# The Effect of Gender on Interruptions at Congressional Hearings

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*W*omen in Congress are highly effective legislators. Yet, if women are more likely than men to be interrupted during committee work, they may face a gender-related impediment. We examine speech patterns during more than 24,000 congressional committee hearings from 1994 to 2018 to determine whether women Members are more likely to be interrupted than men. We find that they are. This is especially true in Senate committees—where women are about 10% more likely to be interrupted. Furthermore, in hearings that discuss women's issues, women are more than twice as likely to be interrupted than while discussing other issues. We see a similar pattern for rapid-fire "interruption clusters," an aggressive form of interruption. We further consider a range of moderating factors, which yields little evidence that women change their communication strategy as they gain experience in Congress. We also find suggestive evidence that interruptions are driven by mixed-gender interactions.

## INTRODUCTION

To be equally effective advocates for their constituents, Members of Congress 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. An abundance of previous work has uncovered 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, are more likely than men to be interrupted (e.g., Aries 1976; Coates 2015; Holmes 2013), or both. At the same time, women in legislatures are strong proponents of women's issues (Gerrity, Osborn, and Mendez 2007; Thomas and Welch 1991). If women Members find it more difficult than men to have their voices heard, there are clear implications for substantive representation not only of the constituents that women represent but also of *all* women.

There is no shortage of scholarship examining gendered differences in factors such as policy content of sponsored bills or the length of floor remarks (Brescoll 2011; Hall 1998; Osborn and Mendez 2010; Pearson and Dancey 2011a; 2011b). Indeed, scholars have even found that women speak with a different vocal quality than men do when speaking on women's issues (Dietrich, Hayes, and O'Brien 2019). We extend this line of inquiry to interruptions, examining whether—and in what conditions—women experience higher rates of interruption in Congress.

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When seeking office, women face hurdles that men do not (Lawless and Pearson 2008; Milyo and Schosberg 2000), and they may work harder on the campaign trail to compensate for these disadvantages (Jenkins 2007; Miller 2015). These dynamics change little once women assume office. Women in Congress often expend more effort on the job than men (Lazarus and Steigerwalt 2018) and are highly effective legislators (e.g., Anzia and Berry 2011; Lazarus and Steigerwalt 2018; Volden, Wiseman, and Wittmer 2013). At the same time, women in legislatures (in the United States and elsewhere) often find themselves marginalized as they are shut out of key leadership positions, relegated to less-powerful committees, or experience challenges to their authority from men (Barnes 2016; Kanthak and Krause 2012; Kathlene 1994; Heath, Schwindt-Bayer, and Taylor-Robinson 2005). In short, women in Congress achieve high levels of job performance despite a number of challenges that men do not face. Given their demonstrable efficacy, it is unlikely that experiencing interruptions from colleagues thwarts women's ability to advance their legislative agendas. However, being interrupted at higher rates than men would be one more hurdle that women must overcome.

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 influence policy in many cases, makes committee action an important venue for assessing whether women are more likely to be talked over.

Using committee transcripts from more than 24,000 congressional hearings over a period of approximately

25 years, we investigate whether women are interrupted more often by their colleagues during committee hearings in the U.S. Congress. We make five contributions. First, we demonstrate that women in Congress are more likely to experience an interruption than men; this effect is driven primarily by patterns in the United States Senate. Second, this gendered interruption gap is significantly amplified in hearings discussing women's issues. Overall, women are more than twice as likely to be interrupted in such hearings compared with those when women's issues are not discussed. Third, in addition to single instances of interruption, we find that the patterns above also apply when we examine the probability of involvement in rapid-fire interruption clusters, which we argue are a particularly aggressive form of interruption. Fourth, although the probability of interruption grows more slowly for women than men as they gain seniority, we find little evidence that women adopt a more aggressive communication style as they gain experience. Finally, analysis of speaker dyads reveals suggestive (but not definitive) evidence that interruptions are more likely in mixed-gender pairings, and also that men are more likely to interrupt women than they are to interrupt men.

## GENDER IN LEGISLATURES

Members of Congress are strategic actors who seek reelection (Mayhew 1974); they should therefore be expected to advocate for their constituents 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 also deviate from the party line to promote their constituents' interests (Carey 2007). Therefore, legislative entrepreneurship might serve as a strong signal to constituents that the legislator is actively advancing their interests (Bowler 2010). For example, acts such as floor speeches and sponsoring bills allow Members to demonstrate energy and/or competence (Burden 2007). This is true even if the legislation is not ultimately successful, as Members might return to their districts and make credible claims about even *attempted* actions (Parker and Goodman 2009).

That said, effective policy entrepreneurs must be able to communicate their ideas. However, this might be especially challenging for women Members, as previous work has found that women tend to speak less than men in a range of settings (Brescoll 2011; Karpowitz and Mendelberg 2014; ; Karpowitz, Mendelberg, and Shaker 2012; Mendelberg and Karpowitz 2016). Mendelberg and Karpowitz (2016) found that women engaging in small-group political debate nearly always spoke less than men unless women significantly outnumbered men in the group—a condition that does not hold in the typical American legislature. Moreover, previous work has also found that 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, or interrupting less frequently (Bilous and Krauss 2010; Hirschman 1994; McMillan et al. 1977; Palomares 2008). Even with these adjustments, women are more likely to be interrupted when speaking (Hancock and Rubin 2015; McMillan et al. 1977).

These findings are relevant for understanding business in Congress, an institution that rewards masculine behaviors (Duerst-Lahti 2002). Existing evidence suggests that Congress marginalizes women—especially women of color (Hawkesworth 2003) and Democrats (Kanthak and Krause 2012). Research focusing on legislative floor behavior has uncovered further evidence of male-dominated legislatures. For instance, Bäck, Debus, and Müller (2014) found that men gave more floor speeches in the Swedish Riksdag primarily due to men speaking more during debates over "hard" issues such as defense or foreign policy. Brescoll (2011) found a positive correlation between member power and the amount of time spent speaking on the U.S. Senate floor for men but not for women. In short, previous work suggests that compared with men, women in Congress might experience more difficulty fully expressing their ideas.

## WOMEN IN COMMITTEES

Although it is certainly important to consider how women's speech during floor debate differs from that of men, we believe that committee action is simultaneously more consequential for the goals of many Members *and* is also more likely to result in gendered differences in members' speech patterns. Ensuring equal ability of Members to participate in committees is important for a number of reasons, not the least of which is that most congressional business is done there (Deering and Smith 1997). In addition, as committees can hold considerable power over not only which bills will advance to the floor but also the form in which they do, committee members can wield disproportionate influence over policy matters in which they are expert (Fenno 1973; Hall 1987). Hearings are a central aspect of this process. Committees frequently use hearings to exercise oversight of executive departments' activity, but they are a crucial part of the legislative process as well; committees hold hearings to get feedback on proposed legislation from experts, interest groups, and the public. During hearings, committee members can question witnesses or use their time to air opinions. They may also choose to engage their colleagues in debate. Thus, hearings serve an important function in both an investigatory and legislative sense and bring members into close contact.

Compared with floor debate, committee hearings are also less restrictive in ways likely to be consequential with respect to how members might be treated, given the gendered communication styles described above. Especially in the House, floor speeches are highly regulated affairs in which members control the floor during their allotted time and during which strong norms might dissuade frequent 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 all members are usually guaranteed the opportunity to speak and the interplay between witness and Member offers more opportunity for one party to interrupt, talk over, or dodge the other. Thus, committees are the ideal theater in which to examine whether women do indeed experience more difficulty communicating their ideas in Congress.

## INTERRUPTIONS AND REPRESENTATION

We focus on a particularly acute example of "communication difficulty" in congressional committees: being interrupted by colleagues while speaking. If women are more likely to be interrupted, there are significant implications for representation and governance. First, as noted above, previous work has recognized that effective communication and committee work are both essential for policy making. Thus, interrupting a Member during committee work could frustrate her ability to make important points that might otherwise not be heard.

This is important because women in Congress act as representatives of not only their own constituents but also women living throughout the country (Carroll 2002; Mansbridge 1999). Elected women have both more interest in women's issues and higher rates of membership on committees overseeing those policy areas than men (Thomas and Welch 1991). Furthermore, women in Congress tend to think carefully about "women's issues" and often make an effort to represent women beyond their district borders (Dittmar, Sanbonmatsu, and Carroll 2018). Women Members speak more on women's issues than men (Hall 1998; Karpowitz and Mendelberg 2014; Osborn and Mendez 2010; Pearson and Dancey 2011b; Swers and Kim 2013), and their statements during legislative action are often intended to advance policy ideas that benefit women or compel their colleagues to consider women's perspectives (Shogan 2001; Swers 2002; Walsh 2002).

These efforts might mark an attempt to compensate in part for the underrepresentation of women in Congress, and available evidence suggests that women in Congress successfully advance their legislative agenda at rates on par with or better than men (Anzia and Berry 2011; Lazarus and Steigerwalt 2018; Volden, Wiseman, and Wittmer 2013). Still, in order to achieve legislative successes, women often must overcome institutional hurdles that men do not face (e.g., Barnes 2016; Kanthak and Krause 2012; Kathlene 1994; Heath, Schwindt-Bayer, and Taylor-Robinson 2005). Experiencing higher rates of interruption is another such hurdle. If women must fight off interrupting colleagues or others seeking to distract, diminish, or deflect them, their path to effective policy making may be more difficult.

Previous work has recognized that a higher likelihood of experiencing interruption might pose challenges for women in governmental roles. For instance, 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. 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 men—both justices and advocates. Second, the conservative justices interrupt the liberal ones more frequently than liberals interrupt conservatives. Third, experience seems to reduce the relative likelihood that women will be interrupted, and much of this effect stems from women justices learning over time to speak more like men on the Court.

Finally, Jacobi and Rozema (2018) analyze Supreme Court interruptions using Justice dyads, finding that each interruption between a pair of Justices is associated with a significant reduction in the probability that the pair votes together on the case. Therefore, these results may signal disagreement, positioning, politicking, or all three, and they are consistent with Supreme Court interruptions being a sign of conflict between Justices. This has important implications for understanding how interruptions affect business in Congress.

## EXPECTATIONS

If interruptions are a sign of conflict in Congress, they could signal conditions in which policy is more contested. As noted above, gender dynamics are a powerful determinant of a group's communication dynamics. Moreover, committee work is an important theater in which women Members can support policies that will benefit women, which may be especially likely to create policy conflict. Although the dynamics surrounding gender, power, and conversation are complex (e.g., Itakura and Tsui 2004), a long-standing body of work has shown that men employ a number of tactics in conversation—including interruption—to exert social dominance (e.g., Zimmermann and West 1996). Meanwhile, women have been substantially underrepresented in American legislatures, and Congress as an institution tends to diminish in various ways Members who are not white, male, or both (Hawkesworth 2003; Kanthak and Krause 2012).

These dynamics are likely to collide in legislative proceedings, with potentially important implications for women Members. Some previous work on state legislative committees has uncovered gendered legislator styles in committee, with women allowing more of the hearing to elapse before speaking, taking fewer turns speaking for a lesser duration, and exhibiting a lower likelihood of interrupting their colleagues than men (Kathlene 1994). In short, there are myriad reasons to believe that women in Congress face hurdles to effective communication that men do not. Thus, our primary hypothesis is that women Members are more likely to experience interruption in Congressional

committees than men. We further expect that the pattern described above will hold when we focus on not only single instances of interruptions but also rapid-fire clusters in which Members fight for control of the conversation, which we believe is an especially aggressive form of interruption. Guided by previous work, (Bilous and Krauss 2010; Hirschman 1994; Palomares 2008), we also expect higher instances of interruption in mixed-gender Member pairings.

Yet, a number of factors beyond gender are likely to affect interruptions—either on their own or by moderating the probability that women are interrupted. As noted above, women Members are powerful advocates for so-called women's issues (e.g., Gerrity, Osborn, and Mendez 2007), and legislative speech-making of men and women in Congress can depend on the topic of a debate (Osborn and Mendez 2010). The fact that men and women in Congress are often advocating different policies is itself a potential mechanism of interruption; although some men will also support these policies, the position of others is likely to range from disinterested to hostile, leading to policy conflict. Thus, although we believe that, all else equal, women will be more likely to experience interruptions, we also expect that this effect will be significantly larger in committee hearings where women's issues are being discussed.

Furthermore, we expect chamber-based differences in the probability of gendered interruption. The Senate is traditionally characterized as one of the world's great deliberative bodies, where personal relationships are especially important and procedural rules are often looser than in the House. These factors could combine to make Senate proceedings seem less formal to Members, which itself might encourage men to assert dominance in committee. However, the Senate is also likely to be a more difficult space for women to navigate. Historically, there have been fewer women in the Senate than in the House, and there is some evidence that men (but not women) in the Senate project their power via floor speech (Brescoll 2011). Thus, all else equal, we might expect the gendered interruption gap to be larger in the Senate than the House.

Contextual factors like party, institutional power, seniority, and even a Member's unwelcome long-windedness might also affect the likelihood that women will be interrupted in congressional committees. Jacobi and Schweers (2017) found that liberal Supreme Court justices are more likely than their conservative colleagues to experience interruption; if a similar dynamic is at work in Congress, we would expect Democrats to be interrupted at higher rates than Republicans. We also expect that being a member of the majority party or holding a committee chair, should tend to *reduce* instances of interruption. Existing work has argued that interruption is a method of asserting dominance (e.g., Zimmermann and West 1996). As the people in charge of their committees, we should expect committee chairs to experience a lower likelihood of interruption.

Power does not always trump gender when it comes to women being interrupted, however (Jacobi and Rozema 2018; Jacobi and Schweers 2017). Men and women wield the chair's gavel differently; although

men chairing committees tend to use their position in a unilateral fashion to steer witness testimony and policy conversation, women approach the job more as a moderator (Kathlene 1990). Therefore, we expect that although chairpersons experience a lower probability of interruption than other Members, relative to men chairing committees, women in the chair will still be more likely to be interrupted.

Perhaps a common-sense expectation is that as debates go long, we will see more interruption. One way to examine this is with the length of continuous remarks. As Members drone on, they could make themselves ripe targets for other Members looking to cut them off. Similarly, we consider the total time elapsed in the hearing prior to the speech chunk. If Members begin to lose interest in the session, they might become more likely to interrupt their colleagues as they grow agitated. Alternatively, if members pay less attention later in proceedings, they might interrupt less as the hearing drags on.

Finally, we consider how seniority affects the likelihood that Members experience an interruption and also how it affects the probability that they *will interrupt* their colleagues. In their analysis of Supreme Court arguments, Jacobi and Schweers (2017) found that as they gain experience, women develop communication strategies to thwart interruption and maintain command. As they become more seasoned, women Members might similarly develop more aggressive tactics intended to retain (or gain) control of the floor. If behavior of women in Congress mirrors that of women on the Supreme Court, we would expect the gendered interruption gap to narrow as Members serve longer tenures in office and also that women become increasingly more likely to interrupt their colleagues compared with men with the same seniority.

## DATA: CONGRESSIONAL HEARING TRANSCRIPTS

We analyze 24,103 congressional hearings published by the Government Printing Office (GPO) from 1994 to 2018 (105th–115th Congresses).[1] This sample of transcripts represents the entirety of those available electronically through the GPO. We merged the congressional hearings data to a database of committee assignments extended from Stewart (2017) to attribute text to Members. Next, we merged NOMINATE ideology data from Lewis et al. (2020). The resulting hearings data include speech from 1,269 Members of Congress. Appendix Table A1 contains characteristics of the Members in our sample for each Congress and chamber.

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[1] We also collected data from the 99th, 100th, 101st, 102nd, 103rd, and 104th Congresses, but too few hearings were published to reveal distributional properties. Therefore, we dropped transcripts from these years to reduce risk of selection effects. This yielded 24,103 complete transcripts for analysis from an original total of 26,425. At this writing, the 115th Congress was in session.

As is evident in Figure 1, the number of hearing transcripts available per Congress varies, with fewer transcripts in the more distant past.[2] The 105th Congress—the first one in our frame—contains the smallest number of transcripts (626). However, the number of available transcripts increases with each subsequent Congress, peaking with the 110th (3,238 transcripts), which was in session between 2007 and 2009; transcript availability has been fairly level since. In our data, the median number of hearing transcripts per Congress is 2,647 (mean = 2,192).[3]

Each hearing transcript contains four major components: metadata, a header, the hearing's transcript, 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 sequenced dialogue, discarding the header and appendices.[4] These chunks were naturally clustered and annotated by GPO transcriptionists; we used the natural separation of chunks into new lines to define chunk boundaries, the GPO's clear speaker attributions to parse title and last name, and the GPO's machine-readable speaker code annotations to identify Members.

We validated and expanded the GPO Member code annotations by matching the parsed titles and last names from the text against an external database of member committee assignments (Stewart 2017).[5]

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FIGURE 1. **Number of Hearing Transcripts Available by Congress**
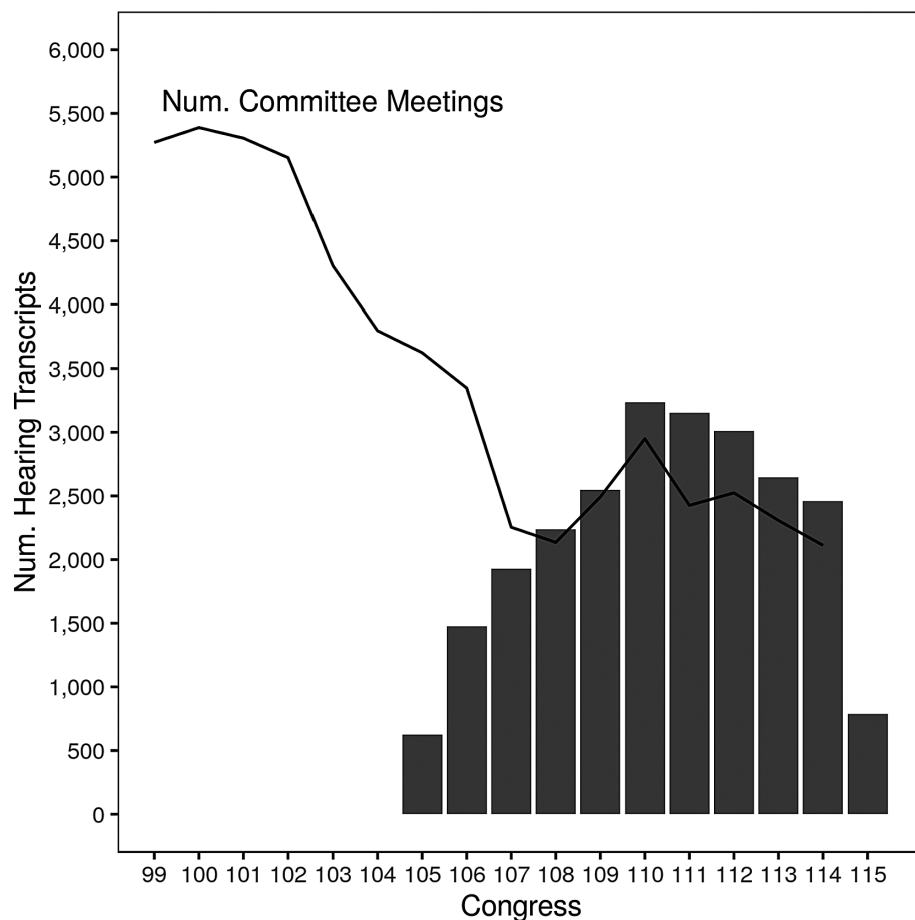


*Note*: Transcript counts compiled by the authors. House committee hearings data from gathered from Ornstein et al. (2018). As of writing, the 115th Congress was in session.

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[2] Table 1 provides further detail on the number of chunks and interruptions per Congress and per the average hearing.
[3] 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 ($p = 0.590$, $t = -2.1$, $df = 8$, $p = 0.07$), it is more likely that factors outside the scope of this analysis condition the number of hearing transcripts available in any given Congress.

[4] To be clear, we define a "chunk" of speech as the entire episode of speech, from a speaker's commencement until their conclusion, either by intention or interruption.
[5] We validated the chunks at scale using automated content analysis scripts, attributing chunks to Members in our database when GPO codes were not present in the transcript. Our codes conflicted with GPO codes on 2,474 cases (less than a tenth of a percent) due to parsing errors. For example, a speaker may directly address another Member at the beginning of a chunk, using their name and title in

We discarded extraneous text chunks that were not attributable to a Member through GPO attributions or annotations, such as statements by witnesses. Appendix Table A1 reports additional validations, which suggest no significant difference in the distributions of the coded transcript data and the known Member population on the basis of Congress, chamber, gender, state, party, and seniority.

The GPO clearly codes for interruptions. Transcriptionists assigned to the hearings annotate the machine-readable text with a flag for interruption, in the form of en or em dashes at the end of a chunk of speech.[6] We rely on the GPO's natural composition and annotation of the chunks to define interruptions, formally coding for an interruption in a chunk if the GPO signal was present within the last 10 characters of the chunk.[7] For example, consider the exchange below, which includes six chunks.[8] Five of these chunks ended in the GPO signal for interruption; in Chunk 4, only the final dash is counted as an interruption, and Chunk 6 includes no interruption.

1. *Mr. Horsford.* Can I ask the point of order as to the reason for—
2. *Mr. Jordan.* You need unanimous consent to enter—
3. *Mr. Cartwright.* What would be the rule that—
4. *Mr. Jordan.* I am gonna recognize—I want to try to move and get to as many of our colleagues as I can. So—
5. *Mr. Horsford.* Mr. Chairman, under rule nine—
6. *Mr. Jordan* (continuing). For the next vote.

This approach produced a total of 3,081,247 chunks used in this analysis—152,338 of which ended in interruptions (4.9%). As Table 1 illustrates, the rate of interruption overall remains fairly stable across all Congresses.

## CHUNK-LEVEL RESULTS

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

We also add a number of other variables to the model, not only to control for their independent effects but also because doing so allows us to explore whether the relationship between gender and interruptions (if any) is conditional on other factors. For instance, we include Member-level indicators for whether the speaker is the *chair* of the hearing ($C_{ij}$) and whether the speaker was in the *majority* party at the time of the hearing ($P_{ij}$).

We also control for the *length* of the chunk because long-winded speakers may be more likely to be interrupted. To do this, we use the percentile rank of the chunk length within the hearing ($L_{ij}$), which transforms the variable into a metric that is comparable across hearings. We control for the *timing* of the speech within the hearing because 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 ($T_{ij}$), 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 include fixed effect dummies for the *Congress*, committee *type*, and *session* ($X_{ij}$).[9] In summary, we model the probability of an interruption with the following regression specification, where the coefficients for gender and its interactions are of primary interest:

$$Pr(Y_{ij} = 1) = \text{logit}^{-1}\left(\beta_1 G_{ij} + \left(\sum_{k \in \{C, L, T, R, P\}} \beta_k k_{ij}\right) \quad (1) \right.$$
$$\left. + \gamma_k k_{ij}{}^* G_{ij}\right) + X_{ij}\delta\right).$$

dialogue. We dropped these cases. Although additional errors in the data are likely—for instance, a transcript might not signal consistently the creation of a new chunk, leading to singular attribution of multiple speakers—we estimate the overall rate of computer-assisted coding error to be consistent with this 0.1 percent benchmark.

[6] The transcriptionist's identity is not indicated within the document. Therefore, it is not possible to control for transcriptionist effects.

[7] Our 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. We return to this point in the Discussion below.

[8] This exchange occurs on page 32 of the transcript for *Hearing Before the House Committee on Oversight and Government Reform: Examining The Justice Department's Response to the IRS Targeting Scandals*, 113th Cong. (2014), https://www.govinfo.gov/app/details/CHRG-113hhrg93834/context, which was held by the Committee on Oversight and Government Reform on July 17, 2014. Appendix Figure A1 reproduces two pages of the original GPO transcript in which this exchange occurred.

[9] Congress ∈ {105th, …, 115th}, committee type ∈ {Senate, House, Joint, Special, Other}, session ∈ {1,2}. We also consider other model specifications, which we report in appendix Tables A4 to A7. These additional specifications include an expanded set of fixed effects for Committees of Jurisdiction and a control for the share of women Members within a committee (see Bäck and Debus 2019). We discuss the results of these additional specifications, which do not affect the coefficients or standard errors of interest substantively, in Appendix Section A1.

**TABLE 1.  Breakdown of Interruptions by Congress**

| Congress | Num. Chunks | Num. Interruptions | Pct. (%) | Num. Hearings | $\mu_\pi$ | $\sigma_\pi$ |
|---|---|---|---|---|---|---|
| 105 | 140,799 | 5,388 | 3.8 | 626 | 3.7 | 3.1 |
| 106 | 241,959 | 9,293 | 3.8 | 1,476 | 3.2 | 3.0 |
| 107 | 270,014 | 10,893 | 4.0 | 1,927 | 3.2 | 3.2 |
| 108 | 265,864 | 11,617 | 4.4 | 2,224 | 3.7 | 4.1 |
| 109 | 293,545 | 14,420 | 4.9 | 2,537 | 4.0 | 4.1 |
| 110 | 421,216 | 20,631 | 4.9 | 3,237 | 4.3 | 4.1 |
| 111 | 355,443 | 16,893 | 4.8 | 3,122 | 4.1 | 4.3 |
| 112 | 357,423 | 17,950 | 5.0 | 3,009 | 4.1 | 4.0 |
| 113 | 334,498 | 19,536 | 5.8 | 2,644 | 4.6 | 4.4 |
| 114 | 309,380 | 21,342 | 6.9 | 2,456 | 5.1 | 4.9 |
| 115 | 91,106 | 4,375 | 4.8 | 787 | 4.0 | 3.9 |
| All | 3,081,247 | 152,338 | 4.9 | 24,045 | 4.0 | 3.9 |

*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 a Member interruption. The percentages are the number of interruptions divided by the total number of chunks, $\mu_\pi$ is the mean of the hearing-level interruption rates, and $\sigma_\pi$ is the standard deviation of the hearing-level interruption rates.

## Women Are More Likely to Be Interrupted in Senate (but Not House) Hearings

Table 2 reports the estimated coefficients and standard errors for the approach reflected in Equation 1. Models 1 and 2 are additive models of Member interruption, whereas Model 3 includes a number of interactions that allow us to calculate probabilities of gender-driven interruption across a range of moderators. In Model 1, which includes controls for specific traits of the chunk, the "Woman" coefficient is positive and statistically significant, suggesting that women in Congress are more likely to experience interruptions. When we include controls for member attributes in Model 2, however, the "Woman" coefficient is effectively zero. Considering that one of these attributes—an indicator for membership in the U.S. Senate—is substantively large and statistically significant, we next examine the possibility that the overall effect in Model 1 is driven by the experience of women in the Senate.

Appendix Table A3 contains results of models that subset the data to House and Senate Committees, allowing us to calculate the predicted probability of interruption for speakers of either gender, in each chamber. We depict those results—as well as some results in Table 2 for members overall—in Figure 2. As Figure 2 demonstrates, the results for Members overall in Table 2 (Model 1) appear to be driven by Senate committees. There is little substantive difference in Figure 2 in the probability of interruption among men and women Members in the House. In the Senate, however, the gap between women and men is approximately one half of a point—a statistically significant effect.

Although this may seem like a small effect, given baseline interruption rates for men it represents more than a 10% increase in the probability of interruption when the senator is a woman. Moreover, this effect is exacerbated because women already are at a disadvantage with respect to their total amount of speaking time. Due to their underrepresentation in the Senate, women

Senators on average use only 21% of the amount of speaking time in a typical hearing.[10] Any interruption is an uncomfortable experience with the potential to sidetrack a speaker's progress, but given that women are already at a disadvantage in terms of overall time, the 10% differential in the interruption rate suggests that women face especially challenging conditions while discussing substantive issues in U.S. Senate committees.

## Women Are More Likely to Be Interrupted When Discussing Women's Issues

We next evaluate whether the likelihood of interruption for men and women in Congress is conditional on the topic of the committee hearing. We expect that women will experience a higher probability of interruption if the topic of the hearing can be labeled as a *women's* issue rather than a *non-women's* issue. To conduct this analysis, we employed a computer-assisted procedure to code committee hearings with respect to whether they addressed a women's issue.

We developed a list of keywords following the methodology of Osborn and Mendez (2010), who divide congressional speech into categories that include *traditional women's policy issues*, such as health care, family-related issues, education, and social welfare issues, as well as *issues of direct relevance to women* as a constituency, which include abortion, women's crime issues, women's health issues, and women's family issues. We also consulted the Routledge International Encyclopedia of Global Women's Issues and Knowledge (Kramarae and Spender 2004), which contains a

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[10] We calculated these expectations using the median number of words spoken by women in each hearing divided by the total number of words spoken in the hearing. The average hearing length is 10,139 words.

**TABLE 2.   Women Members More Likely to Be Interrupted in Congressional Hearings**

| | Interruption | | |
| --- | --- | --- | --- |
| | (1) | (2) | (3) |
| Woman | 0.041*** | 0.002 | 0.094*** |
| | (0.007) | (0.009) | (0.027) |
| Seniority | | 0.006*** | 0.007*** |
| | | (0.0005) | (0.0005) |
| Ideology (DW-NOMINATE) | | 0.052** | 0.036* |
| | | (0.022) | (0.022) |
| Senator | | 0.035*** | 0.022*** |
| | | (0.007) | (0.007) |
| Republican | | −0.050*** | −0.032* |
| | | (0.018) | (0.019) |
| Chair | | −0.254*** | −0.233*** |
| | | (0.009) | (0.010) |
| Majority | | −0.169*** | −0.171*** |
| | | (0.008) | (0.008) |
| Recent interruptions | 0.454*** | 0.454*** | 0.455*** |
| | (0.002) | (0.002) | (0.002) |
| Long-windedness (chunk length) | −1.147*** | −1.273*** | −1.265*** |
| | (0.009) | (0.010) | (0.011) |
| Impatience (chunk timing) | 0.162*** | 0.136*** | 0.141*** |
| | (0.009) | (0.010) | (0.011) |
| Session | 0.040*** | 0.037*** | 0.037*** |
| | (0.005) | (0.006) | (0.006) |
| Woman × Seniority | | | −0.005*** |
| | | | (0.001) |
| Woman × Republican | | | −0.056*** |
| | | | (0.020) |
| Woman × Chair | | | −0.171*** |
| | | | (0.031) |
| Woman × Senator | | | 0.101*** |
| | | | (0.018) |
| Woman × Majority | | | 0.009 |
| | | | (0.018) |
| Woman × Recent interruptions | | | −0.011** |
| | | | (0.006) |
| Woman × Long-windedness | | | −0.059** |
| | | | (0.026) |
| Woman × Impatience | | | −0.046 |
| | | | (0.030) |
| Constant | −3.270 | −3.140 | −3.152 |
| | (0.062) | (0.072) | (0.072) |
| Congress FEs | Yes | Yes | Yes |
| Committee FEs | Yes | Yes | Yes |
| Observations | 3,081,247 | 2,663,730 | 2,663,730 |
| Log Likelihood | −569,932 | −474,344 | −474,296 |
| Akaike Inf. Crit. | 1,139,908 | 948,745 | 948,665 |

*Note*: Entries are coefficients and heteroskedasticity-consistent standard errors from a logistic regression of interruption on speaker and speech characteristics. The unit of analysis is the chunk of speech. The second and third models only use observations where complete data are available. The period for the models spans from the 105th–115th Congresses. $*p < 0.10$, $**p < 0.05$, $***p < 0.01$.

comprehensive bank of keywords on women's issues.[11] We coded an indicator $W_{ij} \in \{0,1\}$, where 1 indicates

that the official hearing title included any of the keywords included in Table A10. Our approach resulted in 3,790 hearings—15.8% of the total hearings—coded as

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[11] We queried the lemmatized hearing title and keyword text to ensure conceptual comparability (Grimmer and Stewart 2013). Keyword queries searched hearing titles using word boundaries to ensure specificity of the query (e.g., a query for "FEM," if not bounded, would return all hearing titles including the word "FEMA"). We

allowed the keywords "FEMIN," "FEMALE," "GENDER," "WOMEN," "WOMAN," and "SEX" to be queried in any substring (unbounded).

**FIGURE 2. Predicted Probability of Interruption in Committee Hearings**
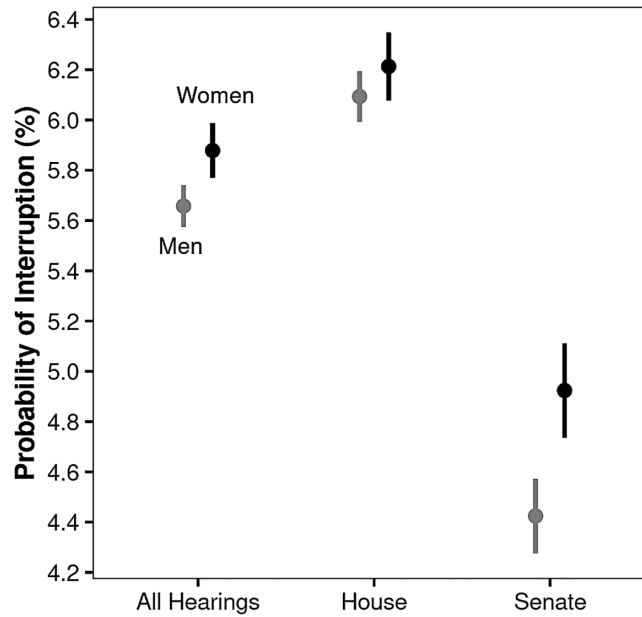


*Note*: Values are predicted probabilities from models 1, 4, and 5, Tables 2 and A3. The models regressed interruption on speech and speaker characteristics and were subsetted by the chamber for which the hearing took place. Modal categories used for prediction. Lines intersecting the points are 95% confidence intervals. Points are labeled by gender. The figure suggests that the probability of interruption is higher given the speaker is a woman, conditional on the chamber in which the hearing is held.

addressing a women's issue.[12] We included this indicator and its interaction with gender into the modeling approach articulated in Equation 1, the results of which are contained in Table A8.

The models in Table A8 indicate that in hearings addressing women's issues, the speaker is more likely to be interrupted regardless of their gender. This is consistent with our expectation of heightened conflict in this policy domain. Also consistent with our expectation, the interaction coefficient in Table A8, Model 3 demonstrates that if the speaker is a woman, she is *even more likely* to be interrupted in hearings devoted to women's issues. In Figure 3 we depict the predicted probabilities derived from these models, as well as those in Table A9, which include interactions that allow us to calculate these probabilities separately by chamber.

The pattern in Figure 3 is striking. Overall, women are on average 2.3 times more likely to be interrupted when discussing women's issues than when not discussing women's issues ($p = 0.01$). In the Senate, the multiplier dips slightly to 1.5 ($p < 0.01$). In the House, the multiplier skyrockets such that a woman is 6 times more likely to be interrupted when discussing women's issues than when not discussing women's issues ($p = 0.02$). The evidence in Figure 3 is therefore consistent with our expectation that women face particularly acute instances of interruption when discussing
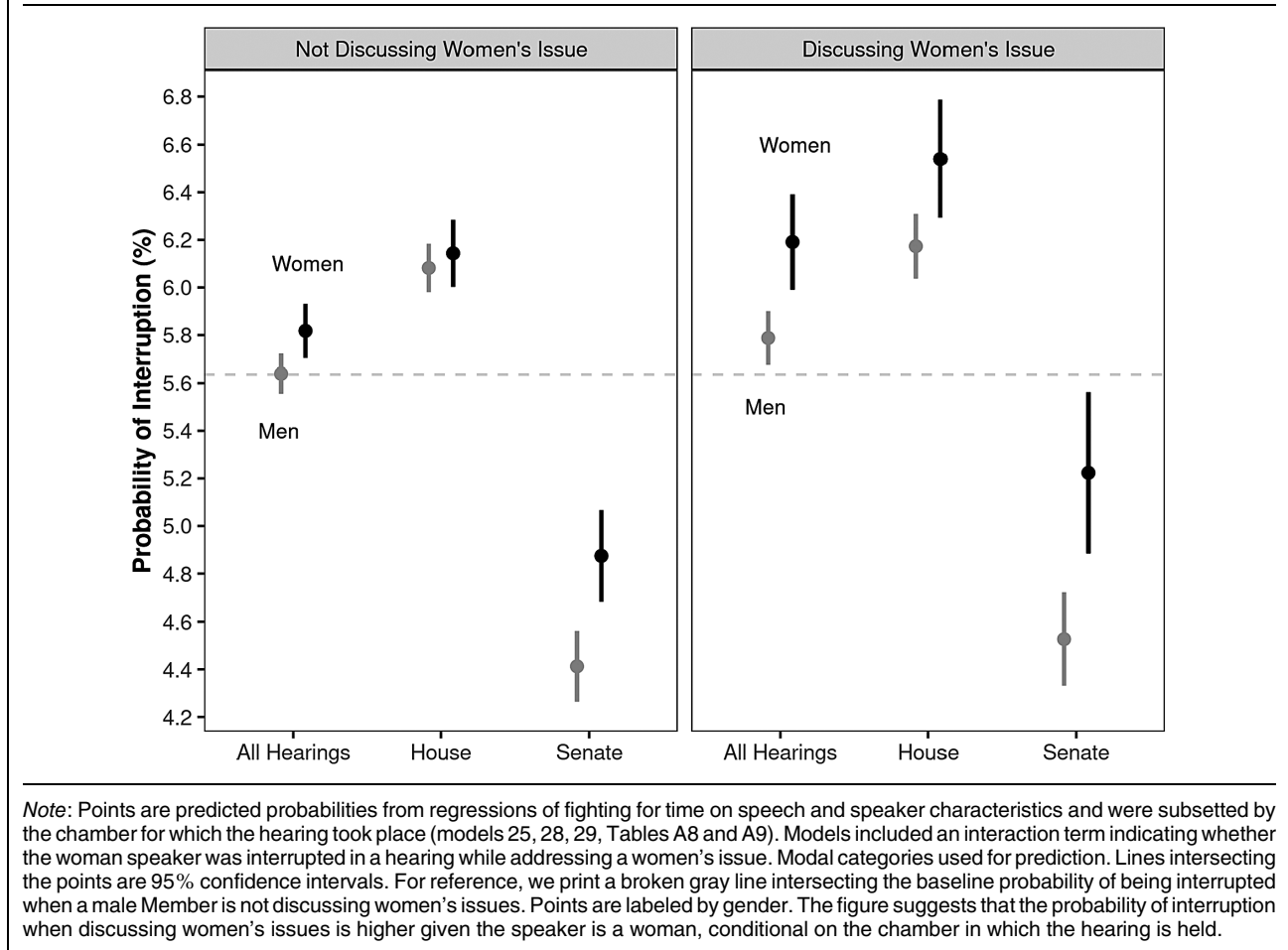
women's issues, which suggests greater conflict surrounding those policies.

## Interruptions across Majority, Chairmanship, and Party

We next consider how chairmanship, being in the majority, and being a member of a particular party shape the probability of interruption, conditional on gender. There is some evidence that these factors on their own generally affect interruptions in Congress. For instance, the chunk models in Table 2 indicate that Members in the majority party are significantly less likely to be interrupted than their minority-party colleagues. That model suggests that committee chairs and Republicans are also less likely to be interrupted relative to other Members, holding other variables constant. All of these results are consistent with our expectations.

Figure 4 depicts the predicted probabilities from Table 2, Model 3 of Members with these traits experiencing an interruption, by gender, with separate effects depicted for the House and Senate. There is some evidence of moderated effects. For instance, in the Senate Democratic women are more likely than Democratic men to experience an interruption, but that effect is not present for Republicans. The probability of interruption is also slightly larger for women in the Senate minority party than for those in the majority. In the House, the effect reverses for women chairing committees, who are about half a point less likely than male chairmen to experience an interruption; this effect

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[12] When the indicator was joined to the chunk database, it resulted in 489,087 chunks (15.9% of the total) coded for women's issues.

**FIGURE 3.  Women Even More Likely to Be Interrupted When Discussing Women's Issues**



*Note*: Points are predicted probabilities from regressions of fighting for time on speech and speaker characteristics and were subsetted by the chamber for which the hearing took place (models 25, 28, 29, Tables A8 and A9). Models included an interaction term indicating whether the woman speaker was interrupted in a hearing while addressing a women's issue. Modal categories used for prediction. Lines intersecting the points are 95% confidence intervals. For reference, we print a broken gray line intersecting the baseline probability of being interrupted when a male Member is not discussing women's issues. Points are labeled by gender. The figure suggests that the probability of interruption when discussing women's issues is higher given the speaker is a woman, conditional on the chamber in which the hearing is held.

is not present in the Senate, though it is directionally negative. In short, certain legislative characteristics do seem to alter the core dynamics at work with respect to the relationship between gender and interruption.[13]

## No Gender Differences across Long-Windedness and Hearing Length

Contrary to expectations, examining the coefficient for chunk length in Table 2, Models 1 and 2, we find that overall Members are actually *less* likely to experience an interruption as they speak for a longer period. Our results further suggest that chunk timing matters; both Models 1 and 2 in Table 2 indicate that Members are

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[13] Another reason we may see lower interruption probabilities among women chairs is the fact that chairs speak for distinct periods at the outset of the hearing, during which time they are less likely to be interrupted, and some unobserved heterogeneity links gender against chair status holding these formalities constant. To gain insight on this idiosyncrasy, we tested the hypothesis that gender was related to interruption, holding these formalities constant. To test this hypothesis, we augmented Model 3 with three-way interactions for the effect of speech length and order conditional on gender and chair status. The effects were not statistically distinguishable from zero ($t = 0.04$ and $t = 0.493$, respectively).

more likely to experience an interruption late in the hearing.

But how do long-windedness and speech timing shape the probability that women Members will experience an interruption? Figure 5 depicts predicted probabilities of interruption conditional on gender across the range of long-windedness and hearing-length percentiles. These probabilities are derived from Model 3 in Table 2—which includes interactions between gender and each of the relevant control variables. Relative patterns for both impatience (left panel) and long-windedness (right panel) are quite similar in the House (top row) and Senate (bottom row). In both chambers, women and men are similarly likely to be interrupted across the range of both the chunk's timing within a hearing and how long Members speak. In each chamber, neither chunk timing nor length appear to affect the probability of interruption differently for men and women.

## Women Do Not Adjust Their Behavior with Experience

In the leftmost panels of Figure 6, we plot the predicted probability of interruption for men and women across

FIGURE 4. Predicted Probability of Interruption in Committee Hearings, within Chair, Majority, and Party Status
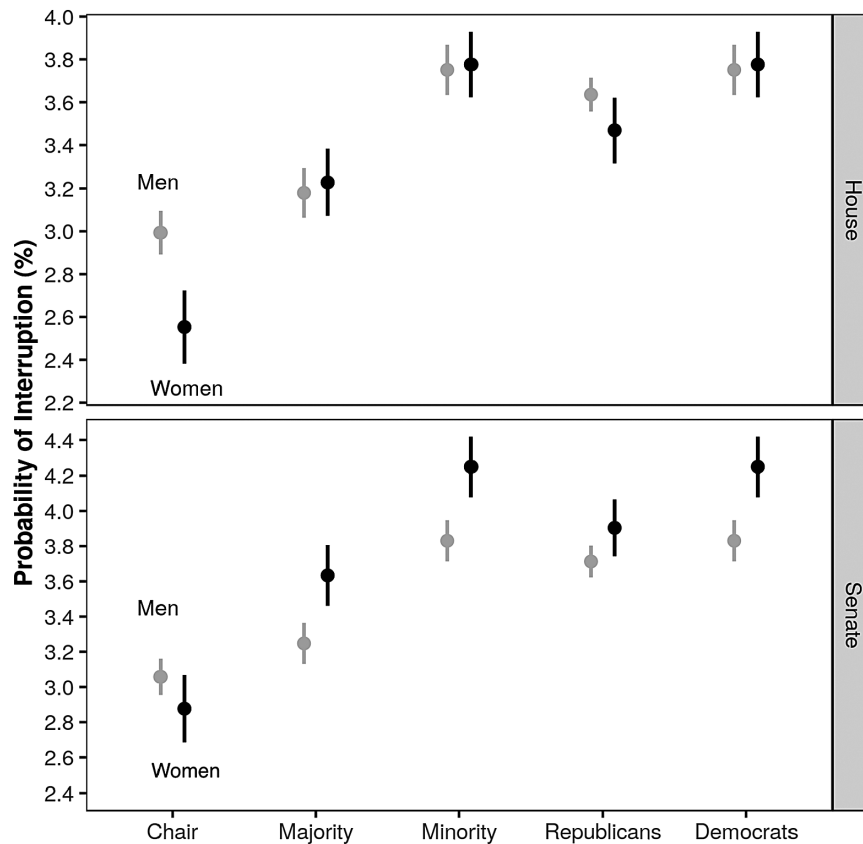


Note: Values are modeled probabilities and 95% confidence intervals from Model 5, Table A12. Modal categories used for prediction. The figure suggests that the effect of gender on interruptions is not moderated by chair, majority, or party status. In all conditions presented, when statistically distinguishable effects are available, women are more likely to be interrupted than men—except in the case of chairs.

years of seniority, computed from Table 2, Model 3. Although both men and women Members grow more likely to be interrupted as they gain seniority, this trend is stronger for men in both chambers. For instance, women begin their Senate careers with a higher estimated probability of interruption (bottom-left panel), but due to the steeper slope for men, the gender gap closes around Members' twentieth year of service. Thereafter, the estimated probability of interruption is lower for women with the same length of service. That said, the confidence regions indicate that the predicted probabilities of interruption for men and women in the Senate are never significantly different at the depicted levels of experience.

That is not the case in the House, however (top-left panel). Women and men begin their House careers with effectively the same interruption probability, and although Members of both genders grow increasingly likely to experience interruption as they serve longer, the probability of interruption grows at a significantly slower rate for women. As a result, after about six terms of service House women are significantly less likely to be interrupted than men with the same amount of experience, with the gap

between men and women continuing to grow as they serve longer.

The slower rate of growth in interruptions across women's House careers—compared with men serving the same tenure—could be taken as evidence that women adapt over time to fending off interruption, perhaps by developing a more masculine legislative style. Such an adjustment would be broadly consistent with the dynamic that Jacobi and Schweers (2017) report among women on the Supreme Court.

But is there evidence that women in Congress are changing their behavior in this way? To answer this question, rather than predicting the likelihood that a Member is interrupted, the right panels of Figure 6 depict predicted probabilities (from Table A11) that a Member who *commits* an interruption will be a man or woman, conditional on the number of years that the interrupter has served in Congress. Because committing an interruption is a purposeful action, it likely provides more information about the communication strategy that Members are attempting to pursue than merely observing whether they are interrupted (Jacobi and Schweers 2017). Thus, if we observe that the effect of seniority on women's likelihood of interrupting

**FIGURE 5.    Predicted Probability of Members Being Interrupted in Committee Hearings, Conditional on Impatience and Long-Windedness**
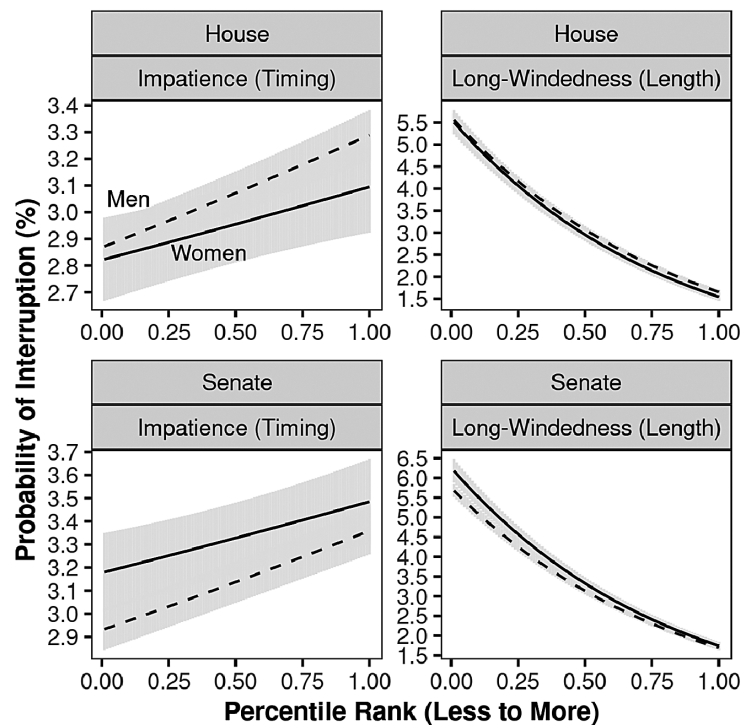


*Note*: Values are modeled probabilities and 95% confidence intervals from Model 3, Table 2, the regression of interruptions on speech characteristics for the Members subset. Modal categories used for prediction. Long-windedness is the percentile rank of the length of the speech chunk, ranked within each hearing. Impatience is the percentile rank of the elapsed time in the hearing when the chunk occurs, ranked across all hearings. Each line is the predicted probability of interruption conditional on gender; lines are labeled by gender. The panels for long-windedness surprisingly indicate that, overall, Members are actually less likely to experience an interruption as they speak for a longer period.

colleagues is significantly higher than that for men, we would have more evidence that women are intentionally adjusting their tactics.

Figure 6 yields no support for that scenario. In both chambers, Members grow more likely to interrupt their colleagues as they gain more seniority. In the House, women are significantly less likely to be the interrupter across the range of seniority, and the growth trend is similar for men and women. In the Senate, women have a *higher* predicted probability of being the interrupter across the range of seniority, though the estimates for men and women Members are not statistically different at any point. Thus, these models do not provide clear evidence that women become more aggressive in their interrupting behavior as they gain experience and, by extension, are not consistent with the notion of women Members changing their tactics relative to men as they serve a longer tenure in office.

## Women Fight for Their Time

We close our chunk-level analysis by providing additional contextual description of the conditions in which women in Congress experience interruption. Jacobi and Rozema (2018) distinguish "conversational overlap," where interruptions occur as a conversation

is transitioning, from "substantive" interruptions that are more clearly intended to cut off a speaker in the middle of making their point. If the interruptions in our data were primarily of the former variety, perhaps they would not indicate a major hurdle in the legislative process. However, most of the interruptions in our data are likely substantive in nature: in a supplementary analysis reported in Table A2 and Figure A2, we find that about three-quarters of the interruptions happen after the first five words of a chunk and more than half of the interruptions happen after the first 10 words of a chunk.

However, we note that "conversational overlap" can also impede substantive points if attempted incursions occur repeatedly at a chunk's outset. Indeed, an interrupter who is truly determined to silence a speaker is likely to make multiple attempts, and repeated efforts to interrupt a speaker before they fully gain the floor could result in "interruption clusters" that may be taken as a *more* aggressive attempt to cut the speaker off. Being involved in these clusters—regardless of where in the original chunk they begin—might therefore be a sign that other Members are trying to talk over each other or otherwise mitigate the speaker's influence. Therefore, understanding whether women are more likely to "fight for their time" can shed light on

**FIGURE 6. Seniority and Interruption**
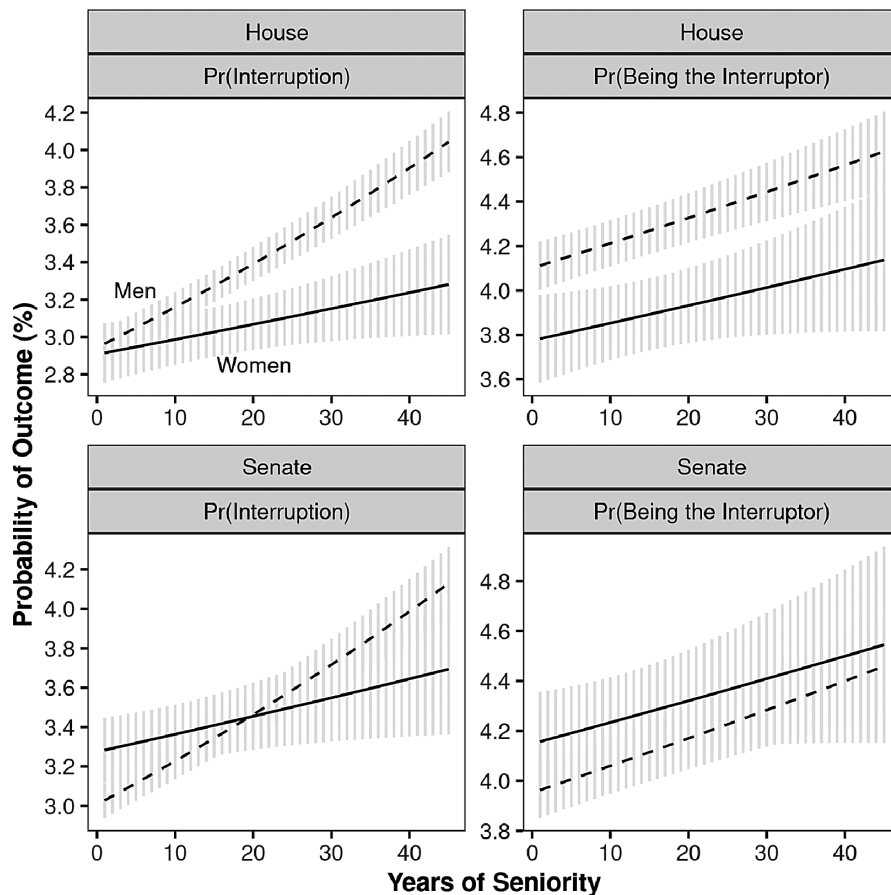


Note: Values are predicted probabilities from Models 3 and 34, Tables 2 and A11. The models are from regressions of chunk codes on speech characteristics, subsetted by the chamber for which the hearing took place. Modal categories used for prediction. Lines intersecting the points are 95% confidence intervals. Points are labeled by gender. Lines may be interpreted as the on average and ceteris paribus effect of gender by seniority. Gender interactions are held constant at median length, median time, average interruption recency, median ideology, Republican party, in the majority, non-chair status, standing committee, 112th Congress, and first session. Any apparently lower interruption rates for women are owing to these intercept settings.

the dynamics underlying their higher likelihood of interruption demonstrated above. If women in congressional committees are more likely than men to find themselves engaged in rapid-fire interruptions as they battle with someone for control of the conversation, it might constitute evidence that women in Congress are interrupted more often because others are actively attempting to thwart the points they were hoping to make.

Therefore, we shift the focus here beyond single instances of an interruption to examine whether women are also more likely to fight for their time. We consider whether the pattern we observe for interruption clusters mirrors that for interruptions reported above. To answer this question we employ the same approach used previously (articulated in Equation 1), but we shift the dependent variable to a binary indicator for whether a speaker has been interrupted more than once during the previous 10 chunks, $Y'_{ij} \in \{0, 1\}$. Table A12 reports the coefficients and standard errors

for these models, and Figure 7 depicts the predicted probabilities from these models by chamber and speaker gender. We see a similar pattern here as in Figure 3: women in both chambers are significantly more likely to be involved in an interruption cluster in hearings involving women's issues than they are during hearings on other topics. Both overall and in the House, men and women are similarly likely to fight for time on non-women's issues.

However, in hearings involving women's issues, significant gaps between men and women emerge. Specifically, women are 44 times more likely ($p < 0.01$) to fight for time on women's issues in Congress overall, and they are 6 times more likely ($p < 0.01$) to do so in the House.[14] Women in the Senate are more likely than men to be involved in interruption clusters across the

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[14] The overall ratio, computed as $1.10/0.025 = 44$, is large due to its denominator, the extremely small difference in the probability of

FIGURE 7. Women More Likely to Fight for Time in Committee Hearings
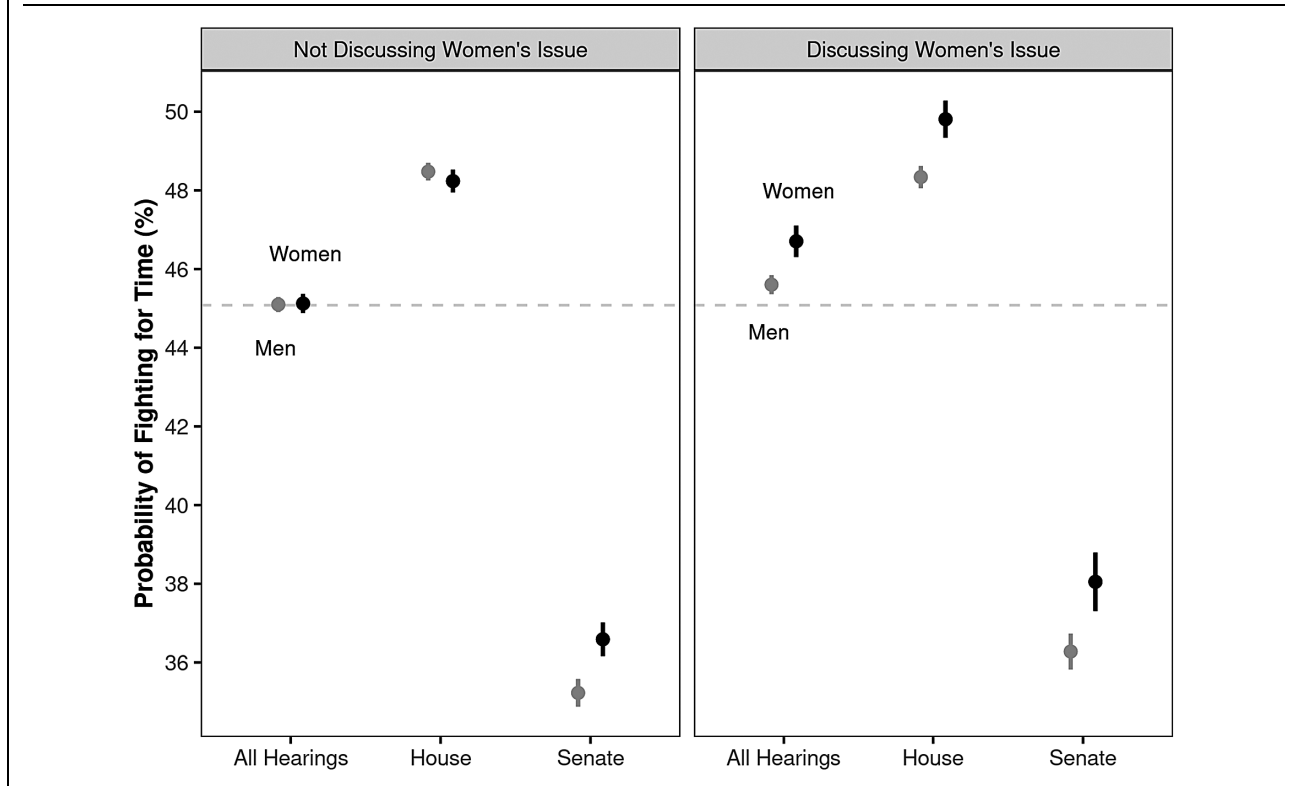
*Note*: Values are predicted probabilities from models 35, 39, and 40, Tables A12 and A13. Models included an interaction term indicating whether the woman speaker was fighting for time in a hearing while addressing a women's issue. Modal categories used for prediction. Lines intersecting the points are 95% confidence intervals. For reference, we print a broken gray line intersecting the baseline probability of being interrupted when a male Member is not discussing women's issues. Points are labeled by gender. The figure panels suggest that the probability of fighting for time is higher regardless of the Member's chamber. Discussion of women's issues moderates the effect, significantly increasing the probability that a woman will fight for time while discussing a women's issue, relative to men.

board, but they are 1.3 times more likely ($p < 0.01$) to fight for time when discussing women's issues. We take this as further evidence that debate surrounding women's issues comes with especially high levels of policy conflict, as women are more likely to experience other speakers intentionally and aggressively trying to impede their ability to effectively communicate in these policy areas.[15]

## DYAD ANALYSIS

We close with an analysis of speaker dyads, designed to examine the question of whether interruptions are

fighting for time between men and women overall (0.02 points). The ratios for the House and Senate are, respectively, 1.46/0.241 = 6 and 1.77/1.31 = 1.3. Because the effect in the House reverses its sign, we use the absolute value of the difference for the denominator; because of this directional reversal, the ratio is biased to understate the change.
[15] In Appendix Table A17, we analyze the initiation of interruption clusters. We find that although women and men are equally likely to initiate clusters overall, seniority is somewhat positively correlated with the likelihood that women start interruption clusters (Appendix Table A18).

more likely to occur in mixed-gender pairings. Because Congress is a social system, we would expect that dyadic interactions are not independent of other interactions. For example, some Members might be naturally disruptive or rude. Likewise, a Member might be more likely to interrupt another because the other Member interrupted her first (an endogenous "retaliation" effect). Or perhaps communication follows different patterns when people are speaking with a partner of the same gender than when groups are gender-mixed (Bilous and Krauss 2010; Hirschman 1994; Palomares 2008).

To account for these types of interactions, we fit additional models for which the unit of analysis is *pairs* of Members within each Congress. We treat each Congress as an individual network, where the nodes are Members and the edges connecting them are weighted by the number of times they interrupted each other. We use this network design to explore whether the heightened probability of interruption reported above is conditional on the gender of the person with whom the speaker interacts. Edges are directed, such that the edge weights between any two Members may vary based on how much one Member interrupts the other. A dyadic approach has been successfully used to study Supreme Court interruptions (Jacobi and Rozema

**FIGURE 8. Predicted Probability of Interruption in Committee Hearings, Controlling for Endogenous Effects**
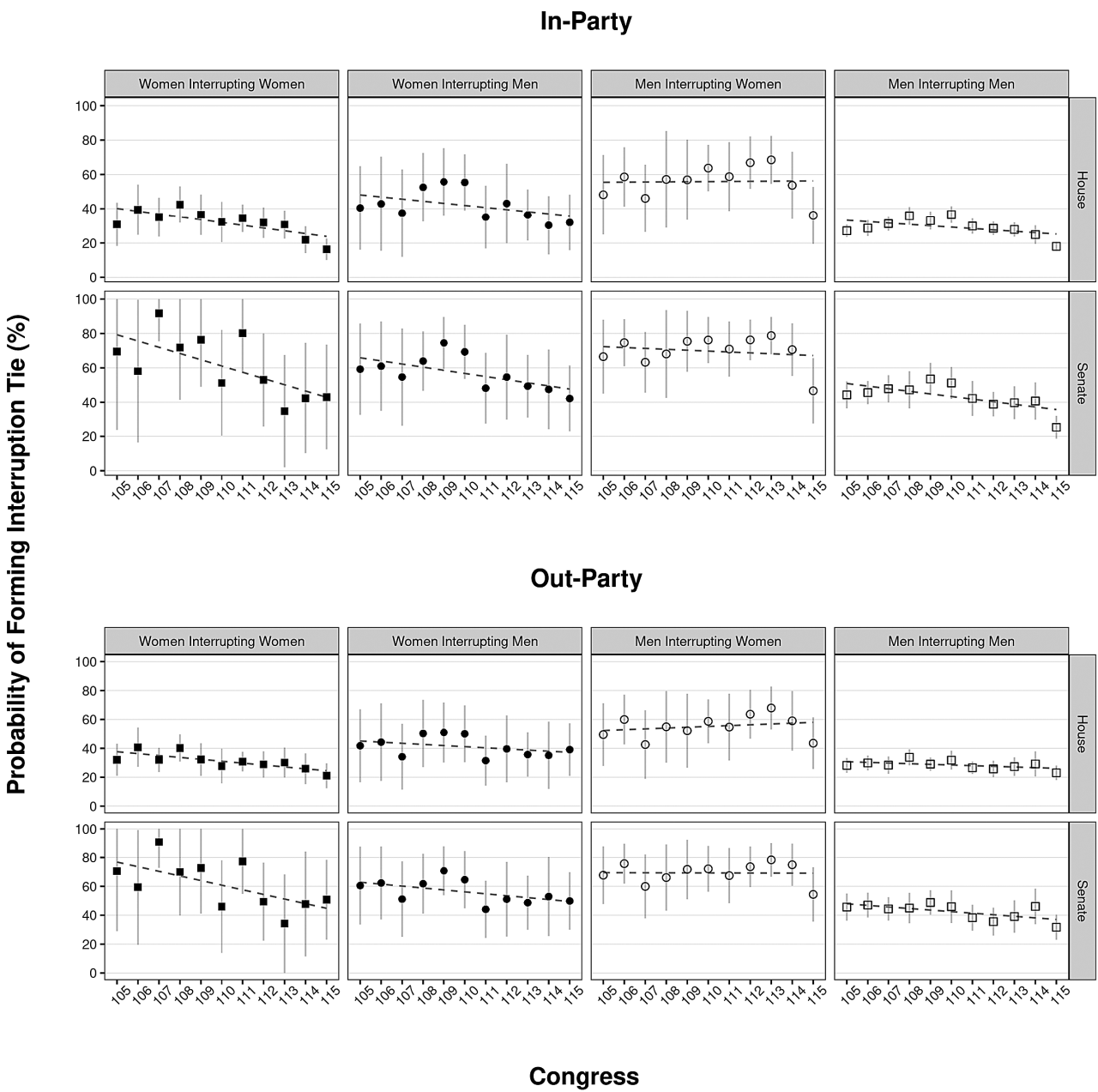


*Note*: Values are modeled probabilities and 95% confidence intervals from Models 44–54 in Tables A15 and A16. Each point is the predicted probability of interruption conditional on dyad composition, with 95% confidence intervals. The broken lines help to show the general position of the points and do not imply direct comparison between model estimates. Interactions include the intercept for average interruption tie probability and assume the following: the dyad participants are from different states, the ideological (NOMINATE) distance between the dyad participants is equal to one standard deviation, the difference in seniority is equal to the average difference in seniority within each chamber and Congress, and the probability of interrupting each other (a "mutual" tie) is 0.5. Panels are broken out by partisan composition. The *in-party* panel illustrates dyad effects when both members are both from the same party, whereas the *out-party* panel illustrates dyad effects when members are from different parties. Subpanels are by gender composition and chamber.

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2018). This approach 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.[16]

Using a logit estimator to account for these types of interactions can result in bias and overstate significance (Aronow, Samii, and Assenova 2017; Cranmer and Desmarais 2011; King and Zeng 2001) due to the endogeneity of interruption behavior. Therefore, we employ an exponential random graph model (ERGM) to allow for these types of complex interdependencies as well as to estimate less biased coefficients and measures of uncertainty. Specifically, we employ an ERGM where edges are specified using binary flags—rather than a valued ERGM, where edges are specified using counts (e.g., Krivitsky 2012)—because the models are easier to interpret and may be more reliably estimated. We follow Cranmer and Desmarais (2011), who use a "thinning rule" to binarize edge data for a network of Members of Congress.

We prepared $N = 8,206,743$ directed edges for $\Omega = 1,264$ Member nodes from the 105th to 115th Congresses.[17] Directed edges for Members were created using the chunk-level data.[18] Each node was associated with an array of Member characteristics including *gender* $G_i$ (where 1 indicates the Member is a woman); chamber membership $C_i$ (where 1 indicates the Senate); partisanship $P_i$ (where 1 indicates a Republican); experience $S_i$, measured as the number of years the Member has served; state delegation $D_i$, an indicator for the Member's state, and; ideology $I_i$, the Member's NOMINATE score in that Congress. After applying a binarization threshold of four interruptions and creating one network for each Congress, we ultimately obtained 174,508 nonzero edges (see Appendix Section A2).

We report the ERGM results in terms of predicted probabilities for the sake of interpretation (for full results see Appendix Table A15.) Figure 8 depicts predicted probabilities of interruption among the four possible gender dyads within each Congress over time.[19] The predicted probability of forming a tie is generally consistent within all four dyad pairings over the time series. The patterns are also comparable across in-party (top panel) and out-party (bottom panel) dyads.

Figure 8 offers some suggestive evidence that interruptions are more likely to occur in mixed-gender dyads, as same-gender dyads have directionally lower probabilities of forming ties than do mixed-gender dyads. Indeed, the "Men Interrupting Women" dyads typically exhibit the highest predicted probabilities of forming an interruption tie. That said, the point estimates for the "Women Interrupting Men" dyads exhibit substantial confidence interval overlap with those in the "Men Interrupting Women" dyads, so we cannot conclude that men are more likely to interrupt women than vice versa.

Figure 8 also suggests that women are about as likely to interrupt women as they are to interrupt men; although as noted the predicted probability of women interrupting men is typically higher than for women interrupting women, there is considerable overlap among the confidence intervals in the women-driven dyads. Among men who interrupt, Figure 8 shows that among the four dyads we examine the estimated probability of forming a tie is typically lowest for "Men Interrupting Men" across Congresses. Moreover, we see little overlap in the confidence intervals around the predicted probability of "Men Interrupting Women" and those around "Men Interrupting Men," suggesting that men may be more likely to interrupt women than they are to interrupt men.

## DISCUSSION

Our chunk analysis yields evidence that, overall, women in Congress—and particularly, the Senate—are significantly more likely to be interrupted. Moreover, these effects are significantly amplified in committee hearings where the topic is women's issues. Our subsequent analysis uncovers moderated effects. The most compelling of these is that in contrast to work finding that women on the Supreme Court learn to fend off interruptions by adopting a more masculine communication style (Jacobi and Schweers 2017), as women gain more experience in Congress, they do not become more aggressive relative to men with the same experience in terms of interrupting other Members. Finally, we find suggestive (but not definitive) evidence that interruptions in Congress are more often than not the result of mixed-gender interactions and that men likely interrupt women more often than they do other men.

Recent work has found that women are effective representatives (Anzia and Berry 2011; Lazarus and Steigerwalt 2018; Volden, Wiseman, and Wittmer 2013) despite having to overcome gender-related obstacles that men do not experience (Barnes 2016; Kanthak and Krause 2012; Kathlene 1994; Heath, Schwindt-Bayer, and Taylor-Robinson 2005). In demonstrating that women are significantly more likely to be interrupted when speaking in committee, our results uncover yet another hurdle that women face. It is difficult to argue that these interruptions thwart their ability to achieve policy goals given the success that women have in advancing their legislative agendas.

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[16] Heterogeneous characteristics of dyads also likely interact to affect interruptive behavior. For example, a Member may be less likely to interrupt another Member from the same party, and the results above suggest that seniority or ideology may also exert an effect on the probability of interruption.

[17] Members drop in and out of Congress, and some Member pairs did not have any interruptions, resulting in a number of edges less than (11 Congresses)*$\Omega^2 = 17,574,656$.

[18] We incremented each pair's $ij$ edge for each interrupted row (chunk), using the row's Member for index $i$ and the next row's Member for index $j$.

[19] Although Figure 8 reports estimated probabilities that are ordered by Congress, the predictions are generated from separate models and do not facilitate the direct comparison of model estimates. Interpretive restraint is therefore warranted.

However, our results underscore that women in Congress likely surmount more challenges than men do.

Our results also suggest that these challenges may be more significant on the issues women care about the most. We expected that a high level of policy conflict surrounding women's issues would intensify the gendered interruption gap when committees discuss women's issues. We find that, overall, women in Congress are more than twice as likely to experience an interruption in hearings covering these issues compared with other hearings. This pattern is also visible with respect to involvement in interruption clusters, which we believe are a particularly aggressive instance of interruption. Given that women's issues are of chief concern for many women in Congress (Dittmar, Sanbonmatsu, and Carroll 2018), our results underscore that the gains that women achieve in these policy domains are likely won in hotly contested conditions. It is highly unlikely however that we have discovered the final obstacle that women in Congress face. Future work should more fully consider how the environment in which women make policy depends on the topic under consideration.

Our finding that women face a higher probability of interruption in Senate committee hearings is perhaps surprising, considering the Senate's reputation as the world's most venerated deliberative body. However, for most of American history fewer than 20 women served in any given Senate, which combined with institutional norms and the power of personal connections between Senators may create a "boys club" atmosphere that is especially difficult for women to navigate. Regardless, the differential effects we report for Senate and House committees is a reminder that legislative rules and culture might have implications—intended or otherwise—for which members are more effective communicators. Future work should examine the link, if any, between these factors and Members' ability to effectively pursue their legislative agenda.

Our findings regarding Member experience also warrant further exploration that is beyond the scope of this article. Regardless of their gender, the likelihood of interruption increases as Members serve for a longer period. However, this growth occurs significantly more slowly for women. In the House, we see that over time this differential eventually leads to women being significantly *less* likely to be interrupted than men with the same amount of experience. Contrary to prior work on the behavior of Supreme Court Justices (Jacobi and Schweers 2017), we do not find evidence that women learn to thwart interruption by adapting a more masculine style over time. We base this claim on the fact that the trend in probability of being the *interrupter* is similar for men and women over the duration of legislative careers. This said, our analysis should not be taken as a definitive study of how gendered communication styles evolve over legislative careers. Rather, this is a rich avenue for future analysis to examine.

A deeper analysis of speaker dyads would also be a welcome addition to this literature. Our dyad-level results are consistent with our expectation of interruptions being more probable among mixed-gender dyads.

However, these results are not definitive and warrant further examination. Moreover, gender is not the only variable that may affect the communication dynamics in congressional hearings. Future work should also examine how factors such as party or seniority affect the probability of interruption. Following recent work on Supreme Court arguments (Jacobi and Rozema 2018), this line of inquiry might also shift to considering interruptions as an independent variable, taking on questions such as how Member dyads that form interruptions work (or vote) together on subsequent bills.

Finally, it is worth more fully considering the substantive context in which an interruption occurs. This is true with respect to both the topic of conversation and the "type" of interruption that speakers experience, broadly defined. Although prior work has argued that interruptions occurring later in speaker chunks are likely a more concerted attack on the substance of the speaker's remarks (Jacobi and Rozema 2018), our analysis finds that women are more likely than men to be involved in rapid-fire interruption clusters. We argue such clusters are a particularly aggressive form of interruption that may previously have escaped classification as a "substantive" interruption. We believe future scholarship should more fully consider the context of gendered interruption in Congress. For instance, our coding did not classify interruptions as destructive (intended to seize control of the conversation) or constructive (intended to aid the speaker). It is conceivable that some interruptions could be helpful to the speaker. Although we leave the answers to these questions for subsequent work, we encourage future efforts to answer them. Doing so will advance a more complete understanding of how gender shapes the patterns of interruption among members of the United States Congress.

## SUPPLEMENTARY MATERIALS

To view supplementary material for this article, please visit http://doi.org/10.1017/S0003055422000260.

## DATA AVAILABILITY STATEMENT

Research documentation and data that support the findings of this study are openly available at the American Political Science Review Dataverse: https://doi.org/10.7910/DVN/5PEQSS (Miller and Sutherland 2022).

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participants at all of those meetings for improving the paper.

## CONFLICT OF INTEREST

The authors declare no ethical issues or conflicts of interest in this research.

## ETHICAL STANDARDS

The authors affirm this research did not involve human subjects.

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