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Substantive Representation of Women: Empirical Evidence

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Abstract
We identify women's revealed preferences for legislative proposals to investigate substantive representation of women. We then examine whether female or male politicians in parliament are more responsive to revealed female preferences using data on 47,527 decisions made by all 777 Swiss parliamentarians between 1996 and 2022. Holding party and constituent preferences constant, our results show differences in the substantive representation of women between female and male politicians for legislative proposals related to social policies. For all policies unrelated to social issues, we find that female politicians are no more responsive to female preferences than male politicians. Heterogeneity analyses show that differences in the substantive representation of women by male and female politicians on social policy issues do not depend on the socialization of the politicians, or the underlying political incentives and constraints.

Introduction

There are fewer women than men in most parliaments around the world, meaning that women are descriptively underrepresented. In 2024, women accounted for approximately 32 per cent of members of parliament in European countries (Inter-Parliamentary Union 2024). Increasing the share of women in politics may translate into better representation of women's preferences if female[1] politicians represent female preferences more closely than male politicians. The literature suggests that women in parliaments make different decisions than their male counterparts (see, for example, Dutta and Maus 2021; Hessami and da Fonseca 2020; Mansbridge 1999; O'Brien and Piscopo 2019). Many studies on gender disparities in politics examine either politicians or voters. Yet, to better understand if the distinct legislative behaviour of female and male politicians is due to them responding to specific preferences of women in the electorate, it is essential to analyze both politicians and voters concurrently. Additionally, assessing the preferences of women on the same legislative issues that politicians vote on in parliament is crucial for insights regarding substantive representation, which we aim to analyze in this paper.

Female voters' preferences could be represented by both female and male politicians. Electoral competition might force male and female politicians to cater to both sexes symmetrically.

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[1]When using the term 'female' we refer to all persons self-identifying as women.

Therefore, underrepresentation in terms of numbers (weak descriptive representation) does not necessarily imply underrepresentation in terms of preferences (weak substantive representation) (Pitkin 1967, 174). Still, the notion that women's descriptive representation can be linked to their substantive representation is supported by several empirical studies (Campbell, Childs, and Lovenduski 2010; Chattopadhyay and Duflo 2004; Hornset and de Soysa 2022; Reingold and Smith 2012). Moreover, the literature on, for example, social identity suggests that politicians are not only driven by electoral concerns but better represent voters with similar social identities (see, for example, Mansbridge 1999; Phillips 1995; Preuhs 2006). This paper empirically identifies differences in the substantive representation of revealed preferences of female voters between male and female politicians concerning actual legislative proposals. Specifically, it addresses the following research question: Are female legislators more responsive to female voters' preferences than male legislators?

We exploit the highly informative institutional setting of Switzerland to analyze how male and female politicians represent the preferences of female voters. Swiss constituents frequently vote on policy issues in referenda and, thereby, reveal their preferences (see Frey 1994; Portmann, Stadelmann, and Eichenberger 2012; Schneider, Pommerehne, and Frey 1981; Stadelmann, Portmann, and Eichenberger 2014; Stadelmann, Portmann, and Eichenberger 2019). Referendum decisions lead to changes in the constitution or the law and, thus, have genuine political consequences. Male and female legislators vote in parliament on the very same legislative proposals (with identical wording) that voters vote on in referenda. To identify women's preferences in the electorate, we draw on representative post-referendum surveys in which the surveyed female respondents state their voting record. Thereby, we directly observe for each referendum three aspects: (1) what legislators decide based on their roll-call votes, (2) what their constituency wants based on referendum results, and (3) what female preferences are based on post-referendum surveys. This information allows us to analyze whether female politicians are more responsive to revealed female preferences than male politicians when deciding in parliament. We examine 47,527 decisions on 234 referenda by the universe of all 777 politicians who were members of the Swiss parliament at some point between 1996 and 2022.

The empirical results show that there are differences between the policy preferences of male and female voters. These differences matter for substantive representation, depending on the subject matter. Female politicians do *not* respond more closely to specific preferences of female voters than male politicians. This holds if we control for the preferences of the constituency, party voting recommendations, an array of characteristics of politicians, as well as district, legislative period, and referendum type fixed effects. We interpret our results to indicate that there are, *ceteris paribus*, no differences in the substantive representation of women between male and female politicians *on average*. Consequentially, male and female legislators can equally represent the preferences of the female electorate.

However, not every policy decision necessarily entails an inherent gender dimension. The literature suggests that women in politics may behave differently from their male counterparts, especially with regard to social and redistributive policies (see Baskaran and Hessami 2023; Chattopadhyay and Duflo 2004; Croson and Gneezy 2009; Dollar, Fisman, and Gatti 2001; Funk and Gathmann 2015; Güvercin 2020; Hornset and de Soysa 2022). Focusing on legislative proposals dealing with these subject matters, we find that female legislators are more responsive to female voters' preferences than male legislators. Our setting allows us to quantify these differences in responsiveness: 10-percentage-point higher female voter preferences, measured as the acceptance rate of women for a referendum, translates, *ceteris paribus*, into an about 2.29-percentage-point higher probability of a female politician supporting the respective legislative proposal than a male politician. An in-depth analysis reveals that the differential representation effects for social policy issues are specific to gender and do not vary with a politician's age, and thus their socialization, or the underlying political incentives and constraints.

Overall, our findings complement and qualify the existing literature, which has suggested that women in politics tend to act more socially minded and provide more public goods than men (see Baskaran and Hessami 2023; Croson and Gneezy 2009; Dollar, Fisman, and Gatti 2001; Funk and Gathmann 2015; Güvercin 2020; Hornset and de Soysa 2022). A lower number of female legislators may indeed weaken substantive representation of women for social issues. However, politics is also about efficiency, security, the organization of the state, foreign affairs, etc. While women's descriptive representation is important for relevant political outcomes (for an overview, see Wängnerud 2009) such as voters' satisfaction with legislators (Lawless 2004), voters' political knowledge and engagement (Dassonneville and McAllister 2018; Koch 1997; Stokes-Brown and Dolan 2010), parties' policy statements (Greene and O'Brien 2016), male politicians' attitudes toward gender equality (Kokkonen and Wängnerud 2017), or government behaviour (Homola 2022), we find that descriptive underrepresentation does not necessarily imply the underrepresentation of preferences. Our empirical results suggest that across all policy areas, male and female politicians respond similarly to female preferences. We recognize that by focusing on political decisions in parliament and actual outcomes in popular referenda, we neither capture all parliamentary activities nor all processes shaping citizen's votes. Given our unique way of measuring substantive representation, our study makes an important contribution to the broad literature on gender-specific representation.

The remainder of this paper is structured as follows: first, we provide a review of the literature on representation and gender effects in policymaking, thereby informing our theoretical framework. We then present our data and the identification strategy. The following section presents the empirical results. The final section offers concluding remarks.

Related Literature and Theoretical Considerations

This article contributes to the expanding literature on gender differences in policymaking with a particular focus on substantive representation.[2] Here, we first highlight the empirical literature on gender differences in politics at large. We then motivate our quantitative analysis with theoretical considerations.

Pronounced gender differences in policymaking have been found in developing countries (see Beaman et al. 2012; Chattopadhyay and Duflo 2004; Clots-Figueras 2011). The results suggest that female politicians engage more heavily in early education, healthcare, and redistributive land reforms than male politicians. Chauvin and Tricaud (2024) show that measures taken in response to the COVID-19 crisis differ between male and female mayors in Brazil. Funk and Philips (2019) highlight that female Brazilian mayors allocate higher proportions of their budgets to education, healthcare, and social welfare. Bhalotra et al. (2023) show that female politicians are more likely to prioritize maternal mortality-reduction policies than male politicians across 22 developing countries.

Studies focusing on Western democracies have found mixed results regarding gender differences in policymaking (for overviews, see Hessami and da Fonseca 2020; O'Brien and Piscopo 2019). Baskaran and Hessami (2023) find that municipalities in the German state of Bavaria with female winners in close mixed-gender local council elections provide more childcare. Lippmann (2022) suggests that female parliamentarians in France engage in different topics than men. For Italy, Casarico, Lattanzio, and Profeta (2022) find no significant differences in the policies implemented by municipalities run by male or female mayors. According to Carozzi and Gago (2023), female-led Spanish local governments are not more supportive of gender-sensitive policies such as long-term-care support, pre-schooling, or work- and family-life balancing services. If there are differences in policymaking between male and female politicians, they usually remain within the broad subfield of social and redistribution policies

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[2]For an overview on the link between descriptive and substantive representation of women see Wängnerud (2009).

(see Cunial 2021; Dutta and Maus 2021; Hessami and da Fonseca 2020; O'Brien and Piscopo 2019). Lloren (2015) suggests that a legislator's gender matters for voting patterns in Switzerland, with female legislators showing stronger support for policy proposals that promote feminist interests compared to their male counterparts. Analyzing a similar setting for the Swiss national parliament, Stadelmann, Portmann, and Eichenberger (2014) find no evidence that gender influences the representation of median voter preferences. Both contributions highlight the central role of party affiliation.

Gender differences in substantive representation presuppose gender differences in the preferences of female and male voters. Indeed, the literature finds that there are differences in policy preferences between female and male voters (see Edlund and Pande 2002; Funk and Gathmann 2015; Giger 2009). Women tend to lean more towards left-wing ideologies and are generally more supportive of welfare policies compared to men. We contribute to the literature on substantive representation, which studies the act of elected representatives actively pursuing the interests of the people they formally represent (for conceptualizations of representation, see, for example, Pitkin 1967; Powell Jr 2004).

Differences in the substantive representation of women's preferences by female and male politicians may be expected according to social identity theory (see, for example, Huddy 2001). Lived experiences and perspectives may shape politicians' behaviour and affect the representation of women, such that female politicians might be seen as best capable of representing women's preferences (Phillips 1995). Sharing the same descriptive characteristics may increase the probability of having similar backgrounds and experiences, reducing information asymmetries, making decisions more credible, and thus facilitating substantive representation (Mansbridge 1999; Preuhs 2006). Several studies support the idea that women's descriptive representation can correlate with their substantive representation (see, among others, Campbell, Childs, and Lovenduski 2010; Chattopadhyay and Duflo 2004; Hornset and de Soysa 2022; Reingold and Smith 2012).

By contrast, in political economy models of electoral competition with equally politically powerful male and female voters and perfect competition, there is, a priori, no reason why politicians would be in any way differently responsive to citizens of either gender. This holds true if politicians behave according to Downs' (1957) model of political competition as it holds for citizen-candidates models with perfect competition (see Besley and Coate 1997; Osborne and Slivinski 1996). However, citizen candidates of either gender could potentially focus on the representation of gender-specific preferences. The debate on whether politicians behave according to Downs' view or the citizen-candidate model can be linked to the broader question of whether politicians are more or less responsive to voters' preferences; that is, whether the electoral connection theory has a relevant explanatory power (Crespin 2010; Hillman 2012; Stratmann 2000) or less so (Hix and Marsh 2007; Poole and Daniels 1985; Skaperdas and Grofman 1995). If electoral competition is imperfect or information asymmetries exist, female politicians may be able to represent women's preferences better than their male counterparts due to shared interests or similar preferences. Thus, it is essentially an empirical question of whether women represent female voters differently than male politicians.

Independently of the precise underlying theoretical view or model of electoral competition, it is well documented empirically that representatives deviate significantly from the preferences of the electorate (see Ansolabehere and Jones 2010; Gerber and Lewis 2004; Kärnä and Öhberg 2023; Levitt 1996; Portmann, Stadelmann, and Eichenberger 2012; Stadelmann, Portmann, and Eichenberger 2013; Stadelmann, Portmann, and Eichenberger 2019). As electoral competition is rarely perfect, politicians' social identity may matter for representation: they may follow their own ideology; they may give more weight to particular voters or groups of voters, which are better informed about politics; turn out more often; and spend more resources, including financial resources, to influence policy (see Balles, Matter, and Stutzer 2024; Dash, Ferris, and Voia 2023;

Dolan 2011; Grossman and Helpman 2001; Lupu and Warner 2022; Matsubayashi and Sakaiya 2021; Stratmann 1992). Thus, as male and female voters differ in their preferences, politicians may pander differently to voters of either sex. This, in turn, may lead to differences in the substantive representation of men and women by male and female politicians, making differences in substantive representation a relevant empirical question.

Our main contribution to the existing literature is to introduce and analyze a new measure for substantive representation of female voters by female and male politicians. Thereby, we add to the literature on the empirical linkage between voters and legislators, which focuses either on responsiveness or congruence (see Arnold and Franklin 2012; Beyer and Hänni 2018; Ferland 2020; Ferland 2021; Lax and Phillips 2012). Regarding measures for substantive representation, most studies have worked with proxies to investigate differences in policymaking and citizens' preferences. For example, they study policy priorities (Gottlieb, Grossman, and Robinson 2018; Koop and Conrad 2021; Schwindt-Bayer 2006) or focus on politicians' attitudes (Gerber et al. 2010; Lovenduski and Norris 2003). The closer studies focus on actual political outcomes, the less evidence for differences in substantive representation tends to emerge (Stadelmann, Portmann, and Eichenberger 2019). Research finding differences in the substantive representation of female preferences usually assess the behaviour of politicians and voters using questionnaires (for example, Campbell, Childs, and Lovenduski 2010; Hornset and de Soysa 2022). We focus on actual policy decisions, and account for constituency preferences, party affiliations of politicians, and also party-specific preferences. In particular, party affiliation has been suggested to be more important for explaining political behaviour than gender (Lovenduski and Norris 2003; Stadelmann, Portmann, and Eichenberger 2019).

Ultimately, whether female politicians represent women in the electorate differently than male politicians depends on the extent to which the roles of social identity, shared preferences, and information asymmetries are constrained by party affiliation and electoral competition. These constraints are likely to differ depending on the subject that politicians and voters vote on. The literature suggests that differences in representation in democracies occur most commonly with social and other issues with divergent preferences between men and women. By contrast, it is less likely that female politicians are, on average, more responsive to women in the electorate when analyzing all policy areas jointly. Considering that we analyze revealed preferences on policy proposals decided in referenda with real-world consequences, we formulate the following hypotheses regarding differences in responsiveness between male and female legislators to female voters' preferences:

H1: Across all policy areas, there are no differences in responsiveness to female voters' preferences between female and male legislators.

H2: For social policy proposals, female legislators are more responsive to female voters' preferences than male legislators.

H3: For policy proposals with distinct differences between female and male voter preferences, female legislators are more responsive to female voters' preferences than male legislators.

Institutional Setting and Empirical Strategy

Institutional Setting and Data

Our measure of substantive representation contrasts decisions made by politicians with the preferences of the electorate and female preferences for the same policy proposals, with identical wording. In referenda, Swiss citizens vote on the laws and constitutional amendments adopted by parliament. This allows us to analyze how male and female politicians respond to citizens'

preferences regarding the same legislative proposals. Because the gender of voting citizens remains unknown, we rely on post-referendum surveys to measure female voters' preferences. The approach of measuring and comparing voter preferences and politicians' decisions sets this article apart from other research on political representation.[3]

We examine the final votes of politicians on legislative proposals during their time in office. Swiss Parliamentarians vote on laws, changes to laws, and constitutional amendments. Legislative proposals accepted by parliament do not necessarily turn into law. Citizens may demand a popular referendum on parliamentary decisions before laws are enacted by collecting 50,000 signatures within 100 days. A referendum is mandatory for any constitutional change. Citizens may propose constitutional amendments themselves through a federal initiative by collecting 100,000 signatures within 18 months (for details see Ahlfeldt et al., 2022; Bursztyn et al. 2023; Portmann, Stadelmann, and Eichenberger 2012; Stadelmann, Portmann, and Eichenberger 2019). Referenda reflect revealed preferences for real policies and their expected outcome as they permit constituents to rank them against the status quo (see Frey 1994; Portmann, Stadelmann, and Eichenberger 2012; Schneider, Pommerehne, and Frey 1981; Stadelmann, Portmann, and Eichenberger 2014; Stadelmann, Portmann, and Eichenberger 2019). We match data on referendum results for each constituency with its legislators' final votes in parliament on the same legislative proposal.

We analyze the voting behaviour of 700 members of the Swiss National Council, which is the lower house of parliament with 200 seats, from 1996 to 2022 and 123 members of the Swiss Council of States, which is the upper house of parliament with 46 seats, from 2007 to 2022.[4] During the period of analysis, 28.5 per cent of legislators were women, increasing from 21.9 per cent in 1996 to 39.4 per cent in 2022. This is a similar trend as in other democracies (Inter-Parliamentary Union 2024). Legislators are elected in twenty-six constituencies, which correspond to the Swiss cantons. Members of the National Council are elected by proportional representation and members of the Council of States by majority rule.

To identify female preferences in the electorate, we rely on representative post-referendum surveys. These surveys, commonly known as VOX analyses, are based on a sample of 1,000 to 3,000 citizens and are conducted after each referendum.[5] The data obtained from the post-referendum surveys cover all 234 referenda held during our period of analysis. The surveys are highly respected, their results are frequently and prominently discussed in the newspapers, and have been successfully used in the literature (see Ahlfeldt et al., 2022; Bello and Galasso 2021; Stutzer, Baltensperger, and Meier 2019). Survey respondents report their socioeconomic characteristics, including gender, as well as their voting record. We use the share of female respondents who reported having voted 'yes' on a referendum to identify female preferences in the electorate. Using the surveys, we can identify the stated preferences of women after referenda via their survey responses on the same legislative proposals that men and women in parliament decided on. Post-referendum surveys for referenda offer a significant advantage over other surveys used in the literature. Employing them, we can exclusively rely on information related to voting behaviour, which entails real political consequences. Voters receive comprehensive information about the consequences of each referendum before their vote. Surveys are designed and weighted

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[3]Swiss referendum data are increasingly being used successfully in the literature (see Ahlfeldt et al., 2022; Barceló 2019; Bursztyn et al. 2023; Frey and Schaltegger 2021; Funk and Gathmann 2015; Stadelmann, Portmann, and Eichenberger 2019).

[4]As serving members of parliament can be elected to the respective other Chamber during their political career, we observe fewer unique individuals than the sum of the observed members of the two Houses – 654 legislators served only in the Lower House, 77 only in the Upper House, and 46 in both Houses (for details on chamber-changing legislators, see Portmann, Stadelmann, and Eichenberger 2022).

[5]Until June 2016, VOX surveys were supervised by gfs.bern and the political science institutes of the Universities of Geneva, Bern, and Zurich. From 2016 to 2019, the project was carried out under the name VOTO by FORS (Swiss Centre of Expertise in the Social Sciences), the ZDA (Centre for Democracy Aarau), and the survey institute LINK. Since November 2020, the survey has been conducted online and in the form of paper questionnaires again by gfs.bern.
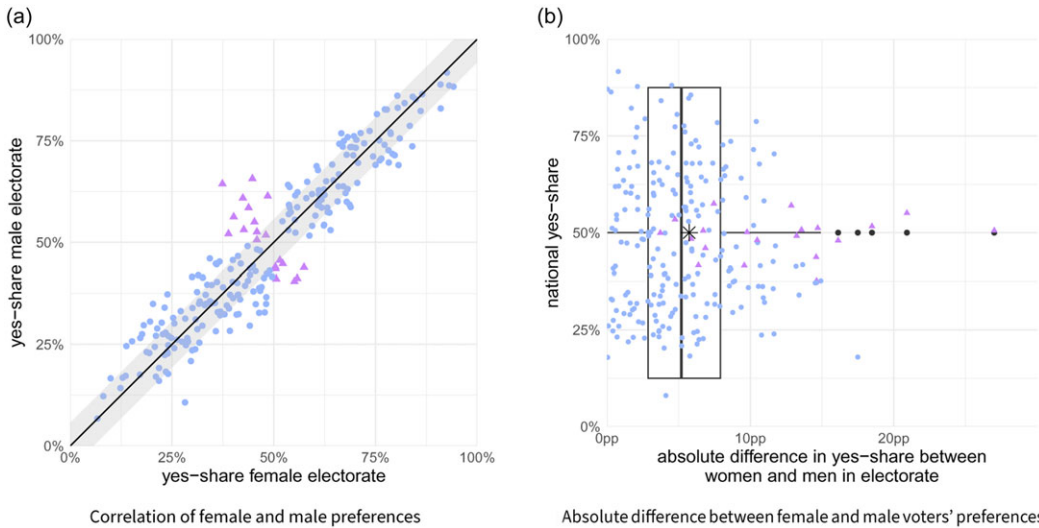
Figure 1. Differences between female and male voters' preferences.
Note: The left-hand graph shows the correlation between the share of 'yes' votes from female and male voters across all referenda. Triangles denote referenda with different majorities between men and women. Dots denote referenda in which the majority of women and men voted the same way. The grey reference band indicates a difference between female and male preferences of less than 5 percentage points. The right-hand graph shows the distribution of the absolute difference between female and male preferences for each referendum on the x-axis and the national share of 'yes' votes for each referendum on the y-axis.

to be representative of the Swiss population, and referendum results correspond to the sample analyzed in the survey. Responses to post-referendum VOX surveys can thus be seen as reliable indicators of policy preferences. As we know voters' preferences in all regional constituencies that elect legislators to the federal parliament as well as parties' voting recommendations, we can explore whether male and female politicians represent female voters to a different extent, given constituency and party preferences.

Figure 1a shows that female and male preferences are positively correlated. Legislative proposals that receive higher levels of support from women in a referendum usually receive higher levels of support from the male electorate. However, in the context of referendum decisions, quantitatively relevant differences between female and male preferences emerge as shown in Fig. 1b. It displays the share of 'yes' votes at the national level for all referenda on the y-axis and the distribution of the absolute difference in the share of stated 'yes' votes between female and male respondents for each referendum on the x-axis. A box plot based on the differences between female and male preferences is superimposed in Fig. 1b, highlighting relevant gender gaps. On average, female and male preferences differ by about 5.7 percentage points. This is a non-negligible difference for referenda. By comparison, the median of the mean absolute difference in the share of 'yes' votes across constituencies is 6.3 percentage points. Moreover, in 20 out of 234 referenda (8.5 per cent), the majority of female survey respondents reported having rejected (accepted) the policy proposal, whereas a majority of male survey respondents reported having accepted (rejected) the proposal, depicted as triangles in Fig. 1. Given our institutional setting, different majorities could imply a different outcome of the referendum if only women or only men had voted and is, therefore, an indicator for particularly divergent preferences. We thus observe relevant differences in preferences between men and women in the electorate in all policy areas. Table A2 in the Appendix provides summary statistics on our measure of male and female voter preferences per referendum.

Our data exhibits important advantages when compared to the existing literature. By considering voting behaviour in referenda, we observe constituents' revealed policy preferences. In

a parliamentary democracy, politicians usually have to infer voters' policy preferences from experience or opinion polls when voting in parliament. Also in our setting, politicians in parliament have to make their decisions based on their inferences regarding voter preferences. The strength of our approach is that the true support for specific policies is revealed in the subsequent referendum, making preferences observable for the researcher *ex-post*. Thus, as politicians vote in parliament before their constituents (men or women) vote in referenda, they have to predict their constituents' preferences just as in any other instances when they have to represent constituents' preferences (see Brunner, Ross, and Washington 2013; Garrett 1999). This allows us to obtain some external validity of our setting because observed politicians cannot simply follow the revealed behaviour of their constituents. As in countries without referenda, politicians do not perfectly know what their constituency wants when they decide in parliament. Rather, they have to infer the preferences of their constituents based on, for example, experience, personal contacts, media responses, or surveys (see Brunner, Ross, and Washington 2013; Stadelmann, Portmann, and Eichenberger 2019).

Empirical Strategy for Analyzing Differences in Responsiveness

As discussed in the literature and theory section, there is evidence of gender differences in policymaking. However, it remains an empirical question whether female politicians pursue policies that are closer to the preferences of women in the electorate such that there are differences in substantive representation. To address this question, the preferences of male and female voters with respect to the policy decisions made by male and female legislators must be known. Studies analyzing gender differences in policymaking usually lack a direct measure of voter preferences. We contribute to closing this gap as we measure the preferences of female voters with respect to policy decisions made by male and female politicians in our sample. This allows us to directly investigate whether female politicians are more responsive to female preferences than male politicians.

In our institutional setting, constituents' preferences for legislative proposals are revealed in referenda. The preferences of women in the electorate can be identified through post-referendum surveys. Legislators are either male or female.[6] We compare whether male or female politicians respond more closely to female preferences. Thus, we can investigate how female preferences in the electorate affect the legislative choices of male and female politicians.

We use the decision of a legislator i on the legislative proposal which led to referendum r as our dependent variable. Because this is a binary measure, we run the following logit model:

$$\begin{aligned} MPYes_{i,r} = \Lambda(\alpha + \beta_1 Female_i + \beta_2 Female_i * FemalePreferences_r \\ + \beta_3 FemalePreferences_r + \beta_4 ConstituencyPreferences_{i,r} \\ + \beta_5 PartyYes_{i,r} + \gamma X_{i,r} + \phi_i + \eta_r + \psi_r) \end{aligned}$$

where $MPYes_{i,r}$ is an indicator equal to one if politician i votes 'yes' in parliament on the legislative proposal of referendum r. $Female_i$ is an indicator equal to one if politician i is a woman. $FemalePreferences_r$ is a continuous measure of female preferences in the electorate regarding referendum r. It represents the stated preferences of women in the post-referendum survey, measured as the share of female respondents who reported having voted 'yes' on referendum r.

β_2 is our main coefficient of interest. It captures whether female legislators are, *ceteris paribus*, more responsive to female preferences than male legislators. In other words, it captures whether female politicians represent female preferences differently than their male counterparts. Specifically, if women in the electorate become more supportive of the legislative proposal (that is, the variable $FemalePreferences_r$ increases), β_2 indicates whether the probability of female

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[6]All legislators during the period of analysis self-identified as either male or female.

politicians supporting the same legislative proposal increases differently compared to male politicians. Identification is based on different support levels across different referendum decisions. β_2 could be interpreted as causal in the sense that if the sex of politicians is exogenous and female voters prefer a proposal in the referendum to the status quo, the coefficient β_2 would causally identify whether male or female legislators vote 'yes' in parliament more often (see Nizalova and Murtazashvili 2016). Our framework specifically assesses the extent to which female politicians respond to the revealed preferences of women in the electorate, and thereby broadly corresponds to typical conceptualizations of responsiveness[7] in the literature. β_2 can also be interpreted as an indicator of differences in substantive representation that are associated with a politician's gender. If $\beta_2 = 0$, such differences in representation do not exist. Consequentially, gender is not a relevant indicator of differences in substantive representation. If $\beta_2 \neq 0$, differences exist between male and female politicians in the substantive representation of female preferences in the electorate.

To interpret β_2 as a measure of how female politicians respond specifically to the preferences of women, we must also account for the preferences of the constituency the politicians are supposed to represent. As Figure B1 in the Appendix shows, this is necessary because the preferences of women in the electorate correlate with the overall preferences of the electorate, given that they reflect the preferences of both female and male voters. Thus, omitting the preferences of the constituency would yield an estimate of β_2 that includes not only how female politicians respond to the preferences of women but also to those of the constituency, introducing a classical omitted variable bias. Therefore, we account for observed preferences of the constituency in Equation 1. *ConstituencyPreferences$_i$*, reflects the share of voters in politician i's constituency who voted 'yes' on referendum r. β_4 can therefore be interpreted as an indicator of how well politician i represented their constituents' preferences in referendum r. We expect $\beta_4 > 0$.

We measure female preferences using national post-referendum survey responses and control for the preferences of a politician's constituency, which are the respective cantons. Thus, our measure of female preferences may pick up systematic differences between national and cantonal voting results. We assume that, if women are more supportive of a referendum at the national level, the same will be true at the constituency level. Thus, *FemalePreferences$_r$* represents a measure of female support for referenda not only at the national level but also within a constituency. Robustness tests using the overall national preferences of male and female voters, instead of the preferences of a constituency as a control variable, show that our results do not depend on the level at which the preferences of voters are measured (see Tables A3, A4 in the Appendix).

Another potential confounding factor that could affect our interpretations, if not adequately considered, is the influence of party voting recommendations (party lines). For Switzerland, in line with international evidence, it has been shown that female politicians are more likely to sort themselves into left-wing parties and female voters are more likely to support left-wing policies (Stadelmann, Portmann, and Eichenberger 2014). Thus, we introduce *PartyYes$_{i,r}$*, which is an indicator equal to one if politician i's party recommended voting 'yes' on the legislative proposal of referendum r. By including *PartyYes$_{i,r}$*, β_2 reflects whether female politicians are more responsive to female preferences while taking into account parties' preferences. Thus, β_5 can be seen as an indicator of how well politicians respond to their party. Legislators in Switzerland are not obliged to vote according to their party's recommendation. The Federal Constitution states that they vote without any directives. Nevertheless, parties are a highly relevant principal for politicians. Therefore, we expect that politicians tend to vote with their party ($\beta_5 > 0$).

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[7]Broad conceptualizations of responsiveness include, for example, 'reflecting and giving expression to the will of the people' (Pennock 1952, 790), 'acting upon them [views, needs, and preferences of one's constituents] in some way that goes beyond mere formal acknowledgment or superficial attention' (Pitkin 1967, 158), or 'when the democratic process induces the government to form and implement policies that the citizens want' (Powell Jr 2004, 91).

Female preferences and the constituents' preferences as well as party recommendations are likely to be partly linearly dependent. It is possible that party preferences are endogenous to voter preferences (that is, the two are correlated) and that both variables are endogenous to female preferences too. Thus, controlling for constituents' preferences and party recommendations allows us to interpret our coefficient of interest as a pure indicator of how politicians respond to female preferences. Consequentially, β_2 captures differences in responsiveness to female preferences independently of how politicians respond to constituency and party recommendations. Thus, our interpretations are *ceteris paribus* for constituents' preferences and party preferences.

Finally, other covariates, such as personal characteristics, party affiliations, constituency, referendum type, and legislative periods, may be associated with legislative voting. $X_{i,r}$ captures individual characteristics (age, education level, service length, party affiliation, and electoral rule) of legislator i at the time when the parliamentary vote is held. Φ_i denote constituency fixed effects, η_r denote referendum-type-fixed effects, and ψ_r denote legislative period fixed effects. Table A1 in the Appendix provides descriptive statistics for the relevant variables.

Empirical Analysis
Results for all Policy Areas
We estimate Equation 1 for the entire dataset of 47,527 decisions from 1996 to 2022. Table 1 shows the results.

Specification (1) presents logit estimates for the coefficient β_2 of the interaction term of interest, $Female_i \times FemalePreferences_r$, and the two corresponding base effects without any controls. β_2 is positive and statistically different from zero. However, specification (1) omits that political decision-making does not depend solely on the gender of the politician and the preferences of women in the electorate. Plausibly, the legislators' decisions are also driven by the preferences of the constituency, made up of female and male citizens and the voting recommendation of their parties, as outlined above.

In specification (2), we additionally control for the preferences of a politician's constituency. We do so by accounting for the share of 'yes' votes among male and female citizens in the respective constituency in a referendum decision. Doing so ensures that any potential differences in the substantive representation of female voters between female and male politicians captured by the interaction term $Female_i \times FemalePreferences_r$ are not driven by the preferences of a constituency. As expected, we find a positive and statistically significant effect of constituency preferences on politicians' decisions ($\beta_4 > 0$). Thus, the probability of a politician voting 'yes' increases with the share of voters in their constituency voting 'yes'.[8] Our main coefficient of interest, β_2, remains positive and statistically significant, meaning that, independently of constituency preferences, female legislators respond differently to higher support of women in the electorate for a legislative proposal than male legislators. However, specification (2) still omits the general correlation between women and parties' preferences.

Separately controlling for party voting recommendations, reflected by $PartyYes_{i,r}$, but excluding constituency preferences in specification (3), shows a positive and statistically significant effect for party voting recommendations on politicians' decisions ($\beta_5 > 0$). Thus, the probability of a politician voting 'yes' is higher if his or her party recommends a 'yes' vote. Once we control for party preferences, the coefficient β_2 drops considerably and approaches zero. Thus, we no longer observe a statistically significant effect for differences in substantive representation between male and female politicians.

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[8]Note that the variable *FemalePreferences* turns negative when adding *ConstituencyPreferences* to the estimation. This is due to the correlation between these variables.

Table 1. Effect of female voters' preferences on decisions by female and male legislators

	1	2	3	4	5	6
(Female) × (Female preferences)	0.859***	0.838***	0.235	0.087	0.083	0.242
	(0.287)	(0.298)	(0.341)	(0.341)	(0.343)	(0.330)
Female	−0.218	−0.224	−0.056	−0.029	−0.010	−0.033
	(0.133)	(0.137)	(0.150)	(0.149)	(0.151)	(0.145)
Female preferences	3.620***	−0.323	2.301***	−1.099***	−1.109***	−1.702***
	(0.150)	(0.398)	(0.165)	(0.276)	(0.275)	(0.292)
Constituency preferences		5.173***		4.514***	4.530***	3.099***
		(0.452)		(0.304)	(0.304)	(0.349)
Party yes			4.785***	4.755***	4.764***	4.805***
			(0.060)	(0.064)	(0.064)	(0.072)
Discrete effect of Female Preferences						
Difference for female/male legislators	0.0186***	0.0208***	0.0039	0.0008	0.0006	0.0065
	(0.0068)	(0.0074)	(0.0045)	(0.0034)	(0.0036)	(0.0079)
Personal characteristics controls					✓	✓
Canton fixed effects						✓
Legislative period fixed effects						✓
Referendum type fixed effects						✓
Pseudo R^2	0.094	0.129	0.604	0.614	0.614	0.630
Observations	47,527	47,527	47,527	47,527	47,527	47,527

Note: Dependent variable is *MPYes*. The discrete effect of *FemalePreferences* is estimated for an increase in *FemalePreferences* from 45 per cent to 55 per cent while all other variables are held at their median values. Robust standard errors in parentheses are clustered at the MP level. Logistic models are estimated. ***$p < 0.01$; **$p < 0.05$; *$p < 0.1$.

In specification (4) we control for both the preferences of a legislator's constituency and their party. Both positively affect legislators' decisions, as the statistically significant coefficients on *ConstituencyPreferences$_{i,r}$* and *PartyYes$_{i,r}$* show. Female legislators do not vote more in line with female preferences than male legislators, as evidenced by the insignificant coefficient β_2 of the interaction term. Thus, once again, we find no support for female legislators responding more closely to female preferences in parliamentary decisions than male legislators.

In specification (5) we control for legislators' personal characteristics (that is, age, age squared, service length, service length squared, having a master's degree or a doctorate, being affiliated to either left or right parties, and the electoral rule). Again, the interaction term of interest remains insignificant. Similarly, there is no effect on the interaction term after controlling for district, referendum type, and legislative period fixed effects in specification (6). The interaction term always remains statistically insignificant and close to zero. The results are thus in line with H1.

To interpret the quantitative relevance of female politicians' responsiveness to female preferences, we report the difference in the discrete effects of the variable *FemalePreferences$_r$* between female and male legislators in Table 1. Discrete effects represent the change in the probability of a politician voting 'yes' if the share of 'yes' votes among women in the electorate increases from 45 to 55 per cent while all other variables are held at their median values. Figure 2 presents how female and male legislators respond to an increase in the level of support of women in the electorate from 45 to 55 per cent for each of the models estimated in Table 1. When not controlling for party recommendations, female politicians are more responsive to female preferences, particularly when not accounting for constituency preferences. Once party recommendations are added and a full set of controls is estimated, there is no differential responsiveness to female preferences between female and male politicians.

Our results are consistent for various specification tests. As seen in Table A3 and the Appendix, we obtain the same results when we control for voters' preferences at the national level measured as the share of 'yes' votes in the entire national electorate, instead of constituents' preferences. Thereby, we rule out the possibility that systematic deviations in the differences between female
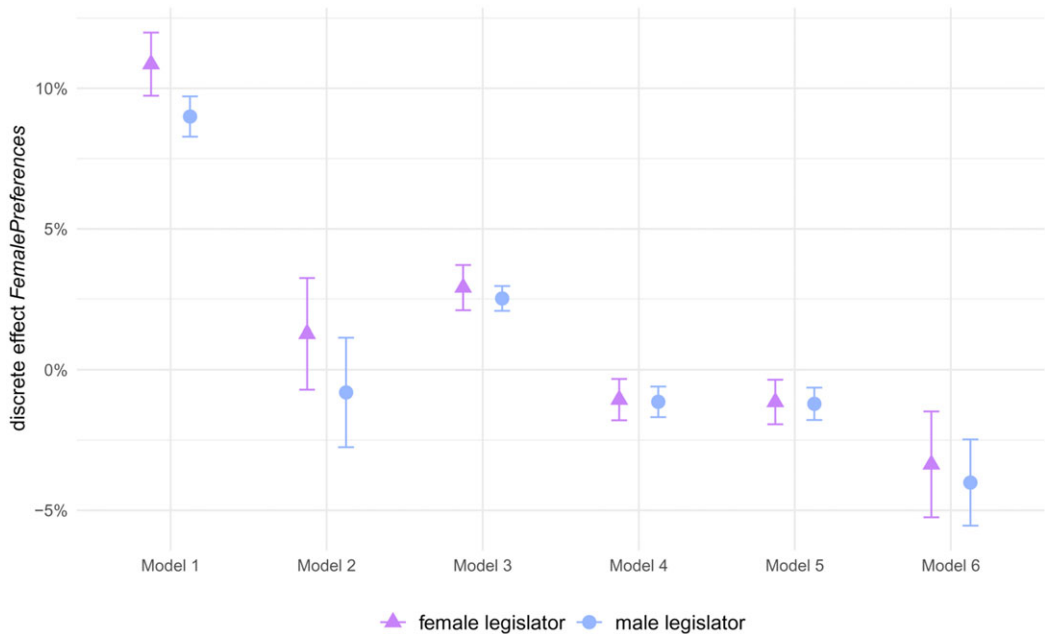
Figure 2. Discrete effect of an increase in female voters' preferences on female and male legislators' decisions.
Note: Discrete effect of an increase in *FemalePreferences* from 45 per cent to 55 per cent while holding all other variables at their median values and 95 per cent confidence intervals are estimated for female (*Female* = 1) and male (*Female* = 0) legislators for models (1) to (6) in Table 1. Confidence bands are based on robust standard errors clustered at the MP level.

and male preferences at the cantonal level from the national level drive our results. Table A4 in the Appendix shows that we also obtain the same results when controlling for voter preferences measured by post-referendum surveys.[9]

There is evidence that women in Switzerland turn out less than men (see Goldberg and Sciarini 2023; Gschwendt 2015). Note that this would make both male and female politicians less responsive to women's preferences. As this article is about differences in female representation between male and female politicians, gender-specific turnout rates do not bias our results.[10]

To summarize, the coefficient of the interaction term between being a female legislator and female preferences is statistically significant and positive when not controlling for party recommendations. Once party preferences are added, female politicians do not represent female preferences differently than their male counterparts. According to this finding, increasing descriptive representation of women does not automatically guarantee substantive representation of their preferences.

Results for Social and Gender Distinctive Policies

The literature provides evidence that female politicians tend to be more focused on redistribution than male politicians. This potentially leads to different provision of public goods and social policies when the number of female politicians increases (see Chattopadhyay and Duflo 2004; Cunial 2021; Dutta and Maus 2021; Hessami and da Fonseca 2020; O'Brien and Piscopo 2019). If female politicians decide differently on social policy issues and if female voters' preferences follow the same pattern, there should be differences in the responsiveness of female and male legislators

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[9]Even when controlling jointly for national preferences and constituency preferences, we do not observe any change in the interaction term. It remains statistically insignificant and close to zero.

[10]When applying weights for overall turnout, turnout for men or turnout for women, our main interpretations remain.

to female voters' preferences. We, therefore, examine differences in substantive representation of women's preferences by male and female politicians, focusing on legislative proposals on social policy issues.

To classify referenda by topic, we rely on the categorization of Année Politique Suisse, a platform hosted by the Institute for Political Science at the University of Bern. They assign each referendum up to three out of twelve topic areas, which are defined by the Federal Statistical Office, with 'Social Policy' being one of them (Swissvotes 2023). We introduce an indicator variable equal to one if the referendum is assigned to 'Social Policy'. Social policies represent one of the most important and thus most frequently voted-on topics. 102 of all 234 referenda observed are classified as being related to social policy.[11]

To test H2, we restrict our dataset to legislative proposals on social policies. The results of this exercise are presented in Table 2, specification (1). In specification (2), we exclude decisions on social policies and focus on all other legislative proposals. To make use of our entire dataset, we introduce a triple-interaction term between the three variables $Female_i$, $FemalePreferences_r$, and $SocialPolicy_r$ in specification (3). This triple interaction captures the difference in the effect of whether female legislators respond more (less) closely to female preferences than male legislators for social policies, as compared to all other legislative proposals. We always estimate the most conservative specification, including constituency preferences, party recommendations, controls for politicians' individual characteristics, and our array of fixed effects. Thus, we estimate the same model as in specification (6) in Table 1 but restrict the dataset in specifications (1) and (2), and introduce a further interaction term in specification (3), respectively. Estimating a less conservative setting yields similar results and interpretations.

In contrast to Table 1, which concerns all policies, the results in Table 2 reveal that substantive representation of female preferences in the electorate differs between male and female legislators for social policies. Consistent with H2, the coefficient of interest for $Female_i \times FemalePreferences_r$ is positive and statistically significant when estimating our model using decisions on only social policies in specification (1). We find differences in substantive representation of female preferences using our most conservative model, which controls for constituent and party preferences as well as constituency, legislative period, and referendum-type-fixed effects. This suggests that female politicians respond more closely to female preferences in the electorate regarding social issues. While the literature suggests that female politicians are often more redistribution-oriented, our results show that with such behaviour female legislators respond to the preferences of their female electorate. To interpret the quantitative relevance of female politicians' responsiveness to female preferences, we report differences in the discrete effects of the variable $FemalePreferences_r$ between female and male legislators as before.

Looking at the difference in the discrete effect between female and male legislators shows that female legislators are 2.29 percentage points more likely to vote 'yes' than their male counterparts if support for a referendum within the female electorate increases by 10 percentage points. To put this in perspective, a 10 percentage point increase in support for a referendum among the entire constituency increases the probability of a politician voting 'yes' by 6.2 percentage points. Thus, the difference in the responsiveness between female and male politicians to female preferences concerning social policies corresponds to about 37 per cent of the responsiveness of both male and female politicians to the preferences of their constituency.

Given that female politicians respond to female preferences mainly when social policy issues are at stake, we should observe that, for other policy areas, female politicians do not respond more closely to female preferences in the electorate than male politicians. This is precisely what we observe in specification (2) for decisions on non-social policies. We do not observe any statistically significant differences in substantive representation between male and female politicians when we

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[11]Next to social policy issues, politicians also decide on topics such as the organization of government in general, foreign policy, and security issues.

Table 2. Effect of female voters' preferences on decisions by female and male legislators – social and gender-specific policies

	A: Social policies			B: Divergent gender preferences	
	1	2	3	4	5
(Female)×(Female preferences)	0.918***	−0.340	−0.271	14.332***	0.157
	(0.304)	(0.358)	(0.347)	(4.289)	(0.280)
Female	−0.303**	0.204	0.142	−6.599***	0.003
	(0.131)	(0.159)	(0.147)	(2.086)	(0.114)
Female preferences	−2.570***	−1.321***	−1.300***	−15.965***	−1.845***
	(0.437)	(0.456)	(0.448)	(3.547)	(0.377)
Constituency preferences	2.812***	4.470***	3.099***	3.518***	3.127***
	(0.760)	(0.550)	(0.559)	(1.324)	(0.510)
Party yes	4.808***	4.916***	4.808***	8.056***	4.651***
	(0.137)	(0.068)	(0.073)	(0.336)	(0.076)
(Female)×(Female preferences)×(Social policy)			1.104***		
			(0.331)		
Social policy			−0.271		
			(0.347)		
(Female)×(Social policy)			−0.369**		
			(0.155)		
(Female preferences)×(Social policy)			−0.849***		
			(0.318)		
Discrete effect of FemalePreferences					
Difference for female/male legislators	0.0229**	−0.0071		0.1990	0.0044
	(0.0090)	(0.0089)		(0.365)	(0.0080)
Personal characteristics controls	✓	✓	✓	✓	✓
Canton fixed effects	✓	✓	✓	✓	✓
Legislative period fixed effects	✓	✓	✓	✓	✓
Referendum type fixed effects	✓	✓	✓	✓	✓
Sample	Social policies	Non-social policies	Full	Divergent gender preferences	Similar gender preferences
Pseudo R^2	0.622	0.645	0.630	0.839	0.617
Observations	20,509	27,018	47,527	4,337	43,190

Note: The dependent variable is *MPYes*. The dataset in specification (1) is limited to social policy referenda, that is, *SocialPolicy$_r$* = 1. The dataset is limited to non-social policies, that is, *SocialPolicy$_r$* = 0, in specification (2). In specification (4) the dataset is limited to referenda in which the majority of female and male survey respondents did not report the same voting record. In specification (5) the dataset is limited to referenda in which the majority of female and male survey respondents reported the same voting record. The discrete effect of *FemalePreferences* is estimated for an increase in *FemalePreferences* from 45 per cent to 55 per cent while all other variables are held at their median values. Robust standard errors in parentheses are clustered at the MP level. Logistic models are estimated. ***$p < 0.01$; **$p < 0.05$; *$p < 0.1$.

consider issues unrelated to social policies. The coefficient β_2 of the interaction term *Female$_i$×FemalePreferences$_r$* is even negative but not statistically significant. Thus, outside the social policy domain, there are no statistically relevant differences in substantive representation of female preferences between male and female politicians.

These findings are further supported by the empirical approach used in specification (3). If women are more responsive to female preferences in the electorate only regarding social policy issues, the coefficient of the triple-interaction term *Female$_i$×FemalePreferences$_r$×SocialPolicy$_r$* should be positive and significant, whereas the coefficient of the interaction term *Female$_i$×FemalePreferences$_r$* should be non-significant because in this setting the coefficient for *Female$_i$×FemalePreferences$_r$* represents substantive representation of female preferences by female politicians for non-social policies. As can be seen in specification (3), this is what we observe. Female politicians are more responsive to female preferences than male politicians with respect to social policies, but not in other policy areas.

The results show that although increasing the number of female politicians in parliament is unlikely to change the substantive representation of female preferences overall, a different picture

emerges for legislative decisions on social issues. There is a significant differential effect between male and female politicians with respect to the representation of female preferences on social policies. We observe that female politicians respond more closely to female preferences than their male counterparts in parliament on these issues. Regarding non-social policies affecting female preferences, we do not observe that women in parliament represent female preferences better than male politicians.

Our data allow us to perform an even more detailed analysis based on differences in preferences of men and women in the electorate. The substantive representation of female preferences may differ for policy issues for which the preferences of men and women in the electorate are particularly different. To test H3, we limit our dataset to referenda in which the majority of female survey respondents reported a different voting record than the majority of male survey respondents; for example, 55 per cent of women reported having voted 'yes' and 45 per cent of men reported having voted 'yes'. Different majorities were observed for twenty referenda. In line with H3, the results in specification (4) reveal that substantive representation of female preferences in the electorate differs between male and female legislators when the majority preferences of men and women in the electorate are different.[12] Specification (5) shows that in the remaining referenda, responsiveness to female preferences does not differ between male and female legislators.

Heterogeneity and Robustness

So far, our results have shown that there are no differences in the substantive representation of female preferences between male and female politicians on average. However, differences emerge in the domain of social policies and policies with strongly diverging gender preferences. We now explore potential channels of heterogeneity with respect to the substantive representation of female preferences on social issues. In particular, we focus on the socialization of the politicians and potential links to social identity theory, as well as incentives and constraints according to theories of electoral competition. We capture heterogeneity in terms of politicians' socialization by focusing on politicians' age and the political incentives and constraints to which they are exposed by focusing on the historical role of women in their constituencies' politics, the share of women in their party, and the electoral rule.

We restrict the analysis to the sample of legislative decisions on social policies as we only observe differences in the substantive representation of female preferences within this subfield.[13] We perform subsample estimates as outlined in Equation 1, defined by the variables mentioned above. We use the most conservative logit specification, including constituency preferences, party recommendations, personal characteristics control variables, referendum type, legislative period, and canton fixed effects. Figure 3 displays the logit estimate for the coefficient β_2 of the interaction term $Female_i \times FemalePreferences_r$ when considering social policies only for the above-mentioned split subsamples. The results for policies outside the domain of social policy are presented in Figure B2 in the Appendix for completeness. We obtain qualitatively identical results when performing a three-way interaction instead of a subsample analysis, as can be seen in Table A7 in the Appendix.

Politicians' socialization, which can be defined as how individuals learn and internalize the values, roles, beliefs, norms, and behaviours of their society, may affect how politicians respond to female preferences. The public role of women has changed considerably over time. This is reflected in the differential evolution of labour market participation (see Giudici and Schumacher 2017; Goldin 2006), education choices (see Becker and Zangger 2013; Federal Statistical Office

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[12]It should be noted that this analysis is based on a sample of only 4,337 decisions.

[13]Examining the referenda with different preferences of the majority of men and women in more detail is not possible due to the limited number of observations.
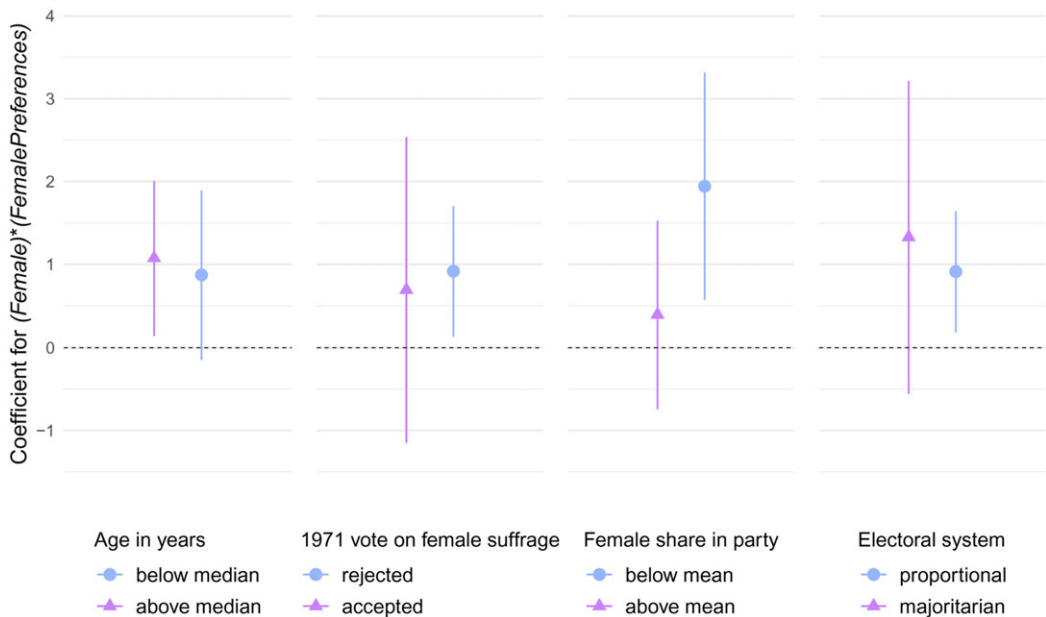
Figure 3. Heterogeneity for social policy issues.

Note: Coefficient β_2 of the interaction term *Female$_i$*FemalePreferences$_r$* and 95 per cent confidence intervals for referred subsets are displayed. The dataset is restricted to social policies. The median age is 54 years. MPs elected by majority vote include all members of the Council of States and all members of the National Council from single-seat constituencies. Median share of women per party is 26.02 per cent. Coefficients for the entire model can be found in Table A5 in the Appendix. Confidence bands are based on robust standard errors clustered at the MP level.

2023), and political participation (see Kostelka, Blais, and Gidengil 2019) between men and women. How male and female politicians have internalized the role of women might, therefore, depend on their age. Younger politicians were socialized at a time when the issue of gender equality was already widely recognized and discussed. Young male politicians might show equal understanding and thus equal responsiveness as female politicians to women's preferences. By contrast, older male politicians grew up in a time of greater gender inequality. The leftmost graph in Figure 3 displays the coefficient β_2 of the interaction term *Female$_i$* $\times$ *FemalePreferences$_r$* and the 95 per cent confidence intervals for legislators who are older, or younger than the median age of all members of parliament. As indicated by the overlapping confidence intervals, there are no differences in the substantive representation of female preferences between male and female politicians of different ages. Thus, there is no differential effect of representation of female preferences with respect to politicians' age.

In Switzerland, female suffrage was introduced at the national level in 1971 by a referendum, allowing us to explore how responsiveness might depend on more conservative versus more progressive role models. While a national majority of male voters supported the referendum, it did not win a majority in all constituencies. In nine of the twenty-six constituencies, a majority of male voters rejected the right to grant women suffrage at the national level. The conservative attitude toward women expressed by the male electorate in these cantons in the past might still be reflected in the political landscape of these cantons today, shaping women's life choices, role models in general, and thus their involvement in politics (Slotwinski and Stutzer 2022). Voter groups with greater involvement in politics are substantively better represented through various channels, such as better information exchange, larger campaign contributions, and higher voter turnout (see Grossman and Helpman 2001). We distinguish between constituencies depending on the involvement of female voters and issues by dividing them based on whether they accepted or

rejected the referendum on female suffrage in 1971. One hypothesis is that today's female legislators from cantons, which rejected women's suffrage, pay particular attention to the preferences of women in the electorate because they see themselves as advocates against conservative norms. However, it could also be argued that female politicians from cantons with a particularly strong influence of male voters may be under even more pressure to cater to the preferences of male voters and, therefore, not to those of female voters. We capture different incentives to respond to female preferences by considering subsets depending on the cantonal result in the vote on female suffrage in 1971 in the second graph in Figure 3. The results show that there are no differences in the substantive representation of female preferences between male and female legislators from cantons that accepted or rejected women's suffrage in 1971. Only the coefficient for politicians from cantons accepting female suffrage is statistically significantly different from zero. Still, the confidence intervals overlap such that we cannot claim a statistically significant difference regarding the point estimates.

Next, we turn our attention to political incentives and constraints that may encourage or prevent politicians from closely adhering to the preferences of specific voter groups, such as women. The incentive to address female preferences in particular may arise when only a few party members focus on female voter's preferences. This might be the case in parties with a low percentage of women. Women from these parties may have an incentive to specialize on women's preferences and, thus, may represent female preferences more closely than male politicians. We split our sample into politicians from parties in which the share of women is above (below) the median share of women across all parties. The coefficients in the third graph of Fig. 3 support our expectations. There are differences in the substantive representation of female preferences but only among male and female politicians from parties with a small share of women. Women in parties with relatively larger shares of female politicians do not represent women in the electorate substantively differently than male politicians from such parties. But again, the confidence intervals overlap such that we cannot claim a statistically significant difference regarding the point estimates.

The electoral system may be important for the heterogeneity of politicians' responsiveness to voters in general and female voters in particular (see Budge 2012; Carey 2007; Golder and Stramski 2010; Grofman 2004; Portmann, Stadelmann, and Eichenberger 2012; Stadelmann, Portmann, and Eichenberger 2019). In majority elections, centripetal forces drive politicians toward the position of the median voter. Conversely, in proportional elections, politicians can deviate more widely from the median voter and thus be more responsive to specific groups of voters, such as women. Therefore, whenever differences in the substantive representation of female preferences by male and female politicians occur, we expect them to be limited to politicians elected by proportional rule. The rightmost graph in Fig. 3 shows that only the point estimate for politicians appointed via proportional representation is positive and statistically significantly different from zero. Thus, as expected, differences in the substantive representation of female preferences are limited to politicians elected by proportional rule.

Finally, as an alternative to analysing responsiveness to female preferences, and for robustness purposes, we investigate the level of congruence between male and female politicians with female voters. There is an extended discussion in the literature on the differences between responsiveness and congruence (see Arnold and Franklin 2012; Beyer and Hänni 2018; Ferland 2020; Ferland 2021; Lax and Phillips 2012). While both approaches link voters' and legislators' positions, congruence in our setting simply reflects the level of agreement of a politician with the majority of the (female) electorate. Given our institutional setting, in which the majority decision is implemented, congruence is a relevant measure (see Kläy et al. 2024a). It is theoretically possible that women in politics are more congruent with women in the electorate, even though they are not more responsive to female preferences. This is because congruence indicates whether decisions by female legislators mirror the majority of female preferences while responsiveness captures how female legislators, *ceteris paribus*, respond to differences in the level of support. Thus, we explore

this possibility as a robustness check in Table A8 in the Appendix. We estimate the probability that a politician votes with the majority of women in the electorate (that is, whether $MPVote_{i,r} = FemaleMajorityPreferences_r$). If there are no differences in congruence with the female electorate between male and female legislators, an indicator of the legislators' gender, $Female_i$, which we use as our explanatory variable, should not be statistically significantly different from zero. Results in Table A8 reveal that the overall congruence of female politicians with female voters is not higher than the congruence of male politicians with female voters when all policy areas are considered. This is also the case when accounting for party preferences. Put differently, male and female politicians are equally congruent with female voters. When we only consider social and redistributive referenda or referenda with large differences in the preferences of male and female voters, we observe differences in the congruence of male and female politicians with female voters. We observe that female politicians have higher congruence levels than male politicians. However, the differences become statistically insignificant when accounting for party preferences.

Conclusions

Women are underrepresented in parliaments around the world compared to their share of the population. Although there is evidence that men and women in the electorate may have different policy preferences (Edlund and Pande 2002; Funk and Gathmann 2015), underrepresentation in terms of numbers does not necessarily imply underrepresentation of preferences. In other words, descriptive underrepresentation is not equivalent to substantive underrepresentation.

We exploit the informative institutional setting in Switzerland, which allows us to identify the preferences of female voters in the electorate for various policy proposals, observe the behaviour of male and female legislators concerning the very same policy proposals, while controlling for the revealed preferences of legislators' constituencies and parties for these policy proposals, at the same time. Thus, we identify whether female politicians respond more closely to female preferences than their male counterparts. Studying representation using preference measures for the very same policy proposals sets our study apart from the previous literature.

Our results show that there is no statistically significant difference in the substantive representation of female preferences by male and female politicians, across all policy areas. This non-existent difference between male and female legislators in the representation of female preferences is robust, in particular when conditioning on constituency and party preferences of legislators, personal characteristics, party group affiliations and district, referendum type, and legislative period fixed effects. Thus, increasing the number of female politicians does not necessarily lead to a greater responsiveness to female preferences in the electorate on average.

However, differences in substantive representation are present and statistically relevant for social policy issues. Female politicians respond more closely to female preferences in the domain of social policy. As previous literature suggested, women's behaviour in politics is different from that of men in the realm of social policy. Our results provide direct evidence that these differences emerge as female politicians respond more closely to female voters' preferences regarding social policy independently of party preferences and the preferences of their constituency. We conclude that increasing the number of female politicians may induce changes regarding the representation of female preferences in the electorate concerning social policies. Outside the domain of social policy, changes in descriptive representation are less likely to result in improvements in substantive representation.

After performing multiple subsample estimations, we conclude that, for social policies, these effects are specific to gender and do not vary based on politicians' socialization, their incentives to respond to female preferences, or constraints preventing them from doing so.

Our findings also add to the discussion on the representation of women in politics and how it can be achieved. A mere increase in the number of women in parliament (for example, through

female quotas[14]) is unlikely to improve the substantive representation of female preferences overall, as measured by women's choices in referenda. However, it can improve substantive female representation concerning social issues.

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[14]Thirty-five European countries have some form of female quota in politics (International Institute for Democracy and Electoral Assistance, 2024).

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