

Talking Like Opposition Parties? Electoral Proximity and Language Styles Employed by Coalition Partners in a Mixed Member Majoritarian System

Abstract

Extant literature has shown that political parties that form a coalition government face one major dilemma; that is, they must govern together but fight elections separately. Thus, coalition members tend to commit to a differentiated strategy as an election approaches. However, existing research has mainly focused on empirical findings from countries with proportional representation and few measures for direct criticism from partners. In order to test the theory, this study collected and examined parliamentary speeches from Japan's mixed-member majoritarian context. It used a supervised machine learning method for measuring confrontational attitudes toward governments irrespective of their ideologies. The study results showed that on average, while a coalition partner may present a slightly hostile attitude toward governments in parliamentary speeches, this effect is not influenced by election proximity. This may imply that incentives for managing coalitions could differ in majoritarian-centered electoral systems.

1 Introduction

In a multi-party parliamentary system, multiple parties usually form a coalition government and govern together. To legislate effectively, coalition partners compromise with each other regarding their policy programs (Bergman et al., 2021; Martin and Vanberg, 2014). While coalition partners unite and cooperate during the governing phases, they must compete separately and adopt differentiated strategies during an electoral campaign to seek votes; this is especially the case when parties with heterogeneous ideologies form a coalition in a proportional representational (PR) system (Fortunato, 2021; Martin and Vanberg, 2008, 2011; Sagarzazu and Klüver, 2017). A coalition member party commits to differentiate because it tries to protect its brand from its partners to seek votes from its key constituents, who may dislike any compromises with coalition partners (Fortunato, 2021). Thereafter, each coalition partner is tempted to deviate from the compromise; ministers propose their most preferred bills rather than ones based on coalition agreements, or backbenchers from junior partners criticize the compromise (Martin and Vanberg, 2014). That is, with vote-seeking incentives, the party behaves confrontationally, showing a fighting pose to keep them distinct from their partners in the parliament.

This article aims to examine confrontational attitudes expressed by coalition and opposition members in a legislature. A confrontational attitude in this article is defined as a parliamentarian’s hostile posturing in parliament and engagement in adversarial discourse. Understanding such confrontation (or cooperation) in parliaments is vital for comprehending the effectiveness of coalition governance between elections, as recent research has focused on policy-making within coalition governments, not only on their formation and termination (Bergman et al., 2021; Fortunato, 2019*b*; Martin and Vanberg, 2011).

To analyze partners’ confrontations with their counterparts in parliaments, existing research uses the number of questions, issue diversification, and amendments as indicators of distinctiveness from coalition partners or confrontational behavior in parliament. However, few studies have directly measured confrontational attitudes among coalition partners; their confrontational language in parliamentary speeches is rarely analyzed to measure their differentiation from counterparts. This study tests the abovementioned argument using a novel measure. It assesses inter-party conflicts by using a supervised machine learning method to analyze politeness-related language styles in parliamentary

speeches. While legislative research literature focuses on speech content (e.g., discussing topics and ideologies), I have attempted to measure conflicts among parliamentarians with a focus on language styles. In particular, focusing on how politely parliamentarians give speeches, I have measured the conflicts irrespective of the themes of the questions and the parliamentarians' ideologies. Although legislative speeches are often conflated with the ideologies, topics, and tone of parliamentarians (Curini, Hino and Osaki, 2020), I can capture parliamentarians' confrontational attitudes toward their governments by focusing only on their politeness-related language styles.

To contribute to the current literature on coalition governance, I have used the Japanese mixed-member majoritarian (MMM) case. I used the Japanese case for the following reasons. First, the nature of the Japanese language lends itself to the measuring of attitudes in parliamentary speeches; sentences written in the Japanese language are divided into two kinds of letters, *kanji* (漢字) and *hiragana* (ひらがな), while most languages use a single system of letters. *Kanji* letters have meanings, while *hiragana* letters do not have meaning like the alphabet characters and are used to spell words auxetically. Words that only use *hiragana* deliver speakers' or writers' tone in sentences. Specifically in political contexts, ideology- and/or policy-related words are usually composed of *kanji*. These are unique characteristics. The Japanese case is crucial to measure polite language styles in a parliament.

Second, Japan presents a useful case for testing arguments for coalition governance. Because the above-discussed arguments have been developed and tested mainly in continental European countries (e.g., Austria, Germany, Denmark, and the Netherlands), empirical tests of the literature have been conducted in countries with PR or mixed member proportional (MMP) systems. However, incentives for differentiated strategies may vary in different electoral systems. Pre-electoral coalitions are more likely to be formed in an MMM system owing to the existence of a single-member district (SMD) tier than in a pure PR system. Moreover, with the coupling of SMD and PR tiers, where the votes are counted separately, to maximize their total votes in both tiers, they have incentives to coordinate nominations in SMDs and trade core constituents' votes in each tier (Catalinac and Motolinia, 2021; Liff and Maeda, 2019). This may lead to coalition members not showing hostility in a parliament. The incentives in MMM differ from those in MMP, which is also a variant of the mixed member system. Compared to MMM, coali-

tion partners in MMP systems have the same incentives to compete separately as in pure PR systems because the total number of seats is allocated based on PR tiers in the MMP. Parties in MMP do not coordinate nominations and trade the votes of core supporters. As Japan has had coalition governments for thirty years in MMM, then it provides a useful context for testing the arguments about coalition governance.

To test the above-mentioned argument, I measure the confrontational attitudes of parliamentarians from parliamentary speeches in the Japanese Diet and run panel-data regression of confrontational attitudes as the dependent variable. The results find that coalition partners and opposition members show more confrontational attitudes in parliamentary speeches than members from the Prime Minister's (PM) party. However, coalition partners' scores are smaller than those of oppositions, and the difference between coalition members and the PM's party in confrontational attitudes does not depend on election proximity. This may imply the coalition members in MMM have few incentives to differentiate themselves from their counterparts even when an election approaches.

The remainder of this article is organized as follows. In the next section, I review existing literature about coalition governance and present hypotheses. In the third section, I introduce data, the novel measures of politeness-related language styles, and explain regression models to test hypotheses. In the fourth section, regression results are shown. I summarize the results, argue the limitations, and discuss future research in the final section.

2 Conflicts within Coalition Governments

Multiparty governance can result in several conflicts because of coalitions' inherent heterogeneous composition (Bergman et al., 2021; Martin and Vanberg, 2008), and parties fight over legislative seats in PR systems unless they form a pre-electoral coalition (Martin and Vanberg, 2011). Because ministers in ideologically heterogeneous coalitions can impose their wills (their preferred policies) on their partners, this system of partnership can create several institutional check-and-balance mechanisms in a ministry and parliament (e.g., the roles of junior ministers and standing committees) (André, Depauw and Martin, 2016; Martin and Vanberg, 2005; Thies, 2001). Coalition partners often scrutinize their counterpart ministers by using legislative reviews in parliamentary committees (Martin

and Vanberg, 2008; André, Depauw and Martin, 2016) and by tabling questions in order to hold ministers accountable (Hömann and Sieberer, 2020; Martin and Whitaker, 2019).

Furthermore, to maintain the support of their key constituents, parties must express political views that differ from those of their partners (Fortunato, 2019*a,b*, 2021). Compromise in policy-making processes leads to junior partners' electoral losses because their electoral pledges are not fulfilled, and their distinctive party brands are blurred (Klüver and Spoon, 2020). According to Fortunato (2021), core party supporters dislike compromise and are biased to see their preferred party as bargaining losers, even though coalition governance often entails policy compromises. As such compromise dilutes their brand, the junior partners are often expected to fight any perceptions of incompetence regarding themselves among their supporters because of their policy-related compromises with the PM's party (Fortunato, 2021).

Thus, partner parties tend to use differentiation strategies to mitigate any potential electoral losses, showing they stand in a different policy position from the PM's party¹. For instance, they frequently table questions and mention diverse political issues in parliamentary speeches (Sagarzazu and Klüver, 2017). The partner parties take their positions to promote protecting their brands and show their ideological distinctiveness, mentioning their counterparts' policies negatively.

Because voters can infer any ideological distances between the coalition parties based on these parties' expressed confrontational attitudes (Adams, Weschle and Wlezien, 2021), junior partner parties use questions and speeches, which express their opinions, in order to differentiate them from the PM's party and protect their valence (competence). Generally, the literature shows that coalition partners' parliamentary speeches might express confrontational attitudes toward their governments ².

H1: Partner parties in coalition governments, who do not hold the premiership, are more likely to present confrontational attitudes in parliamentary speeches than PMs' parties.

Such partner parties' confrontational attitudes depend on time. In particular, as elec-

¹This is similar to the backbenchers' dissent in speeches and floor voting to show their valence to their constituents (Campbell et al., 2019).

²This article defines confrontational attitudes as attacking or negatively mentioning their counterparts. The term is similar to speech dissent within a party (Proksch and Slapin, 2015).

tions approach, these parties often utilize differentiated strategies that differ from their counterparts. The coalition members avoid conflicts and show a cooperative attitude to pass legislation in the middle of the electoral cycle. Compared to the middle of electoral cycles, at the end of the term, electoral incentives dominate the process of joint governance. Approaching elections may mean the end of the coalition. As they fight over legislative seats in an election, they must appeal to their constituents (Imre et al., 2023; Sagarzazu and Klüver, 2017).

The differentiation strategies resemble the opposition parties' negative campaign toward governments. Using parliamentary questions and speeches, opposition parties try to attack the governments' valence and differentiate them from governments' policy positions (Otjes and Louwerse, 2018; Poljak, 2023). Because opposition parties try to take over the government in the next election, opposition parties are more likely to engage in criticism of governments when an election approaches (Poljak and Walter, 2023). When coalition members separately compete in an election, the coalition partners lie in a similar situation to opposition parties; they try to differentiate themselves from their counterparts. Given the electoral incentives, the coalition members' confrontational attitudes will be similar to those of the opposition when elections approach. Therefore, the following hypothesis is derived.

H2: Coalition partners develop increasingly confrontational attitudes when an election is approaching; the effects are more similar to those of opposition members than to PMs' parties.

However, the logic of coalition governments is not universal. Given the importance of electoral incentives, in MMM countries, parties may have different incentives for managing coalition governments owing to their unique seat allocation formula. An MMM system is a two-tier electoral system with two separate SMD and PR blocs. Compared to a mixed-member proportional system, PR and SMD votes are independently counted. This creates incentives for a pre-electoral coalition owing to the existence of SMDs. According to Strom, Budge and Laver (1994), electoral systems with high disproportionality, e.g., SMDs, promote pre-electoral coalition because of the economy of scale. Thus, the coalition partners coordinate competition in SMDs; they do not field candidates in SMDs being contested by their counterparts' candidates. Furthermore, vote trading takes place in each tier (Catalinac and Motolinia, 2021; Liff and Maeda, 2019).

For example, in Japan, the Liberal Democratic Party (LDP) and Komeito have cooperated in elections. As the LDP is larger than Komeito, LDP fields candidates in most SMDs while Komeito nominates only about ten candidates in SMDs. LDP and Komeito do not contest the same SMDs. They trade their core supporters' votes (Catalinac and Motolinia, 2021). They cooperate in both SMDs and in the PR tiers. Komeito's supporters in SMDs with no Komeito candidate cast their votes for an LDP candidate, while LDP supporters in the districts vote for Komeito in a PR tier.

Such cooperation in the electoral arena can lead to less adversarial behavior between coalition members in a parliamentary arena than would be the case for coalition members in a pure PR country, even approaching an election. With such an enduring pre-electoral coalition, the end of the parliamentary term does not mean the end of the coalition. During the course of the parliamentary term, parliamentarians may take a fighting pose toward coalition partners to please their key constituents. But then an election approaches, and showing their unity in parliament signals their enduring cooperation to even their core constituents in the next election. Thus, in MMM, the electoral proximity may not affect partners' confrontational attitudes.

3 Data and Measurement

3.1 Degree of Confrontation as a Language Style

To test the above argument, I need to measure the degree of confrontation among parliamentarians. To assess conflicts in a given parliament, we usually use speeches delivered in the legislative arena (Proksch and Slapin, 2015). In this article, I focus on politeness-related language styles used by parliamentarians to measure partisan conflicts. My strategy involves focusing on *how politely* legislators talk in parliament rather than *what* they talk about.

Existing research tends to use ideologies or topics of speeches³. Nonetheless, as Osna-brügge, Hobolt and Rodon (2021) point out, parliamentarians use emotive rhetoric in high-profile legislative debates in order to convey their feelings regarding policies or governments. Only focusing on the contents (or topics) could carry the risk of overlook-

³Exceptionally, Imre et al. (2023) use the number of times applause occurs during speeches as a measurement of the coalition mood.

ing any existing parties that share policy preferences with the government but attack its valence. Thus, to infer a pattern of conflict, we must focus on words that are not related to the content.

Therefore, in this article, to investigate general partisan conflicts regardless of ideologies and contents, I focus on *how politely parliamentarians speak*, that is, their politeness-related language styles. The extant literature shows that there are certain political language styles that do not relate to the contents of texts; such styles can shed light on new aspects of political phenomena (Huang, Perry and Spirling, 2020). Mosteller and Wallace (1963), a pioneering work focusing on language styles, uses function words, rather than content, to discriminate the authorship of *the Federalist Papers*. Moreover, several studies focus on the language style regardless of contents and elucidate the new aspects of political representation. By focusing on language styles, we can ascertain new political conflict-related concepts or dimensions. For example, Hargrave and Blumenau (2022) investigate the differences in debate style between female and male representatives in the UK. Slapin and Kirkland (2020) use simplicity of language, negative sentiment, and first- and third-person pronouns as predictors of rebel parliamentarians.

Focusing on politeness-related language styles can enable us to infer partisan conflicts irrespective of content. In particular, when the research interest focuses on critique from coalition partners, a language style that captures hostility toward governments is helpful for inferring partisan conflicts across issues.

Politeness, as used in sociolinguistics, is defined as “a tool for smooth and conflict-free communication”(Obana, 2019, 248). During formal meetings, we must often use polite language styles to avoid upsetting others; this is in contrast to the language used in conversations with close friends. These differences in language styles are common across languages. For instance, honorifics (*keigo*) are used as a tool for facilitating conflict-free communication in the Japanese language (Obana, 2019). The language style of a given speaker can be hostile or cooperative depending on their social position and where they are speaking. People usually use appropriate words in formal meetings in order to maintain an appropriate distance from the other conversation partner and express their honesty. However, in parliament, which is one of the most formal meeting places, speeches can be polite or impolite. In parliamentary speeches, parliamentarians strategically use impolite words to take a fighting pose toward governments. For example, some parliamentarians

may strategically use a second-person pronoun “you” when asking the PM questions instead of the PM’s position name (or third-person pronoun) ⁴.

A unique characteristic of the Japanese language is useful for capturing politeness⁵. A sentence in the Japanese language is divided into two parts: *kanji* and *hiragana*. Specifically, using *hiragana* has the potential to measure politeness. For example, “質問に教えてください” means “Would you answer my question?”. This sentence can be divided into kanji (“質問 (*shitsumon*) [question]”) and “答 (えて) (*kotaete*) [answer]”) and hiragana (“に (*ni*),” and “ください (*kudasai*)”). In principle, hiragana has no substantial meaning but sometimes conveys the tone of sentences. Different ends of sentences, “教えてください” and “答えろ,” have different tones. “答えろ” has a very adversarial tone and is an impolite style of question. Although this is an extreme example, “質問に対して答えろよ” was actually used by a Japan Socialist Party (JSP) member in a question at the budget committee ⁶. These features are used for measuring the politeness of the speeches parliamentarians give. In the next section, I explain how to measure politeness, or confrontational attitude, using *hiragana*.

3.2 Language Style Detection Method Used by Supervised Machine Learning

To measure parliamentarians’ confrontational attitudes (politeness-related language styles), I construct a model that classifies parliamentarians’ speeches into a government group and an opposition group, exploiting the language differences in speeches between the government and the opposition; it uses tokens that contain only *hiragana* to measure how much the speakers attack the government. Through learning the model, the impolite words used by opposition members can be detected, and based on the model, predicted probabilities, or confrontational scores, can be calculated for regressions.

While this article examines conflict within coalition governments in parliamentary

⁴In fact, “you” (*anata*) is more frequently used by opposition members than members from the governing party.

⁵Suzuki (2009) examines the language styles used by Japanese politicians. Although this research uses the grammatical characteristics used in the PM’s speeches at the time, it is difficult to interpret what it represents. In contrast, by focusing on differences between the government and the opposition, we can infer any expressions of hostility toward the government and any attacks on the government’s valence.

⁶A question by Yoshimi Mino (JSP) at the budget committee in the House of Representatives on Feb. 3, 1993 (<https://kokkai.ndl.go.jp/#/detail?minId=112605261X00419930203&spkNum=72¤t=76>). Furthermore, other members have also used “答えろよ.”

speeches, the word usage in opposition parliamentarians’ speeches can be used for defining impolite language. As described below, speeches by the opposition members can be used as training sets in a machine learning model, and using the model, I calculate how the coalition members’ speeches are similar to the opposition’s impolite speeches.

An opposition party criticizes a government party and tends to speak in tough tones to embarrass the government (Poljak and Walter, 2023; Seeberg, 2020). In contrast, government backbenchers are likely to use more polite language to show their cooperative or obedient attitudes. For governments, backbenchers’ questions give them a place to promote their policies, and ministers respond to their parties more positively than they do to opposition parties (Kukec, 2022). In this study, I have used the differences in word usage between a government and its opposition in order to assess impolite language styles; that is, I have attempted to measure how coalition partners talk like opposition parliamentarians. If coalition partners use similar impolite words to opposition members, coalition members show confrontational attitudes in parliamentary speeches.

Using a supervised machine learning method, the model can learn opposition parties’ language styles, and I interpret predicted results in terms of how similar a given parliamentarian’s speech is to that of the opposition parties. Exploiting the fact that oppositions criticize the government, the model can measure the extent to which other members show confrontational attitudes toward the government. Grimmer, Roberts and Stewart (2021, 117) call using such predictive models to identify distinctive words “fictitious prediction problems.” Gentzkow, Shapiro and Taddy (2019) use this method to identify unique words used by the two major parties in the US. Furthermore, Wäckerle and Castanho Silva (2023) use a similar method to detect feminine language styles. In this context, the aim of executing a machine learning model is not accurately predicting whether a given speech is made by a government or an opposition member but rather detecting words and weights associated with governments or opposition members. Therefore, only words in speeches are used as explanatory variables, and other metadata is not used.

To construct a model for predicting whether a given speech is delivered by the government or the opposition members, I employ a logistic regression with an elastic net penalty. The probability that a given speech by a member of the Diet i on the day d will be classified as an opposition member’s speech is denoted as θ_{id} . I model this prob-

ability such that $\theta_{id} = \frac{1}{1+\exp(-X_i\beta)}$, where X_i is the i th row of a document-term matrix. The elastic net penalty is a variant of sparse modeling, which can impose restrictions on slope parameters in order to avoid over-fitting and indeterminate coefficients⁷. This method is suitable for analyzing text data because a document-term matrix tends to be high-dimensional, and the slope parameters of words could be larger than the number of documents. In practice, when the maximum likelihood estimation of a logistic regression model is conducted, the following restriction is introduced into the log-likelihood function: $(1 - \alpha)\frac{1}{2}\|\beta\|_{\ell_2}^2 + \alpha\|\beta\|_{\ell_1}$ (Friedman, Hastie and Tibshirani, 2010). The sparse modeling method avoids overfitting and automatically selects useful predictors for prediction through the coefficient parameters of irrelevant predictors, thus forcing them to be zero or extremely small.

The hyper-parameters α , which is the degree of mixing between LASSO and ridge regression, and λ , which is the degree of the penalty, cannot be estimated from the data. Instead, analysts must determine them before estimating the coefficients. To determine hyper-parameters, I employ a ten-fold cross-validation method that was repeated five times for each hyper-parameter. Because of cross-validation, I can assess the predictive abilities of models. The best model for making an accurate prediction is used in the predictive stage.

To ensure that the results will be interpreted as language styles, I include only *hiragana* tokens as predictor variables (that is, X_i), as explained above. Using hiragana is similar to using function words (articles, pronouns, and prepositions) in English, which effectively infer authorship (Mosteller and Wallace, 1963)⁸. Such functional word usages often reveal instinctive attitudes and styles (Liu, 2022).

Assuming that hiragana does not deliver any substantial meanings but does deliver feelings about the politeness of relevant speakers, I constructed a new predictive model that classifies whether parliamentarians belong to the government or the opposition. Adopting an agnostic approach toward text analysis, I have included all hiragana tokens in my corpus in a model because I do not form any hypothesis about what tokens are related to language styles beforehand (Grimmer, Roberts and Stewart, 2022). Predicting whether governments or opposition parties use *hiragana* tokens is the simplest and most exhaustive method for detecting confrontational words and distinguishing parliamentarians' language

⁷This is a blend of LASSO (least absolute shrinkage and selection operator) and ridge regression.

⁸Using *kanji* would make it difficult to identify topics, tones, ideologies, and styles in speeches

styles. “ます (*masu*),” “よろしく (*yoroshiku*),” “いただき (*itadaki*),” “につきまして (*nitsukimashite*),” “いただきます (*itadakimasu*),” “あなた (*anata*),” “ならば (*naraba*),” “です (*desu*),” and “ですが (*desuga*)” are examples of tokens included as features in the machine learning model⁹.

In order to construct a corpus, I collect all speech transcripts recorded at budget committees, which witness the most high-profile debates of the Japanese Diet, in the House of Representatives and the House of Councilors from 1956 to March 22nd, 2022, using the *Kaigiroku* package (Matsuo, 2021). The selected speeches contain oral questions (*shitsugi*) and debates (*toron*), in which parliamentarians, on behalf of each party, took various positions on a given bill or budget. Rather than speaking about specific bills, parliamentarians mention everything related to governments’ activities in speeches at the budget committees. In particular, the oral questions in the budget committee in the Japanese Diet are considered a substitute for plenary debates and are seen as the most prominent debates in the Diet because all ministers attend the meeting, and the meeting is broadcast and featured on television news in prime time slots (Oyama, 2011). The oral questions and debates at the budget committee are seen as a major battleground between the ruling government and opposition parties. As the speeches at the budget committees are, in principle, reactions to governments’ activities, important bills, and budgets, the speakers’ attitudes toward government should appear in the speeches. As parliamentarians mainly use questions and debates to express their attitudes toward the government, these texts are deemed appropriate for this research.

The texts have to be transformed into data (or a matrix) to be used in the analysis. Assuming a bag-of-words model, I construct a document-term matrix using *Quanteda* (Benoit et al., 2018) in the following way. First, I aggregate each speech given by a parliamentarian in one day into a single unit (row) because the same person usually speaks in a day more than a second time. Second, I exclude the content of ministers, parliamentary secretaries, and committee chairs from my data because their language styles, which are related to answering questions and presiding over meetings, tend to be

⁹Using only tokens at the end of sentences might be appropriate for capturing the politeness of speeches, but some tokens in the middle of sentences could be useful, like “ですが (*desuga*).” Then, in the main analysis, all hiragana tokens are included in the machine learning model. The results of the model that includes the tokens at the end of sentences are reported in the appendix (A8). The results are almost the same as the main analysis but more consistent with the expectation from the literature about coalition governance in the MMM system.

different from those of backbenchers. Third, because words are not usually separated by white spaces in the Japanese language, I separate the documents into tokens using boundary detection, which **Quanteda** adopts; therefore, it held only tokens that contain more than two *hiragana* characters. Finally, I use the proportions of the words present in a document because the length of each document was different.

The training data, which is used for coefficient estimation, is needed to construct a model. I use speeches from 1960, when partisan conflicts were settled by the end of mass protests against the U.S-Japan Security Treaty, to 1993, when the 55 system ended (before the 1993 general election), as a training set and confine speeches to those given by the Liberal Democratic Party (LDP) and the Japan Socialist Party (JSP) members¹⁰. Furthermore, to evaluate the predictive accuracy of my model, I split the data; 85% of the data (4345 speeches) is used as a training set and 15% (1176 speeches) as a test set. Speeches by the LDP and JSP members are used for training to predict which party they belong to. That is, the outcome variable is a dummy variable that takes one if a speech is given by a JSP member and zero if a speech is given by an LDP member. I utilize the nature of the one-party dominance in Japan, under which the LDP was always in government while the opposition JSP constantly attacked the LDP-led government. I construct a model to predict whether speeches are delivered by LDP or JSP parliamentarians using 5375 *hiragana* only tokens (i.e., the number of columns of the document-term matrix is 5375). Thus, the model gives us a predicted probability of whether a given member of the Diet belongs to the JSP or the LDP. Because of training, we can obtain a coefficient parameter for the abovementioned model β , and by substituting new data for X , we can calculate a predicted probability that the new data can be classified as relating to an opposition member. The results predicted by the model can be interpreted as the degree of confrontation or how closely members' speech matches that of the opposition. The following regression analysis uses the predicted probability from the machine learning model as the dependent variable.

The accuracy score is 89%, indicating that 89% of test sets are correctly classified. The validity of the results of the machine learning and other metrics have been shown in the online appendix (A1, A2, and A3). The accuracy metrics show that the model can

¹⁰I also use data from the 2000s as training data to construct a model. The model predicts whether a speech is given by a member of the Democratic Party of Japan or LDP. The results are shown in Appendix A7. The conclusion is the same as that of the original analysis.

accurately identify whether speeches belong to the government or the opposition; this implies that opposition members employ a distinct language style compared to government members. Furthermore, when data extends to other periods, the model adequately predicts speeches by opposition members¹¹. The results are consistent with historical facts of Japanese politics¹².

In addition to the accuracy metrics of the model, I provide an example to assess whether the model captures the concept of politeness. The following example is a question by Katsuei Hirasawa (LDP) on February 20, 2011, classified as an opposition members' speech. The confrontational score is 0.99. A part of the speech is the following.

“まず冒頭、きょうの朝日新聞に「普天間予算凍結提示へ」という記事が出ています。社民党に対して配慮して、予算が成立しても執行を凍結すると。どういう意味かよくわかりませんが、その検討を始めたと出ていますけれども、財務大臣、この報道は事実なんですか (First, today's Asahi Shimbun reports 'Government will suspend executing the budgets for Futenma base.' This probably means that the government, making a concession to the SDP, will abandon executing the budgets for the Futenma base even if the Diet approves the annual budget. I don't know what this is, but the article shows that the government has started planning this. Finance Minister, is the article true?)¹³”

This question is a typical example of speeches by opposition members; Hirasawa attacked the government using impolite language. In fact, “よくわかりませんが” and “なんですか” would be seen as offensive by the otherside¹⁴.

3.3 Regression Models

To test the hypothesis, I use speeches that had been made between 1993 (after the Lower House election) and 2021 (before the Lower House election of October 31st, 2021) by members of the House of Representatives because coalition governments were the norm during this period. Any speeches by the committee chairs, ministers, and bureaucrats are excluded because their speeches were totally different from those of backbenchers,

¹¹In appendix (A3), FigA3 - FigA6 show time series plots of confrontational scores. The results confirm the predictive accuracy of the model.

¹²For example, after 2012, the opposition parties have been divided, and some parties show cooperative attitudes toward the LDP government. Figure A6 illustrates such divided opposition parties.

¹³<https://kokkai.ndl.go.jp/#/detail?minId=117705261X01020110210¤t=1>

¹⁴In this example, “事実かどうかお尋ねします” might be more polite than “なんですか”. In fact, according to the machine learning model, “まず” is associated with governments and “です” and “すか” is associated with oppositions (Figure A1 and A2 in appendix A2).

and using their speeches is inappropriate for estimating conflicts in the parliament. The aggregated speeches delivered by a given legislator in one day form the unit of analysis.

I estimate the following baseline equation (equation 1) through an ordinary least squares method where α_i represents parliamentarians' fixed effects, and γ_t represents electoral cycle fixed effects. The parliamentarians' fixed effects could capture and control their idiosyncratic language hostility. In this context, the electoral cycle is the period from the date of the election to the next election. The electoral cycle fixed effects absorb common shocks and the idiosyncrasy of periods ¹⁵.

The dependent variable, the confrontational score, is the predicted probability that the speech is classified as a speech given by an opposition member using the above-mentioned machine learning model; thus, a high score means the speech is similar to that of the opposition. The variable *DaysfromElection* represents how many days have passed since the most recent election, and the variable is divided by the length of the electoral cycle (the maximum values of the variable in each electoral cycle) to normalize the range of the electoral cycle to ease interpretation, and the number of the days is different among electoral cycles due to early elections¹⁶; an increasing value of *DaysfromElection* means that the next election approaches. In this analysis, parliamentarians are categorized into three types: partner parties, opposition parties, and PM's parties. *PartnerParty* indicates whether the speaker's party is a junior partner of the coalition. *OppositionParty* indicates whether the speakers' party is not participating in the government¹⁷. The parties that fall into each category are shown in Appendix A4.

$$\begin{aligned} ConfrontationalScores_{id} = & \beta_1 DaysfromElection_{id} + \beta_2 PartnerParty_{id} + \\ & \beta_3 OppositionParty_{id} + \alpha_i + \gamma_t + \epsilon_{id} \end{aligned} \quad (1)$$

To capture the interaction effects of *DaysfromElection* among the PM's party, coalition partners, and the opposition, I estimate the equation 2, which includes the interaction terms of days from elections and party types, and other variables are the same.

¹⁵The effects of differences in coalition compositions in each period are absorbed in the electoral cycle fixed effects.

¹⁶I also use the variable undivided by the maximum and show the results in the appendix A6. The substantive results are almost the same.

¹⁷Therefore, the category baseline is a party that occupies the premiership.

$$\begin{aligned}
ConfrontationalScores_{id} = & \beta_1 DaysfromElection_d + \beta_2 PartnerParty_{id} + \\
& \beta_3 OppositionParty_{id} + \\
& \beta_4 DaysfromElection_d \times PartnerParty_{id} + \\
& \beta_5 DaysfromElection_d \times OppositionParty_{id} + \\
& \alpha_i + \gamma_t + \epsilon_{id}
\end{aligned} \tag{2}$$

Furthermore, compared to the conditional effects of government parties overall and opposition parties, I also estimate the following equation: the *GovernmentParty* is a dummy variable that takes one if parliamentarian i belongs to the governing coalition; otherwise, it takes zero. By examining the effects of the opposition parties, I can compare the effects of partners and oppositions.

$$\begin{aligned}
ConfrontationalScores_{id} = & \beta_1 DaysfromElection_d + \beta_2 GovernmentParty_{id} + \\
& \beta_3 DaysfromElection_d \times GovernmentParty_{id} + \\
& \alpha_i + \gamma_t + \epsilon_{id}
\end{aligned} \tag{3}$$

The descriptive statistics of variables are shown in Table1.

Table 1: Descriptive Statistics				
	Minimum	Mean	Maximum	SD
Days from Election	0.01	0.51	1.00	0.29
Government Party	0.00	0.26	1.00	0.44
Confrontational Scores	0.00	0.69	1.00	0.32
Opposition Parties	0.00	0.74	1.00	0.44
Partner Parties	0.00	0.10	1.00	0.30

4 Result

Table 2 shows the regression results. The first column shows the estimated result of the baseline equation. We can observe significant coefficients for *DaysfromElection*, *Opposition*, and *PartnerParty* at the 1% level. The sign of the coefficients for *DaysfromElection* implies that parliamentarians use confrontational language styles when an election is

approaching. The coefficients for the partner party show a positive sign; the partners' coefficient is larger than the one for the PM's party. With the positive sign of *Opposition*, opposition members also show confrontational attitudes in parliamentary speeches. Therefore, partner parties often employ a language style that is slightly similar to that of the opposition; this means that they show a slightly hostile attitude toward the government during parliamentary speeches. The coefficient of opposition parties is 0.4, substantially different from that of the PM's party. Their attitudes resemble those exhibited by the JSP as an opposition party, even though the existing opposition parties are now different. The partner parties' score is 0.087 points greater than that of the PM's party. This implies some coalition members show hostile attitudes like opposition members, but their language is also different from that of the opposition members. As Smith (2021) finds that coalition partners have a larger share of the question times than the PM's party, the results imply that coalition partners in fact engage in monitoring and criticize their counterparts using this time. This is consistent with H1.

The second and third columns in Table 2 show models with interaction terms between partner or opposition party/government dummy variables and days remaining until an election, which can capture the difference in the effects among parties. The fourth column shows the replication of the model of the second column with data limited to the 2000s to mitigate the effects of frequently switching coalition frameworks in the 1990s¹⁸.

Although the baseline model indicates that parliamentarians, on average, criticize the government when an election is approaching, the effects should be different for the different parties. The model shown in the second and fourth columns in Table 2 includes an interaction term for partner/opposition and *DaysfromElection*. Both models show similar results. As conditional effects should not be interpreted based on interaction terms themselves (Brambor, Clark and Golder, 2006), Figure 1 shows the conditional effects with 95% confidence intervals of days from elections (upper panel) and party variables (lower panel, calculated based on Model 4). The point estimate of the conditional effects of *DaysfromElection* for partners is smaller than that for the opposition parties; however, with a large confidence interval, the conditional effect is not statistically significant. Furthermore, the model in Column 3 includes an interaction term for days

¹⁸Furthermore, due to the parliamentary reform in the late 90s, bureaucrats rarely speak in parliamentary committees (Goplerud and Smith, 2023). This limitation of data to the 2000s could capture the effects of partner parties on confrontational attitudes toward governments accurately.

Table 2: Estimated Regression Coefficients

Dependent Variable: Model:	Confrotation Score			
	(1)	(2)	(3)	(4)
Days from Election	0.039*** (0.010)	0.006 (0.035)	0.046*** (0.011)	0.029 (0.042)
Opposition Parties	0.400*** (0.017)	0.381*** (0.023)		0.417*** (0.030)
Partner Parties	0.087*** (0.029)	0.083** (0.037)		0.139*** (0.050)
Partner Parties $\times$ Days from Election		0.012 (0.045)		-0.018 (0.050)
Opposition Party $\times$ Days from Election		0.041 (0.038)		0.010 (0.044)
Government			-0.348*** (0.019)	
Government $\times$ Days from Election			-0.025 (0.026)	
<i>Fixed-effects</i>				
Speaker	Yes	Yes	Yes	Yes
Electoral_cycle	Yes	Yes	Yes	Yes
<i>Fit statistics</i>				
Observations	6,504	6,504	6,504	5,036
R ²	0.667	0.667	0.665	0.699
Within R ²	0.193	0.193	0.190	0.186

Clustered (speaker) standard-errors in parentheses
*Signif. Codes: ***: 0.01, **: 0.05, *: 0.1*

from the election and a government dummy variable. The effect for a non-government party (i.e., the coefficients in Table 2) is significant at the 1% level, while the effect for a government party is not significant (the upper panel of Figure 1). The results suggest that partner parties' attitudes toward the government do not depend on electoral cycles, although opposition parties often criticize the government when elections are approaching. Additionally, the differences among opposition members, partner parties, and the PM's party are constant (the lower panel of Figure 1). The differences between partners and the PM's party shrink slightly as an election approaches.

This result implies that even when an election approaches, in contrast to expectations from H2, partner parties seem to have little incentive to differentiate themselves from the PM's party due to electoral cooperation, while opposition parties, who compete with government parties, need to differentiate themselves from government parties. This result might be attributed to the Japanese electoral system, MMM, which would lead to cooperation among coalition parties in the SMD and PR tiers, as explained in the theoretical section. Nevertheless, the difference may not be attributed solely to MMM due to focusing only on Japan; thus, further research is needed to determine the MMM effects on coalition governance.

5 Conclusion

This article uses a supervised machine learning method to assess the language styles used by parliamentarians. Finding and utilizing the differences between the government and the opposition, I detected how coalition partners often speak like opposition backbenchers. I found that the speech of partner party parliamentarians is often slightly similar to that of opposition parties in the Japanese Diet. Partner parties present confrontational attitudes toward their counterparts, but this effect is not conditional on electoral proximity. The Japanese MMM system may explain the results as the system may lead to cooperation among coalition partners. The study results may suggest that, in an MMM setting, the incentives for managing coalitional governance might differ. However, as this research focuses only on the Japanese case, the results might be attributed to other factors. To reach a conclusion on the coalition governance in MMM, we should examine other MMM countries (e.g., Italy).

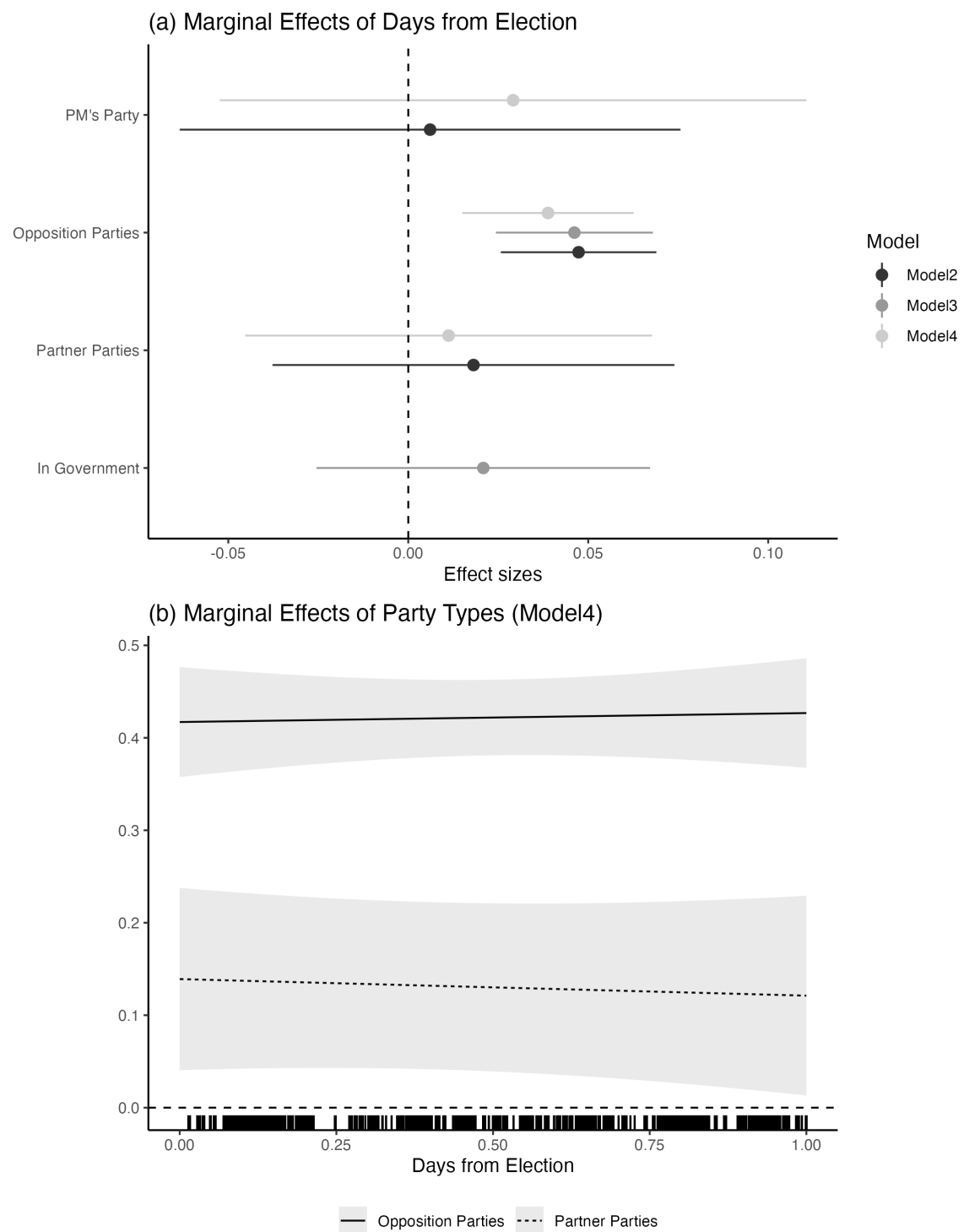


Figure 1: Graphical Representation of Marginal Effects Based on Regression Results

We must deepen our understanding of coalition governance in majoritarian countries. Future work must focus on how electoral cooperation affects legislative debates and reviews. There may be some concerns about the generalizability of the method. Although this article focused on language styles in Japan in order to measure confrontational attitudes, I believe this measurement strategy can be applied to other languages as well. Polite language styles exist in almost all languages. For example, a person may express distance from another person by using the past tense of auxiliary verbs (would and could) and second-person pronouns. In English, by using such words, we can estimate the degree of confrontation between different parties. As there are various systems of language styles, we must develop measurement strategies for each language.

Furthermore, the confrontational attitudes differ among parties, even within partner parties and opposition parties in recent Japanese politics (Appendix A3). These differences may vary with time and be dependent on politicians' attitudes toward other opposition parties, such as anti-communist sentiment. In future research, to deepen the understanding of Japanese politics, coalition management, and opposition behavior, it will be necessary to focus on individual-level variables and examine the differences between them.

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Supporting Information

- A1** Accuracy Statistics for Supervised Machine Learning
- A2** Discriminating Words
- A3** Validity Check: Predictive Validity
- A4** Cabinet Composition
- A5** Regression Results including Squared Term
- A6** Regression Results Using Measure of Days from Election not Divided by the Maximum Value.
- A7** Robustness Check: Using only Data during the 2000s
- A8** Robustness Check: Using only Tokens at the Ends of Sentences