly predicted power motivation ($\gamma = -.60$, $SE = .33$, $t = -1.83$, $p < .05$). Men ($M = 5.05$, $SD = 1.02$) reported higher power motivation than women ($M = 4.46$, $SD = .94$). The

Table 2 Summary statistics (Study 2)

Variables	<i>M</i>	<i>SD</i>	1	2	3	4	5
Controls							
1. Age	23.59	5.60	–				
2. Prototypicality	3.77	1.74	–.20	(.94)			
Predictors							
3. Gender ^a	–	–	.04	.20	–		
4. Power motivation	4.56	.98	–.22 [†]	.03	–.24 [†]	(.85)	
Dependent variables							
5. Leadership role occupancy	4.68	1.17	–.07	.07	–.18	.37**	(.94)

Note. $N = 61$. Internal consistency estimates (Cronbach's alphas) are displayed on the diagonal in parentheses

^a Male = 0, female = 1

[†] $p < .10$, two-tailed; * $p < .05$, two-tailed; ** $p < .01$, two-tailed

size of this difference was $d = 0.60$ (Cohen 1988). In a second step, we regressed the outcome variable (i.e., leadership role occupancy) on the mediator (i.e., power motivation) while controlling for the antecedent (i.e., participants' gender). In line with Hypotheses 2, power motivation was significantly related to leadership role occupancy while controlling for gender ($\gamma = .38$, $SE = .17$, $t = 2.18$, $p < .05$). The third step in our analyses revealed that gender significantly predicted leadership role occupancy ($\gamma = -.87$, $SE = .39$, $t = 2.21$, $p < .05$). Men scored higher on leadership role occupancy than women. Moreover, a comparison of Steps 2 and 3 showed that the relation between gender and leadership role occupancy was significantly reduced when power motivation was entered into the equation ($\gamma = -.64$, $SE = .39$, $t = -1.65$, $p = .052$). These results provide evidence for mediation. This finding was corroborated by a subsequent bootstrap analysis, which revealed that the confidence interval of the indirect effect did not include zero (*indirect effect* = $-.23$, $CI_{90\%} [-.54, -.01]$).³

To obtain an effect size estimate for the indirect effect, we calculated Alwin and Hauser's (1975) validation ratio (P_M). P_M is defined as the ratio of the indirect effect to the total effect. We obtained an estimate of $P_M = .26$. This suggests that 26 % of gender differences in leadership role occupancy could be attributed to differences in power motivation.

³ Please note that 90 % confidence intervals around indirect effects correspond to one-tailed testing at $\alpha = .05$. As methodologists have repeatedly noted, it is fully adequate to examine *directional* mediation hypotheses using one-tailed testing (i.e., 90 % confidence intervals; Preacher et al. 2010).

Table 3 Results of hierarchical linear modeling (Study 2)

Steps and dependent variables	Step 1 Power motivation (PM)		Step 2 Leadership role occupancy (LRO)		Step 3 Leadership role occupancy (LRO)	
	γ	SE	γ	SE	γ	SE
	L1: $PM_{ij} = \beta_{0j} + \beta_{1j} (AG_{ij} - AG_{.j}) + \beta_{2j} (PR_{ij} - PR_{.j}) + \beta_{3j} (GE_{ij} - GE_{.j}) + r_{ij}$		L1: $LRO_{ij} = \beta_{0j} + \beta_{1j} (AG_{ij} - AG_{.j}) + \beta_{2j} (PR_{ij} - PR_{.j}) + \beta_{3j} (GE_{ij} - GE_{.j}) + \beta_{4j} (PM_{ij} - PM_{.j}) + r_{ij}$		L1: $LRO_{ij} = \beta_{0j} + \beta_{1j} (AG_{ij} - AG_{.j}) + \beta_{2j} (PR_{ij} - PR_{.j}) + \beta_{3j} (GE_{ij} - GE_{.j}) + r_{ij}$	
	L2: $\beta_{1j} = \gamma_{10} \beta_{2j} = \gamma_{20} \beta_{3j} = \gamma_{30} \beta_{4j} = \gamma_{40}$		L2: $\beta_{1j} = \gamma_{10} \beta_{2j} = \gamma_{20} \beta_{3j} = \gamma_{30} \beta_{4j} = \gamma_{40}$		L2: $\beta_{1j} = \gamma_{10} \beta_{2j} = \gamma_{20} \beta_{3j} = \gamma_{30}$	
Controls						
Age (AG, γ_{10})	.02	.05	-.02	.05	.00	.05
Prototypicality (PR, γ_{20})	-.14	.10	-.14	.11	-.20	.12
Predictors						
Gender (GE, γ_{30}) ^a	-.60*	.33	-.64	.39	-.87*	.39
Power motivation (PM, γ_{40})	-	-	.38*	.17	-	-
-2 Log likelihood	162.55		179.04		183.53	
Δ -2 Log likelihood	-		-		4.49*	

Note. $N = 61$. It is important to note that we applied one-tailed tests to examine the hypothesized relations. This approach is adequate given the directional nature of the examined hypotheses (Hair et al. 2009)

* $p < .05$, one-tailed

^a Male = 0, female = 1

Supplemental Analyses

In line with Becker's (2005) recommendation, we tested the hypotheses again without any control variables. Becker (2005) noted that this analysis can strengthen the confidence in empirical results as it rules out the control variables as explanatory. Again, gender predicted power motivation ($\gamma = -.65$, $SE = .34$, $t = 1.95$, $p < .05$) and leadership role occupancy ($\gamma = -.95$, $SE = .41$, $t = 2.33$, $p < .05$). Further, power motivation predicted leadership role occupancy ($\gamma = .43$, $SE = .17$, $t = 2.45$, $p < .01$) and mediated the link between gender and leadership role occupancy (indirect effect = $-.28$, $CI_{90\%} [-.64, -.02]$).

Discussion

This study provided the first evidence for our hypothesis that power motivation may mediate the relation between gender and leadership role occupancy. As hypothesized, we found that women scored lower on power motivation than men. This, in turn, emerged as one reason for the lower numbers of female students in leader role occupancy.

One potential shortcoming of this study is that the composition of the teams was based on the voluntary choices of participants rather than on random assignment. However, this does not seem to be a serious problem in the present context because it is unclear how this process would have biased the results toward men (especially given

that women working with vs. without men did not differ in their power motivation and leadership scores). A second limitation of the study is that it relied on a student sample. Even though the research setting possessed a strong degree of realism (the teams worked together for several weeks, which facilitated an informed choice of the leader, and project results were personally relevant to the participants as they were graded), it seemed important to replicate these results in an organizational context. This should be an even more conservative test of our hypotheses because, compared to the present study, leadership selection in organizations is based on more formal processes, and thus the influence of power motivation was expected to be mitigated (Yukl 2010).

Study 3

Participants and Procedure

We recruited participants via links on a diverse set of online portals in Germany. This approach has been repeatedly applied in previous studies because it reaches large heterogeneous samples of working individuals (e.g., Kovjanic et al., 2012; Van Quaquebeke et al. 2011). A total of 382 employees participated in this study. Their average age was 26.58 years ($SD = 7.13$), and mean work experience equaled 9.45 years ($SD = 6.73$). Fifty-seven percent of the participants were female. Participants in our sample

worked in a wide range of sectors with the most frequent being service (22 %), travel/transport (9 %), and engineering (7 %). Participation was voluntary and anonymous. In exchange for their participation, participants could enter a lottery for five gift vouchers worth €25 each.

Measures

All items were translated into German and backtranslated into English following the procedures outlined by Brislin (1980). Items were rated on 5-point scales (1 = *strongly disagree* to 5 = *strongly agree*).

Power Motivation

To measure power motivation, we used the 15-item scale by Borgogni et al. (2004). The scale, which is part of a thoroughly validated motivational questionnaire (Borgogni et al. 2004), is theoretically based on McClelland's (1985) conceptualization of power motivation. As reported above (please see Footnote 1), we found high correlations between this scale and the scales applied in Studies 1 and 2. Sample items are "I have a tendency to take on influential positions" and "I enjoy making decisions for other people" ($\alpha = .86$).

Leadership Role Occupancy

To assess leadership role occupancy, we asked participants to indicate whether they currently held a formal leadership position in their job. The answer format was dichotomous (*yes/no*). This classification of leadership role occupancy based on formal leadership positions has been widely applied in previous studies (e.g., Arvey et al. 2007; Bass 2008; Day et al. 2004; Judge et al. 2002). Many of these studies have applied dichotomous measures (e.g., Day et al. 2004, used the position of captain on hockey teams as an indicator of leadership role occupancy); others applied a scoring function based on hierarchical levels (e.g., Arvey et al. 2007; see also Study 4 below). Importantly, there is strong evidence for the reliability and construct validity of both of these operationalizations (Arvey et al. 2007). Moreover, previous research suggests that objective biographical facts are accurately captured by self-reported information. For instance, Cascio (1991) reported correlations between .90 and .98 between self-reported biographical information and actual biographical records. Finally, it is important to note that leadership role occupancy is distinct from leadership effectiveness (which denotes how well a person performs once in a leadership position; Judge et al. 2002). Accordingly, the present research cannot (and did not intend) to make any inferences about gender differences in leadership effectiveness. For a

detailed discussion of the concept and measurement of leadership role occupancy, please also see Arvey et al. (2007).

Control Variables

Again, we controlled for the influence of several factors. First, we controlled for impression management to eliminate the potential influences of social desirability (Paulhus 1991). Because gender roles regarding leadership behavior differ for men and women, these cultural expectations could influence the responses to power motivation (Eagly and Carli 2007). We assessed this variable with the 10-item scale by Borgogni et al. (2004; $\alpha = .68$). A sample item is "I never disappoint other people who trust in me." Second, we controlled for achievement motivation because this variable has been related to power motivation and leadership role occupancy (McClelland 1985). We measured this variable with the 15-item scale by Borgogni et al. (2004). A sample item is "I strive to reach my goals even if this involves much effort" ($\alpha = .79$). Third, because this was not a university environment anymore (cf. Studies 1 and 2), we controlled for educational attainment because education relates to leadership role occupancy (e.g., Harlan and Weiss 1982). To this end, participants indicated their highest degree in the German education system in three categories from a basic college degree to university degree. Finally, we controlled for participants' age because it too may influence leadership occupancy (Chan and Drasgow 2001).

Analytical Procedure

We conducted hierarchical regression analyses using the procedure by Baron and Kenny (1986) to test our hypotheses. To examine the relation between gender and power motivation, we conducted ordinary least squares regression. To examine the relations between gender as well as power motivation and leadership role occupancy, we applied a logistic regression analysis to account for the dichotomous nature of the outcome variable (Hayes 2011). Please note that for dichotomous outcomes, neither the validation ratio nor any other effect size based on the ratio of the indirect to the total effect can be estimated (Hayes 2011).

Results

Scale Analysis

We conducted CFAs to examine the distinctiveness of the applied scales. Again, we randomly assigned items to parcels (Little et al. 2002). For all three scales (i.e., power

motivation, achievement motivation, and impression management), items were clustered into parcels containing five items each. Results revealed an acceptable fit of the hypothesized three-factor model ($\chi^2 = 73.90$, $df = 17$; CFI = .95; RMSEA = .098). The alternative one-factor and all possible two-factor models fit the data significantly worse (the best fitting alternative model was the one-factor model combining all three scales into one dimension: $\chi^2 = 225.76$, $df = 20$; CFI = .83; RMSEA = .17; $\Delta\chi^2 = 151.86$, $p < .001$).

Hypothesis Tests

Table 4 presents descriptive statistics and correlations among the study variables. To enable closer comparisons between the responses of women and men, Table 5 shows the scores on all variables split by gender. The results of the regression analyses are presented in Table 6. In the first step, participants' gender significantly predicted power motivation ($b = -.17$, $SE = .05$, $\beta = -.15$, $t = -3.35$, $p < .001$) such that men ($M = 3.01$, $SD = 0.58$) reported stronger power motivation than women ($M = 2.82$, $SD = 0.54$). The size of this effect was $d = 0.34$ (Cohen 1988). This result supports Hypothesis 1. In line with Hypothesis 2, power motivation predicted whether participants held a leadership position ($b = 2.07$, $SE = .35$, $Wald = 35.76$, $p < .001$). Individuals who reported higher power motivation were more likely to hold a leadership position than participants with lower levels of this motivation. The third step of our analysis revealed that gender significantly predicted leadership role occupancy ($b = -1.66$, $SE = .30$, $Wald = 31.23$, $p < .001$). Women were less likely to hold a leadership position than men. This relation was significantly weakened when power motivation was entered into the equation ($b = -1.53$, $SE = .32$, $Wald = 22.83$, $p < .001$). Taken together, these results provide evidence for mediation. Additionally, the confidence interval of the subsequent bootstrap analysis did not include zero, which provides further support for the mediating role of power motivation (*indirect effect* = $-.35$, $CI_{95} \% [-.60, -.13]$).⁴

⁴ For Studies 3 and 4, we also conducted all hypothesis tests using industry as an additional control. To this end, we applied the Standard Industrial Classification (SIC) system by the US Department of Labor, which distinguishes 10 broad industrial categories. The SIC has been widely applied in previous studies (e.g., Probst et al. 2008). Importantly, including industry as a control (i.e., nine dummy variables coding the 10 industry types) did not change the pattern of results. Given space restrictions in the tables (i.e., in Tables 5, 6), the results are not reported here; however, they are available from the first author.

Supplemental Analyses

Again, in line with Becker's (2005) recommendation, we conducted tests of all hypotheses without any control variables. We obtained the same pattern of results. Gender predicted power motivation ($b = -.19$, $SE = .06$, $\beta = -.17$, $t = -3.32$, $p < .01$) and leadership role occupancy ($b = -1.54$, $SE = .28$, $Wald = 30.76$, $p < .001$). Further, power motivation significantly predicted leadership role occupancy ($b = 1.97$, $SE = .30$, $Wald = 44.68$, $p < .001$), and the link between gender and leadership role occupancy was significantly reduced when power motivation was entered into the equation ($b = -1.44$, $SE = .30$, $Wald = 22.68$, $p < .001$; *indirect effect* = $-.37$, $CI_{95} \% [-.66, -.16]$).

Discussion

Study 3 provided a test of our hypotheses in a sample of working individuals. As expected, the results showed that female employees scored lower on power motivation and leadership role occupancy than their male counterparts. Additionally, we found that power motivation mediated the link between gender and leadership role occupancy. Because we controlled for the influence of several factors including achievement motivation and impression management, we could rule out several alternative explanations for our findings.

One shortcoming of this study was the dichotomous operationalization of leadership role occupancy we had to rely on. To validate our findings, it would be important to also examine more fine-grained indicators of leadership and power, which may intensify or attenuate the proposed relations. Moreover, this would enable us to estimate the size of the mediated effect (Hayes 2011). Accordingly, we conducted a fourth study in which we assessed participants' hierarchical position as an indicator of leadership role occupancy.

Study 4

Participants and Procedure

The study was conducted in cooperation with organizations from a broad spectrum of industries. Employees of these organizations were invited via e-mail to take part in a study on work-relevant traits and motives. To this end, participants completed the BIP (Hossiep et al. 2003; also see Study 1). A total of 861 employees participated in this study. The sample comprised 255 women and 606 men with a mean age of 39.46 years ($SD = 7.92$). As in Study 3, participants worked in a wide range of sectors with the most frequent being service (19 %), engineering

Table 4 Means, standard deviations, and correlations for Study 3 (above the diagonal) and Study 4 (below the diagonal)

Variables	Study 3			Study 4			1	2	3	4	5	6	7
	Scale	<i>M</i>	<i>SD</i>	Scale	<i>M</i>	<i>SD</i>							
Controls													
1. Age	–	26.58	7.13	–	39.46	7.92	–	.25***	–.02	.03	–.02	–.01	.20***
2. Education ^a	1–3	1.20	.88	1–8	6.72	1.23	.11**	–	–.08	–.04	–.02	–.07	–.02
3. Achievement motivation	1–5	3.80	.41	1–6	4.33	.63	–.07*	.05	–	.57***	–.04	.49***	.18***
4. Impression management	1–5	3.66	.39	1–6	–	–	–	–	–	–	–.03	.25***	.13*
Predictors													
5. Gender ^b	–	–	–	–	–	–	–.22**	–.09*	–.12**	–	–	–.17**	–.30***
6. Power motivation	1–5	2.90	.57	1–6	4.43	.67	.08*	.09**	.52**	–	–.21**	–	.41***
Dependent variables													
7. Leadership role occupancy	%	.21	.41	1–5	1.74	1.11	.29**	.06	.10**	–	–.20**	.29**	–

Note. Study 1: *N* = 382 employees, Study 2: *N* = 861 employees

* *p* < .05, two-tailed; ** *p* < .01, two-tailed; *** *p* < .001, two-tailed

^a Higher scores indicate higher education

^b Male = 0, female = 1

Table 5 Sample characteristics for Studies 3 and 4, split by gender

	Study 3				Study 4			
	Scale	Women <i>n</i> = 217	Men <i>n</i> = 165	<i>d</i>	Scale	Women <i>n</i> = 255	Men <i>n</i> = 606	<i>d</i>
Controls								
Age	–	26.45 (7.45)	26.75 (6.69)	–0.04	–	36.83 (8.09)	40.57 (7.59)	–0.48***
Education ^a	1–3	1.19 (0.78)	1.22 (0.91)	–0.04	1–8	6.55 (1.32)	6.78 (1.19)	–0.19*
Achievement motivation	1–5	3.79 (0.42)	3.82 (0.40)	–0.09**	1–6	4.21 (0.63)	4.38 (0.63)	–0.27***
Impression management	1–5	3.65 (0.40)	3.67 (0.39)	–0.05	1–6	–	–	–
Study variables								
Power motivation	1–5	2.82 (0.54)	3.01 (0.58)	–0.34***	1–6	4.21 (0.69)	4.53 (0.64)	–0.48***
Leadership role occupancy ^b	%	10.14	34.55	–24.4***	1–5	1.40 (1.03)	1.88 (1.11)	–0.44***
Work group supervisor	%	–	–	–	%	46.67	39.44	7.23***
Team leader	%	–	–	–	%	19.61	24.92	–5.31
Department manager	%	–	–	–	%	13.33	20.63	–7.30*
Director	%	–	–	–	%	3.53	7.92	–4.39*
Executive	%	–	–	–	%	–	.99	–0.99

Note. *d* denotes effect sizes based on Cohen’s (1988) *d* for metric variables. For categorical variables, *d* denotes simple difference scores. To test gender differences on metric variables we calculated one-way ANOVAs; for categorical variables, we conducted Chi square tests

* *p* < .05, two-tailed; ** *p* < .01, two-tailed; *** *p* < .001, two-tailed

^a Higher scores indicate higher education

^b In Study 3, leadership role occupancy was operationalized as a dichotomous measure; in Study 4, following the procedure by Arvey et al. (2007), we calculated a composite score based on hierarchical position

(16 %), and pharmaceuticals/chemistry (9 %). Participation was voluntary and anonymous. In exchange for their participation, subjects received an individual feedback report regarding their BIP results. The report was automatically generated and sent exclusively to the individual participant.

Measures

Power Motivation

As in Study 1, power motivation was assessed with the 15-item power motivation scale of the BIP (Hossiep et al.

Table 6 Results of hierarchical regression analyses (Studies 3 and 4)

Steps and dependent variables	Step 1 Leadership motivation		Step 2 Leadership role occupancy		Step 3 Leadership role occupancy	
	<i>b</i>	<i>SE</i>	<i>b</i>	<i>SE</i>	<i>b</i>	<i>SE</i>
Study 3						
Intercept	.63*	.28	−9.64***	1.93	−7.68***	1.70
Controls						
Age	.00	.00	.08***	.02	.08***	.02
Education ^a	−.03	.03	−.17	.18	−.20	.17
Achievement motivation	.69***	.07	−.21	.54	1.20**	.45
Impression management	−.07	.08	.38	.48	.18	.43
Predictors						
Gender ^b	−.17***	.05	−1.53***	.32	−1.66***	.30
Power motivation	−	−	2.07***	.35	−	−
<i>R</i> ²	.26***		−		−	
−2 Log likelihood	−		279.43		325.04	
Δ−2 Log likelihood	−		−		45.49***	
Study 4						
Intercept	1.74***	.20	1.28**	.38	−.52	.37
Controls						
Age	.01**	.00	.04***	.01	.04***	.01
Education ^a	.03	.02	.00	.03	.01	.03
Achievement motivation	.53***	.03	−.06	.07	.18**	.06
Predictors						
Gender ^b	−.19***	.04	−.22**	.08	−.30***	.08
Power motivation	−	−	.44***	.06	−	−
<i>R</i> ²	.30***		.16***		.11***	
Δ <i>R</i> ²	−		−		.05***	

Note. Study 3: *N* = 382 employees, Study 4: *N* = 861 employees. In Study 3, coefficients in Step 1 are based on an ordinary least square regression; coefficients in Steps 2 and 3 were estimated using logistic regression analyses. In Study 4, all coefficients are based on ordinary least square regression analyses

* $p < .05$, two-tailed; ** $p < .01$, two-tailed; *** $p < .001$, two-tailed

^a Higher scores indicate higher education

^b Male = 0, female = 1

2003). All items were rated on a 6-point scale (1 = *strongly disagree* to 6 = *strongly agree*). A sample item is “I derive satisfaction from being able to influence others” ($\alpha = .83$).

Leadership Role Occupancy

To measure leadership role occupancy, we followed the procedure by Arvey et al. (2007). Participants indicated whether they currently held a formal leadership position in their job. Five different options were presented (i.e., work group supervisor, team leader, department manager, director, member of the executive board; also see Table 5). Following Arvey et al. (2007), for each individual, we calculated a score based on these items by assigning 5 points if participants checked executive (i.e., the highest

hierarchical category), 4 points if a person checked director (the second-highest category), etc. The mean leadership role occupancy score was 1.74 ($SD = 1.11$). As describe above, there is substantial evidence for the validity of this biographically based measure of leadership role occupancy, which has been repeatedly been applied in previous studies (cf. Arvey et al. 2007).

Control Variables

As in our previous studies, we controlled for several variables. Again we controlled for achievement motivation due to its links with power motivation and leadership role occupancy (McClelland 1985). We assessed this variable with the 14-item achievement motivation scale of the BIP (Hossiep et al. 2003). Items were rated on a 6-point scale

(1 = *strongly disagree* to 6 = *strongly agree*). Sample items are “Even after doing a very good job I try to do better” ($\alpha = .77$). Further, we controlled for participants’ educational level. Participants were asked to indicate their highest educational degree. Educational level contained six categories from a basic level to an advanced level.

Analytical Procedure

To test our hypotheses, we conducted hierarchical ordinary least squares regressions. Again, we followed the procedure by Baron and Kenny (1986).

Results

Scale Analysis

We conducted CFAs to examine the distinctiveness of our scales. Consistent with Study 1, the items of both scales (achievement and power motivation) were randomly assigned to three parcels each (Little et al. 2002). The hypothesized two-factor model showed an acceptable fit to the data ($\chi^2 = 29.79$, $df = 8$; CFI = .99; RMSEA = .06). The alternative one-factor model combining both variables into one scale fit the data significantly worse ($\chi^2 = 395.74$, $df = 9$; CFI = .81; RMSEA = .22; $\Delta\chi^2 = 365.95$, $p < .001$).

Hypothesis Tests

Table 4 presents descriptive statistics and correlations for all variables. Results of the regression analyses are presented in Table 6. In line with Hypothesis 1, gender significantly predicted power motivation ($b = -.19$, $SE = .04$, $\beta = -.13$, $t = -4.40$, $p < .001$). Men reported higher power motivation ($M = 4.53$, $SD = 0.64$) than women ($M = 4.21$, $SD = 0.69$). The size of this difference was $d = 0.48$ (Cohen 1988). In the second step, power motivation was positively related to leadership role occupancy ($b = .44$, $SE = .06$, $\beta = .26$, $t = 7.08$, $p < .001$). These findings support Hypothesis 2. Finally, a third step of our analysis revealed that gender was significantly related to participants’ leadership role occupancy ($b = -.30$, $SE = .08$, $\beta = -.12$, $t = -3.73$, $p < .001$). Compared to female employees, men had reached higher levels in the hierarchy. The relation between gender and this variable was significantly reduced when power motivation was entered into the equation ($b = -.22$, $SE = .08$, $\beta = -.09$, $t = -2.74$, $p < .01$). Taken together, these results provide evidence for the proposed mediation. Additionally, the confidence interval of the subsequent bootstrap analysis did not include zero, which provides further support for the mediating role of power motivation (*indirect effect* =

$-.08$, CI_{95%} [-.13, -.05], $p < .05$). The effect size of the mediation was $P_M = .27$.

Supplemental Analyses

Again, we tested our hypotheses without any control variables (Becker 2005). We found the same pattern of results. Gender was significantly related to power motivation ($b = -.31$, $SE = .05$, $\beta = -.21$, $t = -6.43$, $p < .001$) and leadership role occupancy ($b = -.48$, $SE = .08$, $\beta = -.20$, $t = -5.88$, $p < .001$). Second, power motivation predicted leadership role occupancy ($b = .47$, $SE = .05$, $\beta = .29$, $t = 8.75$, $p < .001$). Finally, the link between gender and leadership was reduced when power motivation was entered into the analyses ($b = -.35$, $SE = .08$, $\beta = -.14$, $t = -4.28$, $p < .001$). Further support for the mediating role of power motivation was provided by the subsequent bootstrap analyses (*indirect effect* = $-.15$, CI_{95%} [-.20, -.09], $p < .05$).

Discussion

Study 4 replicated the findings of the previous studies and provided support for the expected gender differences in power motivation. Female employees scored lower on power motivation than male employees. Furthermore, this study extended the findings of Study 3 by suggesting that power motivation mediates not only the relation between gender and a dichotomous indicator for leadership role occupancy but also the relation with hierarchical level as a more fine-grained indicator of leadership role occupancy.

General Discussion

A growing body of research has sought to identify the reasons for the underrepresentation of women in leadership positions (Eagly and Carli 2007; Oakley 2000). The present research contributed to these efforts. Specifically, based on an integration of social structural, evolutionary, and motivational theories, we examined whether women and men differ in their motivation for power. Moreover, the study tested whether gender differences in power motivation may be one mechanism that contributes to the uneven representation of women and men in leadership positions—thereby opening up new avenues for potential interventions in practice.

Four studies provided converging support for our hypotheses. Specifically, we consistently found that men scored higher on power motivation than women. In all four studies, the gender difference was relatively strong (Cohen’s d ranged from 0.34 to 0.60.). This was surprising to us given that these differences between women and men

are stronger than many effects reported in traditional research. For instance, in summarizing primary studies conducted between 1969 and 1988, Eagly et al. (1994) reported an average difference of $d = 0.19$ in power motivation; Winter and colleagues even found no gender effects in this motivation (Winter 1988). Although it is important to be cautious when comparing these studies with the present findings [most importantly because they relied on different (i.e., projective) measures], these results suggest that gender differences in power motivation at the very least may not have become weaker across the past three decades. Indeed, one might have rather expected equalization in power motivation given the profound societal changes and the fact that the overlap between the female role and the leadership role has substantially increased (the leadership role increasingly includes feminine relational characteristics; Koenig et al. 2011). This finding suggests that changes in one domain (e.g., leadership roles) may not necessarily generalize to other variables (e.g., power motivation) and that it is highly warranted to carefully distinguish and examine the concepts that relate to differences between women and men.

The second central question of this research concerned the link between gender and leadership role occupancy. The data provided consistent support for the hypothesis that power motivation may be one mediating variable in this relation. Specifically, the results suggest that the higher level of power motivation among men is one route that fosters the higher proportion of male leaders. Across our studies, an inspection of the effect sizes suggests that gender differences in power motivation accounted for about 26 % of the total relation between gender and leadership role occupancy (specifically, 26 % in Study 3; 27 % in Study 4). Hence, this effect was relatively strong, which may reflect the close link between leadership and power (Bass 2008). On the other hand, this result also corroborates the argument that power motivation is only one aspect that contributes to gender differences in leadership positions, and that a substantial proportion of gender differences in leadership role occupancy is due to other important factors, such as explicit and implicit gender discrimination (Eagly and Carli 2007).

It is noteworthy that these findings were robust to several methodological variations. First, the pattern of results did not change whether or not we controlled for several potential influences. Hence, we could exclude important alternative explanations that may have also accounted for the differences in power motivation and leadership role occupancy. Specifically, these analyses suggest that the results cannot be explained by potential gender differences in educational attainment or achievement motivation, nor do they seem to be an artifact of role-congruent impression management but rather seem to reflect actual gender differences.

Second, we applied different measures of power motivation across the studies. Even though these scales were significantly correlated, the fact that we found highly consistent results can provide additional confidence in the findings because they suggest that the reported gender differences were robust to the measures we applied. Finally, on a related token, the consistency of the findings across different operationalizations of leadership role occupancy (other-rated leadership role occupancy and biographically based self-ratings), different samples (students of different subjects as well as employees from a wide range of industries), and study designs (cross-sectional and time lagged) support the validity of the findings.

Limitations

Despite several strengths, the findings of the present study should be interpreted in light of some limitations. Perhaps the primary concern relates to Studies 2 to 4, which examined the relation between gender and leadership role occupancy. We do acknowledge that each of the three studies, when considered in isolation, is not without its limitations—for instance, the relatively small sample size of Study 2, the dichotomous measure of leadership role occupancy in Study 3, or the cross-sectional design (which our research shares with the majority of studies in the leadership domain) in Studies 3 and 4. However, these studies were conducted to complement each other and, when considered as a set, the weaknesses of each study are compensated by the strengths of the others. For example, the fact that we found consistent effects (and effect sizes) in all four studies speaks against the argument that the results of Study 2 are an artifact of sampling error. Moreover, the fact that we found converging results for other-rated leadership role occupancy and for biographically based self-ratings speaks against the interpretation that the findings of Studies 3 and 4 are artifacts of same-source bias or impression management (which is further supported by the fact that controlling for impression management did not change the results). Finally, it is important to note that all operationalizations we used in our studies had been widely applied and validated by previous research.

A second concern one could raise about the present research relates to the fact that all studies were conducted in German samples. However, a comparison of central indicators of gender equality (i.e., including share of workforce, share of management positions, and female representation in parliament; see introduction) reveals a strong similarity between Germany and those countries where most studies on gender differences have been conducted (i.e., the United States and Great Britain; Hausmann et al. 2010). This impression is supported by cross-cultural comparisons of national culture (e.g., Hofstede 2001). On

the masculinity dimension, which captures role differences between men and women and a preference for traditionally male role requirements (Hofstede 2001; Robbins et al. 2010), Germany, the United States, and Great Britain score very similarly (Germany and the UK: 66; United States: 62; Hofstede 2001). These benchmarks suggest that our findings most likely generalize to those western countries that are in a developmental stage of gender equality similar to Germany. However, it would be interesting to compare our findings to countries with higher or lower gender equality. The social structural perspective would assume that gender differences in power motivation depend on differences in role perceptions and hence, should vary between countries with different gender equality. We believe that these cross-cultural comparisons can be a promising avenue for future research.

Practical Implications

The present findings also bear important implications for practice. Indeed, a primary motivation for the present research was to examine a route (i.e., differences in power motivation) that might provide beneficial insights for contributing to a more equal proportion of both genders in leadership positions. Against this background, the central result of this study is that gender differences in power motivation may be one reason for the unequal distribution of women and men in leadership positions. Hence, one effective way to achieve a more balanced gender distribution in leadership positions may lie in measures that help foster power motivation among women.

As stated in the introduction, previous research has shown that power motivation is sensitive to practical interventions. For instance, a structured training course by Miner (1975) to prepare individuals for management and leadership positions in organizations yielded positive effects on power motivation (in pre–post designs as well as in comparison to control groups; Bass 2008; Miner 1978). The course comprised lectures, self-reflections, and discussions and its effects were still evident in follow-up studies more than one year after the program. Importantly, they were equally strong for female and male participants (Miner 1975, 1978). In a similar vein but more recently, a quasi-experimental study showed that (male and female) business students' motivation to pursue a leadership position was enhanced by behavioral role-modeling in a leadership course (Waldman et al. 2012). Again these results emerged in pre–post tests as well as in control-group comparisons. Further studies suggest similar effects for related leadership development initiatives such as mentoring (Noe 1988; also see Hoobler et al., in press).

Integrating these insights with the present findings, one promising route to a more equal gender distribution in

leadership positions may lie in the implementation of development programs designed to strengthen women's motivation for power. Interventions such as these may be implemented in organizations but also in universities and business schools, many of which still lack effective support for women's careers in leadership roles. For example, a recent study found that only about 30 % of the world's leading business schools offer women-focused leadership courses or programs (Ibeh et al. 2008). Against this background, it seems that initiatives addressing the motivation for power (e.g., mentoring, class modules) may be an effective addition to measures designed to reduce the effects of external discrimination of women's progression into leadership positions. Indeed, they may provide an efficient and rather rapid means of supporting change. Whereas the effects of external discrimination are relatively difficult to address, and measures targeting these effects will most likely show their benefits in the medium to long term (as they mainly require profound changes in implicit gender stereotypes; Yukl 2010), changes in power motivation seem to be more immediately achievable. For instance, training courses involving modules on power motivation typically comprise about 30 h of instruction and can be taught over the course of several days or weeks (Bass 2008; Miner 1978). Given that achieving a more equal gender distribution in leadership positions is a topic of highest priority, such short-term interventions seem to be very desirable, especially when combined with changes on a more macro-level.

Conclusion

As previous studies indicate, research into the causes of female underrepresentation not only contributes to our formal knowledge but also identifies measures to promote a more equal distribution of men and women in leadership positions (Eagly and Carli 2007). Based on this notion, we hope that the present research can make an important contribution to both theory development and the design of practical interventions with regard to gender and power motivation.

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