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## Gender Stereotyping and Self-Stereotyping Attitudes: A Large Field Study of Managers

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# **Gender Stereotyping and Self-Stereotyping Attitudes: A Large Field Study of Managers**

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## ABSTRACT

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### **Gender Stereotyping and Self-Stereotyping Attitudes: A Large Field Study of Managers\***

The dearth of women in top managerial positions is characterized by a high persistence and insensitivity to changes and differences in institutions and policies. This suggests it could be caused by slowly changing social norms and attitudes in the labor market, such as gender stereotypes and gender identity. This paper examines gender stereotypes and self-stereotyping in a large cross section of (about 2,970) managers at different job levels in (1,875) Danish private-sector firms. The survey data used contain detailed information about the managers as well as their employers. We find significant gender differences between managers with regard to gender stereotyping attitudes. Male managers on average tend to have stronger gender stereotype views with respect to the role as a successful manager than their female peers. However, female CEOs' gender stereotypes do not differ from their male peers' and have significantly more pronounced masculine stereotypes than female managers at lower levels. Female managers have stronger beliefs in their own managerial abilities regarding feminine skills and weaker beliefs in their masculine skills, whereas the opposite is observed for male managers. Gender stereotypes and self-stereotypes vary across types of managerial employees and firms. Beliefs in own ability could explain at most ten percent of the observed gender differential in C-level executive positions.

**JEL Classification:** J16, D83, D84, M51

**Keywords:** stereotypes, self-stereotypes, gender, glass ceiling effects, managerial labor markets

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## 1. Introduction

It remains a puzzle why so few women have reached top management positions or become directors in large firms despite the fact that in many countries women have overtaken men in terms of educational qualifications and have been full-time labor force participants for decades.<sup>1</sup> Several explanations have been suggested for the observed gender gaps, ranging from differences in human capital and ability, lack of role models, working time flexibility and work-life balance problems. A growing recent literature has focused on the “supply side”: how female employees’ preferences differ from those of their male colleagues, suggesting that the gender gap could be due to women’s unwillingness to compete for higher positions, stronger risk aversion and weaker taste for competition.

There are both optimistic and pessimistic views on whether this situation is about to change or not. Thus, for example Goldin (2014) argues that there is an ongoing ‘grand gender convergence’ because future jobs will be much more flexible with respect to working conditions and hours: “..... changes in the labor market, especially how jobs are structured and remunerated to enhance temporal flexibility. The gender gap in pay would be considerably reduced and might vanish altogether if firms did not have an incentive to disproportionately reward individuals who labored long hours and worked particular hours. Such change has taken off in various sectors, such as technology, science, and health, but is less apparent in the corporate, financial, and legal worlds”, Goldin (2014, p.1). A less optimistic view (see e.g., Bertrand, 2011; Bertrand and Duflo, forthcoming) points to slowly changing social norms, including gender stereotypes and gender identity norms, as explanations for the slow convergence of labor market outcomes of the genders, even when the actual skills and other characteristics of the genders are changing rapidly.

In this paper, we study the prevalence of gender stereotyping and self-stereotyping among managers, and how these attitudes vary across different categories of managers and types of firms. Managers’ stereotypes are important as they are likely to influence promotion decisions and hence may have an impact on the supply of candidates for managerial positions and the gender composition thereof. Our study also contributes to the supply-side analyses of the managerial labor market by examining female managers’ beliefs in their own ability (self-stereotypes).

Earlier studies of gender differences in self-stereotyping and stereotypical behaviors are mainly based on data from lab-experiments, typically using university students as subjects. A strength of lab experiments is that they can illustrate individuals’ behaviors with regard to aspects of interpersonal

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<sup>1</sup> This is also true even in the ‘female-friendly’ Nordic countries (Albrecht et al., 2003; Booth, 2007; Datta Gupta et al., 2008). Notably, Arulampalam et al. (2007) and Mandel (2012) find that the glass ceiling effect is stronger in the Scandinavian countries than elsewhere in Europe.

relations (such as unconscious discrimination) which are otherwise difficult to observe.<sup>2</sup> The external validity of these studies may, however, be weakened by the fact that individuals in managerial positions who have climbed the hierarchical ladder are likely to constitute a highly selected group whose behavior is not easily mimicked in a laboratory setting with students as subjects. Furthermore, existing studies are predominantly concerned with the influence of peers (especially class- or room-mates), not leaders or supervisors.<sup>3</sup>

The current study is one of rather few that aim at documenting gender-stereotyping attitudes among managerial employees. We use data from a survey of a sample of managers in 1,875 Danish private sector firms. The respondents of the survey are managers at different levels in large and medium-sized private-sector firms in Denmark and the questionnaire contains detailed information about the respondent and employer characteristics. As managers, and especially executives in the upper echelons of firms, are likely to differ systematically from the rest of the population, it is important to have access to direct information from managerial employees in order to map gender stereotypes relevant for promotion decisions. Indeed, based on a survey of Swedish managers and a representative sample of the Swedish population, Adams and Funk (2012) have demonstrated that there are significant differences between executives and the general population with respect to risk attitudes and other behavioral characteristics. Thus, they find that female executives are less risk-averse than their male peers, contrary to the results found for the general Swedish population and in several lab experiments (Croson and Gneezy, 2009; Azmat and Petrongolo, 2014; Niederle, forthcoming).

Respondents' gender stereotypes are measured from answers to survey questions regarding what constitute important characteristics for a successful manager. This measure is supplemented with measures of the same respondents' beliefs about their own managerial ability. We use these data to describe the prevalence of gender stereotypes in the sample of managerial employees and how they vary with characteristics of the respondents and the firms they are employed at. The survey data also enable us to study the respondents' self-assessed managerial abilities, how these vary across firms and types of managers, and how they are related the respondents' gender-stereotype attitudes.

We find significant gender differences between managers with respect to gender-stereotyping attitudes. While male managers on average tend to have more gender (masculine) stereotype views with respect to the role as a successful manager, we do not find these differences between the genders at the CEO

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<sup>2</sup> See Fehrstman and Gneezy (2001; 373-374) for an example where individuals are not aware of their own (discriminating) behavior, which is revealed by the experiment.

<sup>3</sup> One notable exception is the study by Glover et al. (2015) of the influence of biased (with respect to ethnicity) managers on minority employees' performance.

level of the organizations. Female top executives are in general significantly different from lower-level female managers.

As for beliefs about their own managerial abilities, male and female managers have ‘traditional’ self-stereotyping attitudes; women rate themselves higher on feminine traits and lower on masculine traits while the opposite pattern is observed for male managers. The exception is female CEOs, who do not display a ‘traditional’ self-stereotyping behavior. Simple regressions with gender stereotypes and beliefs about own managerial ability as dependent variables reveal that these differ between types/characteristics of the managerial employees and their employers, but also that sizable gender differentials in stereotype attitudes and beliefs about own abilities remain after controlling for individual and firm characteristics. Finally, we find that beliefs about own ability are positively correlated with the managers’ gender-stereotype attitudes.

The remainder of the paper is structured as follows. Section 2 highlights relevant aspects of the literature on gender stereotypes and self-stereotyping and discusses how these concepts relate to existing economic models on statistical discrimination, preferences, and identity. Section 3 describes the data sources used and Section 4 details the measurement of stereotypes and self-stereotyping. Section 4 also provides a description of general patterns in the data with respect to gender stereotypes and self-assessed managerial ability and how these differ by gender. In Section 5 we run some simple regressions in order to take a closer look at how gender-stereotype attitudes and beliefs about own managerial ability vary by characteristics of the managerial employees and their employers. Section 6 briefly sheds some light on how and to which extent managerial employees’ beliefs about their own ability (part of which is self-stereotyping) can act as a glass ceiling for women in the managerial labor market. In the final section, we summarize our results and discuss their implications for policy and further research.

## **2. Gender stereotyping and beliefs about own managerial ability**

The Oxford English Dictionary defines stereotypes<sup>4</sup> as a ‘widely held but fixed and oversimplified image or idea of a particular type or thing’. In labor market contexts, stereotypes against a group are often considered to distort the perceived ability of the average member of that group. In psychology and sociology, the concept of gender stereotyping has been widely used and studied; see for instance Schein

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<sup>4</sup> The concept of “stereotype” was originally introduced by the American journalist Walter Lippman (1922) almost one hundred years ago.

(1973), Eagly and Steffen (1984), Turner (1985), and the survey by Gmür (2006).<sup>5</sup> The concept has been much less used by economists, despite the fact that a number of models implicitly build on assumptions about ‘beliefs’ concerning men and women’s ability; see e.g., Fryer (2007), and Bjerck (2008) who use the concept of differences in beliefs in models on statistical discrimination.<sup>6</sup> Recently, more attention has been paid to gender stereotyping and gender identity in studies aiming at explaining gender differences in careers; see the surveys by Bertrand (2011) and Niederle (forthcoming).

Bordalo et al. (2016a) build a model, where the decision maker uses stereotypes as an efficient solution to a ‘prediction problem’, for instance assessing the ability of job candidates coming from two different (and observable) groups, men and women. Like in Kahneman and Tversky’s representativeness heuristics hypothesis, the decision maker is assumed to recall only a limited number of the most representative types from the pool of potential applicants. Bordalo et al. (2016a) show that stereotypes tend to exaggerate actual differences in means and variations between two groups and that stereotypes are context-dependent, i.e. the size of the exaggeration depends on the comparison group. Moreover, they show that since the decision maker tends to overreact with respect to beliefs when the new information is confirming stereotypes, and to underreact to information, which is inconsistent with the current stereotype, the process towards a change in stereotypes may be slow even when the actual characteristics of a given group are changing rapidly.

Gender stereotyping may not only describe the behavior of the decision maker or the ‘principal’. The agent, or in the case we are focusing on, the woman herself, may be subject to self-stereotyping behavior. If there are widespread stereotypes concerning different categories of individuals, the individuals belonging to a given category may be subject to a process of self-stereotyping, i.e. they may begin to ascribe these stereotypes to themselves, i.e., they self-stereotype in a way which is consistent with the existing stereotypes concerning their group; see Lundberg and Startz (1983), Coate and Loury (1993). The concepts of self-categorization and self-stereotyping mechanisms were originally analyzed in social-psychological studies (see for instance Turner, 1985; Latrofa et al. , 2010), but these concepts have also been introduced into economic models that emphasize the role of individuals’ self-images; see for instance Akerlof and Kranton (2000), Croson and Gneezy (2009), Booth and Nolen (2012), Bordalo et al. (2016a).

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<sup>5</sup> Psychological research and recent studies in neuroscience have documented that biases towards other groups may not be conscious or intentional. Implicit biases picked up by the so-called Implicit Association Tests have been shown to arise especially under conditions of ambiguity, high time pressure and cognitive loads; for an economic application, see Bertrand et al. (2005).

<sup>6</sup> In statistical discrimination models there is a rational formation of the belief, i.e. the belief is a central estimate of the true parameter. In stereotyping models, this belief is typically assumed to be a biased estimate of the true parameter, see Bordalo et al. (2016a,b)



Self-stereotyping is closely related to the concept of identity as defined by Akerlof and Kranton (2000) and Bordalo et al. (2016a).<sup>7</sup> If stereotypes concerning women's preferences for leadership or typical female competences are common, potential female managers, who are repeatedly exposed to them, may (unconsciously) think they fit into these stereotypes and adapt a self-stereotyping behavior and identity. Latrofa et al. (2010) show that the self-stereotyping behavior is more widespread in lower-ranked groups (here often females) compared to the higher-ranked ones (often males). Moreover, individuals in the higher-ranked category are found to be more prone to identify with their own personality, irrespective of the stereotypes of their group.

Many lab experiments have demonstrated that women 'shy away from competition' – see for instance Niederle and Vesterlund (2007) – but have also found that women's taste for competition is likely context-dependent; for a recent survey, see Niederle (forthcoming). Thus, women are more willing to compete against other women than to compete in mixed gender groups; see Booth and Nolen (2012), Datta Gupta et al. (2013), Dreber et al. (2014).<sup>8</sup> Coffman (2014) sets up a lab experiment to examine gender differences in willingness to contribute to a group when solving male- and female-type tasks, respectively. She finds that “conditional on their measured ability within a category, women are significantly less likely than men to contribute their answers to the group when the question comes from a category that is perceived as male-typed” (p.3). Providing the subjects with feedback regarding their relative strengths and weaknesses before the decision-making stage, did not lead to a reduction in female subjects' under-contribution. Transferring these findings into the context of our study indicates that gender stereotypes about the role as a successful manager may be one of the explanations for the dearth of women in top management positions. If skills as a 'successful manager' are considered mainly to be 'male skills', gender-stereotyping women may shy away from competing for promotions to top positions, and the reason is not necessarily differences in taste for competition but in self-stereotyping behaviors.<sup>9</sup>

Bordalo et al. (2016b) model the belief shaping process about one's own and other individuals' ability as consisting of two elements: a possible miscalibration of true ability (denoted over- or under-confidence) and stereotypes. By assuming that these two elements vary independently among individuals (orthogonality assumption), they show that the belief about the ability of a given individual

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<sup>7</sup> Note, in Akerlof and Kranton (2000) identity is given, whereas Bordalo et al. (2016a) give an explanation of how it is formed.

<sup>8</sup> Related explanations emphasize gender differences in self-confidence and willingness to take risks; see e.g., Croson and Gneezy (2009), Azmat and Petrongolo (2014).

<sup>9</sup> This hypothesis is related to the stereotypes threat literature in psychology, beginning with Steele and Aronson (1995), documenting that the mere salience of a group's stereotype could impair group members' performance. In other words, here stereotypes cause poor performance.

from group G is an additive function of miscalibration (overconfidence) and stereotypical belief about group G (compared to all other not belonging to group G). Based on data from lab experiments (with student subjects), Bordalo et al. (2016b, p.6) find that ‘beliefs about others are extremely similar to those about selves (indicating that others’ beliefs about one’s own ability are very important for one’s own self-belief), miscalibration/overconfidence ‘is extremely important in shaping belief distortions’, and that ‘stereotypes play a significant role in belief distortions’, especially among the male subjects. These findings resemble those of a study by Reuben et al. (2014), who examined gender differences in hires in an experimental market where the applicant’s performance of an on average gender-neutral task is self-reported. Men boast about their performance whereas women under-report it, but full information about actual performance does not eliminate the gender bias in hires.

Thus, gender-stereotyping behaviors and attitudes may both affect decision makers’ behaviors and give rise to statistical discrimination and glass ceilings. However, gender stereotyping may also affect the “supply side” of potential female executives and induce women to create a glass ceiling for themselves. There is, for obvious reasons, less direct evidence of whether and to which extent stereotypes among decision makers belonging to the favored group contribute to the persistence of or slow changes in group memberships.<sup>10</sup> On the other hand, a small literature has been built up, demonstrating that self-stereotyping may contribute to a self-fulfilling prophecy process where neither they nor their employers invest in skills to change the status of the members of the disadvantaged group.

While there is a relatively large literature documenting unequal treatment of minority groups, such as female employees, there is considerably less research evidence on how to reduce prejudice against minorities like female managers and how to mitigate stereotypes and their consequences for those affected.<sup>11</sup> Prominent themes in this body of research are the impact of increasing the exposure of minority members to majority decision makers and the role of interpersonal contacts. The focus is mostly on how the increased exposure affects majority members’ attitudes towards the minority, and this is motivated by the questions whether quotas or affirmative action programs contribute to changes in majority members’ attitudes and whether increased interpersonal contacts lead to a better

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<sup>10</sup> A favored group may have a higher promotion probability compared to a disadvantaged group even if the decision maker has no stereotypes; see Kamphorst and Swank (2016). Their model assumes perfect information on effort and productivity of the agents. Despite the full information, the decision maker may nevertheless still find it optimal to promote a person from the majority (favored) group instead of a more able person from the minority (disadvantaged) group. This is because the costs of demotivating the favored person from group B may exceed the costs of not promoting person A. In this case, discrimination may actually be profitable, unlike in Becker’s classical model of discrimination.

<sup>11</sup> A large part of this body of research is in psychology and is based on lab experiments. For a survey of economic as well as psychological research on interventions and policies to reduce the impact on stereotypes and discrimination, see Bertrand and Duflo (forthcoming). The following short paragraphs are largely based on their review.

understanding and appreciation of members of the minority. The results are rather mixed, and there is no consensus whether or when greater exposure or increased contacts benefit the disadvantaged groups. The evidence is predominantly from lab experiments and the field studies typically examine room- or classmates in schools. Studies from business settings are rare.

A growing line of research looks at how the minority members' attitudes can be influenced. Psychology scholars have examined mentoring or coaching as means of undoing stereotype threat effects. Evidence is mainly from schools/students and the estimated impacts, which often are found to be positive, are typically of short-term nature. Evidence of beneficial effects of quotas is rather scarce. Gender diversity in management teams does not necessarily generate more diversity. Bagues and Esteve-Volart (2010) and Bagues et al. (2017) have used data from committees with varying gender compositions and show that female members do not necessarily favor other women, most likely because they want to avoid male members' perception of them as being biased.

In the public debate, the function of female leaders/managers as role models for other women is often mentioned. The idea is that these trailblazers can influence attitudes of their group members and their beliefs about their own abilities (and hence increase their aspirations). Only a few studies are available, almost all concerned with students and with mixed results.

Researchers in psychology have also carried out lab experiments with so-called de-biasing treatments, which aim at reducing prejudice and stereotyping views. In a firm or labor-market context, one could think of policies promoting gender equality and improved work and life balance as de-biasing strategies, as ways of "teaching" employees to be less biased against female employees.

### **3. Data description**

The main part of the data used in this study have been collected in cooperation with an organization called *Lederne* (The Association of Danish Managers), which regularly analyzes questions related to corporate governance and management issues based on surveys among their members. Members of *Lederne* are managerial employees in firms and organizations in Denmark, in the 'for profit' as well as the non-profit sectors. The main topic in the survey used in this study was firms' use of different management practices and the respondents were asked a fairly large number of questions regarding the management form, style and practices of the organization in which they are employed. Other items were about internal communication, general firm policies and the firm's business environment. In addition, two questions about gender stereotypes (see below) were included in the end of the questionnaire. The

intention was to give the respondents the perception that the questionnaire was one of the regular surveys on traditional management topics and to 'hide' for the respondents that the survey also intended to reveal their stereotyping attitudes. By this procedure, we expect to reduce a potential risk of answering in a politically correct manner and to reduce attrition due to unwillingness to answer questions related to gender stereotyping. The survey data are merged with register data from the database Experian, which gives us additional information on firm characteristics and performance.

**Table 1. Mean sample values, individual characteristics**

	All	Females	Males
Age	47.0	45.6	47.7
Work experience, years	25.8	23.8	26.7
Tenure in current firm, years	10.2	9.50	10.6
<i>Highest educational degree obtained:</i>			
Primary, lower secondary, upper secondary,	0.086	0.081	0.088
Vocational training	0.263	0.212	0.285
Short higher education	0.225	0.224	0.225
Medium higher education	0.291	0.328	0.274
Long higher education, master or higher	0.108	0.134	0.096
<i>Management level:</i>			
CEO	0.028	0.017	0.033
Other top executives	0.034	0.024	0.038
Manager, high level	0.231	0.166	0.260
Manager, medium level	0.402	0.422	0.393
Manager, low level	0.306	0.372	0.276
<i>Industry/sector</i>			
Manufacturing	0.360	0.300	0.387
Trade and services	0.376	0.413	0.359
Other	0.264	0.286	0.254
Number of observations	2,972	918	2,054

The internet-based survey was sent out to members of the Association of Danish Managers in May 2014. 3,737 members answered the survey, out of these 538 members were from non-profit or public-sector organizations. These respondents are excluded from the current study, leaving us with 3,199 managers in the private sector employed in 1,953 different companies.<sup>12</sup> Due to missing or incomplete information, only 2,972 observations can be used, 918 female and 2,054 male managers, respectively, employed in 1,875 firms; see Table 1 for sample statistics.

<sup>12</sup> This means that 1,454 firms had more than one respondent who were included in the survey.

The average age of the respondents is 47 years, and they have 26 years of work experience and 10 years of tenure in the current firm. Female managers are slightly younger and accordingly have fewer years of experience and shorter firm tenure. On the other hand, female managers have a higher level of formal education than their male peers.

As the respondents are members of the Association of Danish Managers, *Lederne*, a potential concern is that they are not representative of the population of private-sector managerial employees in Denmark. Comparisons with official statistics from Statistics Denmark show that the Copenhagen area is slightly overrepresented in the survey (by about three percentage points)<sup>13</sup>. The share of firms with more than 100 employees matches that in the population but the share of small firms (less than 25 employees) is lower; the distribution by industry mirrors fairly well the population distribution: trade and services are somewhat underrepresented and manufacturing correspondingly slightly overrepresented. 3.3 (1.7) percent of the male (female) respondents are CEOs and 3.8 (2.4) percent of the sample are other top executives. These figures indicate that female CEOs, CFOs, etc. are overrepresented in this sample since there are only about 7 (14) percent females among CEOs (other top executives) for all companies in the private sector in Denmark; see Smith et al. (2013). Overall, for the above-mentioned observable<sup>14</sup> characteristics the sample appears fairly representative of private-sector firms' managerial employees.

Table A-1 in the Appendix shows the distribution of firms by firm characteristics and the definitions of the firm variables.

#### **4. Measures of gender stereotypes and self-stereotyping**

Gender stereotypes and self-stereotyping among managers are for obvious reasons difficult to measure. Take for example the case of interviewing individuals about their stereotypes and self-stereotyping attitudes. These types of attitudes may reflect unconscious norms that the person herself is not fully aware of.<sup>15</sup> Or, she may not want to reveal her true norms and attitudes because she thinks that the answer is not generally conceived of as politically correct or alternatively, not as appropriate views in

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<sup>13</sup> This is not surprising in view of the fact that the head office of *Lederne* is located in Copenhagen.

<sup>14</sup> Clearly, things may differ regarding unobservables such as focus on management development and improvement as members of *Lederne* could plausibly be more interested in these issues.

<sup>15</sup> We know of only one prior study (in economics) which has used survey measures on stereotypes. Janssen and Backes-Gellner (2016) create a measure of occupation stereotypes from a large German survey in which respondents were asked whether her or his job could be equally well performed by a person of the opposite gender. There are a number of economic studies also aiming at explaining the gender gap in promotions based on gender gaps in the 'Big Five personality traits' but these studies do not focus on gender stereotypes; see e.g., Fietze et al. (2011). The papers by Bordalo et al. (2016 a, b) mainly use data from the lab and tests that require observations on both "true" traits and beliefs about them.

the organization where she is employed. This is one of the reasons why lab experiments are used to elicit underlying attitudes and norms. The problem when it comes to analyzing managers is that it is extremely difficult to get a large and representative sample of busy managers to participate in time-consuming lab experiments. Consequently, most lab experiments are using students as subjects. There are several reasons why they may not be representative of the population of managers. Managers are almost by definition a highly selected group that have passed several 'hurdles' during their careers, have been willing to participate in competitive promotion contests, and have proven to possess or at least been able to signal possession of managerial skills. Their preferences for competition and their attitudes concerning what is needed to become a successful leader and stereotypes may also have changed during this process, either because they are influenced by their peers or because they have to adopt these attitudes in order to become promoted or to survive as a manager; see Adams and Funk (2012). It is therefore important to complement the evidence from lab experiments with student subjects with analyses of data collected from 'real managers'.<sup>16</sup>

The empirical literature on gender stereotypes is primarily from sociology, psychology, and management disciplines and provides alternative ways of measuring stereotypes from survey data.<sup>17</sup> Gmür (2006) gives an extensive survey of the empirical research within these areas. One group of studies are based on the *Schein Descriptive Index* (SDI) where respondents are asked to select a number of characteristics (out of 92 items) which they consider to be 'typically male', 'typically female' and 'typical for a successful manager'. The correlation between 'typically male/female' and 'typical for a successful manager' is used as the measure of gender stereotypes; for details, see Schein (1973), who formulated the 'think manager – think male' hypothesis based on this approach. If the correlation between the selected items for 'typically male' and 'typical for a successful manager' is high and the correlation between 'typically female' and 'typical for a successful manager' is low, this is taken as an indication of a high degree of gender stereotypes.

A number of empirical studies, mainly based on student responses and in a few cases on smaller samples of managers, find that the correlation between 'typically male' and 'typical successful manager' traits is considerably higher than the correlation between 'typically female' and 'typical successful manager' traits. According to Gmür's (2006) survey, typical correlations between traits of successful managers and typical males are found in the [+0.50, +0.75] range (higher for male respondents than for female

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<sup>16</sup> Naturally, collecting data from managerial employees does not solve all problems. In particular, in cross sections like our data, we are not able to tell whether there are differences in stereotype attitudes of individuals at different job levels or whether attitudes change as a person moves to higher job levels.

<sup>17</sup> A simple measure occasionally used by psychologists interested in occupational gender stereotypes and which does not require collection of additional data is the proportions of females in certain occupations. Whether or not this is a good measure of stereotypes is an open question, however.

respondents), while the same correlations for female traits typically lie in the [0.00, 0.40] interval. For the latter, the female respondents tend to have much higher correlations than the male respondents.

An alternative measure is the *Bem Sex Role Index* (BSRI), first proposed in Bem (1974). To construct this measure, the items are classified in advance as either ‘masculine’, ‘feminine’ and ‘neutral’, and the respondents are then asked to choose among these items to characterize an ‘ideal manager’. When the respondents tend to pick many items from the masculine list and few items from the feminine list, this is seen as reflecting gender-stereotype attitudes. Empirical studies using the BSRI index, which are also in most cases based on samples of students or a small number of managers as respondents, find that the majority of the selected items tend to be chosen from the ‘masculine’ list; see Gmür (2006). The advantage of the BSRI approach compared with the SDI is that fewer items need to be included in the survey. The advantage of the SDI approach is, however, that it is not necessary to construct the groups ‘masculine’, ‘feminine’ and ‘neutral’ in advance. This is defined by the answers of the respondents. Since masculine and feminine characteristics are not fully objective categories and since they may change over time, this can be a weakness of the BSRI approach. Based on these considerations from earlier research, we propose two measures of stereotyping and self-stereotyping attitudes.

#### **A. Stereotype Index *SI***

Since the respondents of the survey are managerial employees ranging from CEOs to lower-level managers, we had to restrict the length of the survey in order to avoid severe attrition problems. Further, in order to obtain a reasonably high response rate, the survey questions had to be relevant for managers which means that, unlike studies using the BSRI approach, we cannot include traits which could be considered completely irrelevant for being a (successful) manager. Consequently, we selected 11 items which were considered to be relevant for successful managers and which at the same time differed with respect to being considered as masculine, feminine or neutral. Unlike previous studies making use of the BSRI measure, we asked the respondents: “*To which extent do you consider the following traits to be important for a successful manager?*” In other words, we do not only ask whether a trait is important or not, but also ask the respondents to rate the importance of each item. More specifically, the respondents were asked to grade the 11 items on a Likert scale from 1 to 5 (observations with “don’t know” answers are discarded), where 5 stands for ‘important to a very high extent’ and 1 for ‘not at all important’:

*Masculine Items:* Decisive, in self-control, willing to take risk, competitive, self-confident

*Feminine Items:* Socially competent, dialogue-oriented, helpful

*Neutral Items:* Result-oriented, visionary, innovative

Henceforth we call this the stereotypes question.

When selecting the above-mentioned items, it is important to avoid ‘politically correct’ answers and that the respondents answer the questions strategically.<sup>18</sup> Since we also wanted to get a reliable measure of the respondents’ self-assessed ability as managers using the same items (see below), the questions included in the survey should appear as neutral as possible, but at the same time they should be able to capture masculine and feminine characteristics. In order to test for the sensitivity of the categorization of the 11 items into masculine, feminine and neutral, we have performed an alternative analysis where the neutral item ‘result-oriented’ is categorized as a feminine item or a masculine item, respectively. The calculation of the stereotype and ability indices and the estimation results shown below are robust with respect to this change in the categorization of the items in the sense that significant male-female differences in the indices among sub-groups and the estimated coefficients only change marginally and the qualitative results remain the same. As an additional test of the sensitivity of the categorization of the 11 items into masculine, feminine and neutral, we have performed placebo tests where the 11 items have been randomly allocated to the categories ‘masculine’, ‘feminine’ and ‘neutral’, and some of the regression models in Section 5 have been re-estimated. The results from these alternative analyses are available from the authors.

The answers to stereotypes question are summarized in Table 2. The gender difference is numerically largest for the female items ‘social skills’ and ‘dialogue-oriented’. These are considered significantly more important by the female managers than by their male colleagues while there is no significant gender difference for the item ‘helpful’. Surprisingly, female managers also score higher (albeit not significantly) than male managers on the importance of the willingness to take risks for being a successful manager. Being competitive is considered a more important managerial trait by male managers than by their female colleagues, but again the difference does not differ significantly from zero. Female managers consider the three items which are classified as ‘neutral items’ as more important than their male peers, and for the items ‘result-oriented’ and ‘visionary’, the gender differences are statistically significant.<sup>19</sup>

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<sup>18</sup> We apply a categorization based on previous studies, primarily summarized in Gmür (2006). As discussed by Gmür, it is difficult – to some degree by definition – to identify relevant feminine stereotype characteristics, which are also relevant for successful managers. Therefore, we only include three items, which in the literature are usually considered as mainly female; see Berkerey et al. (2013) and Gmür (2006).

<sup>19</sup> The significant difference found in this study for the items which have been categorized as gender-neutral in other studies, see Gmür (2006), poses the question how to categorize ‘female’, ‘male’, and ‘neutral’ items which is not in any way an ‘objective’ categorization. However, the answers to the question how the respondents assess their own managerial abilities, see Table 4, indicate that male managers tend to score themselves significantly higher than female managers on the masculine items, female managers score themselves higher on the feminine items and there is no significant gender difference with respect to the neutral items.



**Table 2. Mean values of the items in the stereotypes question: “To which extent do you consider the following traits to be important for a successful manager?” (5 = ‘important to a very high extent’ and 1 = ‘not at all important’)**

	Females	Males	Females-Males (prob-value)
<b>Male items</b>	<b>3.943</b>	<b>3.934</b>	<b>0.010 (0.628)</b>
Determined	4.423	4.351	0.072 (0.003)
Have Self-control	4.095	4.143	-0.048 (0.102)
Willing to take risk	3.451	3.352	0.099 (0.002)
Competitive	3.823	3.882	-0.059 (0.079)
Self-confident	3.928	3.954	-0.026 (0.387)
<b>Female items</b>	<b>4.073</b>	<b>3.964</b>	<b>0.109 (0.000)</b>
Helpful	3.788	3.787	0.001 (0.975)
Social skills	4.170	3.991	0.180 (0.000)
Dialogue-oriented	4.265	4.118	0.147 (0.000)
<b>Neutral traits</b>	<b>4.121</b>	<b>4.051</b>	<b>0.070 (0.003)</b>
Result-oriented	4.353	4.274	0.079 (0.003)
Visionary	4.089	4.012	0.077 (0.013)
Innovative	3.925	3.871	0.053 (0.096)

In comparison with the study by Gmür (2006) and earlier studies using the BSRI or SDI approaches, we include fewer items. Another difference is that in our survey we ask the respondents to *rate* how important a given item is for being a successful manager. As far as we know, this has not been asked in earlier studies. The information about the importance of each item allows us to rank masculine and female items according to the scores given by the respondents and we utilize this information in the construction of our Stereotype Index (*SI*). In line with Gmür (2006) we define a variant of the BSRI index of stereotyping as:

$$SI = \frac{M+}{2m} - \frac{F+}{2f} - \left( \frac{M-}{2m} - \frac{F-}{2f} \right)$$

where  $M+$  = number of masculine items among the 5 highest ranked items,  $F+$  = number of feminine items among the 5 highest ranked items,  $M-$  = number of masculine items among the 5 lowest ranked items, and  $F-$  = number of feminine items among the 5 lowest ranked items.  $m$  and  $f$  are the number of masculine and feminine items, respectively. Note, that all values of  $SI$  lie in the interval  $[-1,+1]$ .

Respondents who rank all masculine (feminine) items highest and all feminine (masculine) items lowest will obtain a value for *SI* of +1 (-1).<sup>20, 21</sup>

Figure 1 shows the distribution of the *SI* index for the male and female managers, respectively. Although the two distributions look alike, a Kolmogorov-Smirnoff test for equality of distributions rejects equality, (p-value <0.001). The distribution for males is more skewed to the right (reflecting more masculine stereotyping attitudes), but the spread of the distribution is about the same for male and female managers, see Table 3. The mean and median values are close to 0 (slightly negative) indicating an average neutral value of the stereotyping index.

As can be seen from Table 3, the mean values of the *SI* vary across managerial subgroups. Female managers tend to have a significantly lower *SI* value than their male peers. This is not observed for all subgroups, however. The gender difference is smallest for the oldest and youngest age groups, partly driven by the fact that the youngest male and female managers, maybe somewhat surprisingly, have higher values on the gender stereotyping index (i.e., more masculine stereotypes) than managers in older age groups, and this pattern is more pronounced for the female managers.

There is no significant gender difference in the stereotype index for CEOs, while at lower levels female managers have significantly lower scores (less masculine) on the stereotype index than their male peers. Interestingly, among the categories of male managers included in the survey male CEOs have the lowest stereotype score. This is not the case for (the comparatively rather few) female CEOs in comparison with their female colleagues at lower levels. For female managers, the lowest stereotype score is found among female top executives just below the CEO level, i.e., CFOs, COOs and other managers who typically are members of the executive board.

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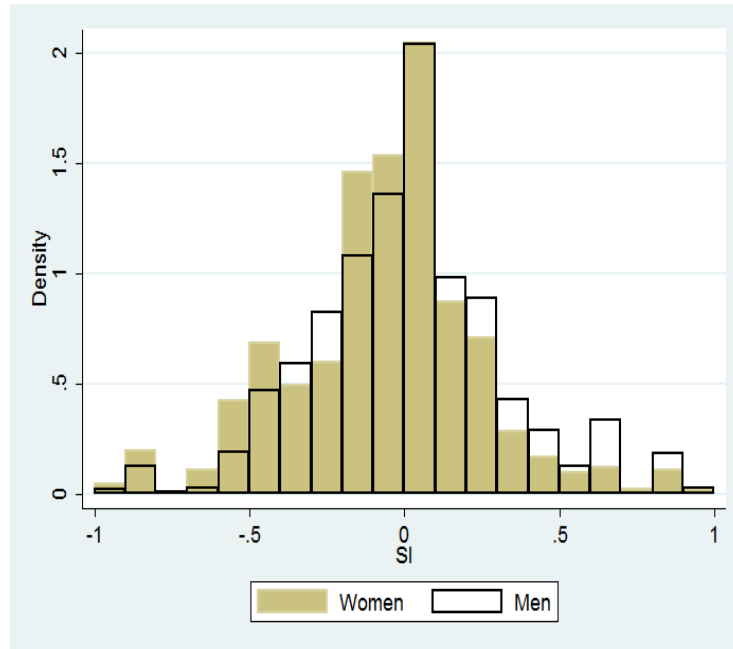
<sup>20</sup> In case of 'ties' where more than 5 items have the same score, the formula is modified and 5 is substituted by 5+x where 5+x is the number of items with highest score. The same procedure applies for M-, F+, and F-.

<sup>21</sup> We have also calculated an alternative measure, *SI(B)*, which is defined as:

$$SI(B) = \frac{MM - m}{(MM - m) + (FF - f)} - \frac{FF - f}{(FF - f) + (MM - m)}$$

where *MM* = total number of scores given to masculine items, and *FF* = total number of scores given to feminine items. All values of *SI(B)* lie in the interval [-1,+1]. Respondents who rank all masculine (feminine) items highest and all feminine (masculine) items lowest will obtain a value for *SI(B)* of +1 (-1). The absolute level is higher for *SI(B)* as compared to *SI*, but the sign of the absolute differences between male and female values of *SI* and *SI(B)* within the subgroups shows the same pattern, and the results in Section 5 are robust when substituting this alternative measure with the *SI* measure.

**Figure 1. Distribution of values of the stereotype index, *SI*, Male and female managers**



**Table 3. Mean values of the stereotype index, *SI*, male and female managers**

	All	Males	Females	Males-females
Means	-0.022	0.000	-0.073	-0.073 (0.000)
Median	0.000	0.000	-0.067	
Std. Dev.	0.307	0.308	0.301	
<i>Sample Means by Group:</i>				
Age group				
≤ 39	0.005 (578)	0.020 (379)	-0.022 (199)	-0.042 (0.118)
40-49	-0.027(1170)	0.008 (764)	-0.092 (406)	-0.100 (0.000)
50-59	-0.035 (1024)	-0.016 (738)	-0.083 (286)	-0.067 (0.002)
60+	-0.010 (200)	-0.005 (173)	-0.042 (27)	-0.037 (0.538)
Managerial level				
CEO	-0.076 (84)	-0.083 (68)	-0.046 (16)	0.038 (0.606)
Other top executives	0.015 (100)	0.069 (78)	-0.174 (22)	-0.243 (0.001)
Manager, high level	0.007 (686)	0.016 (534)	-0.025 (152)	-0.041 (0.146)
Manager, medium level	-0.023(1194)	0.004 (807)	-0.080 (387)	-0.084 (0.000)
Manager, low level	-0.041 (908)	-0.018 (567)	-0.080 (341)	-0.062 (0.004)

Note: Number of observations are given in parentheses in columns 1, 2, and 3, and significance levels (prob. values) for t-tests are given in column 4. Higher (lower) values of *SI* reflect more (less) masculine stereotypes.

## B. Beliefs about Own Ability Index, BOA

The survey also includes the question, henceforth called the BOA question: “*To which extent do you yourself possess the following traits?*”, followed by a list of the same 11 managerial abilities that were used in connection with the stereotypes question. Here the respondent is asked to rank to which degree he/she possesses the same 11 traits as in the stereotypes question on a Likert scale from 1 to 5 (as before ‘don’t know’ answers are discarded), where 5 stands for ‘important to a very high extent’ and 1 for ‘not at all important’.<sup>22</sup>

Table 4 shows the average sample values for the answers to the individual items in the BOA question. Overall, these confirm the gender categorization of masculine, feminine, and neutral items in the sense that on average male managers score themselves higher than female managers on the five masculine items and female managers on average score themselves higher than male managers on the three feminine items. There is no significant gender difference on the overall score for the neutral items. Looking more closely at the individual items, some interesting results appear. While male managers believe more strongly, that they have self-control, and that they are more competitive and self-confident, female managers rate themselves higher than male managers with respect to the masculine item ‘decisive’. Worth noting is that there is no significant gender difference for ‘willing to take risk’.

The information from the answers to the BOA question is used to calculate a BOA index, parallel to the definition given for SI above. The higher the value of BOA, the higher is the relative score for typical masculine traits. Thus, a value of 1 means that the respondent has ranked only masculine traits highest, while a value of -1 means that the respondent has ranked only feminine traits highest in characterizing his or her own managerial traits. Note, only managers who have subordinates have answered the self-stereotypes question. As a consequence, there are somewhat fewer answers from 1,485 male and 576 female managers, respectively.

As can be seen from Figure 2, the gender-specific distributions for the BOA index are clearly different (this is also confirmed by a Kolmogorov-Smirnoff test). The mean and median values of BOA are lower for female managers than for male managers but the standard deviations of the male and female BOA values are very close, see Table 5. Female managers in the age group 40-49 have on average the most negative value of the BOA index, i.e. female managers in this age group (the daughters of the so-called “red stockings”, the feminist cohort of the early seventies) have the most pronounced tendency to rate themselves highest on feminine traits and lowest on masculine traits.

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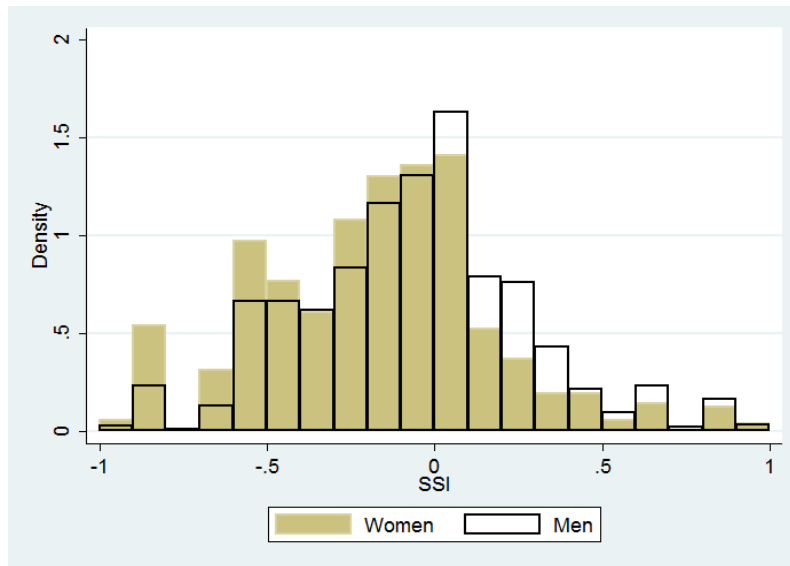
<sup>22</sup> Other sample mean values for individual characteristics of the BOA sample (not shown) differ only marginally compared to those in Table 1.

**Table 4. Mean values of the 11 items in the beliefs about own ability question: "To which extent do you yourself possess the following traits?"**

	Females	Males	Females - Males (prob value)
<b>Masculine items</b>	<b>3.815</b>	<b>3.887</b>	<b>-0.072 (0.005)</b>
Determined	4.225	4.165	0.060 (0.070)
Have self-control	3.967	4.031	-0.064 (0.080)
Willing to take risk	3.383	3.446	-0.063 (0.129)
Competitive	3.691	3.856	-0.165 (0.000)
Self-confident	3.821	3.940	-0.119 (0.001)
<b>Feminine items</b>	<b>4.202</b>	<b>4.041</b>	<b>0.162 (0.000)</b>
Helpful	4.249	4.142	0.107 (0.002)
Social skills	4.188	3.959	0.230 (0.000)
Dialogue-oriented	4.176	4.019	0.157 (0.000)
<b>Neutral traits</b>	<b>3.853</b>	<b>3.874</b>	<b>-0.021 (0.483)</b>
Result-oriented	4.208	4.231	-0.023 (0.503)
Visionary	3.718	3.727	-0.009 (0.820)
Innovative	3.623	3.664	-0.041 (0.310)

Interestingly, female managers over 60 have the strongest beliefs in their managerial ability. The small number of female CEOs (16 observations) have the highest (numerically smallest) value of BOA among all female managers, confirming the hypothesis by Latrofa et al. (2010) that managers in higher-level positions are less prone to self-stereotype into their own gender category. This may also reflect an age or cohort effect (see estimations below) or the fact that female CEOs make up a highly selective group of women who have managed to reach top positions, either because they from the very beginning possessed traits which are typically seen as important for becoming a successful manager, or because they over their managerial careers have become aware that these skills are important for the success as a manager and consequently acquired them as found in Adams and Funk (2012) for Swedish managers. Whether they have changed their behavior and norms during their careers or whether they have always differed from the other female managers, we cannot tell from the data at hand.

For male managers, the BOA values vary much less across age groups. Differences in the average BOA between managerial job levels are also smaller than for females.

**Figure 2. Distribution of values of BOA index****Table 5. Mean values of the BOA-index, male and female managers**

	All	Males	Females	Males-females
Means	-0.102	-0.072	-0.180	0.108 (0.000)
Median	-0.100	-0.067	-0.200	
Std. Dev.	0.343	0.338	0.343	
<i>Sample means by group:</i>				
<i>Age group</i>				
≤ 39	-0.101 (419)	-0.077 (285)	-0.152 (134)	0.076 (0.041)
40-49	-0.113 (837)	-0.067 (575)	-0.214 (262)	0.147 (0.000)
50-59	-0.103 (683)	-0.087 (516)	-0.155 (167)	0.069 (0.025)
60+	-0.018 (122)	-0.010 (109)	-0.085 (13)	0.075 (0.410)
<i>Managerial level</i>				
CEO	-0.023 (84)	-0.018 (68)	-0.046 (16)	0.028 (0.770)
Other top executives	-0.052 (99)	-0.006 (78)	-0.224 (21)	0.218 (0.022)
Manager, high level	-0.058 (684)	-0.040 (532)	-0.120 (152)	0.079 (0.013)
Manager, medium level	-0.137(1,194)	-0.103 (807)	-0.206 (387)	0.103 (0.000)

Note: Number of observations are given in parentheses in columns 1, 2, and 3, and significance levels (probability values) for t-tests are given in column 4.

## 5. Gender stereotypes and beliefs about own managerial ability: regression estimates

In this section we probe deeper into how stereotypes and beliefs about own managerial ability vary with the manager's gender, job level in the corporate hierarchy, and a number of other individual and firm characteristics by estimating regression models in which *SI* and *BOA* are the dependent variables. The

analysis is descriptive – we do not claim to uncover causal relationships. In some cases, it could be argued that the causality may run in both directions or that omitted explanatory variables may be at play. On the other hand, it should also be noted that we have relatively rich data with regard to firm characteristics and how the firms are managed, and thus, the correlations we estimate are based on a large set of conditioning variables. Moreover, since we have access to information from a large sample of actual managers, it is interesting to describe how their stereotypes vary while being able to control for a number of both individual and firm characteristics. As we have multiple observations per firm, mainly from larger companies with many managers, all estimations are performed clustering on firms (except, of course, in the estimations where we estimate firm fixed effect exploiting having access to more than one observation per firm for a subgroup of larger companies, where we can control for time-invariant unobserved heterogeneity among firms).

### 5.1 Gender-stereotyping attitudes

For starters, Table 6 shows OLS estimations where the stereotyping index,  $SI$ , is regressed on individual characteristics. The first three columns are for all managers, while the fourth and fifth columns are for males and females, separately.

Female managers have on average a stereotype index value that is 0.073 points lower than that of their male peers. When we enter controls for age, tenure in firm and in current position, respectively, and managerial job levels, this number changes only little (i.e., is slightly higher), although several of the included RHS variables are statistically significant. The stereotyping index  $SI$  is increasing in tenure in the firm but not in tenure in current position.<sup>23</sup> For males, age is not significant. However, for females there is an inverse U-shaped relation with a maximum around 50 years.

Overall, CEOs seem to have less gender (masculine) stereotype views. One reason for this could be that they have been exposed to more managerial employees of both genders and hence are better informed. When splitting the sample by gender, this result turns out to be solely driven by the male CEOs. For the considerably smaller group of female CEOs, the coefficient is positive but insignificant. Among the top executives just below the CEO level, the picture is different. Here, males are found to have significantly more masculine stereotype views than other male managerial employees at lower levels, while exactly the opposite is found for female top executives below CEO level.

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<sup>23</sup> Tenure in firm and tenure in current position are rather strongly correlated. Entering them individually leads to positive and significant estimates for both tenure variables. This is, however, only true for males.

**Table 6. OLS regression of Stereotype Index (SI) on individual characteristics**

	All	All	All	Males	Females
Female	-0.073*** (0.012)	-0.079*** (0.013)	-0.080*** (0.013)		
Age/10		-0.081 (0.054)	-0.081 (0.054)	-0.006 (0.066)	-0.212** (0.094)
Age <sup>2</sup> /100		0.006 (0.006)	0.006 (0.006)	-0.002 (0.007)	0.020* (0.011)
Tenure firm/10		0.011* (0.006)	0.011* (0.006)	0.012* (0.007)	0.009 (0.015)
Tenure job/10		0.005 (0.011)	0.004 (0.011)	0.013 (0.012)	-0.024 (0.022)
CEO			-0.060* (0.031)	-0.082** (0.034)	0.034 (0.065)
Other top executive			0.030 (0.034)	0.067* (0.040)	-0.100* (0.051)
Constant	0.000** (0.007)	0.233* (0.121)	0.232* (0.121)	0.052 (0.148)	0.459** (0.204)
R <sup>2</sup>	0.012	0.018	0.019	0.009	0.017
N of obs.	2,972	2,698	2,698	1,880	818
N clusters	1,953	1,804	1,804	1,340	654

Note: Control for firm clusters in estimation. \* p<0.1, \*\* p<0.05, \*\*\* p<0.01

The results in Table 6 may be affected by firm characteristics that are not included. We do two things to account for these. First, as we for a sub-sample (of mainly larger firms) have multiple observations per firm, we have re-estimated the models in Table 6 allowing for firm fixed effects. These estimates, which are found in Table B-1 in the Appendix, do not differ qualitatively from the OLS estimates in Table 6. Among the results are that the magnitude of the estimate of the CEO indicator is larger and even more significant for males.

Second, we add a large number of firm characteristics (size, ownership, sector and leadership variables; see Table A-1 in the Appendix) as controls to the model in the third column of Table 6.<sup>24</sup> The estimates are given in Table 7. The negative and significant coefficient to the 'female' dummy is strongly robust to the inclusion of firm characteristics. Consequently, irrespective of individual traits and characteristics

<sup>24</sup> The firm characteristics reported in Table 7 are only a sub-sample of firm traits included in the regression. We entered indicators for foreign ownership, firm size, and industry; the extent to which the firm belongs to a high-risk industry, faces strong competition; whether the firm relies on internal or external recruitment of managerial employees, makes use of performance-based promotions. Moreover, three indicators for centralization of management and management style (rules or value based) were also included.



of the managers' workplaces, male managers as a group are significantly more masculine stereotyping than their female peers.

**Table 7. OLS regression of Stereotype Index (SI) on individual and firm characteristics**

	All	Males	Females
Female	-0.081*** (0.013)		
Age/10	-0.059 (0.055)	0.035 (0.067)	-0.252** (0.100)
Age <sup>2</sup> /100	0.004 (0.006)	-0.006 (0.007)	0.025** (0.011)
Tenure firm/10	0.012* (0.006)	0.013* (0.007)	0.011 (0.016)
Tenure job/10	0.006 (0.011)	0.015 (0.012)	-0.022 (0.023)
CEO	-0.036 (0.031)	-0.061* (0.035)	0.128** (0.062)
Other top executive	0.036 (0.033)	0.069* (0.039)	-0.084 (0.055)
Gender equality agreement	-0.013 (0.015)	-0.026 (0.018)	0.023 (0.028)
Family-friendly workplace	-0.021 (0.015)	-0.017 (0.018)	-0.021 (0.027)
Firm strives to have work-life balance	-0.040*** (0.015)	-0.035* (0.019)	-0.056** (0.027)
Female managers share above 50%	0.011 (0.020)	0.005 (0.027)	0.019 (0.029)
Female CEO in firm	-0.012 (0.021)	0.019 (0.025)	-0.072** (0.036)
Controls for firm characteristics and leadership variables	Yes	Yes	Yes
Constant	0.127 (0.127)	-0.123 (0.154)	0.545** (0.226)
R <sup>2</sup>	0.052	0.046	0.070
N of obs.	2,668	1,867	801
N clusters	1,788	1,333	645

Note: Control for firm clusters in estimation. \* p<0.1, \*\* p<0.05, \*\*\* p<0.01

Most of the firm characteristics in the first column (for both genders) do not differ from zero. Things are, however, different once we estimate the relations separately by gender. The estimates differ not only between but also within the genders. When we enter firm characteristics, the coefficient of the CEO indicator (but not the coefficient of the indicator for other top executives) in the regressions for female managers turns positive and becomes highly significant. Catering for characteristics of the firms they lead, female CEOs have significantly more masculine stereotype views on the traits of successful

managers than other female managerial employees. Notably, this is not the case for male CEOs. The male CEO coefficient is again negative and significant. The female CEOs also have significantly stronger masculine stereotype views than other female managerial employees, including other females in the executive suites. The opposite pattern is observed for males.

Do company policies related to gender, female-led or female-dominated firms make a difference? In Table 7, we enter four variables to capture these firm characteristics. We may note slightly less gender-stereotyping attitudes for male managers in firms with a formalized gender equality policy. However, the variable that seems to matter most is whether the firm actively strives to have a work-life balanced workplace. This policy is associated with weaker masculine stereotype attitudes among the managers.<sup>25</sup> Splitting the sample into male and female managers reveals that this holds for both genders. The observed pattern could be the result of the policy having a de-biasing impact on managers' gender-stereotyping views. It could, however, also be due to a sorting effect of the work-life balance policy, i.e., the policy attracts managers with less gender-stereotype views to work for the firm. Of course, we cannot say which of the two mechanisms that generates the observed pattern.

Having a female CEO is associated with managerial employees holding less masculine stereotyping views, but this only holds (and strongly) for female managers.<sup>26</sup> As female CEOs tend to have stronger masculine stereotypes than their male peers, the explanation of this finding cannot be that the attitudes of the female CEOs are transmitted to their female managerial colleagues at lower levels. There are two additional explanations, which are more consistent with the results in the table. The first is that a female CEO may act as a role model for other female managers in the firm. Exposure to a leader from the minority is expected to affect the attitudes of the minority members without necessarily affecting the majority, which is indeed what we observe in the two last columns in Table 7. A second explanation is the mechanism discussed in Coffman (2014) that when there is a female CEO or the firm has a policy concerning gender equality/family-friendly arrangements or work-balance policies, this may induce women to feel more comfortable in management positions and lead female managers to have less stereotype values.

Another noteworthy pattern is observed for the relationship between tenure in current position and gender stereotypes. For males, stereotype attitudes are stronger, i.e. more masculine, the longer the person has been in his current position. Further, when we distinguish between tenures in levels of current positions, the impacts of tenure do not differ across levels. For females, tenure in current

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<sup>25</sup> The indicator for having a family-friendly workplace and the indicator for being a company with work-life balance are positively, but far from perfectly, correlated. Among the 2,972 managers who answer both questions, 1,843 have a zero for both indicators, 540 have a one for both indicators, and the rest give mixed answers to the two questions.

<sup>26</sup> This result is obtained also for smaller samples, which do not include the CEOs themselves.

position is not associated with differences in stereotyping attitudes except for the CEOs for whom gender stereotyping decreases with tenure. Note, however, that female CEOs have considerably more masculine stereotypes than other female managers, and so, according to the estimates, it would take over ten years of tenure as CEO before this difference is removed. All in all, there is little indication of learning effects giving rise to changes in stereotype attitudes over managers' careers.

## 5.2 Gender differences in beliefs about own managerial ability

We now turn to look at how the respondents' perceptions of their own managerial traits vary with individual, job, and employer characteristics. Table 8 contains OLS regressions with the *BOA* index as the dependent variable. Recall, the more negative the value of the *BOA* index is, the more does the manager consider herself/himself to have typical feminine managerial traits (and hence less typical masculine traits). Since only managers who have subordinates have answered the self-stereotypes question, the estimations based on the *BOA* index are restricted to managers at higher levels in the organization.

When female managers assess their own managerial ability, in general they tend to rate feminine traits significantly higher than their male peers. The coefficient of the female dummy is negative (hovering around -0.11), significant and very robust across all regressions in Table 8 (and is also robust to the successive inclusion of a host of firm characteristics – see Table 9).<sup>27</sup> The age profile for *BOA* is U-shaped for female managers with a minimum around the age of 44, i.e., middle-aged female managers tend to be the more feminine self-stereotyping than younger and older female managers.<sup>28</sup> CEOs have higher positive *BOA* scores than other managerial employees, i.e., they rate themselves as having more masculine managerial traits, but these results in Table 8 are not significant.

Adding a number of firm characteristics (same variables as in Table 7) – see Table 9 – increases the statistical significance and size of the estimates to the CEO indicators. Thus, female and male CEOs consider themselves to have more masculine traits than other managers (not significant for females). Combining the results for the female CEO coefficient in Table 7 with those in Table 9, we can conclude that female CEOs (but not other female top executives) tend to have a significantly more masculine or gender-stereotype view of the management role and they also consider themselves to fulfil the stereotype criteria they put up for successful managers.

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<sup>27</sup> The results in Table 8 are also robust to the inclusion of firm fixed effects; see Table B-2 in the Appendix.

<sup>28</sup> Since this is a cross-sectional analysis, we cannot tell whether this result is due to age variation or variation across birth cohorts.

**Table 8. OLS regression of beliefs about ability index (BOA) on individual characteristics**

	All	All	All	Males	Females
Female	-0.108*** (0.017)	-0.117*** (0.018)	-0.115*** (0.018)		
Age/10		-0.130 (0.082)	-0.135* (0.082)	-0.103 (0.090)	-0.254* (0.149)
Age/100		0.015* (0.009)	0.015* (0.009)	0.011 (0.010)	0.030* (0.016)
Tenure firm/10		0.003 (0.009)	0.003 (0.009)	0.006 (0.010)	-0.009 (0.021)
Tenure Job/10		-0.003 (0.014)	-0.001 (0.014)	-0.002 (0.016)	0.003 (0.031)
CEO			0.056 (0.039)	0.039 (0.040)	0.140 (0.115)
Other top executives			0.041 (0.041)	0.063 (0.048)	-0.041 (0.073)
Constant	-0.072*** (0.009)	0.210 (0.187)	0.221 (0.187)	0.155 (0.206)	0.338 (0.324)
R <sup>2</sup>	0.020	0.025	0.026	0.003	0.011
N of obs.	2,061	1,876	1,876	1,360	516
Clusters	1,446	1,332	1,332	1,027	423

Note: Control for firm clusters in estimation. \* p<0.1, \*\* p<0.05, \*\*\* p<0.01

The coefficient of the dummy for the firm being a family-friendly workplace is negatively signed and statistically significant. This may be due to family-friendly companies attracting managers with a relatively feminine self-stereotype, or alternatively, that companies with many managers with feminine managerial traits tend to be more family-friendly workplaces. A third possibility is that family friendly workplaces ‘allow’ female managers to express a more female-oriented stereotype self-image. This is consistent with the prediction from several lab experiments and the model in Bordalo et al. (2016a) that group membership generates self-stereotype attitudes: women are more likely to underestimate their skills when they belong to the minority. On the other hand, this hypothesis is not supported by the insignificant coefficients to the indicator variables for having a female CEO<sup>29</sup> or for firms in which the majority of managerial employees are females. Nor does it receive support from the findings that the estimates for a family-friendly workplace do not differ between the genders.

In columns 4 to 6 we enter the respondent’s stereotype score (*SI*) as an additional regressor. This specification resembles equation (5) in Bordalo et al. (2016b), which is derived from their model of factors that shape individuals’ beliefs about own and others’ abilities. The model predicts that there are

<sup>29</sup> As for the stereotype index, the results are insensitive to exclusion of the female CEOs from the estimation sample.

two sources of differences in beliefs: miscalibration (i.e., over- or underestimation of actual ability) and stereotypes about groups.<sup>30</sup> We do not have data on miscalibration (as we have no information about the respondents' actual managerial abilities), but our dependent variable is a measure of the respondent's belief about her managerial traits and we have a measure of gender stereotypes. Thus, we can see whether the individual's gender stereotype affects his/her beliefs about own abilities, but we cannot say anything about the relative importance of stereotype attitudes and miscalibration, respectively.

We find that a person's self-assessed managerial ability (masculinity) is positively correlated with the person's masculine stereotype score. In column 4, we observe no differences between the genders in the association between stereotypes and SI scores, while in columns 5 and 6 where the equation is estimated separately by gender and hence, the relations between the other explanatory variables and the BOA score may also differ between the genders, the correlation is slightly lower for the females.<sup>31</sup>

In Table 10, we present corresponding estimates to those in Table 9, but now with self-assessed single managerial ability items as the dependent variables. The three items we focus on are those discussed most in the literature: competitiveness, self-confidence and willingness to take risks. Note, that these are integer measures on a scale from 1 to 5. Beginning with columns 1, 4, and 7 where we include both genders, we may first note that while there are no gender differences with regard to risk-taking willingness, female managerial employees believe that they are less competitive and self-confident than their male peers. For competitiveness and risk-taking, but surprisingly not self-confidence, the scores are increasing at the managerial job level. A related question is whether these beliefs are influenced by how long the person has been in the position. Estimations of interactions between position and tenure, reported in Table B-3 in the Appendix suggest that at least for competitiveness and self-confidence, this seems not to be the case.<sup>32</sup>

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<sup>30</sup> Bordalo et al. (2016b) have data on both from a lab experiment as well as data on participants' beliefs about own and others' abilities. Thus, they are able to distinguish between miscalibration and stereotypes as determinants of the overconfidence.

<sup>31</sup> Bordalo et al. (2016b) find that the relative importance of miscalibration and stereotype differs significantly between the genders. Men's greater overconfidence is more due to miscalibration and this is especially true for more difficult tasks. Moreover, stereotypes play a greater role for tasks in the male domain. Women's lower confidence is due to the fact, that they miscalibrate their abilities less and in the male-typed domains this is further weakened by their self-stereotypes and stereotypes of others.

<sup>32</sup> The self-assessed willingness to take risks increases with tenure as CEO or in other C-level positions, but only for male managers.

Managers in firms that strive to create a work-life balance assess their competitiveness, self-confidence and willingness to take risks higher than managers in other companies. The same is true for beliefs about own competitiveness and risk willingness in firms with a formal gender equality agreement.

**Table 9. OLS regression of BOA index on individual and firm characteristics**

	All	All	All	All	Males	Females
Female	-0.117*** (0.018)	-0.117*** (0.019)	-0.116*** (0.019)	-0.084*** (0.019)		
CEO	0.060 (0.040)	0.063 (0.040)	0.065 (0.040)	0.084** (0.036)	0.069* (0.037)	0.154 (0.119)
Other top executives	0.052 (0.040)	0.054 (0.040)	0.053 (0.040)	0.036 (0.037)	0.044 (0.045)	0.020 (0.070)
Gender equality agreement		0.012 (0.020)	0.012 (0.020)	0.018 (0.018)	0.008 (0.021)	0.036 (0.039)
Family friendly workplace		-0.047** (0.020)	-0.047** (0.020)	-0.034* (0.018)	-0.038* (0.022)	-0.036 (0.033)
Firm strives to have work-life balance		-0.006 (0.021)	-0.005 (0.022)	0.006 (0.020)	0.007 (0.024)	0.025 (0.038)
Female share above 50 percent		0.011 (0.026)	0.017 (0.025)	0.007 (0.024)	-0.036 (0.036)	0.039 (0.033)
Female CEO in firm			-0.029 (0.032)	-0.018 (0.030)	-0.044 (0.037)	0.001 (0.049)
SI				0.444*** (0.029)	0.434*** (0.029)	0.380*** (0.058)
Female x SI				-0.093 (0.062)		
Constant term and controls for firm characteristics and leadership variables	Yes	Yes	Yes	Yes	Yes	Yes
R <sup>2</sup>	0.045	0.049	0.050	0.182	0.187	0.138
N	1,856	1,856	1,856	1,856	1,350	506
Clusters	1,323	1,323	1,323	1,323	1,022	4176

Note: Control for firm clusters in estimation. \* p<0.1, \*\* p<0.05, \*\*\* p<0.01. Additional firm characteristics mentioned in footnote 28 are also included.

Turning next to the within gender estimates, we make two observations. First, the stronger beliefs in own abilities in work-life balanced firms mentioned earlier is mainly due to differences among female managers, whereas the corresponding difference between employers with and without a gender equality agreement is significant only for males. Second, we do not find indications of any role model effects of female CEOs; indeed, the estimate for female managers is far from significant for all three ability items. Nor are there any differences in beliefs in own ability between firms with a female or male majority of managers.

**Table 10. Regression estimates for three self-assessed managerial ability items**

	COMPETITIVENESS			SELF-CONFIDENCE			WILLINGNESS TO TAKE RISKS		
	All	Males	Females	All	Males	Females	All	Males	Females
Female	-0.161*** (0.053)			-0.131*** (0.041)			-0.043 (0.048)		
Age/10	-0.127 (0.198)	-0.064 (0.245)	-0.418 (0.398)	0.199 (0.180)	0.198 (0.216)	0.142 (0.308)	-0.296 (0.215)	-0.454* (0.251)	-0.275 (0.380)
Age <sup>2</sup> /100	0.009 (0.021)	-0.000 (0.026)	0.049 (0.045)	-0.028 (0.020)	-0.029 (0.023)	-0.017 (0.035)	0.032 (0.023)	0.044 (0.027)	0.044 (0.042)
Tenure job/10	-0.013 (0.031)	-0.005 (0.033)	-0.044 (0.080)	0.056** (0.027)	0.070** (0.031)	0.012 (0.060)	-0.001 (0.034)	0.026 (0.039)	-0.069 (0.068)
CEO	0.307*** (0.091)	0.260** (0.101)	0.368 (0.235)	0.113 (0.080)	0.134 (0.080)	0.101 (0.151)	0.112 (0.099)	0.064 (0.110)	0.402* (0.226)
Other top executive	0.132 (0.091)	0.113 (0.104)	0.138 (0.199)	-0.034 (0.082)	0.000 (0.096)	-0.198 (0.159)	0.169*** (0.086)	0.197* (0.105)	0.020 (0.139)
Gender equality agreement	0.101* (0.052)	0.135** (0.056)	-0.054 (0.117)	0.032 (0.041)	0.020 (0.047)	0.074 (0.081)	0.106** (0.048)	0.130** (0.057)	-0.008 (0.098)
Family-friendly workplace	-0.056 (0.052)	-0.050 (0.062)	-0.064 (0.099)	0.045 (0.041)	0.080 (0.050)	-0.060 (0.075)	-0.040 (0.048)	-0.039 (0.054)	-0.087 (0.094)
Firm strives to work-life balance	0.119** (0.057)	0.075 (0.069)	0.267** (0.109)	0.129*** (0.045)	0.109** (0.054)	0.191** (0.081)	0.124** (0.055)	0.074 (0.060)	0.296*** (0.114)
Female share >50%	0.085 (0.069)	0.085 (0.105)	0.104 (0.094)	-0.014 (0.054)	0.041 (0.089)	-0.026 (0.071)	-0.000 (0.064)	0.031 (0.098)	0.010 (0.084)
Female CEO in firm	-0.022 (0.073)	-0.023 (0.110)	-0.020 (0.114)	-0.015 (0.062)	0.019 (0.081)	-0.063 (0.103)	0.090 (0.073)	0.164 (0.101)	-0.059 (0.110)
SI score	0.466*** (0.079)	0.455*** (0.080)	0.435*** (0.139)	0.317*** (0.061)	0.306*** (0.061)	0.374*** (0.114)	0.393*** (0.071)	0.366*** (0.071)	0.502*** (0.139)
Female x SI	-0.047 (0.158)			0.038 (0.122)			0.007 (0.151)		
Constant term and controls for firm characteristics and leadership variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R <sup>2</sup>									
N of obs.									
N clusters	0.068 1,883 1,345	0.065 1,368 1,036	0.097 515 425	0.068 1,886 1,345	0.079 1,370 1,038	0.055 516 426	0.061 1,885 1,347	0.072 1,369 1,037	0.091 515 426

## 6. Beliefs about own managerial ability and managerial careers

The results in Tables 6 – 9 have all suggested that after controlling for age, tenure and a number of firm characteristics, CEOs and – to some extent - other top executives are significantly different from managers at lower levels with respect to gender-stereotyping attitudes as well as self-assessed managerial ability. Since the group of top executives in a company almost by definition makes up the most powerful employees in hiring decisions and company policy processes, it is interesting to study this group in somewhat more depth and to investigate how they differ from lower-level managers. Adams and Funk (2012) found that Swedish female top executives and directors are significantly different from the overall Swedish female population with respect to a number of values like ‘power’, ‘achievement’, ‘security’, and ‘risk-taking’. These Swedish powerful women tend to put higher values on ‘stimulation’ and less values on ‘security’ and ‘tradition’ than their male peers, and even more so when compared to their female peers in the total Swedish population.<sup>33</sup>

The results presented until now are describing the attitudes of Danish managers with respect to the traits that characterize a successful manager and their own self-assessment concerning these traits. The description clearly highlights the existence of gender differences in stereotypes and self-stereotypes. A natural question is: How important are these differences for the observed gender differences in the upper echelons of firms?

In this section, partly inspired by Adams and Funk (2012) and partly by Kaplan et al. (2012), and Kaplan and Sørensen (2016), we carry out two further analyses in order to shed some light on this admittedly broad question. First, we ask whether, and how, respondents’ self-assessed managerial skills measured by the items included in the *BOA* index are correlated with their position in the managerial hierarchy. More specifically, we examine the extent to which managers’ self-assessed management skills are related to their probability of being employed as CEO or in a top (C-level) executive position in the firm. Or, expressed in another way, does self-stereotyping act as a glass ceiling for female managers, and if so, how important is it? Do women tend to give up or compete less strongly for promotions into higher positions because they perceive that their management skills are poorer than those of their male colleagues? Second, we look at which specific leadership traits are important to possess, i.e., are

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<sup>33</sup> The same pattern is found for Germany by Fietze et al. (2011) for the more broad category of managers with subordinates who are significantly different with respect to their self-assessment of personality traits (Big Five and willingness to take risk) compared to employees who are not managers.



masculine traits more important than feminine traits when it comes to the probability of reaching a top position?

We estimate logit regression models where the dependent variable is a binary indicator for the individual being either a CEO or a top executive, and the key right-hand side variables are several alternative measures based on the self-assessed abilities.<sup>34</sup> As the management skills are self-assessed, causality can of course go both ways. We use three sets of scores: the total BOA score, the sub-total scores for masculine, feminine, and neutral traits, and the individual scores for the items making up the aforementioned aggregates. In addition, we enter controls for age, tenure at firm, firm size, and industry. Since we only have BOA measures for the subsample of managers with subordinates, the estimation sample is restricted to managers at higher levels, at which gender differences in traits are smaller, especially for CEOs. The estimates are displayed in Table 11.

The first column in which none of the BOA items is entered shows that the estimated marginal effect of the female indicator is -0.021 and significant. Since the share of top executives in the sample used for this estimation (managers at higher levels) is around ten percent, a female marginal effect of minus two percent is sizable. In the next columns, we add the BOA score measures. The marginal effect (3 percent) of the total BOA score is large and significantly positive. In column 3, where the total score is divided into its three components, we can see that the feminine traits attach a numerically large and negative coefficient and the neutral traits variable carries a positively signed coefficient. Both differ significantly from zero. The masculine component is also positively correlated with being a top executive, but is not significant. In the two last columns, we report estimates for males and females, separately. The feminine traits are associated with a lower probability of being a top executive for both genders, but the estimates are (larger and) statistically significant only for males. The neutral traits are positively correlated with being a top executive for both genders. The male traits also attach positively signed coefficients for both genders but neither of them differ significantly from zero.

It is worth noting that since the mean value of the dependent variable is 8.9 percent, the marginal effects of the BOA variables found in Table 11 are sizable. Another interesting finding is what happens to the estimate to the female dummy as we enter the *BOA* scores. If the lower probability that the top manager is female was mainly due to female managers considering themselves to have weaker management skills than males, then the inclusion of the *BOA* scores should lead to a significant drop in the estimate to the

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<sup>34</sup> In alternative estimations not shown here, we have restricted the estimations to CEOs only, i.e. we have excluded all other top executives in order to test whether the results also hold for this selected subgroup of top executives. The results in Tables 11 and 12 do not differ with respect to the sign of the marginal effects of *BOA* variables.

female dummy. We do indeed find that the estimate decreases, and the decline is marked: the marginal effect drops from -0.021 to -0.015, that is, by about 30 percent, but is now less precisely estimated.<sup>35</sup>

In Table C-1 in the Appendix, we enter all the individual items of the *BOA* score as explanatory variables. Only three items turn out statistically significant. The three abilities are decisive (masculine), visionary (neutral) and helpful (feminine). The two first increase the probability of being a top executive while the last is negatively correlated with being one. All three significant estimates are larger for females, but overall the gender differences are small.

**Table 11. Logit estimates (marginal effects). Dependent variable: Respondent is a top executive (CEO or other top executive)**

	All	All	All	Males	Females
Female	-0.021* (0.011)	-0.020* (0.011)	-0.015 (0.011)		
BOA Management skills total score		0.031*** (0.011)			
BOA Masculine traits			0.016 (0.012)	0.020 (0.016)	0.010 (0.015)
BOA Feminine traits			-0.017* (0.009)	-0.019* (0.011)	-0.012 (0.013)
BOA Neutral traits			0.027*** (0.009)	0.027** (0.012)	0.023* (0.013)
R <sup>2</sup>	0.085	0.091	0.100	0.103	0.097
N of obs	1,953	1,953	1,953	1,412	540
Clusters	1,378	1,378	1,378	1,058	443

Note: Controls for age, tenure, industry, and firm size are included but not shown. \* p<0.1, \*\* p<0.05, \*\*\* p<0.01

A more detailed analysis of the importance of gender differences in the self-assessed management skills is provided in Table 12. Here we present the predicted probabilities of being a top executive for a reference person based on the estimates in Table 11, columns 4 and 5, respectively. The reference persons are 50 years of age, have been employed by the current employer for 10 years and the firm they are employed at is in the trade and services industry and has between 100 and 250 employees. In addition to these characteristics our reference person has the following traits: he is male and his self-assessed managerial abilities equal the average score for all males in the estimation sample. The predicted probability that the reference person is a top executive is, as can be seen from the first row, 17.1 percent. In the second row, we provide him with the average *BOA* scores for the females in the

<sup>35</sup> Kaplan and Sørensen (2016) also find that females are less likely to be CEOs or in other C-level positions, even after controlling for a set of management skills and personality traits.

sample. This leads to a drop in the top executive probability to 15.9 percent. In the third row, we switch the reference person 1's gender and provide her with the average *BOA* scores for females. The consequence of this is a markedly lower probability of being a top executive: 12.8 percent. In the fourth row, we provide her with the average *BOA* scores for males, which yields a one percentage point higher predicted probability. Thus, the simple calculations in Table 12 indicate that less than ten percent of the gender gap in top executive positions is related to self-assessed management abilities. This is not surprising in view of the mean *BOA* values in Table 5, which did not differ between the genders for CEOs. Indeed, performing the exercises in Tables 11 and 12 with CEO as the dependent variable, yields results indicating an even smaller contribution of self-assessed management skills to the observed gender gap.

**Table 12. Predicted top executive probabilities**

Gender	BOA score	Probability (standard error)
Male	Male average	0.171*** (0.028)
Male	Female average	0.159*** (0.027)
Female	Female average	0.128*** (0.026)
Female	Male average	0.138*** (0.027)

Are the gender differences in the beliefs about own managerial skills “real”? Or, do they for instance reflect differences in self-confidence? Coffman (2014) has shown in a lab experiment setting that having self-confidence in a given (especially self-congruent) trait is important for the willingness to contribute.<sup>36</sup> Is confidence in one's management skills also important for reaching top executive positions? Assume that some (or all) of the observed differences in self-assessed skills are due to females having less confidence in their managerial skills, and furthermore that this is in particular the case for the masculine traits. If so, then we would expect that these would be important in “explaining” the gender differential. We do not find that.<sup>37</sup> On the other hand, we do find and for both genders, that higher self-assessed neutral skills increase the probability of being a top executive (and to an equal extent), and

<sup>36</sup> Bordalo et al. (2016b) have in a recent paper shown that beliefs about own and others' abilities are not only a question about (gender) differences in self- or overconfidence but also arise because of miscalibration of own and others' abilities. The latter can also differ by gender.

<sup>37</sup> This can of course be due to the fact, that relatively few female top executives constitute a highly selected group or that being in that position confirms the holder that s/he has these masculine skills.

that stronger feminine skills which are gender-incongruent for males are indeed associated with a lower probability for males being in a C-level position.

## 7. Conclusions

In this paper we have provided a fairly detailed documentation of the prevalence of gender-stereotyping attitudes and beliefs about own managerial skills in a large sample of managers at different levels in Danish private-sector firms. The key findings are: Female managers have on average less masculine stereotype attitudes than their male peers, also when controlling for firm and individual background characteristics. There is, however, no gender differential in gender stereotypes among top executives, in part because male CEOs tend to be less masculine stereotype than other male managers and in part because the considerably fewer female CEOs tend to have more masculine stereotype attitudes than male CEOs. The more gender-stereotype views of female CEOs are not driven by an age effect as younger female managers tend to have more gender-stereotype views than their older peers. Companies with a stronger focus on work-life-balance policies tend to have less gender-stereotyping managers. This holds for managers of both genders and could reflect that the policy teaches employees to have less gender-biased views, but could also be due to sorting.

As for beliefs about own managerial ability, a very robust result is that female managers tend to rate themselves lower than their male peers on the masculine management traits and higher on the feminine management traits. In other words, we find indications of distinct self-stereotyping patterns. Top executives rate themselves higher than other managers on most managerial traits, and in this regard we observe no significant gender differences. Younger (mainly female) managers rate themselves higher than older managers, i.e. young (female) managers see themselves as having more masculine traits compared to their older peers. We do not find support for the hypothesis that female managers in companies with more policies promoting gender equality or work-life-balance arrangements are less (masculine) self-stereotyping.

We find that female managers have stronger beliefs in their managerial abilities regarding the “feminine” skills and weaker beliefs in their “masculine” skills. For the males we observe the opposite pattern. The exception is the small group of female CEOs whose self-assessed managerial abilities do not differ from that of their male colleagues; they are fairly confident that they possess the skills and traits which successful managers should have according to their own norms. We find that belief in own managerial ability is strongly and positively correlated with the manager’s gender-stereotype views and that strength of the relationship differs only little between males and females.

Finally, we ran some simple regressions to describe in more detail the relationship between the gender gap in C-level positions and the managers' beliefs in own abilities. The estimates show a positive relation between having a CEO or top executive position and beliefs about one's own managerial ability. However, beliefs about own ability is estimated to account for less than ten percent of the observed gender difference in the occupancy of C-level positions.

So, what could explain the rest of the gap? Our results point to one obvious candidate: the gender-stereotype attitudes of the decision makers in hiring and promotions. Here we find clear indications of masculine stereotyping, especially among male managers, both at top executive levels (excl. CEO-level) and at lower managerial levels. This is of course pure speculation, as long as we do not have evidence that this is an important mechanism. The main challenge for future research is to set up models, collect data and develop tests that allow us to investigate this hypothesis.

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## Appendix

**Table A-1. Sample means. Firm characteristics**

		All	Females	Males
Firm is subsidiary to a foreign owned company		0.312	0.315	0.310
Industry	Manufacturing	0.360	0.300	0.287
	Trades and Services	0.376	0.413	0.359
	Other	0.264	0.287	0.254
Firm size - Number of employees	0-49	0.259	0.256	0.261
	50-249	0.292	0.293	0.292
	250+	0.449	0.451	0.447
Share of female managers in firm	50-100%	0.121	0.242	0.067
	0-49%	0.879	0.758	0.933
Is top manager a woman	Yes	0.074	0.118	0.055
Recruitment to management positions	Primarily internal	0.131	0.136	0.129
	Internal and external	0.584	0.553	0.597
	Primarily external	0.225	0.241	0.218
Primary basis for promotion of managers	Performance and overall qualifications	0.226	0.232	0.223
	+ other factors	0.774	0.768	0.777
Primary basis for promotion of workers	Performance and overall qualifications	0.258	0.256	0.259
	+ other factors	0.742	0.744	0.741
The firm operates in an industry with high risk	To a (very) little extent or not at all	0.675	0.724	0.653
	To a (very) high extent	0.325	0.276	0.347
The firm operates in an industry with strong competition	To a (very) little extent or not at all	0.199	0.203	0.197
	To a (very) high extent	0.802	0.797	0.803
The firm has a clearly stated gender equality agreement	To a (very) little extent or not at all	0.790	0.837	0.769
	To a (very) high extent	0.210	0.164	0.231
The firm is a family-friendly workplace	To a (very) little extent or not at all	0.693	0.695	0.692
	To a (very) high extent	0.307	0.305	0.308
The firm strives to ensure work-life balance for the employees	To a (very) little extent or not at all	0.745	0.744	0.746
	To a (very) high extent	0.255	0.256	0.254
Management is centralized	To a (very) little extent or not at all	0.666	0.705	0.648
	To a (very) high extent	0.335	0.295	0.352
Management is exercised through rules and directives	To a (very) little extent or not at all	0.707	0.706	0.707
	To a (very) high extent	0.293	0.294	0.293
Management is exercised through motivation and mutual respect	To a (very) little extent or not at all	0.544	0.575	0.531
	To a (very) high extent	0.456	0.425	0.469
No. of obs.		2,972	2,054	9,18

**Table B-1. OLS and FE regressions (firm) of Stereotype Index (SI) on individual characteristics on the subsample of firms with two or more managers in the survey**

	FE estimation			OLS		
	All	Males	Females	All	Males	Females
Female	-0.069** (0.027)			-0.086*** (0.020)		
Age/10	-0.104 (0.118)	-0.030 (0.150)	-0.570** (0.222)	-0.087 (0.088)	0.008 (0.125)	-0.357** (0.163)
Age <sup>2</sup> /100	0.010 (0.013)	0.001 (0.016)	0.062** (0.025)	0.007 (0.010)	-0.002 (0.013)	0.036* (0.019)
Tenure firm/10	0.018 (0.013)	0.026* (0.014)	-0.013 (0.036)	0.008 (0.008)	0.008 (0.008)	-0.009 (0.022)
Tenure job/10	-0.021 (0.022)	-0.020 (0.027)	-0.048 (0.049)	-0.001 (0.016)	-0.011 (0.019)	-0.003 (0.039)
CEO	-0.166** (0.071)	-0.232** (0.093)		-0.072 (0.078)	-0.0021 (0.073)	
Top executive	0.022 (0.026)	0.003 (0.035)	0.0201 (0.058)	0.027 (0.020)	0.013 (0.026)	0.057 (0.044)
Constant	0.258 (0.268)	0.104 (0.353)	1.228** (0.488)	0.232 (0.198)	-0.000 (0.285)	0.771** (0.347)
R <sup>2</sup>	0.018	0.017	0.053	0.022	0.002	0.038
N individuals	1,104	691	236	1,104	691	236
N firms	378	247	94			

Note: Control for firm clusters in OLS-estimation. \* p<0.1, \*\* p<0.05, \*\*\* p<0.01

**Table B-2. OLS and FE regression (firm) of BOA index on individual characteristics on the subsample of firms with two or more managers in the survey**

	FE estimation			OLS		
	All	Males	Females	All	Males	Females
Female	-0.100** (0.040)			-0.119*** (0.027)		
Age/10	-0.086 (0.157)	-0.112 (0.189)	-0.348 (0.307)	-0.144 (0.123)	-0.041 (0.157)	-0.403* (0.240)
Age <sup>2</sup> /100	0.012 (0.017)	0.014 (0.020)	0.049 (0.037)	0.016 (0.013)	0.003 (0.017)	0.049* (0.028)
Tenure firm/10	0.025 (0.021)	0.037** (0.017)	-0.044 (0.040)	-0.002 (0.015)	0.010 (0.011)	-0.072** (0.038)
Tenure job/10	0.029 (0.034)	0.012 (0.037)	0.015 (0.077)	0.010 (0.022)	0.009 (0.023)	-0.004 (0.053)
CEO	0.139 (0.096)	0.179* (0.105)		0.096 (0.072)	0.176** (0.082)	
Top executive	0.105*** (0.033)	0.077* (0.040)	0.026 (0.066)	0.089*** (0.025)	0.070** (0.030)	0.090 (0.059)
Constant	-0.016 (0.355)	0.066 (0.439)	0.393 (0.641)	0.215 (0.279)	0.007 (0.361)	0.656 (0.517)
R <sup>2</sup>	0.059	0.042	0.054	0.046	0.016	0.056
N individuals	776	496	163	776	496	163
N Firms	345	228	86			

Note: Control for firm clusters in OLS-estimation. \* p<0.1, \*\* p<0.05, \*\*\* p<0.01

**Table B-3. Job level – tenure interactions estimates**

	COMP	COMP	COMP	SELF	SELF	SELF	WTR	WTR	WTR
	All	Males	Females	All	Males	Females	All	Males	Females
CEO	0.281** (0.135)	0.233 (0.151)	0.403 (0.367)	0.109 (0.095)	0.124 (0.113)	0.139 (0.214)	-0.025 (0.134)	-0.041 (0.152)	0.097 (0.268)
Top Exec.	0.203*** (0.057)	0.160** (0.068)	0.310*** (0.119)	0.050 (0.051)	0.026 (0.060)	0.066 (0.097)	0.077 (0.057)	0.026 (0.070)	0.199* (0.109)
Tenure in position	-0.011 (0.039)	-0.009 (0.040)	-0.027 (0.101)	0.038 (0.032)	0.051 (0.035)	-0.009 (0.076)	-0.048 (0.040)	-0.038 (0.045)	-0.050 (0.083)
Tenure x CEO	0.181 (0.134)	0.162 (0.144)	0.154 (0.413)	0.072 (0.123)	0.067 (0.123)	0.051 (0.491)	0.313** (0.139)	0.253* (0.142)	0.740 (0.488)
Tenure x Top Exec.	0.004 (0.059)	0.024 (0.067)	-0.059 (0.135)	0.063 (0.058)	0.066 (0.065)	0.091 (0.117)	0.130** (0.060)	0.188*** (0.071)	-0.093 (0.127)

**Table C-1. Logit estimates (marginal effects): Dependent variable: Respondent is a top executive (CEO or other top executive)**

	All 1	Males 2	Females 3
Female	-0.115*** (0.027)		
<i>SSI Items: Masculine traits</i>			
Decisive	0.025 (0.023)	0.010 (0.026)	0.072 (0.047)
In self-control	0,005 (0.180)	0,008 (0.02)	-0.012 (0.033)
Willing to take risks	0.290* (0.156)	0.027 (0.018)	0.026 (0.030)
Competitive	0.046** (0.016)	0.044** (0.020)	0.042 (0.264)
Self-confident	0.006 (0.197)	-0.007 (0.011)	0,163 (0.036)
<i>Feminine traits</i>			
Socially competent	0.158 (0.017)	0.062** (0.025)	0.020 (0.034)
Helpful	-0.118*** (0.020)	-0.010*** (0.023)	-0.029*** (0.011)
Dialogue-oriented	0.024 (0.018)	0.020 (0.021)	-0.16*** (0.036)
<i>Neutral traits</i>			
Visionary	0.020 (0.009)	0.010 (0.023)	0.047** (0.031)
Innovative	0,018 (0.190)	0,002 (0.020)	-0.007 (0.010)
Result-oriented	0.057 (0.021)	0.062** (0.025)	0,051 (0.040)
R <sup>2</sup>	0.053	0.039	0.085
N of obs.	1,923	1,412	526
Clusters	1,378	1,058	443

Note: Controls for age, tenure, industry, and firm size are included but not shown. \* p<0.1, \*\* p<0.05, \*\*\* p<0.01