



LETTER

The Role of District Magnitude in When Women Represent Women

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Abstract

Legislators are likely to substantively represent groups to which they belong or with which they have some particular affinity. However, there are electoral systems that diminish this tendency and systems that promote it. More precisely, as district magnitude increases, representatives will be freer to focus on issues that are not decisive of vote choice for most voters. In this letter, we use a case of electoral reform and the nature of the post-reform chamber (Chile's Chamber of Deputies) to test whether increasing district magnitude makes it more likely that women will focus on women's issues. A series of tests on multiple sets of observations show robust results for the conclusion that as the number of candidates elected in a district increases, elected women become more likely to pursue women's issues.

Keywords: gender; substantive representation; electoral systems; bill cosponsorship; district magnitude

More permissive electoral systems, including those that use multimember districts, lower the vote-share threshold for victory. As the number of seats per contest (that is, district magnitude, or *M*) increases, competitors are increasingly permitted to focus on earning votes from narrower and narrower constituencies (Cox 1990; Myerson 1993). As a result, individual candidates may seek to be known for championing policy in a particular issue area (Bagashka and Clark 2016; Carey and Shugart 1995).

When freed to pursue this kind of constituency specialization, on which policies will individual representatives choose to focus? The policy preferences of representatives are often closely tied to their gender- or race-based identities (Caprioli 2000; Grose 2005; Hero and Preuhs 2010; Hoehmann 2020; Kweon and Ryan 2021; MacDonald and O'Brien 2011; Preuhs 2007; Regan and Paskeviciute 2003; Swers 1998; Thomas 1994; Tschoepe 1997). Several works have shown women representatives are more likely than men representatives to focus on issues of relative importance to women. In Argentina, women members of congress (MCs) are more likely to focus on women's issues than their men counterparts, and they are more likely to collaborate with other women in their chambers when doing so—especially when freed from constraints by party leaders (Barnes 2016). Minority ethnic women in the Netherlands actively seek to represent the interest of women voters by sitting on committees and asking questions on topics that are dear to them (Mügge, van der Pas, and van de Wardt 2019). Women legislators are more likely to request federal agencies in the United States for information on behalf of women constituents (Lowande, Ritchie, and Lauterbach 2019). Women members of parliament in Uganda often address women's interests in their floor speeches (Clayton, Josefsson, and Wang 2017).

We will argue that as district magnitude increases, legislators are freed to carve out specialized or focused constituencies. This may include promoting the *substantive* representation of traditionally underrepresented groups by elected officials from that group (Swers 2001;

Taylor-Robinson 2014; Tremblay 2003). Focusing on issues that are not salient for all voters is not a viable strategy where a candidate must win a large proportion—a plurality or even a majority—of votes to get elected.

After developing our theoretical motivation in somewhat greater detail, we will test our thinking with bill sponsorship data from the lower house of Chile's national legislature. Chile provides a particularly apt empirical setting because it recently engaged in a significant electoral reform. Reformers were motivated by a desire to decrease malapportionment, increase interparty (intra-coalition) competition, and increase the effective size of the party system (Gamboa and Morales 2016). Prior to a reform adopted in 2015, members were selected using a proportional representation (PR) system with two-member districts. Since the reform, members are elected in a PR system with districts ranging in size from three to eight seats (average magnitude is more than 5.5).

We will take multiple looks at bill sponsorship patterns, including before and after the reform, only in the legislative term in which the reform was adopted, only by members elected both before and after the reform, and only during the post-reform term. We repeatedly find support for the conclusion that increasing district magnitude makes it more likely that women deputies devote more effort to women's issues.

What Is the Role of District Magnitude in When Women Represent Women?

Electoral systems impose incentives for how reelection-seeking candidates should go about building reputations. Across most systems, as the number of seats to be distributed in a district increases, the proportion of the vote that a candidate needs to get elected decreases.

In order to generate support from the majority of voters, candidates and their parties tend to focus on policies that are appealing to the median voter (Downs 1957). As district magnitude (M) increases, voters will calculate that they can safely distribute their votes across more candidates without their votes being "wasted" on candidates who are not viable (Cox 1987; Duverger 1954; Leys 1959; Sartori 1968). Parties can even seek to assemble a slate of candidates, each of whom is likely to appeal to a distinct subset of voters (Kweon and Ryan 2021; Shugart, Valdini, and Suominen 2005; Taylor-Robinson 2014). Facing such incentives, instead of perceiving themselves as responsible for the interests of at least 50 per cent + 1 of the constituents in their districts, legislators may feel they can specialize (Coffe 2018; MacDonald and O'Brien 2011; Thomas 1994; Thomas and Welch 2001; Tremblay 2005).

Research Design

Virtually all of the existing literature in this area is dependent on observational data—with all the challenges to causal inference that entails. While the vast majority of the works we have already cited are careful to minimize disjunctures between their theorizing and their empirical tests, some scholars working with observational data have sought to address issues of causal inference more directly. Examples of a few works that have employed innovative research designs include Clark and Caro (2013), Hoehmann (2020), and MacDonald and O'Brien (2011). We see our work as a contribution to this thread of literature that seeks creative ways to exploit observational data.

In this letter, we capitalize on an instance of reform, its timing, and the nature of the post-reform system to take several turns at modeling select observations (see Figure 1). Our strategy could be applied in any context in which an electoral reform is adopted in one legislative term and then first applied for the selection of the subsequent legislature—the way most reforms are likely adopted.

As a first cut, we look at cosponsorship patterns in the last pre-reform legislative term, the term in which the reform was adopted, and the first post-reform legislative term together. Initially, we code members serving in the term in which the reform was adopted as having the incentives imposed by the pre-reform rules, under which they were elected, throughout the entire

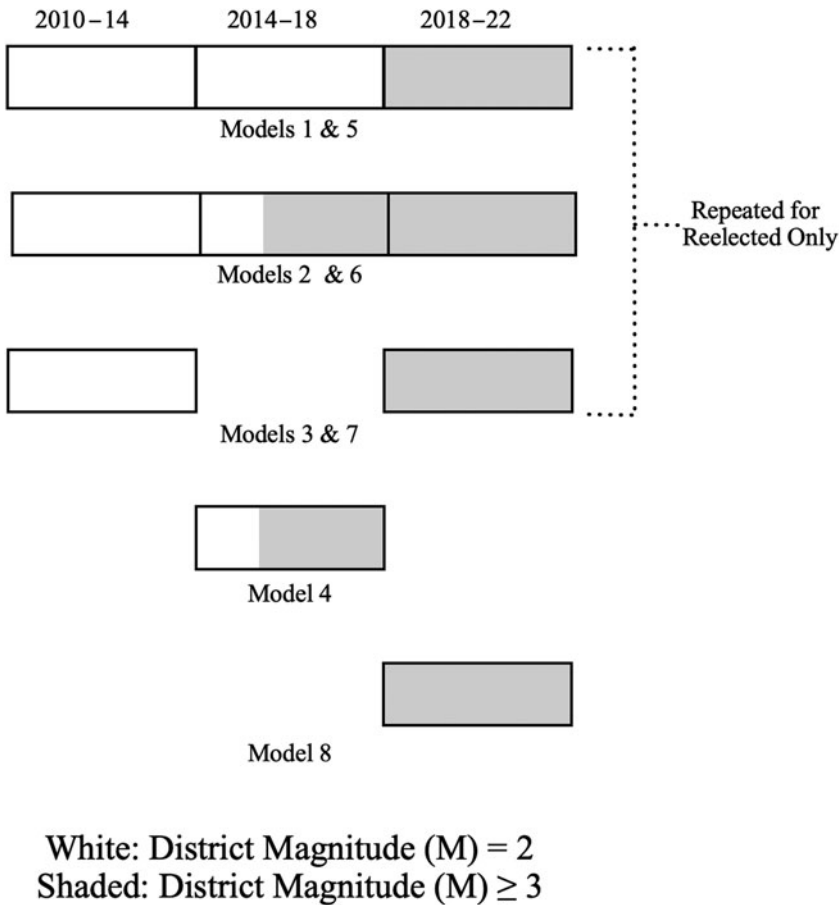


Fig. 1. Modeling strategies.

term (Model 1). We then split those reform-term members based on the precise date of the reform, giving them $M = 2$ prior to the reform and the magnitude they would face in 2018 if they were to seek reelection (Model 2). This was possible because the post-reform districts were either identical to a pre-reform district or were some combination of whole pre-reform districts.¹ We then drop observations from the term in which the reform was adopted all together to rule out the possibility that our results are somehow tainted by observations when electoral incentives were in flux (Model 3). Then, we analyze sponsorship patterns of members only during the term in which the reform was adopted, looking at them before and after its approval (Model 4).² For a comparative depiction of Models 1 through 4, see Figure 1.

In a second cut at the question, we seek to address any concern regarding different individual representatives, with unique policy priorities, serving across different terms. It is possible that candidates, especially women candidates, who entered in the later congress were more attuned

¹We drop the MCs Gonzalo Fuenzalida and Javier Macaya from our main analysis because after the reform, they competed in districts that did not contain their pre-reform districts. We show that our results are robust to their inclusion in SI-C (“Including Data from Gonzalo Fuenzalida and Javier Macaya”) in the Online Appendix.

²This model is especially important for our design because the 2015 reform also created gender quotas. By examining only the term in which changes in magnitude were adopted (but before they, or the gender quota, were implemented), we can rule out the possibility that any results are a function of a compound treatment.

to women's issues than candidates who ran previously. As a result, we might confound this change in the candidate pool with the effects of electoral incentives. In an effort to address such concerns, we limit our observations to only members who served both before and after the reform. On this subset of the data, we repeat the first three modeling strategies outlined earlier: members from all three terms, with reform-term members coded as having only pre-reform incentives (Model 5) and then as facing two different sets of incentives (Model 6); and then only members in the full pre-reform term and the post-reform term (Model 7). For a comparative depiction of Models 5 through 7, see [Figure 1](#).

Finally, one might be concerned that due to some kind of ideological shift, women's issues became increasingly salient over time. Thus, even members who had not focused on them in prior terms might focus on them with greater frequency more recently. Again, we might confound this changing milieu of awareness with a change in electoral incentives. To deal with this, in a third cut at the question, we limit ourselves to examining the effect of the interaction between MC gender and district magnitude in only the post-reform term, where district magnitude varies from three to eight seats but issue salience would be more or less constant (Model 8). For a depiction of Model 8, see [Figure 1](#).

Our ability to parse our data into the eight models described earlier allows us to address multiple concerns that might otherwise typically arise in an observational study unable to capitalize on the timing of an institutional change. That said, despite our repeated shuffling of observations, we are not claiming that we have "as if" random assignment of district magnitude as a treatment.

Data and Methods

We use data from the 2010–14, 2014–18, and 2018–22 *Chilean Cámara de Diputadas y Diputados*. We collected all bills (*mociones*) introduced by legislators.³ In total, our data include 4,481 bills sponsored by 255 unique legislators. Of these, 3,307 bills were co-sponsored by at least one of the fifty-five women elected during this period.

We recognize that defining "women's issues" is not without controversy. In terms of breadth, we take a relatively conservative definition (Funk and Philips 2019)—that is, a relatively narrow definition focused on women's rights and equality. A middling definition adds to these children and family issues and anti-poverty policies. An even broader definition adds to these issues that correspond to women's traditional social roles. While we prefer the first of the three, the bulk of our findings are robust to the use of multiple, possibly competing, sets of keywords for identifying issues.

We combined two approaches to code bills about women's issues. First, we utilized a dictionary-based approach to automatically code the bills as (potentially) addressing a women's issue. We classified bills using Barnes' (2016) and Htun, Lacalle, and Micozzi's (2013) dictionaries. Barnes (2016) was interested in determining when women would represent women, and Htun, Lacalle, and Micozzi (2013) were interested in whether the increasing presence of women in a chamber resulted in more substantive representation. Ideal for our purposes, both dictionaries contain terms related to women's rights (that is, reproductive rights, gender equality in pay, equal representation, access to childcare, and so on) and women's health, but they differ in how they were built. Barnes (2016) created her dictionary by reading through bills, while Htun, Lacalle, and Micozzi (2013) defined their set of keywords *a priori*.⁴ Both were designed for application to the Argentine case at a given point in time. As a result, they may miss nuances in language usage between the two countries. For example, Chileans use the term "*intrafamiliar*" ("intrafamily") when discussing domestic violence but Argentines apparently do not. Moreover, since they were created to code bills mostly introduced before 2012, they may not

³Our data for the ongoing term span from March 11, 2018, to March 22, 2021.

⁴The dictionaries are available in SI-K ("Dictionaries") in the Online Appendix.

contain keywords on women's issues that have received more attention recently. For example, none of the dictionaries contain the term "*femicidio*" ("femicide"), which, according to Google search trends for Chile, has become more widely used in recent years.

We initially used both dictionaries to split the bills into those that were (potentially) related to women's issues and those that were not. Then, we read the titles of the bills to identify false positives and false negatives. In doing this second step, we coded as focused on women's issues, for example, bills about intrafamily violence (*violencia intrafamiliar*), femicide (*feminicidio*), and violence against children and teenagers (an issue that disproportionately affects girls in Chile) that were missed by the original dictionaries. Our reading of the titles allowed us to remove bills about the environment (*madre Tierra* ["mother Earth"]), stem cells (*células madre*), and gender identity that the original two dictionaries included among the bills on women's issues. In total, we coded 250 bills as being about women's issues.⁵

As we explained in the previous section, we use a variety of modeling strategies to test our hypothesis. In all these models, the dependent variable is the percentage of the legislator's portfolio that relates to women's issues (*Women's issues*) and our unit of analysis is the legislator-term (or legislator-term-reform date in the case of Models 2 and 6).

We utilize two explanatory variables in the models, *Woman* and *Magnitude* (or *M*).⁶ For the 2013–14 and 2018–22 terms, *M* is the district magnitude used in the previous election ($M = 2$ for the 2013–14 term and $3 \leq M \leq 8$ for the 2018–22 term). For the 2014–18 term, *M* is set equal to 2 in Models 1 and 5. In Models 2, 4, and 6, $M = 2$ for the period between March 11, 2014, and April 27, 2015, and the *M* established by the reform in the remainder of the term.⁷ Given that we are interested in learning whether women introduce more women's issues bills as a function of the magnitude of the district in which they were elected, we include an interaction between *Woman* and *M* in all models.

Finally, we fit our models using the ordinary least-squared estimator. We opted for this modeling strategy because of its flexibility when handling fixed effects and its easiness of interpretation when including interaction terms.⁸

Results

Table 1 has the complete results for all of the models depicted in Figure 1. They consistently support our reasoning regarding when the share of a representative's portfolio of bills sponsored devoted to women's issues should increase. More specifically, the interaction between *M* (district magnitude) and *Woman* is always positive. Moreover, the interaction is statistically significant in seven of the eight models. To facilitate the interpretation of our results, we calculate predicted

⁵We show in SI-E ("Models using Different Dictionaries") in the Online Appendix that our results are generally robust to the use of either dictionary. For all forty-eight models, we detect a positive growth in women legislators' portfolio share dedicated to women's issues when *M* increases. This growth is statistically significant in forty-one of forty-eight models. Moreover, all seven insignificant results occur in models in which we use only one dictionary. When we combine both dictionaries, all estimates are positive and statistically significant. These findings suggest that the lack of statistical significance may be a result of undercounting women's issues bills.

⁶We show in SI-D ("Models using Log-*M*") in the Online Appendix that our results are robust to the use of log *M*.

⁷April 27, 2015, marks the day President Michelle Bachelet, from the center-left, signed the bill into law. She had promised electoral reform during her presidential campaign, and with the support from some members of the center-right, she was able to get the three-fifths of votes necessary to change the constitution.

⁸We show in SI-F ("Logistic Transformation and Beta Regression Model") in the Online Appendix that our results are generally robust to the use of either a logistic-transformed dependent variable strategy or a beta regression strategy. We find that the predicted change in *Women's issues* for women when *M* increases by one is positive in all models and statistically significant in thirteen of sixteen models. Most of our statistically insignificant results occur in models in which we have a limited number of women legislators in the sample (min = 6 in Model 5, and max = 8 in Model 6) and we employ fixed effects by legislator.

Table 1. Association between legislative portfolio, gender, and district magnitude: 2014–21 *Cámara de Diputadas y Diputados de Chile*

	1	2	3	4	5	6	7	8
M	0.424** (0.183)	0.153 (0.148)	0.301* (0.177)	0.779*** (0.093)	0.690* (0.357)	0.407* (0.235)	0.770*** (0.290)	0.351** (0.177)
Woman	4.896*** (1.103)	2.711*** (0.906)	1.377 (1.352)					2.794 (3.459)
M × Woman	0.773** (0.317)	1.113*** (0.243)	1.299*** (0.347)	0.928** (0.407)	0.602 (0.428)	0.335*** (0.126)	1.012* (0.533)	1.087* (0.573)
Constant								3.225*** (1.037)
FE by legislative term	Yes	Yes	Yes	No	Yes	Yes	Yes	No
FE by reform	No	Yes	No	No	No	Yes	No	No
FE by legislator	No	No	No	Yes	Yes	Yes	Yes	No
Observations	400	516	281	232	108	144	88	160
R ²	0.408	0.404	0.400	0.451	0.108	0.036	0.259	0.426
Adjusted R ²	0.403	0.401	0.394	0.446	0.091	0.022	0.242	0.415

Notes: Table entries are unstandardized coefficients from linear regression models. Clustered robust standard errors by legislator in parentheses for Models 1–7. Robust standard errors in parentheses for Model 8. FE = fixed effects. *** p < 0.01; ** p < 0.05; * p < 0.01.

Table 2. Predicted percentage-point change in the cosponsorship portfolio on women’s issues when M increases by one

	Model 1	Model 2	Model 3	Model 4
Women	1.19** (0.52, 1.86)	1.28** (0.77, 1.73)	1.60** (0.89, 2.31)	1.71** (0.93, 2.43)
Men	0.42** (0.07, 0.75)	0.15 (–0.13, 0.44)	0.29 (–0.08, 0.65)	0.77** (0.6, 0.97)
FE by term	Yes	Yes	Yes	No
FE by reform	No	Yes	No	No
FE by legislator	No	No	No	Yes
Observations	400	516	281	232
Terms included	2010, 2014, & 2018	2010, 2014, & 2018	2010 & 2018	2018
	Model 5	Model 6	Model 7	Model 8
Women	1.27** (0.33, 2.24)	0.75** (0.31, 1.15)	1.75** (0.70, 3.02)	1.42** (0.30, 2.56)
Men	0.68* (–0.03, 1.32)	0.42* (–0.03, 0.86)	0.77** (0.22, 1.34)	0.36** (0.02, 0.70)
FE by term	Yes	Yes	Yes	No
FE by reform	No	Yes	No	No
FE by legislator	Yes	Yes	Yes	No
Observations	108	144	88	160
Terms included	2010, 2014, & 2018	2010, 2014, & 2018	2010 & 2018	2018

Notes: Table entries are the predicted change in the dependent variable (*Women’s issues*) when M increases by one unit. Shown are 95 per cent confidence intervals in parentheses. FE = fixed effects. ** p < 0.05; * p < 0.1.

changes in the portfolio’s share when the district magnitude increases by one, holding legislators’ gender constant (see Table 2).

The predicted changes in Table 2 show that in all eight models depicted in Figure 1, the percentage of the bill portfolios of women legislators dedicated to women’s issues shows a statistically significant increase with magnitude.⁹ The size of the predicted change in *Women’s issues* ranges from 0.75 in Model 6, where we used data from legislators who were reelected in all three terms, to 1.75 in Model 7, where we used data from legislators who were elected in both the 2010–14 and 2018–22 terms. It is important to note that the average percentage of a cosponsorship portfolio focused on women’s issues ranges from 4 per cent (Model 4) to 7.57 per cent

⁹As we do here, Barnes (2016) identified district magnitude as a key determinant of legislators’ behavior. She reasoned that larger district sizes empowered party leaders and found that empowered party leaders were associated with lower levels of collaboration among women. We cannot speak to collaborative behavior, but, as we detail later, larger districts are associated with more attention to women’s issues by women MCs. Our reasoning is compatible with the idea that they may be working alone.

(Model 8). As a result, the predicted changes in *Women's issues* correspond to increases of between 16 per cent (Model 6) and 42 per cent (Model 7) of the average value of the dependent variable.

Let us give some additional substantive interpretation to these results. First, consider the estimates from Model 7, where we look only at the portfolios of MCs elected in both 2010 and 2018 in order to rule out the possibility that our results are driven by the election of individuals with different priorities across terms. Our results suggest that for a woman elected in a district where $M = 2$, we would predict that 3.5 per cent of the bills in her portfolio would be focused on women's issues, but for a woman representative elected in a district where $M = 8$, we would predict that 14.2 per cent of her bill portfolio would be dedicated to such issues.

Model 8, which only includes the bill portfolios of representatives elected to the 2018–22 term, was run to assure that our results are not driven by an overarching increase in the salience of issues predominantly of concern to women. Our results suggest that for a woman elected in a district where $M = 3$, we would predict that 10.3 per cent of the bills in her portfolio would be focused on women's issues, but for a woman representative elected in a district where $M = 8$, we would predict that 17.5 per cent of her bill portfolio would be dedicated to such issues.¹⁰

We do not find a substantively important effect for increasing magnitude when legislators are men. The predicted changes in *Women's issues* are positive in all eight models, and they are statistically significant on six occasions. Regardless of statistical significance, the predicted proportion of a portfolio dedicated to women's issues and the changes in those portfolios are always much smaller than the predicted changes for women legislators. Indeed, the largest predicted increase in men's portfolios is equal to 0.77, representing only 45 per cent and 44 per cent of the increases in men's portfolios based on Models 4 and 7.¹¹

Conclusion

Taylor-Robinson (2014, 257–8) sums up our reasoning nicely¹²:

If we assume that women are as likely as their male colleagues to be politically ambitious, is it a rational career-building strategy to focus on women's issues and representation of women? The answer may in part depend on the electoral system. In at least some PR systems seeking the women's vote may be a viable electoral strategy, just as a political aspirant could obtain an electable slot on their party's list as the representative of labour or business interests, or as a representative of ethnic minorities. However, particularly in single member district (SMD) electoral systems a legislator typically needs to represent the policy preferences of the majority of the people in a geographic district in order to maximize their chances of re-election.

Multimember districts make it possible for candidates to win with support from a lower portion of the district's voters. Increasing district magnitude (M) allows candidates to focus on favored groups (as defined on any dimension) (Cox 1990; Myerson 1993). Individual incumbents may seek to cultivate personal reputations by building portfolios focused on subconstituencies within

¹⁰One may wonder whether our findings travel to other PR systems or systems with larger district magnitudes. Using data from Argentina, a country that uses closed-list PR with M ranging from two to thirty-five, we found additional evidence that attention to women's issues increases when women legislators are from districts with larger magnitudes (see SI-M ["Women's Issues in Argentina"] in the Online Appendix).

¹¹If the share of men's portfolios dedicated to women's issues was already large in the pre-reform period, we might not observe a large change in men's behavior when reform changed incentives because they would have little room to do even more. We show in SI-B ("Descriptive Figures") in the Online Appendix that this was not the case. The pre-reform baseline values on attention to women's issues were lower for men than for women, indicating that the small change in men's behavior in response cannot be attributed to high levels of attention to women's issues in the pre-reform period.

¹²Similar statements could have been drawn from Tremblay (2003) or Swers (2001).

their districts (Bagashka and Clark 2016; Carey and Shugart 1995). Kweon and Ryan (2021) present similar findings from South Korea's mixed-member system. In South Korea, the PR tier is a single district with $M = 47$, and the lists are closed. Women elected in the PR tier are more likely to substantively represent women. Similarly, Mechkova and Carlitz (2021), who use data from all the parliaments in sub-Saharan Africa over a very long time period (2,763 country-years), do not distinguish systems by district magnitude, but they do find across this large and varied sample that PR systems are associated with increased representation of women's interests.

Although, like in all observational studies, we cannot completely rule out the threat of omitted variable bias to our inferences, the robustness of our results across different modeling strategies increases our confidence that the proposed mechanism, that is, increasing district magnitude, is responsible for the uncovered relationship. We not only endeavored to rule out the possibility that our results are a function of individual members changing across terms, but also accounted for the possibility that women's issues simply became more salient over time. As a district is represented by more and more members, those members are freer to engage in "specialized" representation. In the case of woman MCs, that, on average, entails a greater emphasis on women's issues.

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