Does Descriptive Representation Facilitate Women's Distinctive Voice? How Gender Composition and Decision Rules Affect Deliberation

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Does low descriptive representation inhibit substantive representation for women in deliberating groups? We address this question and go beyond to ask if the effects of descriptive representation also depend on decision rule. We conducted an experiment on distributive decisions, randomizing the group's gender composition and decision rule, including many groups, and linking individuals' predeliberation attitudes to their speech and to postdeliberation decisions. Women's descriptive representation does produce substantive representation, but primarily under majority rule—when women are many, they are more likely to voice women's distinctive concerns about children, family, the poor, and the needy, and less likely to voice men's distinctive concerns. Men's references shift similarly with women's numerical status. These effects are associated with group decisions that are more generous to the poor. Unanimous rule protects women in the numerical minority, mitigating some of the negative effects of low descriptive representation. Descriptive representation matters, but in interaction with the decision rule.

Deliberation is often thought to be a backbone of democracy (Chambers 2003; Fishkin 1995; Gutmann and Thompson 2004; Habermas 1989), and group discussions are common in a variety of civic and political settings (Cramer Walsh 2007; Gastil et al. 2010; Jacobs, Cook, and Delli Carpini 2009). A key attraction of deliberation is that it can "diminish the discriminatory effects of class, race, and *gender* inequalities" (Gutmann and Thompson 2004, 48, 50; our emphasis).

However, deliberation may instead reflect existing disadvantages of status or power (Fraser 1992; Mansbridge 1983; Sanders 1997; Williams 2000; Young 1996). Women (and other disadvantaged groups) may refrain from voicing their distinctive concerns and perspectives (Cramer Walsh 2007). Deliberation may therefore fail to produce substantive representation for women.

One potential remedy for the problem of voice among disadvantaged groups is to increase descriptive representation of those groups in deliberating bodies. With respect to gender, this means raising the percentage of women who are present, a solution that has been advocated by many. For example, the U.S. National Health Planning and Resources Development Act required gender balance on boards (Mansbridge 1999, 634), as do some states (Iowa Code §69.16A 2010). More than a hundred countries have complied with declarations issued by the European Union (EU), the United Nations (UN), the Organization of American States, and the African Union urging 30% minimum quotas for women in political bodies (Krook 2010, 3, 10).

But does increasing the descriptive representation of women in a deliberating body increase the prevalence of

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women's distinctive concerns in discussion? The empirical literatures on deliberation and on descriptive representation have not studied this question, yet it is central to normative theories of deliberation and representation. We address this gap.

Moreover, descriptive representation may require particular institutional rules before it can remedy substantive representation. Though procedural rules are little discussed in the literatures on deliberation and descriptive representation, we argue that rules can either reinforce or remedy gender inequality in substantive representation. We hypothesize that *under majority rule, women's voice on "care" issues is more muted, and less effective, when women are the gender minority in the group than when they are the gender majority; women's numbers matter much less under unanimous rule because this rule protects numerical minorities.*

We test these propositions using a large experiment on group decisions about income redistribution in which we randomly assign groups to a decision rule and a gender composition. We systematically analyze individuals' own words and link speech with pre- and postdeliberation preferences and attitudes and with group decisions. Previously Karpowitz, Mendelberg, and Shaker (2012) found that rules and compositions that empower women boost women's talk time and perceived influence. Now we ask whether these conditions align the content and outcome of the discussion with women's distinctive concerns, elevating women's substantive representation in deliberation.

We focus on women's representation for two reasons. First, at issue is the equal representation of half the population, a goal far from reality (Crowder-Meyer 2010). Second, as we explain, women far more than men prioritize the protection of vulnerable populations and other such "care" issues (Hutchings et al. 2004). If women gain substantive representation in citizen and elite deliberating bodies, these deliberations may better prioritize care issues.

Setting the Stage

Karpowitz, Mendelberg, and Shaker (2012) reported that when women are assigned to be the numerical minority in deliberating groups instructed to decide by majority rule, they are significantly less likely to speak and to be rated influential than men in their groups, men in the same minority status, and women in other groups (see Figure A1 for a summary; all "A" tables and figures are in the online supporting information). However, this effect obtains only under majority rule, for two reasons. First, by requiring the consent of each member in order to reach a group decision, unanimous rule empowers the minority, therefore narrowing minority women's participation and authority gap with the male majority. Second, unanimous rule also empowers men when they are the numerical minority; hence, women do not experience the same benefit from higher numbers under unanimous rule. These results hold with various controls and alternative specifications. In sum, majority rule closes the gender gap for majority women, while unanimous rule closes it for minority women.

Is There a Different Voice?

Existing work suggests that women tend to be more oriented to care and compassion for vulnerable groups (Huddy, Cassese, and Lizotte 2008; Hutchings et al. 2004; Kathlene 1995; Norrander 2008). In a review of national survey data, Crowder-Meyer (2007) finds that even after controlling on variables such as party identification, women are more likely than men to believe that "it is problematic that not everyone in the United States has an equal chance in life"; are more supportive of government's role in addressing economic distress and needs such as health care; and are more concerned about economic inequality. Women are more eager for government spending on the poor, elderly, and children.

Even more relevant to what people will say in a group discussion are the issues they say are most important when invited to talk with an interviewer in their own words about the nation's pressing needs. Women in such nationally representative survey interviews are "eighty percent more likely than men to mention poverty or homelessness" (Crowder-Meyer 2007, 13).

Women differ most from men on the topic of children. Women are "two and a half times more likely than men to mention children's issues as a most important problem" (Crowder-Meyer 2007, 14). Perhaps most strikingly, "the least commonly mentioned most important problem for men is children's issues, while women are more likely to mention these as a problem than illegal immigration, taxes, outsourcing, and energy and gas prices" (14).

Other settings and behaviors support these findings. College majors that serve populations in need are overwhelmingly female—health (85%), education (77%), and psychology and social work (74%; Carnevale, Strohl, and Melton 2011). Female activists and officials tend to prioritize issues of children and family and are more likely to work to pass measures that benefit them (Burns, Schlozman, and Verba 2001; Carroll 2001). Most relevant to group deliberation, when people are asked to render a verdict in a simulated trial of first-degree sexual assault

on a six-year-old child, women tend to convict and men to exonerate (Golding et al. 2007). So in group deliberation, as in survey and real-world settings, women tend to place a high priority on the needs of vulnerable people and significantly more so than men.

Some issues emerge as distinctive priorities for men. When asked about the country's problems, men tend to talk more than women do about financial issues—outsourced jobs, energy and gas prices, and taxes (Crowder-Meyer 2007).

In sum, women tend to be more concerned with children and the needy than they are with taxes or prices. Men's priorities are often the reverse.

How Gender Composition May Matter

To derive predictions, we begin with gender role theory, which posits that women will be more likely to express their views in settings where women predominate. According to this theory, men tend to be perceived as more competent and enjoy a higher status than women in discussions of what are perceived to be masculine subjects (Ridgeway and Smith-Lovin 1999). Politics is viewed as a masculine arena (Burns, Schlozman, and Verba 2001; Kanthak and Krause 2010), and both men and women perceive women to have less knowledge than men, regardless of actual knowledge (Mendez and Osborn 2010). Women are less likely to talk about politics and to attempt persuasion (Hansen 1997; Huckfeldt and Sprague 1995). They indicate less competence in public speaking and less politically relevant experience than do similarly qualified men (Lawless and Fox 2011). Consequently, when women discuss political issues in mixed-gender groups, they may feel less free or able to discuss issues not articulated by men, and the group decision will be less aligned with women's distinctive priorities (Aries 1998; Croson and Gneezy 2009; Eagly 1987; Giles et al. 1987; Hastie, Penrod, and Pennington 1983; Johnson and Schulman 1989; Ridgeway 1982; Smith-Lovin and Brody 1989). The more men, the less competent women feel to speak to their priorities. Gender role theory thus leads to the "minority status" hypothesis: being a numerical minority places women in a lower status relative to men in the group, reducing mentions of women's distinctive "care" priorities and the weight the group gives to these in its decision.

The "minority status" hypothesis is seconded by a parallel set of findings that highlight the importance of gendered norms. In groups with many men, the interaction tends to take on characteristics of individual assertion, competition, and dominance; in settings with many women, people tend to interact in a style that emphasizes cooperation, intimacy, and the inclusion of all (Aries 1998; Dindia and Allen 1992; Kathlene 1994; Miller 1985; Smith-Lovin and Brody 1989). Women may thus feel comfortable expressing distinctively feminine concerns in predominantly female groups and feel ill at ease doing so in predominantly male groups.

The Decision Rule

We argue that institutional rules will moderate the effect of numbers because institutions can provide incentives to include social minorities in group decision making. The "minority status" hypothesis is thus incomplete: correct under majority rule, but not under unanimous rule.

Previous work suggests that unanimous rule creates consensus-oriented norms of inclusion that can protect numerical minorities (Bouas and Komorita 1996; Hastie, Penrod, and Pennington 1983; Kameda 1991; Kaplan and Miller 1987; see also Mendelberg 2002). We argue that this protective effect for *preference* minorities holds for *social identity* minorities, including gender minorities. Because it insists that every vote—and voice—is needed for collective decision making, unanimous rule equalizes minority women with majority men, thereby helping women when they are a minority. But it also empowers minority men, preventing majority women from leveraging the power of their numbers.

Thus, decision rule and gender composition interact to shape the content and outcomes of group discussion; hence, our "interaction hypothesis." Minority women will be included more under unanimous than majority rule and feel more welcome to articulate views that differ from men's, increasing their willingness to discuss women's distinctive issues. Consequently, minority women obtain better substantive representation under unanimous than majority rule, mentioning more "care" issues and aligning group decisions with these priorities.

But because it helps any minority, unanimous rule also empowers minority men, muting the effect of women's increased numbers. Karpowitz, Mendelberg, and Shaker (2012) found evidence of this in their work on talk time, a measure that allows for a direct comparison of men's and women's relative disadvantage as gender minorities. Under unanimous rule, majority and minority women will mention care issues at roughly equal rates, and the group outcome will not shift toward women's distinctive priorities. Because majority women under unanimous rule do not reap an advantage from their numbers, while majority women do so under majority rule, majority women are worse off under unanimous than majority rule.

To summarize, our interaction hypothesis predicts the following: (1) Women mention care issues the least,

and succeed the least in aligning the group's decision with those issues, as minorities under majority rule, because their low numbers disadvantage them. (2) Women mention care issues most, shifting the outcome accordingly, as majorities under majority rule, where they benefit from high numbers without the encumbrance of a consensus norm empowering minority men. (3) Minority women mention care issues, with corresponding outcomes, more under unanimous than majority rule, while (4) majority women do the reverse.[1]

Thus, our interaction hypothesis contradicts gender role theory by (1) arguing that minority women are not inevitably quiescent about women's distinctive issues when they are a minority, because unanimous rule protects them, and (2) predicting a rising voice for women with increasing numbers of women only under majority rule. In addition, it adds a unique prediction about the disadvantages for majority women under unanimous rule. Positing the interaction of gender composition and institutional rules is our theoretical contribution to better understanding both representation and deliberation.

A final caveat is in order: differences apparently due to gender may be spuriously caused by attitudes correlated with individual gender. We examine deliberation about income redistribution, so political ideology is a possible confound (Shapiro and Mahajan 1986). We control for the individual's liberalism and the number of liberals in the group. We also replicate the results with controls on the person's predeliberation redistribution preferences and his or her membership in the predeliberation preference majority.

Data and Methods

We fielded a fully crossed 6×2 between-subjects design by randomly assigning individuals to a five-member discussion group composed of between zero and five women and randomly assigning each group to unanimous or majority rule. Random assignment allows us to gauge the unbiased effects of group-level treatments. To randomize gender composition, we randomly assigned compositions to dates on the schedule of experimental sessions; subjects who signed up to attend a session were thus assigned to the corresponding gender-composition condition (recruiting alternates to ensure the assigned composition).[2] This ensured that composition did not cluster on particular days of the week, and participants had a roughly equal probability of being assigned to a composition, satisfying the random assignment assumption (Morton and Williams 2010). Randomization checks and propensity-score analyses show that groups are equivalent on relevant covariates.[3]

We recruited students and community members at two different sites—a small town on the mid-Atlantic coast and a medium-sized city in the Mountain West. Because subjects were randomly assigned within but not across sites, we control on site. The basic results are the same at both sites. In total, we have 470 individuals in 94 groups (Table 1).[4]

We adapted the protocol of an earlier study by Frohlich and Oppenheimer (1990, 1992). As in that study, participants were told that they would be performing tasks to earn money, and that the amount they actually received would be based on their task performance and the group's collective decision about redistribution. They were not told the nature of the work task until after the group made its decision about how the money earned during the task would be distributed.[5] After privately filling out a pretreatment questionnaire and receiving information about different principles of income distribution, individuals sat with their assigned group around a table. They were instructed to conduct a "full and open discussion" to decide collectively (by secret ballot) on the "most just" principle of redistribution and set a poverty line in dollars. All instructions other than the decision rule were identical across conditions. On average, groups discussed for 25 minutes (SD = 11). Following Frohlich and Oppenheimer (1990, 1992), we instructed participants to reach a group decision that would not only apply to themselves but also could apply hypothetically to society, in order to generalize beyond the lab to the decisions people make about redistribution in politics. Participants then returned to private computer stations and completed the protocol, including assessing the group's functioning, performing tasks to earn money, and answering questions on their attitudes.

We taped and transcribed each individual's speech and matched it with his or her individual characteristics,

[1] We have no prediction for differences across decision rule in groups comprised entirely of women.

[2] More than five participants were scheduled per session, ensuring that we could fill the session's assigned gender composition. For additional details, see Section D of the online supporting information.

[3] For full details, see the supporting information (Section D.4).

[4] As is common in experiments, our goal was not a nationally representative sample but one with reasonable variance, and we met this goal (see the supporting information, Table A1). Because race likely introduces powerful interactions, we ran the study only with non-Hispanic whites.

[5] Work tasks involved correcting errors in a text and are not of substantive importance here.

Table 1 Experimental Conditions and Sample Size

	# Unanimous Groups	# Majority Groups	Total # Groups	# of Individuals
0 Females	8	7	15	75
1 Female	10	9	19	95
2 Females	6	7	13	65
3 Females	9	7	16	80
4 Females	8	8	16	80
5 Females	7	8	15	75
Total # of Groups	48	46	94	
# of Individuals	240	230		470

including gender.[6] A sample transcript is in the online supporting information. Our content analysis of speech relied on the Linguist Inquiry and Word Count (LIWC) software (Newman et al. 2008), which counted words in a priori categories we defined. We computed two versions of our dependent variables: (1) a dummy variable indicating whether or not the person mentioned any words in a category at least once (*Mention*) and (2) the number of category words per thousand spoken (*Frequency*).[7] When multiplied by the total number of women in the group, even small individual increases in *Frequency* can mean dramatic changes in the number of times the concept is raised overall during the group's deliberation.

Our "care" categories correspond to women's distinctive issue priorities outlined above: (1) children, (2) family, (3) poor, and (4) needy.[8] We use three contrast categories for the purpose of discriminant validity: (1) rich, (2) salary, and (3) taxes. "Rich" resembles children, families, and the poor in referencing a social group, but it is not one that women prioritize. It serves as a placebo. "Salary" and "taxes" reflect the distinctive priorities of men. Full word lists are in the online supporting information.

References to such care issues are found throughout the transcripts. For example, in the midst of a discussion about how much is needed to survive in today's society, a woman asks, "Let's say there's one person who's bringing the income and then a spouse and a child or something like that, or you could even spend it as a single, like, mother who's working with two kids. How much do they need to get by or something like that?" In another group, a woman volunteers, "[I'd] consider a hand-out because I'm poor. My husband is college educated. I'm trying to go to school, and I have two children, nursing one of them." These are typical examples of how themes of children, family, poverty, and the needs of vulnerable populations emerged in the deliberation. Additional examples are in the online supporting information.

While our word-count method has the virtues of simplicity and ease of systematic analysis, it cannot tell us what is being said about these categories. To rule out the possibility that speakers mention women's distinctive topics unsympathetically, we classified each mention as sympathetic, neutral, or negative. The unit of analysis is the speaking turn containing a reference to care issues ($n = 1926$, the entire set of "care" words we analyze below). For example, negative mentions include "rob from the rich to give to the poor." Examples of sympathetic phrases are "whether the poor ever get help by anyone, that is not even raised here"; "if like the range is like 50,000 or whatever . . . then the poorer they don't get anything. It's kind of risky"; "I thought maximize the floor income was, that was my number one, help those who have the least." Mentions are rarely unsympathetic: 11.7% are positive, 5.0% negative, and 79.8% neutral.[9]

Results

When Do Women Talk about Care Issues?

Building on results from Karpowitz, Mendelberg, and Shaker (2012), we expect that women discuss care issues the least in the conditions that most disadvantage women's floor time and influence—majority rule with

[6]Details on procedure, subjects, item wordings, coding/descriptives (Table A2), and other methodological matters are in the supporting information.

[7]On average, women spoke approximately 700 words over 3.5 minutes, while men spoke approximately 800 words over 4 minutes, but averages vary significantly across the experimental conditions.

[8]We chose not to define women's distinctive priorities based on the most frequently used words uttered by women versus those uttered by men in our discussions because that would be tautological.

[9]The remaining 3.5% turned out to be substantively unrelated to care issues.

minority women. And that is what we find. Women's average individual *Frequency* of care issues in this setting is 6.3 words per 1,000, about half their care *Frequency* in any of the other settings. Also as expected, the setting producing the highest women's care *Frequency* (15 per 1,000) is the setting where women's influence and speaking are highest—majority rule with majority women.[10] *Frequency* is in between these two extremes for unanimous rule groups with minority or majority women (11 words per 1,000).[11]

For multivariate tests, we employ probit for *Mention* and OLS for *Frequency.*[12] The unit of analysis is the individual speaker, and we employ cluster robust standard errors to account for the fact that individuals are nested within groups. We estimate two models. For predicted values, we estimate a set of dummy variables representing each condition, and control on site, number of liberals (a count from 0 to 5), the subject's liberalism, and (for *Mention)* the log of the person's overall word count to control for overall verbosity (Table A3). To better test the predicted interaction of rule and gender composition and include additional controls, we estimate a model containing a dummy variable for majority versus unanimous rule, a count of the number of women (1 to 4), a variable that multiplies the two, and control on site, liberals, liberalism, the subject's predeliberation preference over redistribution, and the subject's membership in the predeliberation preference majority.

Panel A of Figure 1 displays the predicted values for the topics we identified as of distinctive concern to women: the poor, children, family, and the "needy," depicting the overall *Frequency* summed over the four care topics. If descriptive representation enhances substantive representation, then it will increase talk on women's distinctive concerns. And that is what the figure shows, but as predicted, only under majority rule. As the number of women increases, so too do women's references to care topics. The effect is quite large. *Frequency* for a care topic more than triples, moving from 4.2 to 14.8 words per 1,000. The analogous increase in the predicted probability of *Mention* is from 18% to 54%.[13] Moreover, there is no effect under unanimous rule with either *Mention* (Figures A2 and A3) or *Frequency* (Figure 1). Notably, Figure 1 also shows that the increasing talk of care issues is not found for financial issues that tend to be favored by men (taxes, salary; Panel B) or for the placebo category "rich" (Panel C).

To directly test the predicted interaction of rule and gender composition, we estimated a linear model for the mixed-gender groups (Table 2). The interaction term is significant, confirming that the effect of descriptive representation differs under the two rules.[14] Its magnitude and standard error are virtually unchanged no matter whether we control for group and individual ideology, use a dummy for majority liberals, interact controls for liberalism with rule, omit these controls, or replace them with predeliberation redistribution preferences, membership in the group's predeliberation preference majority, and/or age in a variety of configurations (Table 2).[15] In addition, when we remove the individual-level controls and estimate our interactive model at the group level only (see Table A4), we again find the same strong evidence of an interaction between decision rule and gender composition.

We replicated these results with another method, the TM module in R, which identifies the words most frequently used by the sample and calculates for each its proportion of the person's total words. We classified these most frequent words as care issues using the same a priori criteria we applied to the other count.[16] Using this alternate method, we again find a significant interaction between gender composition and decision rule, with women devoting more attention to care issues in majority-rule groups with many women (Table A5).[17]

[10]The difference from groups with minority women is significant at $p < .01$, two-tailed *t*-test. *Mention* also shows a large, statistically significant difference across these conditions ($p < .01$).

[11]This paragraph reports raw sample means excluding all-female groups. In all-female groups, *Frequency* is high across both rules (13.2 in unanimous and 14.6 in majority).

[12]Ordinary least squares (OLS) on *Mention* yields similar results.

[13]See Figure A2, panel A, in the supporting information. These are differences between one and five women; four-woman groups are similar to enclaves. Figure A2 shows average *Mention* over the four care topics. Figure A3 shows that these results are not limited to only one care topic.

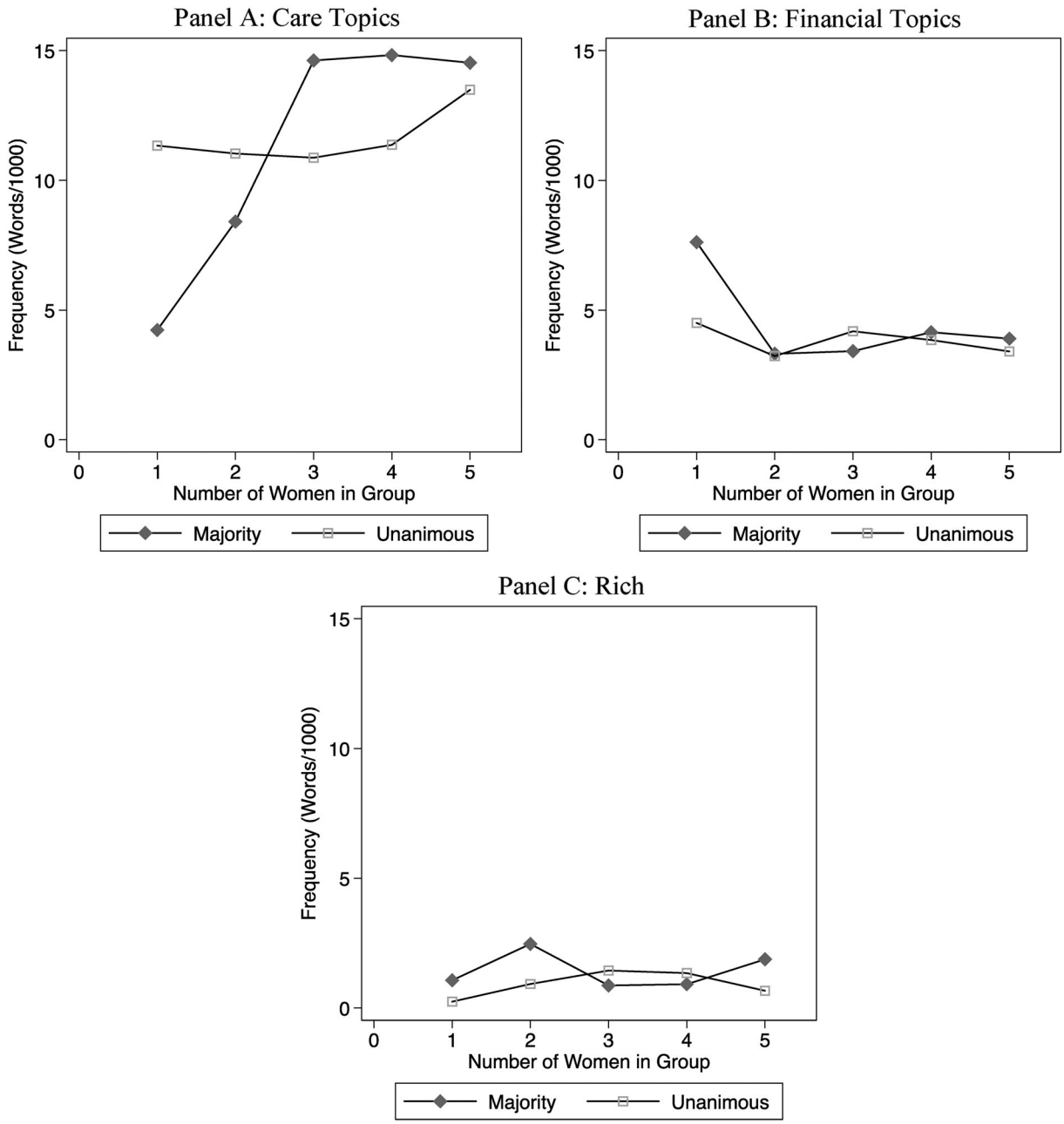
[14]The coefficient for "Majority Rule" indicates that at the gender composition intercept, women's care *Frequency* is lower under majority than unanimity. Because these models analyze women, they omit groups with 0 women, so the magnitude of that coefficient has no meaning in isolation from the interaction term. Wald tests of predicted values from the model confirm that the *Frequency* of care issues is greater under unanimity than majority rule in groups with one woman ($p = .03$, two-tailed).

[15]Age results available from authors. The correlation between gender and liberalism is weak at the individual ($p = .07$) and group ($p = .04$) level.

[16]The words identified by the two methods overlap, suggesting that the words we chose a priori are among the most often used, but they differ enough that the similar results provide somewhat independent replication.

[17]The effect of number of women (1–4) under majority rule on financial issues using TM is negative: $b = -.196$, $SE = .066$, $p = .004$. The model controls on site, rule, and rule∗number of women, excluding all-female groups.

FIGURE 1 Average Frequency of Words Used among Women, by Rule



When women are outnumbered, the paucity of women's topics can be quite striking. Under majority rule, lone women *never* mention family, and only 13% of minority women mention children at least once. In the unanimous condition, however, 46% of minority women mention children (with similar findings for family; $p < .01$ for children and family; all from raw means), making unanimous rule all the more important in protecting minority women's voice.

When Do Women Introduce Care Issues?

How do care issues get on the agenda in the first place? An important measure of women's voice is whether they introduce the topics of distinctive concern to them into the deliberation. Figure 2 depicts how often a woman was the first one within the group to mention a topic of specific concern to women, coded at the group level. The dotted line in Figure 2 shows how often women would mention

TABLE 2 ***Frequency*** **of Care Issues among Women: Ideology Controls vs. Preference Controls**

Variables	(1) Liberalism Controls	(2) Liberalism Controls 2	(3) Liberalism Controls 3	(4) Preference Controls 1	(5) Preference Controls 2
Majority Rule	−1.035**	−1.249***	−1.280***	−0.959**	−1.015**
	(.446)	(.444)	(.423)	(.448)	(.443)
Number of Women	−0.001	0.001	−0.008	0.044	0.017
	(.086)	(.086)	(.088)	(.088)	(.086)
Majority*Number of Women	0.367**	0.345**	0.377**	0.344**	0.366**
	(.158)	(.168)	(.154)	(.154)	(.155)
Individual Liberalism	0.004	0.009	0.012	–	–
	(.337)	(.344)	(.348)		
Number of Liberals	0.024	−0.023		–	–
	(.091)	(.080)			
Majority*Number of Liberals	–	0.143	–	–	–
		(.147)			
Majority Liberals	–	–	−0.119	–	–
			(.258)		
Majority*Majority Liberals	–	–	0.646	–	–
			(.442)		
Rank of Floor Principle	–	–	–	−0.215*	–
				(.109)	
Rank Max Redistribution First	–	–	–	–	−0.182
					(.221)
Rank No Redistribution First	–	–	–	–	−0.212
					(.305)
Matched Principle Pref. Maj.	–	–	–	−0.234	−0.092
				(.149)	(.179)
Constant	0.929***	1.021***	1.068***	1.257***	0.991***
	(.293)	(.232)	(.285)	(.330)	(.326)
Observations	157	157	157	156	157
R-squared	0.108	0.118	0.134	0.123	0.111
Control for Experimental Location	Yes	Yes	Yes	Yes	Yes

Note: Cluster robust standard errors in parentheses. *$p < 0.10$, **$p < 0.05$, ***$p < 0.01$, two-tailed test.
Groups composed of five women excluded.

care topics first if there were no difference between men and women (e.g., women would be first-mentioners 40% of the time when they composed 40% of the group). When women are in the minority, the first mention of a care topic was made by a woman in only 6% of groups under majority rule, but in 31% of groups under unanimity rule ($p < .04$, one-tailed, raw means). The difference between rules disappears when women are the majority (53% under majority versus 47% under unanimity rule, n.s.).

The pattern is familiar. Descriptive representation helps women but primarily under majority rule, and unanimous rule ameliorates minority women's quiescence. Women reach or approach equality as a majority under majority rule or as a minority with the minority-friendly unanimous rule. The magnitudes are striking. For example, no lone woman is the first to mention care issues under majority rule, but a lone woman produces the highest individual likelihood of first mentions under unanimous rule.

To control for individuals' "care" *Frequency,* verbosity, and liberalism and on liberals and location, we estimated an individual-level probit model. The interaction of rule and composition remains strong and significant.[18] Thus, both group- and individual-level analyses show that

[18]See Table A6 of the supporting information.

FIGURE 2 First Mention of Care Topic by Women (Raw Means, by Group)

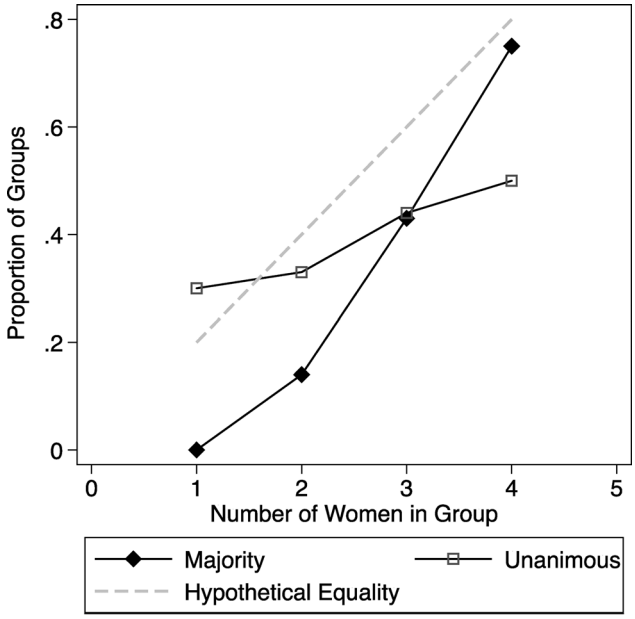
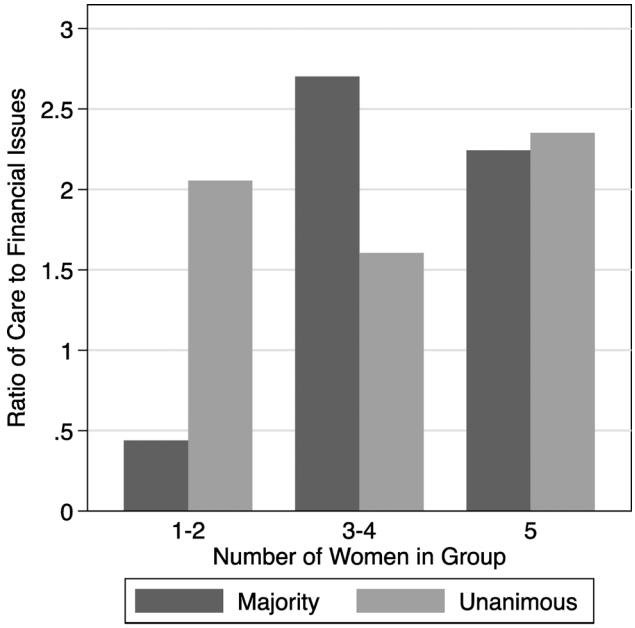


FIGURE 3 Ratio of Care *Frequency* to Financial *Frequency* among Women



women introduce care issues more often in conditions that empower them by the combination of numbers and rule.

How Do Women's Distinctive Issues Compare to Men's Distinctive Issues?

We can get a clearer picture of women's substantive representation by examining the relative balance of care and financial topics across the conditions. We do this by computing the ratio of average *Frequency* of care topics to average *Frequency* of financial topics for each individual in the experiment.[19] The ratios are shown in Figure 3 (raw means by condition) and support our interaction hypothesis.[20] Majority status matters under majority but not unanimous rule: the average woman's ratio of care to financial topics increases under majority rule, from 0.44 as a minority to 2.7 as a majority ($p < .01$), but it declines slightly and not significantly under unanimous rule (from 2.05 as a minority to 1.61 as a majority, $p = .50$). These numbers also show that unanimous rule helps women who are outnumbered by men (0.44 under majority rule and 2.05 under unanimous rule, $p = .04$). Finally, the interaction between gender composition and decision rule is significant, meaning that the effect of increased numbers is different under majority rule than under unanimity ($p = .02$).[21] Numbers benefit women only under majority rule, while unanimous rule protects minority women's voice.

[19]This ratio is computed by dividing the individual's average *Frequency* per care topic by his or her average *Frequency* per financial topic. We adjust for the number of topics in order to avoid the artificial inflation that could result from the fact that there are more care topics (4—children, family, poor, and needy) than financial topics (2—salary and taxes). Even with that adjustment, the magnitude of this ratio is largely a function of the unequal number of possible words in the care and financial categories. Thus, its absolute magnitude does not imply a general female advantage or disadvantage. If an individual made no references to financial topics, the ratio is undefined and not included in the analysis. When we include these individuals by assigning them a very low financial *Frequency* and imputing the ratio, the results are very similar to the patterns we see in the figures. We do not include these imputed values in our analyses, however, because of the inherent uncertainty about exactly what the assigned financial *Frequency* should be. Small differences in the assigned value can make a large difference in the ratio.

[20]We combine groups in which women are a minority (one- and two-women groups) and groups with a majority of women (three- and four-women groups) to simplify the presentation of results and avoid the problem of small N in groups with a single woman.

[21]All tests are two-tailed and are computed using predicted values from a regression model with controls. We regress the ratio of care to financial topics on a dummy variable for majority rule, a dummy variable for whether the group had a majority of women, and the interaction between the two; models include controls for liberalism, the number of liberals in the group, and experimental location. We predict values from the model and conduct a formal Wald test of the difference between the predicted values. Fully saturated models that also include an interaction between rule and the number of liberals and models that include a dummy variable for groups with a majority of liberals produce similar results.

FIGURE 4 Ratio of Care *Frequency* to Financial *Frequency* among Men

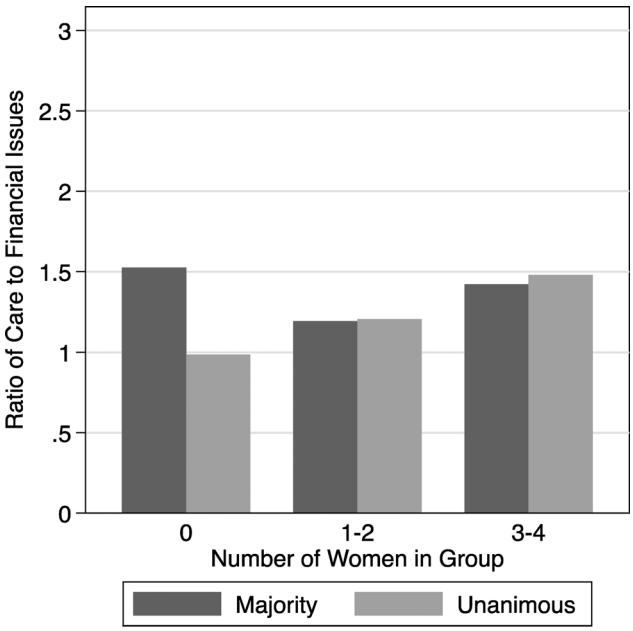
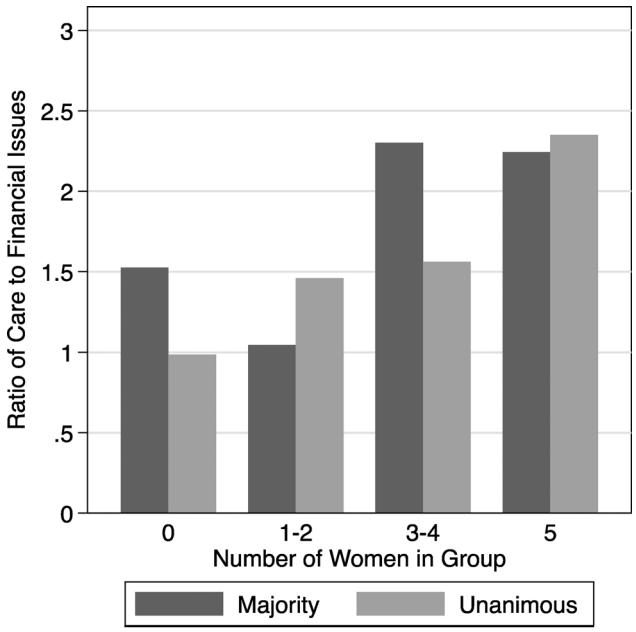


FIGURE 5 Ratio of Care *Frequency* to Financial *Frequency*, Group Average



We have focused primarily on women since it is women's voice that is at issue in the theoretical and political debates that prompt this study. Figure 4 displays predicted values for men (using the same model as above) and shows that the average man is also affected by women's descriptive representation under majority rule, but by a more modest magnitude than the average woman: the ratio of care to financial *Frequency* increases from 1.19 (with female minorities) to 1.42 (with female majorities). Under unanimous rule, the ratio increase is similar, from 1.20 to 1.48. In addition, unanimous rule does not substantially elevate the average man's relative emphasis on women's priorities when women are a minority—unanimous rule protects minority *women's* voice but does not empower women to influence *men's* speech.[22]

Men are, however, affected by the experimental conditions with respect to the topic that is most distinctively women's concern: children. Under majority rule with one woman present, only 19% of men raise the topic of children versus 69% who mention salary-related issues. However, surrounded by four women, men's focus reverses: 62% now mention children, as compared to 50% who discuss salary.[23] But the effects of gender composition do not extend to discussions of the poor or the needy (predicted probabilities from the dummy model using *Mention*, Table A3). Overall, Figure 4 shows evidence of movement in the direction of a higher ratio of care to financial issues, but the movement is modest and not statistically robust.

Finally, the overall substantive representation of women's distinctive issues can also be measured by the average ratio for all participants, including both women and men. Figure 5 shows that when they are empowered by the combination of the rule and their numbers, women can move the overall focus of the group discussion: the ratio of care to financial *Frequency* goes up substantially—more than doubling—as women go from minority to majority, but only under majority rule, where it increases from 1.04 to 2.30 ($p < .01$).[24] For unanimous rule, the effect of gender composition on the group is much smaller, from

[22]The figure also appears to show a difference across rule for male enclaves, but this difference is driven entirely by two men in one group whose ratio measures are more than three standard deviations above the mean for the sample. In the absence of those two outliers, the ratio for male enclaves is identical across rule and low.

[23]These are raw means; from the model with controls (*Mention*, Table A3 in the supporting information), we can see that the increase in men's propensity to mention children is statistically significant ($p = .01$), but it is only when women are a supermajority under majority rule that men mention this most stereotypically feminine topic more often.

[24]The formal test of significance is the same as described above, but the models include all participants in the sample.

1.45 to 1.52, and not statistically significant.[25] Women need the power of both large numbers and a rule that favors large numbers to have the biggest effect on the terms of the group discussion. Unlike the finding on women's talk and consistent with men's talk, unanimous rule confers no statistically discernible benefits over majority rule in minority-female groups (the ratios increase from 1.04 under majority rule to 1.45 under unanimous rule).[26] Despite their increased attention to issues of care, women's small numbers make it difficult for them to affect the overall tenor of the discussion.

Are Women's Voices Disadvantaged Relative to Men's?

So far we have not asked if women's voices are disadvantaged relative to men's—that is, if a gender gap in voice exists or how it changes with the conditions. We do so using the *Mention* measure, which can be interpreted as the chance that a given person refers to the issue and allows us to move the question from how much a person talks to how many people talk. We ask whether women are less likely to raise their distinctive concerns than men are to raise theirs, in the conditions prevalent in the real world—majority rule and minority women. The answer is yes: in these conditions, a woman's probability of mentioning care issues is 57%; a man's probability of mentioning financial issues is 81% ($p < .03$, two-tailed). Thus, in the typical political setting, there is a gender gap in voice. But when women compose a majority under majority rule, the percentages reverse: 89% for women and care versus 68% for men and financial, respectively ($p < .04$).[27] Yet that is not the only way to remedy women's disadvantage. Leaving women as a minority but changing the rule from majority to unanimous raises women's probability of mentioning care issues to 91% and lowers men's probability of mentioning financial issues to 72% ($p < .05$). That is, women are severely disadvantaged relative to men in their group as a minority under majority rule, and they are not disadvantaged as a majority under majority rule or as a minority under unanimous rule.[28]

To illustrate these effects, we provide some qualitative examples in the online supporting information. They show that in conditions of gender equality, women introduce women's topics; when these topics are introduced, they are taken up by subsequent speakers, and women tend to mention these topics to argue for generosity, help, or meeting a need. In conditions with gender inequality, these are less likely, and when a women's topic is mentioned, it tends to die in the conversation.

Does Talk of Care Issues Change the Group's Decision?

The final question is whether groups with a higher *Frequency* of care issues also subsequently set a higher minimum guaranteed income. Children are far more likely to live in poverty than adults.[29] To the extent that poverty policy is more generous to the poor, children will especially benefit. So people concerned with the needs of children may well be more interested in a generous minimum income for the poor, and the more that the discussion focuses on the needs of children and on their care, the higher the minimum income will be. In addition, all the referents of care issues—children, families, the needy, and the poor—tend to be viewed sympathetically (Gilens 1999); so the more they are discussed as beneficiaries, the more generous the assistance is likely to be.[30]

The evidence supports this prediction, but as expected, women's position in the group matters (Table 3).[31] The dependent variable is the group's minimum guaranteed income. Under majority rule, the effect of women's *Frequency* ratio of care to financial issues is negative when women are in the minority, but large and positive in interaction with majority-female compositions. But under unanimous rule, numbers do not moderate the effect of

[25]The difference-in-differences in the effect of gender composition under majority, as opposed to unanimous, rule is significant at $p = .07$ (two-tailed).

[26]Under unanimity, the group's *overall* ratio of care to financial *Frequency* rises slightly as the number of women in the group increases. This increase does not contradict our hypotheses, however, because the *average female* frequency does not rise under unanimous rule.

[27]Percentages in this paragraph are raw means (see Figure A4 in the supporting information). The same relative effects obtain from predicted probabilities for *Mention* using our standard controls.

[28]The advantage minority women receive relative to men mentioning financial issues does not mean that the group's overall ratio of care to financial issues changes—the latter reflects women's low influence where they are few.

[29]See http://www.census.gov/hhes/www/poverty/data/incpovhlth/2009/pov09fig05.pdf and http://www.census.gov/prod/2011pubs/p60–241.pdf.

[30]The group's overall *Frequency* ratio correlates with increased generosity ($p < .05$, two-tailed, mixed-gender groups).

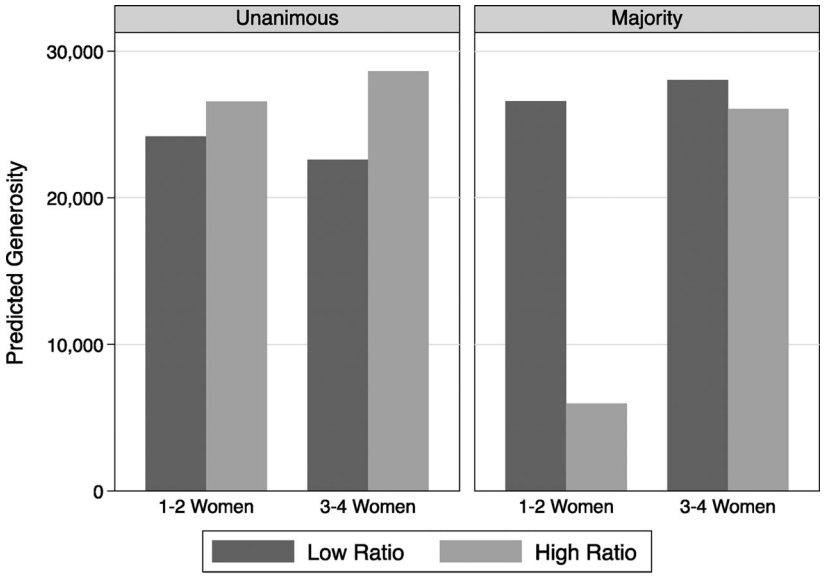
[31]In this group-level analysis, we use a dummy variable for whether women are a minority or a majority in order to conserve cases. Because we have strong directional hypotheses, we employ one-tailed tests.

TABLE 3 Effects of Women's Relative Emphasis on Care Issues on Group Generosity (Group-Level Analysis, Mixed-Gender Groups)

Variables	(1) Majority	(2) Unanimous
Majority-Female Group	1,469.49	−1,590.64
	(3,558.33)	(3,123.82)
Ratio of Care to Financial among Women	−2,743.88**	218.97
	(1,219.74)	(255.89)
Majority Female * Ratio	2,329.01**	460.09
	(1,260.87)	(475.76)
Majority-Liberal Group	−2,858.15	5,632.69
	(4,132.89)	(4,228.63)
Majority Liberal * Ratio	523.27	349.78
	(651.63)	(458.61)
Constant	24,858.11***	21,389.48***
	(2,971.46)	(2,422.08)
Observations	25	32
R-squared	0.47	0.49
Control for Experimental Location	Yes	Yes

Note: The dependent variable is the group's chosen dollar amount for a minimum guaranteed income. Standard errors in parentheses. *$p < 0.10$, **$p < 0.05$, ***$p < 0.01$, one-tailed test.

FIGURE 6 Group Generosity as Women's Emphasis on Care Issues Changes, by Gender Composition and Rule



Note: Predicted values from Table 3.

ratio.[32] Figure 6 displays this rule-numbers interaction, showing how the group's predicted generosity changes with a two standard deviation increase in the average female ratio. When women are disempowered by small numbers under majority rule, raising issues of distinctive concern to women backfires: the more the average woman talks about care issues at the expense of financial issues, the *less* generous the group becomes (this difference in

[32]In several groups, the group-level ratio measure is undefined because no women raised financial issues. Findings are unchanged when we include those groups by substituting *Frequency* of care issues for the ratio.

predicted values is significant at $p < .02$, one-tailed). This result reveals the depth of women's disempowerment in typical settings. Conversely, when numbers favor women under majority rule, the group is generous toward the poor whether women raise care issues often or not (though women are much more likely to raise such issues when they are the majority).[33] Women can raise the group's generosity by raising care issues, but only when the rule and numbers elevate their status in the group.

Because women's voice is endogenous, however, we need to confirm the relationship between women's status in the group and generosity using only exogenous measures—namely, the experimental conditions. Doing so confirms our expectations. Women's descriptive representation under majority rule results in more generous redistribution (controlling on location and liberals): the guaranteed minimum income is $3,580 higher in majority-female than minority-female groups ($p < .05$, one-tailed test). In groups deciding by unanimity, however, this model produces no statistically significant difference in generosity between majority- and minority-female groups (Table A7).[34] Thus, as predicted by our interaction hypothesis, women interacting with men do best as a numerical majority, but only under majority rule, where they are most likely to talk about women's distinctive issues relative to men's. Under those conditions, women achieve a more generous minimal standard of living for a population that they tend to want to benefit.[35]

Discussion

We expected that matching the decision rule with a gender composition equalizes women's status, with women not only enjoying equal participation and authority, but also speaking to their distinctive concerns and aligning the group's decision with these concerns. The evidence is consistent with these notions. Women are worse off in groups with few women and majority rule. Unanimous rule dampens or eliminates this deleterious effect of minority status. As we found with participation and influence, so it is with the agenda and its influence over the outcome—when women are numerical minorities, they are better off with unanimous rule, and as majorities, they are better off with majority rule. These effects are not due to preferences correlated with gender, nor are they consistent with an explanation based on social contagion or appealing to the gender majority, since they are not the effects of numbers alone but of numbers combined with rule. These patterns support our argument that rules and numbers jointly create norms that either empower and include women or fail to do so. The findings represent the power of the setting to produce or mute women's voice on issues of distinctive concern to women.[36]

Different types of substantive representation require different settings. To maximize women's voice on women's distinctive issues, choose settings with many women and majority rule or all-female groups under either rule. To empower individual women to introduce care issues into debate, assemble minority-female groups with unanimous rule. If the goal is to maximize the overall voice for women's distinctive issues, or to prompt men to speak to these issues, the settings are many women under majority rule. To maximize the relative emphasis of care to financial issues in the discussion, the setting is again majority rule with many women or all-female groups under either rule. To translate women's voice into decisions that improve the lot of the disadvantaged or the unfortunate, in line with women's distinctive priorities, one should avoid majority rule with few women, which is the single most deleterious setting for women across multiple measures. If one had to pick the one setting that yields the most forms of substantive representation for women, one should pick majority rule with many women.

Our measure has important limits: mere mention of a topic does not indicate a particular position on the left-right policy spectrum. We have three responses to this valid criticism. First, studies we reviewed suggest that women are both likely to mention these topics and to take liberal positions on these topics. Second, we showed that the mentions in our study are almost never negative. Third, the salience of a topic is itself an important type of substantive representation; in fact, some theorists argue

[33] Figure 6 uses a two standard deviation change in ratio among the whole sample. However, as we showed, the treatments affect the ratio; for minority women under majority rule, the maximum ratio is far lower than the maximum in Figure 6. Figure A5 in the supporting information shows predicted values using the range within each condition.

[34] Among minority-female groups, unanimous rule results in higher minimum guaranteed incomes than majority rule ($p < .06$, one-tailed test). For majority-female groups, the difference between decision rules approaches significance ($p < .12$, one-tailed).

[35] In enclaves, women raise care issues most frequently; these are also the most generous groups, with average poverty lines well above $30,000 (under both rules).

[36] We controlled on preferences in a number of ways. We note too that the effects cannot be due to preference-driven strategic decisions under unanimous rule, since subjects were not told what outcome we would impose should they fail to decide. Finally, strategic explanations fail to account for women's low talk times in conditions where they also speak less to women's issues.

that the presence of an issue on the agenda is the most important measure of political power (Bachrach and Baratz 1962; Gaventa 1982). The disagreement cannot come to light, and no view on the issue can be aired if the topic remains off the agenda. To be sure, where people mention women's distinctive issues but women lack power, the outcome runs against generosity to the vulnerable. Nevertheless, our evidence suggests that on the whole, the conditions where women speak to their distinctive topics tend to foster group decisions in line with women's tendency to prefer generosity. Thus, counting words is a useful way to analyze representation, especially since we also analyze the direction of the decision toward which these words lead.

We address several caveats about our results. Discussion moderators may mitigate gender inequality; on the other hand, moderators typically are not focused on gender equality (Mansbridge et al. 2006). The effects we found may diminish when the topic is clearly feminine. Our study was conducted with non-Hispanic whites since the effects may differ for other populations; this can be tested in future work. Group size may be a moderator. Culture or ideology may also be moderators, though we do replicate the results in two very different milieus in the United States—one a socially conservative, religious community in the West and the other a liberal, secular community on the East Coast. The findings are thus not limited to only conservatives or liberals.[37]

Though conducted in the lab, our study resembled the "real world" in important respects. The task mirrored the purpose of many deliberative settings—the members were asked to make decisions about the distribution of resources both to themselves and in society. In many real settings, deliberations are structured and directed by officials or authorities, and participants are unfamiliar with each other (Jacobs, Cook, and Delli Carpini 2009, 72). Many of these settings have a group size similar to ours. The findings may thus generalize to many settings where citizens congregate in small groups to discuss matters of common concern. Such settings are ubiquitous: juries, local boards, neighborhood councils, and the plethora of community and civic meetings that characterize the United States (Burns, Schlozman, and Verba 2001). Approximately 45% of Americans report attending such a meeting at least once in the past year (Karpowitz 2006; see also Conover, Searing, and Crewe 2002, Table 3).

[37] Our sample was highly educated, yet even these women are affected by their gender status in the group.

This study makes several contributions. Although studies have documented that female representatives act on a distinctive set of concerns from male representatives (e.g., Carroll 2001; Swers 2002), we are not aware of studies showing that women articulate different topics or words from similar men in public discussions (for excellent small-N studies, see Kathlene 1994; Mattei 1998). No study of inequality in representation has used any of the features we use: a large number of groups; randomly assigned treatments; or links between the person's and group's pre- and postdeliberation attitudes with actual speech behavior during deliberation. Linking speech to predeliberation preferences allows us to control on ideology and preferences over the group decision and thus isolate the effects of gender. Therefore, we can conclude that conditions that increase women's talk of women's topics do so by altering the gender dynamic specifically. Our placebo tests further indicate that the shift occurs on women's distinctive issues only and is not caused by nongendered conformity or majority-induced dynamics. In addition, we are not aware of studies documenting that men adopt speech similar to women's, and they do so as women's influence rises. The rich data allow us to conduct a large number of tests and do so rigorously.

The key point of our study is that women's voice in deliberative settings varies a great deal with the institutional setting. Studies of women's representation in legislatures have recognized as much for other institutional variables (Carroll 2001; Grunenfelder and Baechtiger 2007; Kathlene 1994). Our results suggest that rules and norms shape norms of *interaction*. These norms affect men as well as women. They produce quite different levels of conversational salience for the topics that tend to concern women. In these ways, institutional settings can contribute to or detract from equal substantive representation for unequal social groups. Institutional rules and descriptive representation interact to shape substantive representation via the salience of women's concerns. To the extent that our results apply to legislative settings and other elite groups, our study also makes a broader contribution to the study of descriptive representation by unpacking the process of interaction and showing how gender composition and rules affect it.

As Mansbridge (1999) notes, descriptive representation of a social group can promote the group's distinctive perspectives. But as she argued in her magisterial study of deliberative democracy (1983), processes of consensus, and the rules that prompt them, matter. We argue that these processes interact with descriptive representation. And we have unpacked the black box of deliberation to show how, and when, descriptive representation matters for substantive representation.

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Supporting Information

Additional Supporting Information may be found in the online version of this article at the publisher's website:

Table A1: Demographic Characteristics of Participants
Table A2: Descriptive Statistics
Table A3: Regression Models Generating Predicted Probabilities of Mention/Frequency
Table A4: Average Group-Level Care Issue *Frequency* among Women
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