Candidates' professions and the gender gap in parliaments – Evidence from an exit-poll experiment

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Abstract

Despite significant improvement over the last decades, women are still heavily underrepresented in parliament in most countries. This study examines whether voter preferences for stereotypical male occupations may explain part of this gap. For the analysis, we conducted an election experiment built into an exit-poll of voters in Germany in 2014. Participants faced different versions of a hypothetical open list of candidates who exogenously varied their gender and profession. Comparing the voting behavior across different treatments, we do not find any disadvantage for female candidates in the absence of profession information. On the contrary, female candidates even enjoy an electoral advantage, driven by female voters. Once voters know the profession of candidates, however, this changes towards a small edge for male candidates, caused by a stronger preference for gender stereotypical professions among men than among women. This shows that existing gender differences on the labor market spill over into other important areas as well.

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1 Introduction

In most countries, women are underrepresented in parliaments relative to their share in the population. This gender gap can be observed across nations and at all levels of government. For instance, women occupied only 20 percent of the seats in Congress and 24.8 percent in state legislatures in the US in 2018 (CAWP, 2018), 37.4 percent in the European Parliament (European Parliament, 2017), and about 31 percent and 32 percent in the German Bundestag and the British House of Commons, respectively (IPU, 2018). This is even more remarkable since each of these entities has more women than men in the population (World Bank, 2017) and we would therefore expect female candidates to have an advantage at the polls. This underrepresentation of women has consequences for policy decisions because female politicians tend to have different policy preferences and priorities than their male colleagues (Chattopadhyay and Duflo, 2004; Clots-Figueras, 2011, 2012; Thomas, 1991). For instance, parliaments with higher shares of women assign more resources to healthcare and education (Holman, 2014).

Many factors contribute to this situation. This includes women's lower level of political ambitions (Fox and Lawless, 2010) and their higher inhibition to enter competition (Niederle and Vesterlund, 2007), as well as structural disadvantages like biased coverage in the media (Carlin and Winfrey, 2009) and shenanigans of party leaders in favor of male candidates (see Carroll, 1994; Esteve-Volart and Bagues, 2012; Fox and Lawless, 2010; Stambough and O'Regan, 2007, among others). By contrast, the existing evidence is inconclusive about the role of the voters in this context, that is, whether there is a systematic bias against female candidates in the electorate. While some studies report small negative effects of being female (e.g. Giger et al., 2014; Sanbonmatsu, 2002), others show either no impact of candidate gender (McElroy and Marsh, 2010) or even a small advantage for women (Black and Erickson, 2003).

In this paper, we examine an aspect of voter behavior which has been overlooked in the literature so far, but may explain part of the representation gap and some of the variation in the results of these earlier studies. More specifically, we test whether voters have a preference for candidates working in typically male-dominated professions. If this is true, male candidates would possess a hidden systematic advantage over female candidates in situations in which their respective profession is either a prominent feature in the campaign or directly stated on the ballot as additional information on the candidates.[3]

For the analysis, we use data from an election experiment built into an exit poll of voters in Germany in 2014. Respondents faced a list of 30 imaginary candidates of their favorite party and were asked to select the six they would prefer to represent them. Using different information treatments, we first examine whether there is a direct gender

[3]The former is the case in candidate-centered elections with simple majority voting (McDermott, 2005), the latter happens in many countries around the world, including some states in the US, Germany, and Switzerland.

preference among voters in the absence of other information about the candidates. To this end, we exogenously assign first names to the candidates which unambiguously indicate a certain gender. In consequence, female voters strongly prefer female candidates, while male voters seem to be indifferent towards candidate gender. The results for female voters are in line with earlier findings of same-sex preference in the literature (e.g. Dolan, 1998; Sigelman and Sigelman, 1982). Due to this strong bias among the women in our sample, female candidates enjoy a sizable bonus on average in this scenario.

In the second step, we look at the results of six different ballot versions in which we add information about the candidates' profession. More specifically, each candidate appears on two ballot versions with a male-dominated, a female-dominated and a gender-neutral profession, respectively. This way, we are able to identify the impact of the different types of professions while keeping the candidates' name, gender, and position on the list constant.

Our findings suggest that profession information profoundly affects the selection decision. First, individuals reveal a preference for candidates working in a profession which is typically associated with the respective individual's gender, e.g., male voters for physicists, engineers, firefighters, and metalworkers, and female voters for psychologists, elementary school teachers, elderly care nurses, and medical assistants. Second, this bias towards professions dominated by one's own gender is significantly stronger for men than women, confirming sociological research about stronger gender stereotyping among men (e.g. Miller and Budd, 1999; Miller and Hayward, 2006). As a consequence, the advantage for female candidates in the situation without profession information vanishes and even reverses into an electoral bonus for male ones, once we use our findings to simulate results with more realistic shares of male and female candidates working in male and female dominated professions. Finally, this bonus for men leads to losses in electoral ranks for female candidates and therefore to lower chances of rising to the top of the list and ending up in parliaments.

With respect to the literature, these findings suggest that studies examining gender preferences among voters in settings in which profession information does not play a role, will tend to find more positive results with respect to the electoral chances of female candidates (e.g. Baltrunaite et al., 2016; Black and Erickson, 2003; Dolan, 1998; McElroy and Marsh, 2010). While others, in which profession information is available (e.g. Chakraborty, 2012; Giger et al., 2014), will find negative results.

The paper continues as follows: In section 2, we present and discuss the most relevant literature on the use of information cues in low-information elections and the likely impact of profession and gender stereotypes. Then, we introduce the design of our experiment in section 3. Section 4 describes the resulting sample and shows that the random allocation of respondents to the different information treatments led to very similar comparison groups. In section 5 we describe how we identify the impact of gender and profession.

Section 6 reports the empirical findings for both steps of the analysis, as well as for several robustness checks. Finally, section 7 discusses the potential implications of the results, limitations of this study, and possible directions for follow-up research on the topic.

2 Voting, professions and stereotypes

An extensive literature is dedicated to the issue of electoral results for female candidates. It is divided in three main strands.

The first one analyzes the legislative consequences of female representation among politicians. Since the number of women in parliaments and among representatives tends to be lower than that of men, many authors study the counterfactual effects on policy if gender shares were balanced. For instance, Holman (2014) and Thomas (1991) provide evidence that parliaments with stronger female representation increase government spending and assign more resources to healthcare, education and family support. Chattopadhyay and Duflo (2004) find that in India village councils with higher shares of women provide more of those public goods which benefit women. Parts of the existing literature also cover the effects of female policymakers on subsequent electoral success of female candidates. The findings are heterogeneous and depend on the country studied. Baskaran and Hessami (2018), using data from Germany, show that female candidates reach higher vote shares in local council elections if the respective mayor is a women. However, Ferreira and Gyourko (2014) find no evidence for political spillovers of female mayors in the USA.

A second group of studies is concerned with the supply of female candidates, i.e., the selection processes which determine the makeup of party lists and the characteristics of female candidates. Which therefore play an important role in determining the share of women in parliaments. Niederle and Vesterlund (2007) present evidence that women are less likely to sort themselves into competitive environments like political campaigns. Results from Fox and Lawless (2010) indicate that women are also less likely to be recruited as political candidates in the US, and if they are, it is in more competitive districts with a greater risk of losing (Carroll, 1994; Stambough and O'Regan, 2007). In consequence, Anzia and Berry (2011) as well as Ferreira and Gyourko (2014) suggest that those women who do run and get elected are more capable on average, due to the harder selection process they go through. There is mixed evidence if having more female candidates on party lists affects their representation in parliament. For instance, Campa (2011) finds no significant change in female representation after the introduction of gender quotas on ballots in Spanish municipal elections. Esteve-Volart and Bagues (2012) show evidence that this may be due to parties systematically placing female candidates on less favorable positions on the ballot, which diminishes the effects of gender quotas. However, Baltrunaite et al. (2016) exploit the introduction of new election rules in Italy

in a regression discontinuity design and find evidence for strong supply side effects on the election of female representatives.

An important third strand of research, and the one to which our paper contributes the most, studies the determinants of voter demand for female candidates. Early work by Sigelman and Sigelman (1982) shows only weak gender effects among US undergraduate students, especially in comparison to the strong impact of the age of the candidates. Their experimental survey also contained information on candidate professions, but as all of them were gender neutral, it is not possible to derive any results about gender stereotyping from this setup. Huddy and Terkildsen (1993) look at gender effects from a different angle. They provide experimental evidence that voters associate typically female and male candidate traits with different areas of political expertise. Candidates with male traits are considered more competent on the topics of economics and national security, while female character traits are associated with higher competence in topics which require compassion, such as social security and education. Overall, voters seem to consider male character traits to be more important for office holders than female character traits. If this extends to male-dominated professions compared to female-dominated ones, it could explain the impression stated above that studies in environments in which professions play a role tend to find less favorable results for female candidates than in circumstances without information on occupations. Similarly, the different traits attributed to male and female candidates may also explain the finding by McDermott (1997) that female candidates fare better when running for the Democrat Party compared to the Republican Party in the US. Since their perceived competences aline much more closely with the preferences of the electorate of the former party. Going one step further in the analysis and considering the voting patterns of male and female voters separately, there is strong evidence that individuals prefer to be represented by candidates of their own gender. Such behavior is shown by both Dolan (1998) and Sanbonmatsu (2002).

The article most similar to ours in terms of experimental design and empirical approach is McDermott (2005). Using experimental survey data from state-wide races in California, she demonstrates that in low-information settings, occupational characteristics of the candidates serve as a signal for qualification and educational achievement and thus influence voter decisions. The study has two limitations with respect to our topic, however. First, the focus on races for executive offices featured only one candidate per party, which means that the party affiliation of the candidates most likely dominated the other information cues. And second, the experiment only varied whether the given profession of the candidates was revealed or not, but did not exogenously assign gender and different professions to the same candidates. Taking a closer look at gender-profession interactions and their impact on the electoral gender gap is therefore not possible with this setup.

Our paper contributes to this literature in a number of ways. First, it examines ex-

perimentally whether we can explain the different findings on the gender gap in voter preferences with the presence of profession information about the candidates. To this end, we conduct the same election experiment in the absence and presence of profession information and compare the magnitude of the respective gender gaps. Second, we investigate how different types of professions impact the electoral chances of male and female candidates separately. We focus in particular on the role of occupations that are strongly dominated by either gender and may therefore transport certain connotations. And third, we are able to use our rich data containing individual-level information on the participants, their voting behavior, and the characteristics of the candidates in order to specifically look at stereotypical and atypical gender-profession combinations and how voters react to them. To the best of our knowledge, the last two points constitute the first attempts to examine this topic with an adequately powerful experiment and sample size.

With these contributions, our paper also relates to the literature on the hiring of employees, as the context of choosing the best candidate for office resembles the selection of a new employee rather closely. In both cases, the respective principal chooses an agent out of many applicants based on a rather limited set of information about the latter. Gender preferences revealed in hiring decisions could therefore easily exist in voting decisions and vice versa. For instance, Azmat and Petrongolo (2014) conduct a comprehensive review of the international literature on gender differences in hiring and conclude that there is evidence of significant discrimination against women in high-status or male-dominated jobs and against men in female-dominated ones. If politics is considered a more male-dominated domain and more masculine competences like assertiveness and risk-taking are perceived as necessary to thrive there, this could explain a part of the observed gender gap. Additionally, if voters do not care per-se about the gender of the candidate, but appreciate candidates working in high-status or male-dominated jobs in general, this points towards possible negative spill-over effects for female candidates from the labor market into the political arena in situations in which candidate profession is an important cue.

3 Survey design

For the analysis of these phenomena, we use data from a large election experiment conducted as part of an exit-poll at the simultaneous elections to the EU parliament and local councils in Germany in May 2014. At a total of 28 locations in 15 different communities in the population-rich states of Baden-Württemberg and Nordrhein-Westfalen, voters were approached outside the polling stations and asked to participate in an anonymous study on voter behavior.[4] In order to obtain a representative sample of voters

[4]The original questionnaire in German is available from the authors upon request

in these places, interviewers were instructed to approach every third person leaving the buildings. All persons who consented to take the survey obtained the questionnaire and could fill it out on their own with the interviewer remaining nearby in case of questions.[5]

The questionnaire was structured in four main parts:[6] The first asked individuals about the election they just participated in. That is, which party they voted for, how many candidates of that party they knew, and how satisfied they were with their choices. The second was a hypothetical election in different versions which constitutes the core of the present study and will be explained in more detail below. The third part inquired about the experience of voting in this hypothetical election, e.g. what methods they used to select candidates and what additional information they would have liked to know about them. Finally, the fourth elicited the basic personal characteristics of the respondents, that is, their gender, age group, education, family status, and current profession.

In the election experiment, survey participants were asked to allocate six votes among a list of 30 hypothetical candidates, which they should think off as candidates from their preferred party. Thus, the setup mimics the situation of voters who have to choose between mostly unknown candidates of their preferred party on a lower institutional level. For instance in an open list election as used in many countries of Northern and Central Europe or a primary election to determine a party's candidate in a local race in the US.

Respondents were randomly assigned to a total of 16 different versions of the hypothetical election. All of them featured the same candidates, as defined by their family names, at the same ballot positions, but varied in the amount of information provided to the participants. For the purposes of this paper, we use the following eight versions as presented in figure 1: The first one only features the family name and the initials of the first names, such that they appear in a gender-neutral way to the participant. Version 2 spells out the whole name and thus reveals the gender of the candidates. Male and female candidates appear alternating, starting with a male candidate on the first spot. Finally, versions 3 to 8 use the same names and gender as version 2, but additionally state a profession next to the name of the candidates.

The setup of our data collection provides a number of advantages over traditional sources. Compared to surveys conducted on the phone some time after the election, it directly targets the group of people most relevant for this research at a point in time as close to the real decision-making as possible. Selection issues with regards to voting participation are minimized by drawing respondents only from those individuals who actually went to the polls. This ensures that our respondents are in the right set of mind to correctly answer questions about how they voted and how they would choose in a slig-

[5]Bishop and Fisher (1995) have shown that filling out questionnaires oneself increases the accuracy of the answers by reducing the social desirability bias.

[6]A separate part included questions for other research projects which are not important in our context.

htly different environment. Furthermore, a paper-based questionnaire and hypothetical election ballot is much more similar to the real act of voting and making one's cross. In particular in terms of being able to visually scan the whole list of candidates. This would not be possible in the case of phone interviews, especially when the case in question is an election with multiple candidates.

In comparison to using real election outcomes, our setup allows for a much stronger identification of the key effects of interest as the exact combinations of gender and profession of the hypothetical candidates are exogenously determined, while potentially confounding factors like ballot position, name recognition, or age are all either unknown or held constant. This approach makes it possible to precisely set the composition of candidate characteristics and perfectly isolate the effect of profession information on the voter's willingness to choose female candidates from changes in the supply of candidates. Furthermore, having information about several important characteristics of the participants enables us to examine the behavior of relevant subgroups separately, most importantly male and female voters. This is typically impossible when looking at election data due to the anonymity of the voting process.

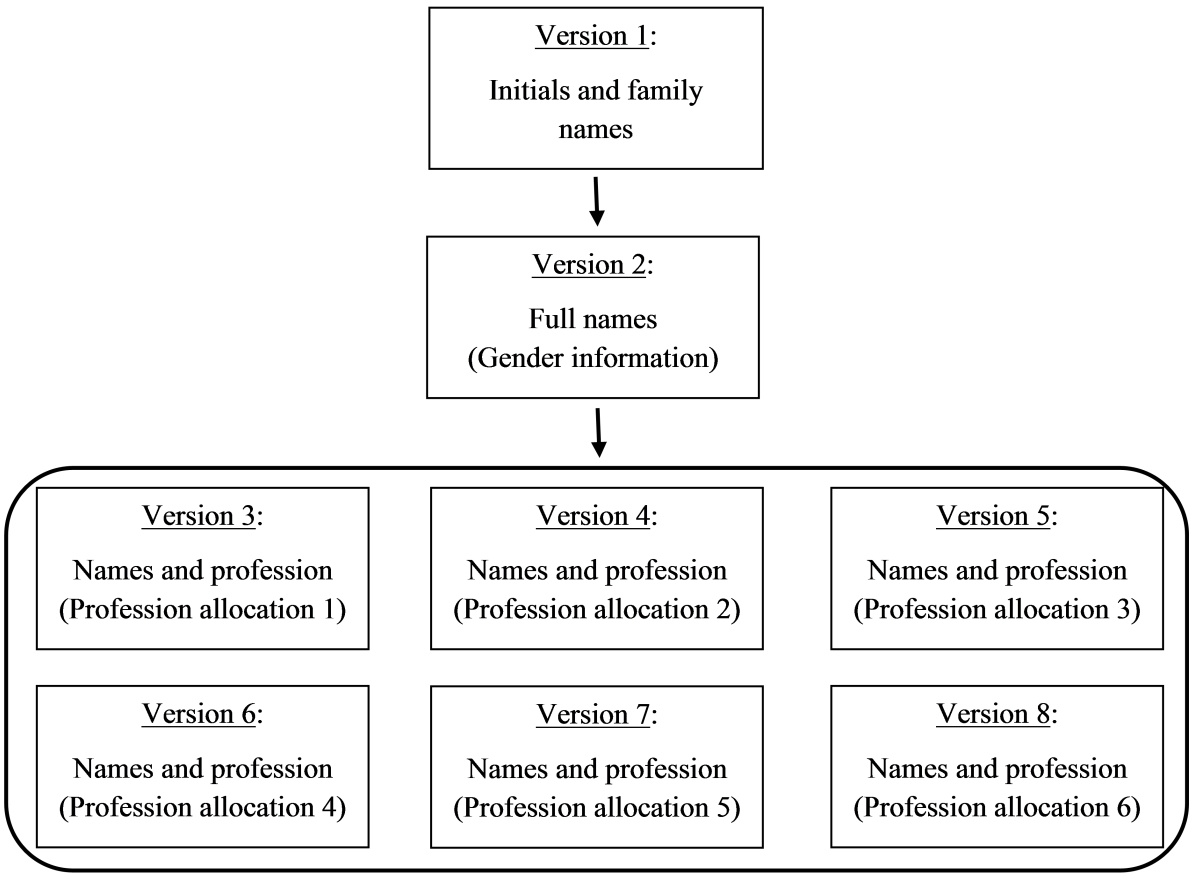

Figure 1: Ballot versions and informational content.

4 Sample descriptives

In total, 2327 voters filled out one of the eight questionnaire versions relevant for this study. We further restrict the sample to those respondents who stated their gender and allocated all of their six votes among the candidates in the hypothetical election. Thus, we end up with 1826 respondents for the empirical analysis. Table A 2 reports the descriptive statistics for the resulting sample. It shows that 49.8 percent of the respondents were female, the average age was around 44 years[7] and 66.8 percent had a university entrance qualification (the German "Abitur"). Finally, about 54.4 percent reported to have voted for a center-left party, which includes the Social Democratic Party (SPD), the Green Party, and the socialist Left Party (Die Linke). In terms of regional distribution, 53.1 percent of participants were interviewed in a larger city (more than 100,000 inhabitants) and 53.2 percent in the state of Baden-Württemberg.

As we will often present results by voter gender in the next sections, it is also interesting to compare the participants by gender. To this end, Table A 2 also presents the respective personal characteristics of male and female participants. The numbers show that male and female voters in the sample appear very similar. The two groups only deviate somewhat with respect to their age distribution and education level. More specifically, female voters are underrepresented in the age group between 26 and 35 years (15 vs. 20 percent among male respondents), slightly overrepresented among those aged 46 to 55 (21 vs. 18 percent), and report a somewhat smaller share of individuals with a secondary or higher degree (64 vs. 69 percent).

Finally, we want to check whether the random allocation of respondents to the different ballot versions led to very similar groups facing the various information treatments. Table A 3 confirms that this is the case. It reports the descriptive statistics of the survey participants for each ballot version and marks those instances in bold in which the average of the respondents in one version differs significantly (on the 5 percent level) from the mean of the others. Thus, we can see that the individual groups resemble each other very much in terms of personal characteristics. Only in 8 out of 136 cells in table A 3 do we observe significant deviations on the 5 percent level, that is, in roughly 5.6 percent of the cases. Given this wide-ranging similarity in the observable characteristics of survey participants across treatments, it seems plausible to assume that they also share the same unobservable characteristics on average and hence constitute credible counterfactuals.

[7] As participants were asked to indicate their age in intervals (see the questionnaire in the appendix), we use the interval means for this calculation and 75 for the group of participants over 65.

5 Identification strategy

Given this experimental setup and the random assignment to the different ballot versions with incrementally increasing or changing informational content, we apply a three-step approach to examine the impact of profession information on the chances of female candidates to get elected. We start by focusing on the ballots without profession information to examine whether our survey participants exhibit a direct preference for either gender. Then, we look at the ballot versions displaying the candidates' occupation to check whether the inclusion of this information leads to indirect changes in the electoral prospects of female candidates. As this is going to be the case, we finally further exploit the experimental setup to test whether this effect is driven by preferences for certain gender-profession combinations. The following subsections present each of these steps in more detail.

5.1 Direct gender preferences

To see whether the gender gap in parliaments may be driven by direct voter preferences for male candidates, we look at the voting behavior of participants who faced hypothetical election ballots without any profession information and check whether the probability of candidate i to get one of the six votes of participant j depends on the gender of the candidate. To this end, we use ballot version 2 and run the following logit model:

$$\Pr\left(\texttt{vote}_{ij}\right) = \Lambda(\alpha_0 + \alpha_1 \texttt{female}_{ij} + \alpha_2 \texttt{rank\&name}_i). \tag{1}$$

Here, `female` is an indicator variable for whether the candidate appears as a woman on the ballot, i.e., appears with a traditionally female first name. To take the potential influence of ballot position and family name into account, we additionally control for each candidate's average probability to receive a vote in ballot version 1 (`rank&name`). Male and female first names are exogenously allocated to the 30 candidates on the list and the better ballot position for men is taken into account by `rank&name`. Coefficient α_1 thus represents the average electoral bonus or disadvantage female candidates possess compared to their male counterparts, i.e., the electoral gender gap.[8] In an extension to the model, we also look at possible differences in the estimated electoral gender gap by gender of the voter by including an indicator for whether voter j is female (`femvot`) and its interaction with the gender of the candidate (`female` $\times$ `femvot`).

[8] We do not include any other candidate characteristics, as they are unknown to the participants by design and therefore redundant. Furthermore, all voter-specific variables do not matter here either, since we restrict the sample to participants who allocated the full six votes.

5.2 Effect of profession information

In the second step, we measure whether the electoral gender gap differs in the presence of profession information on the ballot. To this end, we consider the voting behavior of participants facing ballot versions 3 to 8 In these, the same hypothetical candidates appear at exactly the same positions as in version 2, only with additional information about their respective occupation stated after their names. We pool all these observations and run the specification in equation 1 with this sample to see whether the estimated coefficient of `female` changes under these circumstances. If there is a large deviation from the earlier estimate obtained in the situation without profession displayed on the ballot, we can attribute this change to the inclusion of this piece of information about the candidates.

5.2.1 The impact of gender-profession combinations

If the presence of profession information on the ballot turns out to affect the electoral chances of male and female candidates differently on average, we want to know more about the mechanisms at work. In particular, we want to answer three interrelated questions: First, is this change in voting behavior a mere consequence of switching from one decision criterion to another (here, from gender to profession) and thus happening coincidentally, or do voters systematically connect certain professions with a specific gender and take that (un)consciously into account? Second, do certain kinds of occupations affect the electoral chances of male and female candidates differently? And third, do male and female voters react differently to gender-profession combinations?

To examine these issues, we chose the 30 professions used in our study such that they are well-known and can be characterized as one third female-dominated, gender-neutral, and male-dominated, respectively. The criterion for this sorting was the share of female workers in a certain occupation as reported in the German Microcensus of 2010, an annually conducted representative household survey providing information on about 800,000 individuals. We define a profession as female dominated if the share of women exceeded 70 percent among its workforce in that year, as gender neutral if it lay between 40 and 60 percent, and as male dominated if it was below 30 percent. Table 1 shows the selected professions and their respective share of female workers. To prevent that differences in the skill level of the selected occupations influence our analysis, we also ensured that half the professions in each gender category can be considered as high and low skill employment. The corresponding values for the share of higher educated individuals (defined as having obtained the *Abitur*, the general qualification for university entrance in Germany) among the workforce in the respective profession are also displayed in table 1, with thresholds of above 70 and below 30 percent, respectively. Thus, we end up with six distinct groups of five professions each, distinguished by gender dominance and skill

level.

We distributed the 30 occupations to the 30 candidates on each list such that every candidate features a distinct profession on any given ballot and none of them appears twice. Furthermore, we exogenously varied the allocation of professions to candidates over the six ballot versions which contain this information. More specifically, every candidate appears with an occupation from a different gender-dominance and skill-level group in each version.[9,10] Given this exogenous variation of professions across candidates and ballot versions and since participants were randomly allocated to the different ballot versions, we can use this setup to identify the true effects of working in one type of profession compared to another as well as how this varies with the gender of both the candidate and the voter, respectively.

5.2.2 Type of occupation

We start with a very simple model, in which we only focus on the type of occupation. That is, we regress the probability of candidate i to get one of the six votes of participant j on a constant and indicators for male- and female-dominated occupations, controlling for nothing except ballot position and family name:

$$\Pr\left(\texttt{vote}_{ij}\right) = \Lambda\Big(\beta_0 + \beta_1\texttt{female-dominated}_{ij} + \beta_2\texttt{male-dominated}_{ij} + \beta_3\texttt{rank\&name}_i\Big). \tag{2}$$

This way, we obtain the average effects of appearing with a female- or male-dominated profession on the ballot on the candidates' electoral chances relative to the situation in which they would be identified as working in a gender-neutral profession. If coefficients β_1 and β_2 turn out to be statistically insignificant, we can conclude that the presence of profession information changes the electoral chances of male and female candidates either only coincidentally or through some other channel than gender perceptions. If they are statistically significant, on the other hand, we can interpret them as evidence that the voters systematically connect certain professions to a gender and use this information for their decision.

5.2.3 Profession preference by gender of voters

Next, we examine whether male and female voters react differently to the inclusion of candidate professions, i.e., we look at differences in the preferences for individual profession

[9]Table A 1 in the appendix displays which profession was shown for each candidate across ballot versions.

[10]Two candidates (numbers 7 and 9 from the list) slightly deviated from this rule due to an apparent accident in the allocation. In consequence, one of them (number 9) appears with the same profession in two ballot versions.

Table 1: Fraction of female workers and graduates from Gymnasium in the selected professions.

		Profession	Fraction of ... Female	Gym. grad.
Female-dominated	Higher educated	Psychologist	0.726	0.972
		Elem. schoolteacher	0.781	0.966
		Pharmacist	0.734	0.964
		Social pedagogue	0.718	0.884
		Bookseller	0.726	0.738
	Lower educated	Elderly care nurse	0.864	0.264
		Medical assistant	0.990	0.208
		Textile cleaner	0.853	0.160
		Cleaner	0.890	0.147
		Hairdresser	0.905	0.131
Gender-neutral	Higher educated	Teacher	0.569	0.998
		Lawyer	0.569	0.993
		Dentist	0.424	0.989
		Physician	0.471	0.987
		Local public servant	0.492	0.835
	Lower educated	Inkeeper	0.418	0.327
		Postal worker	0.507	0.234
		Retailer	0.565	0.215
		Cook	0.575	0.234
		Confectioner	0.557	0.154
Male-dominated	Higher educated	Physicist	0.218	0.987
		Construction engineer	0.167	0.971
		Electrical engineer	0.044	0.956
		Software developer	0.135	0.837
		Computer scientist	0.137	0.767
	Lower educated	Firefighter	0.003	0.300
		Carpenter	0.019	0.203
		Farmer	0.222	0.179
		Metal worker	0.145	0.137
		Painter	0.063	0.088

German Microcensus 2010, own calculations.

types between male and female voters. Each time, we introduce an indicator for whether the voter/candidate is female and interact it with the indicators for the profession types. Given the established fact in the literature that voters are more likely to vote for someone similar to them (e.g. Cutler, 2002; Sigelman and Sigelman, 1982), we would expect male voters to favor male-dominated professions and female voters to prefer female-dominated professions on average. With respect to the gender of the candidate, the effect may go both ways. If voters follow traditional views of what men and women are supposed to do, this would trigger better electoral prospects for male candidates working in male professions and female candidates in female professions. However, if atypical gender-profession combinations catch more attention, inspire sympathy or respect, the results could go into the other direction.

5.2.4 Typical and atypical gender-profession combinations

Finally, we combine the two perspectives and consider the impact of different types of occupations by candidate and voter gender. To this end, we rerun the analysis from the previous section, but separately for male and female voters. This will enable us to see whether male or female voters differ with respect to their support for traditional or atypical gender-profession combinations. As previous studies show that men tend to adhere more strongly to traditional views about the appropriate professions for men and women (Miller and Hayward, 2006), it is possible that this behavior plays a role in elections as well.

We also estimate an additional specification which includes a variable which indicates if the candidate and voter have a similar profession, and a variable which indicates if they have similar profession and the same gender. Evidence from theoretical and experimental psychology strongly suggests that voters prefer candidates which display socioeconomic characteristics similar to their own.[11] We expect that this preference for similarity also applies to professions. The inclusion of the indicators allows us to analyze if such similarity effects are present in the data and estimate their strength. In order to separate the effects of profession and gender, we control for average vote probabilities per rank from ballot version 2.[12]

[11] For instance, Piliavin (1987) shows experimental evidence for similarity effects in age, race and sex. Goldstein and Gigerenzer (2002) explore the heuristic mechanism which leads to similarity preferences.

[12] The same results can be obtained by controlling for rank averages from ballot 1, as in equation (**??**), and additionally controlling for candidate gender.

6 Empirical analysis

6.1 Direct gender effects

6.1.1 Direct gender effects without profession information

In a first step, we quantify the effects of candidate gender on vote share which are caused by the shift from ballot version 1 to ballot version 2. These are direct gender effects as differences in vote share between otherwise identical candidates of varying gender and reflect differences in voter preferences between male and female candidates. Gender is visible to voters in the form of unambiguous first names. Version 1 only contains information on candidate surnames, while version 2 adds information cues about first names.

The first column of table 3 shows the vote share effect of being a female candidate, reported in odds ratios.[13] Table A 4 reports the same effects in percentage points. All standard errors are clustered at the voter level in order to account for correlation between candidate choices by the same voter.

Female candidates show a significant vote share bonus relative to male candidates. Conditional on ballot position and influence of their family name, they receive approximately 33 percent more votes and their likelihood of receiving the vote is 4.47 percentage points higher than that of males. This is a substantial vote share bonus when considering that purely random voting would lead to a probability of 20 percent to receive each vote. Male candidates have an average probability of receiving the vote of 19.2 percent while female candidates, on average, receive 21.1 percent. Being female therefore is no drawback for candidates in list elections. On the contrary, voters even seem to have a baseline preferance for female candidates.

As an additional measure of electoral success, we calculate average list rank gains or losses for candidate groups when switching from ballots with less information to ballots with more information.[14] These measures of rank gain reflect the effect on electoral

[13] Abbreviating $\Pr(y = 1)$ as $\Pr(y)$, the odds ratio is defined as

$$OR = \frac{\Pr(y|x = 1)/(1 - \Pr(y|x = 1))}{\Pr(y|x = 0)/(1 - \Pr(y|x = 0))}$$

and shows how many times more likely an outcome of $y = 1$ is relative to $y = 0$, if x is equal to 1. If the estimated odds ratio for the female candidate indicator is larger than 1, female candidates are more likely to receive the vote than male candidates. If it is smaller, female candidates are less likely to receive the vote. The odds ratio shows the odds of receiving the vote for a female candidate as a share of the male candidate's odds. For small values of $\Pr(y = 1)$, the odds ratio is a good approximation of the relative probability of an outcome. In this case, an odds ratio for the female indicator of, for example, 1.05 can be interpreted as an approximately 5 percent higher chance of female candidates receiving the vote.

[14] In each ballot version, the number of votes determines the final rank each candidate achieves in the election outcome. For instance, moving from ballot version 1 to ballot 2 we can calculate for each candidate the rank gain by subtracting the final rank in ballot version 2 from the final rank which the

achievement which was caused by the introduction of the next information cue. When considering list rank gains as a measure of electoral success, female candidates climb an average of 1.47 ranks relative to their position in the list of ballot 1.

In the second columns of tables 3 and A 4, the effect of being a female candidate is interacted with voter gender. The base category, against which the vote share of all other voter and candidate combinations are measured, are male candidates and male voters. Relative to this base category the vote share of female candidates and male voters is not significantly different, as shown in the third row of table 3. However in the second row of table 3 female candidates are approximately 33 percent more likely to receive the vote of a female voter than male candidates are likely to receive the vote of a man. The fourth row of table 3 shows that male candidates are approximately 23 percent less likely to receive the vote of a female voter than that of a male voter. The cross table of odds ratios between all voter and candidate categories (table 4) reinforces the notion that the positive vote share difference for female candidates is driven by female voters. For instance, female candidates are 27.5 percent more likely to receive the vote of a women than that of a man. While female voters display significant preferences for candidate gender, male voters are indifferent with respect to candidate gender. Thus, direct gender effects are driven by female voter bias against male candidates. The probability of receiving the vote of a man does not differ significantly between male and female candidates, which indicates that men do not use gender as a cognitive shortcut for candidate skill. In this respect, our findings align with those of Dolan (1998) who shows that female voters are more sensitive to candidate gender. However, indifference towards gender does not imply that men vote randomly if gender is the only information cue available. When asked about the method by which they allocate their votes in this low information setting, the majority of respondents stated that they based their decisions on names and the position in the candidate list (compare table 2). These statements are confirmed by the highly significant coefficient on the list rank effect in table 3, which indicates that male voters base their voting decision in this setting on list rank and surname.

6.1.2 Direct gender effects with profession

Next, we test if the direct effect of candidate gender on vote share depends on the availability of profession information on the ballot. To this end, we estimate specification 1 on the pooled sample of ballot versions 3 to 8. Results are shown in columns three of

candidate achieves in ballot version 1. Taking the average of rank gains and losses over the subgroups of male and female candidates, we obtain the effect of gender on list rank. Average rank gains for candidates of certain profession types (interacted with gender) are calculated analogous in the move from ballot version 2 to ballot versions 3 to 8. List rank gains provide a very intuitive measure of electoral success. However, list rank gains of individual candidates also depend on the election results of other candidates. Because of the discontinuous nature of list ranks the results are less precise than measured vote shares.

Table 2: Methods used to allocate the votes, by information treatment and gender

	Information stated on the ballot (Treatment)					
	None		Gender		Gender & Profession	
A. Fraction stating this particular type of method among those who used one (Open question, multiple answers possible)						
Voter gender	Males	Females	Males	Females	Males	Females
Names	**0.448**	**0.569**	**0.472**	**0.458**	0.040	0.028
Foreigners	0.207	0.120	0.139	0.125	0.018	0.012
First 6 on the list	0.207	0.120	0.056	0.104	0.033	0.007
Randomly	0.000	0.060	0.056	0.041	0.016	0.002
Profession	0.067	0.020	0.000	0.000	**0.687**	**0.719**
Age	0.100	0.000	0.056	0.146	0.007	0.012
Gender	0.034	0.020	0.361	0.408	0.093	0.155
Family status	0.034	0.000	0.000	0.000	0.000	0.007
Education	0.000	0.000	0.000	0.021	0.111	0.102
Representativeness	0.000	0.000	0.083	0.042	0.084	0.106
Similar to oneself	0.000	0.000	0.000	0.021	0.029	0.039

Notes: (1) Panel A reports the fraction indicating to have used the respective method among those who declared they had allocated their votes in a particular way. In order to solicit unbiased answers, this question was asked in open format, i.e., without predetermined alternatives. (2) The method used by the most individuals is marked in bold for each ballot version.

table 3 and table A 4. When candidate professions are included in the information on the ballot there is no vote share effect for female candidates. The odds ratio for the female candidate indicator of 0.998 is close to one and statistically insignificant. Gender based candidate choice by voters, which leads to a substantial vote share advantage for female candidates in ballot 2, appears to be replaced by a separate set of voter preferences which is heavily influenced by professions. In the questionnaire about the method which they chose to allocate votes, 70 percent of voters with ballots 3 to 8 state that candidate profession was the most important factor that they based their decision on (table 2). These new preferences do not favor female candidates.

Now we interact the female candidate indicator with voter gender, replicating regression specification 2 on a sample from ballots 3 to 8. The aim is to evaluate if male and female voters respond differently to the inclusion of profession information on the ballot. Results are displayed in columns four of table 3 and table A 4. When professions are unknown, male voters are indifferent towards candidate gender while female voters prefer female candidates. With known professions we see a different pattern. Male voters no longer balance their votes between male and female candidates, instead they are about 15.3 percent less likely to give the vote to a female candidate. Female voters, on the other hand, are 15.6 percent less likely to give the vote to a male candidate. Profession

information by itself can't be the cause of these shifts in preferences because profession information cues are perfectly balanced between candidates of both genders by experimental design. Therefore it is the interaction of profession information and candidate gender which leads to gender bias in voting by both male and female voters. In the following section we explore the influence of profession information cues and their interactions with candidate gender in detail.

Table 3: Direct gender effects

	Ballot 2	Ballot 2	Ballots 3-8	Ballots 3-8
Female cand.	1.335^{***} (0.0881)		0.998 (0.0257)	
F.cand.*F.vot.		1.335^{***} (0.0801)		1.002 (0.0295)
F.cand.*M.vot.		1.047 (0.0875)		0.0847^{***} (0.0295)
M. cand.*F.vot.		0.768^{***} (0.0517)		0.844^{***} (0.0295)
Rank effects ballot v. 1	Yes	Yes	No	No
Rank effects ballot v. 2	No	No	Yes	Yes
Base Male cand.	0.192		0.199	
Base Mcand, Mvot		0.211		0.212

Exponentiated coefficients; Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.
Effects in odds ratios show how much more likely a candidate is to receive the vote, relative to the base category. Under fully random voting, the base probability would be 0.2 for each candidate.

Table 4: Cross table of direct gender effects

Base	F. cand.*M. vot.	M. cand.*F. vot.	M. cand.*M. vot.
F. cand.*F. vot.	1.275***	1.738***	1.335***
F. cand.*M. vot.		1.363***	1.047
M. cand.*F. vot.			0.768***

Effects in odds ratios

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

6.2 Indirect gender effects

6.2.1 Indirect gender effects through profession type

Table 5: Raw profession effects

Profession type	Male dominated	Neutral	Female dominated
Probability of receiving the vote	21.6	18.6	19.8

In this chapter we analyze indirect gender effects which are transmitted through profession information cues. Men and women are not evenly distributed between professions. Some professions are heavily dominated by males, e.g. engineering, manual labor and construction. Other professions are almost entirely dominated by women. These professions are often found in education and healthcare. Many professions are gender neutral in the sense that equal numbers of men and women pursue them. For instance lawyers and retail workers. Ballot versions 3 to 8 add information cues on professions of each of the three types defined by gender dominance. Each ballot contains equal numbers of male and female candidates in each profession so that vote share effects of gender dominated professions are independent of candidate gender. Within each profession type, professions are balanced by required qualification. This ensures that gender dominance and not perceived education levels determine voter preferences for each profession type. Even when not controlling for list ranks, the profession types differ in their probability of receiving the vote. In terms of raw probabilities, male dominated professions are more likely to receive the vote than female dominated ones, and both are more likely to be voted for than gender neutral professions (table 5).

This pattern continues in the results from a logit model which controls for list rank effects. We show the effects of each profession type in figure 2. As in the case of raw probabilites, we see evidence of strong profession type effects. Male dominated professions enjoy a significant vote share bonus and are 20 percent more likely to receive the vote than neutral professions. Female dominated professions are significantly more likely to be voted for than neutral professions (8 percent), but are significantly less likely to be voted for than male professions.[15] In terms of list ranks, candidates with male professions gain, on average, 1.85 rank positions. Candidates with female professions gain 0.17 ranks and neutral professions lose 1.68 list ranks (table 8).

This clear ordering of categories establishes that gender dominance plays an important role in voter valuation of professions. If male dominated professions act as information

[15]The difference between the vote share bonuses for candidates in male dominated and female dominated professions is highly significant with a t-test p-value of 0.0023.

shortcuts for typically male character traits like assertiveness and toughness, as suggested by Huddy and Terkildsen (1993) and Lemkau (1983, 1984), it would explain voter preference for such professions. However in that case we would expect both male voters and female voters to prefer candidates in male professions. As we show in figure 3 and table A 5, only male voters prefer male professions while female voters are indifferent between male dominated and neutral professions. Therefore the vote share bonus for male professions is unlikely to be driven by inferred political ability of such professions.

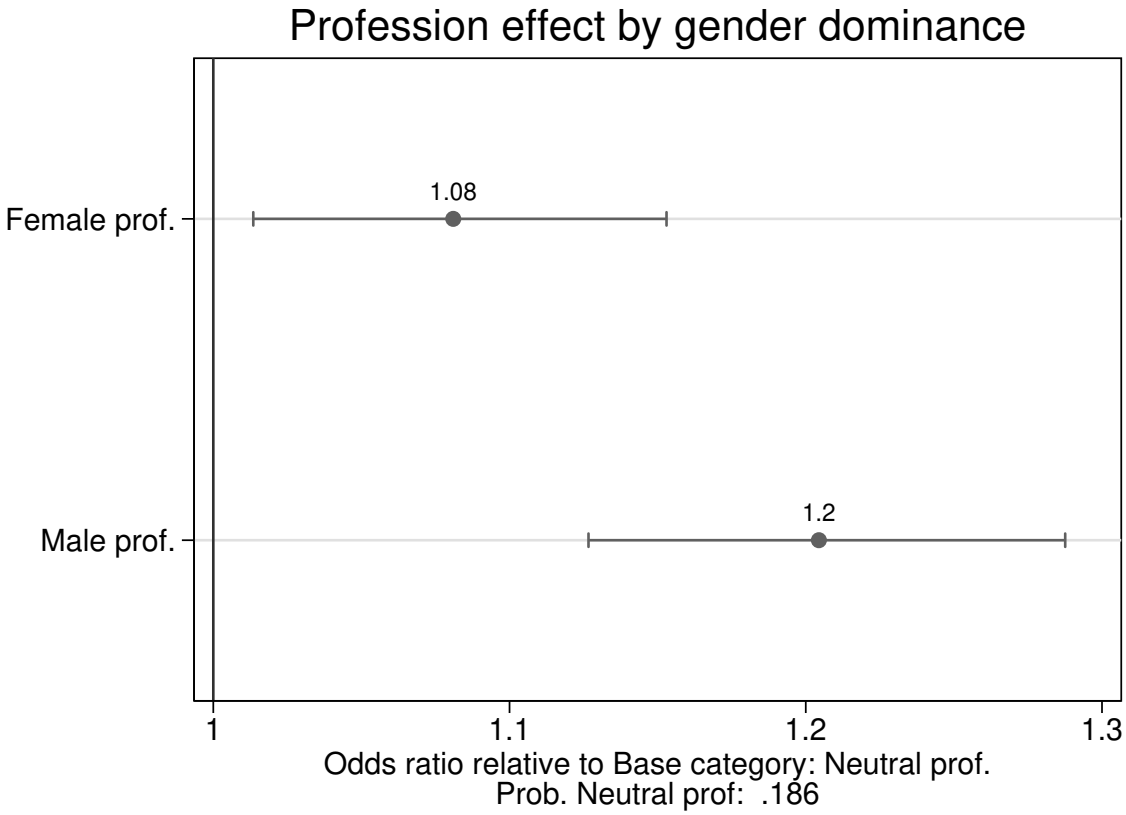

Figure 2

6.2.2 Profession type effects by voter gender

We now interact gender dominated professions with voter gender using data from ballot versions 3 to 8. Therefore, we quantify how voters value professions which are typically held by members of their own gender.

Figure 3 , table A 5 and table 6 show that female voters clearly prefer female dominated professions to male or neutral professions. They are almost 30 percent more likely to vote for candidates in female dominated professions than for candidates in male or neutral professions. Conversely, male voters bestow a large vote share bonus (almost 40 percent) upon candidates in male dominated professions, relative to neutral professions. They are also significantly less likely to vote for candidates in female professions compared

to those in male or neutral professions. It is therefore clear that voters favor candidates in professions which are dominated by their own gender. This gender biased profession effect is more pronounced among male voters, which stands in contrast with the lack of direct gender preferences which male voters display when professions are unknown (compare section 6.1). Male voters do not let gender directly influence their voting decision but show strong indirect gender preferences through the occupation channel. They favor candidates with male dominated professions and show a dislike for candidates in female dominated professions. Female voters on average prefer female professions but their biases are weaker than those of male voters. The vote share bonus they give to candidates in female dominated professions is lower than the bonus given by male voters to male professions. Female voters are also indifferent between male dominated and neutral professions.

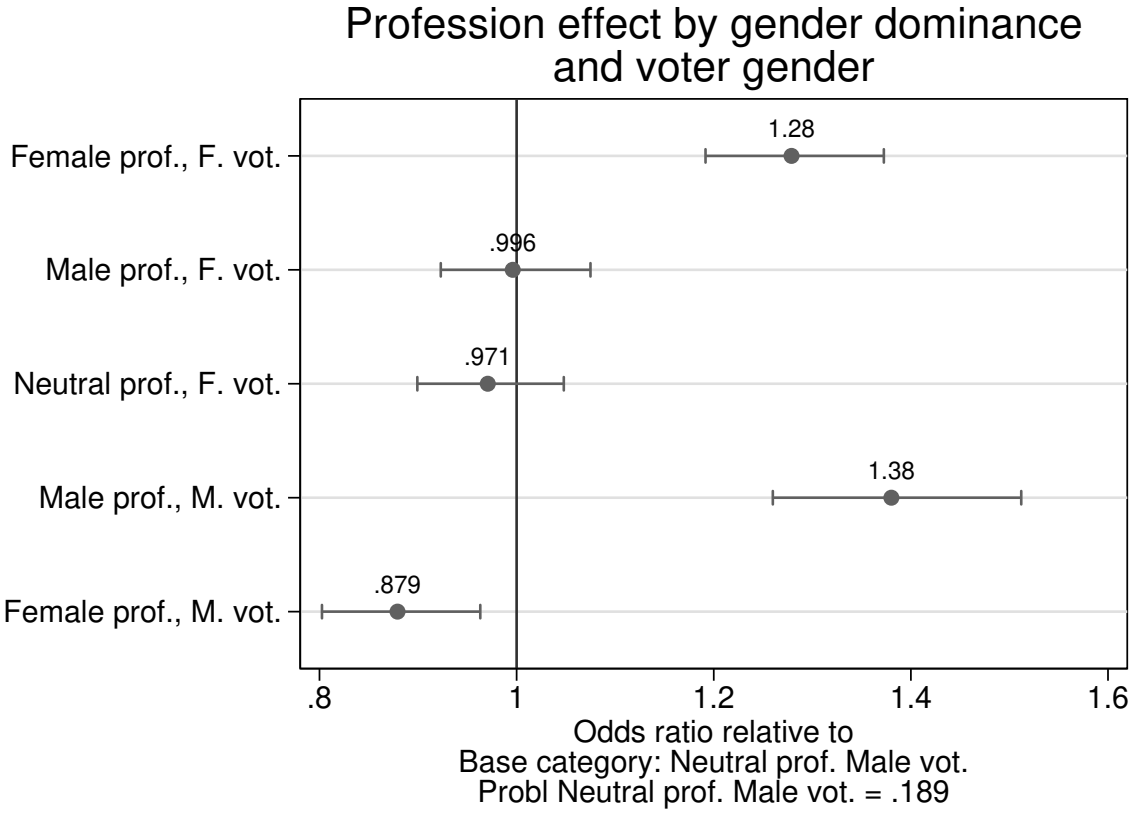

Figure 3

6.2.3 Profession type effects by candidate gender

In the next step, we interact gender dominated profession types with candidate gender. The interaction of candidate genders and profession describes whether or not the candidate conforms to the stereotypes of “men doing men’s work" or “women doing women’s work". By testing if voters value the profession types differently for male and female

Table 6: Cross table of profession effects by voter gender

Base	F. vot.*Male prof.	F. vot.*Neutral prof.	M. vot.*Male prof.	M. vot.*Female prof.	M. vot.*Neutral prof.
F. vot.*Female prof.	1.284***	1.317***	0.962***	1.452***	1.279***
F. vot.*Male prof.		1.026	0.72***	1.133***	1.000
F. vot.*Neutral prof.			0.703***	1.104**	0.970
M. vot.*Male prof.				1.569***	1.380***
M. vot.*Neutral prof.					0.879**

Effects in odds ratios
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

candidates we can quantify the effects of stereotypical gender-profession combinations on vote share. Since voters use information cues as cognitive shortcuts, candidates with stereotypical gender and profession combinations might enjoy a vote share bonus if voters perceive such stereotypical candidates as more predictable or more similar to themselves. The latter has been shown to be an important determinant of voter choice, since voters gravitate towards candidates which are close to them in terms of sociodemographic distance (Cutler, 2002). Results are displayed in figure 4 table A 6 and cross-table 7. Candidates who adhere to the stereotype of men in male dominated professions are preferred over male candidates in other professions. They are approximately 32.5 percent more likely to be voted for than male candidates in neutral professions, and 27 percent more likely than male candidates in female dominated professions.

Female candidates enjoy a significant vote share advantage if they adhere to the stereotype of women in women's professions compared to women in neutral jobs. However, female candidates in male professions also gain a vote share advantage over those in neutral professions. The vote share advantages of female candidates in both male and female dominated professions are of similar size. There is no statistically significant difference in the probability of receiving the vote between females in female or male dominated professions (compare column one, row one of table 7). While female candidates in female professions enjoy a vote share advantage of 17 percent over females in neutral professions, females in male professions have an advantage of 13 percent over those in neutral professions. For candidates in neutral professions, their gender does not influence the vote share in any significant way. These effects are partially reflected in the way that candidates who adhere to stereotypes gain list ranks. Table 8 shows that stereotypical male candidates gain an average of 3.33 list ranks when moving from ballot version 2 to ballot versions 3 to 8. Atypical male candidates on the other hand lose 0.4 ranks. Stereotypically female candidates gain 0.067 ranks and female candidates in male professions gain 0.367 ranks.

While stereotypically female candidates receive more votes, their positions on ballots 2 and 3 to 8 are such that despite their increased vote share they don't always manage to surpass the threshold required for higher ranks.

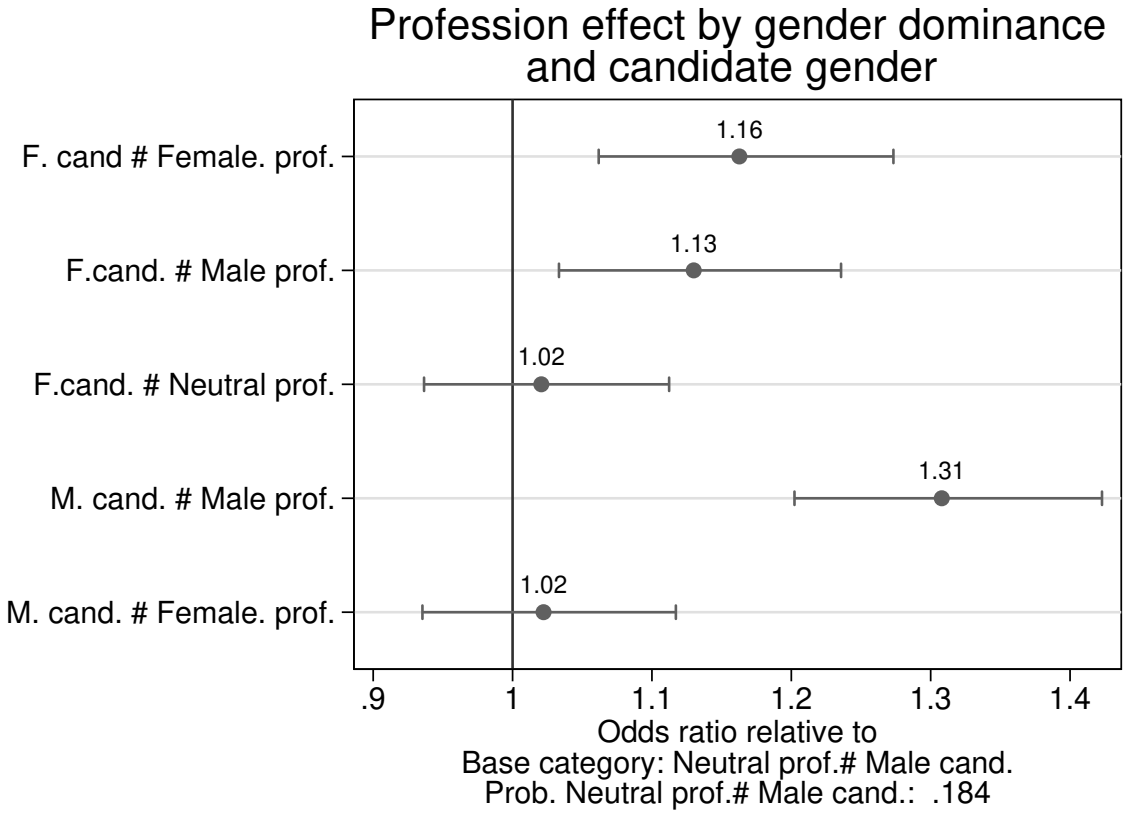

Figure 4

6.2.4 Profession type effects by candidate and voter gender

Next, we interact profession types with candidate gender and report results separately for male and female voters. Results are displayed in figure 5 and table A 7. Male voters have a clear preference for candidates who adhere to the stereotype of men in male dominated professions. These candidates are approximately 41 percent more likely to receive the male voter's vote than male candidates in neutral professions. Male candidates in female professions, or female candidates in female and neutral professions get even fewer votes from male voters.

Female voters strongly prefer stereotypical female candidates. They award a vote share bonus of roughly 72 percent to female candidates in female professions, relative to the base category of male candidates in neutral professions. However, this base category receives the lowest vote share from female voters, which slightly overemphasitzes the bonus for stereotypical female candidates. All other candidate categories have significantly higher probabilities of being voted for than the base category, with odds ratios ranging

Table 7: Cross table of profession effects by candidate gender

Base	F. cand.*Male prof.	F. cand.*Neutral prof.	M. cand.*Male prof.	M. cand. Female prof.	M. cand. Neutral prof.
F. cand.*Female prof.	1.030	1.139***	0.889***	1.137***	1.163***
F. cand.*Male prof.		1.107**	0.864***	1.105**	1.130***
F. cand.*Neutral prof.			0.780***	0.998	1.020
M. cand.*Male prof.				1.279***	1.308***
M. cand.*Female prof.					1.022

Effects in odds ratios
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

between 1.17 and 1.32. Still, female candidates in female professions receive by far the most votes from female voters.

We conclude that gender stereotypes are advantageous for the vote share of male candidates, but that their role in determining the vote share of female candidates is more complex. Females gain a vote share advantage from having typically female professions, just like male candidates gain from typically male professions, although the advantage for women is somewhat smaller. In both cases, this advantage is driven by voters of the respective gender. But female candidates also profit from male dominated professions, almost to the same degree as from female professions. However, while the vote share bonus for stereotypical female candidates is driven by female voters, the bonus for non-stereotypical females is driven by male voters who show a baseline preference for candidates in male professions.

Vote share bonuses for stereotypical candidates might appear through two channels. First, the information cues of candidate gender and gender typical profession complement each other to create the image of a stereotypical person. Stereotyping allows the voters to infer additional characteristics about the candidate, which he or she might not know but which are part of the stereotype (compare Rahn (1993)). This in turn makes such candidates more predictable which might positively influence voter choice in low information contexts which always carry a lot of uncertainty for the voter. Second, voters are more likely to vote for candidates which are similar to themselves, as shown by Cutler (2002). Additional evidence from theoretical and experimental psychology strongly suggests that voters prefer candidates which display socioeconomic characteristics similar to their own.[16] We find that similarity between voters and candidates with respect to gender, profession and the combination thereof leads to strong positive vote share effects. In table 9 we show that voters have a very high chance of giving the vote to candidates

[16]Piliavin (1987) shows experimental evidence for similarity effects in age, race and sex. Goldstein and Gigerenzer (2002) explore the heuristic mechanism which leads to similarity preferences.

Table 8: List rank gains

A. List ranks gained for candidates in each profession type						
Profession type	Male dominated		Neutral		Female dominated	
	0.167		-1.683		1.850	
B. List ranks gained for each profession type, stratified by candidate gender						
Profession type	Male dominated		Neutral		Female dominated	
Candidate gender	Male	Female	Male	Female	Male	Female
	3.333	0.367	-1.300	2.067	-0.400	0.067

Notes: Panel A shows the gain and loss in list ranks when profession information is made available to the voters, averaged over all candidates of the respective profession type. Panel B shows the same list rank gains as in panel A, but averaged over subgroups defined by profession type and candidate gender.

who have the same profession as themselves. The odds of giving the vote to a candidate with the same profession are several times higher than with other candidates.[17] Even more so if they share the same gender. By definition, voters of both genders more often pursue occupations dominated by their own gender. Therefore female voters are more likely to have the same profession and gender as stereotypical female candidates and the same holds for male voters, which in turn leads to higher vote shares for stereotypical candidates. Note, however, that the vote shares of profession/candidate combinations do not vary by much when controlling for profession/gender similarity of candidate and voter (table 9). Similarity between voter and candidate is therefore a significant predictor of vote probability, but only explains a small part of the vote share differences between stereotypical and non-stereotypical candidates. This is mainly because the number of voters who have exactly the same profession as a candidate is fairly small in our sample. Only 4 percent of voters share a profession with a candidate and only 2 percent share both profession and gender.

It is likely that voters prefer candidates who are similar to themselves in a wider sense, which would vastly expand the number of voters who encounter similar candidates on ballots. For instance, they might prefer candidates who work in fields which are related to their profession. A male voter who works as a carpenter might, for example, prefer candidates who are craftsmen in other fields. The expanded similarity channel might

[17]Such high odds ratios can no longer be reliably interpreted as percentage differences but instead serve to illustrate the relative strength of the effect. We show the results in odds ratios for comparison of profession stereotype effects with figure 4.

therefore still contribute substantially to the stereotype preferences which we observe.

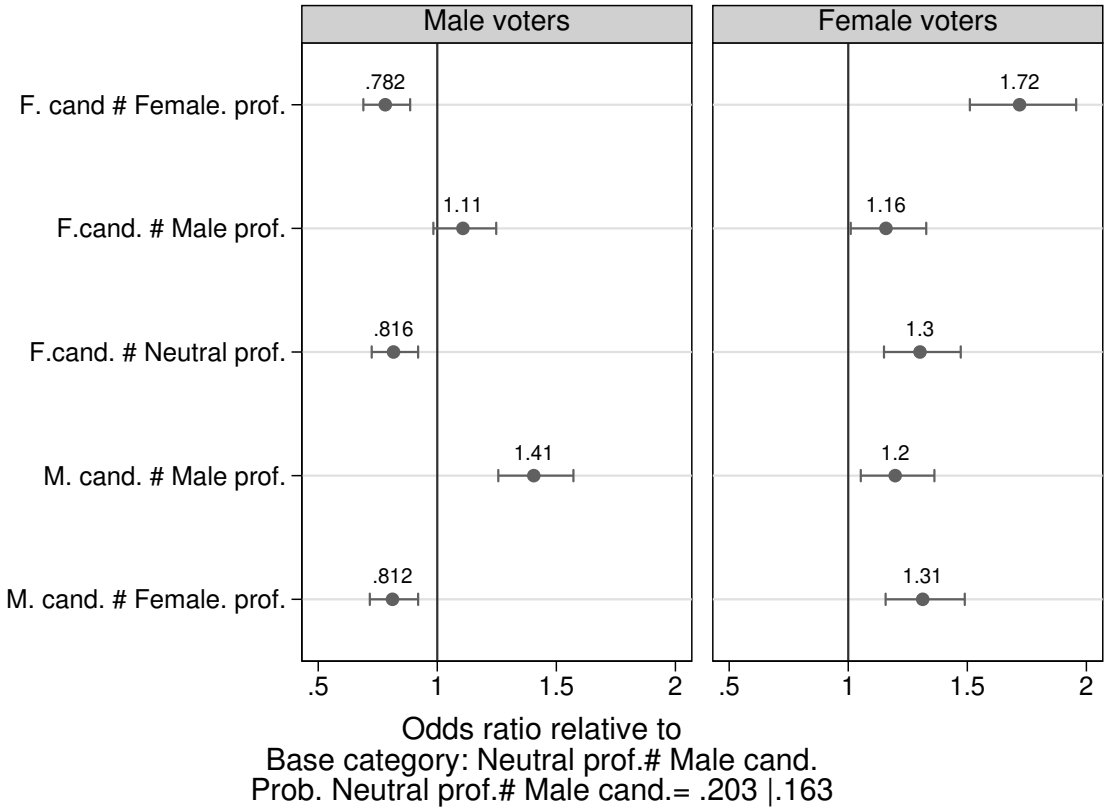

Figure 5

6.2.5 Extension: Simulated vote shares and rank gains under realistic distribution of professions

In the previous section we have shown that voter preference for male candidates in male dominated professions is stronger than for female candidates in female dominated professions. Conversely, voters give less votes to male candidates in female dominated professions than to female candidates in male dominated professions. Aggregating over all professions we find no vote share advantage for either gender when profession information cues are available to the voter. Estimating the gender specific vote share effect for ballot versions 3 to 8, which contain the profession information cues, shows that female candidates receive a statistically insignificant 0.02 percent higher vote share. Their probability of receiving the vote is only 0.037 percentage points higher. Compared to the ballot versions without profession information cues, in which female candidates receive 33 percent more votes than male candidates, this is a substantial drop in vote share. While voters on average like to vote for female candidates, this bonus vanishes when candidate professions are

Table 9: Candidate to voter similarity

Same profession indicator	5.089***	(1.140)
Same gender indicator	1.181***	(0.0306)
Same profession and gender	1.582	(0.505)
F. cand.*Female prof.	1.174***	(0.0536)
F.cand.*Male prof.	1.148***	(0.0527)
F.cand.*Neutral prof.	1.028	(0.0450)
M. cand.*Male prof.	1.317***	(0.0568)
M. cand.*Female. prof.	1.031	(0.0467)
Rank effects ballot v. 2	Yes	
P_val_same_jointly	0	

Exponentiated coefficients; Standard errors in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$
Effects in odds ratios show how much more likely a candidate is to receive the vote,relative to the base category.
Under fully random voting, the base probability would be 0.2 for each candidate.

known.[18]

The ballots in the experimental setting contain equal numbers of candidates for each combination of gender and profession-type. However, by definition, vastly more men pursue male dominated professions and more women work in female dominated ones. Such a gender imbalance within professions will be reflected in the makeup of party lists. Therefore the candidates in real elections do not display the same balanced distribution of professions across genders as the ballots in our experiment. The more pronounced vote share bonus of stereotypically male candidates (31 percent) relative to other candidate types will then lead to a reduced vote share for the aggregate of female candidates. Stereotypically female candidates only gain a bonus of 16 percent, non-stereotypical females 13 percent and non-stereotypical males receive no vote share bonus at all. A reduction in the aggregate female vote share is simply a mechanical consequence of increasing the numbers of stereotypical candidates on the ballot relative to the number of non-stereotypical ones.[19] The number of male candidates who earn the highest vote share increases while the number of male candidates who receive no bonus decreases. For females however, the number of candidates who earn a vote share bonus of 16 percent increases, and the number of those who gain a 13 percent bonus decreases. Since those two vote shares are similar, they largely balance each other out and the aggregate female vote share does not change. In order to quantify the effect of realistic profession distributions on aggregate female vote share, we simulate vote results for different distributions stereotypical candidates by reweighting the share of candidate gender/profession combinations. We show the results for the observed experiment and for three different simulated distributions. Without reweighting the share of female candidates in each profession type (male dominated, female dominated, neutral) is 50 percent. The first simulated distribution has a share of 70 percent female candidates within female dominated professions and a share of 30 percent females within male dominated professions, with the reverse holding for males. The second distribution has a female share of 80 percent in female dominated professions and 20 percent in male dominated ones and the third has shares of 90 percent and 10 percent, respectively. These shares all represent realistic distributions of gender typical professions. In reality, women make up between 99 and $\approx$ 70 percent of workers in female dominated professions and between 0.03 and 22 percent in the male dominated ones (compare table 1). Vote share results for the three simulations are given in table 10. They show that under realistic distributions, female candidates suffer a vote share disadvantage of -3.2, -4.7 and -6.1 percent, respectively, for the three simulated distributions. Compared to the vote share bonus which female candidates receive if pro-

[18] As shown in section 6.1, female voters vastly prefer female candidates while male voters are indifferent with regards to candidate gender.

[19] Here we assume that no general equilibrium effects affect the vote share. That is, voter preferences for candidate types are independent of candidate supply as long as at least one candidate of each type is present on the ballot.

fessions are unknown, this is a drastic decline. Driving these changes in vote share are voter preferences for stereotypical professions, not a preference for candidate gender in itself. Voter predilection for professions overrides their preferences for female candidates, causing the swing in voter demand. When asked directly about the criteria they chose to select candidates, the vast majority of voters declared that they based their voting decision on profession information if that information was known (table 2). When professions were unknown, many voters selected candidates for their name and gender. More specifically, male voters who previously were indifferent to gender, rather give their vote to male candidates in male dominated professions than to any other candidates. This leads to a reduction in the female vote share bonus from 33 percent to almost zero in our sample and to a female vote share penalty of up to 6.1 percent when professions are realistically distributed by gender.

Table 10: Simulated profession distributions

		Gender information	Gender and profession information			
		Benchmark	Experiment	Simulation 1	Simulation 2	Simulation 3
Share of female candidates in...	female professions	n.a.	0.5	0.7	0.8	0.9
	neutral professions	n.a.	0.5	0.5	0.5	0.5
	male professions	n.a.	0.5	0.3	0.2	0.1
Share of male candidates in...	female professions	n.a.	0.5	0.3	0.2	0.1
	neutral professions	n.a.	0.5	0.5	0.5	0.5
	male professions	n.a.	0.5	0.7	0.8	0.9
Share of stereotypical female candidates on the list		n.a.	0.167	0.233	0.267	0.300
Share of stereotypical male candidates on the list		n.a.	0.167	0.233	0.267	0.300
Advantage of stereotypical male candidates over stereotypical females		n.a.	9.72 %	9.72 %	9.72 %	9.72 %
Aggregate vote share bonus of female candidates relative to male candidates		33 %	0.02 %	-3.20 %	-4.70 %	-6.10 %
Average rank gain of female candidates relative to previous ballot		1.467	-0.544	-0.584	-0.604	-0.624

7 Conclusion

In this study, we examine whether information about the profession of candidates running for public office affects the electoral gender gap, i.e., the difference in probability to get elected between men and women. To this end, we use data from an election experiment built into an exit-poll of voters at the elections to the EU parliament in Germany in 2014. We exploit the random allocation of participants into various information treatments to obtain unbiased estimates for direct and indirect gender effects. Our findings suggest that voters, especially women, are inclined to lend their support to female candidates if there are no other cues about the candidates' characteristics and positions. Once the candidates' occupations are revealed, however, the voters use these as their main selection criterion. This leads to shrinking support for female candidates and may even turn into an electoral bonus for male candidates. This remarkable change is driven by male voters who strongly favor stereotypical male candidates working in male-dominated professions. The magnitude of this effect may even be underestimated, as we abstained from including professions indicating manager or supervisor positions, which are typically male-dominated, and houseman or housewife, in which women are overrepresented.

In essence, these results reveal an interesting pattern in the voting behavior of male voters, boiling down to a position of: "I don't care about the gender of the candidates, as long as they are competent, and I believe people working in male professions are just that." In a sense, focusing on profession leads to same-sex preference. This has implications for gender equity policy. It means that the still existing segmentation of parts of the labor market spills-over to the political arena as well. In consequence, any progress of women on the labor market will also lead to progress in addressing the electoral gender gap. That is, policies to promote gender quality at work may also increase female representation in parliaments and councils in the medium and long-run. It also means that there is no baseline-preference for male candidates. Which implies that policy measures which aim to improve female representation in parliaments do not necessarily stand in opposition with voter preferences.

The findings in this paper are not transferable to every political context, however. They are derived and relevant for elections with a low information environment in which the gains from inferred information from stereotyping are much greater than in situations in which the candidates are well known. Typical examples for such low information elections are open lists and primary elections with many candidates belonging to the same party, or any election in which the candidates are relatively unknown, typically on lower institutional levels. By contrast, high-profile races for important political offices in which only a handful of prominent candidates compete against each other are unlikely to be influenced by gender stereotyping. Besides, candidates at the national level tend to be full-time career politicians who only marginally differ in terms of profession anyway.

Further research on the strength of gender-profession stereotypes in different contexts may therefore focus on determining which share of voters use heuristics for their voting decision across different election systems, institutional levels, and numbers of candidates running.

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8 Appendix

8.1 Tables from section 4

Table A 1: Candidates profession across ballot versions.

Pos.	Family name	First name	Profession 1	Profession 2	Profession 3	Profession 4	Profession 5	Profession 6
1	Gillen	Arnold	Physicist	Physician	Elem. schoolteacher	Firefighter	Innkeeper	Textile cleaner
2	Heyer	Regina	Elderly care nurse	Electrical engineer	Lawyer	Pharmacist	Carpenter	Innkeeper
3	Armrein	Karl	Confectioner	Textile cleaner	Physicist	Physician	Social pedagogue	Carpenter
4	Tesch	Iris	Social pedagogue	Farmer	Retailer	Elderly care nurse	Phyiscist	Phyiscian
5	Höhne	Otto	Metalworker	Cook	Medical assistant	Construction engineer	Dentist	Psychologist
6	Lötz	Margarete	Laywer	Pharmacist	Carpenter	Innkeeper	Hairdresser	Software developer
7	Peters	Bernd	Hairdresser	Bookseller	Farmer	Retailer	Elderly care nurse	Computer scientist
8	Gussmann	Ute	Construction engineer	Dentist	Psychologist	Metalworker	Cook	Medical assistant
9	Kilic	Mehmet	Teacher	Software developer	Teacher	Bookseller	Firefighter	Retailer
10	Kunde	Hildegard	Firefighter	Innkeeper	Hairdresser	Computer scientist	Physician	Elem. schoolteacher
11	Berger	Martin	Psychologist	Firefighter	Confectioner	Medical assistant	Electrical engineer	Local public servant
12	Silbernagel	Marianne	Postal worker	Cleaner	Electrical engineer	Local public servant	Elem. schoolteacher	Firefighter
13	Gorges	Hans-Peter	Innkeeper	Hairdresser	Software developer	Dentist	Psychologist	Farmer
14	Kleine	Erika	Bookseller	Painter	Postal worker	Cleaner	Computer scientist	Lawyer
15	Bernsen	Karl-Heinz	Painter	Postal worker	Cleaner	Electrical engineer	Lawyer	Pharmacist
16	Block	Sille	Dentist	Psychologist	Firefighter	Confectioner	Textile cleaner	Electrical engineer
17	Weber	Daniel	Electrical engineer	Lawyer	Pharmacist	Painter	Postal worker	Cleaner
18	Schenzer	Bärbel	Cleaner	Construction engineer	Dentist	Psychologist	Farmer	Confectioner
19	Lütticken	Reinhardt	Physician	Elem. schoolteacher	Painter	Postal worker	Cleaner	Construction engineer
20	Propach	Inge	Farmer	Confectioner	Elderly care nurse	Software developer	Teacher	Bookseller
21	Altenburg	Jürgen	Elem. schoolteacher	Carpenter	Innkeeper	Hairdresser	Construction engineer	Dentist
22	Greiner	Waltraud	Retailer	Medical assistant	Construction engineer	Teacher	Bookseller	Painter
23	Leksen	Walter	Medical assistant	Computer scientist	Local public servant	Social pedagogue	Metalworker	Cook
24	Benz	Barbara	Computer scientist	Local public servant	Social pedagogue	Carpenter	Retailer	Hairdresser
25	Schüttle	Heinrich	Cook	Elderly care nurse	Computer scientist	Lawyer	Pharmacist	Metalworker
26	Rudnick	Julia	Pharmacist	Metalworker	Cook	Textile cleaner	Software developer	Teacher
27	Nawak	Thomas	Carpenter	Retailer	Textile cleaner	Physicist	Local public servant	Social pedagogue
28	Block	Christiane	Local public servant	Social pedagogue	Metalworker	Cook	Medical assistant	Physicist
29	Usleber	Johannes	Software developer	Teacher	Bookseller	Farmer	Confectioner	Elderly care nurse
30	Lochner	Susanne	Textile cleaner	Physicist	Physician	Elem. schoolteacher	Painter	Postal worker

Table A 2: Descriptive statistics for the sample of voters

	Full sample		Male voters		Female voters		Male-Female difference
	mean	sd	mean	sd	mean	sd	p-values
Female voter	0.50	0.50					
Age below 26	0.21	0.41	0.20	0.40	0.22	0.41	0.292
Age 26-35	0.18	0.38	0.20	0.40	0.15	0.36	0.005
Age 36-45	0.15	0.36	0.15	0.36	0.15	0.35	1.000
Age 46-55	0.19	0.40	0.18	0.38	0.21	0.41	0.106
Age 56-65	0.14	0.35	0.14	0.34	0.14	0.35	1.000
Age over 65	0.13	0.34	0.14	0.34	0.13	0.34	0.530
Secondary degree	0.67	0.47	0.69	0.46	0.64	0.48	0.023
City	0.53	0.50	0.54	0.50	0.52	0.50	0.393
Baden Wuerttemberg	0.53	0.50	0.52	0.50	0.54	0.50	0.393
Voted for left-leaning party	0.54	0.50	0.53	0.50	0.56	0.50	0.200
Observations	1826		916		910		

Table A 3: Randomization across ballot versions

Version	1	2	3	4	5	6	7	8
Sample size	213	222	239	255	247	253	246	238
Female	**0.612**	0.479	0.524	0.442	0.466	0.479	0.511	0.489
	(0.49)	(0.50)	(0.50)	(0.50)	(0.50)	(0.50)	(0.50)	(0.50)
Age 16-25	**0.134**	0.212	0.224	**0.260**	0.204	0.199	0.229	0.187
	(0.34)	(0.41)	(0.42)	(0.44)	(0.40)	(0.40)	(0.42)	(0.39)
Age 26-35	0.189	0.157	0.155	0.186	0.196	0.220	0.157	0.143
	(0.39)	(0.36)	(0.36)	(0.39)	(0.40)	(0.42)	(0.36)	(0.35)
Age 36-45	0.144	0.180	0.164	0.124	0.132	0.144	0.178	0.126
	(0.35)	(0.38)	(0.37)	(0.33)	(0.34)	(0.35)	(0.38)	(0.33)
Age 46-55	0.209	0.161	0.203	0.190	0.200	0.191	0.195	0.209
	(0.41)	(0.37)	(0.40)	(0.39)	(0.40)	(0.39)	(0.40)	(0.41)
Age 56-65	0.179	**0.207**	0.125	0.103	0.132	**0.093**	0.131	0.143
	(0.38)	(0.41)	(0.33)	(0.30)	(0.34)	(0.29)	(0.34)	(0.35)
Age 66+	0.144	**0.083**	0.129	0.136	0.136	0.153	0.110	**0.191**
	(0.35)	(0.28)	(0.34)	(0.34)	(0.34)	(0.36)	(0.31)	(0.39)
Currently married	0.547	0.519	0.560	0.521	0.536	0.485	0.511	0.555
	(0.50)	(0.50)	(0.50)	(0.50)	(0.50)	(0.50)	(0.50)	(0.50)
Children [y/n]	0.555	0.525	0.534	0.471	0.545	0.468	0.515	**0.591**
	(0.50)	(0.50)	(0.50)	(0.50)	(0.50)	(0.50)	(0.50)	(0.49)
No. of children	1.144	0.977	1.034	0.975	1.081	0.940	1.030	1.117
	(1.26)	(1.15)	(1.17)	(1.25)	(1.25)	(1.33)	(1.32)	(1.20)
Education low	0.385	0.307	0.328	0.295	0.340	0.358	0.297	0.316
	(0.49)	(0.46)	(0.47)	(0.46)	(0.47)	(0.48)	(0.46)	(0.47)
A-level	0.265	0.326	0.310	0.361	0.302	0.259	0.360	0.294
	(0.44)	(0.47)	(0.46)	(0.48)	(0.46)	(0.44)	(0.48)	(0.46)
University degree	0.350	0.367	0.362	0.344	0.357	0.384	0.343	0.390
	(0.48)	(0.48)	(0.48)	(0.48)	(0.48)	(0.49)	(0.48)	(0.49)
Vote share SPD	0.275	0.293	0.287	0.243	0.292	0.266	0.278	0.302
	(0.43)	(0.45)	(0.44)	(0.42)	(0.45)	(0.43)	(0.44)	(0.45)
Vote share CDU	0.253	0.236	0.263	0.292	0.257	0.253	0.316	0.285
	(0.42)	(0.42)	(0.43)	(0.45)	(0.43)	(0.43)	(0.46)	(0.44)
Large city	0.521	0.532	0.515	0.510	0.534	0.561	0.528	0.521
	(0.50)	(0.50)	(0.50)	(0.50)	(0.50)	(0.50)	(0.50)	(0.50)
State of BW	0.526	0.527	0.556	0.514	0.502	0.534	0.520	0.538
	(0.50)	(0.50)	(0.50)	(0.50)	(0.50)	(0.50)	(0.50)	(0.50)

8.2 Tables from section 6.1

Table A 4: Direct gender effects

	Ballot 2	Ballot 2	Ballots 3-8	Ballots 3-8
Female cand.	0.0447***		-0.000371	
	(0.0101)		(0.00412)	
Fcand*Fvot		0.0466***		0.000262
		(0.00998)		(0.00387)
Fcand*Mvot		0.00720		-0.0258***
		(0.0131)		(0.00528)
Mcand*Fvot		-0.0392***		-0.0264***
		(0.00956)		(0.00391)
Rank effects ballot v. 1	Yes	Yes	No	No
Rank effects ballot v. 2	No	No	Yes	Yes
Base Male cand.	0.192		0.199	
Base Mcand*Mvot		0.211		0.212

Standard errors in parentheses

The coefficients show percentage point changes in the probability of receiving the vote. Under fully random voting, the base probability would be 0.2 for each candidate.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

8.3 Tables from section 6.2

Table A 5: Profession effect by gender dominance and voter gender

Female prof.*F. vot.	0.0410***	(0.00628)
Male prof.*F. vot.	-0.000624	(0.00617)
Neutral prof.*F. vot.	-0.00469	(0.00613)
Male prof.*M. vot.	0.0544***	(0.00830)
Female prof.*M. vot.	-0.0200***	(0.00702)
Rank effects ballot v. 2	0.218***	(0.0251)
Base Neutral prof. M. vot.	0.189	

Standard errors in parentheses
The coefficients show percentage point changes in the probability of receiving the vote. Under fully random voting, the base probability would be 0.2 for each candidate.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A 6: Profession effect by gender dominance and candidate gender

F. cand.*Female. prof.	0.0248***	(0.00782)
F.cand.*Male prof.	0.0200***	(0.00762)
F.cand.*Neutral prof.	0.00327	(0.00706)
M. cand.*Male prof.	0.0451***	(0.00757)
M. cand.*Female. prof.	0.00352	(0.00729)
Rank effect ballot v. 2	0.219***	(0.0251)
Base M. cand.*Neutral prof.	0.184	

Standard errors in parentheses
The coefficients show percentage point changes in the probability of receiving the vote. Under fully random voting, the base probability would be 0.2 for each candidate.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A 7: Profession effect by gender dominance and candidate gender

	Male voters	Female voters
F. cand.*Female prof.	-0.0372***	0.0953***
	(0.00915)	(0.0126)
F.cand.*Male prof.	0.0165*	0.0240**
	(0.00999)	(0.0117)
F.cand.*Neutral prof.	-0.0309***	0.0440***
	(0.00886)	(0.0110)
M. cand.*Male prof.	0.0576***	0.0296***
	(0.0103)	(0.0112)
M. cand.*Female prof.	-0.0317***	0.0455***
	(0.00924)	(0.0113)
Rank effects ballot v. 2	0.213***	0.223***
	(0.0358)	(0.0348)
Base M. cand.*Neutral prof.	0.203	0.163

Standard errors in parentheses
The coefficients show percentage point changes in the probability of receiving the vote. Under fully random voting, the base probability would be 0.2 for each candidate.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A 8: Profession type effect - fixed effect model

	Profession type	by voter gender	by candidate gender
Female prof.	0.0118**		
	(0.00476)		
Male prof.	0.0297***		
	(0.00474)		
Female prof.*M. vot.		-0.0191***	
		(0.00660)	
Female prof.*F. vot.		0.0402***	
		(0.00670)	
Neutral prof.*F. vot.		-0.00450	
		(0.00669)	
Male prof.*M. vot.		0.0541***	
		(0.00659)	
Male prof.*F. vot.		-0.000710	
		(0.00669)	
M. cand.*Female. prof.			0.00263
			(0.00684)
F. cand.*Female. prof.			-0.0729***
			(0.0171)
F.cand.*Neutral prof.			-0.0937***
			(0.0170)
M. cand.*Male prof.			0.0434***
			(0.00691)
F.cand.*Male prof.			-0.0777***
			(0.0172)
Constant	0.186***	0.188***	0.265***
	(0.00336)	(0.00466)	(0.0128)

Standard errors in parentheses

The coefficients show percentage point changes in the probability of receiving the vote.

Under fully random voting, the base probability would be 0.2 for each candidate.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$