Oh, oh! Modeling Parliamentary Interruptions in Canada, 1926-2015

Tanya Whyte
Department of Political Science, University of Toronto

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Abstract

Literature on the Canadian "democratic deficit" argues that parliamentary decorum in the Canadian House of Commons, including disruptive behaviours like heckling and cheering, has been worsening over recent decades. Such questions of long-term change in parliamentary behaviour are amenable to text as data methods, a rapidly emerging field in quantitative social science. This analysis uses the Lipad dataset, a new machine-readable digitization of the complete text of the Canadian House of Commons *Debates* (Hansard), to investigate disruptive behaviour (measured via parliamentary interruptions) in the House of Commons from 1926-2015. Five hypotheses are tested using a multinomial logit model: that interruptions have increased in probability over time; that ministers are likeliest and backbenchers least likeliest to be interrupted; that women MPs are more likely to be interrupted; and that interruptions are more common under majority government conditions.

Preliminary version: Please do not cite or distribute until a final version is posted. Thanks to Arthur Spirling for his advice and feedback.

Introduction

The conduct of elected representatives in the House of Commons has been a frequent target of criticism in the Canadian "democratic deficit" literature. One root of voter malaise in Canada and in other Westminster-style democracies, it is argued, is public repugnance for adversarial and crude political debate, particularly during Question Period (Docherty, 2005; Grisdale, 2011). Observers also assert that parliamentary behaviour has gotten worse in recent decades, making corrective reform an urgent necessity (Blaikie, 2008; Loat & MacMillan, 2014). This longstanding debate has been infused with new life in the contemporary atmosphere of populist politics in Britain and the United States, and associated controversies over what constitutes appropriate discourse in democratic public spheres. Given this context, it is unsurprising that the current Liberal government has attempted to reform the Standing Orders of the House of Commons to preserve what it sees as an effective balance between accountability and governing effectiveness—and that this move has provoked a passionate opposition defence of Question Period as one of the few remaining tools it possesses to hold governments to account (Curry, 2017; Wherry, 2017a, 2017b).

The contention that parliamentary debate is in decline rests primarily on the personal reflections of long-serving members of the House of Commons. However, the recent digitization of the historical Canadian Hansard by the Lipad project (Beelen et al., 2017) presents a new opportunity to assess these claims quantitatively. This paper examines historical trends in parliamentary decorum from 1926–2015 through a measurement of interruptions made in the House of Commons and recorded in the House of Commons *Debates*, more commonly known as Hansard. More specifically, it investigates the following questions: have interruptions increased over time? Who is most likely to be interrupted, and under what parliamentary conditions? In the next section, I provide a short overview of literature on the empirical study of legislative proceedings, both international and Canadian. Next, I elaborate further on the measurement, methodology, and hypotheses directed at answering the questions above. Finally, I present results addressing these questions with some further analysis of the unexpected trends they uncover.

Literature Review

Legislative debate is a natural data source for comparative study, but until recently data availability and labour intensity has limited its use in political science research. Over the past decade, digitization of debate proceedings and voting records, and government open data initiatives, have intensified scholarly interest in this area. In the comparative literature, Bächtiger identifies three general approaches to the empirical study of legislative debate: deliberative, discourse, and strategic or rational choice (Bächtiger, 2014, 2). Deliberative approaches are rooted in the political theory of deliberative democracy most commonly associated with Habermas (1996; 2005). Deliberative researchers are normatively interested in quality deliberation, during which reasonable participants attempt to reach consensus through careful consideration of competing arguments in an enterprise of mutual respect. Their empirical task is to conceptualize and measure the quality of debates as deliberations (Steenbergen, Bächtiger, Spörndli, & Steiner, 2003), as well as assess the prediction that deliberative political processes lead to better outcomes (Bächtiger, 2014, 6). Within this literature exists a lively debate as to whether legislatures are truly deliberative

venues (Fishkin & Luskin, 2005), whether it is possible to persuade opponents via debate (Mucciaroni & Quirk, 2006), and whether persuasion or simply communication is necessary for quality legislative deliberation (Esterling, 2011). Within the Canadian literature, Tremblay's (1998) content analysis of the substantive representation of women's issues by women MPs is an example of this style of work.

Second, the discourse approach to studying debate emphasizes the "rules, conventions, and routines" of legislatures as institutions with strong norms and rituals of practice (Bächtiger, 2014, 20). Scholars in this area emphasize case studies, employing close readings and rhetorical interpretation to illuminate underlying structural relationship. Relevant to this study, Ilie's work on parliamentary interruptions, politeness, and insults is an excellent example of discursive scholarship on legislative debate (Ilie, 2004, 2010, 2015). While most such research is qualitative, scholars have also employed computer assisted text analysis methods to study thematic patterns in debate transcripts (Schonhardt-Bailey, 2008). In Canada, Labbé and Monière investigate thematic and linguistic features in speeches by Canadian and Quebecois politicians in their work (Labbé & Monière, 2003, 2010; Monière, Labbé, & Labbé, 2008). Arguably, Crimmins and Nesbitt-Larking's (1996) analysis of Prime Ministers' parliamentary speeches for psychological traits and for comparison with their British equivalents also fits within this category.

Finally, the rational choice perspective on legislative debate draws on the voting behaviour and agenda setting literatures. Speeches offer opportunities to communicate policy positions, claim credit, and advertise, all important methods of gaining voter support (Mayhew, 1974). One section of this literature extends the practice of using roll call voting data to estimate partisan positions, and employs quantitative analysis of speech data to test and improve spatial voting models (Lowe, Benoit, Mikhaylov, & Laver, 2011; Slapin & Proksch, 2008). More generally, rational choice scholars are interested in modeling how individual motivations, partisan collective action problems, and institutional features shape the decision to speak and the content of speeches made by individual politicians (Bäck & Debus, 2016; Proksch & Slapin, 2014). Much of the Canadian empirical literature on parliamentary debate falls into this category, such as Blidook's (2010) work on Private Members' Business and policy advocacy goals, Blidook and Kerby's (2011) investigation of electoral motivations for posing constituency-related questions, Soroka et al.'s (2009) look at dyadic representation within Question Period, and Penner et al.'s (2006) examination of Question Period and the representation of issue priorities.

This study draws on each of the three approaches. From the deliberative literature, it adopts the concept of quantitative measurement of debate quality to assess normative claims; as a relevant example, Wyss et al. develop a quantitative measure of cognitive complexity and apply it to Swiss parliamentary debates on immigration to assess the claim that the quality of political debate on immigration has declined over time (Wyss, Beste, & Bächtiger, 2015). From the discursive literature, it borrows the idea that persistent institutional practices such as interruptions are a meaningful unit of analysis, as in Ilie's work. Finally, in its quantitative approach at the individual speech level it is strongly associated with the rational choice literature.

Data and Methods

Empirical studies of Canadian parliamentary debate face a number of technical and practical hurdles. One is data availability: the House of Commons website hosts digitized parliamentary proceedings beginning from 1994, necessitating a manual review of Hansard in hard copy for any investigation of prior years. Second is the more general issue of coding, which is typically necessary for a quantitative analysis of parliamentary speeches but which requires a great deal of repetitive human labour (Krippendorff, 1980). Out of necessity, the Canadian literature mentioned above has typically examined subsets of proceedings, including answers by the Prime Minister or by Premiers (Crimmins & Nesbitt-Larking, 1996; Labbé & Monière, 2003; Monière et al., 2008), questions on particular topics (Soroka, 2002), or samples of a few Parliaments (Penner et al., 2006).

The Lipad ("LInked PArliamentary Data") dataset of the Canadian Hansard both overcomes the data availability problem and enables a fully computerized analysis of parliamentary speeches. This dataset consists of the complete machine-readable English text of Hansard since 1901, with each individual speech linked to metadata regarding date, topic, and speaker including personal and partisan information (Beelen et al., 2017). It is available to browse and search online at `www.lipad.ca`, or can be downloaded for offline processing from the website in a variety of data formats. It is also extensible; for the purposes of this study, I link the Lipad dataset with additional electoral metadata sourced from the Library of Parliament's ParlINFO database (Library of Parliament, 2015). Although the dataset begins in the 1900s, I select 1926 as the beginning date for my analysis here for two reasons. First, the basis of the Lipad dataset is an optical character recognition (OCR) of image scans produced from hard copies of Hansard. The older the texts, the more difficult the OCR task due to printing artifacts and document age. Despite our best efforts to correct them, textual mistakes due to OCR errors are an unavoidable artefact of digitization; however, they are much less frequent by about the 1930s. Second, given the relatively small number of interruptions that may occur on a given day of debate—especially in earlier years when Parliament sat for much shorter intervals than is today's practice—my temporal unit of analysis in this paper is the parliamentary session. For reasons of convenience and consistency, it makes sense to begin after the King-Byng affair with the 16th Parliament (November 1926).

The validity of my measurement of parliamentary interruptions as a construct rests on the fact that Hansard is a standardized record of proceedings with continuity to its recording conventions (Bosc & O'Brien, 2009, 1209). When an individual MP, or group of MPs, speaks out of turn and causes a disruption, their interjection is recorded in Hansard under the anonymized name "An hon. member," or "Some hon. members," given their lack of recognition by the Speaker (Bosc & O'Brien, 2009, 604). Typically, no verbatim statement is recorded, and the convention "Oh, oh!" or "Hear, hear!" is generally employed for heckling or applause respectively. More rarely, the text of an anonymous comment may be reproduced (which may be of relevance to any Member who seeks a ruling from the Speaker on a point of order regarding, for example, unparliamentary language (Bosc & O'Brien, 2009, 618)). It is important to note that a number of procedural practices, such as Yeas or Nays on consent for a motion, can also be included as statements by "Some hon. members" in Hansard. However, given these take a consistent form, I filter them out

during data processing. Following this filtering, the remaining recorded speeches by "Hon. member(s)" in the dataset represent a direct and quantifiable indication that a disruptive interruption took place in the House of Commons. I assume that the more parliamentary interruptions, the more raucous and undisciplined the House.[1]

To analyze interruptions, I adapt a methodology employed by Eggers and Spirling (2014) in their investigation of ministerial responsiveness in Britain, wherein they model parliamentary debate as a Markov Chain. A Markov Chain is a simple probabilistic model describing a series of events sharing a set of possible outcomes, or "states". The outcome of each event depends (only) upon the outcome of the preceding event. In the chain, the probability of moving from some state i to some state j is called the "transition probability" $p_{i,j}$. The set of transition probabilities for a given Markov Chain can be summarized as a transition matrix of all the probabilities of any possible transition given the set of possible states (Page & Paur, 1996, 209–212).

Under this type of model, speeches can be understood as states characterized by the parliamentary role of the speaker. The assumption is that each speech represents a "response" dependent solely upon the role of the preceding speaker; for each pair of potential speaker and responder roles/states, there is an associated transition probability. In this study, I model five possible speech states: a government backbencher (G_b), a government minister (G_m), an opposition member (O), an interruption (I), and a statement by the Speaker of the House (S). In practical terms, I recode each speech in the dataset into one of these five categories, according to MP and party metadata. As an example, a passage of debate can be visualized as a directed graph of state transitions between speakers, as in Figure 1.

Given five possible states in the model, there are 25 transition probabilities. The goal of this study is to estimate the probability of parliamentary interruptions; thus, I am primarily interested in the transition probabilities between speech states of MPs (G_b, G_m, and O) and the interruption state (I). To estimate these probabilities, I employ a simple multinomial logit in which the current speaker's state is the independent variable and the next speaker's state is the dependent variable, utilizing the R packages `nnet` (Venables & Ripley, 2002) and `effects` (Fox, 2003; Fox & Hong, 2009) to fit the model using a Bayesian maximum likelihood approach.[2] I model this relationship both at the aggregate level using a fixed effect for Parliament-Session and discretely for each Parliament-Session pair. I also adapt the approach to investigate gender using four speaker states (M, F, I, and S), although due to the skewed nature of the representation of women in the House of Commons historically, I examine trends over time at the less-specific Parliament level.

[1] This method of measurement also has the advantage of being translatable, with minimal modification, across Westminster parliaments with Hansard traditions: for example, the British Hansard records such events as "Interruption," and the Australian, "Interjecting."

[2] Eggers and Spirling (2014) utilize a more complex generalized linear mixed model (GLMM) including random effects for ministry and debate fit using `MCMCglmm` (Hadfield, 2010). In my testing of a similar model for this study, estimation was repeatedly unsuccessful due to both the size of the dataset (about ten times the size studied by Eggers and Spirling) and the sparsity of the interruption and Speaker predicted states especially at the debate (or daily) level. Convergence was also difficult to achieve with a simpler GLMM with random effects for Parliament-Session and a binomial response (interruption/not interruption) model using `lme4` (Bates, Mächler, Bolker, & Walker, 2015). For the purposes of this paper, I therefore present a simpler modeling approach, including a fixed effect for time when relevant, while noting a better fit could be achieved using random effects for Parliament-Session and day.

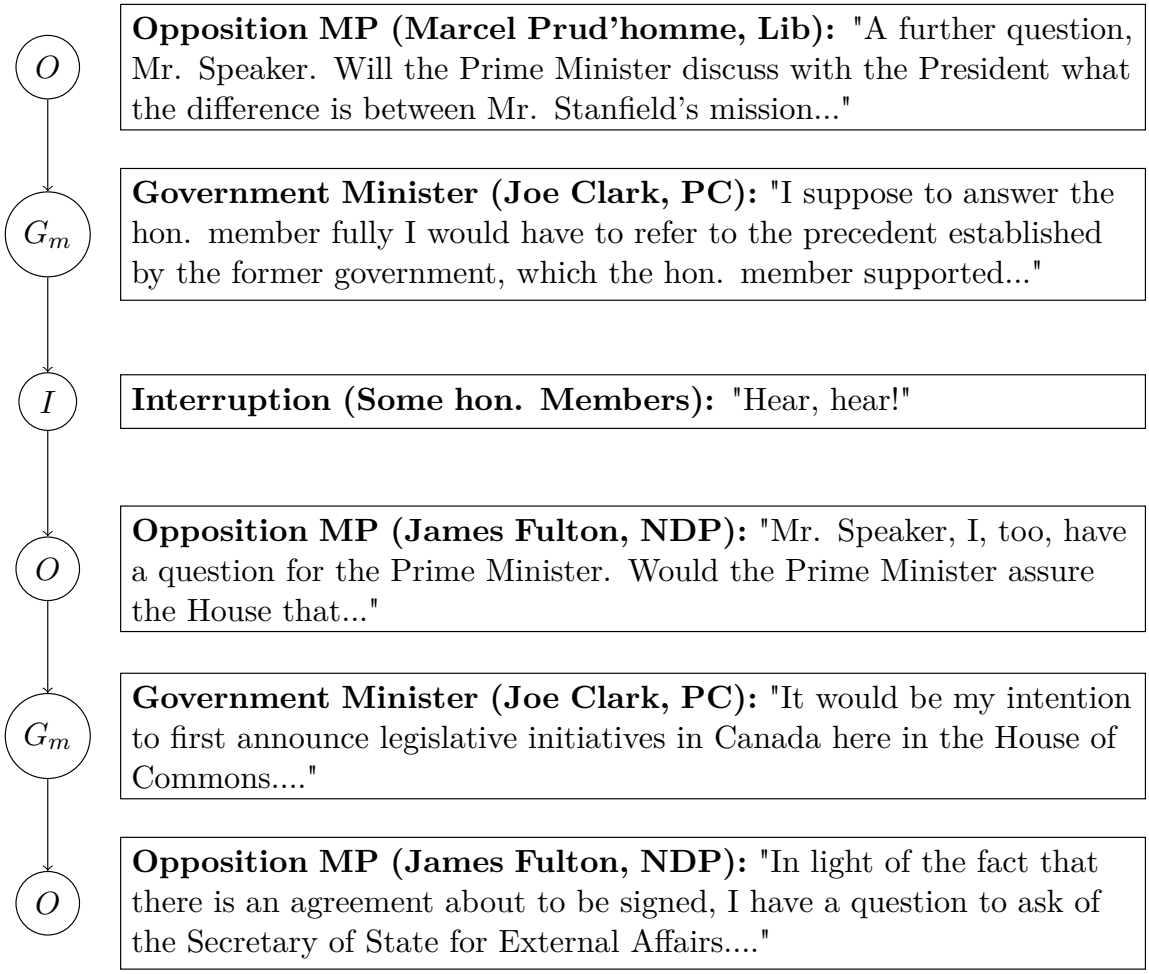

Figure 1. Illustration of an example passage of coded debate (Clark, Fulton, & Prud'homme, 1979)

Hypotheses

The first question I investigate concerns whether interruptions have become more likely over time. There is a general sense in the literature that parliamentary decorum has worsened over time (Blaikie, 2008; Franks, 1987, 1998; Loat & MacMillan, 2014); thus, we should expect an increase in the probability of interruptions over the historical period studied.

Hypothesis 1 (H1): *The probability of an MP speech being followed by an interruption increases over the period under study.*

Second, which types of MP are more likely to be interrupted? The democratic deficit literature emphasizes the inefficacy of backbenchers and the concentration of parliamentary attention on ministers, especially the Prime Minister (Docherty, 2012; White, 2012). Logically, the adversarial nature of accountability in Westminster parliaments suggests ministers

are most likely to be challenged as the opposition holds the executive to account. Blaikie confirms this observation and argues the focus on ministers has intensified since the sponsorship scandal of 2003 (Blaikie & Levy, 2015). Overall, we can expect that government backbenchers are least likely to be interrupted when they speak, and that government ministers should be most likely to be interrupted.

Hypothesis 2 (H2): *A speech by a government backbencher has the lowest probability of being followed by an interruption.*

Hypothesis 3 (H3): *A speech by a government minister has the highest probability of being followed by an interruption.*

An anonymous survey of MPs conducted during the 40th Parliament failed to find significant supporting evidence that women are heckled more often than men in the House of Commons; however, interviews with female MPs have provided qualitative evidence suggesting otherwise (Grisdale, 2011, 39–40). In this study, I test the hypothesis that women MPs are more likely to be interrupted than male MPs.

Hypothesis 4 (H4): *A speech by a female MP is more likely to be followed by an interruption than a speech by a male MP.*

Finally, given H3 (that government ministers are likeliest to be interrupted), it is reasonable to expect that the probability of interruptions will differ based upon whether the government has a majority or a minority. Peter Russell argues that under majority government conditions, debate in Parliament "becomes irrelevant" as government MPs reflexively support their leadership and opposition MPs "howl and squawk" in return, whereas under minority conditions a more deliberative atmosphere prevails (Russell, 2008, 100, 128). Following his argument, we should expect interruptions to be more likely in majority parliaments.

Hypothesis 5 (H5): *The probability of an MP speech being followed by an interruption is higher during majority parliaments and lower during minority parliaments.*

Analysis

The final dataset contains approximately 3.1 million speeches, of which 155 027, or about 5%, are valid interruptions. Note that because I employ a Bayesian approach to estimation of the transition probabilities as posterior probabilities, I report results and perform hypothesis testing in terms of Bayesian credible intervals (Gelman, Carlin, Stern, & Rubin, 2014; Jackman, 2009; Thulin, 2012), except when reporting results for the structural change analysis, which yields traditional frequentist confidence intervals.

H1: Trends over Time

Figure 2 shows a plot of the predicted transition probabilities from an MP speech (one of G_b, G_m, or O) to an interruption, for each Parliament-Session pair. There is a significant upward trend in interruption probability ($p = 0.01$) in a model including a fixed time effect

for Parliament-Session. However, it is visually apparent that the data tell a more complex story.

To quantify this pattern, I perform a structural change analysis using the mean predicted probabilities similar to that employed by Eggers and Spirling (2014), utilizing the R package `strucchange` (Zeileis, Kleiber, Krämer, & Hornik, 2003; Zeileis, Leisch, Hornik, & Kleiber, 2002). The best-fitting model yielded by this analysis specifies three break points demarcating separate linear trends; these points are marked with dashed lines in Figure 2. The first break occurs at the 26th Parliament, 3rd Session (95% CI: 26-1 to 27-1), in 1965 in about in the middle of Pearson's tenure as Prime Minister. The second break occurs at the 31st Parliament, 1st Session (95% CI: 30-1 to 32-2), which was Joe Clark's minority government of 1979. Notably, the introduction of television cameras into the House of Commons took place in the 30th Parliament, 3rd Session (within the confidence interval). The third breakpoint occurs at the 34th Parliament, 2nd Session (95% CI: 33-2 to 35-1), approximately corresponding with the end of Brian Mulroney's tenure as Prime Minister and Kim Campbell's short-lived administration of 1989-1990.

The first and third breakpoints map surprisingly well onto the theoretical predictions associated with theories of the Canadian party system; namely, the transition from the second to the third party system following the Diefenbaker government to the Pearson government, and the beginning of the fourth party system following the defeat of the Mulroney/Campbell government to the Chrétien government (Carty, 1993; Carty, Cross, Young, et al., 2007). This supports the assertion that realignment of the party system fundamentally changes the dynamics of debate in the House of Commons.

The second structural break, however, represents a turning point in the dataset as it marks the end of a long-standing upward trend and begins a relatively consistent downward trend. While it is impossible to prove a causal relationship, there are two interrelated institutional changes that I argue present strong explanatory candidates: the introduction of TV cameras (as mentioned above) in 1977 and changes to the Standing Orders following recommendations by the McGrath Committee in 1986.

The observation of the Speaker at the time, James Jerome, was that television was portended to drastically lower the quality of debate in the House but ended up having little to no effect (Robertson, 2005). Indeed, television appears to have significantly lessened interruptions (and, following the assumptions of this paper, disruptive behaviours) as the effect of being in the public eye moderated parliamentarian behaviour in the long run. However, the process of change was complicated, given interruption probability remained at high levels immediately after the introduction of television. I argue the key to this phenomenon was the parliamentary practice of banging on desks to signal support; this tradition was phased out after the introduction of television due to criticism by the viewing public (Bosc & O'Brien, 2009, 638). The transition from desk-banging to quieter applause in the interests of television appearances can be seen from a closer examination of the text of interruptions made during the 31st Parliament; "Hear, hear!" interruptions surge in relative frequency during this period, then fall off in a pattern that closely resembles the overall trend in interruption likelihood.

Bosc and O'Brien also note that naming, a disciplinary measure that can be evoked by the Speaker against a persistently troublesome Member, also increased substantially after the introduction of television—until changes to the Standing Orders in February 1986, based

upon recommendations by the McGrath Committee, increased the disciplinary powers of the Speaker in February 1986 (or the 33rd Parliament, 1st Session) (Bosc & O'Brien, 2009, 645). The timing of the confidence interval surrounding the 31st Parliament breakpoint in fact closely matches this period between the introduction of cameras and the subsequent changes to the Standing Orders. Some combination, then, of behavioural adjustment to television in the House of Commons (desk banging being a particularly strong example) and increased enforcement powers of the Speaker are a reasonable explanation for the turning point in interruptions over 1974-1984.

To quantify this change, the mean predicted probability of interruption prior to the breakpoint is 0.0412, and after the breakpoint it decreases significantly ($p = 0.01$) to 0.0385.[3] The mean predicted probability of interruption within the breakpoint interval is a stunningly high 0.115.

H2-H3: Backbenchers and Ministers

Overall, we can accept H2 but only partially accept H3. Accounting for fixed time effects, the mean predicted probability of interruption for a government backbencher is 0.0398, for an opposition member 0.0547, and for a government minister 0.0481; differences between the three are significant at the $p = 0.01$ level.

Figure 3 shows the historical trend in predicted mean interruption probability disaggregated by MP type. Visually, it appears that, prior to the 31st Parliament turning point, government ministers were actually the least likely MPs to be interrupted; after the turning point, they are the most likely to be interrupted. A comparison of mean transition probabilities before and after the 31st Parliament confirms this observation. Predicted means and credible intervals ($p = 0.01$) for the three MP types before and after the breakpoint are available in Table 1. In short, prior to the turning point, both backbenchers and opposition members had a similar interruption probability, with ministers less likely to be interrupted; afterwards, backbenchers are the least likely to be interrupted, and ministers are most likely to be interrupted.

ps_tv	state	L.prob.I	prob.I	U.prob.I
notv	G_b	0.0362	0.0371	0.0380
notv	G_m	0.0232	0.0238	0.0243
notv	O	0.0422	0.0428	0.0434
tv	G_b	0.0186	0.0193	0.0199
tv	G_m	0.0398	0.0409	0.0421
tv	O	0.0304	0.0310	0.0317

Table 1
Mean predicted transition probabilities and 99% credible interval for the transition between an MP (state) and the interruption state, before (tv) and after (notv) the 31st Parliament breakpoint.

[3] Note this calculation is based on the endpoints of the 95% confidence interval for the breakpoint; not simply before and after the 31st Parliament.

H4: Female MPs

H4 can also be accepted. The overall mean predicted probability that a speech by a male MP is followed by an interruption is 0.0333, while for a female MP it is 0.0480, controlling for fixed time effects. To understand these probabilities in perspective, it is worthwhile to examine the trend over time in relationship to female representation in the House of Commons, given the skewed nature of that representation over the period studied. Figure 4 shows mean predicted probabilities of interruption for males and females on the lower plot; the upper plot shows the count of female MPs in the House of Commons. The higher likelihood of being a female MP interrupted begins around the 35th Parliament, when a consistent level of female representation is achieved, and accounts for the bulk of the difference between the female and male likelihood overall. However, in the three most recent Parliaments, women and men are interrupted at a rate that is not significantly different ($p = 0.05$).

H5: Majorities and Minorities

The shape of data points in Figure 3 describes whether the Parliament in question is a majority or a minority. No trend appears evident in the plot; this is confirmed by closer analysis, as a very small (0.002) increase in interruption probability exists between majorities and minorities at $p = 0.05$ but this effect disappears at $p = 0.01$. When this trend is disaggregated by MP type, I find no significant difference in interruption probability for backbenchers or opposition ministers across majorities and minorities. There is, however, a slight (0.003) increase in probability of interruption for ministers in a majority versus a minority, significant at $p = 0.01$. Given the robustness of other effects found in this paper at the 0.01 level, it is reasonable to dismiss H5 with a finding of no difference in interruption probabilities between majority and minority governments overall, with the caveat that ministers are slightly more likely to be interrupted in a majority parliament.

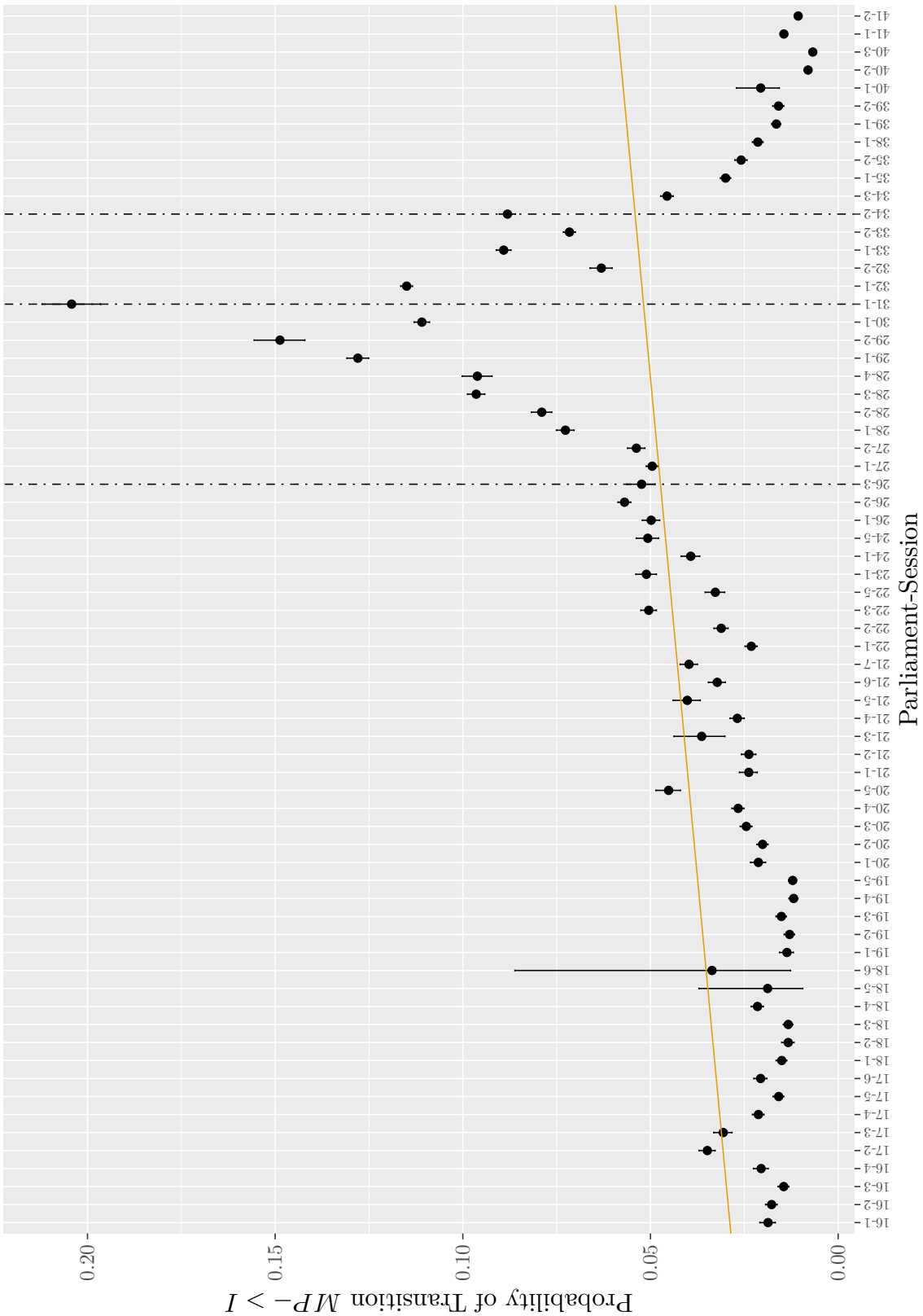

Figure 2. Mean predicted transition probabilities and 95% credible intervals for the transition between the MP state and the interruption state I. The linear fit in orange is calculated including a fixed effect of Parliament-Session on the transition $MP \rightarrow I$. The three dashed vertical lines are breakpoints calculated from the mean transition probability values.

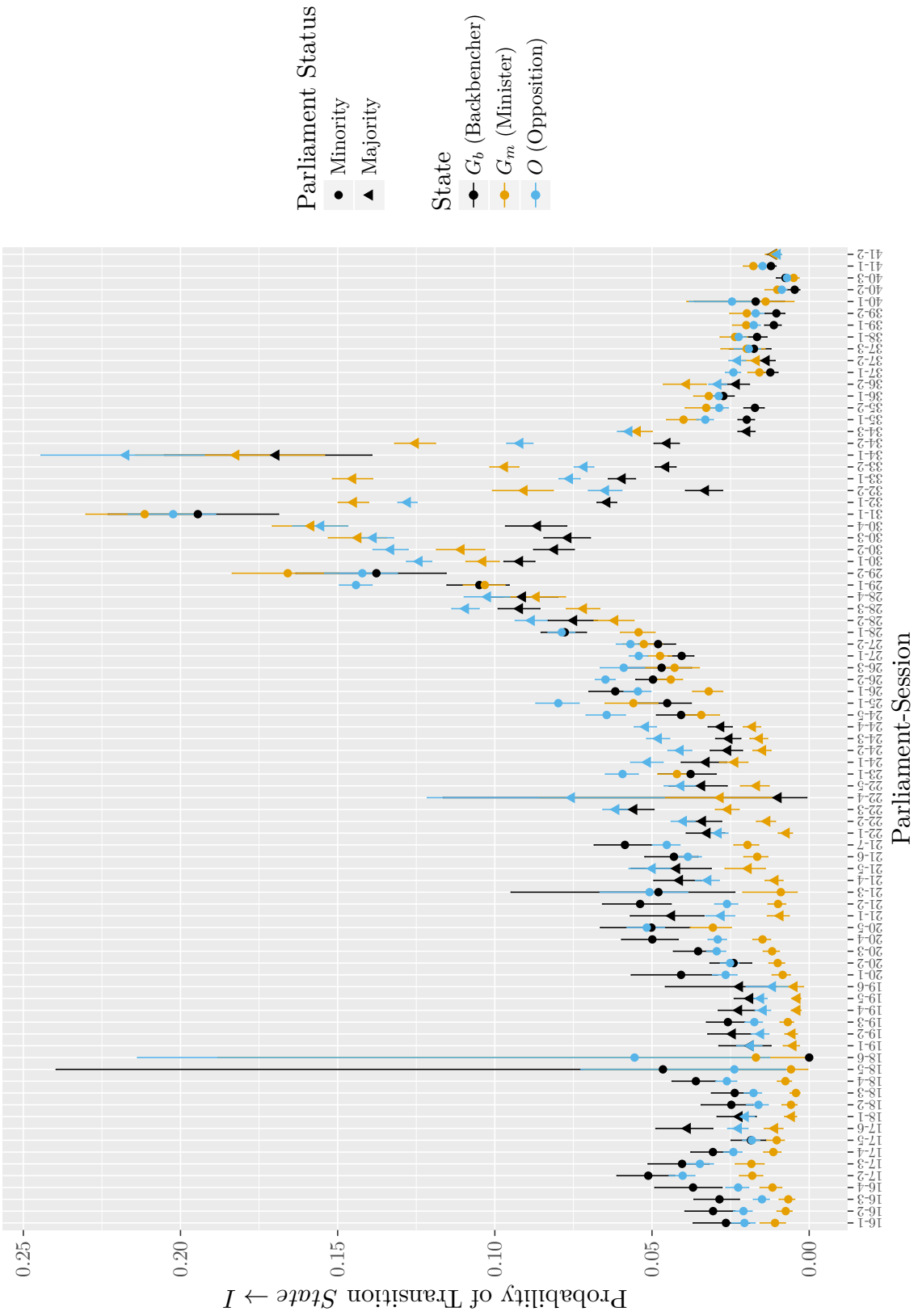

Figure 3. Mean predicted transition probabilities and 95% credible intervals for the transition between the three major speaker states (either government backbencher, government minister, or opposition member) and the interruption state.

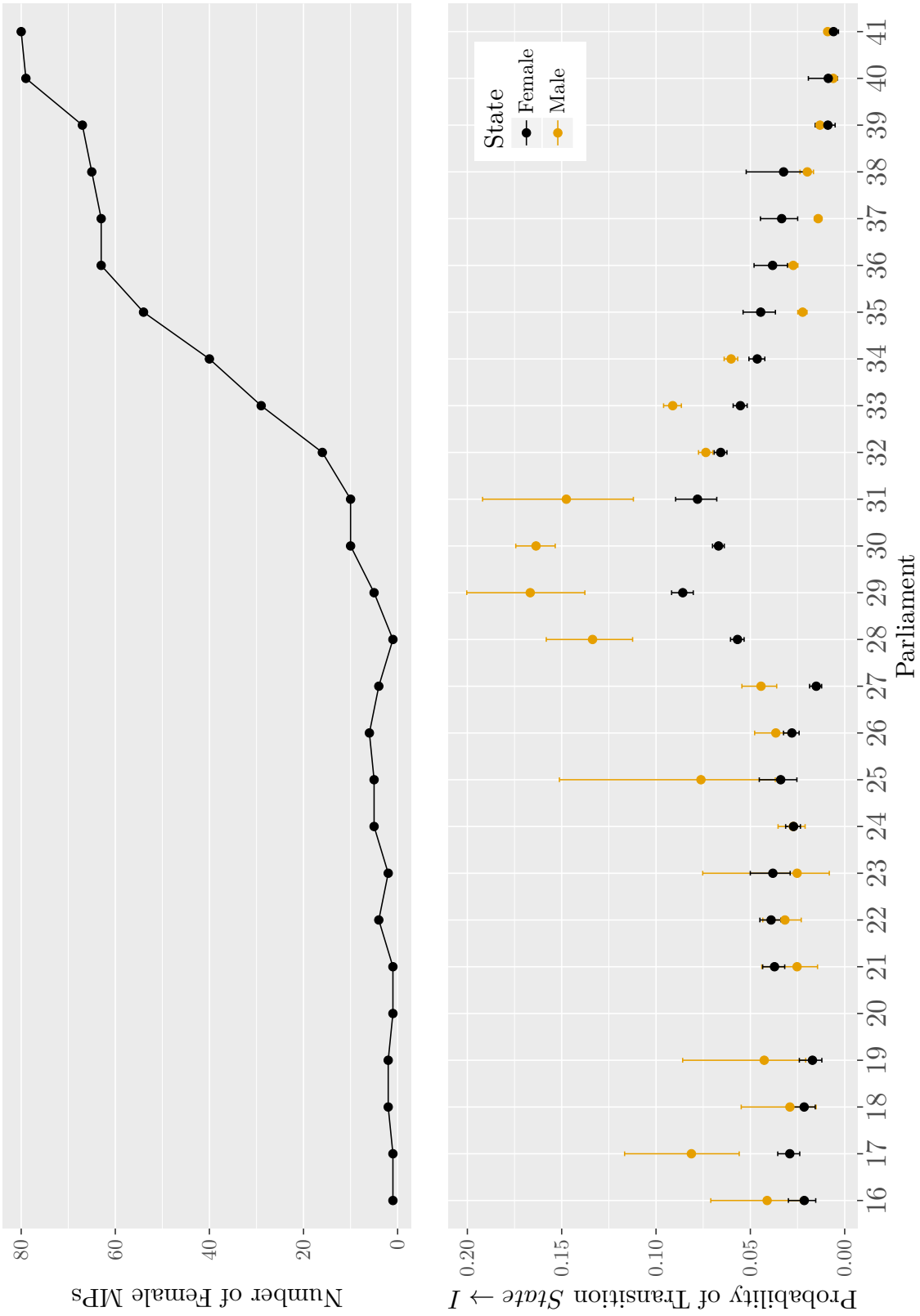

Figure 4. Upper: Count of female MPs in the House of Commons per Parliament. Lower: Mean predicted transition probabilities and 95% credible intervals for the transition between speaker states (either female or male) and the interruption state, per Parliament.

Discussion and Conclusion

From 1926-2015, the probability that a speech given by an MP in the Canadian House of Commons was followed by an interruption increased. However, this finding fails to capture a non-linear trend, in this case the presence of a critical turning point. That is, up until approximately the 31st Parliament in 1979, the likelihood of interruptions was increasing over time; since then, they have been decreasing, and in recent Parliaments the likelihood is similar to or lower than rates seen prior to World War II. A similar shift has occurred in the types of MPs who are likelier to face interruption. Before about 1979, ministers were less likely than backbenchers or opposition members to be interrupted; since then, ministers are more likely to be interrupted. Given the timing and features of this turning point, it appears to have resulted from an interplay of institutional changes, namely the introduction of television cameras into the House of Commons and follow-up changes to the Standing Orders recommended by the McGrath Committee. Partisan realignments have also historically had a significant, though less dramatic, effect on interruption trends. Finally, on the whole female MPs are more likely to be interrupted than male MPs, and majority or minority parliament status does not have a significant effect on the probability of interruption.

This evidence challenges normative claims in the democratic deficit literature and at the same time lends empirical support to its suggestions for reform. First of all, it provides an empirical counterweight to analyses that emphasize the negative aspects of an adversarial parliamentary system. Such assessments are overwhelmingly based on MP self reports as data, and MPs face strong incentives to both overstate the negativity of the House of Commons in an effort to sympathize with voters who find the behaviour of politicians distasteful, and to understate their and their party's contribution to the adversarial climate in service of political objectives (Loat & MacMillan, 2014, 129). Canadian voters are regularly informed about the deplorable state of the Canadian House of Commons by experts and the media. Most understandably lack the time to view parliamentary proceedings themselves and form their own judgments, perhaps in so doing discovering Parliament is a far more mundane experience than they have been led to believe. The finding that female MPs are significantly likelier to be interrupted than male MPs shows the evidence is not all positive. However, parity has been achieved in this respect in recent Parliaments at the same time the overall likelihood of interruptions has reached a historic low. In sum, empirical assessment of the performance of the House of Commons in historical context provides a more reasonable and realistic picture of Parliament today that may assist in challenging a negative cycle in public perceptions of Canadian democracy.

Second, this study provides evidence that both institutional changes and partisan realignments have significantly impacted interruption behaviour in the past, demonstrating the adaptability of the Westminster system to a changing political context. If Canadians are indeed dissatisfied with the practice of parliamentary debate and Question Period, the historical norms of such behaviours appear less entrenched than MPs may bemoan and both procedural reforms and changes at the ballot box are evidently viable paths to affect significant change. On the other hand, the finding that interruptions have been decreasing steadily since 1993 should give pause to critics who argue reforms to improve decorum are critically necessary. Indeed, this trend may signify instead a need for a defense of adversar-

ialism in order to ensure the health of parliamentary debate as a mechanism for democratic accountability. Viewed in this light, the current political struggle over parliamentary reform is a positive sign.

The analysis in this paper could be extended in a number of ways. Interruptions, and the speeches that immediately precede them, could be analyzed for tone and content using topic modeling techniques. This would yield a better understanding of which interruptions are classifiable as heckling and which as supportive, as well as what characteristics of speeches are most associated with provoking interruptions (such as, for example, evasiveness). Second, as mentioned previously, comparison with Britain and other Westminster countries is a logical next step considering the transferability of the interruptions measure to other Hansards. Finally, a more in-depth case study of the turning point identified in this paper, incorporating daily-level random effects to account for the turbulent political context of the time, could more precisely illuminate the character of the downward trend in interruptions since 1979.

References

Bächtiger, A. (2014). Debate and deliberation in legislatures. In S. Martin, T. Saalfeld, K. W. Kaare W. Strøm, & A. Bächtiger (Eds.), *The Oxford handbook of legislative studies.* Oxford: Oxford University Press.

Bäck, H., & Debus, M. (2016). *Political parties, parliaments and legislative speechmaking.* Springer.

Bates, D., Mächler, M., Bolker, B., & Walker, S. (2015). Fitting linear mixed-effects models using lme4. *Journal of Statistical Software*, *67*(1), 1–48. doi: 10.18637/jss.v067.i01

Beelen, K., Thijm, T. A., Cochrane, C., Halvemaan, K., Hirst, G., Kimmins, M., ... Whyte, T. (2017). Digitization of the Canadian parliamentary debates. *Canadian Journal of Political Science*, 1–16.

Blaikie, B. (2008, Autumn). Reflections on reforming Parliament. *Canadian Parliamentary Review*, 2–4.

Blaikie, B., & Levy, G. (2015). Reform of the Commons thirty years after McGrath. In *Annual conference of the canadian political science association, university of ottawa, ottawa.*

Blidook, K. (2010). Exploring the role of 'legislators' in Canada: Do Members of Parliament influence policy? *The Journal of Legislative Studies*, *16*(1), 32–56.

Blidook, K., & Kerby, M. (2011). Constituency influence on 'constituency members': The adaptability of roles to electoral realities in the Canadian case. *The Journal of Legislative Studies*, *17*(3), 327–339.

Bosc, M., & O'Brien, A. (2009). *House of Commons procedure and practice* (2nd ed.). Ottawa: House of Commons.

Carty, R. K. (1993). Three Canadian party systems: an interpretation of the development of national politics. In R. K. Carty (Ed.), *Canadian political party systems* (pp. 563–586). Peterborough, ON: Broadview Press.

Carty, R. K., Cross, W., Young, L., et al. (2007). *Rebuilding Canadian party politics.* Vancouver: UBC Press.

Clark, J., Fulton, J., & Prud'homme, M. (1979, November 7). *Debates.* 36th Parliament, 1st Session. Ottawa: Parliament of Canada. Retrieved from `http://www.lipad.ca/full/1979/11/07/5/`

Crimmins, J. E., & Nesbitt-Larking, P. (1996). Canadian prime ministers in the House of Commons: Patterns of intervention. *The Journal of Legislative Studies*, *2*(3), 145–171.

Curry, B. (2017, April 5). Trudeau fields every question in Question Period as parliamentary reform battle rages. *The Globe and Mail.* Retrieved from `http://www.theglobeandmail.com/news/`

politics/trudeau-fields-every-question-as-parliamentary-reform-battle-rages/article34611215/

Docherty, D. C. (2005). *Legislatures.* Vancouver: UBC Press.

Docherty, D. C. (2012). Imperfect legislatures. In P. T. Lenard & R. Simeon (Eds.), *Imperfect democracies: The democratic deficit in Canada and the United States* (pp. 181–203).

Eggers, A. C., & Spirling, A. (2014). Ministerial responsiveness in Westminster systems: Institutional choices and House of Commons debate, 1832–1915. *American Journal of Political Science*, *58*(4), 873–887.

Esterling, K. M. (2011). "Deliberative disagreement" in US health policy committee hearings. *Legislative Studies Quarterly*, *36*(2), 169–198.

Fishkin, J. S., & Luskin, R. C. (2005). Experimenting with a democratic ideal: Deliberative polling and public opinion. *Acta Politica*, *40*(3), 284–298.

Fox, J. (2003). Effect displays in R for generalised linear models. *Journal of Statistical Software*, *8*(15), 1–27. Retrieved from http://www.jstatsoft.org/v08/i15/

Fox, J., & Hong, J. (2009). Effect displays in R for multinomial and proportional-odds logit models: Extensions to the effects package. *Journal of Statistical Software*, *32*(1), 1–24. Retrieved from http://www.jstatsoft.org/v32/i01/

Franks, C. E. S. (1987). *The parliament of Canada.* Toronto: University of Toronto Press.

Franks, C. E. S. (1998, May 25). The decline of the Canadian parliament. *The Hill Times*, 123–139.

Gelman, A., Carlin, J. B., Stern, H. S., & Rubin, D. B. (2014). *Bayesian data analysis.* Boca Raton, FL: Chapman & Hall/CRC.

Grisdale, M. (2011, Autumn). Heckling in the House of Commons. *Canadian Parliamentary Review*, 38–45.

Habermas, J. (1996). *Between facts and norms: Contributions to a discourse theory of law and democracy.* Cambridge, MA: MIT Press.

Habermas, J. (2005). Concluding comments on empirical approaches to deliberative politics. *Acta Politica*, *40*(3), 384.

Hadfield, J. D. (2010). MCMC methods for multi-response generalized linear mixed models: The MCMCglmm R package. *Journal of Statistical Software*, *33*(2), 1–22. Retrieved from http://www.jstatsoft.org/v33/i02/

Ilie, C. (2004). Insulting as (un) parliamentary practice in the British and Swedish parliaments. *Cross-cultural perspectives on parliamentary discourse*, *10*, 45.

Ilie, C. (2010). Strategic uses of parliamentary forms of address: The case of the UK Parliament and the Swedish Riksdag. *Journal of Pragmatics*, *42*(4), 885–911.

Ilie, C. (2015). Parliamentary discourse. In K. Tracy, C. Ilie, & T. Sandel (Eds.), *The international encyclopedia of language and social interaction.* Hoboken, NJ: Wiley–Blackwell.

Jackman, S. (2009). *Bayesian analysis for the social sciences.* West Sussex: John Wiley & Sons.

Krippendorff, K. (1980). *Content analysis: An introduction to its methodology.* Newbury Park, CA: Sage Publications.

Labbé, D., & Monière, D. (2003). *Le discours gouvernemental. Canada, Québec, France (1945-2000).* Paris: Honoré Champion.

Labbé, D., & Monière, D. (2010). Quelle est la spécificité des discours électoraux? le cas de Stephen Harper. *Canadian Journal of Political Science*, *43*(01), 69–86.

Library of Parliament. (2015, October). *Electoral results by party.* Retrieved from https://lop.parl.ca/ParlInfo/compilations/ElectionsAndRidings/ResultsParty.aspx

Loat, A., & MacMillan, M. (2014). *Tragedy in the commons: Former Members of Parliament speak out about Canada's failing democracy.* Toronto: Random House Canada.

Lowe, W., Benoit, K., Mikhaylov, S., & Laver, M. (2011). Scaling policy preferences from coded political texts. *Legislative studies quarterly*, *36*(1), 123–155.

Mayhew, D. (1974). *Congress: The electoral connection.* New Haven, CT: Yale University Press.

Monière, D., Labbé, C., & Labbé, D. (2008). Les styles discursifs des premiers ministres québécois

de Jean Lesage à Jean Charest. *Canadian Journal of Political Science*, *41*(01), 43–69.

Mucciaroni, G., & Quirk, P. J. (2006). *Deliberative choices: Debating public policy in congress.* Chicago: University of Chicago Press.

Page, L. B., & Paur, S. O. (1996). *Topics in finite mathematics.* Needham Heights, MA: Simon and Schuster Custom Publishing.

Penner, E., Blidook, K., & Soroka, S. (2006). Legislative priorities and public opinion: representation of partisan agendas in the Canadian House of Commons. *Journal of European Public Policy*, *13*(7), 1006–1020.

Proksch, S.-O., & Slapin, J. B. (2014). *The politics of parliamentary debate.* Cambridge: Cambridge University Press.

Robertson, J. R. (2005, September). *Television and the House of Commons.* Library of Parliament: Parliamentary Information and Research Service. Retrieved from `http://www.lop.parl.gc.ca/content/lop/ResearchPublications/bp242-e.htm`

Russell, P. H. (2008). *Two cheers for minority government: the evolution of Canadian parliamentary democracy.* Toronto: Emond Montgomery Publications.

Schonhardt-Bailey, C. (2008). The congressional debate on partial-birth abortion: Constitutional gravitas and moral passion. *British Journal of Political Science*, *38*(3), 383–410.

Slapin, J. B., & Proksch, S.-O. (2008). A scaling model for estimating time-series party positions from texts. *American Journal of Political Science*, *52*(3), 705–722.

Soroka, S. (2002). Issue attributes and agenda-setting by media, the public, and policymakers in Canada. *International Journal of Public Opinion Research*, *14*(3), 264–285.

Soroka, S., Penner, E., & Blidook, K. (2009). Constituency influence in parliament. *Canadian Journal of Political Science*, *42*(3), 563–591.

Steenbergen, M. R., Bächtiger, A., Spörndli, M., & Steiner, J. (2003). Measuring political deliberation: A discourse quality index. *Comparative European Politics*, *1*(1), 21–48.

Thulin, M. (2012, October). Decision-theoretic justifications for Bayesian hypothesis testing using credible sets. *ArXiv e-prints*. Retrieved from `http://adsabs.harvard.edu/abs/2012arXiv1210.1066T`

Tremblay, M. (1998). Do female MPs substantively represent women? A study of legislative behaviour in Canada's 35th Parliament. *Canadian Journal of Political Science*, *31*(3), 435–465.

Venables, W. N., & Ripley, B. D. (2002). *Modern applied statistics with S* (Fourth ed.). New York: Springer. Retrieved from `http://www.stats.ox.ac.uk/pub/MASS4` (ISBN 0-387-95457-0)

Wherry, A. (2017a, March 24). Liberals' latest attempt at parliamentary reform remains a tale of woe, for now. *CBC News*. Retrieved from `http://www.cbc.ca/news/politics/wherry-parliament-reform-chagger-1.4037813`

Wherry, A. (2017b, March 10). Liberals propose changes to how House of Commons works. *CBC News*. Retrieved from `http://www.cbc.ca/news/politics/liberals-parliament-reform-discussion-paper-1.4019904`

White, G. (2012). The 'centre' of the democratic deficit: Power and influence in Canadian political executives. In P. T. Lenard & R. Simeon (Eds.), *Imperfect democracies: The democratic deficit in Canada and the United States* (pp. 226–247).

Wyss, D., Beste, S., & Bächtiger, A. (2015). A decline in the quality of debate? the evolution of cognitive complexity in Swiss parliamentary debates on immigration (1968–2014). *Swiss Political Science Review*, *21*(4), 636–653.

Zeileis, A., Kleiber, C., Krämer, W., & Hornik, K. (2003). Testing and dating of structural changes in practice. *Computational Statistics & Data Analysis*, *44*, 109–123.

Zeileis, A., Leisch, F., Hornik, K., & Kleiber, C. (2002). strucchange: An R package for testing for structural change in linear regression models. *Journal of Statistical Software*, *7*(2), 1–38. Retrieved from `http://www.jstatsoft.org/v07/i02/`