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# When Do Female MPs Represent Women's Interests? Electoral Systems and the Legislative Behavior of Women

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Daniel Höhmann<sup>1</sup> 

## Abstract

Research on women's political representation has repeatedly shown that female legislators represent women's interest more strongly than their male colleagues. However, a growing body of literature shows that the parliamentary behavior of female members of parliament (MPs) and the relationship between descriptive and substantive representation of women is affected by a number of institutional variables. This paper contributes to this debate by analyzing the effect of the electoral incentive structure on the substantive representation of women. Drawing on the Competing Principals Theory, it is expected that female legislators more frequently act on behalf of women if their re-election does not depend on the representation of local interests in electoral districts. The empirical analysis uses the German mixed electoral system and analyzes the representation of women's issues in oral and written parliamentary questions tabled in the German Bundestag between 2005 and 2013. The results of a hurdle regression model show that female MPs are more likely to concentrate on the representation of women's interests if their re-election is secured and if they do not have to fight for additional local votes from their district.

## Keywords

electoral systems, gender, substantive representation, women's interests, parliamentary questions

## Introduction

Research on women in parliaments often proposes a link between the descriptive and substantive representation of women and suggests that having a higher proportion of female legislators leads to a higher representation of women-specific interests (Wängnerud 2009). Because female members of parliament (MPs) share gender-specific experiences and problems with the female population—so the argument goes—it is expected that they are more concerned with women-specific topics and that they also represent these issues more frequently in the parliamentary process compared with their male colleagues (e.g., Mansbridge 1999; Phillips 1995). Numerous empirical studies regarding the behavior of female MPs confirm this hypothesis (e.g., Gerrity, Osborn, and Mendez 2007; Swers 2002; Volden, Wiseman, and Wittmer 2018). More recently, scholars have begun to investigate the causal mechanisms of how descriptive representation is translated into more substantive representation of women. They have shown that the political and institutional conditions in the legislature (e.g., partisanship, quotas) moderate the parliamentary behavior of female MPs and significantly affect their possibilities to focus on the representation of women's interests (e.g., Barnes 2016; Dodson

2006; Xydias 2013, 2014). However, our knowledge about the effect of institutional variables on the parliamentary behavior of female MPs and the substantive representation of women is still limited. As Krook (2018: 187) points out, it is particularly striking that the effect of the incentive structures from different electoral systems on female legislators and the substantive representation of women has only been studied very rarely to date. Although mainstream parliamentary research has repeatedly shown that politicians adapt their parliamentary behavior to the incentives of different electoral systems to increase their re-election probability (Carey and Shugart 1995), an explicit application of these findings to the legislative behavior of women is still missing.

In order to contribute to this debate, this article analyzes the effect of the electoral incentive structure on the substantive representation of women by female legislators. Explicitly, the analysis intends to answer the research

<sup>1</sup>University of Bamberg, Germany

## Corresponding Author:

Daniel Höhmann, Professorship for Empirical Political Science,  
University of Bamberg, Feldkirchenstrasse 21, 96052 Bamberg,  
Germany.  
Email: daniel.hoehmann@uni-bamberg.de

question of whether the electoral incentive structure has an effect on whether and to what extent female legislators more strongly represent women-specific issues compared with their male colleagues.

On a theoretical level, this article explicitly links the assumptions of mainstream parliamentary research about the incentives and constraints of different electoral systems to the study of the substantive representation of women. Assuming that female MPs generally have stronger intrinsic motivations to act on behalf of women compared with male MPs (Phillips 1995), I theoretically expect that the electoral incentive structure of single-member district systems (SMD) constrains female MPs from representing women's issues and that the substantive representation of women should be higher in proportional electoral systems (PR). Drawing on the assumptions of the Competing Principals Theory (CPT; Carey 2007), the electoral incentive structure of SMD systems forces female legislators to represent the local interests of the majority of the people in a geographic district to increase their chances of being re-elected. An exclusive representation of women's interests and a simultaneous disregard of the male constituency or other local issues could thus be a risky strategy. However, in proportional systems, electoral districts are state- or nationwide and the re-election probability mainly depends on the vote share of the national party. This opens up the possibility to concentrate on the representation of broader interests and thus gives female MPs the chance to focus on the substantive representation of women-specific issues (Taylor-Robinson 2014: 258; Tremblay 2006).

On the empirical level, the paper provides the first analysis of the effect of different electoral incentives on the behavior of female MPs in a European national parliament. The empirical analysis uses the German mixed electoral system and analyzes the substantive representation of women between 2005 and 2013.<sup>1</sup> In general, mixed electoral systems offer a promising research design, given that the behavior of legislators that are elected in different electoral systems can be observed within the same country. However, most MPs simultaneously run as dual candidates in both electoral tiers and thus simultaneously face electoral incentives from the PR and the SMD tier. In order to take these "contamination effects" (Ferrara, Herron, and Nishikawa 2005) into consideration, I use the re-election safety of a legislator in the two different tiers to operationalize the overlapping electoral incentive structure of MPs (Stoffel 2014b; Stoffel and Sieberer 2018). Theoretically, it is expected that female legislators are more likely to represent women's interests if their re-election does not depend on the representation of local interests of the constituencies in their electoral districts.

In contrast to a growing number of studies that either use parliamentary speeches (e.g., Bäck, Debus, and Müller 2014) or bill sponsorship (e.g., Volden, Wiseman, and Wittmer 2018) to study the parliamentary behavior of female MPs, this study uses written and oral parliamentary questions (PQs) as a measure of women's substantive representation. Since the Bundestag is a party-centered parliament that is characterized by strong party unity (Sieberer 2006), speeches and bill proposals are significantly influenced by the party leadership and rather reflect the ideological position of the party as a whole. Since the present analysis is primarily interested in the behavior of individual MPs, these indicators are not appropriate in this case. PQs, by contrast, are usually not directly controlled by the party leadership and therefore provide a better and more valid measure of the individual preferences of MPs (Martin 2011b).

Based on an original dataset, the results of a hurdle regression model show a significant interaction effect between gender and the electoral incentive structure. Female legislators are more likely to act on behalf of women if their re-election is secured and if they do not depend on the representation of local interests from the constituencies in their districts. Thus, the theoretical link between descriptive and substantive representation has to be qualified and should take the effect of different electoral systems into account.

## Previous Research on Electoral Systems and the Substantive Representation of Women

With an increasing number of women in parliaments, research on gender and politics has started to analyze the behavior of female legislators and investigated the question of whether women make a difference once elected to the legislative arena. On a theoretical level, it is expected that female legislators represent women's interests in parliament more frequently compared with their male colleagues because they share gender-specific experiences and problems with the female population. Drawing on the works of Pitkin (1967) and Phillips (1995), a causal link between descriptive and substantive representation is postulated, that is, having a higher proportion of women in parliaments leads to an increased representation of women's issues (Dovi 2002; Mansbridge 1999).

The empirical findings of a number of empirical studies suggest that female legislators have different priorities than male MPs and that they see themselves as representatives of the female electorate (Coffé and Reiser 2018; Funk and Philips 2019; Gerrity, Osborn, and Mendez 2007; Reher 2018; Schwindt-Bayer 2010), they increasingly engage in plenary and committee

debates on women-specific interests (Bäck, Debus, and Müller 2014; Swers 2002) and they introduce more law initiatives on women-specific interests (Swers 2002; Volden, Wiseman, and Wittmer 2018). For the case of the German Bundestag, Brunsbach (2011) and Xydias (2007, 2014) show that women are more likely to see themselves as representatives of the female population and that they also articulate women's interests more frequently in committee debates and plenary speeches. These results are corroborated by a more recent study by Coffé and Reiser (2018). Analyzing data from the 2009 German Candidate Survey, the authors find that female candidates in Germany are more likely to believe that women are the better representatives of women's interests in parliament.

However, many of these studies also reveal that the legislative actions of female MPs do not always indicate strong commitments to the representation of women-specific interests. The differences in attitudes and parliamentary behavior between men and women are often very small or even completely non-existent (Taylor-Robinson 2014: 253). Based on the finding that the link between descriptive and substantive representation seems to be more complicated than previously assumed (Dodson 2006), researchers more recently have begun to analyze the political and institutional mechanisms that influence the legislative behavior of female politicians. The central endeavor is to identify the conditions and institutional settings under which female legislators actually represent women's interests more strongly than their male colleagues (Childs and Krook 2009; Krook 2018).

Whereas several studies show that partisanship and ideology are often more important than gender in terms of explaining the legislative behavior of female MPs (e.g., Xydias 2013), the effect of the electoral incentive structure on the substantive representation of women by female MPs has not gained much scholarly attention to date (Krook 2018). For national and subnational parliaments in Latin America, Schwindt-Bayer (2010) and Barnes (2016) find that under party-centered electoral systems (e.g., PR systems or SMD systems with high district magnitudes), female MPs tend to be marginalized by the male-dominated party elite. This gives women fewer opportunities to collaborate and bring women's issues to the parliamentary agenda.

Similar to Barnes (2016) and Schwindt-Bayer (2010), Clark and Caro (2013) examine the effect of district magnitude on the substantive representation of women in the House of Representatives and the Senate of the U.S. state of Arizona. They compare legislative co-sponsorship networks in the Arizona House, which relies upon multi-member districts, and the Arizona Senate, which uses SMDs. The results show that female politi-

cians more often co-sponsor laws on female specific topics if the district magnitude increases.

Manon Tremblay (2003) examines the influence of electoral systems on the perceptions of female legislators in Australia and Canada regarding the substantive representation of women. In contrast to the aforementioned studies, Tremblay finds that female MPs elected under proportional electoral systems generally more often perceive themselves as representatives of women in the population. This effect is much weaker in SMD systems. However, Tremblay does not develop any theoretical foundation from which differences in the behavior of female MPs in different electoral systems could be derived.

This paper adds to these studies and analyzes the effect of the electoral incentive structure on the legislative behavior of female MPs in a European national parliament. It develops a new theoretical framework that stresses the individual decision calculus of re-election-oriented female MPs and provides empirical evidence from the intriguing setting offered by the German mixed electoral system.

## **Different Electoral Incentives and the Substantive Representation of Women**

Scholars in parliamentary research have repeatedly shown that institutional arrangements—and the electoral system in particular—have a strong influence on legislative behavior because politicians adapt their parliamentary activities to the incentives of different electoral system to increase their chances of being re-elected (Bawn and Thies 2003; Carey and Shugart 1995; Crisp et al. 2004; Hug and Martin 2012; Olivella and Tavits 2014). The present analysis perceives female MPs as rational actors driven by the intention to advance their personal goals and careers. Generally, I assume that being re-elected is the primary goal of legislators, given that this is usually the precondition for achieving other policy- and office-related objectives (Müller and Strøm 1999). From this follows the underlying argument that the substantive representation of women's interests by female MPs is dependent on the electoral incentive structure. Although all female MPs might have the intrinsic motivation to act for women's concerns, they will represent these issues more strongly in the legislative arena if it does not compromise their individual re-election prospects. In the following theoretical section, I first derive how pure PR and SMD systems might affect the substantive representation of women. These assumptions are then adapted to the simultaneous electoral incentive structures of the mixed electoral system of the German Bundestag.

This is the first paper that explicitly draws on the CPT (Carey 2007) to develop a theoretical framework explaining the conditions under which the representation of women's issues does not produce electoral disadvantages for female MPs. According to the CPT, a legislator can be accountable to different principals that decisively influence the prospects of her re-election. Politicians in closed-list PR systems have to adhere to the demands of their political party because voters can only cast votes for the entire list of a party and the party controls the position of candidates on that list (Carey 2007; Crisp et al. 2004; Olivella and Tavits 2014). By contrast, legislators elected in SMD systems should mainly adhere to the preferences and needs of the local constituency in their electoral districts. Since voters can cast their votes for individual candidates, politicians have to develop an "electoral connection" with the local citizens in their districts to secure re-election (André and Depauw 2013; Cain, Ferejohn, and Fiorina 1987; Crisp et al. 2004; Fenno 1978).<sup>2</sup>

Contrary to Barnes (2016) and Schwindt-Bayer (2010), who assume that party-centered PR systems have a negative effect on the substantive representation of women because male party elites can actively sideline female MPs in parliament, I draw on previous work from Bawn and Thies (2003), Crisp et al. (2004), Taylor-Robinson (2014) and Hennl (2014) and will show that PR systems offer favorable conditions for the representation of women's issues, whereas the electoral incentive structure of SMD precludes female MPs from exclusively representing women's interests.

In SMD systems, a female legislator has to win the majority of votes of the constituency in her district to be re-elected to parliament. From a rational perspective, an exclusive representation of women's interests and a simultaneous disregard of the male constituency could thus be a risky strategy. If a legislator spends most of her time dealing with women's issues, many other potential problems of the district could not be brought to the legislative arena and many of the local voters (especially most of the male constituency) would not feel sufficiently represented by their deputy. As a result, the re-election chance of the female MP would decrease. Of course, this does not imply that female MPs in SMD systems cannot engage in the substantive representation of women at all. In some cases, the representation of the demands of a local women's group might even be a rewarding form of constituency service.<sup>3</sup> In general, however, the necessity to develop a representational style that is sensitive to all local problems of the district prevents female MPs from exclusively concentrating on women-specific interests. This effect is supported in a recent study by Coffé (2018: 376) who conducted interviews with MPs elected under the mixed electoral systems in New Zealand and

Germany. Her results show that the majority of district MPs express a strong representational focus on their district and that only very few of them felt responsible for the concerns of particular social groups.

However, in proportional systems—where districts are state- or nationwide and re-election mainly depends on the vote share of the party at the national level—female MPs are not bounded by any local responsibilities. This offers the opportunity to engage in the representation of broader interests spread among the whole population (Tremblay 2006). Hence, the electoral incentive structure of PR systems gives female MPs the opportunity to concentrate on the substantive representation of women, without having to fear any electoral disadvantage. Quite the contrary, being the representative of women's interests even helps to increase the vote share of the party among women in the whole population and thereby increases the re-election prospects of the female MPs. Moreover, because other politicians from the same party can concentrate on the representation of other interests, the party does not neglect large parts of the electorate if female MPs more strongly represent topics that disproportionately affect women. In line with this assumption, Coffé (2018) shows that legislators elected under proportional electoral rules are more likely to mention a certain social group (e.g., women, ethnic groups) when asked about their representational focus. Coffé (2018: 378) furthermore reports that

one MP from an ethnic minority stated that they and their party considered standing them in a district, but eventually decided against it. Standing in a district would have meant they would also have had to focus on district issues, whereas only standing as a list MP allowed them to focus exclusively on their ethnic community.

Consequently, the link between descriptive and substantive representation of women should be stronger if the re-election of female MPs does not depend on the representation of interests from the constituencies in their local districts. Thus, female MPs elected in PR systems with closed-party lists should more strongly represent women's issues compared with their male colleagues. By contrast, in SMD systems, no gender-specific differences should occur.

### **CPT and the Mixed Electoral System of the German Bundestag**

In Germany's mixed electoral system, half of the MPs are elected in the 299 SMD) using the first-past-the-post system, while the other half is elected via proportional representation (PR) with closed-party lists in the sixteen federal states (Klingemann and Wessels 2001). Whereas



candidates for the SMD tier are nominated from the local party organizations, party lists are centrally chosen at the state level.

However, given that most candidates for the Bundestag simultaneously run in both electoral tiers (Manow 2013), a simple distinction between MPs elected in the districts and those elected via the party list might not sufficiently reflect the actual electoral incentive structure of the legislators. This problem is often referred to as the “contamination hypothesis,” which states that the different tiers of mixed electoral system do not operate independently because candidates running on both tickets are simultaneously confronted with the incentives from the PR and the SMD tier (Bernauer and Munzert 2014; Ferrara, Herron, and Nishikawa 2005; Ohmura 2014; Olivella and Tavits 2014; Stoffel 2014a).

In order to take this possible contamination into account, I adapt the theoretical expectations for pure PR and SMD systems to the simultaneous electoral incentive structures in the mixed electoral system of the German Bundestag and theoretically derive when dual candidates can represent broad interests and when they have to follow the demands of the constituency in their district (which theoretically hinders female MPs from representing women’s issues).

*Ceteris paribus*, I assume that dual candidates compare the chances of being re-elected in the PR and SMD tier and then follow the demands of the principal that offers them a higher re-election probability as well as stronger prospects for the advancement of their personal careers (Stoffel 2014a).

As shown in the previous section, female MPs can more easily concentrate on the representation of women’s issues if their re-election does not depend on the interests of the constituencies in local districts. Following Stoffel (2014a), the German mixed electoral system essentially offers two scenarios in which female MPs are freed from the necessity to invest a significant amount of their resources in district-related activities, thereby giving them the chance to focus on the representation of women-specific interests. In the first scenario, female MPs are independent from the support of their local constituencies if their re-election probability in the PR tier is high. If female politicians have a safe spot on the party list, their re-election to the Bundestag is virtually certain and they do not have to care about the demands of their local constituency. Second, female MPs do not have to devote many of their scarce resources to district-related tasks if they run as candidates in so-called “stronghold” districts. Based on the ideological orientation of the local electorate, these strongholds always favor the candidate of a specific party. If a female MP is the candidate of the ideologically preferred party, her re-election probability in the SMD tier is very high regardless of the amount of time

that she has invested in district service (Stoffel 2014a: 80). Thus, if the re-election probability of a female MP is high (through either a promising list slot or candidacy in a stronghold district), female politicians do not depend on additional local votes from their districts and they are able to more strongly concentrate on the exclusive representation of women’s interests. Under these scenarios, working for the district does not pay off because the party not only guarantees re-election to parliament but also decides over the personal advancement within parliament (through the distribution of offices and money). However, which electoral incentive structures force female MPs to invest much work into their district and thus prevent them from exclusively working in the interests of women?

In general, female MPs who face a narrow race in their district (several candidates have realistic chances to win the district mandate) should more strongly respond to the demands of their local constituency because gaining a few more votes could guarantee their re-election to parliament (Bernauer and Munzert 2014).<sup>4</sup> However, at the same time, it has to be given that the candidate is not backed up with a promising slot on the party list, which would otherwise serve as a “safety net” (Stratmann and Baur 2002) if the race in the district would be lost.

In sum, the German mixed electoral system provides a promising setting to compare the behavior of MPs that have to respond to different electoral incentives. However, it is not the actual seat type held during the legislative period, but the joint re-election probability that ultimately affects whether MPs conform to the incentives of SMD or PR systems. If the re-election to parliament is not certain, dual candidates have strong incentives to adhere to the demands of their local district and behave like candidates in pure SMD systems, that is, the exclusive representation of women-specific interests becomes a risky strategy (Bernauer and Munzert 2014; Stoffel 2014a; Zittel and Gschwend 2008). If the district race is lopsided or the candidate has a safe position on the party list, she can behave according to the assumptions of pure PR systems. Accordingly, she can focus on the demands of her party and represent broad interests among the electorate. In this case, the substantive representation of women becomes more likely.

*Hypothesis:* Female MPs represent women’s issues more strongly compared with male MPs if their re-election is secured and the electoral incentive structure does not force them to represent the local interests of the constituency in their districts.

## Methods and Data

The empirical part of the paper analyzes the substantive representation of women-specific interests during the 16th and 17th Bundestag (2005–2013). The analysis uses

the German mixed electoral system which offers the promising opportunity to observe the legislative behavior of MPs who have to respond to the demands of different principals (Carey 2007), while all unobserved country-specific characteristics can be held constant. As pointed out above, I take into account the criticism of the contamination literature and explicitly model the simultaneous and overlapping incentive structures for candidates who run in both tiers.

The central dependent variable of the analysis is the substantive representation of women by individual legislators. The measurement and operationalization of the individual behavior of female legislators and their substantive representation of women issues is a complex endeavor. Due to strong party unity—especially in European parliaments—previous measurements (e.g., bill sponsorship, speeches, committee membership of legislators) measure the ideological position of the political party rather than the preferences and behavior of individual legislators. In order to reduce the impact of party discipline, I use written and oral PQs to measure how strongly MPs focus on the representation of women-specific interests (Bird 2005; Martin 2011b). Since PQs are usually not officially controlled by the party leadership, they provide one of the very few direct and quantitative indicators of parliamentary activities and offer an attractive tool to operationalize the representative roles of individual MPs (Bailer and Ohmura 2018; Martin 2011b). As Martin (2011b: 475) points out, asking PQs on a specific topic requires the allocation of scarce resources and is by no means a costless activity in terms of time and opportunity costs (MPs must identify the information they want to obtain with the question, write it, format and submit it appropriately and wait for a reply). Moreover, the number of PQs that can be asked is limited. Individual MPs in the German Bundestag have the right to ask up to four written questions per month as well as two oral questions for the weekly question hour of the Bundestag. Therefore, PQs are a direct indication of the priorities of legislators and the content of the question provides an excellent way to measure the extent to which individual legislators substantially represent the interests of certain social groups (Bailer 2011; Martin 2011a, 2011b; Saalfeld 2011; Saalfeld and Bischof 2013). The simple logic is that the more strongly that a legislator is committed to the substantive representation of women, the more questions about women-specific issues that she should submit.

This study analyzes all written and oral questions tabled by members of the Bundestag between 2005 and 2013 (41,690 questions in total). In order to quantify the substantive representation of women, each question was hand-coded to identify whether it deals with a woman-specific topic.<sup>5</sup> This classification is then used to create a

dataset that includes information on the number of questions with a women-specific concern that each member of the Bundestag has submitted.

At this point, the definition of women's issues needs further clarification. Generally, the concept of women's issues is a widely debated topic that is often criticized for assuming that women are a homogenous group with a common set of interests (Mansbridge 1999). In order to avoid this critique of essentialism, the analysis does not apply a pre-defined list of women-specific interests, which is very subjective and can easily be manipulated by the researcher; instead, it uses the often-cited definitions from Susan Carroll (1994) and Karen Celis (2008). According to Carroll (1994: 15), women's issues are those "where policy consequences are likely to have a more immediate and direct impact on significantly larger numbers of women than of men." Building on Celis (2008), this means that a question is classified as woman-specific if it refers to a topic that—for either biological or social reasons—disproportionally affects women more strongly than men, or if it addresses a social condition in which women are disadvantaged compared with men. Furthermore, questions are coded as women-specific if they propose provisions to mitigate or completely eliminate inequalities between men and women. The majority of questions coded as women-specific addresses issues such as gender pay gaps, legal protection of working mothers, sexual violence against women as well as legal provisions concerning prenatal examinations and abortion. In addition, questions about professions that are more frequently pursued by women than men (e.g., midwives) are coded as women-specific. Questions about youth policies, education and rights for lesbian, gay, bisexual, and transgender (LGBT) are only coded as women-specific if they explicitly refer to discrimination against women or girls.

Below are a few examples of PQs coded as women-specific that were tabled to the government during the 16th and 17th legislative term of the Bundestag:

What is the federal government planning to do to achieve their stated goal of doubling the proportion of women in science within the next 10 years? (Krista Sager, Greens)

When is the federal government expected to have completed the evaluation of the establishment of a nationwide emergency telephone number for victims of all forms of violence against women? (Ina Lenke, Liberals)

How does the federal government react to the fact that—according to the Women's Data Report of the Institute of Economic and Social Research—the average income of women with full-time employment is far lower than that of men? (Inge Höger-Neuling, Left Party)

The independent variables in this study are (1) the sex of a legislator and (2) the electoral incentive structure, which is measured through the re-election probabilities in both electoral tiers. The sex of MPs is coded based on biographical information of the legislators in Kürschner's Handbook of the German Bundestag (Kürschner's Volkshandbuch 2009–2010) and receives the value zero for male and one for female MPs. The most straightforward solution to measure electoral incentives would be a dummy variable indicating whether a MP is elected in the SMD or PR tier. However, as outlined above, a simple dichotomous distinction between list and PR candidates is not sufficient in the German case due to the huge number of dual candidates and the resulting contamination effects between the two electoral tiers.<sup>6</sup> Following Stoffel (2014a, 2014b) and Bernauer and Munzert (2014), I thus use the re-election probability of MPs in both tiers to measure their actual electoral incentive structure. This variable replaces the simple dichotomous distinction between district and list candidates with a continuous measurement, accounts for possible contaminations of the electoral tiers and indicates whether MPs should rather adhere to the incentives of the SMD or PR electoral system. The Online Appendix A5 includes a model with a dummy variable for list candidates instead of the electoral security as the main independent variable.

Re-election probabilities are calculated in a three-step process as described in Stoffel (2014b) and Stoffel and Sieberer (2018).<sup>7</sup> First, in order to determine the re-election safety in the district ( $p_D^i$ ), a probit model is calculated that uses the winning/losing margin at the election at time  $t - 1$  to calculate the probability that an MP wins the district seat at the election at time  $t$ . The coefficient is then used to predict the individual re-election probability for each MP. In the second step, the electoral safety of an MP on her party list is predicted. Again, a probit model is calculated that uses the list position at time  $t$  to predict the probability that a MP wins a list mandate ( $p_L^i$ ) (see Stoffel (2014b) and Stoffel and Sieberer (2018) for a detailed description). In the final step, the two individual probabilities are combined to obtain the total re-election probability for each member of the Bundestag. Following standard probability theory<sup>8</sup> and assuming that ( $p_L^i$ ) and ( $p_D^i$ ) are not mutually exclusive, the overall re-election probability of a MP equals the sum of the district and list probability, minus the joint probability ( $(p_L^i \cap p_D^i) = (p_L^i * p_D^i)$ ) that the MP is elected in both tiers

$$s_i = p_L^i + p_D^i - (p_L^i * p_D^i)$$

Detailed information on the re-election probabilities across parties can be found in the Online Appendix A2.

## Statistical Model: Hurdle Regression Model

The unit of analysis for the following empirical test is the individual MP. For each MP, the dependent variable of the analysis is expressed as the ratio of the number of women-specific questions among the total number of questions that the MP has submitted. The descriptive analysis reveals that during 2005 to 2013 many of the MPs in the Bundestag do not table any women-specific questions at all. Hence, the overwhelming majority of observations receives a score of zero on the dependent variable.

The statistical analysis of proportions with an extremely right- or left-skewed distribution poses several difficulties. Because proportions are bounded on the  $[0;1]$  interval and due to the skewed distribution of the data, the dependent variable cannot be modeled as a linear function of the explanatory variables. In order to address these problems, I estimate a hurdle regression model comprising two different equations that are estimated as separate processes (Hardin and Hilbe 2012; Mullahy 1986). In the first step, the hurdle component models the general decision of MPs to become active in the substantive representation of women or not. If this "hurdle" is overcome, the effect of the explanatory variable on the strength or intensity of the dependent variable is estimated in the second step. More specifically, the first step estimates the effect of the independent variable on the likelihood that the dependent variable does not equal zero. The dependent variable is expressed as a dummy variable that receives a score of one if the proportion of submitted questions with a women-specific concern is greater than zero and a logistic regression model is fitted to determine the effect of the electoral incentive structure on the general decision of an MP to represent women's issues in parliament or not. In the second step, a beta regression model is estimated. This model contains only those observations that have tabled at least one question dealing with a women-specific interest and calculates the effect of the electoral incentive structure on the proportion of women-specific questions (i.e., the intensity of substantive representation).

The beta regression model assumes that the data are distributed according to a beta distribution bounded between zero and one (zero and one not included). The beta distribution is very flexible and thus is very well suited to describe unimodal as well as bimodal distributions (Smithson and Verkuilen 2006). The standard errors of the beta regression are conditional on the results from the logit regression. This accounts for the fact that although the two models are estimated in two separate steps, they are dependent on one another.<sup>9</sup>

Moreover, the statistical model has to take into account the fact that the dataset contains multiple



observations for the same MP that are not independent from each other. Therefore, all models are calculated with robust standard errors clustered at the level of MPs. Since I theoretically expect that the impact of gender is conditional on the electoral incentive structure, multiplicative interaction effects between sex and re-election probability are calculated.

### Control Variables

Although many county-specific factors are controlled for by design, several control variables are introduced. First, dummies for party membership of the MPs are included in the model, because it is assumed that left parties are generally more in favor of gender equality and thus facilitate the descriptive and substantive representation of women (Caul 1999; Xydias 2013). Thus, members of the SPD, Greens and the Left Party should generally more often table questions about women-specific interests compared with MPs from the Union (CDU/CSU) or the FDP.<sup>10</sup> Party membership also has an effect on the electoral security since members of the SPD and the CDU/CSU generally have higher re-election probabilities compared with members of the smaller parties. Moreover, all models control for membership in the Committee on Family Affairs, Senior Citizens, Women and Youth, since these MPs—irrespective of their re-election probability—should be more inclined to submit women-specific questions. Additionally, I include dummy variables for MPs of a governing party and for legislators holding an executive or parliamentary office, because it is expected that these legislators generally submit fewer PQs than MPs from opposition parties.<sup>11</sup> At the same time, being in government or holding an executive office oftentimes guarantees a safe spot on the party list. Bailer and Ohmura (2018) show that the use of PQs in the German Bundestag also depends on the career stages in which legislators are in. In order to control for potential intervening effects of parliamentary experience, I include the duration of parliament membership (measured in years) in the models. Moreover, all models directly control for the total number of PQs tabled by an MP in the respective legislative period to account for different activity levels of MPs over the course of their career. All models additionally include a time dummy that denotes observations from the 16th Bundestag to control for potential time trends that affect all MPs equally. Table A1 in the online appendix contains descriptive statistics of all variables.

### Results

The empirical analysis uses an original data set containing information on the share of submitted questions dealing with a women-specific concern and the electoral

incentive structure for each MP of the 16th and 17th Bundestag (2005–2013). This provides a total of 1,293 observations. The descriptive statistics show that according to the theoretical expectations, female legislators more strongly focus on the substantive representation of women's issues compared with their male colleagues. In all, 32 percent of all female MPs actively represent women's issues in the parliamentary arena and table at least one women-specific PQ. In contrast, only 12 percent of the male MPs become active in the substantive representation of women and table PQs that are concerned with women's issues. Of the 41,911 written and oral questions tabled by the members of the Bundestag between 2005 and 2013, 1,238 PQs (3%) tackle a topic that disproportionately affects women. Among these, 899 PQs (73%) were issued by female MPs, whereas male legislators tabled only 339 (27%) questions on a women's issue.

Let us now turn to the question of whether the assumptions of Carey's (2007) Competing Principal Theory are also reflected in the substantive representation of women and whether female legislators act more strongly on behalf of women if their electoral incentive structure permits it. The complete results for all coefficient estimates can be found in Table 1. Estimates of the logit regression (hurdle component; effect on the decision to act on behalf of women or not) are shown on the left, while the results from the beta regression (effect on the intensity of substantive representation) are presented in the right part of the table. The central explanatory variable is the interaction effect of gender and electoral incentive structure, which tests whether female MPs are more likely to represent women's issues if their re-election is not dependent on local votes from their district constituencies. All coefficients are presented as log odds with robust standard errors clustered at the level of individual MPs.

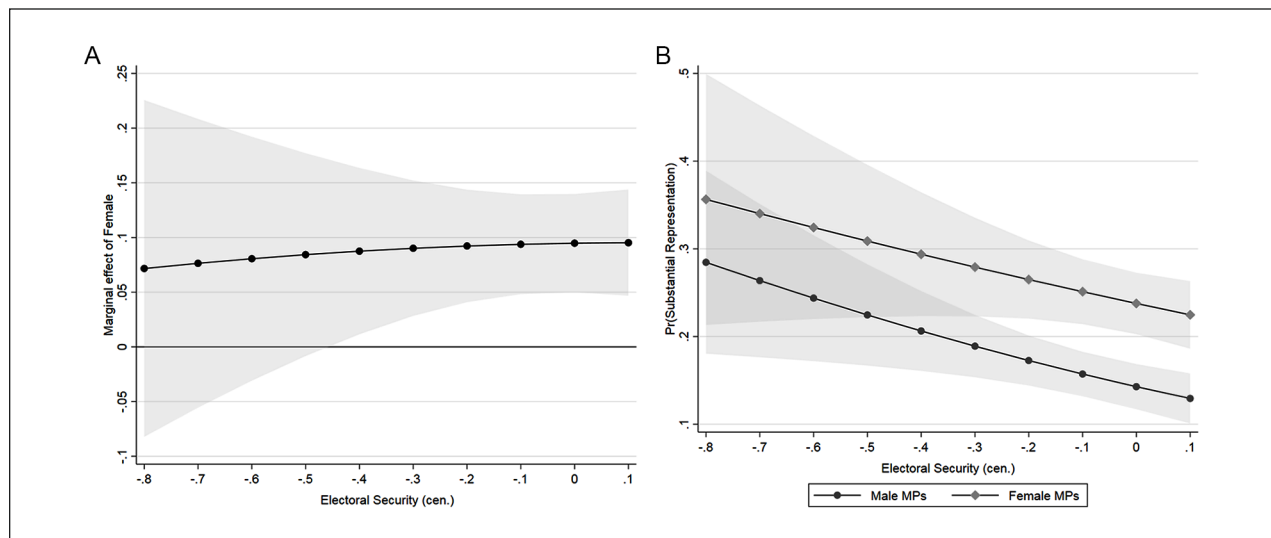
In both parts of the model, the results in Table 1 show the theoretically expected positive interaction effect between gender and re-election security. Accepting the 5 percent significance level, the interaction effect of the beta regression is statistical significant, whereas the coefficient of the logit regression is statistically not distinguishable from zero. However, since both models are non-linear and contain an interaction effect, an assessment of the statistical significance of the interaction term for different values of electoral security as well as an interpretation of the substantive strength of the effects is difficult based on the log odds from Table 1 alone. Therefore, I calculate and plot the average marginal effects as well as the predicted probabilities of gender across the entire range of re-election probability. All other variables retain their empirically observed values, whereby re-election probability is centered around its mean value to obtain useful comparative groups for the conditional effects. The results for the logit regression are

**Table 1.** The Effect of Electoral Incentive Structure on the Substantive Representation of Women's Issues, Log-Odds.

Variables	General decision (Hurdle; Logit-regression)	Intensity of substantive representation (beta-regression)
Female	0.91*** (0.21)	0.40*** (0.10)
Re-election probability (centered)	-1.60** (0.53)	-0.57* (0.26)
Female * Re-election prob.(centered)	0.50 (0.71)	1.06*** (0.34)
No. of submitted questions (in total)	0.01*** (0.002)	-0.003*** (0.001)
Duration MP	0.03 (0.02)	0.01 (0.01)
Member women's committee	1.58*** (0.28)	1.32*** (0.22)
Leadership position	-0.38 (0.21)	0.09 (0.12)
Member governing party	-2.19*** (0.40)	0.49* (0.22)
Social Democrats (SPD)	-0.48 (0.40)	0.41 (0.33)
Greens	-0.41 (0.53)	0.42 (0.32)
Liberals (FDP)	-0.22 (0.49)	0.56 (0.34)
Left	-0.74 (0.54)	0.46 (0.34)
16th Bundestag (Time Dummy)	-0.12 (0.18)	-0.03 (0.14)
Constant	-1.41** (0.48)	-3.25*** (0.40)
N	1268	234
Log-pseudolikelihood	-397.38	419.95
$\chi^2$	429.80***	165.48***

Hurdle Model. DV Model 1: Dummy variable coded 1 if share of women-specific questions > 0. DV Model 2: Share of women-specific questions. Coefficients: Log-Odds. Standard errors (in parentheses) are clustered by MP. Reference category for parties: CDU/CSU. MP = members of parliament.

\* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ .

**Figure 1.** Interaction effect of gender and electoral incentive structure on the general decision to represent women's issues (probability). (A) Marginal effect of female and (B) predicted probabilities.

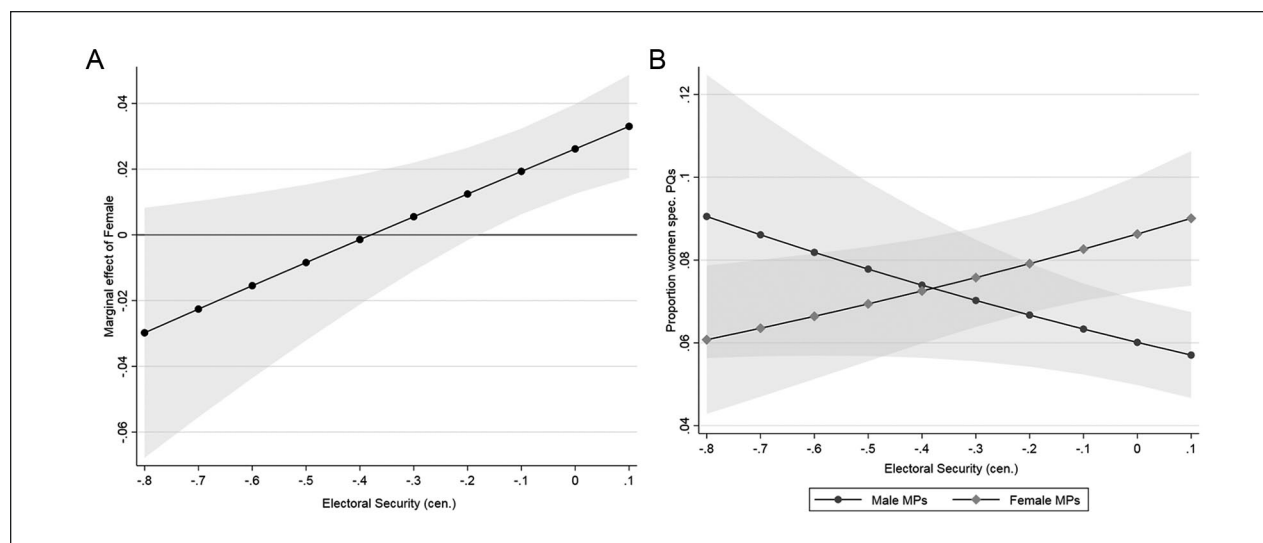
Hurdle Model (Logit Regression). Shaded areas indicate 95 percent confidence intervals. All other variables enter the model with their empirically observed values.

presented in Figure 1 and the plots for the beta regression are shown in Figure 2.

Concerning the estimates for the effect of the electoral incentive structure on the general decision to promote women's interests in parliament, Figure 1A reveals that

the marginal effect of gender is insignificant for low values of the re-election variable.

This means that if the electoral race in the district is not lopsided and the legislators are at the same time not backed up with a secure slot on the party list, female MPs



**Figure 2.** Interaction effect of gender and electoral incentive structure on the intensity of substantive representation of women. (A) Marginal effect of female and (B) predicted proportion of women specific questions. Hurdle Model (Beta Regression). Shaded areas indicate 95 percent confidence intervals. All other variables enter the model with their empirically observed values.

have to adhere to the incentives of the SMD tier and have to invest more time and resources in district-related activities. Consequently, women do not have a significantly higher probability of representing women's issues in parliament compared with their male colleagues. However, this picture changes as the re-election probability increases. In line with the theoretical expectations, the effect of gender increases for higher re-election probabilities. Compared with the men in parliament, female MPs more often decide to promote women-specific topics in parliament if their re-election to the Bundestag is secured. This effect is significant at the 5 percent level for the upper values of re-election probability.<sup>12</sup> The probability for the representation of women-specific interests is almost 10 percentage points higher for female MPs compared with their male colleagues. Thus, it can be shown that female MPs more frequently act on behalf of women if they do not depend on the representation of local interests from the constituencies in their districts.

Surprisingly, however, the predicted probabilities from Figure 1B reveal that among the female legislators, the probability of promoting women's issues in parliament slightly decreases from 39 to 22 percent as electoral security increases. Nevertheless, given that this decline is significantly lower than among the male MPs (from 30 to 12 percent), we can observe the theoretically expected positive interaction effect between gender and the electoral incentive structure.

The results for the control variables indicate that members of the women's committee as well as MPs that generally submit a high number of PQs are more likely to

actively represent women's issues in parliament. In contrast, MPs from governing parties are less likely to submit at least one women-specific PQ.

Let us now turn to the results of the beta regression to estimate the effect of gender and the electoral incentive structure on the intensity with which legislators promote the substantive representation of women. This model includes only those MPs who tabled at least one women-specific question, namely they generally decided to represent women's issues in the parliamentary arena. The results are shown in Figure 2.

Again, the interaction effect between gender and electoral incentive structure is positive and significant at the 5 percent level for high values of the re-election variable. This means that female legislators more frequently act on behalf of women compared with male MPs if their re-election is safe (through either a lopsided district race or a promising position on the party list). Interestingly, the marginal effects (Figure 2A) and predicted probabilities (Figure 2B) reveal that if the prospects for re-election are low, men promote the interests of women more strongly than female MPs and on average they submit roughly 3 percentage points more women-specific questions.<sup>13</sup> Nonetheless, the marginal effect is not significant and—due to the positive interaction effect—this pattern changes when the electoral security increases. The size of the marginal gender effect increases with increasing re-election probabilities and becomes positive and significant at the high end of the electoral security scale. Substantially, women table roughly 3 percentage points more women-specific questions compared with male MPs if re-election

prospects are high. Across the full range of the electoral security scale, the predicted probabilities for the share of women-specific questions increases from slightly above 6 percent to almost 9 percent for women and decreases from 8.5 to slightly under 6 percent for male MPs.

Ina Lenke, for example, a MP from the FDP whose re-election to parliament was almost certain ( $s_i = 0.99$ ) tabled 89 women-specific PQs during the 16th LP of the Bundestag. In total, 67 percent of MP Lenke's PQs referred to women's interests. In contrast, Uta Zapf and Iris Gleicke (both SPD), both of whom had strong incentives to invest more time into district-related activities because their re-election probabilities only amounted to roughly 40 percent, did not submit any women-specific PQ at all.

The control variables show that MPs ask significantly more women-specific PQs if they are a member of the women's committee or a legislator from a governing party. The effect of the total number of PQs is also significant, but the effect size is negligible.

To summarize, the results confirm the theoretical expectations and show that female legislators act more strongly on behalf of women if their re-election is secured and if they do not have to fight for additional local votes from their district. Otherwise, the necessity to represent the local interests of their constituencies prevents female MPs from an exclusive representation of women's interests. This suggests that the unconditional "politics of presence" hypothesis (Phillips 1995) and the assumption of an automatic link between descriptive and substantive representation has to be qualified and should take the incentive structures of different electoral systems into account.<sup>14</sup>

## Conclusion

This paper has empirically investigated the effect of the electoral incentive structures on the behavior of female legislators. Even though previous research has demonstrated that the incentives of different electoral systems affect the parliamentary behavior of MPs (Carey and Shugart 1995), these findings have never been explicitly transferred to the study of women and politics. Thus, the analysis fills a relevant gap in research on the links between descriptive and substantive representation of women and contributes to a better understanding of the institutional settings under which female legislators more strongly represent women-specific interests. Using the German mixed electoral system, the results indicate that female legislators act more strongly on behalf of women if their re-election is secured and if they do not have to fight for additional local votes from their local district. Based on Carey's (2007) CPT, this shows that whenever the electoral incentive structure does not force MPs to

represent local issues of their districts, female legislators use this opportunity to more strongly act in the interest of women. The analysis thereby demonstrates that the assumption of a link between descriptive and substantive representation has to be qualified and should take the effect of different electoral incentive structures into account. This finding is noteworthy because it shows that electoral rules not only affect the number of elected women but that they also have strong effects on the subsequent legislative behavior of female MPs.

In future research, it would be interesting to observe whether the findings of this paper can be generalized to other countries and settings. As the present analysis is limited to the mixed electoral system of the German Bundestag, it has to be tested whether the findings also hold in settings with pure SMD or PR electoral systems. Assuming that female MPs generally perceive a stronger responsibility for the representation of women's issues than male MPs (Coffé and Reiser 2018), the results suggest that female MPs in pure PR systems—in which legislators have the possibility to focus on the representation of broad interests among the whole population—should be more likely to concentrate on the substantive representation of women compared to female MPs elected in SMD systems. These assumptions could be tested in cross-national analyses of countries with pure PR and SMD systems. Since parties in proportional systems have to appeal to different social groups, analyses of pure PR systems could also show which of the female MPs are more likely to engage in women's substantive representation and which rather focus on other diverse interest (e.g., migrants, working class).

Quite surprisingly, the results of the analysis show that men more strongly represent women's issues if they are electorally insecure, thus suggesting that they use this strategy to win additional votes from female voters. For a thorough understanding of the substantive representation of women it is therefore necessary to explore the institutional settings under which male MPs act on behalf of women. Several authors have already suggested that we should rethink the substantive representation of women and that we should move beyond analyzing only female MPs' behavior and the questions of how and when women represent the interests and preferences of their female constituents (e.g., Childs and Krook 2009; Celis et al. 2008; Celis and Erzeel 2015). The findings of this study corroborate this notion and demonstrate that further analyses of the effect of institutional variables on the decision of male MPs to become "critical actors" (Childs and Krook 2009) who represent women's interests in parliament are a necessary next step to deepen our understanding of how and when substantive representation of women occurs. This also requires an extension of the analysis to further legislative periods to observe whether the findings



are stable over time or if the behavior of female and male MPs changes if the composition of the parliament becomes more gender-balanced.

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### Notes

1. Replication data are available on the Harvard dataverse at <https://doi.org/10.7910/DVN/PBK1T7>.
2. For empirical tests of the mandate-divide hypothesis (Thames 2005) in the Bundestag, see Stratmann and Baur (2002), Zittel and Gschwend (2008), Sieberer (2010, 2015), Manow (2013), and Ohmura (2014).
3. Since women make up roughly 50 percent of the population in each district, one could theoretically argue that female MPs could be elected if they win the votes from all women in her district. However, it is very unlikely that female candidates would win the vote of each and every woman in the district.
4. This assumption is corroborated by the empirical finding that the perceived prestige of a district mandate is generally higher than that of list MPs (Coffé 2018; Zittel and Gschwend 2008).
5. All PQs were coded by the author. To ensure the validity of the coding, a student research assistant was familiarized with the definition of women's substantive representation (see below) and was then asked to classify a random sample of 2,000 PQs (PQs that have been classified as women-specific by the author were oversampled and made up 14% of the sample). According to Krippendorff's  $\alpha$ , the intercoder reliability equals 0.94. Among the women-specific PQs, the intercoder agreement is 95.2 percent.
6. Overall, 1,093 (84%) MPs ran as dual candidates.
7. I would like to thank Michael Stoffel for the generous provision of data.
8. If two events (A, B) are not mutually exclusive, then  $P(A \cup B) = P(A) + P(B) - P(A \cap B)$ .
9. Conditional standard errors are estimated with the *suest* command (seemingly unrelated estimation) in Stata 15.
10. In order to control for regional differences within parties (SPD members from Berlin might be more progressive than SPD members from rural areas in Bavaria), I also calculated a model with dummy variables for each party-state combination. As the results do not deviate from the original model, I prefer the more parsimonious model including only party dummies.
11. The following offices are treated as leadership positions: chancellor, president of the Bundestag, cabinet minister, junior minister, committee chair, chair of a parliamentary party group, party whip, and member of the party's executive committee.
12. Given that most MPs have high re-election probabilities, most cases fall within this region.
13. This corroborates the notion that female MPs might not be the only actors in the substantive representation of women and emphasizes that men can also be "critical actors [who] act individually or collectively to bring about women-friendly policy change" (Childs and Krook 2009). The findings suggest that male MPs might not be blamed if they do not represent women's interests, but that they can gain additional credit if they support women's issues (Bergqvist, Bjarnegård, and Zetterberg 2018). Thus, male MPs will become more likely to speak on behalf of women if they have to fight for additional votes to get re-elected (see Conclusion).
14. Additional robustness checks can be found in the online appendix. Online Appendix A3 shows that all results remain stable if I use the absolute number instead of the share of question as the dependent variable. Moreover, the results do not change if I include additional control variables into the model (Online Appendix A4). Online Appendix A5 uses a dummy variable for list candidates instead of the electoral security as the independent variable. The results are insignificant, showing that it is indeed the combination of electoral incentives in both tiers that affects the parliamentary behavior of German MPs. Moreover, the results are not sensitive to the exclusion of MPs with an unusually high number of women-specific PQs (Online Appendix A6). The results are also robust to the exclusion of MPs from the FDP and the Greens which usually have very low re-election probabilities in the district.

### ORCID iD

Daniel Höhmnn  <https://orcid.org/0000-0003-1740-5234>

### Supplemental Material

Supplemental materials for this article are available with the manuscript on the *Political Research Quarterly* (PRQ) website.

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