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# **Gender Differences in Campaigning under Alternative Voting Systems: Evidence from a Quantitative Text Analysis of Election Manifestos in Japan**

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## **Gender Differences in Campaigning under Alternative Voting Systems: Evidence from a Quantitative Text Analysis of Election Manifestos in Japan<sup>1</sup>**

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### **Abstract**

We evaluate an important question in the growing literature on women's substantive representation – whether gender differences in candidate issue engagement are robust to institutional environments that encourage policy convergence and “median-voter” chasing. While a growing body of evidence from American- and comparative politics reveals that gender does play a role in voters' evaluations of candidates, long-standing spatial theories and recent empirical work suggest that such candidate differences should disappear in the face of strategic incentives inherent to single-member district races – thereby limiting the potential for a descriptive-substantive link in women's representation. We address this question by leveraging the case of Japan, which allows us to analyze gender differences both before and after a major electoral reform that effected well documented changes in the nature of campaigning. Owing to the consistent and widespread use of candidate manifestos in Japanese elections, the case also enables us to more comprehensively and reliably measure candidate issue engagement than has typically been done in the representation literature. Using recently pioneered methodologies in probabilistic topic modeling on an analysis of over 20 years of general election manifestos, we find significant differences in the issues that male and female candidates use to present themselves to constituents regardless of party affiliation and other attributes. Moreover, we find that these differences remain salient even after the wholesale change from a multi-member district to a single-member district electoral system.

**Keywords:** Gender, Campaign Manifestos, Electoral System, Text Analysis

**JEL classification:** J16, D72, D91

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## Introduction

Electoral candidates engage in various activities, especially during the campaign period. They attempt to communicate with as many of their constituents as possible in order to garner sufficient support to win the election (Fenno 1978; Michelson 2003).<sup>1</sup> Candidates running for national office in Japan are no exception. They visit various places in their districts and attend local festivals and school events, where many people gather, trying to make direct contact with their constituents. For such candidates, the campaign manifesto is an important instrument for informing constituents of their policy platforms and pledges. Thus, manifestos allow us to analyze candidates' campaign strategies and policy preferences.

Political representation in Japan features a large gender disparity, but the number of female candidates running for office has been rapidly increasing over the last 20 years. The share of female candidates in the 2017 lower house election was 17.7 percent, a record high number since 1945. Studies suggest that voters take candidates' gender into consideration when they evaluate candidates (Ono and Burden 2019; Ono and Yamada forthcoming). Since voters view female candidates through the perspective of gender stereotypes (Lynch and Dolan 2014), female candidates may want to emphasize policy issues that are congruent with gender stereotypes in their campaigns in order to elicit voter support. Candidate surveys in Japan indicate that policy preferences and issue positions also differ between male and female candidates (Ono 2015). At the same time, however, individual-level differences among candidates appear to converge in

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<sup>1</sup> Multiple experimental studies indeed show that direct communication is an effective strategy for mobilizing voter turnout and increasing electoral support (Gerber and Green 2000; Green, Gerber, and Nickerson 2003; Nickerson, Friedrichs, and King 2006).

single-member districts, where electoral competitions are party-centered (Catalinac 2018). These findings lead to several questions about candidates' campaign strategies: Do male and female candidates emphasize different issues in their electoral campaigns? If they do, does the magnitude of the gender gap vary under different electoral rules? In particular, is the gender gap smaller in single-member districts than it is in multiple-member districts?

We identify the role played by candidates' gender in their electoral campaigns and examine how it differs between electoral systems by analyzing the text data of individual candidates' manifestos used in the House of Representatives elections in Japan before and after the electoral reform in 1994. The case of Japan is an appropriate setting in which to examine the effects of electoral systems on gender differences through manifestos because the nation's electoral reform changed the electoral system used to choose members of the House of Representatives from multiple-member districts to single-member districts, while the campaign activities in which candidates are allowed to engage before the election period remain strictly regulated (see McElwain 2008). This setting enables us to examine whether male and female candidates emphasize different issues in their manifestos to garner electoral support even when electoral competitions have become party-centered.

We find that male and female candidates emphasize different policy issues in their manifestos even when they are running for the same party. While the gender differences seen in candidates' election manifestos are smaller than their partisan differences, female candidates are found to highlight gender-stereotypic issues that conform to gender-based expectations. Furthermore, the gender differences in candidates' manifestos persist even after the electoral reform, when candidates have to compete for electoral office in party-centered single-member districts.

## **Candidate Gender and Electoral Campaigns**

Candidate gender plays an important role in voter evaluation. Voters often make inferences based on a candidate's sex (McDermott 1997). Female candidates are presumed to have feminine personality traits, such as compassion and honesty, while lacking masculine personality traits, such as legislative competence and strong leadership (Alexander and Andersen 1993; Huddy and Terkildsen 1993; Lawless 2004; Schneider and Bos 2014). More importantly, female candidates are often considered to not only be better able than male candidates to deal with issues associated with feminine stereotypes such as the environment, education, and healthcare (Dolan 2010; Fridkin and Kenney 2009; Huddy and Terkildsen 1993; Kahn 1994; Sanbonmatsu and Dolan 2009) but also take more liberal and progressive positions on issues (Koch 2000; Sapiro 1981). These gender stereotypes among voters are likely to affect how candidates formulate their electoral campaign strategies (Kahn 1996; Schaffner 2007).

Under such circumstances, female candidates may achieve better electoral results when they emphasize the feminine stereotypes that prevail among voters. Several studies suggest that female candidates gain an electoral advantage when they stress issues associated favorably with women (Herrnson, Lay, and Stokes 2003; Iyengar et al. 1996) and that voters sometimes punish female candidates who deviate from gender stereotypes (Ono and Yamada forthcoming). Other studies argue, by contrast, that counter-stereotypic female candidates do not necessarily suffer lost electoral support (Bauer 2017; Brooks 2013) and that party and issue cues play more important roles than gender stereotypes do (Anderson, Lewis, and Baird 2011; Dolan 2014a, 2014b; Hayes 2011; Matland and King 2002; Thompson and Steckenrider 1997).

Several studies seek to determine whether female candidates present themselves to the

public in a manner conforming to gender stereotypes by analyzing the content of the campaign websites (Dolan 2005) and campaign advertisements (Schaffner 2007) of candidates running for office in the United States. The results show that female candidates do not necessarily highlight gender-stereotyped issues on their campaign websites and that their priority issues are similar to those of male candidates.

While these innovative studies contribute much to our understanding of the relationship between gender stereotypes and campaign strategies, significant challenges and puzzles remain. First, data based on campaign websites and advertisements do not cover all the candidates running for office because some candidates do not use either websites or advertisements, and access to those campaign tools depends on the candidates' resources. For instance, only 65% of major-party candidates have been found to maintain campaign websites (Dolan 2005, 34). Second, prior studies have manually coded the policy issues appearing on campaign websites and in advertisements. This method makes it very difficult to use a large number of issue categories to comprehensively extract the information contained in text data and to cover a number of election cycles in order to control for the effects of election contexts. Third, and most importantly, these studies focus exclusively on electoral competitions that occurred in the single-member district system with two major parties. Thus, we know little about how electoral rules may or may not shape the gender differences in candidates' campaign strategies.

## **Data and Methods**

### **Text Data of Candidate Manifestos**

We employ Japanese candidate manifesto data provided by Catalinac (2017) to analyze a document-feature matrix of individual candidates' manifestos, the columns and rows of which

indicate the candidates and the words used in their campaign manifestos, respectively.<sup>2</sup> Each cell of the matrix contains a value indicating how many times each candidate used each word in his or her own manifesto. The data cover the eight consecutive general elections held between 1986 and 2009. The dataset comprises 7,497 candidates; the sample excludes non-serious candidates, meaning those who failed to win more than 10,000 votes and who were not endorsed by one of the 18 major parties.<sup>3</sup> The number of word types analyzed is 2,830. Details about the study's text data processing are provided in Online Appendix B of Catalinac (2018).<sup>4</sup> In addition to the manifesto data, we also employ the Reed–Smith Japanese House of Representatives Elections Dataset (Smith and Reed 2018) for candidate attributes such as sex, age, and party affiliation.

## **Statistical Methods**

We identify gender differences among candidates in their campaign manifestos by applying latent topic modeling to the manifestos' document-feature matrix. Specifically, we employ the

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<sup>2</sup> The data are part of the replication materials used by Catalinac (2018) and are based on campaign manifestos collected by Shinada (2006).

<sup>3</sup> The major parties are listed in Online Appendix A of Catalinac (2018).

<sup>4</sup> According to Catalinac (2018), the campaign manifestos were tokenized first via morphological analysis using MeCab (Ishida 2017), and the documents' adjectives, verbs, adverbs, and nouns (excluding pronouns, noun-affixes, and numbers) were kept in the data. Then, for each election, low-frequency words that appeared in only 0.5% or less of the manifestos were removed. Finally, words with the same meaning were combined, and stop words and all remaining low-frequency words (that appeared in only 0.5% or less of all the manifestos) were removed.

structural topic model (STM) developed by Roberts et al. (2016). The model is formulated as follows:

$$\boldsymbol{\gamma}_k \sim \text{Normal}(0, \sigma_k^2 \mathbf{I}_P), \quad (1.1)$$

$$\boldsymbol{\eta}_d \sim \text{Normal}(\boldsymbol{\mu}_d, \boldsymbol{\Sigma}), \quad (1.2)$$

$$\boldsymbol{\mu}_d = \boldsymbol{\Gamma}' \mathbf{x}_d, \quad (1.3)$$

$$\theta_{d,k} = \frac{\exp(\boldsymbol{\eta}_{d,k})}{\sum_{i=1}^K \exp(\boldsymbol{\eta}_{d,i})}, \quad (1.4)$$

$$\mathbf{z}_{d,n} \sim \text{Multinomial}(\boldsymbol{\theta}_d), \quad (1.5)$$

$$\mathbf{w}_{d,n} \sim \text{Multinomial}(\boldsymbol{\phi} \mathbf{z}_{d,n}), \quad (1.6)$$

where  $d \in \{1, \dots, D\}$ ,  $n \in \{1, \dots, N_d\}$ , and  $k \in \{1, \dots, K\}$  is a subscript for document, term, and topic, respectively.  $\mathbf{w}_{d,n}$  indicates which term appears in the  $n$ -th word location of document  $d$ , and  $\mathbf{z}_{d,n}$  represents the topic to which the  $n$ -th word location of document  $d$  is assigned.  $\boldsymbol{\phi}$  is the word distribution, and  $\boldsymbol{\theta}_d = (\theta_{d,1}, \dots, \theta_{d,K})$  is the topic distribution of document  $d$ . One of the advantages of the STM is that the documents' topic distributions are expressed by their covariates  $\mathbf{x}_d$ , the number of which is notated as  $P$ , and  $\boldsymbol{\Gamma} = [\boldsymbol{\gamma}_1 \mid \dots \mid \boldsymbol{\gamma}_K]$  represents a matrix that contains their coefficients.  $\boldsymbol{\Sigma}$  is the parameter of correlation between topics.  $\sigma_k$  is the hyperparameter of the prior distribution of  $\boldsymbol{\gamma}_k$ .

We include the following candidate attributes in covariate vector  $\mathbf{x}_d$ . The key variable is the candidate's sex, which takes the value of one if a candidate is a female and zero otherwise. Another important variable is the election year, which we specify as a set of dummy variables and add them to the model as year-specific constants. We further control for a candidate's age (and its squared term), incumbency status, seniority (the natural log of the number of times the candidate has served as a member of the HoR), and party affiliation.



For party affiliation, we treat major parties that fielded more than 100 candidates during the period of our study as independent categories. We categorize the remaining small parties into either left- or right-wing groups, except for the *Mushozoku no Kai* (an alliance for independents) and parties coded as “Minor” in the Reed-Smith dataset.<sup>5</sup> These remaining parties as well as pure independents are categorized into a residual group. We treat party-affiliated “independent” candidates as partisan candidates.

We estimate two models with different specifications of topic distributions. First, we examine the average gender gap in candidate manifestos between 1986 and 2009 by specifying topic distributions (Equation [1.3]) as follows:

$$\mu_d = \gamma Female_d + \alpha_{Year_d} + \beta_{Party_d} + \dots, \quad (2)$$

where  $Female_d$  is a dummy variable for female candidates,  $Year_d$  is an indicator for the election year,  $Party_d$  is an indicator of party affiliation,  $\gamma$  is a coefficient vector of the female dummy,  $\alpha$  represents a vector of year-specific constants, and  $\beta$  represents a vector of party-specific constants. The omitted part includes terms related to candidates’ age, incumbency, and seniority. Our main interest is in  $\gamma$ , which indicates a difference between male and female candidates in the probability that each topic was mentioned in their election manifestos.

Second, we investigate whether the gender gap in election manifestos changed or remained consistent over time by varying the coefficient of  $Female_d$  by election year:

$$\mu_d = \gamma_{Year_d} Female_d + \alpha_{Year_d} + \beta_{Party_d \cdot Year_d} + \dots. \quad (3)$$

We also vary party-specific constants by election year; otherwise, the change in the coefficient of  $Female_d$  is attributable to the fact that some parties began putting up more female candidates,

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<sup>5</sup> A detailed list of party categories used in this study is provided in Online Appendix A.1.

and candidates who were endorsed by such parties simply discussed topics different from those of other parties' candidates. This specification can be achieved by interacting a set of year dummies with a female dummy and a set of party dummies.

We estimate the parameters of the STM using a variational expectation-maximization algorithm using R package `stm` (Roberts, Stewart, and Tingley 2019). We estimate the model by varying the number of topics included; we ultimately adopt the 75-topic model after evaluating the model's performance based on several criteria.<sup>6</sup>

## Results

### Gender Gap in Topic Distribution of Candidate Manifestos

First, we present the 10 most frequently mentioned topics in election manifestos in Table 1.<sup>7</sup> We examine the topic rankings for the three major parties in the period of our study: the Liberal Democratic Party (LDP), the Japan Socialist Party/Social Democratic Party (JSP/SDP), and the Democratic Party of Japan (DPJ). The LDP was the leading party in the Diet throughout the period of our analysis and was in government for the whole period, except for about 10 months after the 1993 election. The JSP, which changed its name as the SDP in 1996, and the DPJ were the biggest opposition parties before 1994 and after 1997, respectively. We analyze these three parties separately because, if we compute the topic rankings for male and female candidates in

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<sup>6</sup> Details on the estimation procedure, including the post-estimation simulation explained below, are provided in Online Appendices A.2 and A.3. The number of topics in our model is very similar to that used in Catalinac (2016).

<sup>7</sup> A list of all the topics, as well as the frequent terms for each, is provided in Online Appendix B.1.

all political parties, the gender gap in the rankings may merely reflect partisan differences in issue priority. This is especially important because, in Japan, left-wing parties such as the JSP/SDP are much more likely to field female candidates than are right-wing parties such as the LDP. We identify these topics by taking the average of the topic distributions in the election manifestos for each group. We attach a label for each topic by examining the terms that appear frequently in each topic.<sup>8</sup>

[Table 1 about here]

Table 1 shows that male and female candidates mention different topics in their election manifestos even if they are running for the same party. Frequent topics in female candidates' manifestos include "women's issues" such as "policy support for mothers" and "gender equality." Moreover, female candidates are more likely to mention so-called "feminine" issues, such as "child care," "elderly care," and "environmental issues" than male candidates are. By contrast, male candidates tend to more frequently mention topics such as economic issues ("increasing domestic demand" for the JSP/SDP) and foreign issues ("world affairs" for the LDP), which are often seen as masculine.

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<sup>8</sup> Our model detects several topics specific to a certain party's candidates in a certain year (e.g., a topic mentioned almost exclusively by the JSP candidates in the 1990 election). This probably occurs because some parties distributed a manifesto template to their candidates, and most of those candidates used the template, including for the wording used to express issues and phrases. We indicate such party-specific topics by adding a year to the topic label in parentheses. Nonetheless, even in such parties, candidates still had some discretion about what to highlight in their own manifestos.

We further examine which topics appear in different proportions overall between male and female candidates by simulating first-differences in the probability of appearance for each topic between male and female candidates' election manifestos based on the parameters estimated in Equation (2). To do so, we conduct a post-estimation simulation of the parameters, compute the expected proportion of each topic for each observation while replacing the candidate's sex, take averages over all the observations, and take first-differences between men and women.

Figure 1 shows the results. The dots represent the point estimates, and the horizontal bars surrounding the dots represent 95% confidence intervals. We may detect false positive differences because we examine so many topics. Therefore, we conduct conservative tests of the coefficient of a candidate's sex ( $\gamma$  in Equation [2]) by employing the Holm correction for multiple testing, and indicate the topics that pass the test at the 5% significance level with square dots in Figure 1.<sup>9</sup> Table 2 shows the top 10 words with the highest probability within the five topics the proportions of which are found to differ significantly in their manifestos between male

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<sup>9</sup> The Holm correction (Holm 1979) procedure is as follows. Letting  $n$  denote the number of tests, we arrange null hypotheses in ascending order of  $p$ -values. We call these  $H_0^{(1)}, H_0^{(2)}, \dots, H_0^{(n)}$  and the corresponding  $p$ -values  $p^{(1)}, p^{(2)}, \dots, p^{(n)}$  in this order. First, we test whether  $p^{(1)} < \alpha/n$ , where  $\alpha$  is the significance level. If it is a false, we accept  $H_0^{(1)}$  and the following set of null hypotheses and cease the procedure. Otherwise, we reject  $H_0^{(1)}$ , and we then test whether  $p^{(2)} < \alpha/(n-1)$ . We repeat such procedures that decrease the denominator of the threshold value until we can no longer reject the null hypotheses.

and female candidates.<sup>10</sup>

[Figure 1 about here]

[Table 2 about here]

The most prevalent topic in female candidates' manifestos is "policy support for mothers," which occupies 1.8 percentage points more topic space in their manifestos than in male candidates' manifestos. Although the nominal value seems to be small and marginal, this is a very large difference. Our simulation shows that the expected proportion of "policy support for mothers" in male and female candidates' manifestos is 1.5% and 3.3%, respectively; thus, 2.26 times more space is devoted to this topic in females' manifestos than in males'. Moreover, female candidates mention "child care," "gender equality," and "pacifism" 1.2 percentage points (1.67, 1.79, and 1.86 times, respectively) more than male candidates do. By contrast, female candidates are less likely to discuss "agricultural administration" policy than are male candidates, though the difference is not great (0.5 percentage points; 0.61 times). Because we include covariates such as party affiliation, election years, age, incumbency, and seniority in Equation (2), we can conclude that the gender differences listed above exist even after these factors are controlled for.<sup>11</sup>

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<sup>10</sup> Online Appendix B.2 displays some actual manifestos that are closely associated with these five topics as examples.

<sup>11</sup> In addition, we test whether female candidates are more likely to represent women when any one of their opponent candidates is a woman; specifically, we examine whether female candidates are more likely to mention female-stereotypic topics when they face at least one female opponent. Our additional analysis does not fully support this hypothesis: Gender difference in the proportion

We compare the gender differences in the topic proportions with differences attributed to party affiliation in order to evaluate the substantive magnitude of those differences. We compute first-differences in topic proportions between the LDP and JSP/SDP candidates (see Figure 2). In addition, we conduct similar comparisons between the LDP and DPJ candidates (see Figure 3). The simulation procedures are the same as those used for the results shown in Figure 1.

[Figure 2 about here]

[Figure 3 about here]

Figures 2 and 3 show that the differences in topic proportions between the LDP candidates and the two opposing parties are at most around 7 percentage points. Such differences are not surprising because these parties hold quite different ideological positions (i.e., the LDP is right-leaning, the JSP/SDP is left-leaning, and the DPJ is center-left). This implies that the differences in topic proportions attributable to candidate gender are about one-fourth of the partisan gaps when we compare them based on the topic with the greatest difference. Thus, candidate gender is not as influential on manifesto content as is party affiliation, but the effect of candidate gender is not negligible. From another viewpoint, the 1.2 to 1.8 percentage point gender gap among female-stereotypical topics is as large as is the difference between the proportions of LDP and DPJ candidates' mentions of "elderly care," "public pension," and "gender equality" in their manifestos. Therefore, significant differences in manifestos are observed between men and women candidates, especially in their mention of gender-stereotypic topics, and the gender gaps

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of the "policy support for mothers" topic is slightly greater when there are more than two female candidates in a district, but it is only marginally significant. This tendency is also not observed for "child care," "gender equality," or "pacifism." Details are provided in Online Appendix C.

are comparable to partisan differences in the proportions of several salient topics.<sup>12</sup>

### **Temporal Change in Gender Gap**

We test whether the gender gaps in the manifestos found in the previous section are observed to equal degrees both before and after the electoral reform by estimating the STM by replacing Equation (2) with Equation (3). The number of topics is set to the same value as in the original model. The latent topics detected by the STM with this specification are almost the same as the original ones.

Figure 4 displays the mean absolute difference (MD) trend in the proportion of topics between female and male candidates' manifestos. As in the previous section, we compute gender differences by conducting a post-estimation simulation. The MDs seem to be slightly decreasing after the mixed member majoritarian system was introduced in 1994, which is represented by a dotted line in the figure. However, the 95% confidence intervals are largely overlapping, and the simulation outcomes indicate that the difference in the MD before and after the electoral reform is statistically indistinguishable from zero.<sup>13</sup>

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<sup>12</sup> Online Appendix D shows that gender differences among candidates in terms of topic prevalence are still observed when our analysis is limited to only the candidates who won the election. Online Appendix E further shows that the gender differences in the campaign manifestos are not driven by gender differences in the degree of urbaneness of the candidates' electoral districts.

<sup>13</sup> The point estimate of the difference in the MD between before and after the reform is  $-0.0026$ , and its 95% confidence interval is  $[-0.0068, 0.0006]$ .

Furthermore, we simulate the expected proportions of the manifesto topics that are found to differ between male and female candidates in the original analysis and the first-difference between them for each year. The results are shown in Figure 5. Gender differences are consistently observed over time for “policy support for mothers” and “pacifism,” though the first-differences for the latter do not reach statistical significance at the conventional level when simulated on a year-by-year basis. “Gender equality” shows gender gaps in the earlier period, but the difference disappears in the later period. This result is not necessarily attributable to the electoral reform, however. This topic has not been discussed in recent years by either male or female candidates. Instead, “child care” has come to be more frequently mentioned in recent years, and the gender difference in the proportion of this topic has increased. We consider that these two topics deal with similar issues (i.e., women’s empowerment) but simply employ different framings; therefore, we can conclude that gender differences related to women’s empowerment issues existed throughout the period. Finally, gender differences in the proportion of “agricultural administration” are substantial and significant only in 1990, which also does not support the hypothesis that the gender difference is caused by the personal-vote-oriented electoral system.

[Figure 5 about here]

## **Conclusion**

Multiple studies have shown that voters view candidates through the lens of gender stereotypes and that they use candidate gender as an important information cue. To win elections, therefore, candidates may need to behave in a manner associated with gender-based expectations. Indeed, elite survey outcomes show that male and female candidates display different policy preferences.



Therefore, candidates may emphasize those gender differences in their electoral campaigns. At the same time, however, other studies show that individual-level differences among candidates tend to converge in single-member districts, where elections are party-centered. We examine the role played by candidates' gender in their electoral campaigns and its differences between electoral systems by analyzing data drawn from campaign manifestos used in Japanese national elections between 1986 and 2009.

The results of our empirical analyses reveal a significant gender disparity in campaign manifestos. Men and women candidates emphasize different issues in their manifestos, even when running for the same party. Moreover, the gender differences in candidate manifestos persist even after the electoral reform. Topics with gender gaps differ across time because the significance levels of agenda items also vary across time, but gender gaps are found both before and after the electoral reform, which changed the electoral process from a personal-vote-oriented system to a party-centered system. Thus, we find that the individual-level differences among candidates do not converge in single-member districts, at least in terms of candidates' gender, even though they have to survive party-centered electoral contests. Future research could examine whether candidate gender affects voter evaluation equally across political parties.

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**Table 1** Top 10 most frequent topics in male and female manifestos**(A) Candidates of Liberal Democratic Party**

Male			Female	
	Topic label	%	Topic label	%
1	Appeals of their efforts	4.5	Child care	8.9
2	Administration reform	3.7	Policy support for mothers	5.8
3	Local tourism	3.2	Postal privatization	5.5
4	Science and technology	3.2	Wealth inequality	5.5
5	World affairs	3.1	Science and technology	4.1
6	Infrastructure	3.0	Local tourism	3.2
7	Child care	2.9	Administration reform	3.1
8	Local development	2.7	Appeals of their sincerity	3.0
9	Policies of the Koizumi government	2.6	Appeals for change	2.9
10	Appeals for freshness	2.6	Future of Japan	2.7

**(B) Candidates of Japan Socialist Party/Social Democratic Party**

Male			Female	
	Topic label	%	Topic label	%
1	Pacifism	6.7	Pacifism	15.0
2	Gender equality	6.6	Gender equality	9.3
3	Political reform	6.5	Public pension	4.4
4	Increasing domestic demand	5.3	Policy support for mothers	4.3
5	Criticism of the government (1990)	5.2	Elderly care	4.2
6	Abolition of the consumption tax	5.1	Political reform	3.9
7	Political ethics	4.9	Abolition of the consumption tax	3.8
8	Public pension	2.7	Environmental issues	3.3
9	Criticism of the government (1986)	2.7	Child care	3.0
10	Elderly care	2.5	Criticism of the government (1990)	2.3

**(C) Candidates of Democratic Party of Japan**

Male			Female	
	Topic label	%	Topic label	%
1	DPJ manifesto (2009)	9.0	DPJ manifesto (2009)	12.1
2	DPJ manifesto (2005)	5.8	DPJ manifesto (2005)	5.5
3	Privatization of the JH	4.9	Elderly care	5.4
4	Administrative efficiency	4.1	Child care	5.1
5	Elderly care	3.9	Policy support for mothers	4.9
6	Freedom of information	3.6	Gender equality	3.9
7	Small and medium-sized enterprises	3.3	Freedom of information	3.7
8	Appeals for change	3.3	Privatization of the JH	3.1
9	Regime change	3.2	Public pension	2.9
10	Fiscal reconstruction	3.2	Small and medium-sized enterprises	2.9

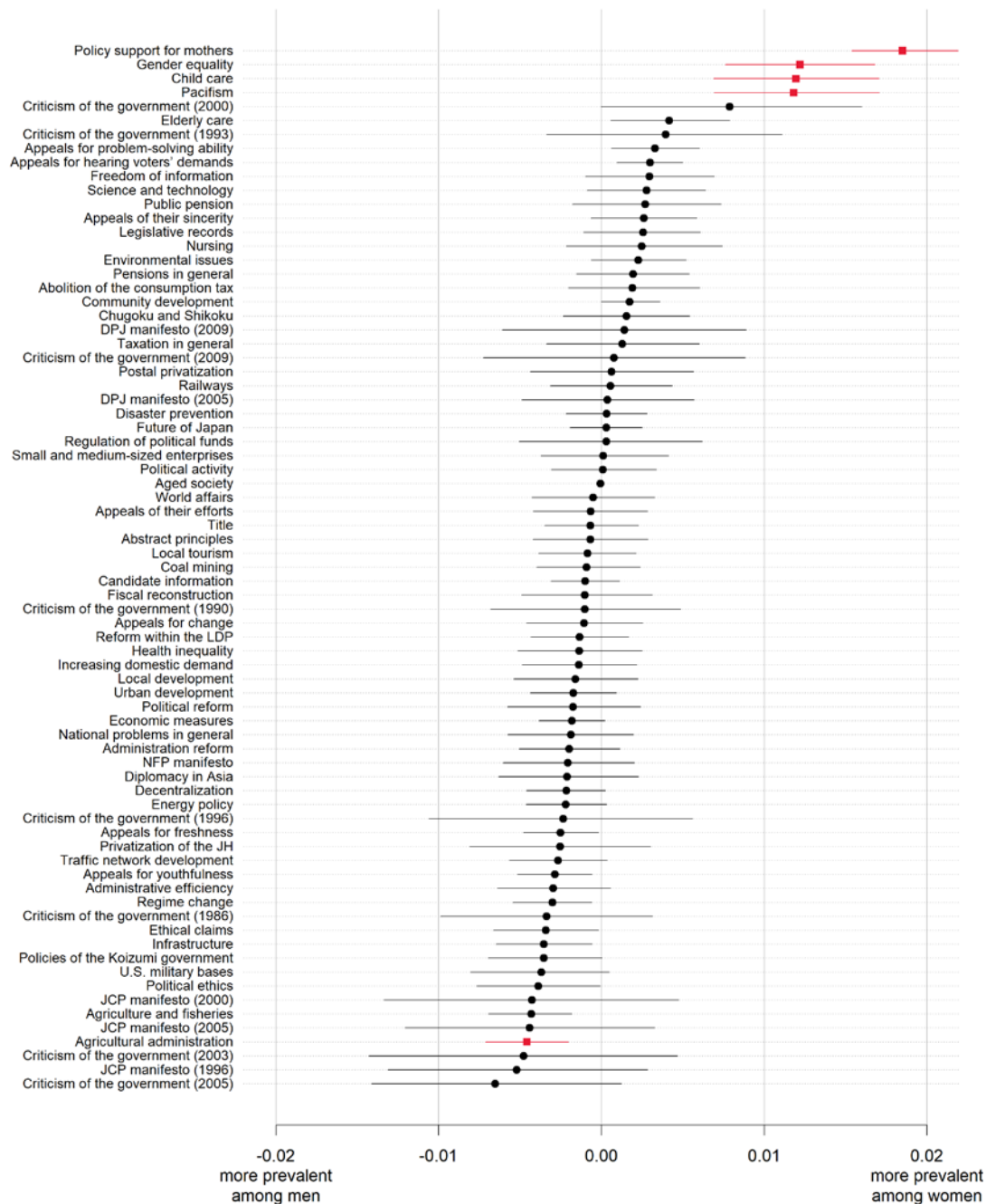
Note: We identify the top 10 topics by taking the average of the topic distributions of manifestos for each group. JH = Japan Highway Public Corporation.

**Table 2** Top 10 most frequent words within topics whose proportions differ significantly between male and female manifestos

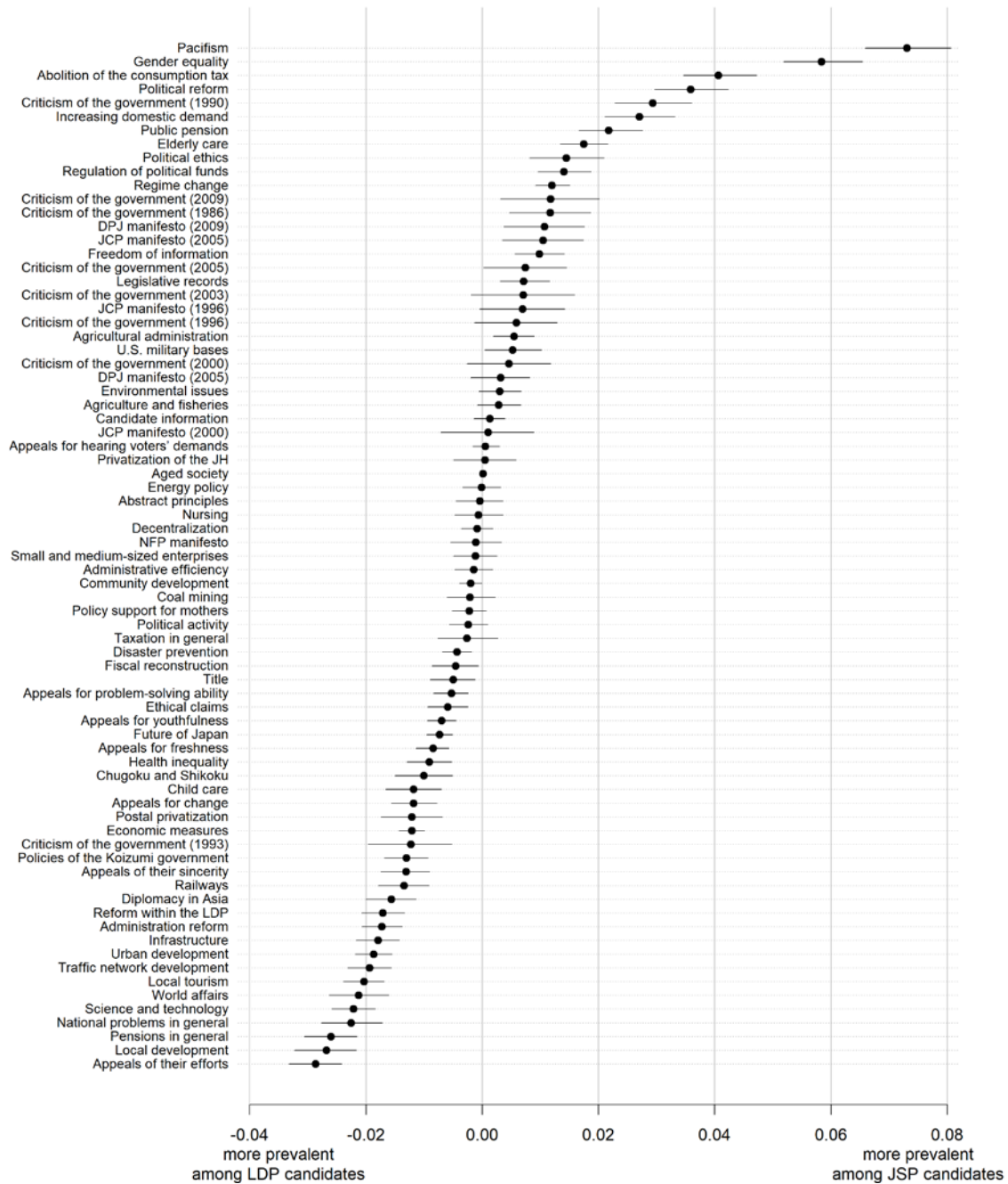
Topic label	Top 10 words with highest probability
Policy support for mothers	children, education, women, society, make, rear, work, elderly, school, safety
Gender equality	society, realize, women, human rights, men and women, welfare, aim, education, labor, peace
Child care	support, institution, encourage, child care, enhance, security, nursing, safety, medicine, region
Pacifism	peace, constitution, maintain, war, oppose, world, living, self-defense force, life, allow
Agricultural administration	agriculture, self-sufficiency, rate, food, farmer, production, prefecture, agricultural administration, rural area

Note: There are only nine frequent words in the “agricultural administration” topic because two of the frequent words (both pronounced *shokuryo* but written with different Chinese characters) have the same meaning in Japanese and are thus translated into the same English word (“food”).

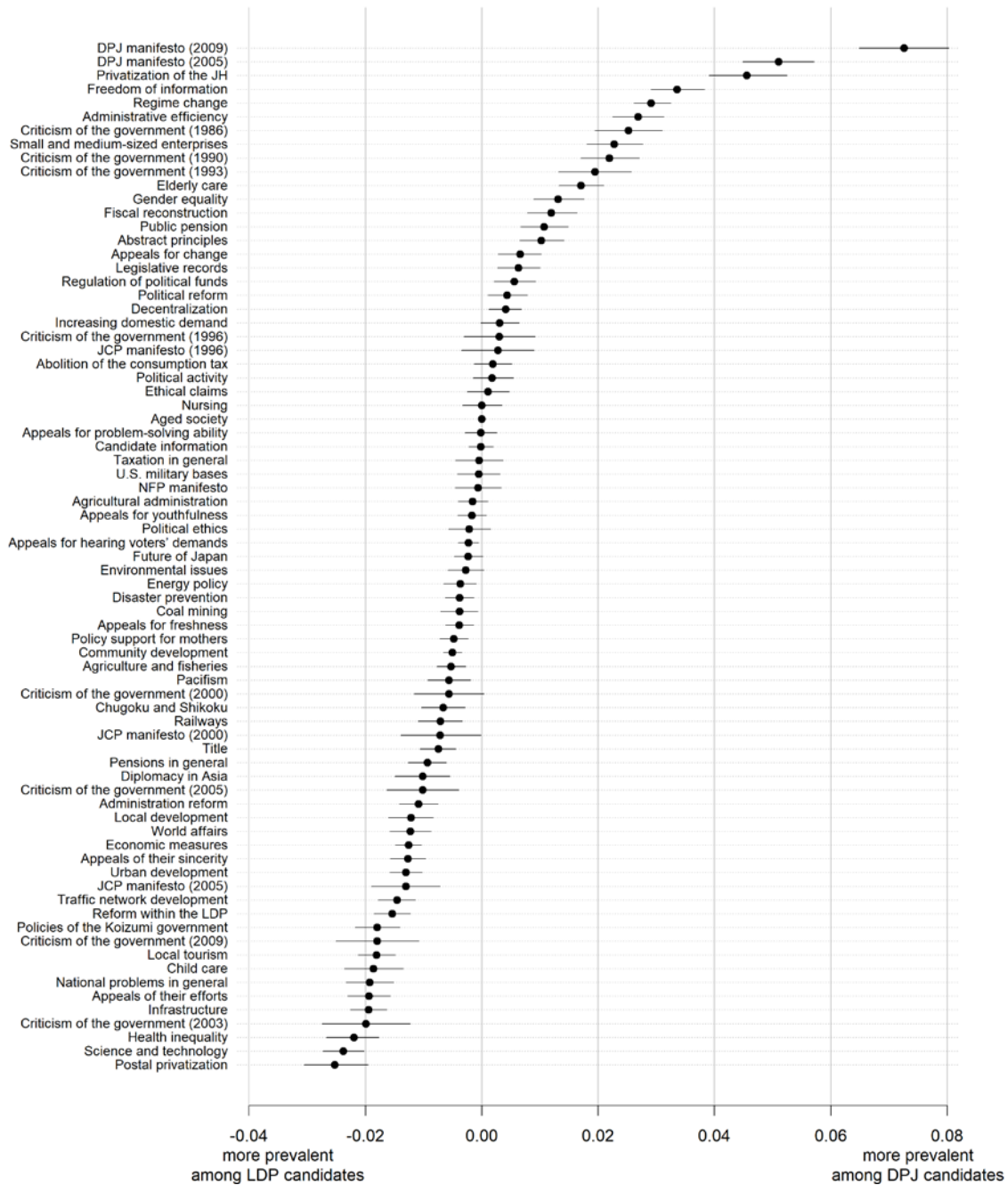




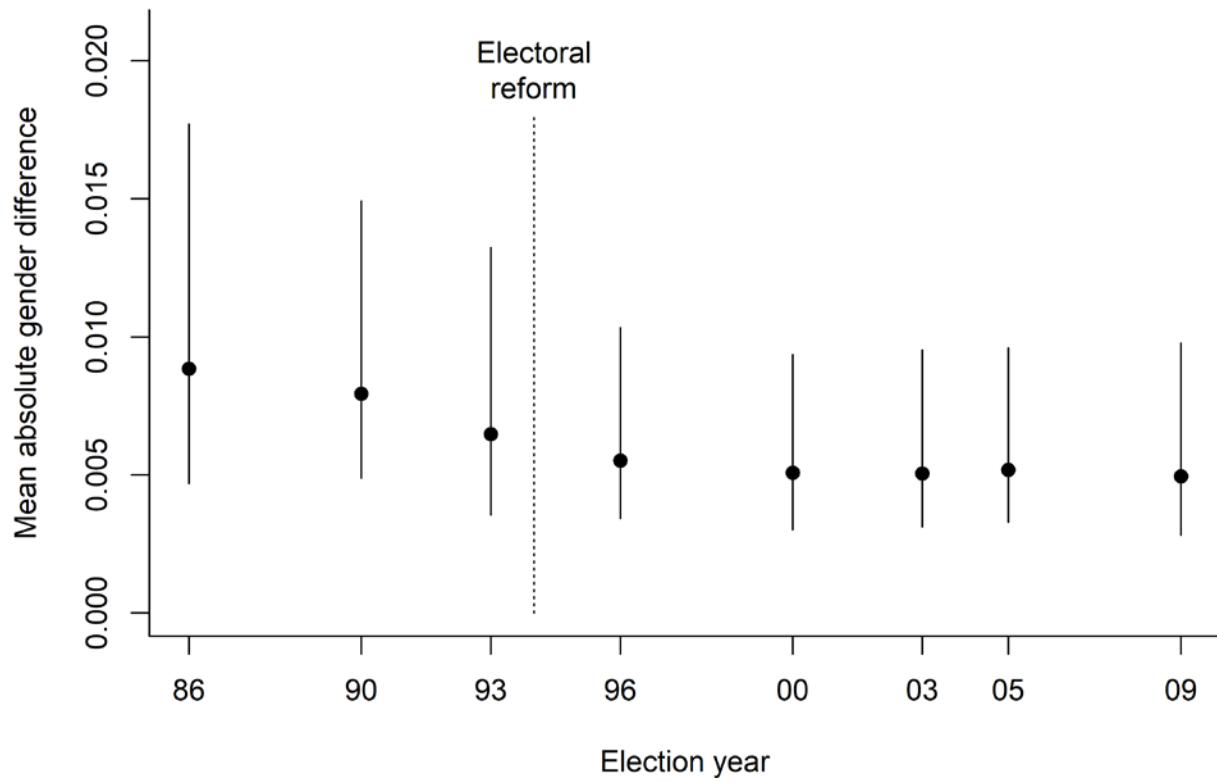
**Fig. 1** Prevalence of topics in manifestos by gender. Dots represent the point estimates, and segments represent 95% confidence intervals. Square dots indicate that the difference is significant at the 5% level after the Holm correction for multiple testing. JH = Japan Highway Public Corporation.



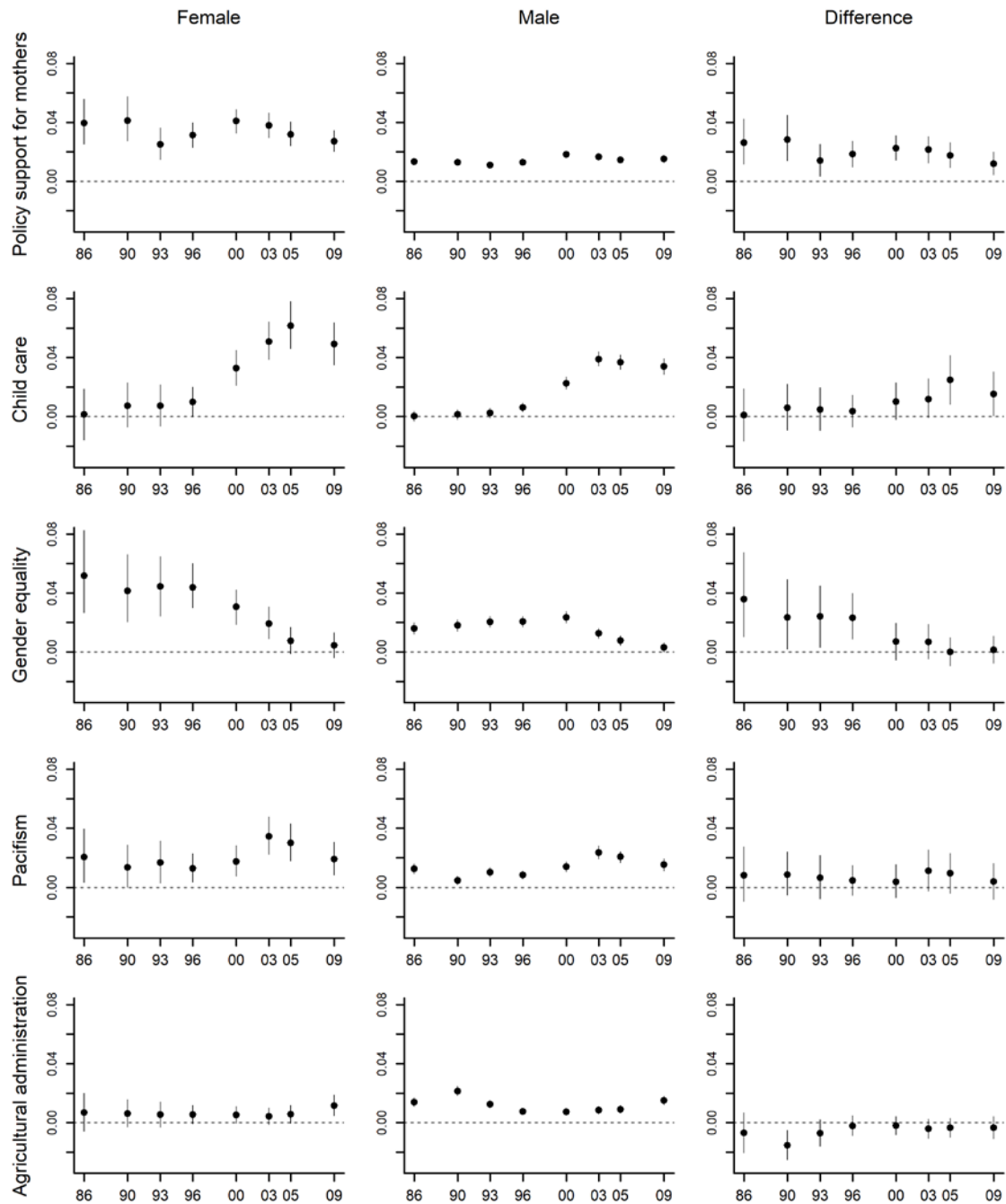
**Fig. 2** Prevalence of topics in manifestos by party affiliation (LDP versus JSP/SDP). The results are based on post-estimation simulation of parameters. Dots represent the point estimates, and segments represent 95% confidence intervals. JH = Japan Highway Public Corporation.



**Fig. 3** Prevalence of topics in manifestos by party affiliation (LDP versus DPJ). The results are based on post-estimation simulation of parameters. Dots represent the point estimates, and segments represent 95% confidence intervals. JH = Japan Highway Public Corporation.



**Fig. 4** Mean absolute difference trend in proportion of topics between female and male candidates' manifestos. The results are based on post-estimation simulation of parameters. Dots represent the point estimates, and segments represent 95% confidence intervals.



**Fig. 5** Expected proportions of topics in male and female manifestos (first and second columns, respectively) and first-difference (third column). The results are based on post-estimation simulation of parameters. Dots represent the point estimates, and segments represent 95% confidence intervals.

**Online Appendix for**  
**Gender Differences in Electoral Campaigns under Alternative Electoral Systems:**  
**Evidence from Quantitative Text Analysis of Election Manifestos in Japan**

**A. Details of the Specification and Estimation of the STM**

**A.1 Specification of Party Affiliation**

The Liberal Democratic Party, Japan Socialist Party/Social Democratic Party, Komeito, Democratic Socialist Party, Japan Communist Party, New Frontier Party, and Democratic Party of Japan all produced more than 100 candidates.

Of the remaining parties, Sakigake, Social Democratic League, New Socialist Party, and Democratic Reform League are leftist, while the New Liberal Club, Japan New Party, Renewal, Liberal Party, Liberal Alliance, Progressive Party, Conservative Party, Reform Club, People's New Party, New Party Japan, Your Party, and Happiness Realization Party are rightist.

**A.2 Estimating the Models and Specifying the Number of Topics**

We use R version 3.4.3 throughout the analyses in this study. We handle a document-feature matrix using `quanteda` package version 1.3.4 (Benoit et al. 2018). We estimate the STM using `stm()` in the `stm` package version 1.3.3 (Roberts, Stewart, and Tingley 2019). We follow the default choices of this function with regard to technical settings such as initial values, an estimation algorithm, and prior distributions of parameters. See Roberts, Stewart, and Tingley (2019) for more details.

We estimate the models varying the number of topics from 30 to 130 by an interval of 10. We compute average semantic coherence and exclusivity, which are the criteria for searching the

number of topics recommended by Roberts et al. (2014). We compute these criteria via `semanticCoherence()` and `exclusivity()` in the `stm` package.

We plot these values in Figure A.1. There is a trade-off between semantic coherence and exclusivity. Because exclusivity hits a ceiling when the number of topics reaches 80 or more but semantic coherence decreases as the number of topics increases even after it reaches 80, we can infer that the number of topics should be 80 or less.

[Figure A.1 about here]

We then estimate the 71- to 89-topic models and examine their average semantic coherence and exclusivity. The results are plotted in Figure A.2. Although this figure does not show that a certain model is clearly superior, we choose the 75-topic model due to its relatively good balance between two measures. We prefer a relatively low number of topics because it is close to the number of topics employed by Catalinac (2016; specifically, 69), who analyzed the same manifesto data examined in our study using latent Dirichlet allocation.

[Figure A.2 about here]

### **A.3 Simulation Procedure**

Here, we explain how we compute first-differences in topic proportions between the male and female manifestos. We conduct a post-estimation simulation to draw the parameters of the topic prevalence model (Equation [2] or [3] in the main text) using `estimateEffect()` in the `stm` package. The package provides a user-friendly function, `plot.estimateEffect()`, which would enable us to estimate first-differences in topic proportions for the variables of interest and visualize them, but we did not use this function because it fixes variables other than the subject of simulation to their median or mode (Hanmer and Kalkan (2013) call this the “average case

approach”). Because the topic proportions of candidate manifestos differ considerably across parties, fixing a candidate’s party to its mode (i.e., the LDP) affects the simulation results for expected topic proportions in the male and female manifestos, which then distorts the evaluation of the relative impact of gender differences. Instead of the average case approach, we employ the “observed-value approach,” which “involves holding each of the other independent variables at the observed values for each case in the sample, calculating the relevant predicted probabilities or marginal effect for each case, and then averaging over all of the cases” (Hanmer and Kalkan 2013, p. 264). Specifically, we compute the expected topic proportion for each observation, but the candidate’s sex is replaced by male or female and the averages over all observations are taken. Then, we take first-differences in topic proportions between males and females. When taking first-differences on a year-by-year basis (i.e., see Figure 4 in the main text), we use only the observations of the year in question to simulate the values.

## **B. Details on the Detected Topics**

### **B.1 List of Topics**

In this section, we list all the topics detected by the 75-topic model in descending order of expected proportion, which is shown in parentheses. For each topic, we construct a summary label based on our interpretation of the frequent words in the topic. We also show the top five words with the highest probability in Japanese and English for each topic. For some topics, we list fewer than five English words because synonyms are combined.

The meanings of the abbreviations used below are as follows: DPJ = Democratic Party of Japan, JSP = Japan Socialist Party, JH = Japan Highway Public Corporation, JCP = Japan Communist Party, NFP = New Frontier Party, LDP = Liberal Democratic Party.



- 1: Criticism of the government (2003)——税, 消費, 憲法, 日本, 増税 / tax, consumption, constitution, Japan, tax increase (3.0%)
- 2: Administration reform——改革, 推進, 教育, 社会, 制度 / reform, advance, education, society, institution (2.6%)
- 3: Appeals of their efforts——図る, つとめる, 推進, 安定, 充実 / try, make an effort, advance, stability, enhance (2.3%)
- 4: Appeals for change——政治, 国民, 持つ, 変える, 感 / politics, people, have, change, feeling (2.0%)
- 5: JCP manifesto (2000)——政治, 日本, 社会, 国民, 自民党 / politics, Japan, society, people, the LDP (2.0%)
- 6: Child care——支援, 制度, 推進, 子育て, 充実 / support, institution, encourage, child care, enhance (2.0%)
- 7: Criticism of the government (2009)——円, 国民, 政治, 日本, 医療 / yen, people, politics, Japan, medical service (1.9%)
- 8: Appeals for freshness——新しい, 政治, 時代, 力, 世紀 / new, politics, age, power, century (1.9%)
- 9: Policy support for mothers——子供, 教育, 女性, 社会, 作る / children, education, women, society, make (1.9%)
- 10: Elderly care——安心, 不安, 年金, 生活, 社会 / relief, anxiety, pension, life, society (1.8%)
- 11: Political ethics——政治, 国民, 生活, 信頼, 豊か / politics, people, life, trust, affluent (1.8%)

- 12: JCP manifesto (1996)——日本, 共産党, 国民, 税, 増税 / Japan, the JCP, people, tax, tax increase (1.8%)
- 13: Criticism of the government (2000)——守る, 社会, 政治, 日本, 国民 / protect, society, politics, Japan, people (1.8%)
- 14: JCP manifesto (2005)——増税, 守る, 反対, 憲法, 国民 / tax increase, maintain, opposition, constitution, people (1.7%)
- 15: DPJ manifesto (2009)——円, 年金, 制度, 地域, 医療 / yen, pension, institution, region, medical service (1.7%)
- 16: Local tourism——地域, 産業, 故郷, 作り, 文化 / region, industry, home, make, culture (1.7%)
- 17: Criticism of the government (1986)——共産党, 自民党, 日本, 費, 政治 / the JCP, the LDP, Japan, expenditure, politics (1.7%)
- 18: Criticism of the government (1990)——税, 消費, 自民党, 廃止, 政治 / tax, consumption, the LDP, abolition, politics (1.7%)
- 19: Public pension——年金, 負担, 円, 制度, 医療 / pension, burden, yen, institution, medical service (1.7%)
- 20: Criticism of the government (1996)——日本, 国民, 共産党, 政治, 消費 / Japan, people, the JCP, politics, consumption (1.7%)
- 21: Infrastructure——整備, 全力, 実現, 取り組む, 交通 / maintenance, do one's best, realize, work, traffic (1.6%)
- 22: Political reform——政治, 改革, 腐敗, 自民党, 実現 / politics, reform, corruption, the LDP,

realize (1.6%)

23: World affairs——世界, 日本, 平和, 国際, 社会 / world, Japan, peace, international, society

(1.6%)

24: Science and technology——技術, 社会, 教育, 力, 心 / technology, society, education, power,

mind (1.6%)

25: Community development——進める, 作り, ひと, 目指す, まち / advance, make, person, aim,

town (1.6%)

26: Gender equality——社会, 実現, 女性, 人権, 男女 / society, realize, women, human rights,

men and women (1.6%)

27: Appeals for problem-solving ability——問題, ひと, 必要, 自分, 解決 / problem, person,

necessary, self, solve (1.6%)

28: Environmental issues——環境, 社会, 地球, 自然, 保全 / environment, society, the Earth,

nature, preservation (1.5%)

29: Criticism of the government (1993)——政治, 改革, 国民, 日本, 自民党 / politics, reform,

people, Japan, the LDP (1.5%)

30: Criticism of the government (2005)——増税, 円, 憲法, 自民党, 税 / tax increase, yen,

constitution, the LDP, tax (1.5%)

31: Appeals of their sincerity——心, 働く, ひと, 政治, 汗 / mind, work, person, politics, sweat

(1.4%)

32: Economic measures——景気, 回復, 対策, 企業, 中小 / economy, recovery, measure,

company, small and medium (1.4%)

- 33: Increasing domestic demand——円, 減税, 税, 教育, 拡大 / yen, tax cut, tax, education, expansion (1.4%)
- 34: Decentralization——地方, 地域, 分権, 国, 中央 / local, region, decentralization, country, center (1.4%)
- 35: Urban development——都市, 整備, 施設, 圏, 文化 / city, maintenance, institution, area, culture (1.4%)
- 36: Pacifism——平和, 憲法, 守る, 戦争, 反対 / peace, constitution, maintain, war, oppose (1.4%)
- 37: Fiscal reconstruction——財政, 介護, 行政, 政府, 経済 / finance, nursing, administration, government, economy (1.4%)
- 38: Policies of the Koizumi government——改革, 日本, 経済, 再生, 安全 / reform, Japan, economy, rebirth, safety (1.4%)
- 39: Local development——郷土, 支援, 県, 発展, あたたかい / local, be granted, prefecture, development, warm (1.3%)
- 40: Future of Japan——日本, 未来, 元気, 創る, 強い / Japan, future, vigorous, create, strong (1.3%)
- 41: Postal privatization——改革, 郵政, 民営, 政府, 郵便 / reform, postal administration, private, government, mail (1.3%)
- 42: Health inequality——医療, 社会, 守る, 保障, 実現 / medical service, society, maintain, security, realization (1.3%)
- 43: Abstract principles——主義, 社会, 自由, 民主, 国家 / philosophy, society, freedom,

democracy, nation (1.2%)

44: Reform within the LDP——改革, 自民党, 政治, 安定, 責任 / reform, the LDP, politics, stability, responsibility (1.2%)

45: Traffic network development——道, 道路, 早期, 自動車, 高速 / road, early, car, highway (1.1%)

46: Candidate information——選挙, 区, 国会, 票, 議員 / election, district, the Diet, vote, legislator (1.1%)

47: Railways——線, 促進, 建設, 実現, 駅 / line, advance, construction, realization, station (1.1%)

48: Agriculture and fisheries——農林, 漁業, 水産, 振興, 農 / agriculture and forestry, fisheries, promotion, agriculture (1.1%)

49: NFP manifesto——税, 消費, 行政, 国民, 改革 / tax, consumption, administration, people, reform (1.1%)

50: Taxation in general——税, 住宅, 生活, 減税, 資産 / tax, house, life, tax cut, assets (1.1%)

51: Appeals for hearing voters' demands——声, 国政, いかす, 政治, 経験 / voice, national politics, reflect, politics, experience (1.1%)

52: Ethical claims——作る, 国, 日本, 社会, 国民 / make, country, Japan, society, people (1.1%)

53: Agricultural administration——農業, 自給, 率, 食糧, 農家 / agriculture, self-sufficiency, rate, food, farmer (1.1%)

54: Administrative efficiency——無駄, 税金, 官僚, 天下り, なくす / waste, tax, bureaucrat,

revolving door, abolish (1.1%)

55: Abolition of the consumption tax——消費, 税, 税制, 廃止, 社会党 / consumption, tax, taxation, abolition, the JSP (1.1%)

56: National problems in general——問題, 我が国, 経済, 努力, 必要 / problem, our country, economy, effort, necessary (1.0%)

57: DPJ manifesto (2005)——年金, 円, 廃止, 兆, 改革 / pension, yen, abolition, trillion, reform (1.0%)

58: Diplomacy in Asia——日本, 外交, アジア, 安全, 世界 / Japan, diplomacy, Asia, safety, world (1.0%)

59: Regulation of political funds——企業, 献金, 政治, 禁止, 政党 / corporation, donation, politics, prohibition, party (1.0%)

60: Freedom of information——市民, 政治, 官僚, 情報, 公開 / citizen, politics, bureaucrat, information, open (1.0%)

61: Legislative records——議員, 国会, 法案, 成立, 委員 / legislator, the Diet, bill, be passed, committee member (0.9%)

62: Regime change——政権, 交代, 自民党, 民主党, 政策 / government, change, the LDP, the DPJ, policy (0.9%)

63: Privatization of the JH——道路, 年金, 高速, 削減, 無料 / road, pension, highway, reduction, free (0.9%)

64: Appeals for youthfulness——世代, 日本, 若い, 挑戦, 歳 / generation, Japan, young, challenge, year-old (0.9%)

- 65: Pensions in general——企業, 充実, 改善, 開発, 教育 / corporation, enhance, improvement, development, education (0.9%)
- 66: Small and medium-sized enterprises——金, 企業, 中小, 保証, 制度 / yen, corporation, small and medium, security, institution (0.9%)
- 67: Title——大臣, 長, 委員, 党, 内閣 / minister, president, committee member, party, cabinet (0.8%)
- 68: U.S. military bases——基地, 沖縄, 米, 軍, 県民 / military base, Okinawa, the United States, military, the people of a prefecture (0.6%)
- 69: Energy policy——エネルギー, 産業, 開発, 秋田, 日本海 / energy, industry, development, Akita, the Sea of Japan (0.6%)
- 70: Political activity——政党, 議員, 政治, 政界, 個人 / party, legislator, politics, political arena, individual (0.5%)
- 71: Nursing——大阪, 老人, ホーム, 守る, 政治 / Osaka, older people, home, maintain, politics (0.5%)
- 72: Disaster prevention——災害, 防災, 京都, 対策, 地震 / disaster, disaster prevention, Kyoto, countermeasure, earthquake (0.5%)
- 73: Chugoku and Shikoku——県, 社会, 徳島, 生活, 岡山 / prefecture, society, Tokushima, life, Okayama (0.5%)
- 74: Coal mining——北九州, 産, 福岡, 郷土, 振興 / Kitakyushu, made in, Fukuoka, local, promotion (0.3%)
- 75: Aged society——社会, 国, 政策, 高齢, 実現 / society, country, policy, older, realization

(0.2%)

## **B.2 Illustrating Manifestos Associated with Topics in Which Gender Differences Are Found**

The STM provides the posterior topic distribution of each document. To justify our topic labeling, we illustrate the manifestos that are most closely associated (i.e.,  $\hat{\theta}_{d,k}$  is the highest manifesto value) with the five topics in which we find significant gender differences in the main analysis (i.e., “policy support for mothers,” “gender equality,” “child care,” “pacifism,” “agricultural administration”). Scanned images of these manifestos are shown in Figure A.3. Additionally, we provide English translations of these manifestos below. We did not translate bibliographies, profiles, and endorsements because these texts are not included in the data analyzed in this study (Catalinac 2018; Shinada 2006).

[Figure A.3 about here]

### **(a) Policy support for mothers**

Candidate name: Naoto Hosaka

Election year: 1996

District: Tokyo 22<sup>nd</sup> district

Affiliation: Social Democratic Party of Japan

Top three most prevalent topics: Policy support for mothers (33.2%), Appeals for problem-solving ability (17.0%), Appeals for change (5.8%)

I love children, so I want to protect them!

Children are now in a difficult time.



Storms of “bullying” are raging in classrooms, and children lead their school lives with bated breath. Even though a bullying-related suicide committed the year before last by Okouchi, a junior high-school student in Aichi prefecture, greatly shocked the nation, there are still countless victims.

The responsibility for such continuous tragedies rests with us adults. Children driven into a corner in schools, homes, and local communities have nowhere to go. We adults are required to devote our wisdom and sympathy to all children. Making a system to protect unstable children at last driven into a corner in a safety zone—this is the role of politics, isn’t it?

However, concrete solutions for the bullying problem have never been discussed in the Diet. The current politics neglecting the most earnest wish of parents in local communities is not good at all.

I have tackled the problems of children and schools for many years as an education journalist and a civic activist. Moreover, I was consulted on and solved countless “bullyings.”

Of course, political topics are not limited to “children” and “school.” However, I focus my efforts on my work, which changes current schools and gives children a bright future. We can do it if we try. I can propose methods and skills based on my abundant experience. I now take a step forward to reform schools in Japan into safe places with children full of smiles.

I want to do this worthwhile task with you.

Vote for the Social Democratic Party of Japan in the Tokyo district of proportional representation!

## **(b) Gender equality**

Candidate name: Yumi Morimoto

Election year: 2000

District: Fukuoka 10<sup>th</sup> district

Affiliation: Social Democratic Party of Japan

Top three most prevalent topics: Gender equality (38.7%), Freedom of information (9.3%), Policy support for mothers (8.5%)

Will you participate in politics with me? Please entrust me with your hope (welfare, peace, education, environment, human rights, freedom of information, and employment).

My determination

- I aim to create a society where all people—including women, older people, young people, children, foreign residents in Japan, and handicapped persons—are not discriminated against and excluded and are cared for, and individual differences are respected as individuality.
- I will put a brake on the competitive society with its law of the jungle, increase budgets for welfare, the environment, and education, and aim to create an inclusive society where we can live with security.
- I promote freedom of information and the disclosure of decision processes in the Diet and a reform of the current institutions and systems to make it easy for citizens to participate in politics.
- I reflect women's voices in policies through women's political empowerment and seek to realize a society where men and women are equal and feel better.

Yumi Morimoto promises

- to realize a gender-equal society.
- to realize an open parliament and a society where diversity is recognized.
- to maintain the pacifist constitution and create a human-friendly welfare society.

- to protect the rights of employees and establish new employment.

Please write “the Social Democratic Party of Japan” for proportional representation.

Toward a 21st century of peace and inclusiveness. High-spirited women will change politics.

### **(c) Child care**

Candidate name: Yutaka Fukushima

Election year: 2003

District: Osaka 6<sup>th</sup> district

Affiliation: Komeito

Top three most prevalent topics: Child care (56.6%), Public pension (9.5%), Nursing (7.9%)

Prominent policy-making skill in the coalition government!

Yutaka Fukushima’s Manifesto

“Yutaka Fukushima,” an expert in medical service and welfare, realized.

- Promoting bone marrow transplant and cord blood transplant (making cord blood transplant covered by insurance)
- Promoting measures for allergies and “sick building” syndrome
- Enhancing pediatric care (e.g., enhancing the emergency care system)
- Promoting measures for long-term care insurance and a preventive care project for low-income people
- Expanding the child allowance
- Promoting a system of assisted fertility treatments
- Supporting self-reliance among single-mother families (passing a bill for employment

support)

- Enacting the Basic Law for Measures for a Society with Declining Fertility

“Yutaka Fukushima” will definitely realize a bright future in the next four years.

- Fundamentally reforming the pension system in 2004 (secure-for-100-years pension plan)
- Creating employment for five million people (selectively investing in 21<sup>st</sup>-century industry)
- Aiming to realize number portability for mobile phones!
- Maintaining “outpatient service specialized for women” in all prefectures
- Expanding the child allowance to third-grade elementary students in the 2004 fiscal year
- Solving the problem of waiting lists for special elderly nursing homes
- Further promoting universal design in stations and surrounding areas

#### **(d) Pacifism**

Candidate name: Kazumi Hara

Election year: 2003

District: Hyogo 1st district

Affiliation: Social Democratic Party of Japan

Top three most prevalent topics: Pacifism (72.2%), Legislative records (3.3%), Gender equality (1.9%)

Peace and life are important.

I make use of the constitution.

When the three defense bills were passed with approval by nine-tenths of the legislators in the Diet, someone said, “The bottom fell out of the constitution.” The constitution, especially

article 9 declaring war renunciation and demilitarization and article 25 stating the people's right to live, which are the most important articles in the constitution, has already become a dead letter.

In the next election, we put a brake on the Koizumi government, which is pushing to make “a country that can go to war,” and aim not to create a selfish and opportunistic society but to create a society with trust based on humanistic contact between individuals. Let's hold each other's hands. Let's widen the network of people who protect the constitution.

**(e) Agricultural administration**

Candidate name: Keiki Ishiyama

Election year: 2005

District: Miyagi 4<sup>th</sup> district

Affiliation: Democratic Party of Japan

Top three most prevalent topics: Agricultural administration (29.6%), Small and medium-sized enterprises (13.0%), Child care (5.8%)

My dream is the restoration of our hometown.

I was born into a rice farmer's family. I have been studying the development of high-quality productive rice plants as a researcher for 10 years, considering it brings stable incomes to rice farmers. However, farmers are becoming poor and cannot wait for the development of science. Agricultural policies with purposeless subsidies and agricultural construction-centered budgetary allocation put many farmers, including my parents, in the red and even threaten their lives. I considered that the only way to help rice farmers in the present situation and ensure a stable supply of rice to consumers is to pursue a fundamental reform of agricultural politics and aim to become

a politician.

Our region has major food-producing areas that sustain the Japanese food supply, such as Osaki rice and Shiogama fishes. However, the decline of the primary industry sector represented by agriculture and fisheries has reduced the purchasing power of the workers of these industries, and shopping districts in our hometown, which used to be very active, are now ruined. The restoration of the primary sector will promote the activation of our region and make it possible to supply safe and secure foods to urban residents.

I intend to go forward under the slogan of “My dream is the restoration of our hometown.”

Approaches to restore our hometown:

Activation of the primary industry sector

- Increasing budgets for agricultural construction to encourage agricultural managers
- Increasing incomes from agriculture and fisheries by expanding the market

The vitality of small and medium-sized enterprises is Japan’s vitality.

- Reducing burdens on small and medium-sized enterprises by abolishing guarantors and the stamp duty
- Restoring shopping districts and making city areas active

Making highways free

- Connecting urban cities and rural towns and restoring towns, agriculture, and fisheries

Creating a secure future

- Unifying pensions and abolishing pensions for Diet members
- Realizing beneficiary-friendly medical and nursing services

### **C. Analysis of Female Candidates’ Strategy When Facing Female Opponents**

We test the hypothesis that female candidates are more likely to represent women when any one of their opponent candidates is a woman by estimating the STM with the following topic prevalence model:

$$\mu_d = \gamma Female_d + \kappa x_d + \lambda Female_d x_d + \alpha_{Year_d} + \beta_{Party_d} + \dots, \quad (A.1)$$

where  $x_d$  is a dummy variable that equals one if document  $d$  is produced in a district where more than one female candidates run and zero otherwise, and  $\kappa$  is its coefficient.  $\lambda$  is a coefficient of the interaction term between  $Female_d$  and  $x_d$ . Other notations are the same as in Equation (2) in the main text.

Figure A.4 shows the results of the post-estimation simulation for the five topics whose prevalence differs between male and female manifestos in the main analysis. For each panel, the left column shows the gender difference in districts where more than one female candidates run, and the center column shows the gender difference districts where only one female candidate runs. The right column shows a second difference: The value shown in the left column minus the value shown in the center column.

[Figure A.4 about here]

The left-most panel shows that the gender difference in the prevalence of “policy support for mothers” is 1.7 percentage points when there is only one female candidate in a district, while the corresponding value is 2.3 percentage points when two or more female candidates compete with each other. The second difference is positive but only marginally significant at the 10% level. Therefore, we cannot conclude that female candidates are likely to emphasize “policy support for mothers” more when at least one of their opponents is a woman. A similar difference is observed for “child care”, but the second difference is not significant. Regarding the other three topics, gender differences in topic prevalence do not vary depending on the number of female candidates

within the districts.

## **D. Analysis of Candidates Who Won the Elections**

### **D.1 Results**

To confirm that our results are replicated for successful candidates, we conduct the same analysis as that in the main text but exclude data on defeated candidates. The number of manifestos analyzed here is 3,531. We set the number of topics to 48 by considering a trade-off between the exclusivity and semantic coherence measures (see Figures A.5 and A.6). A list of the topics is provided in Section D.2.

[Figure A.5 about here]

[Figure A.6 about here]

Figure A.7 shows the simulation results for differences in topic prevalence between men and women. As in Figure 1 in the main text, we conduct conservative tests of the coefficient of a candidate's sex using the Holm correction. The “policy support for mothers” topic is the only topic that passed the test at the 5% significance level.<sup>1</sup> Our simulation indicates that successful female candidates are more likely to refer to this topic by 3.1 percentage points (2.37 times) than are successful male candidates. Although it did not pass the conservative test, the “social welfare” and “pacifism” topics are also more prevalent in female manifestos than in male manifestos, and the gender differences in the proportions of these topics are 1.9 and 1.4 percentage points (1.57 and

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<sup>1</sup> The top 10 words with the highest probability in the “policy support for mothers” topic are as follows: “human,” “children,” “education,” “mind,” “women,” “work,” “important,” “society,” “older people,” and “family.”



1.70 times), respectively.<sup>2</sup> These gender differences in topic prevalence are even greater than the differences found in the main analysis with defeated candidates included. We conjecture that the gender differences found in the analysis of successful candidates did not reach significance because of the reduction in the number of observations (from 7,497 to 3,531), especially the reduction in the number of female manifestos (from 764 to 167). Therefore, our argument that female candidates are more likely to emphasize female-stereotypic issues holds even when we restrict the subject of our analysis to successful candidates.

[Figure A.7 about here]

## **D.2 List of Topics (Analysis of Successful Candidates)**

The list below is similar to that in Section B.

1: Local development——豊か, 社会, 作り, 故郷, 郷土 / affluent, society, make, home, local  
(4.1%)

2: Community development——作り, まち, 教育, 推進, 社会 / make, town, education, promotion, society (3.9%)

3: Social welfare——安心, 社会, 作る, 年金, 制度 / relief, society, make, pension, institution  
(3.7%)

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<sup>2</sup> The top 10 words with the highest probability in the “social welfare” topic are as follows: “relief,” “society,” “make,” “pension,” “institution,” “region,” “anxiety,” “medical service,” “children,” and “life.” The corresponding words in the “pacifism” topic are as follows: “peace,” “welfare,” “maintain,” “society,” “constitution,” “realization,” “life,” “education,” “aim,” and “try.”

- 4: Appeals for honesty——政治, 国民, 実現, 守る, 信頼 / politics, people, realization, maintain, trust (3.2%)
- 5: Appeals of their efforts——推進, 図る, 社会, つとめる, 安定 / promotion, try, society, make an effort, stability (2.9%)
- 6: DPJ manifesto (2009)——年金, 円, 制度, 地域, 月額 / pension, yen, institution, region, monthly amount (2.9%)
- 7: Agriculture and fisheries——振興, 充実, 図る, 漁業, 整備 / promotion, enhance, try, fisheries, maintenance (2.9%)
- 8: World affairs——世界, 平和, 国際, 社会, 環境 / world, peace, international, society, environment (2.8%)
- 9: Economic measures——景気, 回復, 対策, 改革, 社会 / economy, recovery, measure, reform, society (2.8%)
- 10: Appeals for change——日本, 国, 変える, 持つ, 改革 / Japan, country, change, have, reform (2.8%)
- 11: Traffic network development——道, 整備, 道路, 早期, 自動車 / road, maintenance, early, car (2.5%)
- 12: Support for rural areas——地域, 支援, 整備, 対策, 農林 / region, support, maintenance, measure, agriculture and forestry (2.5%)
- 13: Postal privatization——改革, 民営, 郵政, 政府, 民間 / reform, private, postal administration, government (2.5%)

- 14: Policy support for mothers——ひと, 子供, 教育, 心, 女性 / human, children, education, mind, women (2.5%)
- 15: Abolition of the consumption tax——消費, 税, 廃止, 政治, 自民党 / consumption, tax, abolition, politics, the LDP (2.4%)
- 16: Infrastructure——社会, 整備, 地域, 農業, 環境 / society, maintenance, region, agriculture, environment (2.4%)
- 17: Appeals for freshness——政治, 新しい, 時代, 力, 世紀 / politics, new, age, power, century (2.4%)
- 18: Science and technology——技術, 産業, 力, 科学, 時代 / technology, industry, power, science, age (2.4%)
- 19: Decentralization——地方, 改革, 分権, 行政, 国 / local, reform, decentralization, public administration, country (2.3%)
- 20: Appeals for their firm beliefs——政治, 政策, 持つ, 問題, 責任 / politics, policy, have, problem, responsibility (2.2%)
- 21: Railways——都市, 線, 整備, 実現, 交通 / city, route, maintenance, realization, traffic (2.1%)
- 22: National problems in general——必要, 問題, 経済, 国, 日本 / necessary, problem, economy, country, Japan (2.1%)
- 23: Public pension——医療, 制度, 年金, 介護, 保険 / medical service, institution, pension, nursing, insurance (2.0%)
- 24: Child care——支援, 年金, 保育, 制度, 実現 / support, pension, day care, institution,

realization (2.0%)

25: Policies of the Nakasone government——円, 減税, 税, 大型, 中曽根 / yen, tax cut, tax, large,

Nakasone (2.0%)

26: Pacifism——平和, 福祉, 守る, 社会, 憲法 / peace, welfare, maintain, society, constitution

(2.0%)

27: Political mistrust——改革, 政治, 選挙, 国民, 信頼 / reform, politics, election, people, trust

(1.9%)

28: Gratitude for support——郷土, 努力, 大臣, 県, 支援 / local, effort, minister, prefecture,

support (1.9%)

29: Taxation in general——税, 生活, 住宅, 消費, 減税 / tax, life, house, consumption, tax cut

(1.9%)

30: Political reform——政治, 新しい, 改革, 自民党, 作る / politics, new, reform, the LDP, make

(1.8%)

31: Public security——安全, 日本, 食, 外交, 守る / safety, Japan, food, diplomacy, maintain

(1.7%)

32: Administrative efficiency——税金, 無駄, 官僚, 政治, 変える / tax, waste, bureaucrat, politics,

change (1.7%)

33: Environmental issues——政策, 社会, 環境, 国, 経済 / policy, society, environment, country,

economy (1.6%)

34: DPJ manifesto (2003)——道路, 年金, ひと, 廃止, 金 / road, pension, human, abolition,

money (1.6%)

- 35: Criticism of the government (1993)——政治, 改革, 腐敗, 選挙, 金権 / election, reform, corruption, election, power of money (1.5%)
- 36: Administrative reform——行政, 改革, 税, 消費, 介護 / public administration, reform, tax, consumption, nursing (1.5%)
- 37: Civil society——市民, 社会, 政治, 実現, 環境 / citizen, society, politics, realization, environment (1.5%)
- 38: Legislative records——議員, 国会, 委員, 法案, 成立 / legislator, the Diet, committee member, bill, be passed (1.4%)
- 39: Issues in the 2000 election——日本, 教育, 憲法, 国民, 作る / Japan, education, constitution, people, make (1.4%)
- 40: Candidate information——選挙, 区, 議員, 自民党, 政党 / election, district, legislator, the LDP, party (1.4%)
- 41: JCP manifesto (1986–90)——政治, 日本, 国民, 守る, 軍事 / politics, Japan, people, maintain, military (1.3%)
- 42: JCP manifesto (1996–2009)——日本, 国民, 憲法, 政治, 消費 / Japan, people, constitution, politics, consumption (1.2%)
- 43: Okinawan politics——県, 基地, 沖縄, 県民, 振興 / prefecture, military base, Okinawa, the people of a prefecture, promotion (1.2%)
- 44: Budget——円, 兆, 予算, 事業, 財源 / yen, trillion, budget, project, financial resource (1.2%)
- 45: Change of government——政権, 交代, 選挙, 自民党, 民主党 / government, change, election,

the LDP, the DPJ (1.2%)

46: DPJ manifesto (2005)——年金, 円, 廃止, 改革, 兆 / pension, yen, abolition, reform, trillion (1.1%)

47: Abstract principles——自由, 主義, 民主, 社会, 体制 / freedom, philosophy, democracy, society, regime (1.1%)

48: Local topics——市, 政策, 対策, 町, 県 / city, policy, measure, town, prefecture (0.6%)

## **E. Analysis Controlling for District Urbaneness**

### **E.1 Results**

Some may consider that our results are attributable to the gender differences in the degree of urbaneness of the candidates' electoral districts. More concretely, female candidates may be more likely to run in urban districts than male colleagues, and candidates running in urban districts may emphasize feminine topics more frequently than those running in rural districts, regardless of their gender. By using the readily available data on district urbaneness in the 2003 election and later, we reanalyze our model controlling for a candidate's district urbaneness score to test the robustness of our findings. The candidates who ran in the 2003 elections and later total 2,781, and 368 of these are women.

We operationalize the degree of urbaneness of each electoral district by using three variables. The first is the densely inhabited district (DID) population ratio. The DID population ratio is the share of the population living in overcrowded areas. This is published in the national census at the municipality level and has been widely used as a measure of the urbaneness of municipalities in

Japan. We employ the district-level DID ratio, drawn from a dataset provided by Taku Sugawara.<sup>3</sup> The other variables are the percentage of elderly people (aged over 65) and the percentage of the population working in the primary sector in each district. The data for these two variables are provided by Akira Nishizawa.<sup>4</sup>

We estimate the STM in the same manner as in our main analysis, except that we use data only from 2003 to 2009 and add the three variables related to district urbaneness to Equation (2) in the main text. We use the 48-topic model because its exclusivity and semantic coherence measures take a local maximum (see Figures A.8 and A.9). The topics are listed in Section E.2.

[Figure A.8 about here]

[Figure A.9 about here]

We conduct a post-estimation simulation comparable to that in our main analysis. The results are shown in Figure A.10. Only the “Welfare” topic reaches the 5% significance with the correction of multiple testing.<sup>5</sup> The simulation outcomes show that female candidates are more likely to refer to this topic by 2.1 percentage points (1.88 times) than are identical male candidates.

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<sup>3</sup> We downloaded the district-level DID ratio from Sugawara’s personal website, which is not currently available.

<sup>4</sup> District-level census data were downloaded from the following website: <https://home.csis.u-tokyo.ac.jp/~nishizawa/senkyoku/>

<sup>5</sup> The top 10 words with the highest probability in the “Welfare” topic are as follows: “medical care,” “support,” “institution,” “nursing,” “enhance,” “day care,” “child care,” “children,” “expansion,” and “welfare.” This topic seems to be a part of the “policy support for mothers” topic in the analysis using the entire data.

Although conservative tests did not pass the bar of 5% statistical significance, the “community education,” “child care,” and “pacifism” topics, which are female-stereotypic issues, are also referred to by female candidates more often than by male candidates.<sup>6</sup> The difference in the prevalence of these topics between female and male manifestos, from 1.0 to 1.3 percentage points (from 1.45 to 2.00 times), is comparable to the gender differences found in the main analysis. Similar to the results of our analysis of successful candidates in the previous section, the lack of statistical significance is likely attributable to the reduction in the number of observations.

[Figure A.10 about here]

The results in this section imply that the gender differences found in our main analysis are not an artifact of rural–urban differences in candidates’ electoral districts.

## **E.2 List of Topics after Controlling for District Urbaneness**

Below is the list of topics (similar to those in Section B) after the urbaneness of candidates’ electoral districts is controlled for.

1: Criticism of the government (2009)—— 円, 国民, 政治, 日本, 政権 / yen, people, politics, Japan, government (5.1%)

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<sup>6</sup> The top 10 words with the highest probability within these three topics are as follows: “food,” “region,” “society,” “promote,” “education,” “nurture,” “reform,” “base,” “science,” and “heart” for “community education”; “peace,” “constitution,” “protect,” “person,” “society,” “war,” “Iraq,” “education,” “employment,” and “citizen” for “pacifism”; “Japan,” “children,” “vigorous,” “future,” “affluent,” “power,” “education,” “make,” “country,” and “environment” for “child care.”



- 2: JCP manifesto (2003)——政治, 暮らし, 日本, 守る, 憲法 / politics, life, Japan, protect, constitution (4.2%)
- 3: DPJ manifesto (2009)——円, 年金, 制度, 医療, 地域 / yen, pension, institution, medical service, region (4.2%)
- 4: Criticism of the government (2005)——増税, 憲法, 自民党, 日本, 守る / tax increase, constitution, the LDP, Japan, protect (3.6%)
- 5: Elderly care——安心, 社会, 年金, 不安, 制度 / relief, society, pension, anxiety, institution (3.5%)
- 6: Economic measure——対策, 安全, 推進, 改革, 安心 / measure, safe, advance, reform, security (3.4%)
- 7: Criticism of the government (2003)——税, 消費, 憲法, 増税, 日本 / tax, consumption, constitution, tax increase, Japan (3.3%)
- 8: JCP manifesto (2005)——守る, 増税, 反対, 政治, 憲法 / protect, tax increase, opposition, politics, constitution (3.1%)
- 9: Child care——日本, 子供, 元気, 未来, 豊か / Japan, children, vigorous, future, affluent (3.0%)
- 10: International issues——日本, 国, 外交, 社会, 教育 / Japan, country, diplomacy, society, education (3.0%)
- 11: Support for rural areas——地域, 整備, 産業, 社会, 図る / region, maintenance, industry, society, make an effort (3.0%)
- 12: Welfare——医療, 支援, 制度, 介護, 充実 / medical care, support, institution, nursing,

enhance (3.0%)

13: Appeals for change——政治, 日本, 変える, ひと, 新しい / politics, Japan, change, person, new (2.8%)

14: JCP's economic policy——消費, 税, 日本, 年金, 平和 / consumption, tax, Japan, pension, peace (2.7%)

15: Highway——道路, 年金, 高速, 補助, 金 / road, pension, highway, aid, money (2.5%)

16: Regime change——政権, 政治, 交代, 作る, 地域 / government, politics, change, make, region (2.3%)

17: Structural reform——改革, 構造, 地方, 官, 政府 / reform, structure, local, public sector, government (2.3%)

18: North Korea——問題, 拉致, 国民, 解決, 外交 / problem, abduction, people, solve, diplomacy (2.1%)

19: DPJ manifesto (2005)——円, 兆, 年金, 廃止, 改革 / yen, trillion, pension, abolition, reform (2.1%)

20: Public pension——年金, 負担, 保険, 金, 円 / pension, burden, insurance, money, yen (2.1%)

21: Pacifism——平和, 憲法, 守る, ひと, 社会 / peace, constitution, protect, person, society (2.0%)

22: Appeals for hearing voters' demands——政治, 声, 国政, 国民, 生活 / politics, voice, national politics, people, life (2.0%)

23: Postal privatization——郵政, 民営, 改革, 民間, 国民 / postal administration, private, reform, private sector, people (2.0%)

24: Health inequality——医療, 守る, 支援, 対策, 地域 / medical care, protect, support, measure, region (1.8%)

25: Social Democratic Party's manifesto (2009)——労働, 制度, 政治, 平和, 雇用 / labor, institution, politics, peace, employment (1.7%)

26: Agriculture and fisheries——地方, 農林, 地域, 水産, 県 / local, agriculture and forestry, region, fisheries, prefecture (1.8%)

27: Administrative efficiency——無駄, 税金, 官僚, 天下り, なくす / waste, tax, bureaucrat, revolving door, abolish (1.7%)

28: Agricultural administration——農業, 率, 自給, 食料, 安全 / agriculture, rate, self-sufficiency, food, security (1.7%)

29: Local administration reform——改革, 行政, 地方, 法人, 財政 / reform, administration, local, corporation, fiscal policy (1.6%)

30: Traffic network development——整備, 道路, 早期, 道, 駅 / maintenance, road, early, station (1.6%)

31: Anti-Koizumi government——政権, 民主党, 交代, 選挙, 小泉 / government, the DPJ, change, election, Koizumi (1.5%)

32: Community development——作り, まち, 教育, 国, 強い / make, town, education, country, strong (1.5%)

33: Urban development——観光, 都市, 文化, 国際, 産業 / tourism, city, culture, international, industry (1.5%)

34: Anti-corruption policy——政治, 議員, 癒着, 官僚, 国民 / politics, legislator, collusion,

bureaucrat, people (1.4%)

35: Legislative records——議員, 法案, 国会, 委員, 成立 / legislator, bill, the Diet, committee member, be passed (1.4%)

36: Candidate information——区, 選挙, 自民党, 政策, 市 / district, election, the LDP, policy, city (1.4%)

37: Anti-neoliberal policy——円, 増税, 税, 日本, 憲法 / yen, tax increase, tax, Japan, constitution (1.4%)

38: Small and medium-sized enterprises——企業, 中小, 保証, 予算, 個人 / corporation, small and medium, expenditure, individual (1.3%)

39: City declaration——日本, 教育, 宣言, 改革, 都市 / Japan, education, declaration, reform, city (1.3%)

40: Community education——食, 地域, 社会, 推進, 教育 / food, region, society, promote, education (1.3%)

41: Budget——円, 金, 兆, 対策, 地方 / yen, money, trillion, measure, local (1.2%)

42: Energy policy——環境, エネルギー, 産業, 技術, 世界 / environment, energy, industry, technology, world (1.2%)

43: Postal savings——郵便, 局, 円, 貯金, 税 / postal service, office, yen, saving, tax (1.1%)

44: Tax increase——増税, サラリーマン, 税, 反対, 消費 / tax increase, salaried worker, tax, opposition, consumption (1.0%)

45: Social issues——社会, 日本, 環境, 犯罪, 問題 / society, Japan, environment, crime, problem

(1.0%)

46: *Doshu* system——社会, 環境, 実現, 州, 道 / society, environment, realize, state, circuit (1.0%)

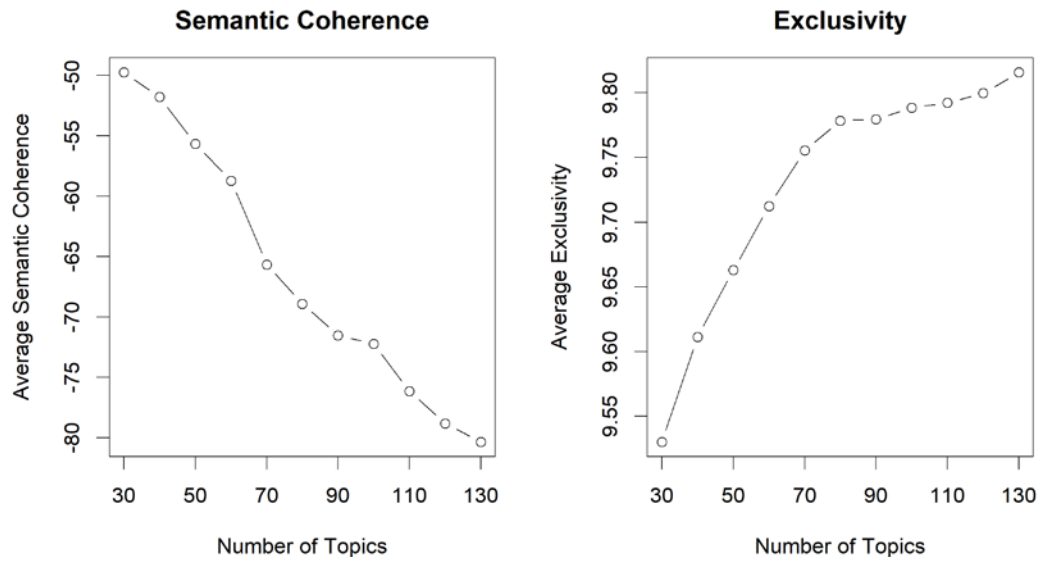
47: Okinawan politics——基地, 沖縄, 軍, 離島, 振興 / military base, Okinawa, military, remote island, promotion (0.7%)

48: Appeals for responsibility——責任, 制度, 日本, 年金, 教育 / responsibility, institution, Japan, pension, education (0.2%)

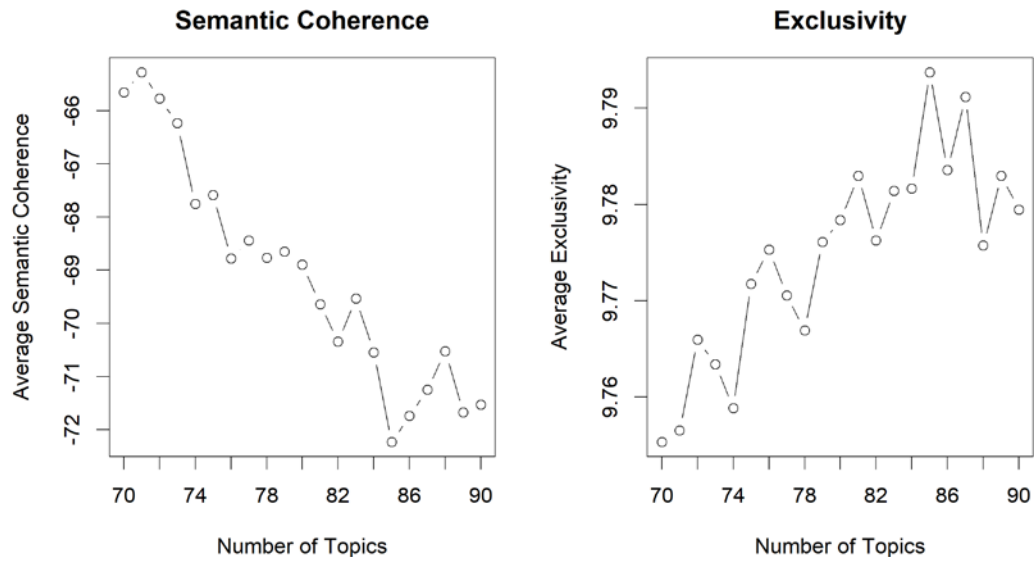
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*Nihon Seiji Kenkyu* 3 (2): 63-91.



**Fig. A.1** Average of exclusivity and semantic coherence (from 30- to 130-topic models).



**Fig. A.2** Average of exclusivity and semantic coherence (from 70- to 90-topic models).





# 福島 豊のマニフェスト

**医療福祉のエキスパート「福島 豊」が実現しました。**


- 骨髄移植・さい帯血移植の推進(さい帯血移植の保険適用を実現)
- アレルギー・シックハウス対策を推進
- 小児医療の充実(救急体制の充実など)
- 介護保険の低所得者対策や介護予防事業の推進
- 児童手当の拡充
- 不妊治療の助成制度の推進
- 母子家庭の自立を後押し(就業支援法を成立)
- 少子化社会対策基本法の制定

**早くも未来のために「福島 豊」は4年間で必ず実現します。**

- 2004年に年金制度を抜本改革(年金安心100年プラン)
- 「女性専門外来」を全都道府県に整備
- 特別養護老人ホーム待機者を解消
- 新たな雇用を500万人(21世紀産業への重点投資)
- 2004年度中に児童手当を小学生まで引き上げを
- 駅・周辺地域のバリアフリー化をさらに推進
- 携帯電話の番号ポータビリティの実現を目指す!

**連立与党 屈指の政策力!**

公明党公認  
自民党推薦  
保守新党推薦



**プロフィール**

- 1958年1月4日大阪府堺市生まれ。45歳。
- 小児喘息で悩んだ経験から医師を目指す。京都大学医学部を卒業。
- 10年間の医師経験を経て1993年の衆議院選挙に出馬し初当選。2000年には厚生総務政務次官として活躍。
- 現在、党政務調査会副会長、同厚生労働部会長、与党「食の安全確保プロジェクト」副座長、衆院厚生労働委員会理事。

**私達も推します。**

公明党代表 大塚幹雄  
門真市長

神崎 武法  
太田 房江  
東 潤

公明党代表代行 大塚幹雄  
安藤

浜四津敏子  
磯村 隆文  
久本 雅美

自民党幹事長 安倍 晋三  
守口市長 喜多 洋三

(c) Child care

**原和美の歩み**

1960年1月1日、福島県南会津郡生まれ。53歳。神戸市外国語大学卒業。同校同窓会執行委員。同校同窓会執行委員。同校同窓会執行委員。

1996年3月、神戸大学大学院法学研究科(公共政策学)修了。

1996年4月、神戸市議会議員に初当選。以来、連任。同校同窓会執行委員。同校同窓会執行委員。

## 大切なのは 平和といのち

**原和美さんを応援します**

赤松 徳治 小山乃里子  
あわはら富夫 佐治 孝典  
家 正治 柴田富子  
井上 力 永倉 寛子  
岡崎 宏美 中田 作成  
おーまきちまき 中川ともこ  
北川れん子 飛田 雄一

**改憲阻止市民の会**

ホームページをご覧ください  
<http://www.h7.dion.ne.jp/~h9plus25/>

**原和美**

はらかずみ

●憲法を活かします

国会で議員の9割が賛成して、有事3法が成立したとき、ある人は「憲法の底が抜けた」と評しました。憲法の中でもいちばん大事な不戦・非武装の9条と国民の生存権を規定した25条を中心に、憲法はすでに形骸化されています。

こんどの総選挙で私たちは、「戦争のできる国」に向かって突っ走る小泉政権にブレーキをかけ、打算の積み重ねによる「都合主義の社会」ではなく、人々の人間としてのふれあいを基礎とした信頼で築かれる社会をめざしたいのです。手をつなぎましょう。そして、憲法を守る人々の輪を広げましょう。

(d) Pacifism

Fig. A.3 Manifestos associated with topics in which gender differences are found (cont.).

# 夢は、地元再生!!

私は、加美郡加美町(旧小野田町)の米農家に生まれました。これまで高品質で生産性の高い稲の開発が米農家の安定した収入に繋がると考え、10年間、科学者として研究を続けてきました。しかし、農家の生活は切迫し、科学の発展を待つことができません。無目的な助成金や農業土木費用中心の予算配分を行う農業政策は私の実家を含め多くの農家を赤字経営とし、その生活さえ脅かしています。米農家が置かれている現状を救い、生活者の皆様に安定したお米の供給をするに唯一の方法は、抜本的な農政改革であると考へ、政治の道を志しました。

私たちが生活する地域は、大崎の米と塩釜の魚という日本の食を支える一大生産地を抱えています。しかし、農漁業に代表される第一次産業の衰退は、その従事者の購買力を落とし、以前大変賑わっていた地元商店街は、今や荒廃しているものがあります。第一次産業の再生復興は地域の活性化を促すとともに都市生活者へ安心安全な食を供給することができるようになります。

私は、夢は、地元再生、を合言葉に邁進する所存です。



**民主党公認**  
**衆議院宮城県**  
**第四区候補者**

## 石山 けんいち

**35歳**

### \* 地元再生のためのアプローチ

#### 一次産業の活性化

- ・ 農業土木の予算を農業経営者の育成へ
- ・ 販路の拡大により、農業・漁業収入の向上を目指す

#### 中小企業の元気が日本の元気

- ・ 連帯保証人や印紙税廃止で中小企業の負担を軽減
- ・ 商店街を再生し、中心市街地に賑わいを

#### 高速道路の無料化

- ・ 都市と農村をつなげ、街と農業・漁業を再生する

#### 安心の未来をつくる

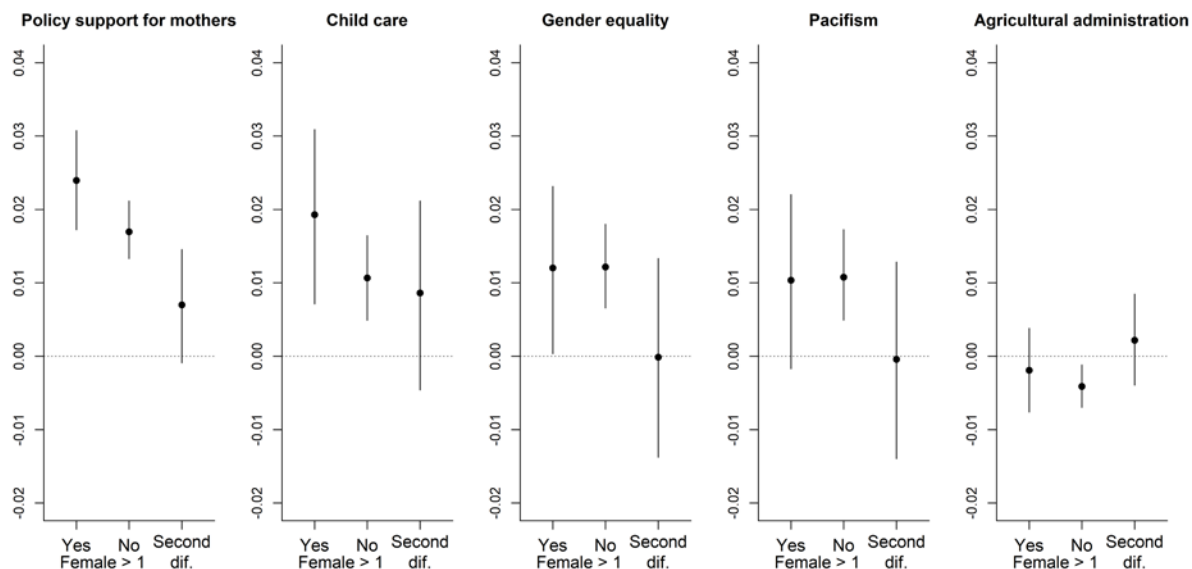
- ・ 年金を一元化し、議員年金を廃止
- ・ 利用者の側に立った医療と介護の実現を

#### プロフィール

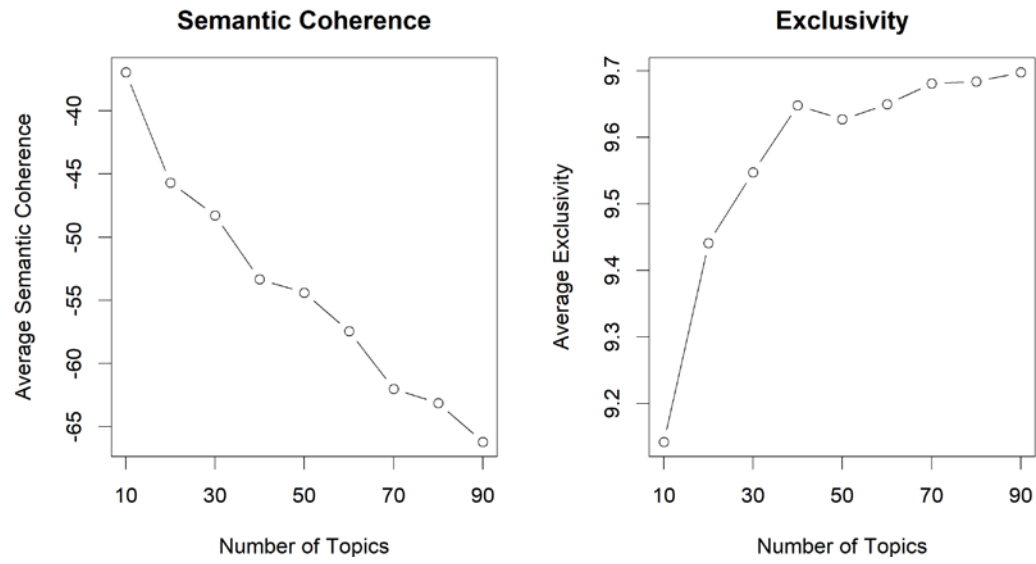
**【生年月日】** 昭和44年12月10日  
**【出身】** 加美郡加美町(旧小野田町)  
**【経歴】** S.57 東小野田小学校卒業  
S.60 東小野田中学校卒業  
S.63 古川高校卒業  
H. 7 東北大学農学部卒業  
H.12 東北大学大学院修了  
**【職歴】** 日本学術振興会特別研究員  
米国のワシントン州立大学  
博士研究員  
理化学研究所研究員  
**【家族】** 妻：育恵 (旧姓・小川)  
S.56 東小野田小学校卒業  
S.59 東小野田中学校卒業  
S.62 古川女子高校卒業  
父：久義  
加美農業高校卒業  
米農家  
子ども：敬華(たかかげ) 7歳  
実弟(みや) 5歳

(e) Agricultural administration

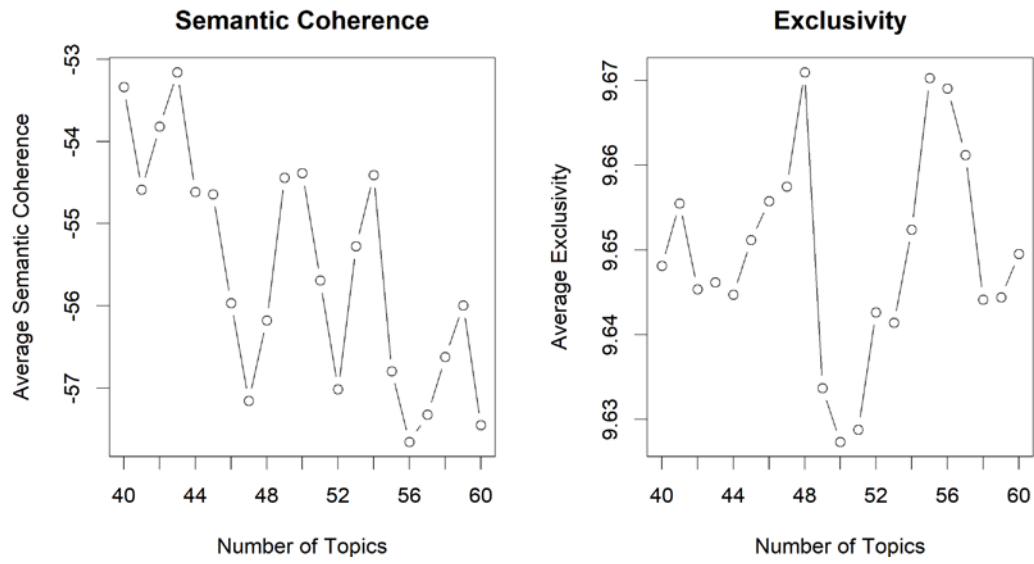
**Fig. A.3** Manifestos associated with topics in which gender differences are found (cont.).



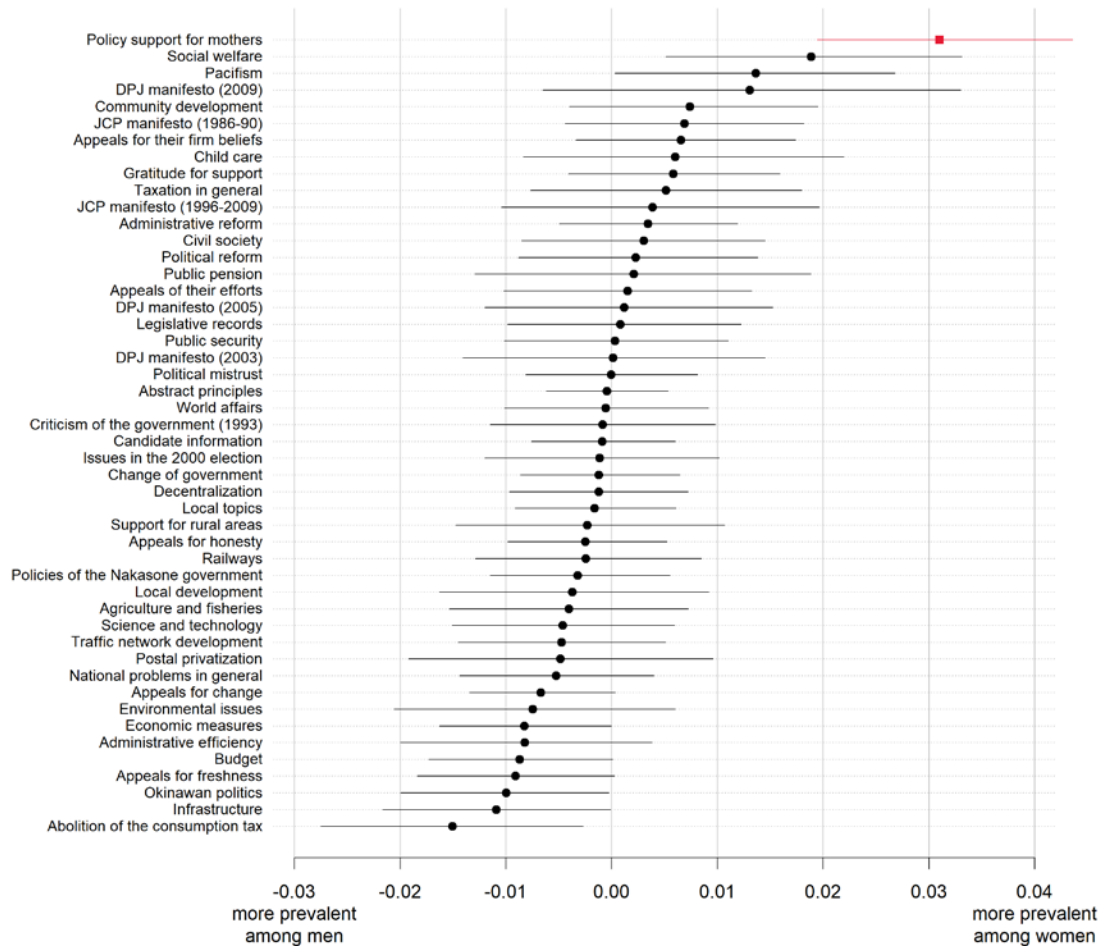
**Fig. A.4** Gender differences in expected proportions of topics and number of female candidates within districts. For each panel, the left column shows (a) a gender difference in electoral districts where more than one female candidates are competing, the center column shows (b) a gender difference in electoral districts where only one female candidate is running, and the right column shows (a) minus (b) (a second difference). The results are based on post-estimation simulation of parameters. Dots represent the point estimates, and segments represent 95% confidence intervals.



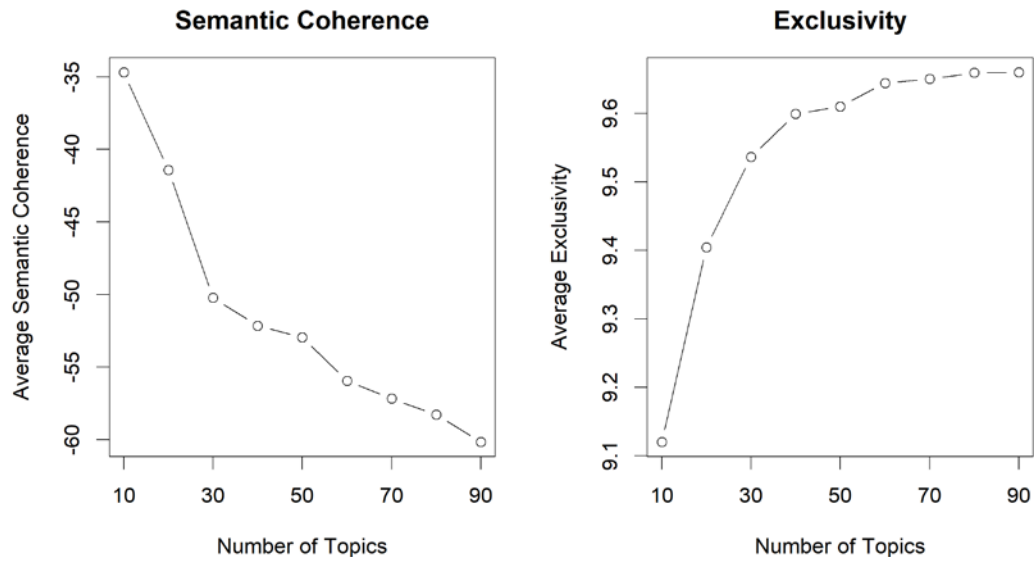
**Fig. A.5** Average of exclusivity and semantic coherence (from 10- to 90-topic models, winners only).



**Fig. A.6** Average of exclusivity and semantic coherence (from 40- to 60-topic models, winners only)

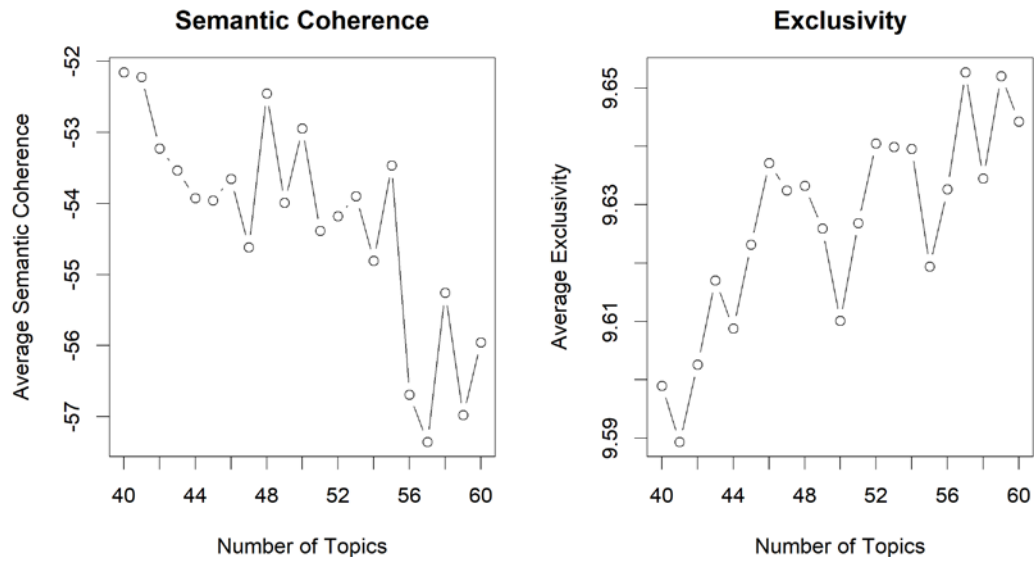


**Fig. A.7** Prevalence of topics in manifestos by gender (only among winners). Dots represent the point estimates, and segments represent 95% confidence intervals. Square dots indicate that the difference is significant at the 5% level after the Holm correction for multiple testing.

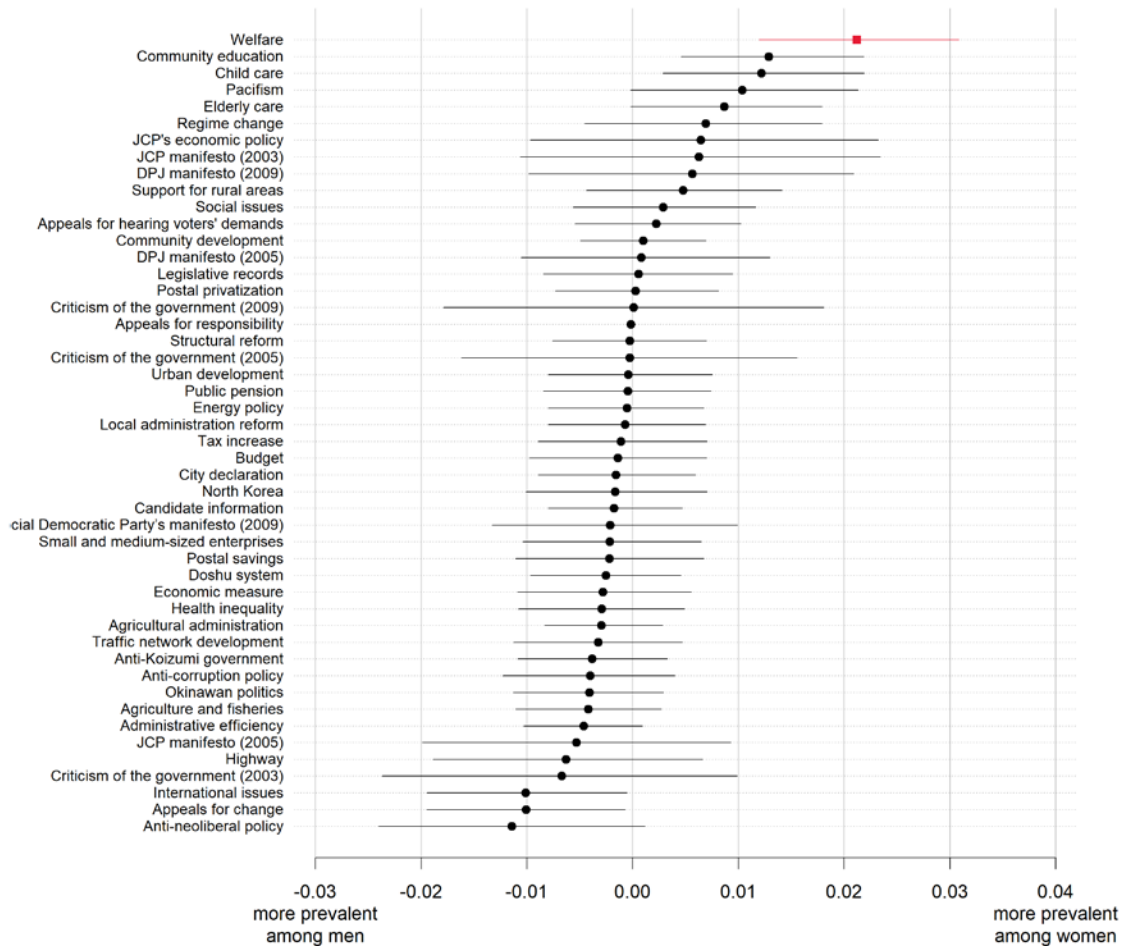


**Fig. A.8** Average of exclusivity and semantic coherence (from 10- to 90-topic models, controlling for district urbaneness).





**Fig. A.9** Average of exclusivity and semantic coherence (from 40- to 60-topic models, controlling for district urbaneness).



**Fig. A.10** Prevalence of topics in manifestos by gender (after controlling for the urbaneness of a candidate's electoral district). Dots represent the point estimates, and segments represent 95% confidence intervals. Square dots indicate that the difference is significant at the 5% level after the Holm correction for multiple testing.