

# Group Identities and Parliamentary Debates

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June 10, 2025

## Abstract

In list-based proportional representation systems, the election of individual politicians depends on their rank position on the ballot. Party organizations therefore play a crucial role in determining which candidates will be elected, and incumbents have incentives to remain popular among party elites. What role do politicians' group identities play in such a setting? We study this question using legislative speech from the Norwegian Parliament and recently developed techniques for measuring group differences in high-dimensional choices. Across the background characteristics we consider — gender, age, urbanicity, and class background — we document substantial differences in speech, even when comparing legislators from the same political party and policy committee. This suggests that even in party-centered environments, politicians' social ties and group identities matter for the policymaking process.

**Keywords:** political parties, representation, text analysis, penalized logistic regression

**Online appendix:** Supplementary materials can be found in the online appendix.

**Replication statement:** Replication files are available in the JOP Dataverse (<https://dataverse.harvard.edu/dataverse/jop>). The empirical analysis has been successfully replicated by the JOP replication analyst. Supplementary materials can be found in the online appendix.

**Financial support:** Fiva acknowledges financial support from the Research Council of Norway (grant no. 314079).

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# 1. Introduction

In closed-list proportional representation systems, voters cast their ballots for political parties rather than individual candidates, and candidates are elected according to their rank on the party ballot.<sup>1</sup> In such systems, party elites employ various strategies to discipline rank-and-file incumbents, resulting in high levels of legislative cohesion (see, e.g., Cirone, Cox and Fiva, 2021). Does the significant power parties hold to enforce party discipline in a closed-list proportional representation system render politicians' background characteristics irrelevant?

We examine the extent to which politicians' social ties and group identities influence the policymaking process within Norway's closed-list proportional representation system. We rely on floor speeches between 1981 and 2021, along with individual-level background characteristics, as a means to gain insight into legislators' policy preferences. In candidate-centered electoral environments, such as the United States, roll-call voting can be used to measure individual legislators' policy preferences (e.g., Poole and Rosenthal, 2000). However, in most parliamentary systems, voting is tightly controlled through party discipline, meaning that legislators vote with their party possibly not because of their personal policy preferences, but sometimes in spite of them (Bailer et al., 2022; Proksch and Slapin, 2012; Schwarz, Traber and Benoit, 2017). Floor speeches provide valuable insight into individual politicians' contributions to policymaking, reflecting the full legislative process, from policy formation to implementation and justification.

To quantify differences in speech patterns by legislators with different background characteristics, we build on the work of Gentzkow, Shapiro and Taddy (2019). Their method is ideal for our purposes since it allows us to compare bivariate characteristics while taking into account covariates, and controlling for small sample bias.<sup>2</sup> While

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<sup>1</sup>Catalinac and Motolinia (2021) identify 47 countries worldwide that use closed-list proportional representation, including many Western European democracies.

<sup>2</sup>Because parties might allocate legislators strategically to committees based on their descriptive backgrounds, we include committee fixed effects in our analyses. Previous work has shown, for example, that women are assigned disproportionately to committees that focus on women's issues and social

Gentzkow, Shapiro and Taddy (2019) study differences in political speech *across* the two parties in the United States Congress, we are primarily interested in quantifying differences across legislators belonging to the *same political party*.

As a benchmark to assess within-party divergence, we first quantify divergence *across* the political blocs (i.e., political polarization) that dominate Norwegian politics; the left-leaning social democratic camp vs. the right-leaning conservative camp. We document substantial bloc divergence in legislative speech, which is increasing over our sample period. We find similar, but somewhat smaller, differences across the four background dimensions that we consider. In the second half of our sample period (2002–2021), we estimate that the probability that a neutral observer correctly guesses the speaker’s bloc affiliation is about 68 percent after hearing a one-minute speech. For the four background dimensions that we consider, a one-minute speech gives a neutral observer about 57 – 64 percent chance of correctly guessing the relevant background characteristic. In most parliamentary sessions, we can rule out that the observed differences in speech patterns are driven by random variations for all background characteristics.

After establishing the existence of speech divergence between legislators with opposing background characteristics, we examine how these differences manifest by scrutinizing the most divergent words between background pairs. For example, we find that rural legislators focus on topics, such as regional policies, farming, and sparsely populated areas, while urban legislators prioritize city-specific issues like crime and urban development. Similarly, women devote more attention to family and welfare policies in their speeches than their male colleagues.<sup>3</sup> These divisions align with the policy preferences of voters that share their background characteristics.

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issues and are often underrepresented on committees that deal with economics or foreign affairs (see, e.g., Michelle Heath, Schwindt-Bayer and Taylor-Robinson, 2005; Pansardi and Vercesi, 2016). We find a similar pattern in Norway. Søyland and Høyland (2021) find that legislators in the Norwegian parliament primarily participate in debates related to their respective committees.

<sup>3</sup>Several scholars have previously documented similar general differences in legislative speech between men and women. See, for example, Bäck, Debus and Müller (2014); Lippmann (2022); Clayton, Josefsson and Wang (2017); Osborn and Mendez (2010); Blumenau (2021) for studies of Sweden, France, Uganda, the United States, and the United Kingdom, respectively. Less is known about the other background characteristics that we consider (Gulzar, 2021).

A key reason for focusing on legislative debate is that it serves as an “observable product of party politics” (Laver, 2021, p.26). Legislative speeches reveal legislators’ intentions and priorities before formal laws are enacted and shed light on inter-party divisions, intra-party disagreements, and opposition to policy compromises (e.g., Baumgartner, Breunig and Grossman, 2019; Martin and Vanberg, 2008; Ivanusch, 2024; Itzkovitch-Malka et al., 2024). While the canonical spatial model of multiparty competition assumes that parties can be treated “as if” they are unitary actors—either due to legislator sorting into party groups with similar preferences (Krehbiel, 1993) or because party leaders wield control over key rewards and punishments to enforce strong party discipline (Cox and McCubbins, 2005)—our analysis challenges this assumption. Specifically, we find evidence suggesting that parties are unable to fully discipline their rank-and-file members, and that descriptive representation matters for the policymaking process. This result is particularly noteworthy in the Norwegian context, where party leaders have “both the ability and the incentive to select only speakers who they expect to stick to the official party line” (Laver, 2021, p.27). An alternative interpretation of our findings is that parties may intentionally allow politicians’ individual preferences to surface. If voters hold diverse policy preferences, a vote-maximizing party might strategically encourage politicians with particular background characteristics to publicly advocate for these issues.

Our study contributes to the literature in two ways. First, we contribute to the broader literature on how disparities in *descriptive representation* influence a group’s *substantive representation*.<sup>4</sup> Existing evidence from candidate-centered electoral environments suggest that politicians’ social ties and group identities matter for policy outcomes, (see, e.g., Chattopadhyay and Duflo, 2004; Hyttinen et al., 2018; Pande, 2003).<sup>5</sup> Less is known about the importance of group affiliations in party-centered electoral environments, where parties have strong tools to discipline their elected officials.

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<sup>4</sup>In her seminal work, Pitkin (1967) distinguishes between legislators who are descriptively similar and thereby “stand for” their constituents, and those who substantively “act for” constituents by promoting issues of concern to that group.

<sup>5</sup>The findings in this literature are however, not unequivocal, (see, e.g., Ferreira and Gyourko, 2014; Gagliarducci and Paserman, 2012).

Previous studies on substantive representation have often focused on specific underrepresented groups.<sup>6</sup> This fragmentation limits our understanding of whether representation mechanisms are consistent across groups. We address this gap by adopting a comprehensive approach, simultaneously analyzing four key background characteristics.

Second, we contribute to an emerging literature on intraparty politics in list-based electoral systems. Much of this literature focuses on how parties allocate nominations and valuable positions to their members (e.g., Buisseret et al., 2022; Cox et al., 2021; Folke, Persson and Rickne, 2016; Fujiwara and Sanz, 2020; Meriläinen and Tukiainen, 2018) and how this shapes party stability (e.g., Buisseret and Prato, 2022; Cirone, Cox and Fiva, 2021; Matakos et al., 2024). Cirone, Cox and Fiva (2021), for example, argue that party elites create career paths within the party partly because they want to increase legislative cohesion. Empirically, it is complicated to quantify the extent to which party leaders control their rank-and-file members. Roll-call votes in parliamentary systems suffer from a number of problems that prevent them from forming a reliable basis for estimating individual legislators’ ideal points (Goet, 2019; Hug, 2010; Peterson and Spirling, 2018; Schwarz, Traber and Benoit, 2017). We believe that our study, based on legislative speech, delivers important insights into intraparty dynamics in party-centered environments.

## 2. Empirical case: Norway 1981–2021

### 2.1 *Election system*

Norwegian national elections are held every fourth year in September (1981, 1985, ..., 2021) using closed-list proportional representation.<sup>7</sup> Each parliamentary session starts in the first week of October and normally ends in the third week of June. Below, we define

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<sup>6</sup>Bailer et al. (2022) provide a notable counterexample, examining how gender, migrant status, social class, and age influence parliamentary questions in the German Bundestag. Their findings suggest that descriptive representation fosters substantive representation, particularly early in legislators’ careers.

<sup>7</sup>An unusual constitutional feature is the lack of any provision for early parliamentary dissolution. Norway and Switzerland are the only Western European countries without this “safety valve” (Strøm and Swindle, 2002).

parliamentary sessions by the year in which they ended.

Seats are allocated in two rounds. First, regular seats are allocated at the district level using the Modified Sainte-Laguë method. Second, adjustment seats are given to parties that are underrepresented nationally after the first-tier seats have been allocated, provided that those parties reach an electoral threshold of 4% of the national vote count (Fiva and Smith, 2017). Candidate nominations and rank positions are formally determined by party conventions at the electoral district level. In our sample period (1981–2021), the parliament consisted of 155–169 members (MPs).

## 2.2 *Two-bloc politics*

The Norwegian party system has been shaped by political cleavages that originated from economic, geographical, and cultural factors (Rokkan, 1967). The policy space has, however, been well represented by a left-right dimension, where the main political divide went between the left-leaning social democratic bloc and the right-leaning conservative bloc (Strøm, 2022). The left-wing bloc traditionally consisted of two parties, the *Socialist Left Party* (SV) and the *Labour Party* (A). The right-wing bloc has been more fragmented and consists of the *Conservatives* (H), the *Liberals* (V), *Christian Democrats* (KrF), and the *Progress Party* (FrP). The *Centre Party* (Sp) has traditionally sided with the conservative bloc but switched sides in 2005 when they formed a government together with A and SV.<sup>8</sup>

Two-bloc politics has significantly shaped the formation of cabinets in Norway and contributed to the prevalence of minority governments. Norway ranks among the world's parliamentary democracies with one of the highest rates of minority governments (Strøm, 2022). In our 40-year sample period, Norway was governed by minority governments for about 29 years (see Table A.1). Despite being one of the countries with the highest prevalence of minority governments, Norway's democracy remains stable, likely because

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<sup>8</sup>In addition to the seven main parties mentioned, four minor parties have been represented by a single MP in one or more election periods during our sample period (*Future for Finnmark*, the *Coastal Party*, the *Green Party*, and the *Red Party*).

it is historically rooted in a consensus-based political culture and has relatively high levels of political trust. The political consensus culture in Norway has likely emerged because of its relatively egalitarian nature. The presence of “cross-cutting cleavages” has created enough common ground across groups with potentially conflicting interests to avoid deep-seated conflicts (Lipset and Rokkan, 1967; Wollebæk, Brekke and Fladmoe, 2022). This, together with most elites supporting the basic institutions, has created an environment that accepts policymaking through compromise. However, in later years, there are concerns that controversial issues, such as immigration, identity politics, and urbanization, have increased divergence across groups (Gulbrandsen and Engelstad, 2013; Wollebæk, Brekke and Fladmoe, 2022).

### **2.3 Party discipline**

Voting against one’s party on a whipped vote is the ultimate act of defiance (Proksch and Slapin, 2015). Like in most parliamentary systems, intraparty cohesiveness in roll-call voting is extremely high in Norway. In the 2017-2021 election period, for example, the seven main parties were individually united in 96% of cases.<sup>9</sup> Generally, parties only allow legislators to break party ranks on issues of strong constituency interest (e.g., roads) or moral beliefs (e.g., abortion), and only when they do not threaten the standing of the government (Rasch, 1999).

### **2.4 Parliamentary committees**

There are currently 12 standing committees (*fagkomiteer*) in the Norwegian Parliament. These have responsibility for the majority of parliamentary proceedings. The committee size varies from 11 to 18 members. Representatives are proportionally assigned to each committee, according to their party’s size in the parliament. The exception is *The Standing Committee of Scrutiny and Constitutional Affairs*, where all parties are represented.

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<sup>9</sup>The sample includes roll-call votes recorded by the electronic voting device of the *Storting*, and therefore excludes unanimous and some near-unanimous decisions. Panel A of Figure A.1 illustrates that when a party is *not* united, it is typically because a small fraction of legislators broke with the party line. Panel B of Figure A.1 shows that party discipline has been stable at a high level for decades.

Figure A.2 shows the number of legislators from each party by the policy area of the standing committee.<sup>10</sup> The figure shows that the largest parties in each political bloc, the Labour Party and the Conservatives, are typically represented by several legislators in all policy areas. Most of the other parties, however, are typically represented by a single legislator in each policy area. Due to their relatively small size and the confidential nature of their proceedings, parliamentary committees foster an environment conducive to legislative compromise (Strøm, 2022).

## 2.5 *Parliamentary speech*

There are strict behavioral rules in the Norwegian Parliament. All speeches must be addressed to the parliamentary president and should strictly concern the matter that is discussed. The tone should be formal and the audience is not allowed to call out or demonstrate other forms of rowdy disapproval or agreement. In contrast to many other parliamentary systems, such as Finland's (Simola, Nieminen and Tukiainen, 2025) and the United Kingdom's (Proksch and Slapin, 2012), the speech length is strictly regulated by parliamentary rules in the Norwegian Parliament.<sup>11</sup>

In Norway's party-centered political environment, parties possess both explicit and implicit authority to distribute floor time. Søyland and Høyland (2021) document that committee assignments and leadership positions within the committee responsible for preparing the issue under discussion, are particularly important for the allocation of speaking time. This indicates that parliamentary debates function as a platform for committee members to update the plenary on committee discussions. Given that MPs

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<sup>10</sup>We choose to describe groupings by policy area rather than committee name, because some committees change names, merge, or split during our sample period (see Table A.2). In most instances, each policy area captures a single committee, but there are a few exceptions. For example, "Foreign Affairs" and "Defence" were two separate committees in the 1993–2009 period.

<sup>11</sup>The first speech of an ordinary debate is restricted to 15 minutes, while the second and third speeches are restricted to 10 and 3 minutes. Minor comments should not exceed 1 minute. Accounts by cabinet ministers should not exceed 1 hour. If the account is followed by a debate, one MP from each party is allowed 5 minutes to comment. MPs may speak only twice per topic unless exceptions are made by the parliamentary president. There are different ways in which MPs can ask questions of cabinet members, as explained by Søyland (2022). In *Interpellations*, ministers have one month to prepare responses to written questions. In *Oral Question Hour*, MPs pose short questions for immediate answers.

primarily engage in debates stemming from their respective committees, it is important to control for committee fixed effects in our analyses that follow below.

### 3. Data

#### 3.1 *Four decades of parliamentary debates*

In this paper, we analyze plenary speeches in the Norwegian Parliament from October 1981 to June 2021 (N=623,863 ). Our data comes from the *Norwegian Parliamentary Debates Dataset*, which includes all speeches since 1945 (Fiva, Nedregård and Øien, 2025).

From March 2004 our data set includes time stamps. Figure A.3 shows the speech length distribution for this sub-sample. Speech length is measured as the time from the start of one speech to the beginning of the next, slightly overstating the actual speech length. The rules of conduct are evident in the empirical distribution of speech length, with distinct spikes just above the one-, three-, five-, and ten-minute marks.

We drop speeches by presidents and vice presidents of the Parliament (164,125 observations), since these contain formalities and parliamentary proceedings that are of little relevance to the question we are studying. Additionally, we remove individuals who have served as cabinet members at any point during a given election period, as their roles differ from those of regular MPs; for instance, they are responsible for providing parliamentary accounts and addressing questions from MPs (see footnote 11), as well as deputy MPs (115,433 observations). Deputy MPs substitute for MPs who are promoted to the cabinet or for some other reason are prevented from serving.

There are two official forms of written Norwegian, *bokmål* and *nynorsk*.<sup>12</sup> The linguistic differences between the two languages might lead the model to predict a separation of speeches that, in reality, are equal in terms of topic and meaning. To address this problem, we exclude all speakers that predominantly use the minority language *nynorsk*,

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<sup>12</sup>*Nynorsk* is used by a minority of the Norwegian population. Approximately 14 percent of Norwegian pupils had *nynorsk* as their main language in primary education in 2019/2020 (*Grunnskolen Informasjonssystem* <https://gsi.udir.no/>), and there are 15 percent *nynorsk* speeches in our data

defined as having a majority of their speeches in this form (38,186 observations), and individual *nynorsk* speeches (714 observations).

Lastly, we exclude party-independent MPs and MPs from minor parties (4,206 observations).<sup>13</sup> This is to restrict our analysis to parties that have a clear bloc affiliation and existed for the entire time period that we are studying. After aggregating to session level, we are left with 4,081 MP-session observations (550 unique MPs).

Before standardizing the features, we eliminate the names of all MPs and cabinet members from parliamentary speeches. We then lemmatize all words to allow several versions of a word to be analyzed as one using the Oslo-Bergen tagger (Johannessen et al., 2012) (about 90% of words in our corpus have a single lemma; for the remainder, we apply the first lemma suggested by the algorithm). Lemmatization is better than stemming at discriminating between words with different meanings, and hence yields a more accurate image of speech.

To reduce the number of features to something manageable, a common first step is to strip out elements of the raw text other than words. In line with this convention, we remove all punctuation, numbers, symbols, and parentheses — including the text within them, which often reflects reactions in the chamber (e.g., laughter, applause) or editorial comments inserted by the stenographer. We also remove party names and party acronyms. Next, we retain words that occur more than ten times in at least one parliamentary session, spoken in at least ten unique speaker-sessions, and spoken at least twenty times across all sessions. We remove a set of stop words (Table A.11) and procedural words (Table A.12) which appear frequently but is not informative about the differences in speech that we aim to measure.<sup>14</sup> Appendix B shows how feature engineering and lemmatization affect an example speech. Because compound words are quite common in Norwegian, e.g., *velferdsstat* meaning “welfare state”, we rely on single

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<sup>13</sup>We exclude 819 MP-session observations in which the MP was not assigned to any policy committee, and eight MP-session observations in which the MP switched parties or became independent during the session.

<sup>14</sup>We also standardize a common linguistic class marker that is not related to substantive policy differences by changing all words that starts with ‘fram’ to starting with ‘frem’.

words or unigrams as input into our analyses. After pre-processing, we are left with a parliamentary vocabulary of 14,795 unique lemmas. Table A.3 shows that, on average, a legislator speaks 45 times, and utters 4,438 words in a session (after pre-processing).

### 3.2 *Characteristics of politicians*

As mentioned above, we consider four background characteristics; gender, urbanicity, age, and class background. Most of this information is readily available from electoral lists and is organized by Fiva and Smith (2017). We manually supplement this data using biographies whenever necessary.

Figure 1 displays how descriptive representation in the Norwegian Parliament has evolved since 1945 for each political bloc. The top-left panel shows that the fraction of female legislators in the left-wing bloc increased dramatically during the 1970s and 1980s. Since about 1990, there is close to gender parity within the left-wing bloc. The fraction of women legislators in the right-wing bloc has increased more modestly during our sample period. In total, women are still underrepresented in Parliament today.

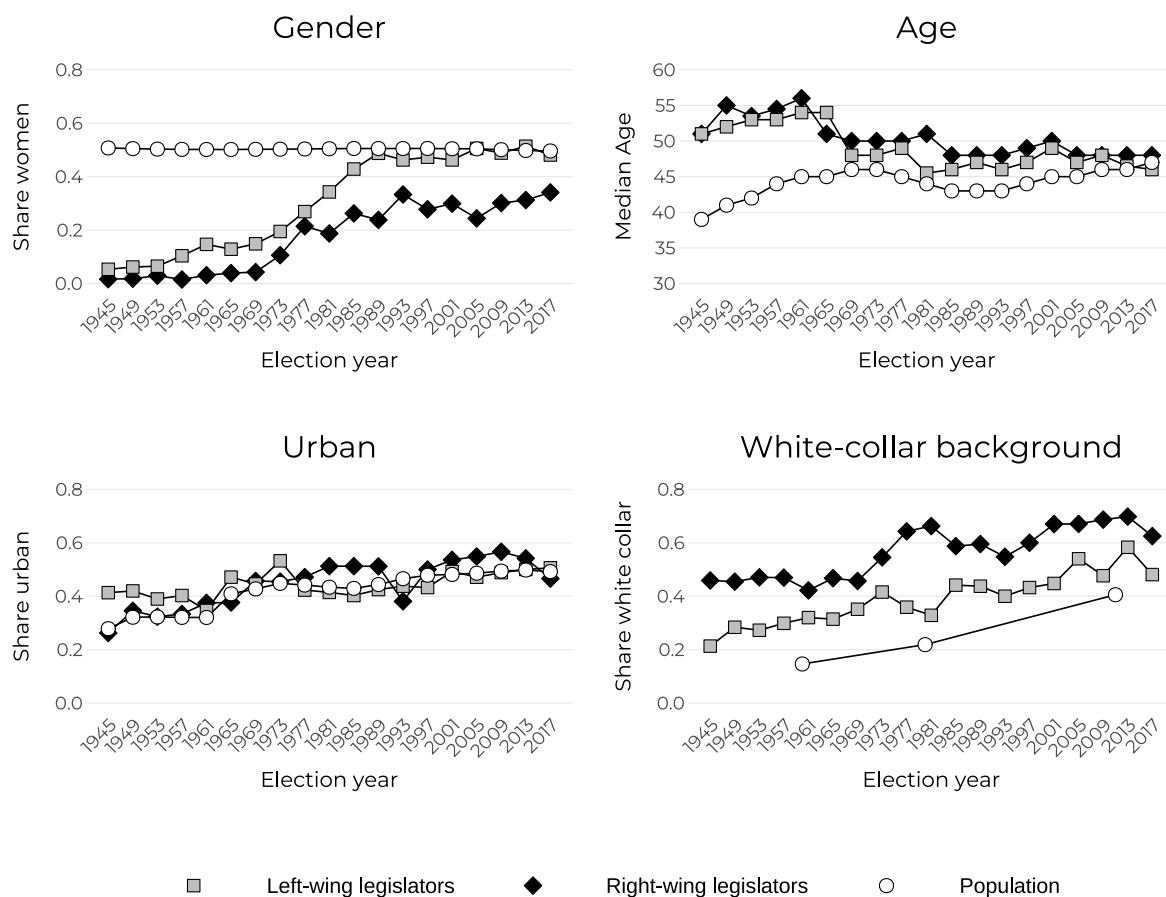
An understudied aspect of political representation is the difference in age of the citizens and legislators (Gulzar, 2021). The top-right panel shows that during the period from 1945 to 1965, the median age of legislators elected in each bloc was approximately ten years higher than the median age of the adult population. However, in the subsequent election years, these age gaps gradually decreased. As of 2017, the median age of left-wing legislators was 46, right-wing legislators had a median age of 48, and the median age of the overall population stood at 47.

To distinguish between politicians from urban and rural areas, we follow Fiva and Smith (2017) and code legislators (citizens) residing in a municipality with historical town status as urban.<sup>15</sup> The bottom-left panel of Figure 1 shows that urban areas are represented in parliament in about proportion to their size in the population for both blocs. This is likely driven both by the electoral law, which distributes seats *across* dis-

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<sup>15</sup>Municipalities are traditionally designated as towns by the government, and identified by the second digit in their municipality identifier number being "0".

Figure 1: Descriptive representation over time



*Note:* The figure shows how background characteristics of left-wing legislators (gray squares), right-wing legislators (black diamonds), and the population (white circles) evolved over the 1945-2017 period. The left-wing parties are SV, A, and SP (2005–2017). The right-wing parties are V, KrF, H, FrP, and SP (1945–2001). The top-left panel plots the fraction of women in the legislature (population) by election year. The top-right panel plots the median age of legislators (median age of citizens, eighteen years and older) by election year. The bottom-left panel plots the fraction of legislators (citizens) residing in municipalities with “town” status (using data from Fiva and Smith (2017)). The bottom-right panel plots the fraction of legislators whose father held a white-collar occupation (ISCO codes 1, 2, 3, 4, 5, and a residual category including self-employed and capitalists) (using biographical information from the Archive of Politicians) by election year. For this panel, we do not have a complete population counterpart readily available. Instead, we rely on numbers from Modalsli (2017), which are based on father-son pairs identified in Norwegian censuses (1960 with fathers observed in 1910; 1980 with fathers observed in 1960; and 2011 with fathers observed in 1980).

tricts partly based on their population size, and parties' strong tendency to geographically balance their ticket *within* the district (Fiva, Halse and Smith, 2021).

To measure class background, we rely on information about fathers' occupation from the *Archive of Politicians* at the Norwegian Centre for Research Data.<sup>16</sup> Using these biographical data, we classify fathers' occupations using ISCO-08 (International Standard Classification of Occupations) codes. In our main analysis, we measure class background using two broad categories: Politicians whose father held a "blue-collar occupation" (ISCO codes 6–9; including farmers) and politicians whose father held a "white-collar occupation" (ISCO codes 1–5; including a residual "other" category).

The bottom-right panel of Figure 1 contrasts the development in legislators' social background with corresponding numbers from Modalsli (2017), based on father-son pairs identified in Norwegian population censuses (1960 with fathers observed in 1910; 1980 with fathers observed in 1960; and 2011 with fathers observed in 1980). There is a positive trend in the share of fathers having a white-collar occupation for both left-wing legislators, right-wing legislators, and the general (prime-age male) population. The substantial level difference between the three curves suggests that even in the comparatively egalitarian case of Norway, elected politicians are a privileged elite.

Table A.4 shows that the background characteristics overlap only to a modest degree. The pairwise correlations vary from  $-0.106$  to  $0.175$ . The most notable distinctions indicate that white-collar legislators tend to be somewhat younger and more urban than their blue-collar counterparts. There are no clear systematic associations between politicians' gender, age, and urbanicity.

In Table A.5 we present descriptive statistics for the speech data by legislator background characteristics. On average, women speak somewhat less than men. We find similar average differences for the other background characteristics: the young speak

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<sup>16</sup>We use father's occupation – the traditional proxy for social background (Buis, 2013; Marks, 2008) – because the vast majority (85 percent) of MPs elected in our sample period is born between 1915 and 1970, a period in which fathers were the primary earners and mothers' primary role was to manage the household. Another alternative measure of class background could be based on politicians' own pre-office occupation. However, because most MPs come from white-collar jobs, we quickly run into problems with statistical precision when analyzing these data based on the methods presented below.

slightly more than the old; urban legislators speak slightly more than rural legislators; and legislators with white-collar backgrounds speak slightly more than legislators with blue-collar backgrounds.

## 4. Methods

As mentioned above, we build on the work of Gentzkow, Shapiro and Taddy (2019) to quantify differences in speech patterns by legislators with different background characteristics. In this section, we explain how we proceed.

### 4.1 *Measurement and estimation of political divergence*

Gentzkow, Shapiro and Taddy (2019) specify a multinomial model of speech where choice probabilities,  $\mathbf{q}_t^{C(i)}(\mathbf{x}_{it})$ , defined over the  $J$  available words for speaker  $i$  in session  $t$ , vary by party.<sup>17</sup> In our case,  $C^k(i)$  denotes the group affiliation of characteristic  $k$  for individual  $i$  where  $k \in \{\text{Bloc, Gender, Age, Urban, Background}\}$ , and we let  $A_t^k = \{i : C^k(i) = A, m_{it} > 0\}$  and  $B_t^k = \{i : C^k(i) = B, m_{it} > 0\}$  denote the set of active speakers in indicator and reference category, respectively, where  $m_{it}$  is total number of words spoken by individual  $i$  in session  $t$ . Our set of indicator categories for our five characteristics is  $A \in \{\text{Right-wing, Female, Old, Urban, White-collar}\}$  and our set of reference categories is  $B \in \{\text{Left-wing, Male, Young, Rural, Blue-collar}\}$ . To estimate the choice probabilities for each background characteristic, we run separate multinomial logistic regressions. The model is represented by the following equations:

$$q_{jt}^{C^k(i)}(\mathbf{x}_{it}) = \frac{e^{u_{ijt}^k}}{\sum_l e^{u_{ilt}^k}}, u_{ijt}^k = \alpha_{jt}^k + \mathbf{x}_{it}' \boldsymbol{\gamma}_{jt}^k + \phi_{jt}^k \mathbf{1}_{i \in A_t^k}. \quad (1)$$

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<sup>17</sup>Speech by legislator  $i$  in session  $t$  is a  $J$ -dimensional vector of word counts,  $\mathbf{c}_{it}$ . The  $j$ -th element in  $\mathbf{c}_{it}$ ,  $c_{ijt}$ , is the number of times legislator  $i$  used word  $j$  in session  $t$ . This model assumes that speeches are generated as independent draws from a multinomial distribution. Specifically, the speech  $\mathbf{c}_{it}$  is based on a vector of choice probabilities  $\mathbf{q}_t^{C(i)} = \{q_{t1}, \dots, q_{tJ}\}^{C(i)}$ , where  $q_{tj}^{C(i)}$  is the probability of choosing word  $j$  in session  $t$  by legislator  $i$ . Given the total number of words  $m_{it} = \sum_j c_{ijt}$  spoken by  $i$  in session  $t$ , the model can be summarized as follows:  $\mathbf{c}_{it} \sim \text{Multinomial}(m_{it}, \mathbf{q}_t^{C(i)})$ . In this formulation, legislator  $i$  selects a total of  $m_{it}$  words according to the probabilities specified by  $\mathbf{q}_t^{C(i)}$ .

Here  $\alpha_{jt}^k$  is word  $j$ 's baseline popularity for characteristic  $k$  at time  $t$ ,  $\gamma_{jt}^k$  is a  $K$ -vector capturing the effects of  $\mathbf{x}_{it}$  on the propensity to use word  $j$  for characteristic  $k$  in session  $t$ , and our coefficient of interest  $\phi_{jt}^k$  measures the effect of characteristic  $k$  affiliation on the propensity to use word  $j$  in session  $t$ . Because we are interested in measuring whether legislative speech is distinguishable according to legislators' background characteristics within political party over time, we include party and session fixed effects in  $\mathbf{x}_{it}$ . In addition, we include committee fixed effects to rule out that potential differences are driven by allocation of committee membership.<sup>18</sup> To quantify the divergence between  $q_t^{A^k}$  and  $q_t^{B^k}$ , we use the expected posterior at  $\mathbf{x}$  that a neutral observer identifies group  $k$  affiliation after hearing one word:

$$\boldsymbol{\pi}_t(\mathbf{x}) = \frac{1}{2}\mathbf{q}_t^{A^k}(\mathbf{x}) \cdot \boldsymbol{\rho}_t(\mathbf{x}) + \frac{1}{2}\mathbf{q}_t^{B^k}(\mathbf{x}) \cdot (\mathbf{1} - \boldsymbol{\rho}_t(\mathbf{x})), \quad (2)$$

where  $\rho_{jt}(x) = \frac{q_{jt}^{A^k}(x)}{q_{jt}^{A^k}(x) + q_{jt}^{B^k}(x)}$  is the posterior probability a neutral observer assigns to an individual being part of  $A^k$  after hearing word  $j$ . This measure reflects the expected posterior probability that an observer with a neutral prior correctly identifies the speaker's group  $k$  affiliation after hearing a single word. For a neutral observer, with probability  $\frac{1}{2}q_{jt}^{A^k}$ , the posterior probability of being correct is  $\rho_{jt}(x)$ , and with probability  $\frac{1}{2}q_{jt}^{B^k}$ , the posterior probability of being correct is  $1 - \rho_{jt}(x)$ . The expected posterior of being correct for word  $j$  is  $\frac{1}{2}q_{jt}^{A^k}\rho_{jt}(x) + \frac{1}{2}q_{jt}^{B^k}(1 - \rho_{jt}(x))$ . By summing over all  $j$  words, we obtain the expected posterior of being correct for an "average" word at  $\mathbf{x}$ , as shown in Equation (2). The average political divergence,  $\bar{\pi}_t$ , which is the measure we report in the results section, is the average of Equation (2) across the values of  $\mathbf{x}$ .

The value of  $\bar{\pi}_t$ , which ranges from 0.5 to 1, represents the probability of correctly identifying the speaker based on an average word. In the absence of any information, the probability of a correct guess is 0.5. A  $\bar{\pi}_t$  value exceeding 0.5 indicates that the average word contains information to distinguish whether the speaker belongs to group

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<sup>18</sup>For each individual in each session, we identify the policy committee(s) to which they belong. If committee assignments change during a session, we assign the committee(s) where the individual delivered the most speeches in that session. A small percentage (0.6 %) of observations belong to multiple committees simultaneously and therefore have two committee dummies.

A or group B. This suggests that differences in the legislators’ backgrounds significantly influence their speech patterns, thereby shaping the policymaking process.

To identify which words are important in distinguishing speech by group  $A^k$  and  $B^k$ , we follow Gentzkow, Shapiro and Taddy (2019) and measure the change in the expected posterior at  $\mathbf{x}_{it}$  that a speaker belongs to group  $A^k$  after removing word  $j$  from the vocabulary:

$$\zeta_{jt}(\mathbf{x}_{it}) = \frac{1}{2} - \frac{1}{2} \sum_{s \neq j}^J \left( \frac{q_s^{A^k}(\mathbf{x}_{it})}{1 - q_j^{A^k}(\mathbf{x}_{it})} \rho_s + \frac{q_s^{B^k}(\mathbf{x}_{it})}{1 - q_j^{B^k}(\mathbf{x}_{it})} \rho_s \right). \quad (3)$$

The divergence of word  $j$  is the average of  $\zeta_{jt}(\mathbf{x}_{it})$  across all active speakers  $i$ . This measures the change in the expected posterior of the speaker belonging to  $A^k$ , because for a neutral observer, the posterior that the speaker belongs to  $A^k$  is equal to  $\frac{1}{2}$ , and the corrected posterior after removing word  $j$  is given by the right-most term in Equation (3).<sup>19</sup> This measure of divergence has both direction and magnitude. Intuitively, if the removal of the word  $j$  from the vocabulary results in the corrected expected posterior falling below  $\frac{1}{2}$ , we have removed a word predicting that the speaker belongs to  $A^k$ . The more positive the difference between  $\frac{1}{2}$  and the corrected posterior, the more divergent the word is in favor of  $A^k$ . If we remove a word and the corrected posterior is above  $\frac{1}{2}$ , we have removed a word predicting the speaker belongs to  $B^k$ , and the more negative the difference in Equation (3), the more divergent the word is in favor of  $B^k$ . More divergent words pull  $\bar{\pi}_t$  above 0.5 and towards 1, indicating a stronger predictive power of words for identifying the speaker’s group affiliation.

## 4.2 Estimation

The model is estimated using distributed multinomial regression (*dmr*), developed by Taddy (2015). This method approximates the logit likelihood in Equation (1) with  $J$ -

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<sup>19</sup>Define  $\rho_j^{A^k}$  as the posterior probability that a speaker belongs to  $A^k$ . The expected posterior over words for a neutral observer, ignoring  $\mathbf{x}_{it}$  for simplicity, is  $1/2 \sum_{j=1}^J [q_j^{A^k} + q_j^{B^k}] \rho_j = 1/2 \sum_{j=1}^J [q_j^{A^k} + q_j^{B^k}] \frac{q_j^{A^k}}{q_j^{A^k} + q_j^{B^k}} = 1/2 \sum_{j=1}^J q_j^{A^k} = 1/2$

independent Poisson likelihoods. In high-dimensional speech data, traditional estimation methods are computationally infeasible. *dmr* assumes that word counts are independently Poisson distributed with mean  $e^{\log(m_{it})+u_{ijt}}$ , where  $m_{it}$  is the speech length of speaker  $i$  in session  $t$ . This transforms the negative log-likelihood for each word  $j$  into:

$$l(\alpha_{jt}, \gamma_{jt}, \phi_{jt}) = \sum_t \sum_i \left[ m_{it} \exp(\alpha_{jt} + x'_{it} \gamma_{jt} + \phi_{jt} \cdot 1_{i \in A_t^k}) - c_{ijt} (\alpha_{jt} + x'_{it} \gamma_{jt} + \phi_{jt} \cdot 1_{i \in A_t^k}) \right] \quad (4)$$

The estimation is done by fitting  $J$ -independent Poisson regressions, providing a computational advantage as the regressions can be done entirely in parallel.

To address small sample bias, a Lasso penalty is included on the coefficient of interest. The estimation is performed by solving the following minimization problem:

$$\hat{\alpha}_{jt}, \hat{\gamma}_{jt}, \hat{\phi}_{jt} = \arg \min_{\alpha_{jt}, \gamma_{jt}, \phi_{jt}} \left[ l(\alpha_{jt}, \gamma_{jt}, \phi_{jt}) + N \sum_t [\psi(|\alpha_{jt}| + \|\gamma_{jt}\|_1) + \lambda_j |\phi_{jt}|] \right] \quad (5)$$

The Lasso penalty,  $\lambda_j |\phi_{jt}|$ , shrinks coefficients, producing a sparse solution and reducing small sample bias. The optimal  $\lambda_j$  is determined by minimizing a corrected version of Akaike's information criterion, starting with a high  $\lambda_j$  and gradually decreasing it. A constant penalty  $\psi = 10^{-5}$  is applied to other coefficients to ensure convergence.

### 4.3 *Magnitudes*

The average divergence  $\bar{\pi}_t$  represents the posterior that a neutral observer assigns to a speaker's true identity after hearing *a single word*. However, political speeches usually last for several minutes. How does the probability of correctly guessing a speaker's characteristic change with the number of words? We quantify the informativeness of speech by speech length and session using Monte Carlo simulations. For each speaker  $i$  and session  $t$ , we draw words according to the estimated choice probabilities in Equation (2) and compute the average divergence.

#### 4.4 *Validation*

As previously mentioned, the number of words a legislator could choose is large relative to the total amount of speech we observe. As a consequence, many words are said mostly by one type of legislator purely by chance. The estimator we use controls for this bias by applying a lasso penalty (see equation (5)) but is still biased in finite samples.

To quantify this bias, we rely on a permutation test by randomly reassigning  $C^k(i) \in \{A^k, B^k\}$  and re-estimating the model 100 times. In these series,  $q_t^{A^k} = q_t^{B^k}$  by construction, so the true value of  $\pi_t(\mathbf{x})$  is 0.5. The deviation from 0.5 provides a valid measure of finite-sample bias under the permutation.

## 5. Results

### 5.1 *Across-bloc divergence*

The left-hand panel of Figure 2 illustrates the average divergence (defined by Equation (2)) across party blocs for each year in our sample period. The gray shaded area represents the average divergence in hypothetical data in which each speaker’s party bloc is randomly assigned with the probability that the speaker is right-wing (left-wing). The upper and lower bounds on the light gray shaded area correspond to the 5th and the 95th percentiles of the placebo distributions. The dark gray shaded area represents the corresponding 10th and 90th percentiles. For each year in our sample period, the observed divergence consistently falls outside the placebo distribution, providing strong statistical evidence of political polarization in legislative speech.

In the first two decades of our sample period, the estimated  $\bar{\pi}$  falls in the range 0.503–0.505. The initial twenty years reflect a time when Norway, like numerous Western nations, experienced a political shift towards the right. Interestingly, the left-to-right divergence in parliamentary speech does not seem to increase in this period. This may be explained by the strategic response of the Labor Party to the right-wing wave. The Labor

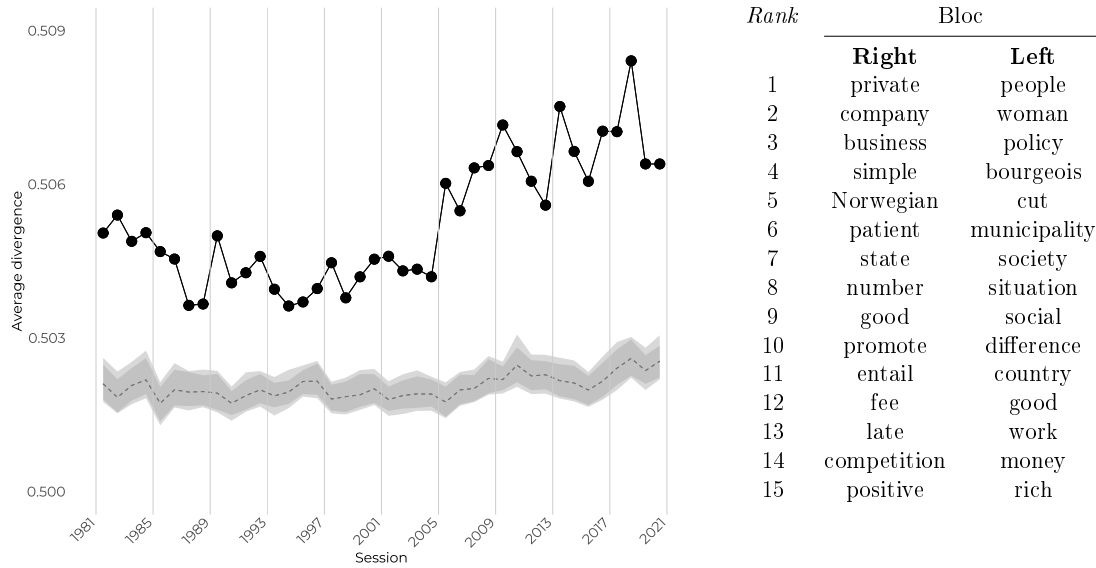
Party, by far the most influential party in post-war Norway, pivoted its politics towards a more market-friendly direction, emphasizing individual rights and freedoms (Njølstad, 2023; Sejersted, 2023). For instance, it was a minority labor government (Brundtland III), with support from the right, that signed the agreement to make Norway part of the European Economic Area (EEA) in 1992, resulting in a significant liberalization of the Norwegian economy (Sejersted, 2023). The EEA agreement and the subsequent 1994 referendum on EU membership, were the defining issues of the 1990s (Notaker, 2023). However, as illustrated in Figure 2, these issues did not change the left-to-right divergence in Norwegian politics, likely because the Conservative and Labor Party, the two dominant forces on either side of the political spectrum, held similar positions on these matters.

In the second half of our sample period, a rising trend in across-bloc divergence emerges, seemingly starting after the 2005 election.<sup>20</sup> This aligns well with the literature documenting the growing importance of issue competition in Western Europe, i.e. competition on which issues should dominate the political agenda (e.g., Green-Pedersen, 2007, 2019). This is also reflected in the 15 most divergent words for each bloc across the full sample period, which we show in the right-hand panel of Figure 2 (Appendix A.6 gives the top-fifty). The top words suggest that parties do not compete solely by offering different policy positions (as in, e.g., Downs (1957)), but also by highlighting distinct issues – preferably issues they ‘own’; these are issues for which a majority of the electorate traditionally perceives them as competent and capable in addressing (Abou-Chadi, 2016; Petrocik, 1996). Right-leaning legislators appear concerned about the performance of the private sector, taxes, and national identity. Our model identifies “private”, “company”, “competition”, “fee” and “Norwegian” as key right-leaning words. Left-leaning legislators

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<sup>20</sup>In the 2005 election, a center-left coalition (Stoltenberg II) dominated by the Labor Party won the parliamentary majority. In the election campaign, and as the leading party of the center-left coalition, the Labor Party reverted to more traditional, at least rhetorically, left-wing issues. This reversion is probably a response to the spectacular loss of Stoltenberg’s first government, which can be considered to be the peak of right-leaning Labor governments in Norway. Stoltenberg I implemented a series of significant reforms, including privatization, tax and pension system overhaul, and the introduction of performance measures and corporatization in public management. However, these reforms were unpopular with voters, resulting in the Labor Party’s parliamentary share plummeting from 39% to 26% in the 2001 election, its worst performance since the interwar period.

Figure 2: Across-bloc divergence over time



*Note:* In the left-hand panel the black points correspond to the average bloc divergence of speech for each session in the period 1981–2020 after controlling for legislators’ committee assignment. The gray vertical lines indicate elections. The gray shaded area represents the average divergence in hypothetical data in which each speaker’s party bloc is randomly assigned with a probability that the speaker is right-wing. We construct 100 hypothetical data sets and compute the average divergence in each session. The upper and lower bounds of the light gray shaded area correspond to the 5th and the 95th highest scores across the placebo distributions. The dark gray shaded area represents the corresponding 10th and 90th highest scores. The dashed line corresponds to the mean divergence for each session across the distribution of placebo estimates. In the right-hand panel, we provide a list of the 15 words with the highest relative utility for each bloc.

emphasize redistribution and employment, and tend to use terms like “people”, “society”, “work”, and “rich”.

When interpreting Figure 2, the reader should keep in mind that  $\bar{\pi}$  is the posterior that a neutral observer expects to assign to a speaker’s true party bloc after hearing a *single word* from the vocabulary (defined in section 3.1). As a rough comparison, Gentzkow, Shapiro and Taddy (2019) report a  $\bar{\pi}$  of about 0.502 – 0.504 for the 1870–1990 period in the United States Congress, which later increases to about 0.510. Simola, Nieminen and Tukiainen (2025) find lower levels of divergence in the Finnish Parliament. For the period after 2000, they find a  $\bar{\pi}$  of about 0.502 – 0.504.<sup>21</sup> In section 5.3, we consider the informativeness of legislative speech by speech length.

<sup>21</sup>There are several reasons why our estimates are not directly comparable to the ones reported by Gentzkow, Shapiro and Taddy (2019) and Simola, Nieminen and Tukiainen (2025). For example, both of these studies rely on bigrams rather than unigrams.

## 5.2 *Within-party divergence*

Figure 3 illustrates within-party political divergence in parliament over time across four background dimensions: gender, age, urbanicity, and class background. To aid in the interpretation and validation of our findings, Table 3 lists the top 15 most divergent words for each background dimension, and a more comprehensive listing of the top 50 most divergent words for each dimension can be found in Tables A.7 to A.10.

The estimated within-party divergences across all dimensions are somewhat below the across-bloc divergence established in Figure 2. However, we can typically rule out that observed differences in speech are driven by random variations since observed differences (black points) fall outside the placebo distribution (gray shaded area). Figure A.4 contrast the distribution of actual estimates (black points in Figure 3) to the distribution of mean placebo estimates (black dashed line in Figure 3) for each background characteristics. There is minimal overlap between the distributions for gender and age, while some overlap is noticeable for the two other background characteristics.

### **Gender**

According to the literature review by O’Brien and Piscopo (2019, p.54), scholars typically categorize women’s interest as those (i) issues that directly affect women *as women* (e.g., reproductive health), (ii) issues connected to women’s traditional role as caregivers (e.g., children), and (iii) issues tied to the social sphere more broadly (e.g., health care and education). Consistent with this categorization, data from the *Norwegian National Election Survey* (1981–2017) reveal that female voters focus more on child care, education, and welfare policies (see Appendix C). Table 3 indicates that these policy issues are mirrored by female legislators in parliament. For example, the word that most clearly separates women from men legislators (belonging to the same policy committee and party) is “children”, followed by “woman” and “work” (see also Table A.7). These gender differences aligns with the findings of Lippmann (2022), who study lawmaking in the French parlia-

ment, and Baskaran and Hessami (2025) which examines council meeting discussions in Bavaria.

## **Age**

The existing empirical evidence on the effect of legislators’ age is relatively scarce. Poole (2007) found that US Congress members’ voting records demonstrate a high degree of continuity across a politician’s lifetime suggesting that age is not important. However, two recent papers that use regression discontinuity designs and data from Germany and Japan, respectively, come to the opposite conclusion (politicians’ age matter for policy) (Baskaran, Hessami and Schirner, 2024; McClean, 2023). The upward trend in the top-right panel of Figure 3 suggest that the age dimension have become increasingly important over time in the Norwegian parliament. Table 3 reveal that young legislators talk more about childcare (e.g., “kindergarten”) and schooling (e.g., “school”), while their older counterparts appear to prioritize health-related topics (e.g., “treatment”, “patient”) (see Appendix Table A.8). We see no evidence, based on the top-fifty lists, that older legislators talk more about pensions, as one might have expected from survey evidence (Appendix C).

## **Urban-Rural**

During the initial half of our sample period, we find no clear evidence that the rural-urban status of a legislator affects parliamentary speech. In the bottom-left panel of Figure 3 the divergence estimates frequently position in the upper range, but they do not consistently exceed the placebo distribution. However, in the latter half our sample period, the divergence estimates are trending upwards.<sup>22</sup> At the end of the sample period, our estimated divergence is comparable to the one we find for other background characteristics. The increasing urban-rural divide could be a second-order manifestation of deeper demographic and cultural divides, as observed in other European countries (Gallego et al.,

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<sup>22</sup>Huijsmans and Rodden (2025) similarly find that urban-rural electoral divides in Norway have increased in the same period and document analogous patterns in other European countries.

2016; Maxwell, 2019; Rodríguez-Pose, 2018).

Knutsen (2004) argues that rural populations tend to support parties addressing agrarian concerns, decentralization, economic support for smaller municipalities, and welfare policies targeting rural communities. The interests that separate rural from urban interests are mirrored in parliamentary speeches. Across our full sample period, we observe that rural legislators frequently discuss regional policy (e.g., “municipality”, “district”), farming (e.g., “agriculture”), and sparsely populated areas (e.g., “Finnmark” and “Hedmark”). In short, rural legislators appear to talk about topics that resonate with the concerns of rural voters (see Appendix C). In contrast, urban legislators often address issues encountered in cities (e.g., “city”, “police”, and “prison”), as shown in Table 3.

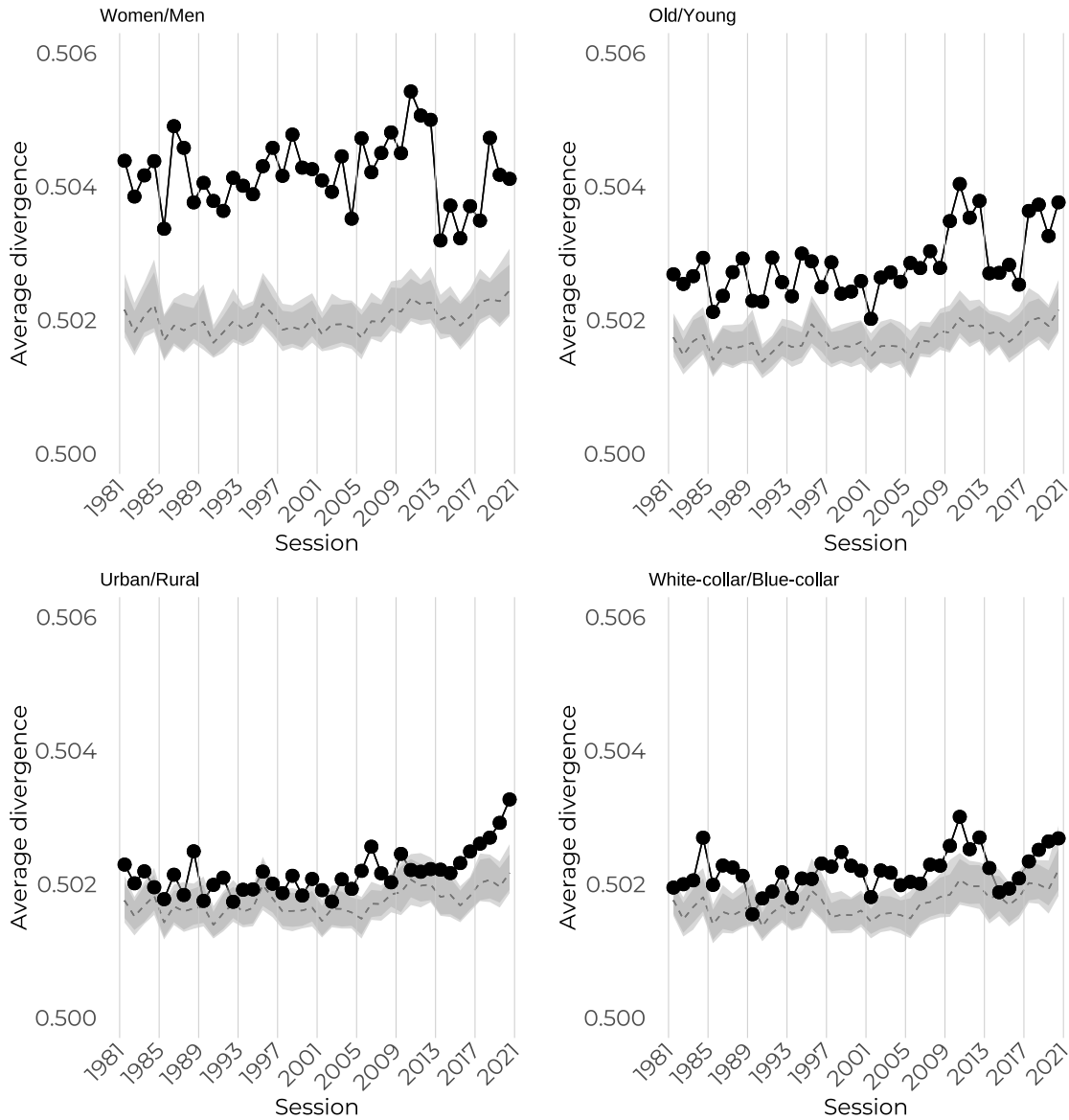
## **Class**

We find that politicians whose fathers have a white-collar occupation tend to talk more about children and education (e.g., “children”, “kindergarten” and “school”), while politicians with blue-collar backgrounds tend to talk more about farming (e.g., “agriculture” and “farmer”) and defense-related topics (e.g., “defense”) . These findings complement related studies from the United States and Latin America, which typically finds that working-class politicians tend to propose and cosponsor bills that are more leftist on labor, economic, and redistributive issues (Carnes and Lupu, 2023). In the context of party-centered political systems, the impact of legislators’ occupational and social backgrounds remains less explored. However, a notable study by O’Grady (2019) using speech data from the United Kingdom, reveals that the Labour Party’s shift towards career politicians from working-class MPs significantly diluted the advocacy for working-class voters’ interests.

### **5.3 *Magnitudes***

In Figure 4, we plot the average expected posterior across two time periods, by the length of speech, for each dimension we consider. In the first half of our sample period (1982-

Figure 3: Within-party divergence over time



*Note: This figure displays divergence in legislative speech for four dimensions (given in the sub-panel headings) in the period 1982-2021, controlling for party and the legislator's committee assignment. The models are estimated separately for each background characteristic. The black points correspond to the average divergence of speech in each session and the black vertical lines indicate elections. The gray shaded area represents the average divergence in hypothetical data in which each speaker's identity is randomly assigned. We construct 100 hypothetical data sets and compute the average divergence in each session. The dashed line corresponds to the mean divergence for each session across the distribution of placebo estimates. The upper and lower bounds of the light gray shaded area correspond to the 5th and the 95th highest scores across the placebo distributions. The dark gray shaded area represents the corresponding 10th and 90th highest scores.*

Table 1: Most divergent words for each background dimension

<i>Rank</i>	Gender		Age	
	<b>Women</b>	<b>Men</b>	<b>Old</b>	<b>Young</b>
1	children	Norwegian	cooperation	day
2	woman	relationship	mention	policy
3	work	political	Nordic	select
4	parent	lie	Norwegian kroner	Norway
5	measures	that is	million	people
6	young	fall	emphasize	trade
7	school	expression	very	relationship
8	increase	situation	good	chamber
9	family	policy	number	ensure
10	education	post	municipality	tie
11	municipality	director	director	job
12	child welfare	context	state	Norwegian
13	kindergarten	of course	business	children
14	competence	interesting	patient	kindergarten
15	offer	belief	develop	political

<i>Rank</i>	Urbanicity		Father's occupation	
	<b>Urban</b>	<b>Rural</b>	<b>White</b>	<b>Blue</b>
1	Norwegian	good	children	defense
2	that is	municipality	Norway	patient
3	problem	agriculture	policy	good
4	city	relationship	that is	area
5	international	defense	police	agriculture
6	country	district	woman	vision
7	Norway	Finmark	state	director
8	separate	Akershus	school	district
9	Bergen	Norwegian kroner	kindergarten	Minister of Health
10	ensure	county	municipality	Hedmark
11	police	Hedmark	working	light
12	tie	million	human	attempt
13	political	children	tie	if
14	turn	area	billion	wolf
15	Minister of Health	Nordland	political	farming

*Note: This table displays the 15 most divergent words of legislative speech for four dimensions: gender, age, urbanicity, and class. Each model is estimated separately and controls for the speaker's party and committee assignment.*

2001), we find that the probability that a neutral observer correctly guesses the speaker’s bloc affiliation is about 63 (78) percent after hearing one minute (three minutes) of speech.<sup>23</sup> In line with Figure 2, we observe that it becomes easier to predict a legislator’s bloc affiliation over time. In the second half of our sample period (2002–2021), we estimate that the probability that a neutral observer correctly guesses the speaker’s bloc affiliation is about 68 (84) percent after hearing one minute (three minutes) of speech. When interpreting these numbers one should keep in mind that parliamentary speeches might reflect more cohesion within a party than actually exists because party leaders make it difficult for rebels to express their views on the floor (Proksch and Slapin, 2015).

We estimate that the probability of correctly guessing the speaker’s gender, age, urbanicity status, or occupational background category is close to, but slightly below, the estimated across-bloc divergence during the first half of our sample period. A one-minute speech gives a neutral observer approximately 57 – 64 percent chance of correctly identifying the relevant background characteristic.

#### 5.4 *Sensitivity checks*

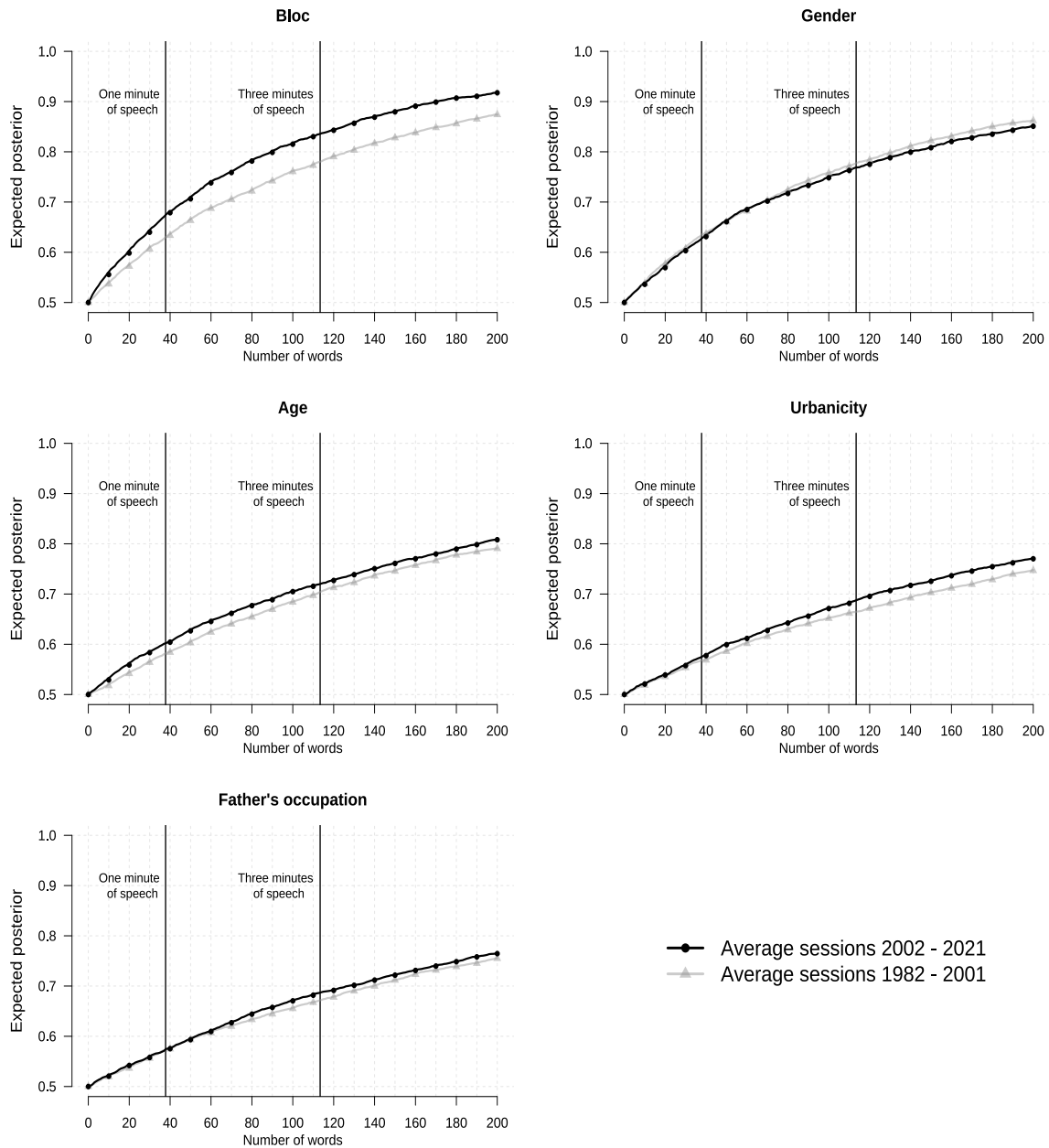
Our baseline analyses suggest that legislator background characteristics matter for legislative speech. Next, we explore the sensitivity of this result to various modelling choices.

First, we repeat our baseline analyses without controlling for party affiliation. In other words, we compare legislators with different background characteristics (from the same committee) both across and within parties. Even though candidate background characteristics vary across political blocs (Figure 1), we find that the estimated background divergence change only slightly when party fixed effects are omitted (Figure A.5). When compared with our baseline results, we find that it is somewhat easier to guess the group identity of speakers, especially towards the end of our sample period, when party fixed effects are excluded. In the case of gender, our estimates are almost unal-

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<sup>23</sup>After pre-processing our data, the median number of words per minute of speech is 37.79 . To calculate the median number of words per minute of speech, we use data from March 2004 onwards, which, as previously mentioned, includes a time stamp for each speech. Before pre-processing, one minute of speech is 150 words (see section 3.1 and Appendix B).

Figure 4: Political divergence by speech length



Note: The figure shows average divergence as a function of the number of words after data pre-processing (see section 3.1 for details). The expected posterior is calculated by drawing 200 words for each speaker  $i$  and session  $t$ , given characteristics  $x_{it}$  using the estimated choice probabilities. The expected posterior as a function of the number of words is calculated as follows: Within each session, we calculate the average probability that a neutral observer assigns to the speaker's true identity after hearing the first word. Then we use this probability as the prior, when we calculate the posterior probability after hearing an additional word. This is continued until 200 words are spoken. The average lines in the figure are found by taking the average over the session-specific, expected posterior. The vertical line marks the median number of words per minute of speech. This number is calculated by dividing the number of words by the number of minutes for each speaker-session observation and taking the median of this ratio across observations. The median one-minute speech is calculated using data from the 2004 session, which contains the starting time of each speech.

tered throughout our sample period (i.e. it is about equally easy to distinguish between men and women belonging to the same party as it is to distinguish between men and women belonging to different parties). This suggest that political parties do not strongly orchestrate parliamentary speech.

Next, we explore the role of standing committees in the parliament. Individual committees are unlikely to be mirror images of the parliament both because of demand and supply forces. On the demand side, parties might keep an eye on the background characteristics of legislators when arranging the composition of committees. On the supply side, politicians with different backgrounds may be interested in different policy areas and may therefore self-select into different committees.

We find a substantial imbalance in the composition of committees regarding gender (Figure A.6), but less so for the other background characteristics (Figure A.7 – A.9).<sup>24</sup> For example, women have been consistently underrepresented in the *Committee of Finance* and overrepresented in the *Committee of Family and Culture* throughout our sample period. This imbalance was particularly pronounced during the 2005–2009 election period, when women made up only 14% of the *Committee of Finance* but 75% of the *Committee of Family and Culture*.

Our analyses control for committee assignment via fixed effects. In other words, we are comparing differences in speech patterns across women and men, who belong to the same committee and party. If we drop the committee fixed effects, we reach qualitatively the same conclusions as in our baseline analysis. As one might expect, the differences in the estimates for gender divergence occur when committee assignment is least balanced across genders. The most salient difference is, however, that the placebo distributions widen without committee fixed effects (Figure A.11).

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<sup>24</sup>Figures A.6–A.9 illustrate the evolution of group representation in policy areas across parliamentary sessions. Figure A.10 presents group representation in policy areas relative to their share in Parliament over the entire sample period. Appendix Table A.2 provides a mapping of committees to policy areas.

## 6. Conclusion

Political parties can be conceptualized as a team of candidates “tethered by a rubber band to the ideology espoused by the parties whose label they run on” (Grofman, 2008). In the context of the closed-list system we examine, the rubber band is not expected to be very elastic. Indeed, roll-call vote data from Norway suggest that political elites limit within-party divergence to a minimum. Nevertheless, we argue that it would be premature to conclude that party leaders have complete control over their rank-and-file legislators. Four decades of legislative speech data indicate that legislators tend to advocate for the policy preferences of voters who share their background characteristics, in line with the commitment issues highlighted in the citizen-candidate framework (Alesina, 1988; Besley and Coate, 1997; Osborne and Slivinski, 1996).

In contrast to much of the existing literature on substantive representation, which tends to focus on a single characteristic, we take a comprehensive approach by currently considering four key background traits. For all background characteristics, including those that are mostly unobservable to voters (such as class background), we consistently find that estimates of within-party divergence fall (i) below our benchmark estimates of across-bloc divergence but (ii) above placebo estimates. In addition, we find that the inclusion of party fixed effects does not substantially change how easy it is to separate background pairs. Together, these findings suggest that the results are not driven by party elites strategically assigning speeches to speakers based on their descriptive characteristics. Instead, our results show that even in party-centered environments legislators’ group identities matter for what they bring to the table.

## Acknowledgments

The paper was previously circulated under the title “Polarization in Parliamentary Speech.” We thank Elliott Ash, Jack Blumenau, Ali Cirone, Gary Cox, Jens Olav Dahlgaard, Elias Dinas, Ben Geys, Orit Kedar, Yvonne Markaki, Maria Olsson, Carlo Prato, Carlos Sanz, Jesse Shapiro, Dan Smith, Martin Søyland, Janne Tukiainen, Galina Zudenkova, and the referees for their valuable comments and suggestions. We are also grateful to Tuva Værøy for assistance with data collection.

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