

# When They Go High, We Go Low: Rhetorical Rewards of Governing

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Political power is transmitted not only by what politicians say but also by how they say it. Although government generally faces larger electoral and rhetorical costs compared to the opposition, politicians in governing roles can reap rhetorical rewards. By adjusting their vocal pitch, they can shape perceptions of valued traits like competence, dominance, and composure. I therefore expect politicians in governing roles to speak with a lower pitch than politicians in non-governing roles. Using a multimodal dataset containing text-audio data from more than twenty years of parliamentary speeches in Denmark, I show compelling evidence consistent with this claim. When politicians enter government, they lower their vocal pitch by more than half a standard deviation but revert to their pre-government level when they leave office. This finding holds when functional and accountability constraints are taken into account. The results offer a possible lens to understanding the co-existence of empirical laws of the cost of governing and the incumbency advantage and strengthen our understanding of the general advantages and disadvantages governments face vis-à-vis oppositions.

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# 1 Introduction

It is well known that government faces both an electoral cost and a rhetorical cost of governing.<sup>1</sup> Governments typically employ more complex and positive language, and oppositions tend to use simpler and more negative language. This rhetorical division is one of the most robust findings on the use of political language and is replicated in different contexts and time periods (Pipal et al. 2024). This dynamic gives the government a rhetorical disadvantage relative to the opposition, as voters generally prefer simplistic messages (e.g., Bischof and Senninger 2018), exhibit negativity bias (e.g., Ashton and Kal Munis 2021), and are more exposed to negative news about government power (e.g., Thesen et al. 2024).

However, this paper argues that there are also rhetorical rewards to governing. Beyond rhetorical tone and complexity, politicians adopt a rhetorical style that reflects their political roles. Compared to tone and complexity, this style can give the government an advantage over the opposition, as it allows government members to signal competence, dominance, and composure, which are highly valued traits in political leaders. By effectively presenting themselves through this rhetorical style, politicians can reap the rewards of governing by signaling traits expected from those in power and thereby offset and counter their rhetorical disadvantages.

How do politicians adapt their rhetorical style to signal valued and expected traits when they assume a governing role? The approach I focus on is vocal style-shifting. To inform this, I use work from political psychology showing that voters' perceptions, and ultimately their vote choice, are affected by voice characteristics, particularly candidates' average vocal pitch (Banai et al. 2017; Gregory Jr and Gallagher 2002; Klofstad et al. 2012; Klofstad 2016; Klofstad et al. 2016; Klofstad and Anderson 2018; Tigue et al. 2012). This literature shows that voters prefer candidates with lower-pitched voices, likely because a lower pitch signals traits that voters value in political leaders, such as competence. This indicates that vocal style-shifting is an efficient way for politicians

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<sup>1</sup>The term 'rhetorical cost of governing' is taken from the paper 'Losing Touch: The Rhetorical Cost of Governing' authored by Hjorth (2024). Link: <https://osf.io/r53gj>.

to shape perceptions and align with their role expectations. Drawing on role congruity theory, I posit that traits are both valued and expected in political leaders. This expectation provides politicians with a set of role constraints that shape their choice of vocal style. Based on this theoretical framework, I propose that as a low pitch conveys signals of competence, dominance, and composure, and because voters expect these traits from political leaders, *politicians speak with a lower pitch when they assume governing roles than when they are in non-governing roles.*

I assess this claim using a novel corpus of multimodal speech data from parliamentary debates in the Danish parliament, Folketinget, spanning more than two decades (2000-2022). The empirical case of Denmark is a unique setting due to (1) the availability of over twenty years of audio recordings, longer than most other sources of natural audio (e.g., [Dietrich et al. 2019](#); [Rittmann 2023](#)); (2) its *de facto* two-party system despite the multiparty character of the Danish political landscape ([Green-Pedersen and Thomsen 2005](#); [Green-Pedersen and Mortensen 2010](#)); and (3) the tradition of selecting government members among elected officials ensures that nearly all government members are observed before, during, and after their time in office ([Strøm 1997](#), p. 168).

I provide compelling evidence in favor of vocal style-shifting. When politicians enter government, they lower their vocal pitch by more than half a standard deviation compared to their average. Consistent with the proposed mechanism, I show that politicians are more likely to lower their pitch due to role constraints than to the functional and accountability constraints that are inherent in governing power. Vocal style-shifting is unrelated to formal tasks that come with running government, such as reading legislation out loud ([Hjorth 2024](#)), and unaffected by the latitude of the agenda-setting power between government and opposition ([Seeberg 2023](#)). Furthermore, consistent with the role expectations, politicians increase their vocal pitch when they re-join the opposition.

Vocal style-shifting is an efficient way to reap the rhetorical rewards of governing. While important in its own right, this draws the contours for a larger theoretical framework for understanding how politicians use their vocal style to adapt and conform to expectations associated with the different political roles they transition in and out of throughout their careers. Analyzing how

they change their vocal style in these shifts might strengthen our knowledge about how they manage and navigate different incentives and motives. This speaks to recent political science studies of how politicians change their representational and legislative style throughout their careers (Bailer and Ohmura 2018; Bailer et al. 2022; Hargrave 2023; Hjorth 2024; Rask 2024b). The literature has focused on within-politician variation, i.e., continuous variation over the course of careers, as legislators gain seniority and political experience. The framework sketched in this paper indicates that within-politician variation is also relevant in terms of discrete changes such as role transitions, exemplified here by governing and non-governing roles.

The results are also relevant for political representation and the role of representatives. The idea that politicians engage in vocal style-shifting to align with the expectations of their roles closely parallels what Saward (2014) refers to as the ‘shape-shifting representative’. The concept of ‘vocal style-shifting’ echoes this notion, drawing on the Machiavellian idea that representatives (i.e., the princes) do not adhere to a single representative role – unlike in the Burkean models of representation involving ‘trustees’ and ‘delegates’ (Eulau et al. 1959), Pitkin’s conceptualization of representation (Pitkin 1967), or Rehfeld’s ideal-types of representatives (Rehfeld 2009). Instead, they “adjust and modify their claims and seek to influence the perceptions of constituencies and audiences” (Saward 2014, 735). More broadly, the findings presented in this paper suggest that roles are relevant not only for understanding representative functions (see, e.g., Wahlke et al. 1962; Eulau and Karpis 1977; Müller and Saalfeld 1997) but also for studying more functional roles, such as “membership in any institutionalized group” (Wahlke et al. 1962, p. 10), including serving as minister, committee chair, or speaker of the house.

Vocal style-shifting is likely to be a prominent dimension of shape-shifting. Politicians can adjust their vocal style to shape audience perceptions, such as when moving between the campaign trail and legislatures navigating roles of representative and legislator (Neumann 2019), when speaking to the general electorate or a small set of voters (Osnabrügge et al. 2021), or when the composition of the district changes (Spirling 2016). Following this line of reasoning, the results presented here can be reinterpreted as a relationship between representative and audience. When

politicians assume governing roles, their role as representative changes as the audience expands from their electoral constituency to the broader electorate. This shape-shifting also changes the claims made by the representative, particularly regarding whom the representative claims to represent. From this perspective, politicians in governing roles move from a principal-agent relationship with their constituents to “surrogate representation” (Mansbridge 2003), “representation by representatives with whom constituents have no electoral relationship with no direct electoral relationship (Wolkenstein and Wratil 2021, p. 863).

Lastly, the paper adds to our understanding of why seemingly contradictory empirical regularities can co-exist: the ‘law of shrinking support’ and the ‘law of incumbent advantage’ (Cuzán 2015). Where the law of shrinking support says that governments lose votes over time, the law of incumbent advantage states that incumbents have an electoral advantage over challengers in upcoming elections because they are able to harvest the valence-based rewards of incumbency, such as reflecting experience, competence, and leadership (Stone and Simas 2010). As noted by previous research, these seemingly conflictual laws can co-exist because “the incumbency advantage usually relates to legislators and parties whereas the cost of ruling usually relates to coalitions of parties” (Liang 2013, p. 260). The theory put forward in this paper sheds further light on this puzzle. Specifically, it suggests that politicians can adjust their vocal style when assuming governing roles to maintain and sustain the valence-based nature of incumbency by signaling positively valued traits associated with positions of power.

## **2 Rhetorical Divisions, Costs, and Rewards of Governing**

### **2.1 Rhetorical Divisions of Governing**

The government-opposition divide is arguably the biggest driver of legislative politics in parliamentary democracies (e.g., King 1976; Russell and Cowley 2018; Laver and Shepsle 1996; Lijphart 1999; Martin 2004). Governments are generally tasked with creating, proposing, and executing policy, and oppositions with scrutinizing and critiquing the government’s actions to keep it ac-

countable (Tuttnauer and Wegmann 2022). This institutional feature manifests in clear differences in the legislative behavior of governments and oppositions (e.g. Hix and Noury 2016; Behrens et al. 2023) and in the type and number of policy issues addressed by governments (Jennings et al. 2011; Mortensen et al. 2011; Greene and O'Brien 2016; Green-Pedersen et al. 2018).

The division of power also translates into divisions in rhetoric. In assessing multiple grand theories explaining the tone in politics, Pipal et al. (2024) find that the government-opposition divide is the only systematic finding, replicating over time in seven European parliaments.<sup>2</sup> Politicians in government consistently use more positive sentiment, more reasoning, and less negativity in their speeches. Opposition politicians speak with more negative sentiment, more emotionality, and more negativity (Rheault et al. 2016; Haselmayer and Jenny 2017; Proksch et al. 2019; Kosmidis et al. 2019; Crabtree et al. 2020; Schwalbach 2022; Gennaro and Ash 2022).

The different use of tone in their rhetoric relates to how the agenda-setting power of governments shapes the dynamics of legislative debates. In parliamentary systems, governments are almost exclusively tasked with producing and introducing policy proposals (e.g., Bräuninger and Debus 2009). This also reflects in the structure of legislative debates. During the first reading of a bill, ministers introduce legislation, reading its content out loud, followed by a debate between representatives from the political parties. In this way, opposition is institutionalized in the structure of debates. The proposer – typically the minister – is likely to emphasize the benefits and necessity of the bill, whereas the debaters, typically the opposition, will express a position towards the bill that depends on the party's relative position to the parties in government and the ideological distance to the content of the policy. This dynamic implies that ministers tend to use more positive language during legislative debates to frame their bills in a positive light, followed by government party members and then legislators from the opposition (Proksch et al. 2019, p. 101).

Why are governments motivated to use positive language? According to Crabtree et al. (2020), this differential use of tone can be traced back to the varying *accountability constraints* faced

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<sup>2</sup>The authors use the term *tone* to refer to how politicians strike when they speak. Related concepts are sentiment, emotive rhetoric, and negativity (Pipal et al. 2024).

by government and opposition and the logic of retrospective voting, i.e., voters reward or punish incumbents based on how they perceive the incumbent's performance in office (Fiorina 1978). Because this evaluation is affected by perceptions of the performance (Evans and Andersen 2006), politicians with governing power are motivated to use positive sentiment to make voters employ a positive frame when evaluating the state of the world (Crabtree et al. 2020, p. 1046-47) and to showcase their record in office (Kosmidis et al. 2019, p. 822). Conversely, politicians in opposition are motivated to use negative sentiment to make voters employ a negative frame and ultimately replace the incumbent after the next election (Seeberg 2020; Poljak and Walter 2023).

The division in rhetoric also manifests in the complexity by which governments and oppositions communicate. A range of studies show that members of government tend to speak with greater rhetorical complexity than members of the opposition (Tetlock 1981; Pancer et al. 1992; Schoonvelde et al. 2019; Hjorth 2024). Complexity has been measured both in linguistic and cognitive terms. Linguistically, complexity is captured by the use of rare words and the general readability of a text (e.g., Hjorth 2024). Cognitively, complexity denotes a speaker's ability to integrate competing perspectives in a speech, acknowledging, accommodating, and accepting counterarguments (Suedfeld and Tetlock 1977).

According to cognitive psychology, the different uses of rhetorical complexity relate to *psychological accountability constraints* on members of government and opposition. On the surface, this literature seemingly echoes the literature on retrospective voting. However, whereas the latter emphasizes an economic dimension of accountability, the former highlights a psychological dimension of accountability (Tetlock 1981, 1985), drawing attention to the cognitive "need to be able to offer a plausible justification to the public for one's policies and actions" (Pancer et al. 1992, p. 32). This prompts politicians with governing responsibility to use more complex rhetoric in justifying that their policy is well crafted and executed.

The fact that governments tend to use more complex language than the opposition can also be explained by the *functional constraints* that come with office. According to Hjorth (2024), serving in governments implies role responsibilities that affect a politician's rhetorical complexity. Unlike

members of the opposition, government members face *formal* and *subjective functional constraints* in the sense that as policy-makers, they are compelled to give certain speeches in parliament, for example the first reading of a bill, and in the sense that they have less control over which topics they can emphasize. Governments must take action on any issue that arises, for instance pandemics (Louwerse et al. 2021) or global financial crises (Healy and Malhotra 2013). These formal and subjective constraints result in a higher rhetorical complexity, the former through reading technical legislation out loud and the latter through an indirect effect of having to diversify one's issue portfolio (Hjorth 2024, p. 9-10).

## 2.2 Rhetorical Costs of Governing

The rhetorical division of tone and complexity gives oppositions an advantage vis-à-vis governments. Governments' disadvantage is most clearly explicated in the literature on rhetorical complexity. Drawing on the work on the 'cost of governing', i.e., the empirical tendency for governments to lose votes over time (e.g., Thesen et al. 2020), Hjorth (2024) argues that governments pay not only an electoral but also a 'rhetorical cost of governing'. This cost arises from the rhetorical challenges inherent in governing, which constrain government members' ability to craft political messages as effectively as members of the opposition. Given that voters generally prefer simplistic language (Bischof and Senninger 2018; Decadri and Boussalis 2020), politicians motivated by re-election (e.g., Mayhew 1974) should ideally employ simpler rhetoric to appeal to voters. However, as noted by Hjorth (2024), the responsibilities associated with governing functionally limit their capacity to do so, compelling politicians in power to adopt more rhetorically complex language than they might prefer.

The cost of governing can also be linked to rhetorical tone. Governments tend to use more positive rhetoric to frame their bills and general performance in a positive light to remain in office, and oppositions use negative rhetoric to frame the government's performance in a negative light to throw the incumbent out of office. To the extent that vote choice is shaped by perceptions of the incumbent's performance (e.g., Wlezien et al. 1997), this makes the framing of performance a



zero-sum game where the most efficient framing decides whether a government remains in office. Based on this line of reasoning, governments should lose votes only if they lose the battle of shaping voters' perceptions of the current state of the world.

The framing prediction seemingly contrasts the empirical regularity with which governing parties lose votes, indicating that framing itself is not the only explanation.<sup>3</sup> A possible explanation is provided by [Nannestad and Paldam \(2003\)](#), who argue that the electoral cost of governing can be explained as a grievance asymmetry, defined as humans value “an improvement in the economy less than they dislike the corresponding deterioration” ([Nannestad and Paldam 1997](#), p. 81). The notion of asymmetry refers to the human tendency to weight information in different ways when forming evaluations (e.g., [Jordan 1965](#); [Lau 1982](#)), and the notion of grievance refers to the tendency that negative information outweighs positive information ([Lau 1985](#); [Rozin and Royzman 2001](#); [Kahneman and Tversky 2013](#)). As observed by [Hjorth \(2024\)](#), this can be seen as a variant of negativity bias ([Ashton and Kal Munis 2021](#)), which is voters' tendency to pay more attention to negative than to positive changes despite their preference for positive rhetoric (e.g., [Costa 2021](#)).

Negativity is also a factor at the media level. According to [Thesen et al. \(2024\)](#), the apparent ‘incumbency bonus’ of receiving more media attention is a Trojan horse for governing parties, since it typically reflects the media’s critical approach to government power (e.g., [Haselmayer et al. 2019](#)). This ‘incumbency burden’ translates into negative support for the government and gives rise to a cost of governing, potentially also because of accumulated exposure to a more negative tone in news featuring the government ([Thesen et al. 2020](#)). Because media coverage gravitates towards negativity ([Harcup and O’neill 2017](#)) and voters are more exposed to negative than to positive stories about incumbents, there is a cumulative decline in government support over time. Based on these accounts, oppositions hold a prior advantage over governments in shaping perceptions of the incumbent’s performance because voters pay more attention to negative information and are more

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<sup>3</sup>In fact, the cost of governing is deemed so regular that it is conceived as one of the few laws existing in politics ([Cuzán 2015](#), p. 416-417). This suggests that framing cannot explain this empirical phenomenon as it predicts electoral costs to apply roughly equally to governments and oppositions assuming that they are equally capable of crafting messages.

exposed to negative information about the government.<sup>4</sup>

### 2.3 Rhetorical Rewards of Governing

The divisions in rhetorical tone and complexity between government and opposition suggest that governments have a rhetorical disadvantage simply because they hold power. However, governments do not just pay the ‘rhetorical costs of governing’ (Hjorth 2024), they also reap the ‘rhetorical rewards of governing’. Politicians with governing power typically speak with a *rhetorical style* characterized by greater nuance, reasoning, and composure than members from the opposition, signaling their competence and authority to voters and their effort in reaching political compromises (e.g., Paris 2017). By rhetorical style, I refer to how politicians behave and present themselves in their speeches. This entails vocal cues such as pitch, loudness, and speech rate (Fox 2002), and higher-order characteristics such as the overall delivery of a speech, vocal style, or whether the speaking style is formal or informal (e.g., Neumann 2020).

The rhetorical style adds a third division beyond tone and complexity, this time in favor of the government. Politicians with governing power tend to speak with more politeness in legislative debates (Ishima 2024), with more factive and epistemic adverbs such as “fortunately” and “possibly” (Navarretta and Hansen 2024, p. 157), and with less emotional arousal (Vainio et al. 2023). This style gives members of government an advantage over members of the opposition – a reward of governing – by allowing them to rhetorically showcase traits that are universally valued in political leaders, such as competence, authority, and trustworthiness (e.g., Kinder 1986; Adams et al. 2011). Perceptions of non-policy attributes such as competence substantially influence how voters evaluate politicians (Funk 1997), particularly political leaders (Fiorina and Abrams 1981; Popkin 1991). Because a trait such as competence is universally valued by voters, it is classified as a valence attribute (Stokes 1963), giving the government a prior advantage vis-à-vis the opposition independently of their actual performance.

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<sup>4</sup>Note that while negativity bias might help explain the cost of governing, this is only one of many potential explanations of the phenomenon (Pereira and Mueller 2004; Green and Jennings 2017; Wleziem 2017).

The notion of valence is closely tied to the empirical law of the ‘incumbency advantage’ (e.g., Erikson 1971; Gelman and King 1990; Cox and Katz 1996; Ansolabehere et al. 2000; Lee 2008; Hainmueller and Kern 2008; Golden and Picci 2015; Dahlgaard 2016; Klačnja and Titiunik 2017),<sup>5</sup> which refers to the empirical regularity that incumbents tend to hold a prior advantage over the challenger in the upcoming election, simply by virtue of being the incumbent (Fowler and Hall 2014, p. 502). This makes incumbency a valence attribute in itself (Stone and Simas 2010) because it signals leadership and experience (Peskovitz 2019, p. 467).

The incumbency advantage illustrates that there may be rewards associated with governing that apply to governments vis-à-vis oppositions and not only to incumbents vis-à-vis challengers. On the surface, this seemingly contradicts the law of shrinking support. However, the cost of governing applies to coalitions of parties, and the reward of governing applies to individual legislators and parties (Liang 2013). In other words, ruling coalitions bear the cost of governing over time, but individual legislators may benefit from the valence-based rewards of incumbency, reflecting their experience and stability in office.<sup>6</sup>

The concept of rhetorical style provides a lens for understanding the nature of this paradox. Where accountability (e.g., Crabtree et al. 2020) and functional constraints (e.g., Hjorth 2024) collectively constrain the rhetoric used by politicians assuming governing roles – for instance, when they read legislation out loud – each politician still has the leverage to speak with a rhetorical style that maintains and sustains the valence-based nature of incumbency by signaling positively valued traits associated with holding positions of power. I spell out this idea in the next section where I develop a theory explaining why politicians in governing roles are expected to signal certain character traits, and how they navigate those expectations through their rhetoric style.

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<sup>5</sup>Cuzán (2015) identifies this as the second empirical law in political science (p. 416).

<sup>6</sup>These seemingly contradictory results can be seen as a variant of Fenno’s paradox that people generally disapprove of Congress as an institution but still support their representative. The paradox is introduced in Fenno’s canonical book *Home Style: House Members in Their Districts* (Fenno 1978).

### 3 Theory: Political Roles and Vocal Style-Shifting

In this section, I present the theory of how role expectations of politicians with governing power shape their rhetorical style. Using literature on role congruity theory, valence issues, and the psychology of voice perceptions, I argue that politicians shift their vocal style when they transition between roles to align with the expectations associated with their roles. Role expectations imply *role constraints* beyond accountability and functional constraints. Specifically, when politicians assume governing roles, e.g., become ministers, they adjust their vocal style to signal leadership and shape perceptions of competence, dominance, and composure, traits that are valued, preferred, and therefore expected in political leaders. Adhering to these role expectations helps sustain the incumbency advantage and allows politicians to reap the rewards of governing.

#### 3.1 Role Expectations

The theory starts from the general assumption that voters *ceteris paribus* favor politicians with stronger valence attributes (Stokes 1963; Enelow and Hinich 1982; Serra 2010). In other words, the more competent, trustworthy, and credible a politician is perceived to be, the more positive the voters' evaluation. Valence traits that convey signals of leadership give politicians in governing roles a prior advantage over politicians in non-governing roles (e.g. backbenchers) due to the close ties between valence attributes and perceptions of political leadership.

The nature of this link revolves around *role expectations*: Voters favor politicians with more valence attributes and expect politicians to hold these attributes, especially when politicians assume roles closely tied to perceptions of those traits. To exemplify this, consider the case of competence and different political roles. We know from the literature on valence issues that competent politicians are favored universally over incompetent politicians (though, see, Mizuno and Okazawa 2022), and this is likely to be even more pronounced if a politician occupies a role that implies expectations regarding competence (see, e.g., Fulton 2014). For example, voters likely expects prime

ministers to demonstrate greater competence than backbenchers (cf., [Laustsen and Olsen 2022](#)).<sup>7</sup>

The example illustrates a more general point. While valence attributes are universally valued in officeholders, the different roles politicians occupy each comes with expectations that amplify the importance of signaling certain character traits. Specifically, in a given role, a politician is expected to signal three types of traits: *valence*, *contextual*, and *role-specific* traits.<sup>8</sup> Those traits operate as a set of role expectations to how politicians should behave and to their rhetorical style. I refer to this as *role constraints*, emphasizing the link to the accountability and functional constraints, which explain rhetorical divisions in tone and complexity. Accountability and functional constraints pertain to a government's performance and the practical demands of governing, and role constraints focus solely on role expectations and traits that are deemed desirable for a specific role.

Using role constraints to denote a set of expectations (or norms) that limit a politician's room for maneuver resembles the sociological concept of political roles found in legislative studies ([Blomgren and Rozenberg 2015](#)). Following this literature, I define a role as "a set of norms (obligations or expectations) attached to an individual's social position, occupation, or relationship status" ([Weber 1995](#), p. 1134). In this view, a political role becomes synonymous with the expectations associated with that role, whether it is legislator, representative, or party leader ([Blomgren and Rozenberg 2015](#), p. 8). Politicians are well aware of these norms and likely adapt their behavior and communication accordingly. Awareness of expectations is key. Indeed, as noted by [Wahlke et al. \(1962\)](#), the concept of a role "postulates that individual legislators are aware of the norms constituting the role and consciously adapt their behavior to them in some fashion" (p. 9).

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<sup>7</sup>While competence is generally considered a valence issue in the sense that it is valued by all voters (e.g., [Serra 2010](#)), this does not mean that competence is universally more important than other traits such as warmth ([Fiske et al. 2002](#)). For example, [Laustsen and Bor \(2017\)](#) find that warmth is more important than competence in shaping vote choice.

<sup>8</sup>Personality traits that are situationally valued, like contextual and role-specific traits, resemble what [Enelow and Hinich \(1982\)](#) refer to as ascriptive characteristics, such as race, religion, and ethnicity, in that voters do not universally value them. However, role traits differ from ascriptive traits in that, contingent on a role, *all* voters value the role-based trait. For example, dominance is not universally valued by voters (e.g., [Laustsen and Petersen 2015](#)). I elaborate and define each trait in the next section.

The notion of role constraints is implicitly invoked in role congruity theory, which posits that individuals are positively evaluated when their behavior and style conform with their role expectations and negatively when they do not (Eagly and Diekmann 2005). This is well established in political science with respect to gender (e.g., Bäck and Debus 2019). Role congruity theory has been used to explain why women in leadership roles are evaluated less positively than male leaders (Eagly and Karau 2002), why women seeking office display different levels and types of emotions than men (Boussalis et al. 2021), and why nonverbal audience reactions in parliamentary debates are gendered (Ash et al. 2024).

Role congruity theory provides a framework to derive which valence, contextual, and role-specific traits voters expect in politicians in governing roles. Because politicians are aware of the norms and expectations associated with their roles (e.g., Boussalis et al. 2021), role congruity theory also provides a framework to empirically predict *how* politicians adapt to expectations.

### **3.2 Traits of Governing**

Voters generally hold firm expectations about what traits are deemed desired in politicians, and political leaders in particular (e.g., Kinder 1986). At a minimum, voters expect political leaders to be competent. The concept of competence refers to voters' perceptions of a candidate's "ability (...) to properly perform his/her job, identifying and employing the appropriate policies that enable her to get the job done" (Galeotti and Zizzo 2018, p. 27). Competence is a valence trait in that it is valued across officeholders, but its importance is amplified when the role comes with executive power, simply because the stakes of incompetence are higher.

Voters also expect political leaders to be dominant. The notion of dominance refers to an individual's ability to tell people what to do, be respected, and wield influence (Puts et al. 2006). As a contextual trait, dominance is important in politicians with executive decision-making power, who are expected to navigate complex situations. Contexts such as interstate aggression (Little 2014; Petersen and Laustsen 2020), international disputes (Laustsen and Petersen 2020), and terror attacks (Merolla and Zechmeister 2009) have consistently been linked to a higher preference

for dominant political leaders, likely because dominance signals a leader's capacity to manage crises (Laustsen and Petersen 2015). This suggests that a trait like dominance is more desirable when politicians assume governing roles compared to when they assume non-governing roles, but conditional on the intensity of the intergroup conflict. For instance, party leaders from parties of a governing coalition are expected to display more dominance than backbenchers of the ruling coalition because it signals the ability to maintain party unity when conceding the inevitable electoral cost of governing (e.g., Bøggild and Pedersen 2024).

Finally, voters expect political leaders to maintain composure. Composure is closely linked to the role of emotions (Marcus 2000), more specifically the emotional arousal (e.g., Larsen and Stanley 2021) and emotional stability (e.g., Klingler et al. 2019) with which politicians express themselves. Unlike competence and dominance, which are valence and contextual traits, composure is a role-specific trait in that its value is entirely conditional and specific to a politician's role. Politicians in governing roles are expected to be composed, signal authority, decisiveness, and leadership qualities to the voters (Masters and Sullivan 1989, p. 127). Although theoretically distinct, this suggests that signals of composure are closely associated with perceptions of competence and dominance, but only in the context of political leadership. In contrast, composure is not automatically valued when politicians are in opposition. In holding the executive power accountable, members of the opposition are generally presumed to be more aroused and polarizing rather than composed and unifying (e.g., Noble 2023).

### **3.3 Vocal Style-Shifting and Signaling of Traits**

How do politicians adapt their rhetorical style to the traits expected in their political roles? I start with the basic assumption that politicians are well aware of role expectations and, as a result, strive to present themselves in ways that align with their political roles to avoid being punished by voters for inappropriate behavior (e.g., Bucy 2000, 2016). For politicians assuming governing roles, this means signaling traits – competence, dominance, and composure – that are consistent with the roles of political leadership. To effectively align with these expectations, politicians must carefully

navigate how they signal these traits when communicating with the public.

Politicians use their vocal style to navigate role expectations by shaping voters' perceptions of their characteristics by conveying information about their character traits and overall state of mind. Vocal style includes articulation, "the clarity and fullness with which phones, the fundamental building blocks of speech, are pronounced" (Neumann 2019, p. 2); pitch, the perceived "highness" or "lowness" of a voice (Klofstad 2016, p. 726); and intonation, subtle variations in pitch that convey a speaker's emotional state (Dietrich et al. 2019, p. 942).<sup>9</sup>

The efficiency of vocal style in signaling traits is rooted in the psychology of voice perceptions. Humans, and animals (Darwin 1872), possess sophisticated psychological systems that enable them to extract information about the dispositions and traits of others based on their voices (e.g., Feinberg 2008). Humans draw inferences about characteristics such as attractiveness, masculinity, dominance, body size, and physical strength from a speaker's vocal characteristics (Cheng et al. 2016; Pisanski et al. 2014; Puts et al. 2006; Raine et al. 2018; Zuckerman and Driver 1989; Zuckerman and Miyake 1993). The human psychology of voice perceptions has deep evolutionary roots and is often ascribed to the process of natural selection, which has encouraged us throughout human history to effectively detect good leaders "because the choice of a leader affects an individual's ability to survive and reproduce within a social group" (Tigue et al. 2012, p. 210).

Voice perceptions also influence the selection of political leaders in elections, as shown in a large body of work in political psychology (Banai et al. 2017; Gregory Jr and Gallagher 2002; Klofstad et al. 2012; Klofstad 2016; Klofstad et al. 2016; Klofstad and Anderson 2018; Tigue et al. 2012). The preference is based on mediated perceptions, particularly perceptions drawn from a politician's vocal pitch. Voters consistently prefer candidates with lower-pitched voices, apparently because lower pitch signals valued traits like competence and dominance (e.g., Klofstad et al. 2015; Laustsen et al. 2015). Voice perceptions also shape the selection of leaders beyond

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<sup>9</sup>Other relevant components are regional dialects, accents, and (in)formality. While accents and dialects have not been studied systematically as an outcome in political science, other work has shown that language appeals are an effective way of signaling your ethnic identity (Zárate et al. 2024) and that historical non-standard regional dialects vary systematically with contemporary concentrations of far-right support (Ziblatt et al. 2023). For an overview of the importance of formal and informal speech, see Neumann (2020).



a speaker's average pitch (e.g., [Pisanski et al. 2016](#)). Voters are more likely to vote for candidates who modulate their voices when speaking because it signals desirable traits like competence, passion, and enthusiasm ([Damann et al. 2024](#)).

### 3.4 Theoretical Expectations and Hypotheses

The fact that the link between voice characteristics and the selection of political leaders is mediated by perceptions indicates that voters have firm expectations not only about which traits political leaders should possess but also about how political leaders' voices convey those traits. Given that politicians are acutely aware of these expectations (e.g., [Boussalis et al. 2021](#)), the evolutionary roots of voice perceptions might shape politicians' vocal styles to the extent that it functions as a self-enforcing mechanism, guiding them to conform to their role expectations.<sup>10</sup> Since these perceptions are largely shaped by vocal pitch, I suspect that pitch is a crucial component of vocal style and a key signaling tool that politicians can use to align with the expectations associated with governing roles. This leads to the main claim of the theory: as pitch conveys signals of leadership traits such as competence and dominance, and because voters expect these traits from political leaders, *politicians speak with a lower pitch when assuming governing roles compared to when they are in non-governing roles.*

Because the theory targets how politicians use their vocal style to adapt to expectations associated with the roles occupied by politicians, the focus is on how pitch varies for politicians in different roles. While this contrasts with the focus on between-politician variation studied in extant work on how vocal pitch shapes selection of political leaders (see, e.g., [Tigue et al. 2012](#)), the mechanism is hypothesized to apply uniformly for all politicians since role expectations regarding voice perceptions of leadership are generally invariant to gender (e.g., [Klofstad 2016](#)) and the social context of the domain ([Anderson and Klofstad 2012](#)). In other words, even though women vocalize approximately one octave above men with a baseline pitch of around 165-255 Hz com-

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<sup>10</sup>[Ostrom \(2000\)](#) develops a similar argument about how the evolution of social norms facilitates collective action such as electoral voting, paying taxes without cheating, and contributing to voluntary associations.

pared to men’s 80-180 Hz (Titze 1994), I expect both female and male politicians to lower their pitch to signal competence, dominance, and composure when assuming governing roles. In Appendix E, I show that there are no substantial gender differences in how women and men politicians in the governing roles adjust their vocal style.

The mechanism linking political roles to vocal style-shifting lies in role constraints that arise from role expectations, prompting politicians to lower their pitch when assuming governing positions. This type of constraint differs fundamentally from accountability and functional constraints, which influence a government’s performance and the operational demands of governing, and shape rhetorical tone and complexity, respectively. The empirical analysis presents tests that aim to disentangle those competing accounts.

## 4 Data and Methods

### 4.1 Multimodal Corpus of Parliamentary Speeches from Folketinget

To study how politicians change their vocal style when they transition from opposition to government, I compile a novel multimodal text-audio data set of parliamentary speeches in the Danish parliament, Folketinget, from October 2000 to September 2022. This period spans six national elections, 28 parliamentary terms, and 2,282 debates. The empirical case of Denmark offers a valuable setting for testing the theory for three main reasons. First, audio recordings and speech transcripts have been available for over twenty years, providing a longer continuous source of natural audio of political speech than any other context (e.g., Dietrich et al. 2019; Rittmann 2023). Second, despite its multiparty nature, the Danish party system functions as a *de facto* two-bloc system with a clear division between left and right and consequently between government and opposition (Green-Pedersen and Thomsen 2005; Green-Pedersen and Mortensen 2010). Third, Denmark has a strong tradition of selecting government members among elected officials, which means that nearly all government members can be observed before, during, and after their time in office (Strøm 1997, p. 168).

## Audio

The recordings are downloaded in video format from the Danish Royal Library (2000-2009)<sup>11</sup> and from the parliament's TV archive (2010-2022).<sup>12</sup> All recordings are downloaded using the same procedure. First, the recording is extracted as an M3U8-file, then converted to MP4-format (video), and subsequently to a WAV-file (audio) with a sampling rate of 16,000 Hz with monaural sound and 16-bit encoding. A total of 2,260 (out of 2,282) recordings are downloaded for use.

## Text

The corresponding transcripts are collected using a combination of **ParlSpeech V2** (2000-2018) and manually scraped XML-files directly from the parliamentary archive (2019-2022). Each transcript is linked to a corresponding recording for 2,186 of the 2,260 debates ( $\approx 97$  pct.). Non-matches are typically debates that occur on the same day. The remaining debates have a total of 850,357 speeches. I remove all speeches by chairs as these do not constitute valid a counterfactual when studying how entering government relative to being in opposition influences the vocal style.

## Alignment

To align the text and audio data to construct a multimodal dataset of parliamentary speeches, I rely on an automated annotation approach proposed by **Rask (2024a)**, which allows me to align text and audio using a fuzzy string matching technique. This was successful for 96.26 pct. of the speeches, yielding multimodal speech data for 391,530 parliamentary speeches from 2000-2022.

## Government Data

To obtain data on the government status of a legislator for each speech, I write a scraper that automatically compiles the compositions of governments during the study period from the parliament's

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<sup>11</sup><https://dansklyd.statsbiblioteket.dk/samling/folketingsforhandlinger/>

<sup>12</sup><https://www.ft.dk/da/aktuelt/tv-fra-folketinget>

website.<sup>13</sup> This spans a total of ten governments containing 131 different ministers distributed across six parties. The scraped data contains the start and end date of each government spell. The government status for each legislator at a given speech is obtained by linking each spell to the multimodal speech corpus by matching the names of the government members to the names of the speakers.<sup>14</sup> I also add biographical information obtained from the [Danish Legislator Database \(DLD\)](#) (Klint et al. 2023) to obtain data on gender, seniority, and education for all politicians elected at least once between 1849–2022.

## 4.2 Measuring Vocal Style

I measure vocal style with vocal pitch, the perceived ‘highness’ or ‘lowness’ of a voice (Klofstad 2016, p. 726). Pitch is the perceptual analog of the fundamental frequency ( $F0$ ) of a sound, human speech for example, and is defined as “the number of vibrations per second made by the vocal folds to produce a vocalization” (Tusing and Dillard 2000, p. 150). While no single feature can fully characterize a politician’s vocal style, or any other tone or sound (Knox and Lucas 2021, p. 652), the vocal pitch has been linked consistently to perceptions of traits like competence, dominance, and composure (e.g., Banse and Scherer 1996; Bänziger and Scherer 2005; Klofstad et al. 2015), and is unaffected by temporal changes in recording technology, microphone quality and distance, and room acoustic (Vainio et al. 2023). Since the human psychology of voice perceptions relies heavily on the pitch, I use it to measure vocal style.

Pitch is computed at the speech level using the `communication` in R (Knox and Lucas 2021). This software estimates the fundamental frequency  $F0$  of an audio signal – the acoustic analog of pitch – on windows of 25 ms with a slide of 12 ms. This means that a speech lasting 30 seconds yields 2,400 estimates.<sup>15</sup> All estimates are then averaged using the arithmetic mean to produce a

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<sup>13</sup><https://www.ft.dk/da/folkestyret/regeringen/regeringer-siden-1953>

<sup>14</sup>This means that legislators whose party is in government are classified as “opposition members”. These legislators might not constitute a relevant counterfactual to the co-partisans who are ministers. To test this, I include an indicator capturing whether the legislator’s party is in government. In [Appendix A](#), I show that this has virtually no influence on the effect.

<sup>15</sup>The `communication` package allows me to compute  $F0$  with two separate algorithms. I exploit this by account-

single pitch estimate for each speech. When an estimate is produced for all speeches, the speech-level estimates are  $z$ -standardized at the level of each speaker to account for voice heterogeneity, most notably sex differences (Dietrich et al. 2019). Standardization implies that each speaker is forced to have a vocal pitch of mean zero and unit variance, effectively removing any physiological and speaker-specific differences in the size of the vocal cords that explain most of the variance in the unstandardized distribution of  $F0$ .

Using only vocal pitch to characterize vocal style is a coarse approach and suggests that pitch serves as a reductive proxy for vocal style. As demonstrated by Damann et al. (2024), reducing vocal style to a single feature – such as vocal pitch – can lead to omitted variable bias, as changes in pitch are often accompanied by alterations in other aspects of vocal style, such as articulation and modulation (i.e., the variation in pitch and loudness). While this concern is valid in theory, its empirical impact is less pronounced. In the corpus analyzed in this study, average pitch accounts for 80 pct. variation in voice modulation, indicating that a speech-level average of vocal pitch captures more complex speech dynamics beyond the mere ‘highness’ or ‘lowness’ of the human voice.

### 4.3 Dynamic Difference-in-Differences

Identifying the effect of serving in political roles on vocal style is challenged by the inherent selection bias arising from the nonrandom assignment of legislators to specific roles, such as the decision to serve in government (Bailer and Ohmura 2018). This makes regressing vocal pitch on government status an insufficient identification strategy in estimating the causal effect. Furthermore, treatment adoption is ‘staggered’ because legislators might enter government at different times (Baker et al. 2022).

To address selection bias and the issue of staggered treatment adoption, I estimate a ‘dynamic’ difference-in-differences model – also known as an event study – using a two-way fixed effects

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ing for measurement errors and only consider an estimate valid if both algorithms return a non-zero estimate. Non-zero estimates indicate that the speech window is classified as voiced speech. Keeping only voiced speech regions follows the common practice of extant work (e.g., Dietrich et al. 2019). See Hess (2008) for a thorough review.

(TWFE) regression estimator that exploits the panel structure of the multimodal corpus and the staggered nature of entering government. Unlike the traditional ‘static’ variant that estimates a single time-invariant average treatment effect on the treated (ATT), the ‘dynamic’ specification incorporates leads and lags of the treatment variable, i.e., government membership (Sun and Abraham 2021, p. 180).<sup>16</sup> The inclusion of leads and lags makes it possible to capture dynamic treatment effects non-parametrically and enables falsification tests of the identifying assumption by assessing the parallel trends assumption both visually and statistically (Borusyak et al. 2024, p. 9-10).

The leads and lags are encoded with relative indicators denoting the relative time since a legislator first entered government with year zero denoting the first year in office. Using relative time is equivalent to centering the time to enter government and is necessary to handle the staggered adoption.<sup>17</sup> The distribution of these relative time indicators is presented in Figure 1, which shows that during the period covered in the corpus, legislators who eventually serve in government give a speech maximum 18 years before entering government and 9 years after.<sup>18</sup> These relative time indicators mean that instead of comparing the mean difference in vocal style between politicians who serve in government at any time and politicians in the opposition, the difference is compared across the timeline from the last lead to the last lag.

I define the following ‘fully dynamic’ difference-in-differences model (Borusyak et al. 2024, p. 9):

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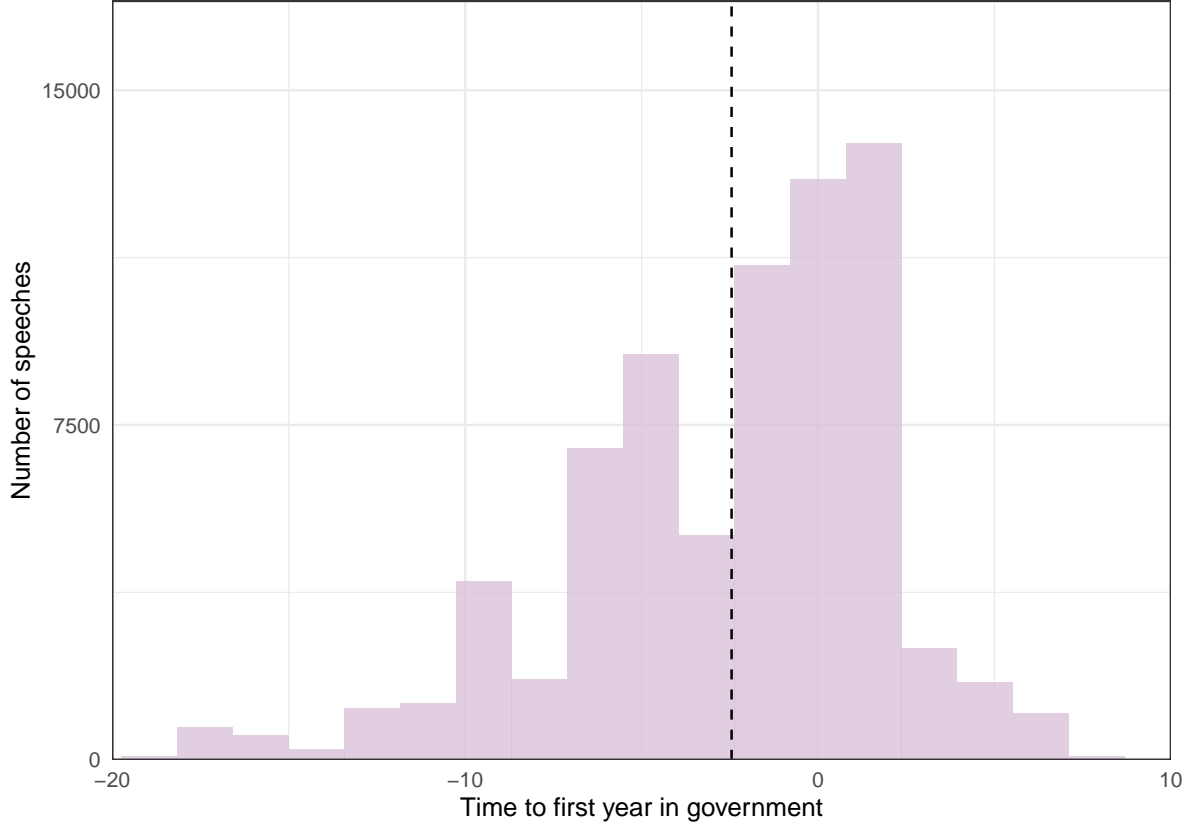
<sup>16</sup>The ‘static’ model takes the form:

$$y_{ijt} = \alpha_j + \gamma_t + \delta \mathbb{1}[D_{jt} = 1] + u_{ijt}$$

and only denotes whether a unit (i.e., a legislator) is treated (i.e., in government) but not *when*. For applications of the ‘static’ model, see Bechtel and Hainmueller (2011) or Dynes and Holbein (2020).

<sup>17</sup>This modeling strategy keeps only a legislator’s first spell, even if they serve in multiple spells throughout their career.

<sup>18</sup>As shown in Figure 1, most speeches (91 pct.) given by a government member fall within the first four years after starting the first spell in government. The reason is that the Danish Constitutional Act, *Grundloven*, prescribes that an election must be held at least every fourth year (§32). This means that governments might be turned over, at a minimum, every fourth year. Speeches given five years or later are politicians serving as ministers in consecutive governments (9 pct.).



**Figure 1:** Distribution of relative time indicators. The dotted vertical line denotes the average (-2.45).

$$y_{ijt} = \alpha_j + \gamma_t + \sum_{\substack{\tau=-a \\ \tau \neq -1}}^{b-1} \delta_\tau \mathbb{1}[D_{jt} = \tau] + \delta_{b+} \mathbb{1}[D_{jt} \geq b] + u_{ijt} \quad (1)$$

Here,  $y_{ijt}$  is the average speech-level vocal pitch ( $z$ -standardized by legislators) in speech  $i$  given by legislator  $j$  in year  $t$ ,  $a \geq 0$  and  $b \geq 0$  each denote the number of leads and lags relative to the treatment timing (in this case  $a = 18$  and  $b = 9$ ),  $\alpha_j$  and  $\gamma_t$  are the two-way fixed effects, and  $u_{ijt}$  is the error term.<sup>19</sup> This specification explicitly divides the coefficients into ‘pre-treatment’ and ‘post-treatment’. The pre-treatment coefficients can be used as a placebo, testing the identifying assumption of parallel trends visually and statistically. Post-treatment coefficients, on the other

<sup>19</sup>The baseline period  $\tau \neq -1$  is excluded to avoid perfect multicollinearity. I follow typical practice and omit the period next to (i.e., before) the relative treatment onset, i.e., -1 (Li and Strezhnev 2024), though see Roth et al. (2023), who refer to the period as 0.

hand, are considered effects of serving in government as a function of time after starting the first spell, i.e., treatment effects.

In addition to the fully dynamic model, I use an estimator that accounts for potential bias arising from ‘contamination bias’ (Sun and Abraham 2021) and ‘forbidden comparisons’ (Borusyak et al. 2024) in estimating (1) with a TWFE regression. TWFE regressions have found to be biased when treatment effects are dynamic under staggered adoption (De Chaisemartin and d’Haultfoeuille 2020; Imai and Kim 2021; Goodman-Bacon 2021; Callaway and Sant’Anna 2021; Sun and Abraham 2021; Roth et al. 2023; Li and Strezhnev 2024), because already treated groups end up as untreated groups in ATTs of other relative time periods, contaminating relative time treatment effects with effects from other relative periods. This would happen if the treatment effects vary by timing groups, i.e., by governments. To account for this potential bias, I estimate cohort-specific treatment effects using the estimator proposed by Sun and Abraham (2021), averaging relative time ATTs over the distribution of cohorts by each cohort’s sample size (Baker et al. 2022, p. 21-22) to obtain unbiased estimates of the relative time ATTs.<sup>20</sup>

For the main analysis, I report both the TWFE estimates of the dynamic difference-in-differences model in (1) and estimates using the estimator proposed by Sun and Abraham (2021). I also report TWFE estimates using the ‘static’ version in Appendix A, showing that it yields substantively similar results to the ‘dynamic’ model. If anything, the ‘static’ model underestimates the causal effect.

## 5 Results

In this section, I turn to the empirical results. First, I evaluate the validity of the main prediction, namely that legislators should lower their pitch when entering government. Second, I present different tests to disentangle the theoretical mechanisms of accountability, functional, and role constraints. Third, and finally, I investigate whether serving in government has heterogeneous

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<sup>20</sup>Sun and Abraham (2021) call the timing groups ‘cohorts’; Callaway and Sant’Anna (2021) call them ‘groups’.



effects on a legislator’s verbal and nonverbal displays.

## 5.1 Main Results

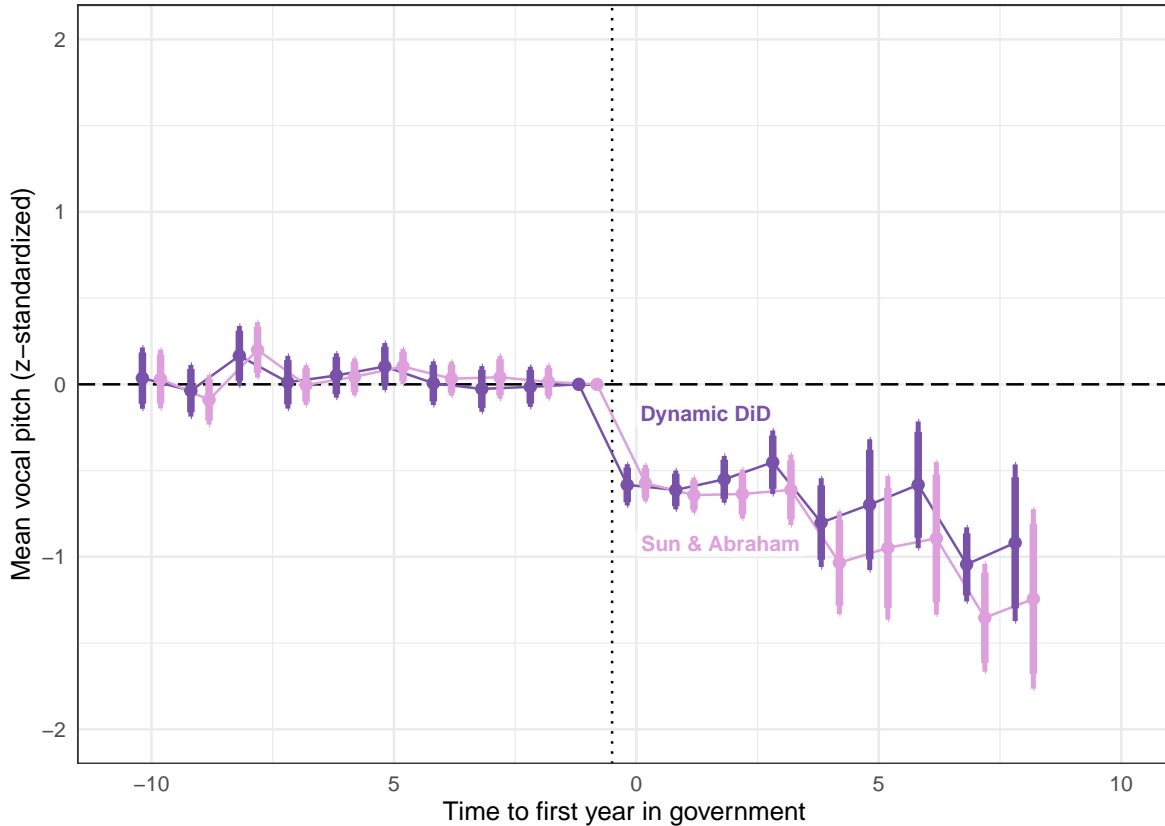
I first turn to the main prediction of the paper. [Figure 2](#) shows the relative time estimates with 90 and 95 pct. confidence intervals across the relative time periods using TWFE regression (‘[Dynamic DiD](#)’) and the [Sun and Abraham \(2021\)](#) estimator (‘[Sun and Abraham](#)’). The event study design allows visual assessment of the parallel trends assumption (i.e., the identifying assumption). As seen in the figure, there are no clear pre-trend effects in vocal style before entering government regardless of the estimator. The pre-trend coefficients all fluctuate around zero showing that there is no difference in vocal style between government and opposition members for each relative time period relative to the baseline of  $\tau = -1$ . This strongly substantiates the parallel trend assumption, showing no signs of anticipation.<sup>21</sup>

While there are no pre-trends in vocal pitch before serving in government, this changes radically when legislators enter government. During the first year, legislators lower their pitch by 0.58 standard deviations, with all lags being statistically significant. The post-treatment effect estimates range from  $-0.452$  (relative time: +4, estimator: ‘[Dynamic DiD](#)’) to  $-1.353$  (relative time: +7, estimator: ‘[Sun and Abraham](#)’). Both estimators identify the same post-trend dynamics with negligible differences in effect sizes in each relative time period. The similarity between the estimators suggests that treatment effects are largely homogeneous with no clear temporal trend.

This interpretation is also supported visually. Most of the change in vocal style happens during the transition from opposition to government where the pitch is lowered significantly, but it does not show any clear signs of dynamic heterogeneity. The effect size is nearly identical during the first four years in government, and while the magnitude becomes larger after five years, this only corresponds to nine pct. of speeches. In comparison, 91 pct. of speeches take place in the first four years. These results strongly support the main prediction that politicians shift vocal style when

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<sup>21</sup>The identifying assumption also holds up statistically. A linear hypothesis test of the leads from  $\tau \in \{10, \dots, -2\}$  using TWFE regression returns an F-statistic of 1.304 with a p-value of 0.229.



**Figure 2:** Event-study estimates by the relative time to the first year in office. The effects are shown using a dynamic difference-in-differences (“Dynamic DiD”) specification estimated with the TWFE estimator and the cohort estimator (“Sun & Abraham”) presented by Sun and Abraham (2021). The standard errors are clustered at the legislator-year level in both estimations. Confidence intervals are reported using 90 (thick) and 95 (thin) pct., respectively. Note that the x-axis is censored at  $\tau = -10$  for presentational purposes. ATT estimates for each estimator are reported in Table 1.

they enter government.

To summarize the average effects shown in Figure 2, I compute the average treatment effect on the treated (ATT) for both the ‘Dynamic DiD’ and the ‘Sun and Abraham’ estimator (see Table 1). Legislators lower their pitch  $-0.590$  and  $-0.645$  standard deviations when I use the two estimators, respectively. As expected from the event plot, the ATTs are similar in size. The magnitude of the ATTs is substantial and each classifies as ‘large’ ( $r = .50$ ) effect sizes (Gignac and Szodorai 2016). Converted to Hertz, the natural unit of vocal pitch, a magnitude of  $-0.50$  standard deviations corresponds to an average change in pitch of  $-12$  Hz. This only reinforces the strong support for

**Table 1:** ATT estimates using TWFE regression of dynamic difference-in-difference model and the Sun and Abraham (2021)-estimator.

	Dynamic DiD	Sun & Abraham
ATT	-0.590*** (0.055)	-0.645*** (0.117)
<i>N</i>	257290	257287
Adj. $R^2$	0.093	0.104
Within $R^2$	0.018	0.030
RMSE	0.95	0.95
<i>Fixed Effects:</i>		
Legislator	✓	✓
Year	✓	✓

+  $p < 0.1$ , \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

Standard errors clustered at the legislator-year level.

the main claim: Legislators lower their pitch significantly when they enter government.

## 5.2 Unpacking the Mechanism

While the pattern presented in the main analysis strongly supports the main prediction of vocal style-shifting, it is not year clear what drives this relationship. In this section, I present tests that seek to unpack the mechanism by disentangling competing accounts – accountability and functional constraints – from the theorized effect role constraints. I also investigate whether the proposed role effect is confounded with political experience, reflecting a learning effect.

### 5.2.1 Accountability Mechanism

The first competing explanation is *accountability*. This account posits that vocal style-shifting happens not because of role expectations but because politicians in their role as government mem-

bers face stronger accountability constraints from the electorate than members of the opposition. I conduct two tests of this competing mechanism: One using variation in debate types and one using partisan conflict.

For the first test, I take advantage of the fact that the parliamentary calendar features a set of debates that receive more attention than others. The Danish parliament has recurring ‘opening’ and ‘closing’ debates in which all legislators participate and where the debate is more ideological than the traditional lawmaking debates. The media covers these debates extensively, giving ‘opening’ and ‘closing’ debates a significantly larger audience to speak to. This allows government members to highlight and emphasize their record in office to the voters, who may view the debates directly or indirectly through media coverage.

If members of government adjust their vocal style as a response to accountability and not role constraints, vocal style-shifting should be heterogeneous to the type of debate. Specifically, the change in vocal pitch should be less pronounced (i.e., less negative) for debates with a larger audience (i.e., ‘opening’ and ‘closing’). This expectation follows [Osnabrügge et al. \(2021\)](#), who argue that while it is not universally beneficial for the average legislator to use emotive rhetoric, it is likely more beneficial in what they call ‘high-profile’ than in ‘low-profile’ debates.<sup>22</sup> This is also the case for government members, who are still expected to keep their calm more than the opposition but are more likely to be more emotional, here indicated by higher pitch (e.g., [Dietrich et al. 2019](#); [Rittmann 2023](#)), in high-profile than in low-profile debates.

To conduct this test, I construct an indicator marking whether a speech is given in a ‘high-profile’ (4 pct.) or in the reference category ‘low-profile’ (96. pct.) debate. Legislators who never held a governing role during the sample period are omitted from the analysis. Static TWFE regression estimates of government membership on the vocal pitch are then compared for legislators ‘before office’ and ‘in office’ using a split-sample strategy for high- and low-profile debates. I use a static two-way fixed effects (TWFE) regression instead of the dynamic variant due to power

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<sup>22</sup>In this labeling, ‘opening’ and ‘closing’ debates qualify as ‘high-profile’, whereas regular policy debates, such as reading bills, qualify as ‘low-profile’.

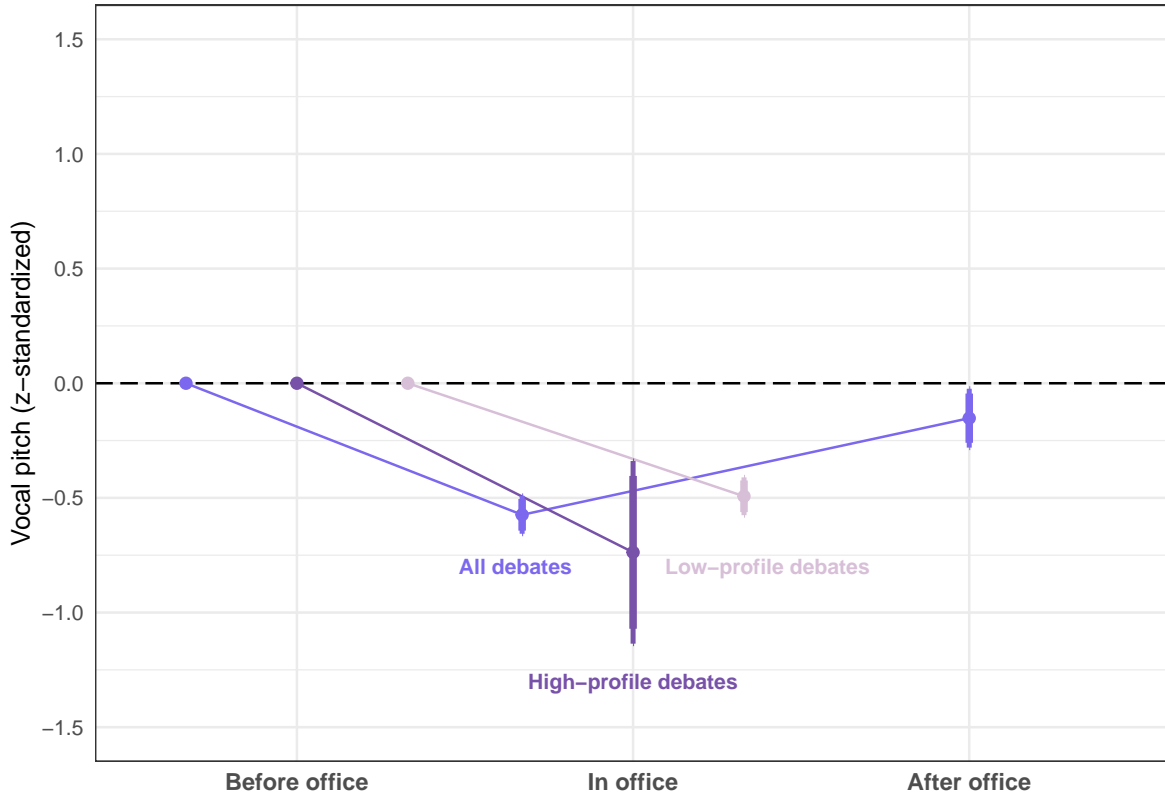
concerns, as only 4 pct. of the speeches are given in high-profile debates. The static approach leverages repeated spells in government, thereby increasing statistical power. Following the modeling strategy of Hjorth (2024), I consolidate repeated spells into a single period, omitting any intervening non-governing intervals. The start of the spell is defined as the first day a legislator assumes a governing role, and the end is the last day of their final spell in government. The results are presented in Figure 3.

Replicating the result from the main analysis, the estimate for ‘all debates’ echoes the general effect of government membership on vocal style. The same result is found for both ‘high profile debates’ and ‘low-profile debates’ where the estimates are similar in sign and nearly similar in size. Contrary to the expectations derived from the accountability mechanism, the estimate is even more negative for high-profile ( $\hat{\delta} = -0.738$ ) than for low-profile debates ( $\hat{\delta} = -0.493$ ). While this difference is not statistically significant when assessed in an interaction model (Table B2 in Appendix B.1), the magnitude of the estimates runs counter to the accountability mechanism and is more in line with the proposed theory of role constraints.<sup>23</sup> Considering that legislators on average speak with a vocal pitch of  $\approx 0.65$  standard deviations higher in high-profile than in low-profile debates (Table A1 in Appendix A), this further reinforces the interpretation of a role effect when legislators serving in government lower their pitch even more when the debate is high-profile.

For the second test, I consider how partisan conflict moderates the link between government membership and vocal style-shifting. If legislators adjust their vocal style as a response to accountability and not role constraints, this should show up when parties are polarized because heightened polarization intensifies the opposition’s scrutiny. Specifically, the accountability mechanism prescribes that the change in vocal pitch should be less pronounced (i.e., less negative) under conditions with higher levels of partisan polarization, as it prompts governments to defend their policy and performance (Jones 2010). This manifests in members of government speaking with a higher pitch, indicating greater emotional activation (e.g., Dietrich et al. 2019; Rittmann 2023), when the gov-

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<sup>23</sup>When I explicitly model repeated spells (Table B1 in Appendix B.1), i.e., do not collapse them to a single spell, the estimates are slightly less negative for high-profile ( $\Delta = 0.10$  SD) than for low-profile debates. Still, the estimates are similar in sign and magnitude, lending more support to the role than the accountability mechanism.



**Figure 3:** Vocal pitch as a function of government status and debate type. The coefficients are based on legislators who serve in government at some point during their career, omitting legislators who never join office. The “Before office” category acts as the reference category and is omitted in the estimation to avoid perfect collinearity. The estimates are shown for all debates and for split-samples using high-profile and low-profile debates. Only estimates for “In office” is reported. Estimates for “After office” reverts to “Before office” levels. All models are estimated with static TWFE regressions using clustered standard errors at the legislator-year level. Regression tables are in [Appendix B.1](#).

ernment and opposition are more polarized.

To analyze the explanatory power of this mechanism, I study dyadic exchanges in parliament, i.e., “instances where the speaker addresses a single party by name or an individual legislator from that party” ([Rask and Hjorth 2024](#), p. 7). I identify those dyadic exchanges and use them to study speeches with heightened polarization. Speech dyads are a prominent aspect of parliamentary debates with 35 pct. of exchanges classifying as dyadic (a total of 105,321). I define a polarizing dyad as one where the speaker targets a party from the ‘outbloc’.<sup>24</sup> During dyadic exchanges, the

<sup>24</sup>The use of blocs comes from the tradition of European multiparty systems, including the Danish case ([Kosiara-](#)

outbloc is targeted 59 pct. of the time. The analysis is conducted without further partitioning the data, keeping all legislators regardless of whether they have served in government. To estimate the moderating effect of polarization, I use a split-sample strategy for ‘inbloc’ and ‘outbloc’ speech dyads. I use static TWFE regressions to include repeated spells in the estimation. The results are reported in [Figure 4](#).

I first consider vocal pitch as a function of dyadic speech compared to non-dyadic speech. This is reported in [Table B3](#) in [Appendix B.2](#). Legislators in government lower their pitch by  $-0.398$  standard deviations in dyadic speeches and by  $-0.494$  in non-dyadic speeches. At first glance, this suggests that accountability influences vocal style through partisan polarization. However, when dyadic speeches are split into inbloc and outbloc speech dyads, this link disappears. As evident from the coefficients in [Figure 4](#), vocal pitch is fully invariant to whether a government member targets an inbloc or an outbloc party. This also leaves weak support for the accountability mechanism when polarization is considered as an alternative channel. Instead, it lends more support to the theorized mechanism of role constraints: Even in contexts of heightened polarization, where accountability constraints are more salient, government members maintain their composure.

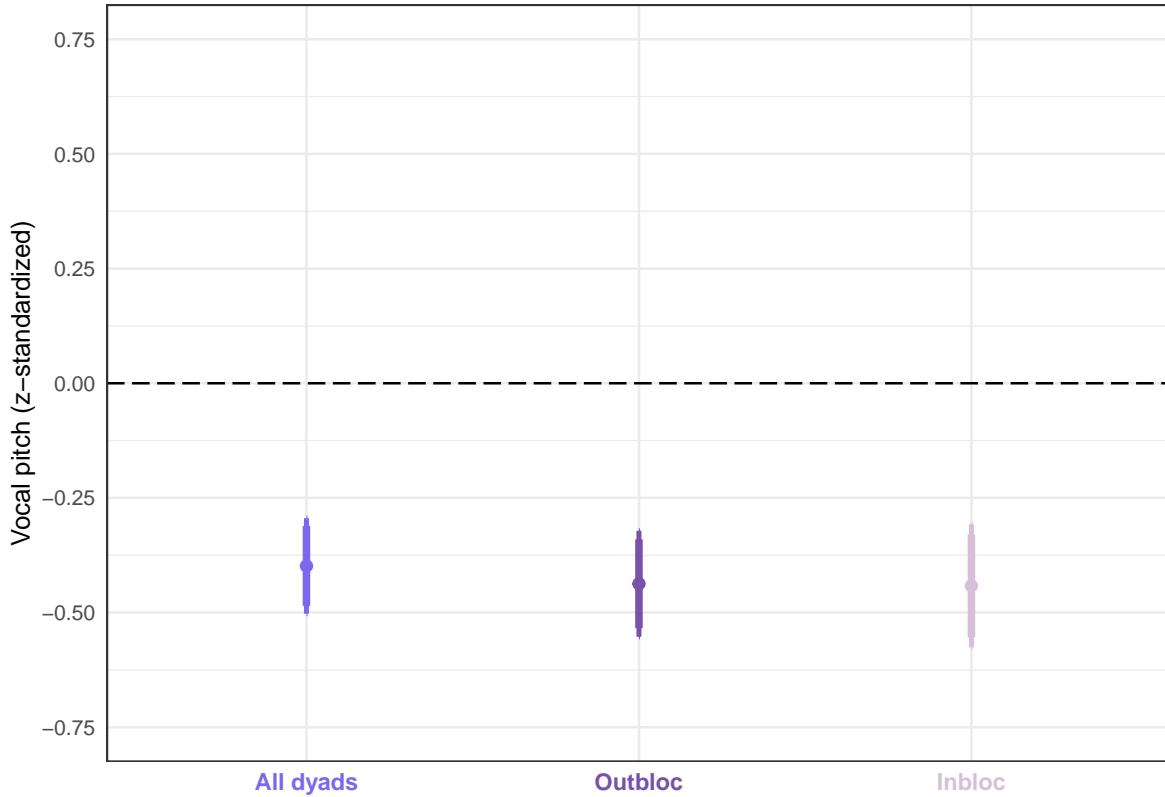
## 5.2.2 Functional Mechanism

The second competing explanation is functional demands. This account posits that vocal style-shifting occurs not because of role expectations but because politicians in their role as government have tasks and responsibilities that functionally constrain their vocal style more than that of members of the opposition. Following the distinction proposed by [Hjorth \(2024\)](#), I test whether a legislator’s vocal style responds more to formal or subjective functional constraints than to role constraints.

To assess the merits of the formal functional role mechanism, I revert to the ‘opening’ and ‘closing’ debates, which in addition to drawing extensive media coverage and thus reaching a

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[Pedersen and Kurrild-Klitgaard 2018](#)), which are structured around blocs of ideologically similar parties more than around individual parties like in the US Congress.



**Figure 4:** Vocal pitch as a function of government membership. The models are based on dyadic exchanges only and are estimated with TWFE regressions split-sampled on whether the speech targets an ‘inbloc’ or an ‘outbloc’. The sample includes repeated spells. Standard errors are clustered at the legislator-year level. Regression tables corresponding to the estimates in the figure are found in [Appendix B.2](#).

larger audience revolve around principled policy rather than legislation. Because of this, members of governments are not tasked with reading out legislation and therefore have “no formal constraints on speech” (Hjorth 2024, p. 21). If vocal style-shifting happens mostly because of formal functional constraints and not a role effect, this would suggest that legislators in a governing role lower their pitch in low-profile debates but not in high-profile debates. As already established in [Figure 3](#), this is not what happens. Legislators lower their pitch even more in high-profile than in low-profile debates, which strongly indicates that formal functional constraints do not explain vocal style-shifting.

I now turn to the merits of the mechanism of subjective functional constraints. Where formal constraints refer to the formality of speeches, subjective constraints are concerned with their sub-

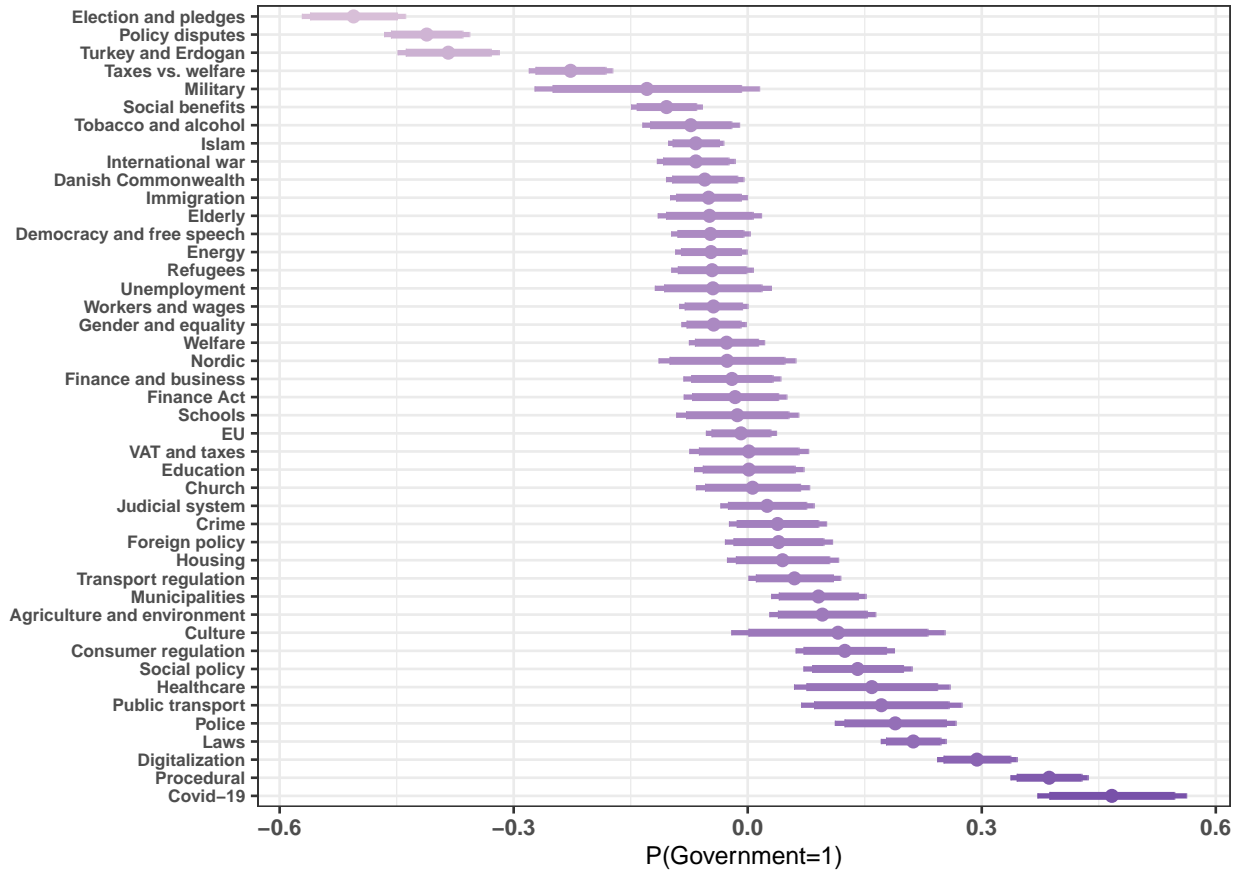


stance. I follow [Hjorth \(2024\)](#) and consider how this manifests in topic selection. To identify the topic of a speech, I estimate a Structural Topic Model (STM) with  $K = 50$  topics and manually provide labels based on topic keywords for 45 of 50 topics. See [Appendix H](#) for more information about the estimation of speech topics and keywords.

A necessary condition for subjective constraints to drive the link between government membership and vocal style is that government membership is a sufficiently strong predictor of topic selection. To assess this precondition, I first fit a linear probability model (LPM) regressing government membership on each topic's speech share. Positive coefficients indicate that governments are more likely to raise a topic than oppositions, and negative coefficients vice versa. The probabilities are reported in [Figure 5](#). Topics associated with governments are characterized by general regulatory, legislative, and technical topics such as 'Procedural', 'Digitalization', and 'Laws'. The topic with the highest probability is 'Covid-19', indicating that governments are tasked with responding to crises such as a global pandemic. Topics that are negatively associated with governments include 'Election and pledges', 'Policy dispute', and 'Taxes and welfare', which are clearly more ideological, emotive, and polarizing than the topics that are positively associated with governments.

These results strongly suggest that governments face different subjective functional constraints than oppositions. However, this does not mean that subjective constraints translate into a different vocal style, only that governments and oppositions emphasize different issues. To test this, I re-estimate the dynamic difference-in-difference model in [\(1\)](#), this time with topic fixed effects  $\lambda_i$ . This means that changes in vocal style not only vary within a legislator and the year of a speech but also within topics. If topics drive the change in vocal style as legislators enter government, the effect observed in [Figure 2](#) should vanish or at the very least diminish. Due to the similarity between the TWFE regression estimator and the [Sun and Abraham \(2021\)](#) estimator, I estimate the model using the former. As in the main analysis, I only consider a legislator's first spell in office (if any). The results are reported as an event study in [Figure 6](#).

As evident from the event study estimates, the link between government membership and vocal style appear fully unrelated to the subjective constraints faced by governments. While governments

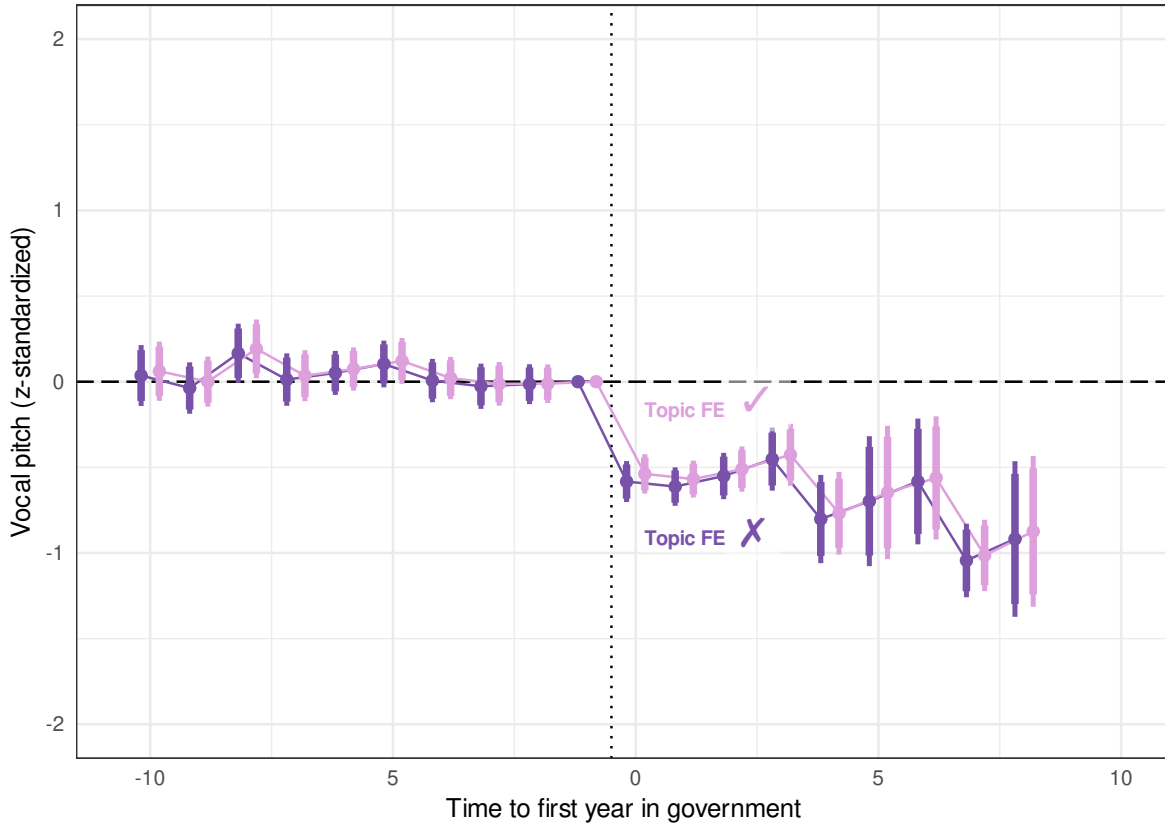


**Figure 5:** Ranking of topics by association with government membership. The topics are from an STM model with  $k = 50$  (44 of 45 labeled topics shown), sorted by the association with government membership. Topic labeled ‘LGBT’ is excluded due to a diminishing share for all but few speeches. The coefficients are from linear probability models (LPMs) where the outcome is whether the speech is given by a government member or not, and the predictor is the STM topic share. Positive values indicate government-oriented topics, and negative values indicate opposition-oriented topics. Confidence intervals are reported using 90 (thick) and 95 (thin) pct., respectively. See [Appendix H](#) for topic keywords associated with each manually labeled topic.

are obligated to talk about different topics than oppositions (see [Figure 5](#)) due to their decision-making capability and executive power, this does not factor into how legislators adjust their vocal style when they enter government.

### 5.2.3 Learning Mechanism

So far, the unpacking of the theoretical mechanism lends more support to the hypothesized role effect than explanations favoring accountability and functional constraints. However, what appears



**Figure 6:** Event-study estimates by the relative time to the first year in office shown for models with ‘Topic ✓’ and without ‘Topic X’ fixed effects. The model specification is similar to (1) augmented with topic fixed effects  $\lambda_i$ . I use TWFE OLS regression and clustered standard errors at the legislator-year level. Confidence intervals are reported using 90 (thick) and 95 (thin) pct., respectively. Note that the x-axis is censored at  $\tau = -10$  for presentational purposes.

to be a role effect might reflect an underlying learning effect. Over time, politicians learn to navigate politics and learn how they should express and present themselves. Because legislators who serve in government often have more political experience, seniority might explain vocal style-shifting more than role expectations. In the corpus, average seniority is 7.97 years for opposition members and 13.73 for government members.

This explanation finds strong anecdotal evidence. In the United Kingdom, former PM from the Conservative Party, Margaret Thatcher, attended voice coaching to learn to display a more powerful character and persona (Moore 2013). In Denmark, former PM from the Social Democrats, Helle Thorning-Schmidt, attended voice training to heighten her pitch to avoid backlash due to

her voice being too bright.<sup>25</sup> In the United States, political candidates are known for learning how to shift their voice based on the demographics of the audience (Amira et al. 2018; Ash et al. 2020; Neumann 2020; Zárate 2023). While these examples illustrate the potential learning effect, it cannot be distinguished from the role effect.

To disentangle the two mechanisms, I exploit that the temporal span of the corpus implies that legislators serving in government are often observed *before*, *in*, and *after* office. If vocal style-shifting reflects a learning effect, legislators should gradually lower their pitch (i.e., continuously) throughout their career and maintain the same vocal style after leaving office. If it reflects a role effect, legislators should lower their pitch immediately (i.e., discontinuously) when entering government and revert to the same vocal style when leaving office.

To assess the merits of these rivaling observable implications, I start by qualitatively consulting the main results. The event plot in Figure 2 leans more towards the role than the learning mechanism. The abrupt lowering of the pitch from one year to the next is more in line with the observable implication suggested by the hypothesized role mechanism. The learning effect is theoretically inconsistent with the parallel trends assumptions as it would prescribe that parts of the pre-trends should be significant, especially the leads close to the treatment (i.e., entering government).

To assess the same implication quantitatively, I partition the data similarly to testing the accountability mechanism with variation in debate type. I specify a TWFE regression with a predictor denoting the government status for a legislator: ‘before office’, ‘in office’, and ‘after office’. Note that office refers to being in government and not whether a legislator is elected. The results are reported in Figure 3 indicated with ‘all debates’. The statistical analysis echoes the qualitative analysis. As already established, legislators lower their pitch ( $\hat{\delta} = -0.574$ ) standard deviations when they enter office compared to before entering office. However, inconsistent with the learning mechanism, the pitch heightens substantially when legislators leave office and reverts nearly to pre-office level. This V-pattern is not in line with the learning effect, but lends more support to a role effect.

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<sup>25</sup><https://www.alt.dk/artikler/helle-thorning-schmidt-om-politik-koen-og-london/3160249>.

### 5.3 Auxiliary Results

Beyond the tests already presented in the empirical results, I conduct a series of auxiliary analyses to further probe the robustness of the results and mechanism and to explore heterogeneities. In [Appendix A](#), I augment the ‘dynamic’ difference-in-difference specification in (1) with time-varying controls and covariates for textual components of speeches. As time-varying controls, I include measures of a legislator’s age, seniority, party’s government status, partisan conflict, and type of debate. As text controls, I include measures of sentiment, emotionality, complexity. Speech topic is also included as a textual control but as fixed effects.

Including age and seniority takes potential life-cycle changes in vocal style into account ([Stathopoulos et al. 2011](#)) and accounts for changes in legislators’ career paths ([Bailer and Ohmura 2018](#)). Including a legislator’s party’s government status explicitly models that legislators from governing parties who do not serve in government might not be a relevant counterfactual to legislators from governing parties who serve in government. As shown in [Appendix A](#) in [Table A1](#), this has no effect on the relationship. Measures of partisan conflict and debate type are included to account for variations in accountability constraints. Textual covariates are incorporated to isolate the vocal communication of power from the verbal channel. Vocal style is conceptualized as a distinct mode of conveying political power, expected to persist even after control for the textual content of the speech. To test this, sentiment is used to capture tone, readability serves as a proxy for complexity, and emotionality is treated as a separate rhetorical dimension that may differentiate governments from oppositions ([Gennaro and Ash 2022](#)). Additionally, the speech topic is used as a control to rule out potential confounding effects related to agenda-setting power.

The main result is robust to the inclusion of all time-varying and textual covariates, with all signs behaving as expected ([Table A1](#)). The effect of government membership is largely invariant to the inclusion of time-varying covariates and fully invariant to the inclusion of textual covariates. This reinforces the notion that vocal style is a separate and important channel of communicating political power independently of the verbal components of political speeches. In [Appendix G](#), I further show that when the effect of government membership is considered for, on the one hand,

vocal pitch, and on the other, sentiment, emotionality, and complexity, vocal pitch reacts more to entering government than the textual measures.

The appendix also contains a series of tests aiming at exploring heterogeneities in the relationship. [Appendix F](#) estimates the effect of government membership on vocal style separately for governing parties. This is equivalent to using fixed effects for parties, capturing potential heterogeneity with respect to ideology. As shown in [Figure F1](#), the effect is invariant to the party. While effect sizes are less negative for right-wing ('V' and 'KF') than left-wing parties ('S' and 'SF'), the differences are neither substantially nor statistically significant. I also explore gender heterogeneity by estimating the model in (1) separately for male and female politicians. The analysis reveals no significant gender differences in how politicians adjust their vocal style when serving in government versus the opposition.

## 6 Conclusion and Discussion

It is well known that governments face both an electoral and a rhetorical cost of governing, which gives governments a disadvantage vis-à-vis oppositions. However, governing also comes with rhetorical rewards. This paper offers a novel perspective on the rewards of governing. Drawing on role congruity theory, I argue that politicians adjust their vocal style when assuming governing roles to signal traits like competence, dominance, and composure to align with their role expectations. Because a trait like competence is universally valued, because dominance is valued in leaders with decision-making power, and because composure is valued specifically in politicians assuming governing roles, vocal style-shifting allows politicians to reap the rhetorical rewards of governing and gives governments a rhetorical advantage over the opposition that potentially counters their rhetorical disadvantages.

I provide compelling evidence consistent with the theory of role effect using a novel multi-modal corpus containing text-audio data from more than twenty years of parliamentary speeches in Denmark. Using legislator-standardized vocal pitch as a measure of vocal style, I document

a strong negative effect of government membership on the vocal pitch. When legislators enter government, they lower their vocal pitch by more than half a standard deviation compared to their average, a statistically and substantially significant effect. In disentangling the mechanism behind vocal style-shifting, I report strong support in favor of the hypothesized role effect. Consistent with the role mechanism, the effect persists almost entirely when accountability and functional constraints, such as partisan polarization and agenda-setting power, are taken into account.

Before spelling out the study's implications, it is worth considering its limitations. First, using only average speech-level vocal pitch – a single auditory feature – to characterize vocal style is a coarse and crude approach that does not capture all aspects of vocal style. Using a richer set of auditory features or modeling different vocal styles might yield a more nuanced and complete characterization. While average speech-level vocal pitch accounts for more than 80 pct. of the variation in vocal modulation, another prominent and persuasive component of speech delivery, in the corpus, a richer set of features still enhances the measure of vocal style.

Second, the external validity of the results is a possible concern. While I expect role effects to operate across political systems, other mechanisms such as accountability and functional constraints might vary between contexts and eat some of the variation caused by role expectations. Notwithstanding, the case of Denmark is more a least-likely than a most-likely case for a role effect. The Danish government has a strong tradition of appointing ministers among elected officials, making the executives directly accountable to the constituents. Furthermore, ministers have several functional tasks. Still, we need future work to evaluate the generalizability of the theorized role effect. In particular, the external validity might be relevant in assessing the gendered effects of role expectations.

Third, and most importantly, the theoretical driver underpinning the mechanism of a role effect is not explicitly tested. The paper draws on work from psychology on voice perceptions, arguing that vocal pitch signals traits valued in political leaders. Contrary to this literature, I study how the *same* politician varies the vocal pitch, positing that a politician, independent of the baseline pitch, can shape perceptions of competence, dominance, and composure. The link between voice per-

ceptions and within-variation is not directly tested in the paper but relies on theoretical arguments. This can be tested with a survey experiment that manipulates the pitch of the same politician. This approach, however, might be complicated due to questions of pretreatment effects since voice perceptions might be sticky.

These limitations and caveats notwithstanding, the paper holds important implications. First, it provides systematic evidence that political power is transmitted by not only what politicians say but also by how they say it. Even though the link between voice and power has been noted since Ancient Greece and Aristotle and has been documented consistently in psychology, political science has not studied the voicing of power as an outcome. To the extent that politicians are able to shape perceptions of their qualities as leaders, this might impact democratic accountability so far that perceptions are unrelated to actual qualities. This suggests that politicians can trick voters into thinking they are good leaders by shaping perceptions through their vocal style. If vocal style is unrelated to actual ability as indicated by [Klofstad and Anderson \(2018\)](#), this might reduce democratic accountability as voters are not able to hold incompetent politicians accountable. This is an important question to study for future research.

Second, the results enrich our understanding of the incumbency advantage, i.e., that incumbents tend to hold an advantage over challengers in elections. The theory put forward in this paper suggests that politicians can engage in vocal style-shifting when assuming governing roles to signal traits like competence, dominance, and composure. Because these traits are valued in political leaders, signaling those traits might help sustain the incumbency advantage. The potential link between vocal style and the incumbency advantage is an intriguing topic for future research, particularly due to the large effect sizes documented in this paper. The magnitude of the effects might suggest that vocal style is a prominent rather than a marginal component of the advantage.

Third and finally, the results have implications for our understanding of populist parties' struggles to maintain electoral support. Populist leaders often gain traction by using vocal styles that emphasize emotionality, passion, and defiance, aligning with their anti-establishment rhetoric. However, when they enter the mainstream, the shift in vocal style to meet leadership expectations and



traits expected by officeholders – such as signaling competence and composure – might undermine the core nature of populist rhetorical style. To the extent that the link between vocal style and political roles not only works in terms of governing and non-governing but also campaign vs. parliament, this shift could alienate their core supporters, who expect populists to maintain their fiery, conflictual tone. As a result, populist politicians may lose their distinct appeal, and voters may perceive them as inconsistent or too similar to the political establishment they once challenged, contributing to their electoral difficulties. This, along with the other raised implications, is promising avenues for future research.

## References

- Adams, James, Samuel Merrill III, Elizabeth N Simas, and Walter J Stone. 2011. “When candidates value good character: A spatial model with applications to congressional elections”. *The Journal of Politics* 73 (1): 17–30.
- Amira, Karyn, Christopher A Cooper, H Gibbs Knotts, and Claire Wofford. 2018. “The southern accent as a heuristic in American campaigns and elections”. *American Politics Research* 46 (6): 1065–1093.
- Anderson, Rindy C and Casey A Klofstad. 2012. “Preference for leaders with masculine voices holds in the case of feminine leadership roles”. *PloS one* 7 (12): e51216.
- Ansolabehere, Stephen, James M Snyder Jr, and Charles Stewart III. 2000. “Old voters, new voters, and the personal vote: Using redistricting to measure the incumbency advantage”. *American Journal of Political Science*: 17–34.
- Ash, Elliott, Johann Krümmel, and Jonathan B Slapin. 2024. “Gender and reactions to speeches in german parliamentary debates”. *American Journal of Political Science*.
- Ash, Kathleen, Wesley Johnson, Gracie Lagadinos, Sarah Simon, Jared Thomas, Evan Wright, and Jason Gainous. 2020. “Southern Accents and Partisan Stereotypes: Evaluating Political Candidates”. *Social Science Quarterly* 101 (5): 1951–1968.
- Ashton, Benjamin H and B Kal Munis. 2021. “Information valence and evaluations of congress and individual legislators: experimental evidence regarding negativity bias in politics”. *Legislative Studies Quarterly* 46 (2): 525–558.
- Bäck, Hanna and Marc Debus. 2019. “When do women speak? a comparative analysis of the role of gender in legislative debates”. *Political Studies* 67 (3): 576–596.

- Bailer, Stefanie, Christian Breunig, Nathalie Giger, and Andreas M Wüst. 2022. “The diminishing value of representing the disadvantaged: Between group representation and individual career paths”. *British Journal of Political Science* 52 (2): 535–552.
- Bailer, Stefanie and Tamaki Ohmura. 2018. “Exploring, maintaining, and disengaging—the three phases of a legislator’s life”. *Legislative Studies Quarterly* 43 (3): 493–520.
- Baker, Andrew C, David F Larcker, and Charles CY Wang. 2022. “How much should we trust staggered difference-in-differences estimates?”. *Journal of Financial Economics* 144 (2): 370–395.
- Banai, Irena Pavela, Benjamin Banai, and Kosta Bovan. 2017. “Vocal characteristics of presidential candidates can predict the outcome of actual elections”. *Evolution and Human Behavior* 38 (3): 309–314.
- Banse, Rainer and Klaus R Scherer. 1996. “Acoustic profiles in vocal emotion expression.”. *Journal of personality and social psychology* 70 (3): 614.
- Bänziger, Tanja and Klaus R Scherer. 2005. “The role of intonation in emotional expressions”. *Speech communication* 46 (3-4): 252–267.
- Bechtel, Michael M and Jens Hainmueller. 2011. “How lasting is voter gratitude? an analysis of the short-and long-term electoral returns to beneficial policy”. *American journal of political science* 55 (4): 852–868.
- Behrens, Lion, Dominic Nyhuis, and Thomas Gschwend. 2023. “Political ambition and opposition legislative review: Bill scrutiny as an intra-party signaling device”. *European Journal of Political Research*.
- Bischof, Daniel and Roman Senninger. 2018. “Simple politics for the people? Complexity in campaign messages and political knowledge”. *European Journal of Political Research* 57 (2): 473–495.

- Blei, David and John Lafferty. 2006. “Correlated topic models”. *Advances in neural information processing systems* 18 : 147.
- Blei, David M, Andrew Y Ng, and Michael I Jordan. 2003. “Latent dirichlet allocation”. *Journal of machine Learning research* 3 (Jan): 993–1022.
- Blomgren, Magnus and Olivier Rozenberg. 2015. “Legislative roles and legislative studies: the neo-institutionalist turning point?”. In *Parliamentary roles in modern legislatures*, pp. 8–36. Routledge.
- Bøggild, Troels and Helene Helboe Pedersen. 2024. “The legislative cost of ruling: Voter punishment of governing parties fuels legislator party dissent”. *European Journal of Political Research* 63 (1): 132–152.
- Borusyak, Kirill, Xavier Jaravel, and Jann Spiess. 2024. “Revisiting event-study designs: robust and efficient estimation”. *Review of Economic Studies*: rdae007.
- Boussalis, Constantine, Travis G Coan, Mirya R Holman, and Stefan Müller. 2021. “Gender, candidate emotional expression, and voter reactions during televised debates”. *American Political Science Review* 115 (4): 1242–1257.
- Bräuninger, Thomas and Marc Debus. 2009. “Legislative agenda-setting in parliamentary democracies”. *European Journal of Political Research* 48 (6): 804–839.
- Bucy, Erik P. 2000. “Emotional and evaluative consequences of inappropriate leader displays”. *Communication research* 27 (2): 194–226.
- Bucy, Erik P. 2016. “The look of losing, then and now: Nixon, obama, and nonverbal indicators of opportunity lost”. *American Behavioral Scientist* 60 (14): 1772–1798.
- Callaway, Brantly and Pedro HC Sant’Anna. 2021. “Difference-in-differences with multiple time periods”. *Journal of econometrics* 225 (2): 200–230.

- Cheng, Joey T, Jessica L Tracy, Simon Ho, and Joseph Henrich. 2016. “Listen, follow me: Dynamic vocal signals of dominance predict emergent social rank in humans.”. *Journal of Experimental Psychology: General* 145 (5): 536.
- Costa, Mia. 2021. “Ideology, not affect: What americans want from political representation”. *American Journal of Political Science* 65 (2): 342–358.
- Cox, Gary W and Jonathan N Katz. 1996. “Why did the incumbency advantage in us house elections grow?”. *American journal of political science*: 478–497.
- Crabtree, Charles, Matt Golder, Thomas Gschwend, and Indriði H Indriðason. 2020. “It is not only what you say, it is also how you say it: The strategic use of campaign sentiment”. *The Journal of Politics* 82 (3): 1044–1060.
- Cuzán, Alfred G. 2015. “Five laws of politics”. *PS: Political Science & Politics* 48 (3): 415–419.
- Dahlgaard, Jens Olav. 2016. “You just made it: Individual incumbency advantage under proportional representation”. *Electoral Studies* 44 : 319–328.
- Damann, Taylor J, Dean Knox, and Christopher Lucas. 2024. “A framework for studying causal effects of speech style: Application to u.s. presidential campaigns”.
- Darwin, Charles. 1872. *The expression of the emotions in man and animals*. University of Chicago press.
- De Chaisemartin, Clément and Xavier d’Haultfoeuille. 2020. “Two-way fixed effects estimators with heterogeneous treatment effects”. *American economic review* 110 (9): 2964–2996.
- Decadri, Silvia and Constantine Boussalis. 2020. “Populism, party membership, and language complexity in the italian chamber of deputies”. *Journal of Elections, Public Opinion and Parties* 30 (4): 484–503.
- Denny, Matthew J and Arthur Spirling. 2018. “Text preprocessing for unsupervised learning: Why it matters, when it misleads, and what to do about it”. *Political Analysis* 26 (2): 168–189.

- Dietrich, Bryce J, Ryan D Enos, and Maya Sen. 2019. "Emotional arousal predicts voting on the us supreme court". *Political Analysis* 27 (2): 237–243.
- Dietrich, Bryce J, Matthew Hayes, and Diana Z O'Brien. 2019. "Pitch perfect: Vocal pitch and the emotional intensity of congressional speech". *American Political Science Review* 113 (4): 941–962.
- Dynes, Adam M and John B Holbein. 2020. "Noisy retrospection: The effect of party control on policy outcomes". *American Political Science Review* 114(1): 237–257.
- Eagly, Alice H and Amanda B Diekmann. 2005. "What is the problem? prejudice as an attitude-in-context". *On the nature of prejudice: Fifty years after Allport*: 19–35.
- Eagly, Alice H and Steven J Karau. 2002. "Role congruity theory of prejudice toward female leaders.". *Psychological review* 109 (3): 573.
- Enelow, James M and Melvin J Hinich. 1982. "Nonspatial candidate characteristics and electoral competition". *The Journal of Politics* 44 (1): 115–130.
- Erikson, Robert S. 1971. "The advantage of incumbency in congressional elections". *Polity* 3 (3): 395–405.
- Eulau, Heinz and Paul D Karps. 1977. "The puzzle of representation: Specifying components of responsiveness". *Legislative Studies Quarterly*: 233–254.
- Eulau, Heinz, John C Wahlke, William Buchanan, and Leroy C Ferguson. 1959. "The role of the representative: Some empirical observations on the theory of edmund burke". *American Political Science Review* 53 (3): 742–756.
- Evans, Geoffrey and Robert Andersen. 2006. "The political conditioning of economic perceptions". *The Journal of Politics* 68 (1): 194–207.

- Feinberg, David R. 2008. "Are human faces and voices ornaments signaling common underlying cues to mate value?". *Evolutionary Anthropology: Issues, News, and Reviews: Issues, News, and Reviews* 17 (2): 112–118.
- Fenno, Richard. 1978. *Homestyle: Members of Congress in Their Constituencies*. Boston, MA: Addison Wesley.
- Fiorina, Morris P. 1978. "Economic retrospective voting in american national elections: A micro-analysis". *American Journal of political science*: 426–443.
- Fiorina, Morris P and Samuel J Abrams. 1981. *Retrospective Voting in American National Elections*. Yale University Press.
- Fiske, Susan T, Amy JC Cuddy, Peter Glick, and Jun Xu. 2002. "A model of (often mixed) stereotype content: competence and warmth respectively follow from perceived status and competition.". *Journal of personality and social psychology* 82 (6): 878.
- Fowler, Anthony and Andrew Hall. 2014. "Disentangling the personal and partisan incumbency advantages: Evidence from close elections and term limits". *Quarterly Journal of Political Science* 9 (4): 501–531.
- Fox, Anthony. 2002. *Prosodic features and prosodic structure: The phonology of 'suprasegmentals'*. OUP Oxford.
- Fulton, Sarah A. 2014. "When gender matters: Macro-dynamics and micro-mechanisms". *Political Behavior* 36 : 605–630.
- Funk, Carolyn L. 1997. "Implications of political expertise in candidate trait evaluations". *Political Research Quarterly* 50 (3): 675–697.
- Galeotti, Fabio and Daniel John Zizzo. 2018. "Identifying voter preferences: The trade-off between honesty and competence". *European Economic Review* 105 : 27–50.

- Gelman, Andrew and Gary King. 1990. "Estimating incumbency advantage without bias". *American Journal of Political Science*: 1142–1164.
- Gennaro, Gloria and Elliott Ash. 2022. "Emotion and reason in political language". *The Economic Journal* 132 (643): 1037–1059.
- Gignac, Gilles E and Eva T Szodorai. 2016. "Effect size guidelines for individual differences researchers". *Personality and individual differences* 102 : 74–78.
- Golden, Miriam A. and Lucio Picci. 2015. "Incumbency effects under proportional representation: Leaders and backbenchers in the postwar Italian chamber of deputies". *Legislative Studies Quarterly* 40 (4): 509–538.
- Goodman-Bacon, Andrew. 2021. "Difference-in-differences with variation in treatment timing". *Journal of econometrics* 225 (2): 254–277.
- Green, Jane and Will Jennings. 2017. *The politics of competence: Parties, public opinion and voters*. Cambridge University Press.
- Green-Pedersen, Christoffer and Peter B Mortensen. 2010. "Who sets the agenda and who responds to it in the Danish parliament? a new model of issue competition and agenda-setting". *European Journal of Political Research* 49 (2): 257–281.
- Green-Pedersen, Christoffer, Peter B Mortensen, and Florence So. 2018. "The agenda-setting power of the prime minister party in coalition governments". *Political Research Quarterly* 71 (4): 743–756.
- Green-Pedersen, Christoffer and Lisbeth Hoffmann Thomsen. 2005. "Bloc politics vs. broad cooperation? The functioning of Danish minority parliamentarism". *The Journal of Legislative Studies* 11 (2): 153–169.



- Greene, Zachary and Diana Z O'Brien. 2016. "Diverse parties, diverse agendas? female politicians and the parliamentary party's role in platform formation". *European Journal of Political Research* 55 (3): 435–453.
- Gregory Jr, Stanford W and Timothy J Gallagher. 2002. "Spectral analysis of candidates' nonverbal vocal communication: Predicting US presidential election outcomes". *Social Psychology Quarterly*: 298–308.
- Hainmueller, Jens and Holger Lutz Kern. 2008. "Incumbency as a source of spillover effects in mixed electoral systems: Evidence from a regression-discontinuity design". *Electoral studies* 27 (2): 213–227.
- Harcup, Tony and Deirdre O'neill. 2017. "What is news? news values revisited (again)". *Journalism studies* 18 (12): 1470–1488.
- Hargrave, Lotte. 2023. "Earning their stripes? how political experience shapes gendered policy prioritization". *Legislative Studies Quarterly*.
- Haselmayer, Martin and Marcelo Jenny. 2017. "Sentiment analysis of political communication: Combining a dictionary approach with crowdcoding". *Quality & quantity* 51 : 2623–2646.
- Haselmayer, Martin, Thomas M Meyer, and Markus Wagner. 2019. "Fighting for attention: Media coverage of negative campaign messages". *Party Politics* 25 (3): 412–423.
- Healy, Andrew and Neil Malhotra. 2013. "Retrospective voting reconsidered". *Annual review of political science* 16 (1): 285–306.
- Hess, Wolfgang J. 2008. "Pitch and voicing determination of speech with an extension toward music signals". *Springer handbook of speech processing*: 181–212.
- Hix, Simon and Abdul Noury. 2016. "Government-opposition or left-right? The institutional determinants of voting in legislatures". *Political Science Research and Methods* 4 (2): 249–273.

- Hjorth, Frederik. 2024. "Losing touch: The rhetorical cost of governing".
- Imai, Kosuke and In Song Kim. 2021. "On the use of two-way fixed effects regression models for causal inference with panel data". *Political Analysis* 29 (3): 405–415.
- Ishima, Hideo. 2024. "Talking like opposition parties? electoral proximity and language styles employed by coalition partners in a mixed member majoritarian system". *Legislative Studies Quarterly* 49 (3): 721–740.
- Jennings, Will, Shaun Bevan, Arco Timmermans, Gerard Breeman, Sylvain Brouard, Laura Chaqués-Bonafont, Christoffer Green-Pedersen, Peter John, Peter B Mortensen, and Anna M Palau. 2011. "Effects of the core functions of government on the diversity of executive agendas". *Comparative Political Studies* 44 (8): 1001–1030.
- Jones, David R. 2010. "Partisan polarization and congressional accountability in house elections". *American Journal of Political Science* 54 (2): 323–337.
- Jordan, Nehemiah. 1965. "The asymmetry of liking and disliking: A phenomenon meriting further reflection and research". *The Public Opinion Quarterly* 29 (2): 315–322.
- Kahneman, Daniel and Amos Tversky. 2013. "Prospect theory: An analysis of decision under risk". In *Handbook of the fundamentals of financial decision making: Part I*, pp. 99–127. World Scientific.
- Kinder, Donald R. 1986. "Presidential character revisited". In *Political cognition: The 19th annual Carnegie symposium on cognition/Lawrence Erlbaum Associates*.
- King, Anthony. 1976. "Modes of executive-legislative relations: Great Britain, France, and West Germany". *Legislative Studies Quarterly*: 11–36.
- Klašnja, Marko and Rocío Titiunik. 2017. "The incumbency curse: Weak parties, term limits, and unfulfilled accountability". *American Political Science Review* 111 (1): 129–148.

- Klingler, Jonathan D, Gary E Hollibaugh, and Adam J Ramey. 2019. “What i like about you: Legislator personality and legislator approval”. *Political Behavior* 41 : 499–525.
- Klint, Thorkil, Anne Sofie Evert, Ulrik Kjær, Mogens N Pedersen, and Frederik Hjorth. 2023. “The danish legislators database”. *Electoral Studies* 84 : 102624.
- Klofstad, Casey A. 2016. “Candidate voice pitch influences election outcomes”. *Political psychology* 37 (5): 725–738.
- Klofstad, Casey A and Rindy C Anderson. 2018. “Voice pitch predicts electability, but does not signal leadership ability”. *Evolution and human behavior* 39 (3): 349–354.
- Klofstad, Casey A, Rindy C Anderson, and Stephen Nowicki. 2015. “Perceptions of competence, strength, and age influence voters to select leaders with lower-pitched voices”. *PLoS one* 10 (8): e0133779.
- Klofstad, Casey A, Rindy C Anderson, and Susan Peters. 2012. “Sounds like a winner: voice pitch influences perception of leadership capacity in both men and women”. *Proceedings of the Royal Society B: Biological Sciences* 279 (1738): 2698–2704.
- Klofstad, Casey A, Stephen Nowicki, and Rindy C Anderson. 2016. “How voice pitch influences our choice of leaders: when candidates speak, their vocal characteristics—as well as their words—influence voters’ attitudes toward them”. *American Scientist* 104 (5): 282–288.
- Knox, Dean and Christopher Lucas. 2021. “A dynamic model of speech for the social sciences”. *American Political Science Review* 115 (2): 649–666.
- Kosiara-Pedersen, Karina and Peter Kurrild-Klitgaard. 2018. “Change and stability in the Danish party system”. In *Party system change, the European crisis and the state of democracy*, pp. 63–79. Routledge.
- Kosmidis, Spyros, Sara B Hobolt, Eamonn Molloy, and Stephen Whitefield. 2019. “Party competition and emotive rhetoric”. *Comparative Political Studies* 52 (6): 811–837.

- Larsen, Kelsey L and Elizabeth A Stanley. 2021. "Leaders' windows of tolerance for affect arousal—and their effects on political decision-making during covid-19". *Frontiers in psychology* 12 : 749715.
- Lau, Richard R. 1982. "Negativity in political perception". *Political behavior* 4 : 353–377.
- Lau, Richard R. 1985. "Two explanations for negativity effects in political behavior". *American journal of political science*: 119–138.
- Lauridsen, Gustav Aarup, Jacob Aarup Dalsgaard, and Lars Kjartan Bacher Svendsen. 2019. "SENTIDA: A new tool for sentiment analysis in Danish". *Journal of Language Works-Sprogvidenskabeligt Studentertidsskrift* 4 (1): 38–53.
- Laustsen, Lasse and Alexander Bor. 2017. "The relative weight of character traits in political candidate evaluations: Warmth is more important than competence, leadership and integrity". *Electoral Studies* 49 : 96–107.
- Laustsen, Lasse and Asmus Leth Olsen. 2022. "Is a disease leader attractive? six tests of whether the covid-19 pandemic affected follower preferences for attractiveness, health and other traits in political and non-political leaders". *The Leadership Quarterly* 33 (6): 101574.
- Laustsen, Lasse and Michael Bang Petersen. 2015. "Does a competent leader make a good friend? conflict, ideology and the psychologies of friendship and followership". *Evolution and Human Behavior* 36 (4): 286–293.
- Laustsen, Lasse and Michael Bang Petersen. 2020. "Online tallies and the context of politics: How online tallies make dominant candidates appear competent in contexts of conflict". *American Journal of Political Science* 64 (2): 240–255.
- Laustsen, Lasse, Michael Bang Petersen, and Casey A Klobstad. 2015. "Vote choice, ideology, and social dominance orientation influence preferences for lower pitched voices in political candidates". *Evolutionary Psychology* 13 (3): 1474704915600576.

- Laver, Michael and Kenneth A Shepsle. 1996. *Making and Breaking Governments: Cabinets and Legislatures in Parliamentary Democracies*. Cambridge University Press.
- Lee, David S. 2008. “Randomized experiments from non-random selection in u.s. house elections”. *Journal of Econometrics* 142 (2): 675–697. The regression discontinuity design: Theory and applications.
- Li, Zikai and Anton Strezhnev. 2024. “A guide to dynamic difference-in-differences regressions for political scientists”.
- Liang, Che-Yuan. 2013. “Is there an incumbency advantage or cost of ruling in proportional election systems?”. *Public Choice* 154 : 259–284.
- Lijphart, Arend. 1999. *Patterns of democracy: Government forms and performance in thirty-six countries*. Yale University Press.
- Little, Anthony C. 2014. “Facial appearance and leader choice in different contexts: Evidence for task contingent selection based on implicit and learned face-behaviour/face-ability associations”. *The Leadership Quarterly* 25 (5): 865–874.
- Louwerse, Tom, Ulrich Sieberer, Or Tuttnauer, and Rudy B Andeweg. 2021. “Opposition in times of crisis: Covid-19 in parliamentary debates”. *West European Politics* 44 (5-6): 1025–1051.
- Mansbridge, Jane. 2003. “Rethinking representation”. *American political science review* 97 (4): 515–528.
- Marcus, George E. 2000. “Emotions in politics”. *Annual review of political science* 3 (1): 221–250.
- Martin, Lanny W. 2004. “The government agenda in parliamentary democracies”. *American Journal of Political Science* 48 (3): 445–461.
- Masters, Roger D and Denis G Sullivan. 1989. “Nonverbal displays and political leadership in france and the united states”. *Political behavior* 11 : 123–156.

- Mayhew, David R. 1974. *Congress: The electoral connection*. Yale university press.
- Merolla, Jennifer L and Elizabeth J Zechmeister. 2009. “Terrorist threat, leadership, and the vote: Evidence from three experiments”. *Political Behavior* 31 : 575–601.
- Mikolov, Tomas, Ilya Sutskever, Kai Chen, Greg S Corrado, and Jeff Dean. 2013. “Distributed representations of words and phrases and their compositionality”. *Advances in neural information processing systems* 26 .
- Mizuno, Nobuhiro and Ryosuke Okazawa. 2022. “Why do voters elect less qualified candidates?”. *Journal of Theoretical Politics* 34 (3): 443–477.
- Moore, Charles. 2013. *Margaret Thatcher: From Grantham to the Falklands*. Vintage.
- Mortensen, Peter Bjerre, Christoffer Green-Pedersen, Gerard Breeman, Laura Chaqués-Bonafont, Will Jennings, Peter John, Anna M Palau, and Arco Timmermans. 2011. “Comparing government agendas: Executive speeches in the netherlands, united kingdom, and denmark”. *Comparative Political Studies* 44 (8): 973–1000.
- Müller, Wolfgang C and Thomas Saalfeld. 1997. *Members of Parliament in Western Europe: roles and behaviour*. Psychology Press.
- Nannestad, Peter and Martin Paldam. 1997. “The grievance asymmetry revisited: A micro study of economic voting in denmark, 1986–1992”. *European Journal of Political Economy* 13 (1): 81–99.
- Nannestad, Peter and Martin Paldam. 2003. “The cost of ruling: A foundation stone for two theories”. In *Economic voting*, pp. 17–44. Routledge.
- Navarretta, Costanza and Dorte Haltrup Hansen. 2024. “Government and opposition in danish parliamentary debates”. In *Proceedings of the IV Workshop on Creating, Analysing, and Increasing Accessibility of Parliamentary Corpora (ParlaCLARIN)@ LREC-COLING 2024*, pp. 154–162.

- Neumann, Markus. 2019. "Hooked with phonetics: The strategic use of style-shifting in political rhetoric". In *Annual Meeting of the American Political Science Association. Washington, DC*.
- Neumann, Markus. 2020. "Nonverbal political communication in the us". *Working Paper*.
- Nielsen, Finn Årup. 2011. "A new anew: Evaluation of a word list for sentiment analysis in microblogs". *arXiv preprint arXiv:1103.2903*.
- Noble, Benjamin S. 2023. "Presidential cues and the nationalization of congressional rhetoric, 1973–2016". *American Journal of Political Science*.
- Osnabrügge, Moritz, Sara B Hobolt, and Toni Rodon. 2021. "Playing to the gallery: Emotive rhetoric in parliaments". *American Political Science Review* 115 (3): 885–899.
- Ostrom, Elinor. 2000. "Collective action and the evolution of social norms". *Journal of economic perspectives* 14 (3): 137–158.
- Pancer, S Mark, Bruce Hunsberger, Michael W Pratt, Sylvie Boisvert, and Don Roth. 1992. "Political roles and the complexity of political rhetoric". *Political Psychology*: 31–43.
- Paris, Celia. 2017. "Breaking down bipartisanship: when and why citizens react to cooperation across party lines". *Public Opinion Quarterly* 81 (2): 473–494.
- Pereira, Carlos and Bernardo Mueller. 2004. "The cost of governing: strategic behavior of the president and legislators in brazil's budgetary process". *Comparative Political Studies* 37 (7): 781–815.
- Peskowitz, Zachary. 2019. "Ideological signaling and incumbency advantage". *British Journal of Political Science* 49 (2): 467–490.
- Petersen, Michael Bang and Lasse Laustsen. 2020. "Dominant leaders and the political psychology of followership". *Current opinion in psychology* 33 : 136–141.

- Pipal, Christian, Bert N Bakker, Gijs Schumacher, and Mariken ACG van der Velden. 2024. “Tone in politics is not systematically related to macro trends, ideology, or experience”. *Scientific Reports* 14 (1): 3241.
- Pisanski, Katarzyna, Valentina Cartei, Carolyn McGettigan, Jordan Raine, and David Reby. 2016. “Voice modulation: a window into the origins of human vocal control?”. *Trends in cognitive sciences* 20 (4): 304–318.
- Pisanski, Katarzyna, Paul J Fraccaro, Cara C Tigue, Jillian JM O’Connor, Susanne Röder, Paul W Andrews, Bernhard Fink, Lisa M DeBruine, Benedict C Jones, and David R Feinberg. 2014. “Vocal indicators of body size in men and women: a meta-analysis”. *Animal Behaviour* 95 : 89–99.
- Pitkin, Hanna Fenichel. 1967. *The concept of representation*. University of California Press.
- Poljak, Željko and Annemarie S Walter. 2023. “Parties’ parliamentary attack behaviour throughout the electoral cycle”. *Party Politics*: 13540688231188476.
- Popkin, Samuel L. 1991. *The reasoning voter: Communication and persuasion in presidential campaigns*. University of Chicago Press.
- Proksch, Sven-Oliver, Will Lowe, Jens Wäckerle, and Stuart Soroka. 2019. “Multilingual sentiment analysis: A new approach to measuring conflict in legislative speeches”. *Legislative Studies Quarterly* 44 (1): 97–131.
- Puts, David Andrew, Steven JC Gaulin, and Katherine Verdolini. 2006. “Dominance and the evolution of sexual dimorphism in human voice pitch”. *Evolution and human behavior* 27 (4): 283–296.
- Raine, Jordan, Katarzyna Pisanski, Anna Oleszkiewicz, Julia Simner, and David Reby. 2018. “Human listeners can accurately judge strength and height relative to self from aggressive roars and speech”. *IScience* 4 : 273–280.



- Rask, Mathias. 2024a. “Automated annotation of political speech recordings”. *Working Paper*.
- Rask, Mathias. 2024b. “Committed but constrained: Explaining why the descriptive-to-substantive representation link weakens over time”. *Working Paper*.
- Rask, Mathias and Frederik Hjorth. 2024. “Partisan conflict in nonverbal communication”. *Working Paper*.
- Rauh, Christian and Jan Schwalbach. 2020. “The ParlSpeech V2 data set: Full-text corpora of 6.3 million parliamentary speeches in the key legislative chambers of nine representative democracies”.
- Rehfeld, Andrew. 2009. “Representation rethought: on trustees, delegates, and gyroscopes in the study of political representation and democracy”. *American political science review* 103 (2): 214–230.
- Rheault, Ludovic, Kaspar Beelen, Christopher Cochrane, and Graeme Hirst. 2016. “Measuring emotion in parliamentary debates with automated textual analysis”. *PloS one* 11 (12): e0168843.
- Rittmann, Oliver. 2023. “Legislators’ Emotional Engagement with Women’s Issues: Gendered Patterns of Vocal Pitch in the German Bundestag”. *Forthcoming in British Journal of Political Science*.
- Roberts, Margaret E, Brandon M Stewart, Dustin Tingley, Christopher Lucas, Jetson Leder-Luis, Shana Kushner Gadarian, Bethany Albertson, and David G Rand. 2014. “Structural topic models for open-ended survey responses”. *American journal of political science* 58 (4): 1064–1082.
- Roth, Jonathan, Pedro HC Sant’Anna, Alyssa Bilinski, and John Poe. 2023. “What’s trending in difference-in-differences? a synthesis of the recent econometrics literature”. *Journal of Econometrics* 235 (2): 2218–2244.
- Rozin, Paul and Edward B Royzman. 2001. “Negativity bias, negativity dominance, and contagion”. *Personality and social psychology review* 5 (4): 296–320.

- Russell, Meg and Philip Cowley. 2018. "Modes of uk executive–legislative relations revisited". *The Political Quarterly* 89 (1): 18–28.
- Saward, Michael. 2014. "Shape-shifting representation". *American Political Science Review* 108 (4): 723–736.
- Schoonvelde, Martijn, Anna Brosius, Gijs Schumacher, and Bert N Bakker. 2019. "Liberals lecture, conservatives communicate: Analyzing complexity and ideology in 381,609 political speeches". *PloS one* 14 (2): e0208450.
- Schwalbach, Jan. 2022. "Going in circles? the influence of the electoral cycle on the party behaviour in parliament". *European Political Science Review* 14 (1): 36–55.
- Seeberg, Henrik Bech. 2020. "The impact of opposition criticism on the public's evaluation of government competence". *Party Politics* 26 (4): 484–495.
- Seeberg, Henrik Bech. 2023. "The power of the loser: Evidence on an agenda-setting model of opposition policy influence". *European Journal of Political Research* 62 (2): 463–485.
- Serra, Gilles. 2010. "Polarization of what? A model of elections with endogenous valence". *The Journal of Politics* 72 (2): 426–437.
- Spirling, Arthur. 2016. "Democratization and linguistic complexity: The effect of franchise extension on parliamentary discourse, 1832–1915". *The Journal of Politics* 78 (1): 120–136.
- Stathopoulos, Elaine T, Jessica E Huber, and Joan E Sussman. 2011. "Changes in acoustic characteristics of the voice across the life span: Measures from individuals 4–93 years of age".
- Stokes, Donald E. 1963. "Spatial models of party competition". *American political science review* 57 (2): 368–377.
- Stone, Walter J and Elizabeth N Simas. 2010. "Candidate valence and ideological positions in us house elections". *American Journal of Political Science* 54 (2): 371–388.

- Strøm, Kaare. 1997. "Rules, reasons and routines: Legislative roles in parliamentary democracies". *The Journal of Legislative Studies* 3 (1): 155–174.
- Suedfeld, Peter and Philip Tetlock. 1977. "Integrative complexity of communications in international crises". *Journal of conflict resolution* 21 (1): 169–184.
- Sun, Liyang and Sarah Abraham. 2021. "Estimating dynamic treatment effects in event studies with heterogeneous treatment effects". *Journal of econometrics* 225 (2): 175–199.
- Tetlock, PE. 1985. "Accountability: The neglected social context of judgment and choice". *Research in Organizational Behavior* 7 .
- Tetlock, Philip E. 1981. "Pre-to postelection shifts in presidential rhetoric: Impression management or cognitive adjustment.". *Journal of Personality and Social Psychology* 41 (2): 207.
- Thesen, Gunnar, Christoffer Green-Pedersen, and Peter B Mortensen. 2024. "From bonus to burden: The cost of ruling from a new (s) perspective". *European Journal of Political Research*.
- Thesen, Gunnar, Peter B Mortensen, and Christoffer Green-Pedersen. 2020. "Cost of ruling as a game of tones: The accumulation of bad news and incumbents' vote loss". *European Journal of Political Research* 59 (3): 555–577.
- Tigue, Cara C, Diana J Borak, Jillian JM O'Connor, Charles Schandl, and David R Feinberg. 2012. "Voice pitch influences voting behavior". *Evolution and Human Behavior* 33 (3): 210–216.
- Titze, Ingo R. 1994. *Principles of Voice Production*. Prentice Hall.
- Tusing, Kyle James and James Price Dillard. 2000. "The sounds of dominance. Vocal precursors of perceived dominance during interpersonal influence". *Human Communication Research* 26 (1): 148–171.
- Tuttnauer, Or and Simone Wegmann. 2022. "Voting for votes: Opposition parties' legislative activity and electoral outcomes". *American Political Science Review* 116 (4): 1357–1374.

- Vainio, Martti, Antti Suni, Juraj Šimko, and Sofoklis Kakouros. 2023. “The power of prosody and prosody of power: An acoustic analysis of finnish parliamentary speech”. *arXiv preprint arXiv:2305.16040*.
- Wahlke, John C., Heinz Eulau, William Buchanan, and Leroy C. Fergusson. 1962. *The Legislative System: Explorations in Legislative Behaviour*. New York: John Wiley and Sons.
- Weber, Ann L. 1995. “Role conflict and role strain”. In H. L. Delgado and F. N. Magill (Eds.), *International Encyclopedia of Sociology* (1995 ed.), pp. 1134–7. London, Fitzroy Dearborn.
- Wlezien, Christopher. 2017. “Policy (mis) representation and the cost of ruling: Us presidential elections in comparative perspective”. *Comparative Political Studies* 50 (6): 711–738.
- Wlezien, Christopher, Mark Franklin, and Daniel Twigg. 1997. “Economic perceptions and vote choice: Disentangling the endogeneity”. *Political Behavior* 19 (1): 7–17.
- Wolkenstein, Fabio and Christopher Wratil. 2021. “Multidimensional representation”. *American Journal of Political Science* 65 (4): 862–876.
- Zárate, Marques G. 2023. “Dimensions of pandering perceptions among hispanic americans and their effect on political trust”. *Political Communication* 40 (4): 440–463.
- Ziblatt, Daniel, Hanno Hilbig, and Daniel Bischof. 2023. “Wealth of tongues: Why peripheral regions vote for the radical right in germany”. *American Political Science Review*: 1–17.
- Zuckerman, Miron and Robert E Driver. 1989. “What sounds beautiful is good: The vocal attractiveness stereotype”. *Journal of nonverbal behavior* 13 (2): 67–82.
- Zuckerman, Miron and Kunitate Miyake. 1993. “The attractive voice: What makes it so?”. *Journal of nonverbal behavior* 17 (2): 119–135.
- Zárate, Marques G., Enrique Quezada-Llanes, and Angel D. Armenta. 2024. “Se habla español: Spanish-language appeals and candidate evaluations in the united states”. *American Political Science Review* 118 (1): 363–379.

# Online Appendix

## Contents

A	Robustness of TWFE Regressions . . . . .	1
B	Accountability Mechanism . . . . .	4
C	Minister and Party Effects . . . . .	9
D	Age and Seniority . . . . .	11
E	Gender Heterogeneity . . . . .	12
F	Party Heterogeneity . . . . .	14
G	Vocal and Verbal Displays . . . . .	15
H	Structural Topic Model . . . . .	17

## A Robustness of TWFE Regressions

### *Time-varying covariates:*

- ‘Government party’: Indicator equal to 1 if the party of legislator  $j$  is a member of a party in government in speech  $i$ . Obtained via scraping *Folketinget’s* website for government compositions and changes.<sup>1</sup>
- ‘Age (years)’: Age in years when legislator gives a speech, defined as the difference between the date of speech  $i$  and the date of birth of legislator  $j$ . Obtained from the **Danish Legislator Database** (DLD).
- ‘Seniority (years)’: Seniority in years when legislator  $j$  gives a speech, defined as the difference between the date of speech  $i$  and the date where legislator  $j$  is first elected. Obtained from the **Danish Legislator Database** (DLD)
- ‘Outbloc target’: Indicator equal to 1 if legislator  $j$  targets a party from the outbloc in speech  $i$ . Obtained by creating dictionaries of legislator and party names using a simple lookup method.
- ‘High-profile debate’: Indicator equal to 1 if speech  $i$  is given in a high-profile debate defined as ‘opening’ and ‘closing’ debates. Obtained by manually compiling dates of ‘opening’ and ‘closing’ debates.

### *Text covariates:*

- ‘Sentiment’: Dictionary measure the relative use of positive and negative words computed with Danish sentiment tool **Sentida** (Lauridsen et al. 2019). Measure is  $z$ -standardized to mean zero and unit variance, and reversed such that higher values indicate more negative sentiment and lower values indicate more positive sentiment.

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<sup>1</sup><https://www.ft.dk/da/folkestyret/regeringen/regeringer-siden-1953>.

- ‘Emotionality’: Word embedding measure of the of emotionality and reasoning constructed using the approach proposed by [Gennaro and Ash \(2022\)](#). Measure combines dictionary seeds from Danish dictionary [AFINN \(Nielsen 2011\)](#) to construct affective seeds (i.e. emotion) and neutral seeds (i.e. reasoning). Word embeddings ( $d = 300$ ) are computed with a local implementation of Word2Vec ([Mikolov et al. 2013](#)). A speech’s emotionality is then computed as the ratio of the average cosine similarity between all word vectors ( $\mathbf{s}_i$ ) in speech  $i$  and the affective ( $\mathbf{A}$ ) and neutral ( $\mathbf{N}$ ) seed centroids:

$$\frac{\text{sim}(\mathbf{s}_i, \mathbf{A}) + b}{\text{sim}(\mathbf{s}_i, \mathbf{N}) + b}$$

with higher values indicating greater emotionality and lower values indicating greater reasoning. Measure is  $z$ -standardized to mean zero and unit variance.

- ‘Complexity’: Measure of the complexity using the Swedish ‘läsbarhetsindex’ (LIX). This is a domain-specific readability metric of a text written or spoken in a Scandinavian language (Swedish, Danish, Norwegian, Icelandic, and Faroese) measured as:

$$\left(\frac{O}{P}\right) + \left(\frac{L}{O}\right) \times 100$$

with  $O$  being the number of words in speech  $i$ ,  $P$  being the number of sentences in speech  $i$ , and  $L$  being the number of words with more than six characters in speech  $i$ . Measure is  $z$ -standardized to mean zero and unit variance, and reversed such that higher values less complexity and lower values indicate more complexity.

- ‘Topic’: Measure of the topic distribution for speech  $i$  computed with the Structural Topic Model (STM) using  $K = 50$  ([Roberts et al. 2014](#)). Topics are included as fixed effects with a value of 1 if topic  $k$  has the highest topic share for speech  $i$ . See [Appendix H](#) for details about the estimation and labeling.

**Table A1:** ATT estimates and covariates using ‘dynamic’ and ‘static’ TWFE regressions.

	Baseline		Time-varying covariates		Text covariates	
	Dynamic	Static	Dynamic	Static	Dynamic	Static
ATT	-0.607*** (0.077)	-0.503*** (0.047)	-0.463** (0.123)	-0.378*** (0.077)	-0.450*** (0.117)	-0.358*** (0.076)
Government party			-0.012 (0.032)	-0.006 (0.030)	-0.002 (0.031)	0.005 (0.030)
Age (years)			-0.061** (0.021)	-0.061** (0.018)	-0.059** (0.020)	-0.058** (0.017)
Seniority (years)			0.043 (0.033)	0.042 (0.030)	0.030 (0.032)	0.029 (0.029)
Outbloc target			0.138*** (0.019)	0.144*** (0.018)	0.090*** (0.017)	0.095*** (0.016)
High-profile debate			0.721*** (0.066)	0.707*** (0.063)	0.666*** (0.063)	0.649*** (0.060)
Sentiment					0.062*** (0.004)	0.062*** (0.004)
Emotionality					0.005 (0.008)	0.005 (0.008)
Complexity					0.058*** (0.006)	0.057*** (0.006)
<i>N</i>	257 290	300 498	95 244	105 321	94 297	104 288
Adj. <i>R</i> <sup>2</sup>	0.094	0.093	0.117	0.109	0.134	0.126
Within <i>R</i> <sup>2</sup>	0.018	0.017	0.033	0.033	0.035	0.033
RMSE	0.95	0.95	0.94	0.94	0.93	0.93
<i>Fixed Effects:</i>						
Legislator	✓	✓	✓	✓	✓	✓
Parl. Term	✓	✓	✓	✓	✓	✓
Topic	✗	✗	✗	✗	✓	✓

+ p &lt; 0.1, \* p &lt; 0.05, \*\* p &lt; 0.01, \*\*\* p &lt; 0.001

Standard errors clustered at the legislator-parl. term level.



## B Accountability Mechanism

### B.1 Debates

**Table B1:** Static TWFE regressions using split-samples for debate type.

	All debates	Low-profile debates	High-profile debates
Minister	-0.502*** (0.026)	-0.442*** (0.025)	-0.287+ (0.168)
<i>N</i>	300498	287872	12626
Adj. $R^2$	0.093	0.093	0.260
Within $R^2$	0.017	0.014	0.002
RMSE	0.95	0.94	0.84
<i>Fixed Effects:</i>			
Legislator	✓	✓	✓
Year	✓	✓	✓

+  $p < 0.1$ , \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

Standard errors clustered at the legislator-year level.

**Table B2:** Static TWFE regression interacting government status with debate type.

	(1)
Minister	-0.440*** (0.025)
High-profile debate	0.690*** (0.027)
Minister $\times$ High-profile debate	0.063 (0.085)
<i>N</i>	300498
Adj. $R^2$	0.110
Within $R^2$	0.036
RMSE	0.94
<i>Fixed Effects:</i>	
Legislator	✓
Year	✓

+  $p < 0.1$ , \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

Standard errors clustered at the legislator-year level.

## B.2 Conflict

**Table B3:** Static TWFE regressions using split-samples for bloc target.

	Non-dyadic speeches	Dyadic speeches
Minister	-0.494*** (0.026)	-0.398*** (0.053)
<i>N</i>	195 177	105 321
Adj. $R^2$	0.100	0.083
Within $R^2$	0.019	0.004
RMSE	0.94	0.96
<i>Fixed Effects:</i>		
Legislator	✓	✓
Year	✓	✓

+  $p < 0.1$ , \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

Standard errors clustered at the legislator-year level.

**Table B4:** Static TWFE regressions using split-samples for bloc target.

	All targets	Inbloc targets	Outbloc targets
Minister	-0.398*** (0.053)	-0.442*** (0.068)	-0.437*** (0.059)
<i>N</i>	105 321	42 966	62 355
Adj. $R^2$	0.083	0.104	0.087
Within $R^2$	0.004	0.003	0.005
RMSE	0.96	0.92	0.96
<i>Fixed Effects:</i>			
Legislator	✓	✓	✓
Year	✓	✓	✓

+ p < 0.1, \* p < 0.05, \*\* p < 0.01, \*\*\* p < 0.001

Standard errors clustered at the legislator-year level.

**Table B5:** Static TWFE regression interacting government membership with speech dyad.

	(1)
Minister	−0.425*** (0.064)
Outbloc target	0.163*** (0.010)
Minister × Outbloc target	−0.012 (0.049)
<i>N</i>	105 321
Adj. $R^2$	0.089
Within $R^2$	0.010
RMSE	0.95
<i>Fixed Effects:</i>	
Legislator	✓
Year	✓

+  $p < 0.1$ , \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

Standard errors clustered at the legislator-year level.

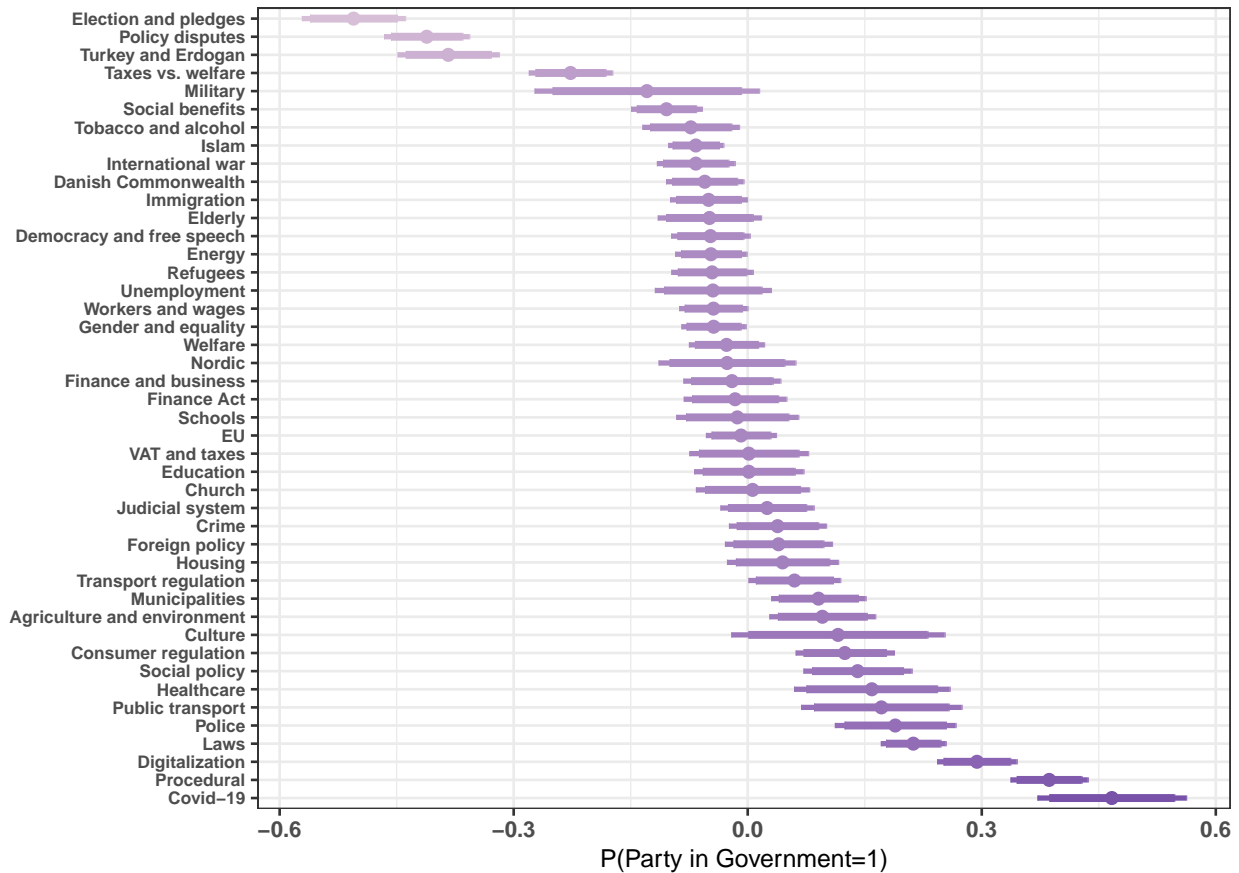
## C Minister and Party Effects

**Table C1:** Static TWFE regressions for minister vs. party effects.

	Governing legislator	Governing party
In office	-0.502*** (0.026)	-0.239*** (0.020)
<i>N</i>	300498	300498
Adj. $R^2$	0.093	0.083
Within $R^2$	0.017	0.007
RMSE	0.95	0.95
<i>Fixed Effects:</i>		
Legislator	✓	✓
Year	✓	✓

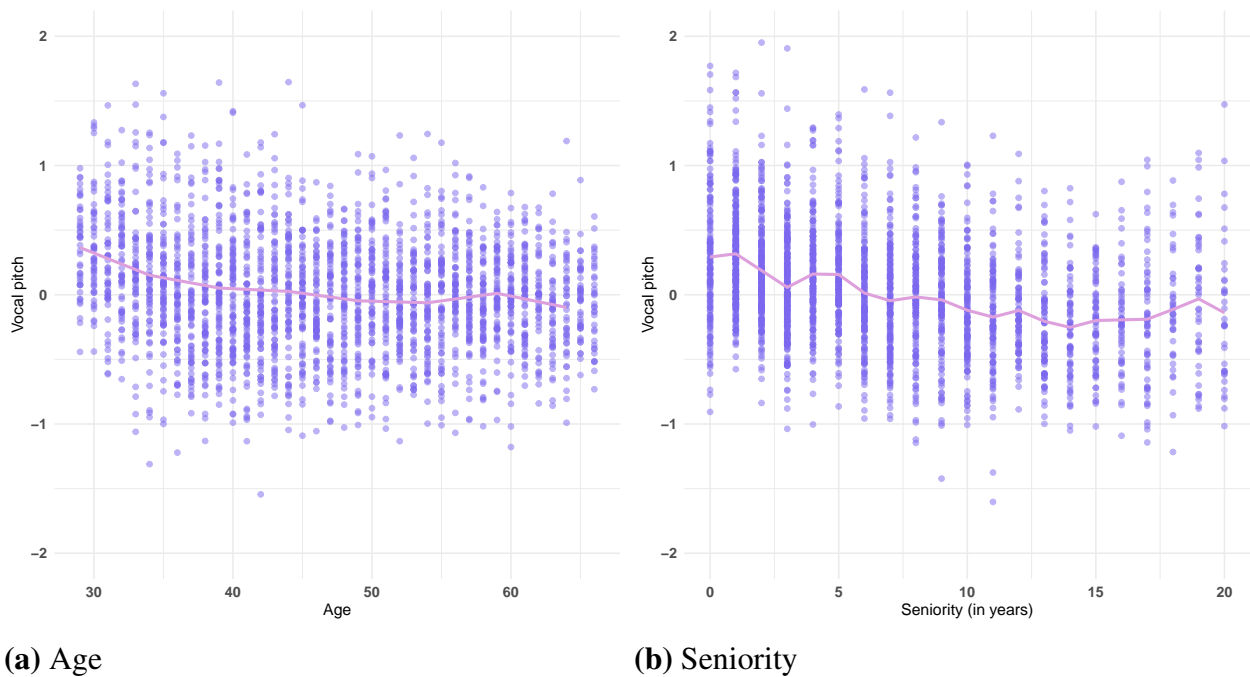
+  $p < 0.1$ , \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

Standard errors clustered at the legislator-year level.



**Figure C1:** Ranking of topics by association with party in government. The topics are from a STM model with  $k = 50$  (45 labeled topics), sorted by the association with party in government. The coefficients are from linear probability models (LPMs) where the outcome is whether the speech is given by a legislator who's party is in government or not and the predictor is the STM topic share. Positive values indicate government-oriented topics and negative values indicate opposition-oriented topics. Confidence intervals are reported using 90 (thick) and 95 (thin) pct., respectively. See [Appendix H](#) for topic keywords associated with each manually labeled topic.

## D Age and Seniority



**Figure D1:** Average vocal pitch by each age and year of seniority for each legislator. The relationship between age and pitch is shown for ages between the 5th and 95th percentile. The relationship between seniority and pitch is shown for between zero and 20 years (corresponding to the 90th percentile) of experience. The trend line for **Figure D1a** is shown for every fifth year. The trend line for **Figure D1b** is shown for each year of experience.



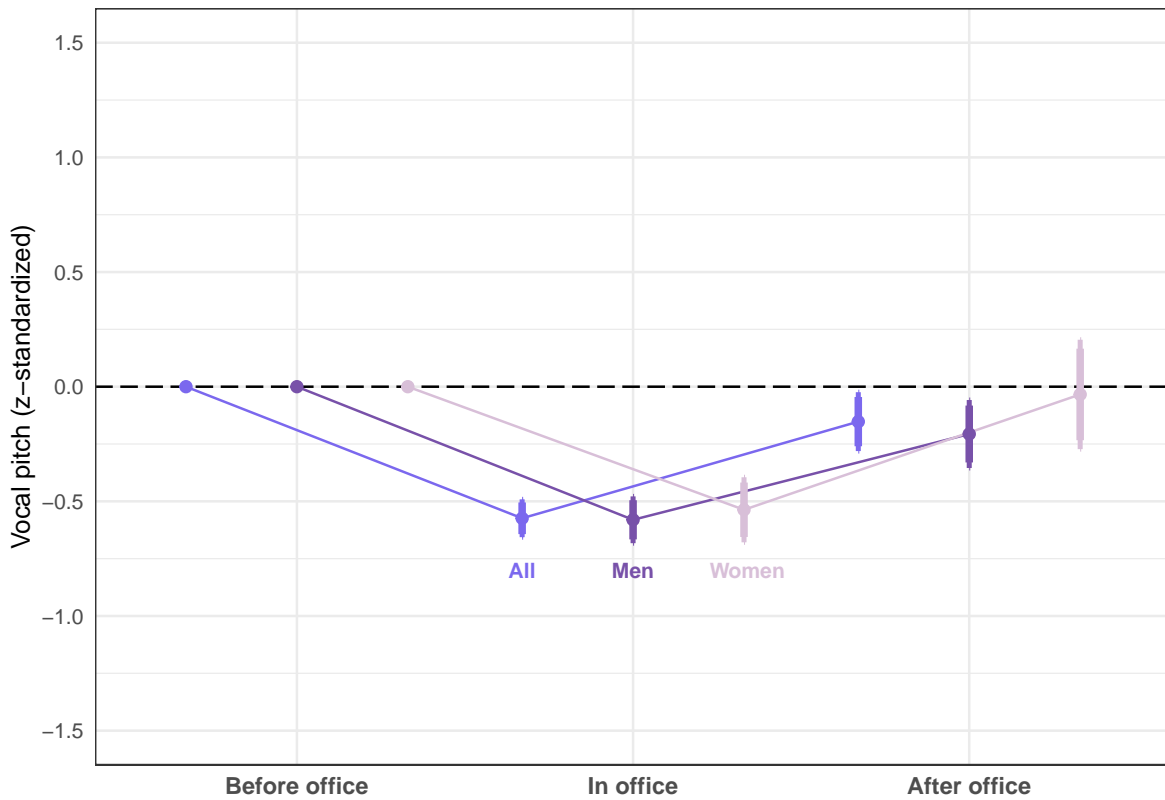
## E Gender Heterogeneity

**Table E1:** ATT estimates from dynamic difference-in-difference models split-sampled by gender.

	Women	Men
ATT	-0.465** (0.142)	-0.686*** (0.083)
<i>N</i>	88 299	168 991
Adj. $R^2$	0.110	0.090
Within $R^2$	0.023	0.016
RMSE	0.95	0.95
<i>Fixed Effects:</i>		
Legislator	✓	✓
Year	✓	✓

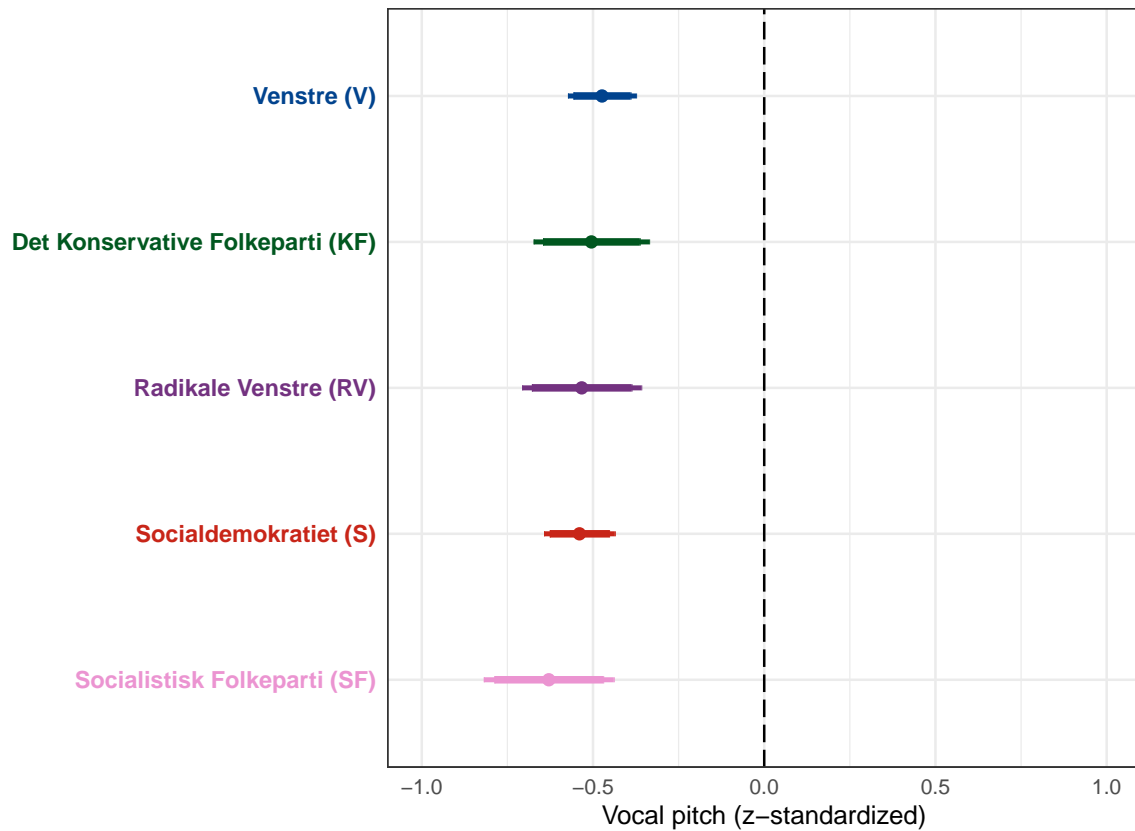
+  $p < 0.1$ , \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

Standard errors clustered at the legislator-parl. term level.



**Figure E1:** Vocal style as a function of office status split-sampled by gender. The coefficients are from TWFE regressions based on sub-sample of legislators that have served at least one spell in government during the period of the study. The “Before office” category acts as the reference category. Repeated spells are collapsed into a single period, omitting any intervening non-governing intervals. This means that ‘After office’ denotes speeches given after a legislator last appearance as a government member. Standard errors are clustered at the legislator-year level. The error bars show 90 (thick) and 95 (thin) pct. confidence intervals.

## F Party Heterogeneity



**Figure F1:** Effect of office status on vocal style by party. The estimates are from five different TWFE models with legislator and year FEs. Standard errors are clustered at the legislator-year level. Models are only estimated if a party has had more than five unique legislators serving one or more spells in government during the study period. The error bars show 90 (thick) and 95 (thin) pct. confidence intervals.

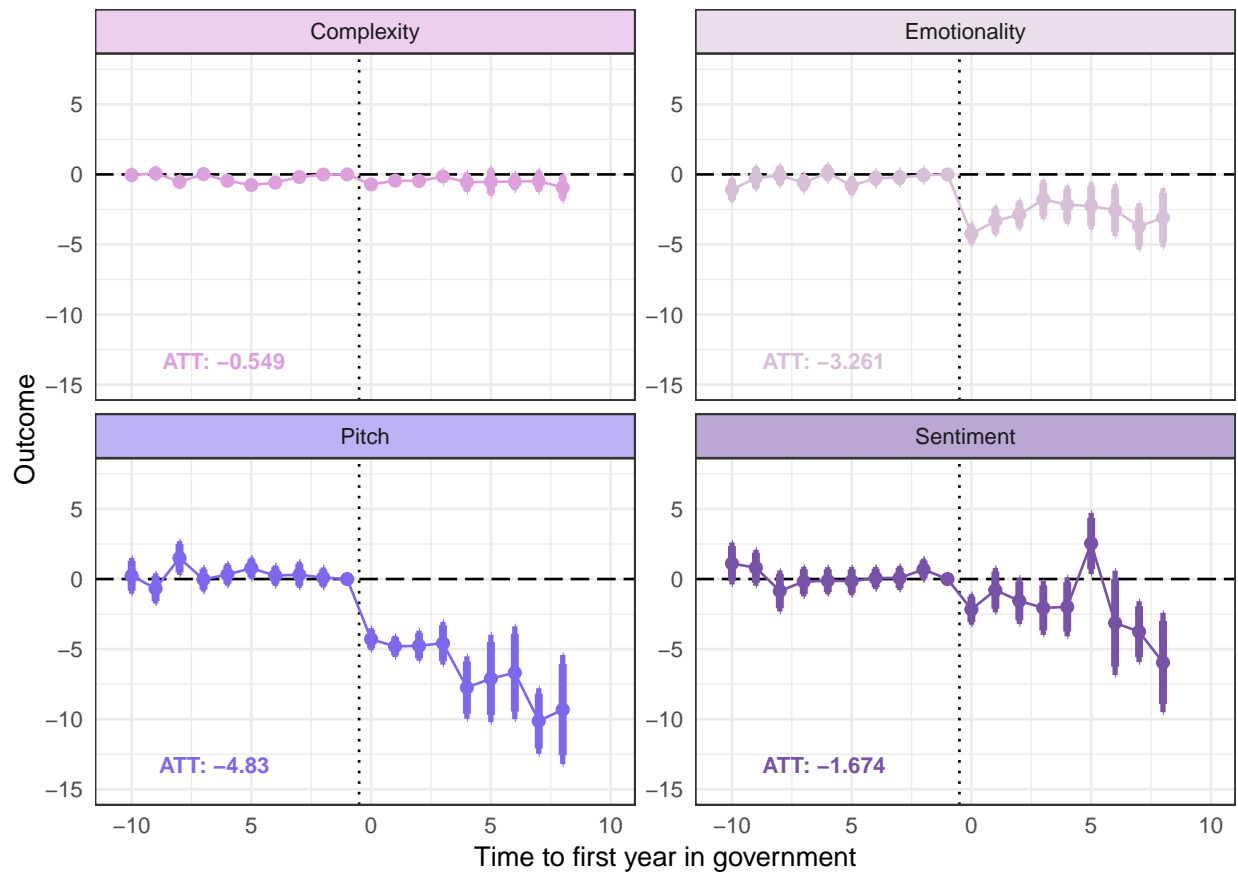
## G Vocal and Verbal Displays

**Table G1:** ATT estimates of serving in government on verbal and vocal displays using the Sun and Abraham (2021)-estimator. Outcomes are rescaled to range 0-100.

	Complexity	Emotionality	Pitch	Sentiment
ATT	-0.549*** (0.285)	-3.261*** (0.934)	-4.830*** (0.877)	-1.674* (1.210)
<i>N</i>	257287	236892	257287	240509
Adj. $R^2$	0.083	0.141	0.104	0.067
Within $R^2$	0.004	0.007	0.030	0.003
RMSE	4.39	7.81	7.08	13.52
<i>Fixed Effects:</i>				
Legislator	✓	✓	✓	✓
Year	✓	✓	✓	✓

+  $p < 0.1$ , \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

Standard errors clustered at the legislator-year level.



**Figure G1**

## H Structural Topic Model

To identify the topics of speeches, I use the Structural Topic Model (STM) as implemented in R (Roberts et al. 2014). For the estimation, I use no covariates, making it identical to the Correlated Topic Model (Blei and Lafferty 2006) allowing topics to be dependent unlike the traditional LDA algorithm (Blei et al. 2003). To select the number of topics  $K$ , I estimate a series of models with  $K \in \{10, 20, \dots, 80\}$  to explore the sensitivity of the results (Denny and Spirling 2018). After consulting model diagnostics and the face validity of the models, I use  $K = 50$  as the baseline.

Before estimating the STM, the corpus is preprocessed using standard techniques, such as removing general stopwords and corpus-specific stopwords (e.g., *ordfører* and *lovforslag* in Danish, *spokesperson* and *bill* in English.). I use the original words as I found no significant improvements by stemming or lemmatization. After preprocessing the texts. Rare and frequent occurring words are excluded. After preprocessing, the texts are vectorized using bag-of-words. After estimating the STM, the topics are labeled manually by consulting the top keywords for each topic. I assign labels to 45 out of 50 topics. The list of topics and their keyword as measured by FREX, lift, and score are shown in Table H1.

**Table H1:** Structural Topic Model: Labels and Keywords

Topic No.	Label	Keywords
1	Danish Commonwealth	FREX: grønlandske, grønland, færøerne, grønlands, grønlanderne, færøske, grønlandsk, landsstyre, rigsfællesskabet, landsstyret.; Lift: selvstyrelov, grønlanderne, hjemmestyret, johansen, kuupik, lars-emil, selvstyrekommissionen, dansk-grønlandske, henningsen, selvstyreloven.; Score: grønland, færøerne, grønlandske, rigsfællesskabet, billede, politikere, grønlands, blande, færøske, sprog.
2	Education	FREX: videregående, uddannelser, erhvervsuddannelserne, praktikpladser, erhvervsuddannelse, skolepraktik, produktionsskolerne, uddannelsen, studerende, praktikplads.; Lift: ects-point, professionsuddannelser, uddannelsesgarantien, fremdriftsreformen, skolepraktikken, adgangsbegrænsning, efteruddannelsessystem, erhvervsakademier, grundforløb, merit.; Score: studerende, uddannelser, videregående, ungdomsuddannelse, universiteterne, su, praktikpladser, elever, uddannelserne, uddannelsen.
3	Laws	FREX: ændring, åbenhed, bemærkningerne, aktindsigt, lovens, ændres, praksis, bemyndigelse, fastsætte, fremført.; Lift: offentlighedskommissionen, offentlighedslov, offentlighedslovens, offentlighedsloven, kongehusets, aktindsigt, revisionsbestemmelsen, kalendere, lovteksten, statsrevisorer.; Score: ændring, praksis, åbenhed, ændringer, grundloven, lovgivningen, aktindsigt, bestemmelser, bemærkningerne, afgørelser.
4	Social policy	FREX: handicap, ankestyrelsen, satspuljen, anbragt, anbragte, handicapområdet, udsatte, anbringelse, socialt, handicappede.; Lift: familierådslagning, plejefamilien, plejefamilierne, anbragte, anbringelsesreformen, børnetelefonen, anbringelsen, anbringelser, plejefamilie, anbringelsesområdet.; Score: udsatte, handicap, barnet, barnets, forældre, børnene, tilbud, forældrene, satspuljen, socialt.

Continued on next page

Table H1 – continued from previous page

Topic No.	Label	Keywords
5	Policy disputes	FREX: uenige, synspunkt, uenig, mene, uenighed, borgerlige, argumentere, venstrefløj, ligeglad, ideologisk.; Lift: uenige, argumentere, politikersvar, mistænkeliggøre, vredet, fløjtende, forfægter, ligeglad, uenighed, synspunkt.; Score: synspunkt, borgerlige, uenige, synspunkter, uenig, mene, venstrefløj, uenighed, argumentere, borgerlig.
6	Election and pledges	FREX: valget, valgkampen, garantere, vælgerne, thulesen, mandater, spurgte, dahl, lovede, valgkamp.; Lift: dahl, thulesen, vælgerbedrag, dahls, uld, pensionsfond, løftebrud, fortrudt, valgkampen, mandater.; Score: valget, befolkningen, thulesen, dahl, vælgerne, stillede, valgkampen, spurgte, løfte, løfter.
7	Church	FREX: folkekirken, kirken, præster, karen, menighedsråd, folkekirkens, folkekirke, kirke, klint, menighedsrådene.; Lift: biskopperne, civilregistreringen, kirkeråd, menighedsrådene, præstestillinger, sognene, biskopper, evangeliet, evangelisk-luthersk, folkekirkelige.; Score: folkekirken, trossamfund, forsøg, kirke, kirken, folkekirke, registreret, ægteskab, præster, folkekirkens.
8	Agriculture and environment	FREX: kvælstof, vandløb, skov, urørt, nationalparker, skovene, randzoner, biodiversiteten, ha, biodiversitet.; Lift: 000-arealerne, habitatområder, havbrug, landbrugskommissionen, landbrugskommissionens, nationalparkerne, naturbeskyttelseslovens, naturpakken, skovdrift, skovene.; Score: landbruget, landbrug, natur, naturen, landmænd, arealer, vandløb, miljøet, skov, miljø.
9	Military	FREX: talen, læst, rød, øerne, røde, blok, blå, hjemmeværnet, øer, lovhjemmel.; Lift: strike, rigsretssager, landevejsprincip, færge-sekretariat, forsvarschefen, granskningskommissionen, flyvestation, lampe, granskningskommission, rigsretssag.; Score: læst, forsvaret, styr, mink, røde, talen, blå, erstatning, øer, blok.

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Table H1 – continued from previous page

Topic No.	Label	Keywords
10	Turkey and Erdogan	FREX: ærlig, talt, tyrkiet, kritik, anerkende, dybt, kritisere, tyrkiske, undskyldning, kritiserer.; Lift: armenske, erdogans, samarbejdspolitikken, tyrkerne, tyrkiske, ærlig, tyrkiets, mindes, erdogan, godhavnsdrene.; Score: tyrkiet, talt, kritik, anerkender, ærlig, dybt, tyrkiske, anerkende, pres, erdogan.
11	Unemployment	FREX: barfod, line, ledige, jobcentre, aktivering, a-kasserne, job, dagpengeperioden, christiania, arbejdsløse.; Lift: løntilskudsjob, akutjob, barfod, line, barfods, udfaldstruede, aktiveringen, jobcentre, jobcentre, christianitterne.; Score: job, ledige, barfod, line, arbejdsløse, dagpenge, beskæftigelse, dagpengesystemet, aktivering, dagpengeperioden.
12	Transport regulation	FREX: knallert, cykelhjelme, kørekort, motorcykel, bil, registreringsafgift, miljøzoner, færdselssikkerheden, cykler, køretøjer.; Lift: hastighedsgrænse, cykelhjelme, færdselssikkerhedsmæssige, motorcykler, alkohol, cyklist, hastighedsgrænsen, motorcykel, alkohol, færdselssikkerhedskommissionen.; Score: køre, biler, kører, bil, km, t, elbiler, trafikken, kørekort, registreringsafgiften.
13	Energy	FREX: fossile, brændsler, kul, gas, biomasse, energiaftalen, no, omstilling, solceller, energipolitik.; Lift: energisystem, havvindmøllepark, overskudsvarme, portland, ccs, geotermi, havvind, iblandingskravet, landvind, landvindmølle.; Score: arbejdspladser, grønne, omstilling, co, energi, grøn, vedvarende, landdistrikterne, fossile, biomasse.
14	Public transport	FREX: togfonden, dsb, jernbanen, jernbane, dsb's, metroen, arriva, dk, metro, femern.; Lift: linjeføringen, cityringen, dk's, dobbeltsporet, infrastrukturfonden, infrastrukturkommissionen, jernbanedrift, jernbanedriften, kattelgatforbindelse, linjeføring.; Score: trafik, kollektive, københavn, dsb, københavns, projekt, togfonden, motorvej, kollektiv, aalborg.

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Table H1 – continued from previous page

Topic No.	Label	Keywords
15	Digitalization	FREX: digital, digitale, post, effektiv, handlingsplan, efterretningstjeneste, effektivt, kommunikation, implementering, standarder.; Lift: digitaliseringsstrategi, droner, selvbetjeningsløsninger, selvbetjening, digital, tjenestens, cybersikkerhed, signatur, it-, efterretningstjenesterne.; Score: efterretningstjeneste, oplysninger, digitale, pet, handlingsplan, digital, effektiv, myndigheder, samt, skibe.
16	Culture	FREX: public, kunst, teater, radio, taiwan, h.c, kulturpolitik, teatre, kunstnere, dr.; Lift: public, teaterområdet, underholdningssorkestret, billedkunstneriske, h.c, kunstråd, licensmidler, lokal-tv, medieforliget, programansvar.; Score: kina, radio, public, tlovforslag_id, taiwan, kultur, kunst, bestyrelse, kunstnere, teater.
17	Nordic	FREX: nordiske, sverige, svenske, norge, løst, nordisk, norden, fjerne, erfaringer, norske.; Lift: pasunion, barsebäck, svenskerne, grænsehindringer, svenske, svensk, norden, nordmændene, norske, norge.; Score: nordiske, sverige, løst, norge, nordisk, erfaringer, tyskland, fjerne, svenske, problemerne.
18	Islam	FREX: islam, muslimer, muslimske, tørklæde, diskrimination, minoriteter, religion, muslimsk, burka, værdier.; Lift: burka, bønekalde, niqab, kvindeundertrykkende, tørklædet, burkaen, omskåret, tørklæde, bederum, kalot.; Score: frihed, værdier, religiøse, islam, muslimske, religion, muslimer, rettigheder, diskrimination, kristne.
19	Immigration	FREX: statsborgerskab, indfødsret, statsborgere, statsborger, udlændinge, kriterier, indfødsretsudvalget, udlænding, opvokset, statsborgerskabet.; Lift: danskprøve, indfødsretsprøve, indfødsretten, statsborgerskab, statsborgerskaber, indfødsrets, indfødsretsaf-tale, indfødsretsprøven, indfødsretsudvalg, statsborgerskabsprøve.; Score: statsborgerskab, udlændinge, statsborgere, opholdstilladelse, indvandrere, indfødsret, ophold, udlændingepolitik, integration, statsborger.

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Table H1 – continued from previous page

Topic No.	Label	Keywords
20	Crime	FREX: indsatte, lavalder, kriminalforsorgen, fængslerne, afsoning, samfundstjeneste, bandemedlemmer, afsone, prøveløsladelse, kriminelle.; Lift: afsoning, afsoningen, prøveløsladt, afsones, fodlænkeordningen, lavalder, pebersprayen, prøveløsladelse, prøveløslades, recidiv.; Score: kriminalitet, kriminelle, fængsel, straf, vold, straffen, begået, begår, kriminalforsorgen, forbrydelser.
21	Gender and equality	FREX: barselorlov, barsel, befrugtning, orlov, mændene, far, fædrene, barselorloven, ligeløn, mænd.; Lift: barslen, fædrene, ligelønningen, løngabet, orloven, barselorloven, løngab, topposter, adoptanter, sorgorlov.; Score: kvinder, mænd, ligestilling, barn, mor, barsel, kvinde, far, barnet, forældre.
22	Welfare	FREX: page, gratis, brugerbetaling, pm, fm, am, tilskud, friday, udgift, brugerbetalingen.; Lift: am, friday, tuesday, fm, fttm000, fttmo000, january, page, thursday, wednesday.; Score: brugerbetaling, tilskud, gratis, page, førtidspension, compensation, indføre, fleksjob, pm, udgifter.
23	Judicial system	FREX: læser, påstand, klager, skøn, retssikkerhed, aviser, advokater, afgjort, saglige, retssikkerheden.; Lift: højesteretsdommere, bla, skattesag, camilla, advokaterne, byretterne, dommeres, landsskatteretten, anke, landsretterne.; Score: retssikkerhed, domstolene, læser, retssikkerheden, dokumentation, føler, klage, sagerne, systemet, undersøgt.
24	Democracy and free speech	FREX: ytringsfriheden, demokratiet, facebook, holdninger, forening, foreninger, racismeparagraffen, ytringsfrihed, hizb-ut-tahrir, frivillige.; Lift: ut-tahrir, hizb-ut-tahrir, hizb, ytringsfrihedens, racismeparagraffen, valgforbund, vælgererklæringer, borgerting, racismeparagraf, valghandlingen.; Score: demokrati, ytringsfriheden, demokratiet, medlem, demokratiske, holdninger, ytringsfrihed, medlemmer, demokratisk, organisationer.

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Table H1 – continued from previous page

Topic No.	Label	Keywords
25	Taxes vs. welfare	FREX: skattelettelser, skatter, skattereform, skatten, skattestoppet, topskatten, skattelettelse, skattereformen, skattestop, skattepolitik.; Lift: topskatten, ginikoefficienten, marginals-katten, skattelettelserne, skatteomlægninger, mellemskatten, skattelettelser, arbejdsindkomster, arbejdsudbudsreformer, skattetryk.; Score: skattelettelser, skatten, skatter, skattereform, vækst, afgifter, skattestoppet, sektor, velfærd, reformer.
26	Covid-19	FREX: smitte, styrelsen, vacciner, smitten, covid-000, retningslinjer, anbefalinger, eksperter, serum, tilsyn.; Lift: mutation, serum, vaccine, seruminstituttet, vaccinerne, genåbningen, smittespredning, coronapas, vaccinen, epidemiloven.; Score: tilsyn, anbefalinger, data, institut, risiko, retningslinjer, sundhedsstyrelsen, eksperter, tilsynet, statens.
27	Elderly	FREX: ældreplejen, hjemmehjælp, plejehjem, ældre, ældreområdet, ældres, ældrepleje, hjemmeplejen, demens, værdig.; Lift: ældrelov, ældreordfører, ældreliv, værdighedsmilliarden, hjemmeplejen, ældrerådene, plejehjemmet, demente, ældres, demenshandlingsplanen.; Score: ældre, ældreområdet, plejehjem, ældreplejen, pårørende, hjemmehjælp, borgeren, ældrepleje, pleje, omsorg.
28	Police	FREX: hunde, hund, kameraer, overtrædelser, fyrværkeri, tv-overvågning, dyrenes, forældelsesfristen, dommerkendelse, dyreværnsloven.; Lift: dyremishandling, dyreværnslovens, dyreværns-sager, hundeejere, muskelhunde, dyreværnsloven, hundeloven, hunderacer, dyreværnslovgivningen, dyreværnspoliti.; Score: politiet, dyr, politiets, politi, dyrene, hunde, dyrevelfærd, overgreb, overtrædelse, rigspolitiet.

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Table H1 – continued from previous page

Topic No.	Label	Keywords
29	Refugees	FREX: asylansøgere, kvoteflygtninge, asyl, asylsystem, afviste, flygtninge, migranter, asylcentre, grænsekontrol, flygtningenævnet.; Lift: asylansøgning, asylsagsbehandling, modtagecenter, asylbehandling, asylansøgerne, kvoteflygtningesystem, kvoteflygtningesystemet, menneskesmuglernes, kvoteflygtninge, asylsagsbehandlingen.; Score: flygtninge, asylansøgere, asyl, hjem, grænsekontrol, kvoteflygtninge, grænse, opholdstilladelse, grænser, syrien.
30	Workers and wages	FREX: dumping, arbeidstilsynet, løn-, overenskomster, arbejdsvilkår, overenskomst, lønmodtageren, arbejdsmarkedets, fagbevægelsen, arbejdsmiljøet.; Lift: rut-registeret, østaf-talen, dumping, sikkerhedsrepræsentanter, bst, rut, jobklausuler, konkurrenceklausuler, arbejdsklausuler, løn-.; Score: arbejdskraft, dumping, arbejdsmarkedets, løn, medarbejdere, arbejdsmiljø, arbejdsmarked, arbejdsgiverne, arbejdsgivere, parter.
31	Schools	FREX: grundskoler, skolen, folkeskole, lærerne, skoler, friskole, friskolerne, skole, skolens, tosprogede.; Lift: elevplaner, elevsammensætningen, friskolernes, helhedsskole, helhedsskolen, helhedsskoler, holddeling, privatskolerne, sfo'en, sfo'er.; Score: folkeskolen, elever, skoler, skole, eleverne, skolen, skolerne, forældrene, folkeskole, børnene.
32	Housing	FREX: lejerne, landsbyggefonden, boliger, udlejer, ungdomsboliger, udlejere, lejer, andelsboliger, lejere, lejernes.; Lift: andelsboligen, andelsboligforeningen, andelshaver, boligafdeling, boligforlig, boligreguleringslovens, erstatningsbolig, huslejenævnet, lejeboliger, lejeren.; Score: boliger, almene, bolig, lejerne, bor, lejere, boligområder, bo, byggeri, landsbyggefonden.

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Table H1 – continued from previous page

Topic No.	Label	Keywords
33	Consumer regulation	FREX: cannabis, stoffer, hormonforstyrrende, fixerum, heroin, mærkning, forbrugeren, stof, produkter, forsigtighedsprincippet.; Lift: efsa, kanyler, bisfenol-a, bromerede, ftalater, sundhedsrum, sutteflasker, bisfenol, fixerum, flammehæmmere.; Score: forbrugerne, stoffer, produkter, forbud, cannabis, fødevarer, forbrugere, hash, hormonforstyrrende, forbrugeren.
34	International war	FREX: saddam, hussein, israel, palæstinensiske, sikkerhedsrådet, israelske, hamas, sikkerhedsråd, palæstinenserne, gaza.; Lift: afvæbnes, bosættelsespolitik, fn-mandat, fn-resolution, gaza, sharon, sikringsstyrke, våbeninspektionen, våbeninspektørerne, arafat.; Score: irak, israel, saddam, usa, hussein, fn, soldater, rusland, krig, afghanistan.
35	Finance Act	FREX: finansloven, forskning, pulje, midlerne, besparelse, forskningen, forskere, prioritere, puljer, finanslovsforhandlingerne.; Lift: uredelighed, grundforskningsfonden, lomborg, grundforskningsfond, højteknologifonden, lomborgs, grundforskningsreserven, bjørn, bevillingen.; Score: finansloven, forskning, finanslov, afsat, prioritere, besparelser, prioritering, pulje, forskere, beløb.
36	Foreign policy	FREX: spiller, rolle, nævn, osce, strategi, arktis, spille, interesser, strategien, udviklingslandene.; Lift: valgobservationer, udviklingssamarbejdet, verdenstopmødet, johannesburg, osce's, udviklingspolitiske, udviklingssamarbejde, udviklingspolitik, johannesburgtopmødet, verdensmålene.; Score: råd, rolle, strategi, arktis, osce, nævn, spiller, interesser, udviklingsbistand, spille.

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Table H1 – continued from previous page

Topic No.	Label	Keywords
37	Municipalities	FREX: amt, farum, kommunalreformen, borgmester, udligningsreform, kommunalreform, amter, borgmestre, udligning, budgetterne.; Lift: vestsjællands, sammenlægningsudvalg, udligningssystemet, udligningsreformen, udligningsreform, amtsborgmester, kommunalreform, farum, skattecentre, kommunestyret.; Score: kommunale, kommunernes, lokale, opgaver, selvstyre, amterne, amt, kl, kommunen, regionerne.
38	EU	FREX: lissabontraktaten, traktat, traktaten, europaudvalget, europol, euroen, ef-domstolen, nicetraktaten, finanspagten, retsforbeholdet.; Lift: lissabontraktaten, traktatændringer, ceta, euroforbehold, europagten, overstatslige, overstatsligt, parallelaftaler, traktatgrundlag, cameron.; Score: europæiske, folkeafstemning, europa, eu's, kommissionen, europarådet, konventioner, traktat, euroen, europol.
39	Finance and business	FREX: aktier, selskaber, atp, finanstillsynet, bank, bankerne, finansielle, kapital, finansiel, skattehul.; Lift: ld, investeringsforeninger, pensionsselskab, succession, unoterede, atp's, kapitalkravet, aktiemajoriteten, kommanditselskaber, børsnotering.; Score: skat, finansielle, selskaber, virksomhed, virksomhederne, beskatning, lån, atp, bankerne, aktier.
40	Healthcare	FREX: patienter, patienterne, sundhedsvæsen, læger, patienten, sygehusvalg, sundhedsvæsenet, praktiserende, patient, læge.; Lift: høretab, kræftpatienterne, pakkeforløb, patientrettighed, regionssklinikker, produktivitetskravet, sygehusvalg, hjerteområdet, somatikken, sundhedshuse.; Score: patienter, sundhedsvæsen, patienterne, læger, regionerne, sundhedsvæsenet, sygehuse, læge, patienten, psykiatrien.

Continued on next page

Table H1 – continued from previous page

Topic No.	Label	Keywords
41	Tobacco and alcohol	FREX: ryge, rygning, cigaretter, tobak, begynder, grunden, pakke, fornuft, ryger, sund.; Lift: tobaksrygning, rygere, rygning, røgfri, snus, rygerum, rygerne, cigaretterne, nikotinprodukter, rygeloven.; Score: købe, ryge, begynder, cigaretter, grunden, effekt, rygning, prisen, tobak, alkohol.
42	Social benefits	FREX: kontanthjælpsloftet, efterløn, ydelse, kontanthjælpen, pensionsalderen, starthjælp, pensionister, starthjælpen, folkepension, fattigdomsgrænse.; Lift: forsørgerpligt, seniorpensionen, parirer, seniorpension, pair-ordningen, omkostningstillæg, au, efterlønsbidrag, fattigdomsgrænse, kontanthjælpsægtepar.; Score: kontanthjælp, ordning, ydelser, ordningen, kontanthjælpsloftet, pension, ydelse, fattigdom, pensionister, efterlønnen.
43	Procedural	FREX: høring, derefter, førstebehandlingen, belyst, afklaret, grundigt, afvente, kraft, kommission, arbejdsgruppe.; Lift: overgik, forkastedes, forhandlingen, sattes, høringsfrist, gældsinddrivelse, vedtoges, høringsfristen, første-, kommissoriet.; Score: proces, hermed, høring, sluttede, kraft, tilsagn, bemærkninger, derefter, arbejdsgruppe, takke.
44	VAT and taxes	FREX: afgift, fiskere, affald, gebyr, afgiften, fiskerne, butikker, momsens, omkostninger, havne.; Lift: kystfiskeri, udsimid, retursystem, affaldet, lukkeloven, genanvendt, hotelovernatninger, fiskerne, overnatninger, fisken.; Score: afgift, afgifter, afgiften, affald, omkostninger, varer, grænsen, konkurrence, moms, fiskeri.
45	LGBT	FREX: skifte, juridisk, overskue, overens, transkønnede, cpr-nummer, kønsskifte, konsekvenserne, betragte, forstand.; Lift: kønsskifte, cpr-nummeret, cpr-nummer, personnummer, transkønnede, skifte, cpr-numre, transkønnethed, indikation, kategorien.; Score: skifte, juridisk, kønsskifte, transkønnede, cpr-nummer, køn, transpersoner, personnummer, kønsidentitet, hverken.