

An Artificial Intelligence Approach to Measuring Legislative Obstruction in the Canadian House of Commons

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Abstract

Obstruction—behavior by legislators with a specific intent to delay the proceedings of a legislature—is a ubiquitous phenomenon in all legislatures, but existing techniques for its measurement are limited. In this paper, I propose a novel speech-based approach to the measurement of obstruction. I combine the inferential power of measurement models with the ability of Large Language Models (LLMs) such as GPT-4 to annotate long sequences of legislative debate by using GPT-4 to generate a series of indicator variables associated with obstruction, and use these indicators to fit a latent variable model of obstruction. I then use the model to generate obstruction scores for each debate, and use these scores to train a random forest regression model to predict the obstructiveness of debates from their embedding representations. I apply this approach to a corpus of over 35,000 debates from the 11th and 12th Parliaments of the Canadian House of Commons.

1 Introduction

Every legislature must decide at some point how to deal with obstructive minorities who use dilatory tactics to slow or outright halt the passage of legislation (Cox 2009), and a growing body of research has sought to explain when legislators obstruct, and when majorities change the rules to limit obstruction. Researchers have argued that obstruction *matters*, providing legislators the ability to extract policy concessions from majorities (Magleby and Reynolds 2017; Fong and Krehbiel 2018), make informative signals to the electorate (Patty 2016) and to other legislators (Dion et al. 2016), and fundamentally limiting the types of policies that are implemented Krehbiel (1998).

While there is no standard technique for measuring obstruction, one common approach is to count the use of certain procedures, such as the proportion of motions to adjourn and the total number of motions in the US House of Representatives (Binder 1996, 1997), and the proportion of *failed* motions to adjourn in the UK House of Commons (Goet 2019). Others use the frequency of newspaper reporting on obstructive episodes (Koger 2010), or simply assume that the threat of obstruction is higher when the rules permit obstruction and majority and minority parties are ideologically polarized (Sieberer et al. 2020). However, procedural measures have several limitations: they are not sensitive to the context in which procedural motions are used, they are not able to capture non-procedural obstruction, and they are not able to capture the use of new obstructionary techniques. Consequently, these measures are ill-suited to measuring obstruction over long periods of time or across cases.

What is needed, then, is a measure of obstruction that can capture a variety of different obstructionary techniques, is sensitive to the context in which these techniques are used, that provides more granular measures of obstructiveness, and that can be used to measure obstruction across cases and over time.

To this end, I propose a latent variable measure of obstruction based on legislative debate. I take advantage of the ability of recent advances in the ability of Generative Pretrained Transformer (GPT) models to both follow complex instructions and parse long sequences, and use OpenAI’s GPT-4 model to annotate excerpts of legislative debate (up to 8000 tokens, or roughly 3000 words in length) on a series of dimensions that I argue are indicators of obstruction. I use these indicators to fit a Confirmatory Factor Analysis (CFA) model, with the dual purpose of validating the proposed measure, and generating scores to predict the obstructiveness of other debates.

As a proof of concept, I apply this approach to a corpus of over 35,000 legislative debates from the 11th and 12th Parliaments of the Canadian House of Commons, which encompasses a period from 1909 to 1917 during which obstruction was a common tactic used by both major parties during their respective times in minority, culminating in the April 1913 addition of the closure rule by Robert Borden’s Conservative government. I show that both the GPT-4 annotations and the predictions of the random forest model have face validity, and map well onto established expectations about the nature of legislative obstruction.

The rest of this paper is organized as follows. In Section 2, I discuss the challenges of measuring obstruction, and propose a novel measure of obstruction as a latent variable. In Section 3, I describe the process that I use to measure obstruction from legislative debate: first, generating annotations of debates using GPT-4; second, validate the match of the annotations to the latent variable with confirmatory factor analysis, and generate obstruction scores for each debate; third, train a random forest regression model to predict the obstruction score of a debate from its embedding representation; and fourth, use the model to predict the obstruction scores of the remaining debates in the corpus. In Section 5, I present the results of the analysis, and in Section 6, I summarize my findings and provide a road-map for future research.

2 Measuring Obstruction in Legislatures

2.1 Conceptualizing Obstruction

I define obstruction as the positive use of legislative tactics with the intent to delay or prevent the passage of legislation. By *positive*, I mean that it manifests as the presence of action, such as the introduction of amendments, the use of points of order, or the use of parliamentary questions to delay the passage of legislation. Obstruction can be *negative*, in the sense that it manifests as the absence of action, such as the failure to vote on a bill, or the failure to move to the next item on the agenda.¹ However, I do not confront the thorny problem of measuring negative obstruction in this paper.

All forms of positive obstruction – points of order, amendments, filibustering, etc. – ultimately manifest as one of two forms of action: speech or votes. Procedural manipulation is a means to generate one (or both) of these fundamental forms of action. For example, a legislator who wishes to delay the passage of a bill that they disagree with may propose an amendment. The proposal of an amendment, however, provides limited delay in and of itself. Rather, it is a means to continue debate over the bill, and to potentially force a time-consuming vote. Similarly, a legislator who wishes to delay the passage of a bill may propose a series of points of order, which will force the Speaker to rule on the point of order, and potentially force a vote on the Speaker’s ruling.

¹An example of negative obstruction is the “disappearing quorum”, a commonly used technique in the late 19th century US House of Representatives. Legislators would deliberately absent themselves from the chamber, preventing the House from reaching a quorum and thus preventing the passage of legislation.

2.2 Procedural Measures of Obstruction

As a result, there are two ways that we might measure the amount of obstruction that goes on in a legislature: by counting the number of procedural motions that are used (as do Binder (1997) and Goet (2019)), under the assumption that these motions are used to provide the opportunity to speak and to vote, or by directly measure the type of speech and/or votes that constitutes obstruction.

There are three key problems with measuring obstruction using the procedural approach. First, procedural motions are neither a necessary or sufficient condition for legislative obstruction to occur. Since obstruction can occur in the absence of any formal procedural tactic, a measure of obstruction that is based on procedural motions will not capture all of the obstruction that occurs in the absence of formal motions.

Second, since procedural approaches focus on specific obstruction tactics (high rates of amendments, proposals to adjourn, etc.) they will necessarily underestimate the extent of obstruction if legislators adopt new techniques that are not captured by the measure. Consequently, measures of obstruction over long periods of time or across cases will underestimate the extent of obstruction outside of the specific context in which these tactics are the predominant form of obstruction.

Third, procedural counting approaches do not consider the context in which a particular procedural motion is made. Since the same action (e.g., proposing an amendment) can be a regular legislative move in one context, and an act of obstruction in another, these measure tell us relatively little about whether a specific procedural motion is obstructive or not. As a result, procedural measures are only informative at a high level of aggregation (e.g. month or legislative session). Moreover, the combination of genuinely obstructive motions and run-of-the-mill legislative action may bias the estimated level of obstruction upward during periods where there are high rates of procedural action unrelated to obstruction.

While the newspaper article approach of Koger (2010) can help to address both of these issues, relying on the subjective opinions of journalists as the basis of a measure of the prevalence of obstruction has its own problems for generalizability and comparison across cases. Additionally, this approach is likely to be biased towards the most salient and dramatic instances of obstruction, and against smaller, more common instances.

2.3 A Speech-Based Measure of Obstruction

Each of these problems – non-procedural obstruction, changing procedural tactics, blindness to context, and overlooking small-scale obstruction – can be solved by measuring obstruction from legislative speech. Since speech is not an alternative to procedural tactics, but rather one of the fundamental forms of action that procedural tactics are used to generate, a speech-based measure of obstruction will capture all speech-based obstruction (i.e., not vote-based), regardless of whether the obstruction was initiated by procedural motions. Moreover, since a speech-based measure of obstruction is not tied to specific procedural tactics, it will be able to capture new forms of obstruction as they emerge. Finally, since speech takes place in a larger context of debate, we can use that context to help determine whether a given speech or motion is obstructive in intent.

That is not to say, however, that we should ignore procedural tactics. Rather, a speech-based measure of obstruction also encompasses procedural tactics, since the use of procedural tactics is itself a form of speech. That is, when deciding whether a tract of speech is obstructive or not, we can use the presence of procedural tactics such as amendments, points of order, and motions to adjourn as indicators of obstruction. However, we can also use other indicators of obstruction, such as the tone of the speech, the length of the debate, and the presence of personal attacks, to determine whether obstruction is occurring.

Mr. LANCASTER.(Conservative): Not at all. That hon. gentleman simply drew attention to a statement of the Minister of Customs (Mr. Paterson), which was utterly unfounded, and which he made while neglecting his duties in this House in order to take part in a local election. Had the hon. member for East Kent not interfered my hon. friend from Northumberland would have made his statement, which did not take him five minutes, we would have had the answer of the Minister of Finance and my reply, and we would have been in Supply an hour ago.

Figure 1: An example of an obstructive speech without context.

2.4 The Importance of Debate-Level Context

The main challenge to the measurement of obstruction from speech is that it is not straightforward to simply identify whether a speech is obstructive or not by inspecting it, since legislators who obstruct are unlikely to admit to doing so. Instead, they will often claim that they are trying to improve the bill, or that they are simply exercising their right to debate. As a result, an individual speech that is clearly part of an obstruction campaign may not contain any explicit indication of obstruction.

Consider, for example, the speech in Figure 1 from the 10th Parliament of the Canadian House of Commons.² The speaker, Mr. Lancaster, is using a critical tone, and is referring to a discussion about the time that a debate is taking up. However, these are not sufficient to determine whether the speech is obstructive, rather than simply critical of the government. However, if we look at the speech within its context, as in Figure 2, we can see that the speech is part of a larger debate about the time that a debate is taking up, that the speaker is a member of the opposition party, and that he is accused of obstructing government business by the majority party. That is, the additional context makes it more clear that Lancaster’s conduct is obstructive.

3 Methodology

In this section, I describe the procedure that I use to measure the obstructiveness of debates in the Canadian House of Commons, which is summarized in Algorithm 1. To do so, I use the following procedure. First, I define a hierarchical latent variable model of obstruction. Then, using a corpus of legislative debates, and models for generating embedding representations of debates, annotating debates according to a set of instructions, scoring the speeches, and learning the relationship between scores and embeddings, I *annotate* a random subset of debates from the corpus, estimate the *score* for the annotated debates, *train* a regression model to predict a debate’s score given its embeddings, and then *predict* the score for the rest of the corpus.

3.1 A Latent Variable Approach to Measuring Obstruction from Debate

Because it is not possible to directly observe whether a speech is obstructive or not, it is necessary to infer whether a speech is obstructive from a series of indicators that we have reason to believe are associated with obstruction.

I formalize this intuition by assuming that there is a latent variable \mathcal{O} that is a function of a set of observable indicators \mathbf{X} . That is,

$$\mathbf{X} = f(\mathcal{O}) + \epsilon \tag{1}$$

²For the complete exchange that the example speech is drawn from, see Appendix A

Mr. LANCASTER.(Conservative): Are these hon. gentlemen who interrupt not satisfied with that declaration of the Minister of Finance or are they convinced that he is talking nonsense when he says the majority have no rights in this House?

Mr. FIELDING.(Liberal): The hon. gentleman continues to repeat that I said the opposition had no rights. I said nothing of the kind. I said that every member of this House has the rights which the rules of the House, passed by the majority, give him.

Mr. LANCASTER.(Conservative): We had a lively discussion on that question, and the Minister of Finance said that we have no rights except what the majority chose to give us.

Mr. FIELDING.(Liberal): That is right.

Mr. LANCASTER.(Conservative): Now the hon. member for East Kent (Mr. Gordon) says our rights should be curtailed.

Mr. GORDON.(Liberal): We complain that you are abusing and going beyond your rights.

Mr. LANCASTER.(Conservative): If we have none at all how can we go beyond them? The Speaker could prevent our exercising any rights if we have none. When the Minister of Finance said that we have no rights he said what was not true, and now we have the hon. member for East Kent (Mr. Gordon) making a speech to prove that the Minister of Finance was all wrong in his statement and that the rights of the minority should be more curtailed than they are. But he is thus opening up a very large question indeed; and if that question be discussed until midnight, it is entirely his fault. [rest of speech omitted]

Mr. GORDON.(Liberal): Was it not the hon. member for Northumberland (Mr. Owen) who started the issue?

Mr. LANCASTER.(Conservative): **Not at all. That hon. gentleman simply drew attention to a statement of the Minister of Customs (Mr. Paterson), which was utterly unfounded, and which he made while neglecting his duties in this House in order to take part in a local election. Had the hon. member for East Kent not interfered my hon. friend from Northumberland would have made his statement, which did not take him five minutes, we would have had the answer of the Minister of Finance and my reply, and we would have been in Supply an hour ago. [rest of speech omitted]**

Figure 2: An example of an obstructive speech with debate-level context. Bolded text indicates the speech that was presented without context in Figure 1.

Algorithm 1 Measuring Obstructiveness in Legislative Debates

Require: Legislative corpus \mathcal{C} , embedding model \mathcal{E} , annotation model \mathcal{G} , measurement model \mathcal{F} , prediction model \mathcal{R}

Ensure: Obstruction scores S for each debate in \mathcal{C}

- 1: Divide \mathcal{C} into annotated subset \mathcal{C}_a and prediction subset \mathcal{C}_p .
 - 2: Use \mathcal{G} to annotate each debate $d \in \mathcal{C}_a$, producing boolean indicators B_a .
 - 3: Use \mathcal{F} to produce obstruction scores S_a .
 - 4: Use \mathcal{E} to extract embedding features E for all debates $d \in \mathcal{C}$.
 - 5: Train \mathcal{R} using E_a and S_a to predict obstructiveness.
 - 6: For each $d \in \mathcal{C}_p$, predict obstructiveness score using \mathcal{R} and embeddings E_p .
 - 7: Combine annotated scores S_a and predicted scores S_p to form S for \mathcal{C} .
-

where ϵ is a vector of error terms capturing the unexplained variance in \mathbf{X} , and $f()$ is a linear function, so that

$$\mathbf{X} = \boldsymbol{\lambda}\mathcal{O} + \epsilon \quad (2)$$

where $\boldsymbol{\lambda}$ is a vector of factor loadings that indicate how strongly each observable indicator in \mathbf{X} is related to the latent variable \mathcal{O} .

The set of manifest indicators associated with obstructiveness are listed in Table 1. Each indicator is a boolean variable that is either present or absent in a given speech or debate. For example, the indicator *NegativeSentiment* is present if the overall sentiment of the debate is negative, and absent otherwise. Similarly, the indicator *AmendmentProposals* is present if there are amendments being proposed, and absent otherwise.

I include two types of indicators: procedural and debate-level. Procedural indicators focus on elements that directly relate to the rules and process of the debate. For instance, the length of the debate can indicate attempts to delay proceedings, while frequent amendment proposals often serve to complicate or stall legislative action. Other procedural indicators like frequent questions, escalation attempts, and interruptions serve similar obstructive roles. Coordinated behavior among members and agenda manipulation are more explicit signs of procedural tactics aimed at affecting the course or outcome of the debate.

On the other hand, debate-level indicators capture the tone and content of the speeches and interactions. Negative sentiment and an adversarial tone usually signify a contentious environment, potentially leading to obstruction. Personal attacks and repetitive content can serve to escalate tensions and prolong discussions. Additional indicators like off-topic content and contradictions among speakers contribute to a disordered and obstructive debate atmosphere. Accusations of obstruction, coordinated speech patterns, and accusatory behavior by a group can be both symptoms and drivers of obstructiveness.

In the previous section, I argued that we should use both procedural and debate level indicators to measure obstruction, based on the intuition that speech acts as a fundamental form of action that procedural tactics are used to generate. One key advantage of the use of a measurement model is that it allows me to both *validate* the model for its downstream use of generating obstruction scores to be used in prediction, and to test hypotheses about the relative importance of different indicators in determining the obstructiveness of a debate. I therefore formalize and test the hypothesis that the indicators associated with debate – negative sentiment, adversarial tone, personal attacks, repetitive content, off-topic content, contradictions, accusations of obstruction – are significantly associated with obstruction.

To both validate the model and test hypotheses, I use Confirmatory Factor Analysis (CFA), a

statistical technique that is used to estimate the relationship between a set of observed variables and a set of latent variables (Brown 2015). Using the `semopy` package in Python (Meshcheryakov, Igoikina, and Samsonova 2021) I estimate the model from Equation 2, and examine factor loadings and goodness of fit statistics to determine which model is a better fit for the data, and whether the debate-level indicators are significantly associated with obstruction. I then generate factor scores for each debate, which serve as the obstruction scores used to train the prediction model.

3.2 Using Artificial Intelligence to Annotate Debates at Scale

Until recently, the main obstacle to implementing this measurement approach was that annotating even a small collection of debates according to the criteria in Table 1 would have been time-consuming and labor-intensive. Many legislative debates are long, frequently spanning thousands of words, and often use complex language that requires subject expertise to fully understand, making it difficult to employ qualified annotators. Statistical techniques did not offer an obvious solution either: using machine learning tools (e.g. Naive Bayes, or SVM) to classify each debate on each of the features would have required a large amount of training data, which would have been difficult to generate without a large number of annotated debates in the first place.

However, advances in artificial intelligence have made it possible to automate the annotation process. In particular, models such as OpenAI’s GPT-4 are able to read long sequences of text, follow complex instructions, and generate structured annotations based on those instructions. I use OpenAI’s GPT-4 model (OpenAI 2023) to generate annotations of the texts. The Generative Pre-trained Transformer (Radford et al. 2018), or GPT family of LLMs, are state-of-the-art language models that perform exceptionally well across a wide range of natural language processing tasks, including text classification and annotation. I use GPT-4 because it is the most recent and highest capacity model, and in my experimentation it performed far better than GPT-3.5 (OpenAI’s next most capable model) at accurately annotating speeches. Since GPT-4 is the most expensive of OpenAI’s models,³ I annotate only a small subset of the entire corpus. To generate annotations, I provide GPT-4 with a set of instructions, which contains the annotation task and desired output format,⁴ and the text of the debate to be annotated. The GPT model then returns the set of requested boolean-valued annotations. For an example of the debate that I provide to the model and the JSON object that it returns, see Appendix B.

To validate the accuracy of the annotations, I manually check a random subset of the annotations at the low, medium, and high ends of the obstructiveness spectrum. I find that the annotations are highly accurate, with an accuracy of over 90% for the low and high obstructiveness scores, and an accuracy of 80% for the medium obstructiveness scores. I also find that the annotations are consistent with my expectations about the nature of obstruction in the Canadian House of Commons. For example, the model correctly identifies that the debate from which the example speech in Figure 1 is drawn is obstructive, and that the speech itself is obstructive.

3.3 Predicting Obstruction from Embeddings Representation of Debates

Finally, I use the obstruction scores generated by the CFA model to train a regression model to predict obstruction using embedding representations of the debates. Embeddings are a representation of a text as a Embeddings are dense vector representations of words that capture their semantic

³The version I used cost \$0.03 USD per 1000 input tokens, and \$0.06 USD per 1000 output tokens, with a maximum of 8192 total tokens. A typical annotation task of roughly 7000 input tokens and 1000 output tokens would cost roughly \$0.27 USD per debate.

⁴I use JavaScript Object Notation (JSON) as my requested output format.

Feature	Description
<i>Procedural Indicators</i>	
LengthOfDebate	Is the debate long?
AmendmentProposals	Are amendments being proposed?
FrequentQuestions	Is there a pattern of speakers asking a series of questions?
EscalationAttempts	Are there attempts abuse procedure to intensify the situation?
Interruptions	Are there frequent interruptions, such as points of order?
CoordinatedBehavior	Are members taking turns speaking or interrupting?
AgendaManipulation	Are there coordinated amendments or explicit statements to prolong debate?
ProceduralTactics	Are there frequent points of order or coordinated calls for division?
<i>Debate-Level Indicators</i>	
NegativeSentiment	Is the overall sentiment of the debate negative?
AdversarialTone	Is the tone of the debate predominantly adversarial?
PersonalAttacks	Are there frequent personal attacks or strong criticisms?
RepetitiveContent	Is there a pattern of speakers repeating the same points?
OffTopicContent	Are speakers frequently deviating from the main topic?
Contradictions	Are there frequent contradictions among speakers?
AccusationsOfObstruction	Are there direct or indirect accusations of obstruction?
CoordinatedSpeechPatterns	Do multiple speakers from the same group make repetitive arguments?
AccusatoryBehavior	Are legislators accsused of bad behavior?
IdenticalOrSimilarLanguage	Do members use strikingly similar language?
ReferencingEachOther	Do members frequently reference or endorse points made by other group members?

Table 1: **Description of Legislative Debate Features Categorized by Procedural and Debate-Level Indicators.**

meaning in a continuous space. These representations are learned from large corpora of text data and have proven to be effective in various natural language processing tasks (Mikolov et al. 2013; Pennington, Socher, and Manning 2014).

Recent advances in embedding models have enabled the generation of embedding representations for longer sequences of text, such as sentences, paragraphs, and entire documents. For this application, I use OpenAI’s `text-embedding-ada-002` model, which can embed text sequences up to 8192 tokens (roughly 3000 words). To do this, I first split each debate into a series of 8000-token chunks, and then generate an embedding representation for each chunk.⁵

For prediction, I train a random forest regression model to predict the obstructiveness of debates from their embedding representations. I use the `RandomForestRegressor` implementation from the `scikit-learn` package (Pedregosa et al. 2011) with the default parameters. Random forest regression is a bagging ensemble method that uses a collection of decision trees to predict a continuous variable. I use random forest regression because it is a relatively simple model and lightweight model that has been shown to handle high-dimensionality well, and is robust to overfitting (Breiman 2001).

To train and validate the model, I use k -fold cross-validation on the annotated subset. In each fold, the model is trained on $k - 1$ subsets and validated on the remaining subset. The root mean squared error (RMSE) is calculated for each fold, and the average RMSE across all folds serves as the overall measure of model performance.

After obtaining the optimal hyperparameters and feature set based on cross-validation, I train the random forest model on the entire annotated subset. This final model is then used to predict the obstructiveness of debates in the prediction subset. I estimate the uncertainty of the predictions by calculating the standard deviation of the predictions the tree models in the random forest (Criminisi, Shotton, and Konukoglu 2011).

4 Data

To motivate my approach, I analyze a period between 1909 and 1917 in the 11th and 12th Parliaments of the Canadian House of Commons. During this period, a high degree of obstruction had become endemic in the Canadian Parliament, with both parties vociferously obstructing each-other during their respective time as minority. As Godbout (2020, 77) writes:⁶

[O]bstruction began to be seen as a tactic to obtain concessions from the government side. For example, before the adoption of the closure rule in 1913, members could discuss issues almost indefinitely on the floor of the House to prevent the adjournment of debates. In the most extreme cases, these debates could last for several days, or even lead to the dissolution of Parliament, as in 1896, when Parliament was dissolved over the Manitoba Schools Question, or in 1911, when the Conservative Party filibustered the adoption of a reciprocity trade agreement with the United States.

In 1913, a Conservative government under the leadership of Robert Borden changed the rules to allow closure by a simple majority vote. The Liberal minority had been obstructing the passage of a bill proposing 35 million dollars in naval aid to the United Kingdom for two straight weeks, principally by repeatedly amending and debating government bills.

This period around the turn of the century is therefore ideal for measuring the phenomenon of obstruction in the Canadian House of Commons: we know that obstruction was a common tactic,

⁵OpenAI charges \$0.0001 USD per thousand tokens, so embedding an 8000 token debate costs roughly \$0.0008 USD.

⁶For a thorough summary, see also Melrose (2003).

and that legislators were sensitive to its use; we have a relatively clear understanding of what obstruction looks like (extended debate, repeated division, off topic speech); and thanks to the LiPaD database, a digitization of the Canadian Hansard,⁷ we have the complete, high quality text of every speech made during this period, organized by debate.

Using these resources, I compile a corpus of all debates from the 11th and 12th Parliaments, amounting to over 35,000 debates in total. The debates vary in length, from a single speech to over one hundred speeches, and in content, ranging from question period to debates on specific bills.

To generate the annotation set, I randomly sample roughly 1% of the corpus, which results in 335 annotated debates. I then use the remaining debates as the prediction set.

5 Results

In this section, I present the results of applying the methodology described in Section 3 to the corpus of debates from the 11th and 12th Parliaments of the Canadian House of Commons. First I present descriptive results of the distribution of annotations from the GPT-4 annotation procedure. Second, I show the results of the confirmatory factor analysis that indicate that a both procedural and discourse-level factors combine to form the latent construct of obstruction. Finally, I show the results of training the random forest model using the obstruction scores.

5.1 Descriptive Statistics

Feature	Frequency
FrequentQuestions	81
ReferencingEachOther	57
LengthOfDebate	52
Contradictions	49
AdversarialTone	48
NegativeSentiment	41
AmendmentProposals	41
AccusatoryBehavior	20
Interruptions	20
RepetitiveContent	28
PersonalAttacks	13
OffTopicContent	16
EscalationAttempts	11
AccusationsOfObstruction	10
CoordinatedBehavior	5
AgendaManipulation	5
ProceduralTactics	5
CoordinatedSpeechPatterns	3
IdenticalOrSimilarLanguage	2

Table 2: Feature Frequency From 335 Annotated Debates

Table 2 shows the frequency of each feature in the annotated debates. The most common features are *FrequentQuestions*, *ReferencingEachOther*, and *LengthOfDebate*, which appear in 81, 57, and

⁷See <http://lipad.ca>

52 debates respectively. The least common features are ProceduralTactics, CoordinatedBehavior, AgendaManipulation, CoordinatedSpeechPatterns, and IdenticalOrSimilarLanguage, which appear in only 5, 5, 5, 3, and 2 debates respectively.

5.2 Confirmatory Factor Analysis

I use Confirmatory Factor Analysis (CFA) to validate the structure of the latent variable \mathcal{O} and its relationship to the observed variables \mathbf{X} . Table 3 presents the factor loadings, standard errors, z-values, and p-values for each observed variable on the latent construct “Obstruction” (O). Factor loadings for each indicator are shown. In Confirmatory Factor Analysis (CFA), a reference indicator is fixed at a value of 1.0 to serve as a baseline. As such, no factor loadings or standard errors are reported for these reference indicators. A p-value below 0.05 denotes statistical significance at the 95% confidence level.

The indicators related to procedural manipulation are all statistically significant at the 95% confidence level. Notably, ‘Length of Debate’ and ‘Amendment Proposals’ have higher loadings, suggesting their importance in capturing obstructive procedural behavior.

Similarly, the indicators related to contentious speech are also statistically significant. ‘Adversarial Tone’ and ‘Personal Attacks’ stand out with higher factor loadings, corroborating their significance in measuring contentious elements in speech.

While most indicators exhibit strong loadings, implying a significant contribution to the latent construct “Obstruction,” some indicators such as ‘Coordinated Speech Patterns’ and ‘Identical or Similar Language’ show low factor loadings. Specifically, ‘Identical or Similar Language’ has a factor loading of just 0.007 and is not statistically significant with a p-value of 0.662. This suggests that these indicators may not be as important in capturing the concept of “Obstruction” as initially hypothesized. The low loadings and lack of statistical significance for these indicators indicate that they contribute minimally to the construct and could be candidates for exclusion in future model refinements.

While the factor loadings suggest strong construct validity, the model fit statistics in Table 4 indicate a less-than-ideal fit (e.g., CFI of 0.687, RMSEA of 0.140).⁸

Overall, despite suboptimal model fit statistics, the results still provide strong evidence for construct validity. The factor loadings for the majority of the indicators are statistically significant and substantial in magnitude, suggesting that they are capturing the latent construct of “Obstruction” effectively. This supports the proposed theoretical framework, where both contentious speech and procedural manipulation contribute to the overarching construct of obstruction. Therefore, the measure offers a valid operationalization of the concept of “Obstruction,” even though the model fit could be improved.

5.3 Predicted Obstruction Scores

In this section, I briefly describe the measure of obstruction that I generate by training the random forest model with the obstruction scores from the CFA model, and the embedding representations of the debates.

Table 7 shows the descriptive statistics for the obstruction scores generated by the random forest model. The mean obstruction score is 0.012, with a standard deviation of 0.175. The scores are

⁸In a well-fitting model, the Comparative Fit Index (CFI) should ideally be close to or greater than 0.95, suggesting a good fit between the model and the observed data. A value below 0.90 is generally considered indicative of a poor fit. Similarly, the Root Mean Square Error of Approximation (RMSEA) should ideally be close to or less than 0.06. Lower RMSEA values indicate a better fit, while values above 0.10 are generally considered to indicate a poor fit (Hu and Bentler 1999).

Indicator Variable	Factor	Estimate	Standard Error	Z-value	P-value
AdversarialTone	<i>O</i>	1.163	0.068	17.205	0.0
LengthOfDebate	<i>O</i>	1.062	0.072	14.706	0.0
ReferencingEachOther	<i>O</i>	1.066	0.075	14.127	0.0
Contradictions	<i>O</i>	1.118	0.069	16.168	0.0
NegativeSentiment	<i>O</i>	1.000	-	-	-
RepetitiveContent	<i>O</i>	0.771	0.056	13.819	0.0
FrequentQuestions	<i>O</i>	0.797	0.091	8.754	0.0
AccusatoryBehavior	<i>O</i>	0.653	0.048	13.635	0.0
Interruptions	<i>O</i>	0.624	0.048	12.924	0.0
PersonalAttacks	<i>O</i>	0.473	0.040	11.888	0.0
EscalationAttempts	<i>O</i>	0.456	0.037	12.485	0.0
AccusationsOfObstruction	<i>O</i>	0.434	0.035	12.443	0.0
OffTopicContent	<i>O</i>	0.279	0.046	6.027	0.0
AmendmentProposals	<i>O</i>	0.309	0.072	4.306	0.000
AgendaManipulation	<i>O</i>	0.214	0.026	8.242	0.0
CoordinatedBehavior	<i>O</i>	0.150	0.026	5.689	0.0
ProceduralTactics	<i>O</i>	0.131	0.026	4.950	0.000
CoordinatedSpeechPatterns	<i>O</i>	0.079	0.021	3.823	0.000
IdenticalOrSimilarLanguage	<i>O</i>	0.007	0.017	0.437	0.662

Table 3: **Factor Loadings for the CFA Model.**

approximately normally distributed, with a slight positive skew. The scores range from -0.113 to 0.943, with the majority of scores falling between -0.1 and 0.1.

We can also visualize the distribution of the obstruction scores by plotting a histogram of the scores, as shown in Figure 3. The results are consistent with the descriptive statistics: the scores are skewed to the left, with the majority of score falling below 0. This matches with our expectations that the vast majority of debates in the House of Commons aren’t particularly obstructive.

We can also inspect the variation of the obstruction scores over time. Figure 4 shows the summed obstruction scores for each week of debate between 1909 and 1918. The empty periods indicate periods during which the House of Commons was not in session. We can see that there is substantial variation over time and within sessions in the amount of weekly obstruction that occurs. We can also inspect some of the spikes in obstruction to make a first cut assessment of validity. The major spike between 1911 and 1912 corresponds to the weeks before the 1911 election, when the Conservative Party under Robert Borden obstructed then Prime Minister Wilfrid Laurier’s liberals to the point that Laurier called an election, which he ultimately lost.

6 Discussion and Conclusion

In sum, I have proposed a new approach to measuring obstruction in legislatures using legislative text corpora, I have shown that it is possible to use cutting edge AI models to generate annotations for obstruction and other difficult-to-measure phenomena, and I have shown that these annotations can be used to generate a measure of obstruction that in initial tests appears to have face validity. This work, however, is still very preliminary. Much more is needed to validate the measure, and to

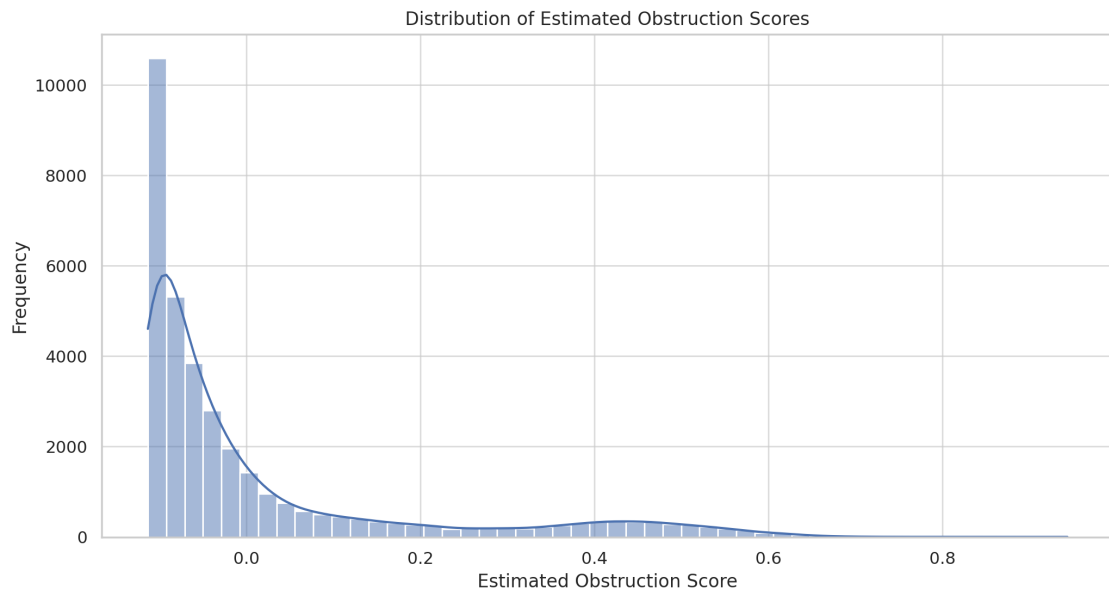


Figure 3: Histogram of Predicted Obstruction Scores

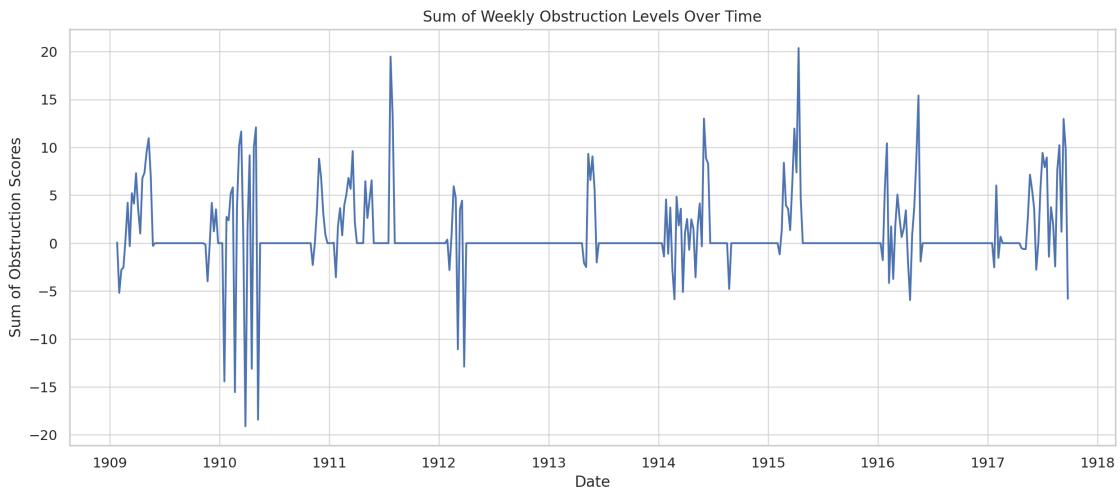


Figure 4: Summed Weekly Obstruction Over Time

Fit Statistic	Value
Degrees of Freedom (DoF)	152
DoF Baseline	171
χ^2	1151.014
χ^2 p-value	0.0
χ^2 Baseline	3362.199
Comparative Fit Index (CFI)	0.687
Goodness of Fit Index (GFI)	0.658
Adjusted Goodness of Fit Index (AGFI)	0.615
Normed Fit Index (NFI)	0.658
Tucker-Lewis Index (TLI)	0.648
Root Mean Square Error of Approximation (RMSEA)	0.140
Akaike Information Criterion (AIC)	69.108
Bayesian Information Criterion (BIC)	213.931
Log Likelihood (LogLik)	3.446

Table 4: **Model Fit Statistics for the CFA Model.**

	Count	Mean	Std	Min	25%	50%	75%	Max
Predicted Obstruction	334.000	0.000	0.248	-0.113	-0.113	-0.113	-0.046	1.145

Table 5: Descriptive Statistics for Predicted Obstruction Scores

ensure that it is robust to variations in the other design choices that I have made.

However, I strongly believe that the approach I have outlined in this paper – defining a measurement model, using cutting edge AI models to generate annotations, and using those annotations to estimate the measurement model – has the potential to improve our ability to capture hard-to-measure phenomena from all kinds of political texts.

Table 6: Descriptive Statistics

Statistic	Value
Count	35,269 (Number of observations)
Mean	0.012
Standard Deviation	0.175
Variance	0.031
Minimum	-0.113
25th Percentile	-0.098
Median (50th Percentile)	-0.063
75th Percentile	0.024
Maximum	0.943
Mode	-0.113

Table 7: Descriptive Statistics for Predicted Obstruction Scores

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A Obstructive Example

The following is an excerpt from an obstructive episode, that took place on June 5th, 1908,⁹ when the Liberals were the majority party. In this exchange, Mr. Lancaster, a Conservative MP, talks at length in a critical tone. He is accused of obstruction by several Liberal MPs.

Mr. LANCASTER.(Conservative (1867-1942)): Are these hon. gentlemen who interrupt not satisfied with that declaration of the Minister of Finance or are they convinced that he is talking nonsense when he says the majority have no rights in this House?

Mr. FIELDING.(Liberal): The hon. gentleman continues to repeat that I said the opposition had no rights. I said nothing of the kind. I said that every member of this House has the rights which the rules of the House, passed by the majority, give him.

Mr. LANCASTER.(Conservative (1867-1942)): We had a lively discussion on that question, and the Minister of Finance said that we have no rights except what the majority chose to give us.

Mr. FIELDING.(Liberal): That is right.

Mr. LANCASTER.(Conservative (1867-1942)): Now the hon. member for East Kent (Mr. Gordon) says our rights should be curtailed.

Mr. GORDON.(Liberal): We complain that you are abusing and going beyond your rights.

Mr. LANCASTER.(Conservative (1867-1942)): If we have none at all how can we go beyond them? The Speaker could prevent our exercising any rights if we have none. When the Minister of Finance said that we have no rights he said what was not true, and now we have the hon. member for East Kent (Mr. Gordon) making a speech to prove that the Minister of Finance was all wrong in his statement and that the rights of the minority should be more curtailed than they are. But he is thus opening up a very large question indeed; and if that question be discussed until midnight, it is entirely his fault. The hon. gentleman said, on the motion to go into Supply, that he had an important question to bring up which should be settled. But he did not move any amendment, and therefore we are completely in the dark as to what method he proposes to curtail our rights. I apprehend that he himself has been taking up the attention of the House simply for the purpose of obstructing Supply. When he talks of preventing members of the opposition from discussing matters which are properly before the House, he should have backed up his speech by a motion so that we might have some idea of what he proposes this House should do in order to accomplish the object he aims at. He should have moved an amendment in concrete form and in not doing so he has been guilty of discourtesy to this House. He urged that before going into Supply, the rules of the House should be amended. In this way he was obstructing Supply, and yet he does not submit any motion which would indicate exactly in what way he proposes to curtail our rights. And while raising such an important discussion and thus taking up valuable time, he expressed the hope that this discussion would not delay the House too long. But if he were sincere in not desiring to waste the time of the House, why did he not move an amendment so that we might know what he means? Possibly the hon. gentleman is one of those many members from the province of Ontario who are convinced that their usefulness as members of this House has gone and that they stand no chance, or very

⁹For the whole debate, see <https://lipad.ca/full/1908/06/05/5/>

little chance, of being reelected. Possibly he feels that he cannot expect re-election if he undertakes any longer to support this government through thick and thin, and therefore is seeking a pretext which will enable him to go before his electors and claim that he is not backing up the government in everything. True the government were complaining that the opposition were preventing Supply going through, but the hon. gentleman wants to be able to say that he has acted as an independent and was not going any longer to follow the Laurier government in that regard. How else can we account for the fact that when the government is asking for Supply, we find him raising such an important question now as that affecting the rights of members of this House to criticise the conduct of the government. For my part I protest against the hon. gentleman arguing that the rules should be amended and then sitting down without putting his ideas into the concrete form of an amendment to the motion to go into Supply.

Mr. GORDON.(Liberal): Was it not the hon. member for Northumberland (Mr. Owen) who started the issue?

Mr. LANCASTER.(Conservative (1867-1942)): Not at all. That hon. gentleman simply drew attention to a statement of the Minister of Customs (Mr. Paterson), which was utterly unfounded, and which he made while neglecting his duties in this House in order to take part in a local election. Had the hon. member for East Kent not interfered my hon. friend from Northumberland would have made his statement, which did not take him five minutes, we would have had the answer of the Minister of Finance and my reply, and we would have been in Supply an hour ago. But the hon. member for East Kent (Mr. Gordon) stood up in his place; and in order to show the people of his constituency that he was not entirely in the hands of the government on this question, he raised the issue of amending the rules of debate without at the same time indicating, by a motion, in what respect he would have them amended. Had it not been for his interference in the discussion and for his bringing up a question so open to discussion, we would have been in Supply at twenty-five minutes to twelve. The hon. gentleman in fact blocked the Supply and prevented the Speaker leaving the chair, and he did this by raising the question of interfering with the rights of the minority, although his leader, the Minister of Finance, has declared that the minority have no rights.

Mr. GORDON.(Liberal): The hon. gentleman finds fault with me for taking up half an hour of the time of the House, but how many hours has he taken up this session?

Mr. LANCASTER.(Conservative (1867-1942)): I do not pretend to know, but I do say that the hon. gentleman who has just spoken is the first member of this House who has said that I wasted time by speaking here. He may have plucked up courage enough to say that here, but I venture to say he will take it back if he should meet me at lunch time. He has said to me in conversation, not once only but half a dozen times, that if all the members of the opposition talked as little and as sensibly as I do there would be no waste of time. Now, I do not care a button which of the different opinions the hon. gentleman expressed is his real opinion. Ail I say is that he ought to have a conservative mind and say the same thing whether he is in the House or out of it. He ought not to be so good a supporter of the Laurier government as to say one thing at one time and a different thing at another time. I am not influenced one way or the other by the hon. gentleman's opinion, I do not speak in this House with a view to either winning or opposing such opinion concerning myself. I think that like other hon. members on this side I speak only when it seems to me in the interest of my constituents and the

country that I should speak. But, when we are in Supply and a cabinet minister refuses information, refuses even to produce original documents, would the hon. member say that we should allow that Supply to go through without getting the information to which the country is entitled ? The hon. gentleman's argument is that the rights of the opposition should be curtailed according to the wish of the Finance Minister or any other member of the government who may have certain business he wishes to put through. What would become of responsible government if that view of the case should prevail ? The government undertakes to do something knowing that the people are against them, and knowing that the feeling against them will be the more increased the more the matter is discussed. The hon. gentleman would say: gag the opposition. If this could be done, there would be no object in people electing members to check and criticise the government, for the opposition would be deprived of the opportunity to perform that function. What would be the result ? There would be a petition to the King to reconsider the constitution of the country. If the hon. gentleman knows anything about public rights he must know that.

Mr. JOHNSTON.(Liberal): Give it to him.

Mr. LANCASTER.(Conservative (1867-1942)): Give what to whom? If I could give the hon. gentleman from Gape Breton (Mr. Johnston) some knowledge of the duty he owes to his constituents- who, I understand, are not very anxious to send him back after the approaching elections-it would be a good thing. But what the hon. gentleman says does not affect me, for he no more than the hon. member for East Kent (Mr. Gordon) gives me sincere advice. The hon. gentleman is willing that the country should be dealt with by the government as the government pleases. But we are not in that position. The people have the right to know what is to be done with the taxes they pay to this government, and it is the duty of the opposition to see that that information is supplied. It would suit the hon. member for Cape Breton (Mr. Johnston) very well at present to have the government all-powerful. But after the next election, he will come to the conclusion that the opposition should have some rights.

Mr. JOHNSTON.(Liberal): It is just a quarter to one. Does the hon. member (Mr. Lancaster) think he can talk it out ?

Mr. LANCASTER.(Conservative (1867-1942)): I will try, if it will accommodate the hon. gentleman.

Mr. JOHNSTON.(Liberal): Only a quarter of an hour more.

Mr. LANCASTER.(Conservative (1867-1942)): I am willing to sit down now if I have convinced the House of the correctness of the position of the hon. member for East Northumberland (Mr. Owen) in raising this important question. And the hon. members who are interrupting me are doing no good to the country as a whole by taking the position that the Minister of Customs, or any other minister, is justified in leaving the House, especially at a time when business is so pressing that morning sittings have been ordered, to take part in the provincial election and to complain to the public about the business here not being done. I wonder that some good intelligent Reformer, did not ask the Minister of Customs why he was not down here doing what he could, at any rate, to have the business put through. In fact, that may have happened, but the 'Globe' has not seen fit to repeat it. And the Minister of Customs has not represented the matter fairly before the country, in complaining that the money of which he spoke was voted.

Mr. JOHNSTON.(Liberal): No, no.

Mr. LANCASTER.(Conservative (1867-1942)): That is what he said. What is the use of the hon. gentleman (Mr. Johnston) denying it ? The money was voted in Committee of Supply. ' It could not be available without a Supply Bill, but the Minister of Customs did not propose a Supply Bill. So he is misleading the people when he says he cannot get his 1,800 men paid. In view of the statements made by the member for East Kent (Mr. Gordon) and the Minister of Finance (Mr. Fielding) concerning the rights of the minority, I thought it well to discuss this matter, but I understand that some hon. gentlemen desire to speak, so I will give way.

B Examples of Input to and Output from GPT Model

The following are examples of the debate input that is provided to the GPT model, and the JSON output that is returned by the model.

Debate Date: 1913-05-09
Main Topic: NAVAL FORCES OF THE EMPIRE
Number of Speeches: 165
Total Number of Words: 7345

Speaker: Robert Laird Borden
Position: Prime Minister
Party: Conservative (1867-1942)
Speech Text: I beg to move, Mr Chairman, that the Bill be reported as amended.
Mr. CARROT: This afternoon I intimated that I proposed to make a motion adding another clause to the Bill.

Speaker: Arthur Meighen
Party: Conservative (1867-1942)
Speech Text: I rise to a point of order.
Some hon. MEMBERS: Order; sit down.

Speaker: Pierre Édouard Blondin
Position: Deputy Speaker and Chair of Committees of the Whole
Party: Conservative (1867-1942)
Speech Text: Let the hon. member state his point of order. A point of order is always in order.

Speaker: Arthur Meighen
Party: Conservative (1867-1942)
Speech Text: My point of order is that the Prime Minister having moved that we report this Bill an amendment cannot be moved.

Speaker: Some hon. MEMBERS:
Speech Text: No; sit down.

Speaker: Wilfrid Laurier
Position: Leader of the Official Opposition
Party: Liberal
Speech Text: That is not a point of order. I beg to say a word on the question of order. The question at this moment is whether or not an amendment can be moved at this stage of the proceedings.
Mr. MEIGHEN: If you will excuse me, that is not the point. The point is this: the Prime Minister, as I understood it, rose and moved that we report this Bill.

Figure 5: An excerpt of the debate representation that is provided to the GPT model.

```

{
  "general_observations": {
    "topic": "Naval Forces of the Empire",
    "summary": "The debate revolves around the introduction of an
    ↪ amendment to a bill regarding naval forces. There are echoes of
    ↪ frustration due to some members believing they are being
    ↪ obstructed from introducing another clause into the bill. The
    ↪ majority of the debate is spent discussing points of order and
    ↪ when different amendments can be proposed.",
    "other_observations": "Strong party division and tensions are very
    ↪ evident in this debate."
  },
  "overall_characteristics": {
    "length_of_debate": true,
    "negative_sentiment": true,
    "adversarial_tone": true,
    "personal_attacks": false
  },
  "obstruction_tactics": {
    "repetitive_content": true,
    "amendment_proposals": true,
    "frequent_questions": true,
    "escalation_attempts": true
  },
  "deviations_and_interruptions": {
    "off_topic_content": false,
    "contradictions": true,
    "accusations_of_obstruction": true,
    "interruptions": true
  },
  "group_obstruction_indicators": {
    "coordinated_speech_patterns": false,
    "coordinated_behavior": false,
    "agenda_manipulation": true,
    "procedural_tactics": true,
    "accusatory_behavior": true,
    "identical_or_similar_language": false,
    "referencing_each_other": true
  }
}

```

Figure 6: The JSON object that is returned by the GPT model, including the mode's coding for each feature, and a brief summary of the debate.