

The Effect of Gender, Party and Seniority on Interruptions at Congressional Hearings*

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Abstract

We examine speech patterns during more than 25,000 committee hearings in the United States Congress from 1994 to 2018 to determine whether women are more likely to be interrupted than men. We find consistent evidence that women are indeed more likely to experience interruptions when they are speaking. This effect is especially strong among Members. Further analysis of speaker dyads suggests that this effect is driven by mixed-gender interactions; women are both more likely to be interrupted and more likely to interrupt, but these effects diminish significantly when two women are speaking to each other.

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1 Introduction

To be equally effective advocates for their constituents, members of Congress (MCs) must be afforded equal opportunity to communicate their ideas. Yet, there is reason to believe that certain group dynamics may make it more difficult for women to convey their thoughts. There is an abundance of previous work that has found gendered patterns in political communication across a range of settings. Much of this work has found that women tend to speak less than men in mixed-gender groups, and/or are more likely than men to be interrupted (e.g. [Aries 1976](#); [Holmes 2013](#); [Coates 2015](#)). At the same time, women in legislatures are strong proponents of women's issues ([Gerrity, Osborn and Mendez 2007](#); [Thomas and Welch 1991a](#)). If women MCs find it more difficult than men to have their voices heard, there are therefore clear implications for substantive representation not only of the constituents that women represent, but also of *all* women.

There is no shortage of scholarship that has examined differences in factors such as the policy content or length of floor debates given by men and women ([Brescoll 2011](#); [Hall 1998](#); [Osborn and Mendez 2010](#); [Pearson and Dancey 2011a,b](#)). Yet, we believe that in addition to focusing on what women say in Congress, it is also worthwhile to assess whether they are allowed to finish saying it. Recent work has found that women on the U.S. Supreme Court are interrupted at higher rates than their male colleagues ([Jacobi and Schweers 2017](#)), a finding that has important implications for legislative behavior as well. Simply, if women are cut off before finishing their thoughts, it could be that their ideas are less likely to connect with their colleagues—and are therefore less likely to find their way into policy.

At first glance, it might appear that concerns about interruption in Congress are unwarranted. Floor debates are nearly always governed by rules and well-established norms that preclude disruptions, and at any rate are often poorly attended, with few other

members present to interrupt. However, most business in Congress is done in committee, and the process of questioning witnesses is analogous to the dynamics of a Supreme Court argument in many respects. This, in tandem with the fact that committee work affords the most immediate opportunity to impact policy in many cases, makes committee action an important venue for assessing whether women are more likely to be talked over or interrupted.

We examine speech patterns during more than 25,000 committee hearings in the United States Congress from 1994 to 2018. The core question we pose is whether women are more likely to be interrupted than men in these proceedings. We find consistent evidence that women are indeed more likely to experience interruptions when they are speaking. The effect of gender on likelihood of interruption is particularly strong for women Members, who are on average more than ten points more likely to be interrupted than are male MCs, holding relevant covariates constant. Analysis of speaker dyads suggests that this effect is driven by mixed-gender interactions; women are more likely to be interrupted *and* more likely to interrupt, but these effects diminish significantly when two women are speaking to each other. Our findings have implications for legislative behavior, representation, and policy.

2 Gender, Ideology, and Seniority in Congressional Committees

Members of Congress are strategic actors who seek re-election ([Mayhew 1974](#)); they should therefore be expected to advocate for their constituents' interests whenever possible. When it comes to policy advocacy, party leaders might act as a significant constraint on individual legislators' activities (e.g., [Cox and McCubbins 2005, 2007](#)). However, legislators may deviate from the party line to promote their constituents' interests ([Carey](#)

2007). Indeed, legislative entrepreneurship might serve as a strong signal to voters in a member's district that the legislator is actively advancing their interests (Bowler 2010; Wawro 2001). For example, acts such as floor speeches and sponsoring bills allow MCs to demonstrate energy and/or competence (Burden 2007). This is true even if the legislation is not ultimately successful, since MCs might return to their districts and make credible claims about even *attempted* actions (Fenno 1978; Parker and Goodman 2009). Effectively communicating a position can therefore be an important aspect of a legislator's success.

But there is also evidence that legislators' attributes or political environment could make them differentially effective when it comes to having their viewpoints heard. For instance, legislators with more seniority or policy expertise might find it easier to locate an audience for their ideas. Alternatively, MCs in the minority party might be more active during committee hearings—one of their few opportunities to influence legislation (Hall 1987). Similarly, members of the minority party, members of extreme ideology, or both might use institutional quirks such as unconstrained floor time to advance policy goals that might otherwise receive little attention (Maltzman and Sigelman 1996).

Gender is also likely to play an important role in how legislators pursue their policy objectives. One clear theme in previous research is that women are less likely than men to display dominant and/or aggressive behavior (Archer 2009).¹ On average, women also speak less than men (Brescoll 2011). With regard to political conversations, Mendelberg and Karpowitz (2016) found that women engaging in small-group political debate nearly always spoke at a lower rate than men, unless women significantly outnumbered men in the group.² These findings are consistent with several other studies, which have found not only that women exhibit a lower propensity to speak, but also that the effect seems to be

¹There are several possible reasons for this, including socialization (Eagly and Steffen 2000) or the fact that men's higher testosterone levels contribute to a greater natural proclivity toward aggressive behaviors (Dabbs and Dabbs 2000).

²The rules under which consensus is reached (e.g., majority-rule or unanimous consent) also appear to be consequential.

driven by gender, as opposed to other traits (Karpowitz, Mendelberg and Shaker 2012; Karpowitz and Mendelberg 2014).

Gender also appears to affect the manner in which a speaker's conversation partner interacts with him or her. Women face a higher risk of being deemed less likable when they display dominant behavior (Williams and Tiedens 2016). Among both male and female listeners, women experience a backlash when they speak more than others in a peer group (Brescoll 2011). This may be one reason why women (but not men) alter their speaking patterns when they are communicating with a person of the opposite sex, speaking less, using fewer personal pronouns, and interrupting less frequently when they speak with a man (Bilous and Krauss 1988; Hirschman 1994; McMillan et al. 1977; Palomares 2008). Nonetheless, women are more likely to be interrupted when they are speaking (Hancock and Rubin 2015; McMillan et al. 1977).

These findings suggest that women may ultimately have a different experience as legislators than their male colleagues. Congress has been characterized as a gendered institution, where masculine behaviors are most likely to be successful (Duerst-Lahti 2002). Perhaps unsurprisingly, women—and women of color in particular—report feeling marginalized by colleagues, and treated as less than peers (Hawkesworth 2003).

That is not to say however that women are less effective legislators. For instance, women in congressional minority parties have more success keeping their bills alive than men, because they appear to be willing to cooperate across the aisle (Volden, Wiseman and Wittmer 2013). Surveys of legislators have not found large differences in the self-reported activities of men and women, though women do tend to report higher interest in “women's issues,” and higher rates of membership on committees overseeing those policy areas (Thomas and Welch 1991a). This is consistent with other work finding that women are effective advocates for women's issues (e.g., Gerrity, Osborn and Mendez (2007); Thomas (1991b)).

That said, considering the importance of communication to policymaking, it is worth considering how gendered differences translate to legislative business. Some research that has explicitly considered how legislators' gender is related to their behavior on the floor has comported with the expectation of a male-dominated arena. For instance, [Brescoll \(2011\)](#) found a positive correlation between member power and volubility (the amount of time spent speaking) on the U.S. Senate floor for men, but not for women. [Bäck, Debus and Müller \(2014\)](#) found that men gave more floor speeches in the Swedish *Riksdag*, and that the finding was driven primarily by men speaking more during debates over "hard" issues.

However, there is also evidence that women speak *more* on women's issues in a range of settings ([Karpowitz and Mendelberg 2014](#)), including in the U.S. House ([Hall 1998](#)) and Senate ([Osborn and Mendez 2010](#)). Indeed, [Pearson and Dancey \(2011a\)](#) found that women in the U.S. House speak more often than men on the floor, particularly in one-minute speeches (in which members can speak on any topic of their choosing) and in debates over salient legislation. Likewise, [Pearson and Dancey \(2011b\)](#) found that women are more likely than men to invoke gender in their one-minute speeches, which suggests that women MCs are compensating for their own underrepresentation, speaking more to increase their visibility and by extension, descriptive representation.³

It is certainly important to consider how women's speech during floor debate differs from that of men. However, we believe that relative to activity on the floor, committee action is simultaneously more consequential for the goals of many MCs *and* is also more likely to demonstrate gendered differences in members' speech patterns. The former claim is based on simple fact that most congressional business is done in committee ([Deering and Smith 1997](#)). Especially in the House of Representatives, the committee markup process

³Speaking also appears to build more self-efficacy for women than men([Karpowitz and Mendelberg 2014](#)).

generally offers MCs the best chance to achieve personal policy goals via the amendment process (Hall 1987).

On the latter claim, committee hearings are less restrictive in ways that are likely to be consequential, given the gendered communication styles described above. Floor speeches are highly regulated affairs, in which members control the floor during their allotted time, and during which strong norms prevent interruption. Indeed, during many floor speeches in the modern Congress, there are often few other members present at all. Members' time is generally regulated during committee hearings as well, but the interplay between witness and MC offers more opportunity for one party to interrupt, talk over, or dodge the other.

Interruptions have long been recognized as an important aspect of Supreme Court arguments (Johnson, Black and Wedeking 2009; Sullivan and Canty 2015), which are of interest because justices' questioning of an advocate bears some similarities to the process of witness interrogation in legislative committees. In two separate analyses, Jacobi and Schweers (2017) report three important findings with respect to interruptions of justices on the U.S. Supreme Court. First, women justices are interrupted at higher rates by both the male justices and male advocates. Second, the conservative justices interrupt the liberal ones more frequently than liberals interrupt conservatives. Third, experience seems to reduce the likelihood that a justice will be interrupted, but much of this effect stems from the women learning over time to speak more like their male colleagues, adopting more masculine question framing.

Given these findings, it should not be surprising that some existing work has found important differences between men and women in legislative committees. For instance, while male committee chairs tend to use their position in a unilateral fashion to steer witness testimony and policy conversation, women chairs approach the job more as a moderator (Kathlene 1990). Furthermore, using transcripts from twelve legislative

committee hearings in Colorado, [Kathlene \(1994\)](#) found that women allowed more of the hearing to elapse before speaking, took fewer turns speaking and spoke for a lesser duration than men, and were less likely to interrupt their colleagues than men.

The few studies of committee and Supreme Court interruptions therefore seem to confirm what might be expected, given evaluation of the broader population: Women are more likely to be interrupted, which presents an obvious impediment to their ability to fully communicate their ideas. This is important for at least two reasons. First, previous work has recognized that—especially when they are not instrumental in passing a given policy—both floor speeches ([Maltzman and Sigelman 1996](#)) and committee action ([Hall 1987](#)) are an important means for MCs to signal their views. Thus, interrupting an MC during committee work could frustrate her ability to make important points that might otherwise not be heard. Second, women legislators act as representatives not only of their own constituents, but also of women living throughout the country ([Carroll 2002](#); [Mansbridge 1999](#)). As such, their statements during legislative action are often intended to advance policy ideas that benefit women and/or compel their colleagues to consider the women’s perspectives ([Shogan 2001](#); [Swers 2002](#); [Walsh 2002](#)). Thus, interrupting women in legislative committee likely has implications for the representation of women in the broader public.

We therefore investigate whether women are interrupted more often during committee hearings in the U.S. Congress. Guided by previous work, we expect to find that women MCs are more frequently interrupted by their colleagues and witnesses than their male colleagues.

3 Congressional Hearing Transcripts

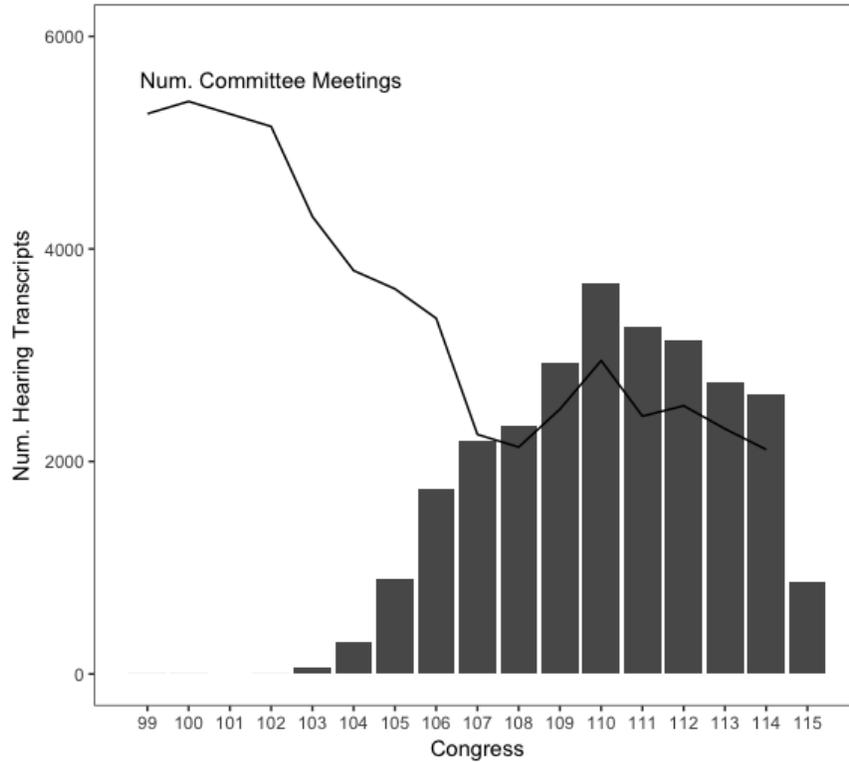
We analyze 26,425 congressional hearings published by the Government Printing Office (GPO) from 1994–2018 (105th–115th Congresses).⁴ This sample of transcripts represents the entirety of those available electronically through the GPO. The hearings data includes speech from 1,476 Members of Congress. Members of Congress were collected and linked to their congressional Bioguide records. Linking to the Bioguide allows for the inclusion of Member metadata, such as state delegation, seniority, partisanship, and ideology.

The number of hearing transcripts available per Congress varies, conditional on the time period. Transcripts become increasingly available within the early range of the time period we examine; as such, the 105th Congress contains the smallest number of transcripts (872). The number of available transcripts increases with each subsequent Congress, peaking with the 110th (3,677 transcripts), which was in session between 2007 and 2009, and has been fairly level since. In our data, the median number of hearing transcripts per Congress is 2,632 ($\mu = 2,402$). There might be concern that certain hearing transcripts are more likely to be published, resulting in selection effects; however, because the number of hearings varies with the number of committee meetings counted in each session ($\rho = 0.749$), it is more likely that factors outside the scope of this analysis condition the number of hearing transcripts available in any given Congress. See Figure 1 for detail.

Each hearing transcript contains four major components: metadata, a header, the hearing’s discussion, and appendices (if any). We parsed the metadata to extract the GPO codes for the Members present. Then, we used a series of regular expressions to process these hearing transcripts into annotated chunks of dialogue, discarding the header and appendices. Each annotated chunk reports who generated the speech and whether or not

⁴We also collected data from the 99th, 100th, 101st, 102nd, 103rd, and 104th Congresses, but too few hearings were published to reveal distributional properties. We therefore dropped 361 hearing transcripts from these years, to reduce risk of selection effects.

Figure 1: Number of Hearing Transcripts Available by Congress



Note: Transcript counts compiled by the authors. House committee hearings data from gathered from [Ornstein et al. \(2018\)](#).

the speaker was interrupted. The GPO attributes each chunk of speech clearly, by title and last name. We extracted these attributions with a series of regular expressions to generate a table of ordered speech chunks, each of which was checked against the metadata to link entities to existing Member profiles. In the case that the speaker was not a Member, we extracted the gender of the speaker using the speaker's title.⁵ The GPO also codes interruptions clearly. Transcriptionists assigned to the hearings actually annotate the machine-readable text with a flag for interruption, in the form of three or more en- or em-dashes at the beginning or end of a chunk of speech.

⁵For example, *Mr. Zerhouni* would be coded as a male, and *Ms. Johnson* would be coded as a female. This approach has the disadvantage of failing to detect gender when other titles are used, such as *Maj. Smith* or *Prof. Jones*.

We define an interruption to have occurred if for any chunk of speech the GPO signal was present and the next chunk of speech had a different speaker.⁶ Furthermore, we define the directed dyad of the interruption to be an ordered pair of the interruptor and interruptee involved in an interruption. We determined these dyads using the location of the interruption and the identities of the speakers. For example, the following three chunks would all be coded as interruptions:

1. *Ms. DeGette*. You have written—
2. *Mr. Zerhouni*. Human subject ethics rules, yes. Obviously, ethics rules that relate to the conduct of the trial, a human trial—
3. *Ms. DeGette*. Right, but—

The interruptor–interruptee dyads would be Mr. Zerhouni–Ms. DeGette and Ms. DeGette–Mr. Zerhouni. This approach produced a total of 21,541,731 chunks—619,694 of which (2.88%) ended in interruptions. This rate remains fairly constant across all Congresses. See Table 1 for detail.

4 Women are More Likely to be Interrupted in Hearings

The first analysis considers ordered chunks of speech as the unit of analysis. Both members and non-members are included in the analysis. Each hearing j is represented as a panel of chunks, and each chunk i is coded for interruption, gender, and an array of control variables. The dependent variable—whether the speaker was *interrupted* on that chunk—is coded as binary indicator $Y_{ij} \in \{0, 1\}$, where 1 indicates an interruption.

⁶Our definition of an interruption departs from that of [Kathlene \(1994\)](#), which classifies interruptions into five types. For example, an interruption might be classified under Kathlene’s scheme as *successful* or *unsuccessful*. Our coding scheme does not delineate the type of interruption, only that the signal for an interruption occurred.

Table 1: Breakdown of Interruptions by Congress

Congress	Num. Chunks	Num. Interruptions	Pct. (%)	Num. Hearings	μ_π	σ_π
105	1,145,425	33,500	2.92	892	2.35	2.85
106	1,752,397	43,738	2.50	1,740	2.02	2.18
107	2,094,077	46,242	2.21	2,194	1.65	1.95
108	1,989,900	54,511	2.74	2,340	2.36	3.08
109	2,091,713	57,704	2.76	2,932	2.50	3.26
110	3,005,830	84,568	2.81	3,677	2.75	3.45
111	2,645,510	73,226	2.77	3,265	2.40	2.47
112	2,417,874	74,468	3.08	3,141	2.71	2.81
113	2,034,110	67,578	3.32	2,740	3.12	3.21
114	1,743,024	66,897	3.84	2,632	3.49	3.79
115	611,871	17,262	2.82	872	2.67	2.79
All	21,541,731	619,694	2.88	26,425	2.59	3.04

Note: Entries are counts and derived quantities for the chunks parsed from the congressional hearing transcripts. The number of chunks is the total number of chunks parsed. The number of interruptions is the number of chunks coded as containing an interruption. The percents are the number of interruptions divided by the total number of chunks. μ_π is the mean of the hearing-level interruption rates. σ_π is the standard deviation of the hearing-level interruption rates.

The independent variable of interest (*gender*) is coded as a binary indicator $G_{ij} \in \{0, 1\}$, where 1 indicates that the speaker is female. We control for whether the speaker is a *Member* $M_{ij} \in \{0, 1\}$, where 1 indicates the speaker is a member, because Members may be less likely to be interrupted by virtue of their status. We also include Member-level indicators for whether the speaker is the *chair* of the hearing $C_{ij} \in \{0, 1\}$, where 1 indicates the speaker was the chair, and whether the speaker was in the *majority* party at the time of the hearing $P_{ij} \in \{0, 1\}$, where 1 indicates the speaker was in the majority party.

Other variables are included to control for additional factors that may influence interruption. We control for *length* of the chunk of speech because long-winded speakers may be more likely to be interrupted. We use the percentile rank of the length of the chunk within the hearing $L_{ij} \in [0, 1]$, which transforms the variable into a metric which is comparable across hearings. We also control for the *timing* of the speech because hearing participants may become fatigued or feel time constrained as hearings progress,

resulting in higher rates of interruption. We capture timing with the percentile rank of the index of the chunk $T_{ij} \in [0, 1]$, which reflects when in the hearing the chunk occurred (like the *length* metric, *timing* is also comparable across hearings). We also include a control for *recent interruptions* R_{ij} , as interruptions may tend to cluster together conditional on topic or cadence. We use the log of the sum of the number of interruptions in the previous 10 chunks to operationalize this variable. Finally, we also include fixed effect dummies for the *Congress*, *committee type*, and *session* (X_{ij}).⁷ We model the probability of an interruption with a regression specification where the coefficient for gender (β_1) is of primary interest:

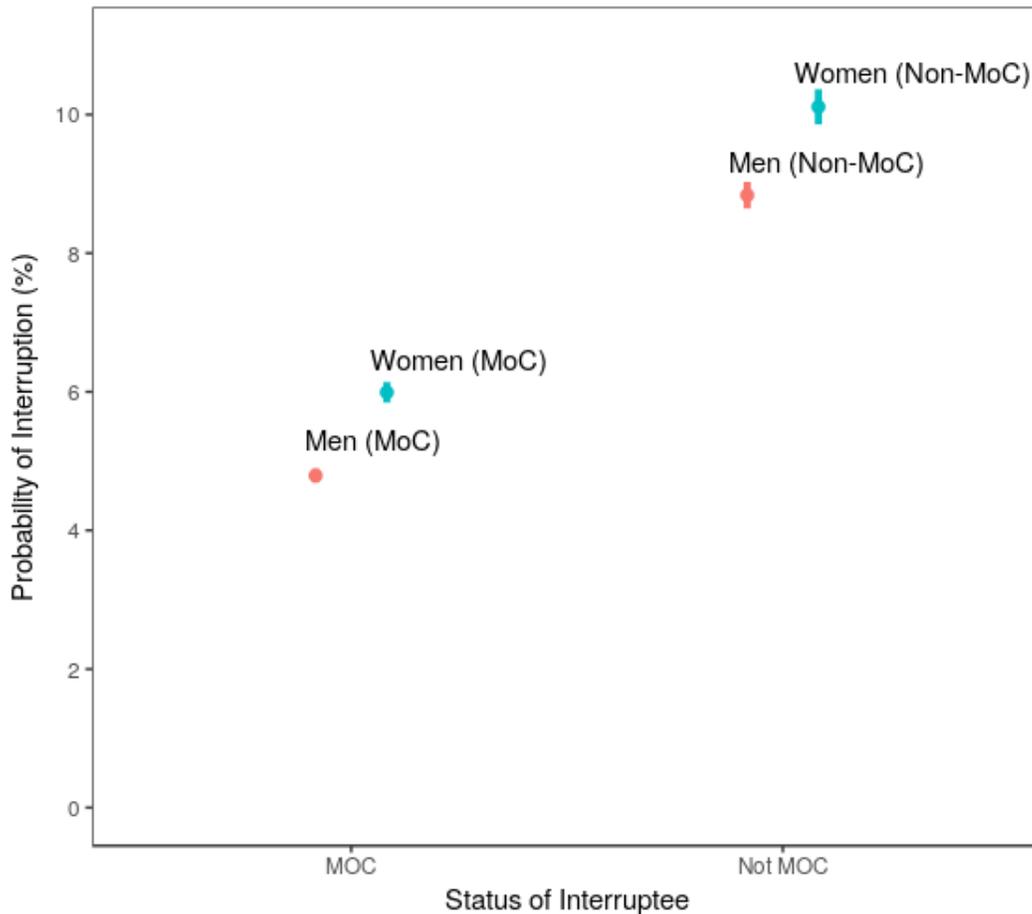
$$Pr(Y_{ij} = 1) = \text{logit}^{-1}(\beta_1 G_{ij} + \beta_2 C_{ij} + \beta_3 M_{ij} + \beta_4 L_{ij} + \beta_5 T_{ij} + \beta_6 R_{ij} + \beta_6 P_{ij} + X_{ij}\gamma), \quad (1)$$

Table 2 reports the estimated coefficients and standard errors for the approach reflected in Equation 1. Model 1 contains results from a model of all chunks, regardless of whether the speaker was a Member. Model 2 includes an interaction term that allows us to see whether the effect of gender on the likelihood of interruption differs for Members. Model 3 is estimated for Members only and codes gender using Bioguide information instead of title. Several interesting results emerge from Models 1 and 2. First, among speakers who are not Members, women are significantly more likely to be interrupted than men. Second, being a member significantly reduces the likelihood of interruption. Third, the interaction effect in Model 2 suggests that relative to male Members, women Members are also significantly more likely to be interrupted.

The results from the interacted model (Model 2) become clearer in Figure 2, which depicts predicted probabilities of interruption conditional on sample averages, for male/female speakers who are either Members or not. It is clear in Figure 2 that being a Member significantly reduces the likelihood of interruption, but women Members are interrupted more

⁷Congress $\in \{104\text{th}, \dots, 115\text{th}\}$, committee type $\in \{\text{Senate, House, Joint, Special, Other}\}$, session $\in \{1, 2\}$

Figure 2: Probability of Interruption in Committee Hearings



Note: Points are predicted probabilities from Model 2, the regression of interruptions on speech characteristics for all speakers, including members and non-members. Lines intersecting the points are 95% confidence intervals. Points are labeled by gender and status. The figure suggests that the probability of interruption is higher given the speaker is a woman, regardless of status as a Member.

than male MCs, and the same gendered pattern is apparent among non-Members. In total then, the results of Models 1 and 2 are strongly suggestive that women are more likely to be interrupted than are men, regardless of whether the individual is a Member.

Model 3 in Table 2 presents a more straightforward analysis of only Members' speech. As indicated by the *Female* coefficient, the results indicate that women are significantly more likely than their male colleagues to be interrupted in the course of committee hearings. Specifically, women Members are 10.47 points (SE= 0.027 points) more likely to

be interrupted, holding other variables constant. Figure 3 depicts the predicted probabilities of interruption for the MC subsample conditional on gender, across the range of long-windedness. As is evident in that figure, the probability of interruption does increase as the speaker talks for a longer period of time, but it is always significantly higher for women. The results from Model 3 therefore yield further support for the hypothesis that women are more likely to be interrupted than men.

The coefficients on other controls reveal additional theoretically-consistent patterns. To begin with, long-winded speech increases the likelihood of interruption. The longer a hearing goes, the more likely the speaker is to be interrupted (though the length of the hearing does not yield a significant effect in the restricted sample). Chairs are less likely to be interrupted relative to other MCs, but are more likely to be interrupted when all of the data are included; this, however, could be explained by the fact that chairs open hearings with several chunks of uninterrupted introductory speech. Being in the majority slightly reduces the likelihood of interruption. Interruptions are much more likely when a chunk of speech follows recent interruptions; this suggests that interruptions are likely to be clustered around certain points of discussion.

5 Results Hold in Member Dyads

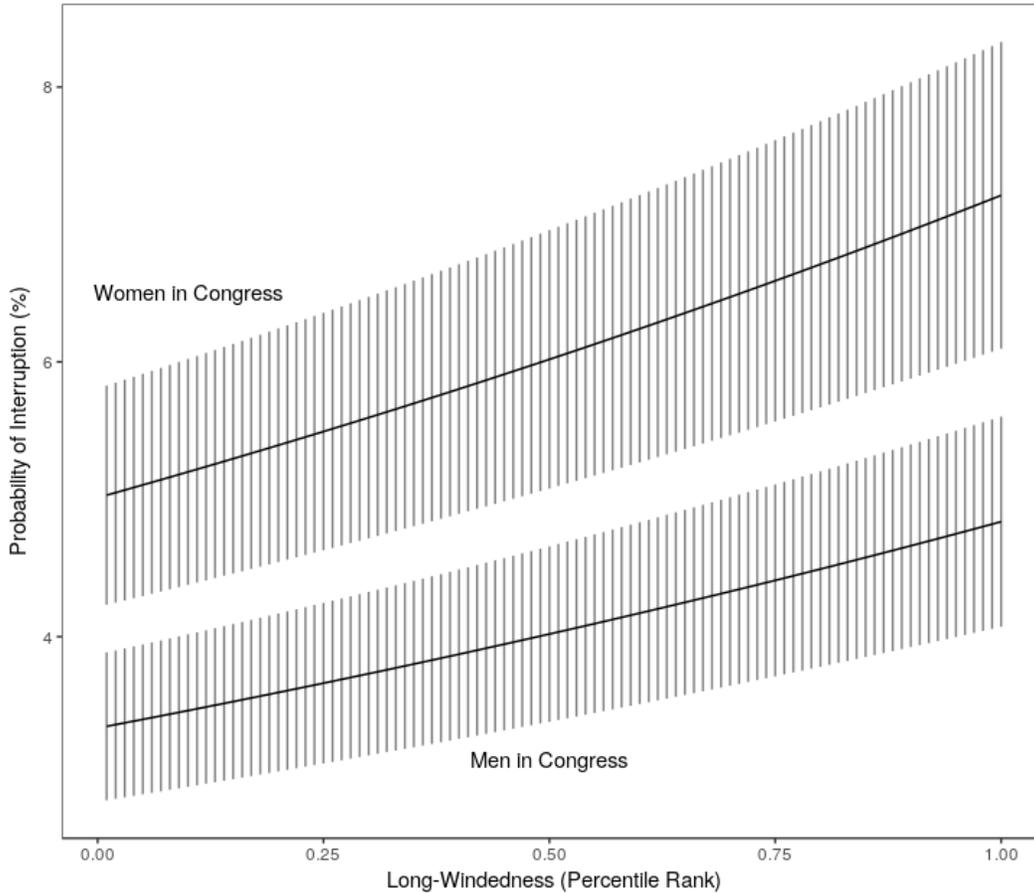
The second analysis changes the unit of analysis to pairs of Members within each hearing, where each pair is represented as a directed dyad. This second analysis allows us to focus on the factors that contribute to the relationships between Members, conditional on factors such as their gender, institutional status, party, delegation, and chamber. We index dyads with $i = 1, \dots, n$, and group Members with $j = 1, \dots, J$. Any directed dyad i is mapped to a unique pair of members by the dyad mapping function $d(j, j')$, where j is the interruptor, and j' is the interruptee. Our data preparation produced $n = 9,956$ directed

Table 2: Women More Likely to Be Interrupted in Congressional Hearings

	Likelihood of Interruption		
	All Speakers (1)	All Speakers (2)	Members Only (3)
Female	0.192*** (0.009)	0.149*** (0.012)	0.425*** (0.011)
Member	-0.630*** (0.010)	-0.656*** (0.012)	
Chair	0.274*** (0.014)	0.284*** (0.014)	-0.429*** (0.017)
Majority	-0.185*** (0.010)	-0.181*** (0.010)	-0.017* (0.010)
Recent Interruptions	0.463*** (0.003)	0.464*** (0.003)	0.426*** (0.003)
Chunk Length	-0.011 (0.010)	-0.012 (0.010)	0.387*** (0.014)
Chunk Timing	0.044*** (0.012)	0.044*** (0.012)	-0.024 (0.016)
Session	-0.027*** (0.007)	-0.027*** (0.007)	-0.024** (0.010)
Female*Member		0.088*** (0.017)	
Constant	-3.574 (0.364)	-3.546 (0.363)	-5.528 (1.011)
Congress FE	Yes	Yes	Yes
Committee Type FE	Yes	Yes	Yes
Observations	2,143,709	2,143,709	1,387,346
Log Likelihood	-329,748.200	-329,734.600	-190,495.600
Akaike Inf. Crit.	659,548.300	659,523.200	381,041.300
Residual Deviance	659,496.300	659,469.200	380,991.300
Null Deviance	702,877.000	702,877.000	412,293.500

Note: Entries are coefficients and heteroskedasticity-consistent standard errors from a logistic regression of interruption on speaker characteristics. The unit of analysis is the chunk of speech. The first and second models are estimated for all participants in the hearings, including non-Members. The third model is estimated for Members only and uses Bioguide information to code gender. The time period for both models spans from the 105th–115th Congresses.

Figure 3: Probability of Members Being Interrupted in Committee Hearings



Note: Values are modeled probabilities and 95% confidence intervals from model 3, the regression of interruptions on speech characteristics for the Members subset. Long-windedness is the percentile rank of the length of the speech chunk, ranked within each hearing. Each line is the predicted probability of interruption conditional on gender; lines are labeled by gender. The figure suggests that the probability of interruption is higher given the Member is a woman.

dyads, of which $\#d(j, j') = 7,111$ are unique pairs. The creation of dyads is important because much previous work has found that communication follows different patterns when people are speaking with a partner of the same gender than when groups are gender-mixed (Bilous and Krauss 1988; Hirschman 1994; McMillan et al. 1977; Palomares 2008). Thus, we explore whether the heightened propensity of interruption reported above is conditional on the gender of the person with whom the speaker interacts.

To that end, each dyad is composed of the average number of times member j in-

interrupted member j' in each hearing, \bar{Y}_i . Each dyad is also associated with an array of actor characteristics including *gender* G_j (where 1 indicates the member is a woman); chamber membership S_j (where 1 indicates the member is a member of the Senate), and partisanship $U_j \in \{0, 1\}$ (where 1 indicates the member is a Republican). We also construct some variables at the dyad level, including indicators for whether the members are of the same delegation $D_i \in \{0, 1\}$ (where 1 indicates that they are), and seniority $E_i \in \{0, 1\}$ (where 1 indicates j has seniority over j'). These variables are included in the model to allow for effects that vary conditional on shared characteristics (*e.g.*, a Member may be less likely to interrupt her copartisan or delegation). Let the set Q contain indicators for j , $Q = \{G, U, S\}$.

As the adage goes, a New Yorker will always beat a Southerner in a debate because of the way she dialogues, and as such heterogeneous characteristics of dyads likely interact to affect interruptive behavior. Further, Members may express heterogeneous interruption behavior due to individual characteristics. Since the directed dyads are not independent, we fit a multilevel model to estimate the effect of gender while allowing for heteroskedasticity and random effects over dyadic and individual characteristics. The model takes the general log-linear form:

$$\ln(\bar{Y}_i) = \alpha_{j[i]} + \alpha_{j'[i]} + \delta_{d(j,j')} + \left(\sum_{q \in Q} q_j + q_{j'} + q_j q_{j'} \right) \beta + \gamma D_i + \eta E_i + \epsilon_i, \quad (2)$$

$$\alpha_j \sim \mathcal{N}(\mu_\alpha, \sigma_\alpha^2), \quad (3)$$

$$\delta_{d(j,j')} \sim \mathcal{N}(\mu_\delta, \sigma_\delta^2). \quad (4)$$

We also include a random effect for each Congress but omit them from equation 2 for the sake of brevity. The specification tests whether the effects of the jj' predictors differ significantly conditional on q .

Table 3: Patterns in Member-to-Member Interruption

	Log Interruptions
	(4)
Female _{<i>j</i>}	0.054*** (0.012)
Female _{<i>j'</i>}	0.109*** (0.012)
Republican _{<i>j</i>}	0.004 (0.011)
Republican _{<i>j'</i>}	0.019* (0.011)
Senate _{<i>j</i>}	-0.016 (0.016)
Senate _{<i>j'</i>}	-0.013 (0.016)
Seniority _{<i>j</i>}	0.004 (0.007)
Same Delegation	-0.023 (0.019)
Same Gender (F)	-0.062* (0.033)
Same Party (R)	-0.075*** (0.017)
Same Chamber (S)	-0.023 (0.027)
Constant	0.180*** (0.010)
Random Effects	Yes
Observations	9,956
Log Likelihood	-4,278.730
Akaike Inf. Crit.	8,585.460
Bayesian Inf. Crit.	8,686.343

Note: Entries are coefficients and standard errors from a multilevel regression of interruption on individual and dyadic characteristics. The unit of analysis is the directed dyad within each Congress. Random effects and intra-cluster error correlations reported in the supplemental appendix.

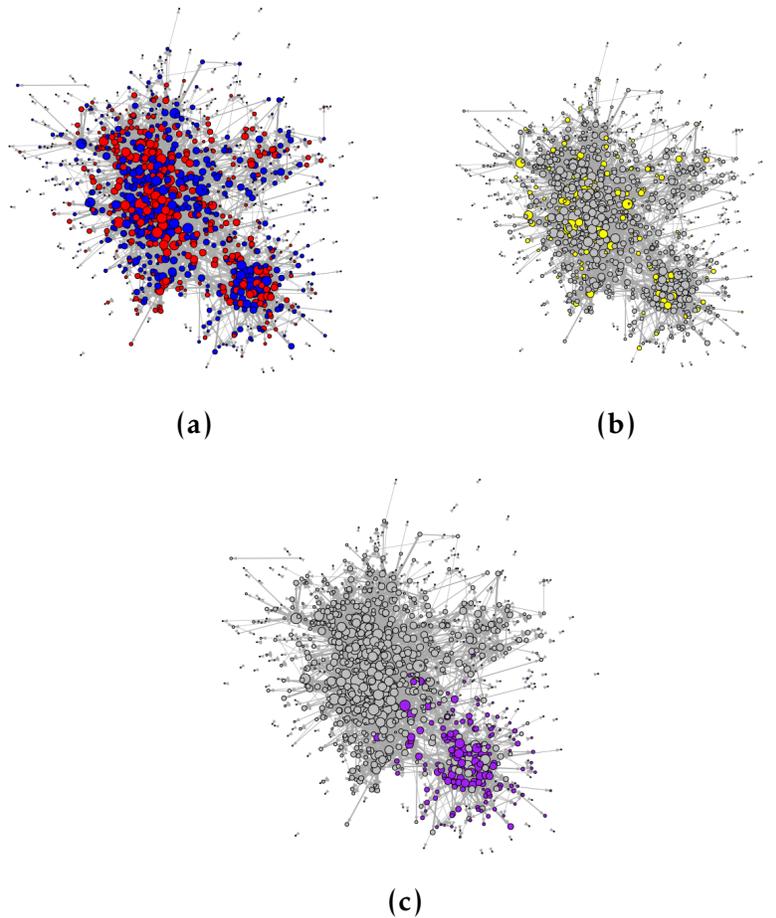
Table 3 reports the estimated coefficients and standard errors for the approach described in Equations 2–4. Given the findings reported above, it is not surprising that the results in Table 3 suggest that women are 10.9 points (SE= 0.012 points) more likely to be interrupted than are men. This result would further lead us to reject the null hypothesis that gender has no effect on the likelihood of interruption. However, the model in Table 3 also suggests that women are about 5 points (SE= 0.012 points) more likely to interrupt when someone else is speaking. While these results might seem somewhat curious, we believe a third result offers some clarity: When both members of the dyad are women, they are less likely to interrupt each other (–6.2 points; SE=3.3 points).⁸ Taken together, these findings are consistent with the expectation that while women give each other space to finish their thoughts, mixed-gender groups are more prone to interruptions. We return to this point below.

6 Interruption is Common Across All Congressional Contexts

Representing the directed dyads as networks reveals patterns consistent with the foregoing multivariate results. Figure 4 displays the network of interruptions, where each node is a Member, each directed edge indicates the Member interrupted the Member at the end of the arrow at least once, and the size of each node indicates the log total of interruptions the Member made over the period (105th–Present). Panel (a) colors the nodes by party; blue nodes indicate Democrats, and red nodes indicate Republicans. Panel (b) colors the nodes by gender; yellow nodes indicate women, and gray nodes indicate men. Panel (c) colors the nodes by chamber; purple nodes indicate members of the Senate,

⁸Members of the same party are significantly less likely to interrupt each other (–7.5 points; SE=1.7 points).

Figure 4: Network of Interruptive Behavior Among Members



Note: Data collected by the authors. Subfigures are networks of interruption among Members, from 104th–115th Congresses. Each node is a Member, each gray directed edge indicates the Member interrupted the Member at the end of the arrow at least once, and the size of each node indicates the log total of interruptions the Member made over the period. Panel (a) colors the nodes by party; blue nodes indicate Democrats, and red nodes indicate Republicans. Panel (b) colors the nodes by gender; yellow nodes indicate women, and gray nodes indicate men. Panel (c) colors the nodes by chamber; purple nodes indicate members of the Senate, and gray nodes indicate members of the House.

and gray nodes indicate members of the House.

In general, larger nodes within the network are more likely to cluster together, which means that Members who are major interruptors usually interrupt Members who are also major interruptors. This would suggest that interruptors are not necessarily “bullying” quieter members, but rather that Members who interrupt tend to get into “tit-for-tats”

with other interruptive Members. It could also be the case that Members who are more likely to interrupt are also placed together in more hearings, or hearings where there is more opportunity to interrupt. It also appears that there are two distinct clusters of interruptors.

More specifically, panels (a) and (b) suggest that the distribution of the network is not conditional on party or gender; the colored nodes are distributed uniformly throughout the network. Panel (c) suggests that the network clusters conditional on Chamber. This is perhaps obvious, as hearings are often specific to the Chamber. Interestingly, there are a few key Senators who are represented in the overlap between the House and the Senate. This likely is related to the behavior of members during hearings of Joint or Special committees. Further, some members of the House who are primarily clustered within the Senate nodes.

7 Discussion and Conclusion

We conducted what is to our knowledge the most comprehensive analysis of speech in Congressional committees to date. We find that women—regardless of whether they are Members—are significantly more likely to be interrupted. The issue is particularly acute for women MCs, whose probability of being interrupted is roughly ten points higher than men. Further analysis of speaker dyads indicates that women are both more likely to *be interrupted*, but also are more likely to *interrupt*. That said, women are *less* likely to interrupt when the other speaker is a woman. In total, our findings suggest that interruptions are more frequent in mixed-gender pairings, which is consistent with previous work in settings beyond Congress (Bilous and Krauss 1988; Hirschman 1994; McMillan et al. 1977; Palomares 2008). Our network analysis yields evidence that the effects we report are not driven by any small group of interruptors, but rather by general

behavioral phenomena that are common to all women, regardless of context.

We believe these findings are important in advancing our understanding of legislative behavior. Congressional committees are crucial to the policymaking process, and afford members some of their best chances at impacting legislation. As noted above, previous work has found that women are energetic representatives for women's issues ([Gerrity, Osborn and Mendez 2007](#); [Thomas and Welch 1991a](#)). If, as our findings suggest, women are less likely to finish their points in committee, their efforts in this area may be hampered. We therefore believe that this paper marks an important contribution to literatures in elite behavior and policy.

That said, we also believe that our data can support a more thorough investigation into how gender affects speech in the U.S. Congress, in at least three areas. First, in future versions of this paper, we intend to examine whether the patterns we identify hold across committees. Specifically, we will compare interruption rates in committees that focus on so-called male issues (such as Armed Services and Homeland Security) with committees that deal with women's issues (such as Education and the Workforce). Similarly, we may examine whether the content of the discussion (male vs. female issues) affects the likelihood of interruption.

Second—and perhaps relatedly—we will determine whether committee (gender) heterogeneity affects the likelihood that women will be interrupted. Our results to date suggest that this should be an important institutional covariate, given the speaker-listener dynamics in our dyads. We therefore plan to examine whether committees with more women experience a different pattern of interruption than male-dominated committees. We will also explore other variable interactions to determine whether women's status in the minority/majority party, or their years of experience, affect their communication dynamics. Finally, we intend to move beyond interruptions to determine whether gender shapes Member volubility in committee hearings.

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