

# Communicative Power, Inequality and Representation

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## Abstract

How can we evaluate the distribution of political power and the quality of democratic representation when public opinion is influenced by elite communication? I argue that, in such contexts, a key component of political power is ‘communicative power’, or the power to influence public opinion. Correspondingly, an equal distribution of communicative power is a necessary condition for political equality. The extent of inequalities in communicative power is well-captured by the degree of ‘communicative representation’ – or how much, across issues, elite communication proportionately reflects and responds to citizen opinion. I introduce an empirical strategy for measuring how far communicative representation actually obtains. To illustrate its feasibility, I use this approach to analyze communicative representation on redistribution and immigration in the United Kingdom (UK) between 2010 and 2019. Cumulatively, this study breaks new ground in theoretical and empirical research on political representation and inequality, and joins efforts to bridge the two.

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# 1 Introduction

Political equality, or an equal distribution of political power, is a widely held commitment among theorists of liberal democracy and political representation. This commitment also drives much empirical research on electoral representation in democracies. At the same time, empirical political scientists have amassed considerable evidence that public opinion both influences and is influenced by elite speech. The possibility of such ‘opinion endogeneity’ introduces additional sources of political inequality. This has important implications for the study of representation, which have received little attention from researchers thus far. Insofar as an individual (or group) is able to influence public opinion in line with their own preferences, this is an important source of political power for that individual (or group). For instance, although citizens can choose who to elect, once elected, representatives can use their privileged position to reshape citizens’ opinions in a direction more consistent with their own interests or values. I argue that the standard mechanisms of representative democracy cannot eliminate this concern. Consequently, existing approaches to the study of political (in)equality and representation in democracies overlook an important component of the distribution of effective political power in a polity: the presence and influence that individual political actors have within public political debate, and therefore over public opinion. In other words, their ‘communicative power’.

I argue here that a full consideration of how effective political power is distributed in a polity must thus consider inequalities in communicative power as well. The extent of this inequality is captured by the degree of ‘communicative representation’ in that polity – or the degree to which, across issues, political speech by elite actors proportionately reflects, as well as responds to, the opinions of individual citizens. Moreover, I propose an empirical strategy for measuring how far communicative representation, thus defined, obtains in actually existing polities. Finally, to illustrate the feasibility and validity of this

strategy, I apply this approach to characterize the level of communicative representation in the United Kingdom (UK) between 2010 and 2019.

My argument proceeds as follows. If the policy opinions and factual beliefs of citizens are, to some extent, influenced by elite political communication, any assessment of the political power exercised by individual citizens in a polity must also consider their communicative power, or presence and influence within public political debate. As such, an equal distribution of communicative power – i.e. a high degree of communicative representation – is necessary for the full realization of political equality. The level of communicative representation in a polity, in turn, reflects the distribution of communicative power within that polity. This is because low communicative representation implies that elite actors with certain opinions, and the citizens who share them, have disproportionate presence and influence in public debate, and so disproportionate power over public opinion. Conversely, if communicative representation is high, the preferences of voters must be more proportionately represented within elite discourse, implying greater political equality.

I advance and validate an empirical strategy to measure the degree of communicative representation in a polity that is concrete, replicable and scalable to a large number of countries, issues and years. My proposed measure of communicative representation has two components: ‘communicative congruence’ – i.e. the extent to which, across issues, the entire distribution of voter preferences is proportionately reflected in elite speech – and ‘communicative responsiveness’ – i.e., the extent to which changes in the distribution of voter preferences (appear to) produce corresponding changes in the preferences expressed in elite speech. I also propose three additional statistics that provide deeper insight into the degree and sources of unequal communicative representation in a polity: the extent of ‘communicative malapportionment’ in a polity, the ‘relative communicative presence’ of different social groups within an electorate, and elites’ ‘relative communica-

tive responsiveness' to these social groups. By helping us identify which social groups are relatively under- or over-represented in elite speech (and by how much), and whether elites are disproportionately responding to changes in the preferences of certain groups, these latter two statistics provide particular insight into the sources of any inequalities of communicative power that we identify. As proof of concept, I apply this empirical strategy to study communicative representation on two key issues, redistribution and immigration, between 2010 and 2019 in the UK, using parliamentary speech as a proxy for elite speech.

The contributions of this article are fourfold. First and foremost, by taking on the question of how one can even characterize, and therefore evaluate, the distribution of political power in the presence of opinion endogeneity, this article breaks new ground in normative analyses of political representation and inequality. Although contemporary theorists of representation have long recognized and even lauded the role of 'discursive processes' within representative relationships (Mansbridge, 2003; Saward, 2010), the question of what such processes imply for how we can and should assess the distribution of political power in a polity has received minimal attention within this research tradition.<sup>1</sup>

Second, by proposing and validating a concrete, replicable and scalable empirical strategy to examine the level of communicative representation in a polity, I add to the repertoire of potential measures empirical researchers can use when assessing the quality of political representation in a polity.

Third, my analysis of the UK constitutes the first attempt to empirically estimate patterns in communicative representation in a polity. I find evidence of significant communicative malapportionment on both issues, alongside some overall communicative respon-

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<sup>1</sup>My concept of 'communicative power' relates closely to the notion of 'ideological power', the 'third face of power' identified by Lukes (1974). However, to my knowledge, subsequent research building on Lukes' seminal account has not answered the question of who, if opinions are endogenous, can be said to have more or less (ideological or communicative) power than others – as I endeavor to do.

siveness. Across issues, I find that the opinions of women, and especially low education voters, are consistently *under*-represented in legislative speech. Meanwhile, the (more left-wing) opinions of working-class voters on redistribution, and the (more right-wing) opinions of white working-class and older voters on immigration are also consistently under-represented in speech throughout. The patterns that I uncover align well with previous research on unequal representation in established democracies – and in particular, the descriptive and substantive under-representation of female, working-class and low education voters – including in the UK.

Last but not least, this enterprise adds to recent efforts to place democratic theory on more ‘realistic’ foundations (e.g. Bagg (2018); Bächtiger and Parkinson (2019)).<sup>2</sup> I contend that my proposed measure of communicative representation in a polity provides a useful and important barometer of how and how far its political environment deviates from one crucial aspect of the democratic ideal of political equality at any given moment. Moreover, performance on this measure also provides us with a criterion which we can use to rank actually existing democracies, to compare their performance against a benchmark of ‘perfect’ communicative representation, and to explore the correlates of any variation in performance across countries and over time (so as to better understand the sources of variation in political inequality). Further, by offering a strategy to evaluate not just *whether* communicative power is unequally distributed, but *for the benefit of whom*, this enterprise can help us evaluate the effectiveness of various strategies which have been proposed to reduce political inequality, or to identify new ones. As such, it also responds to calls for a more ‘problem-based’ approach to democratic theory (Warren, 2017), as well as a ‘comparative’ approach to normative political theory and institutional design

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<sup>2</sup>Although Wolkenstein and Wratil (2021) also seek to bridge normative and empirical research on political representation, they are more concerned with empirically operationalizing conceptions of representation recently advanced by normative theorists. My enterprise is distinct, as my intended contribution is to normative democratic theory as well.

(Ganghof, 2013; Blum and Zuber, 2016).

## 2 The Importance of Communicative Representation

### 2.1 Political Equality and Opinion Endogeneity

Political equality, or an equal distribution of political power, is a widely held normative commitment among theorists and proponents of liberal democracy. For many, the democratic ideal is synonymous with political equality, and the intrinsic value and moral authority of democracy follows from its egalitarian character.<sup>3</sup> If political power is understood as the “the opportunity to influence political decisions, which usually take the form of laws and other directives that are regularly enforced against, or widely considered binding for, [a] group’s members” (Viehoff 2019, 5), equal political power in turn requires that all citizens have an equal opportunity to influence political decisions.<sup>4</sup>

This egalitarian commitment is also shared by many, if not most, scholars of political representation. For instance, Mansbridge (2003) discusses the normative criteria implied by various ‘models’ of political representation in terms of their implications for political equality, while Urbinati (2019) cites equality as her ‘guide’ in analysing and evaluating

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<sup>3</sup>As discussed in Viehoff (2014), the claim that democracy is intrinsically valuable *because* it grants all citizens an equal say in lawmaking, is held by, for example, Mansbridge (1980) and Cohen (1997), while Christiano (2008) is a prominent recent advocate of the claim that the moral authority of (at least some) democratically made laws follows from the egalitarian nature of democratic procedures.

<sup>4</sup>Of course, with good reason, representative democracies delegate actual decision-making power to certain elites, such as legislators and bureaucrats, and so some inequalities of political power are both inevitable and desirable (Viehoff, 2019; Beramendi, Besley and Levi, 2022). This has motivated many political philosophers to define political equality instead as entailing ‘equal consideration’ (Anderson, 1999; Verba, 2003; Beramendi, Besley and Levi, 2022). However, I argue later in in Section 2.2 and footnote 9 that the importance of communicative power and representation for political equality are robust to these alternative definitions.

current ‘interpretations’ of political representation. The same impulse has motivated much empirical research on representation, producing a vast literature that documents significant inequalities in political representation by income and social class, educational background, gender and ethnicity.<sup>5</sup>

At the same time, decades of empirical research by political scientists has established that citizens’ policy opinions and beliefs are, at least to some degree, influenced by elite political communication, with potential consequences for electoral behavior (‘opinion endogeneity’). A large body of work has documented citizens’ tendencies to adapt their policy opinions based on partisan cues and framing, in experimental settings (Bolsen, Druckman and Cook, 2014; Broockman and Butler, 2017; Barber and Pope, 2019) as well as in real-world contexts (Lenz, 2009, 2012; Slothuus and Bisgaard, 2021). Studies have also found evidence for the susceptibility of citizens’ factual beliefs and interpretation to elite communication, including from partisan sources, finding an effect of elite cues on beliefs regarding seemingly objective conditions like the existence of climate change (Tesler, 2018), the prevalence of electoral fraud (Clayton et al., 2021), and the state of the economy (Bisgaard and Slothuus, 2018).<sup>6</sup>

Such opinion endogeneity introduces the potential for additional sources of political inequality that would not exist if citizen opinion was fully exogenous. In particular, it introduces new power asymmetries into the principal-agent relationship linking representatives and constituents: given that there is asymmetric and incomplete information,

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<sup>5</sup>See, for example, O’Grady (2019); Schakel and van der Pas (2021); Krook and O’Brien (2012); McClendon (2016) and the citations therein.

<sup>6</sup>A separate line of research has considered the evidence for ‘priming’, whereby campaign and media messages, through their issue emphases or framing, can alter voters’ issue priorities when evaluating parties and politicians (for example, see Druckman and Holmes (2004) and Tesler (2015)). There is also a vast literature on these topics. The endogeneity of citizens’ issue priorities to elite cues and of public opinion to media frames and attention are outside the immediate scope of this study, but also have implications for the study of political inequality.

although the citizen can choose who to elect, once elected, the representative can use their position to reshape citizens' opinions in a direction more consistent with their own (perhaps newly acquired) interests or values. As Mansbridge and others have argued, this may be normatively justified and desirable.<sup>7</sup> Naturally, given constraints of time, information and expertise, many citizens will want to defer to the expertise of more informed and engaged citizens (including elected representatives). They then award those citizens more influence over their own opinions than they wield over the opinions of others. In many cases, given more information and time for reflection, they would even approve of how their opinions have been reshaped through this fundamentally unequal relationship.

However, these same power asymmetries mean that voters do not subsequently receive either the time or the information to determine whether their new opinions are more aligned with their underlying interests and values than previously. It is also not possible for a citizen to determine *ex ante* if, in a counterfactual universe where she had received different information and arguments from her representatives, she would arrive at the same judgment regarding her newly acquired opinions.

These concerns are not fully addressed by what Landa and Pevnick (2020), for instance, label the 'selection' and 'treatment' mechanisms of representative democracy. Landa and Pevnick (2020) argue that, in a 'well-designed' representative democracy, elected representatives will exercise power with due care and consideration for the public interest – as they will be aware of their pivotal role in policy-making and be disciplined by electoral incentives (the 'treatment mechanism'). Additionally, repeated elections will filter out biased or incompetent representatives (the 'selection mechanism'). However, if citizens lack information about which policies are consistent with their underlying inter-

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<sup>7</sup>For example, Mansbridge (2003) sees an important positive role for 'mutually educative communication' in electoral representation, with the opinions of the represented being reshaped by their representatives but only in a direction that, given more information and time for reflection, the represented would approve.



ests and values, it is not obvious that these mechanisms would motivate representatives to provide this information. It is likely that, were a voter to become aware that she had been receiving biased or incomplete information from her representative, she would punish them electorally. But, it is difficult, if not impossible, for citizens who are currently un- or mis-informed to determine that this is the case. This means that they cannot use elections to either discipline or select representatives who will provide unbiased and complete information effectively.

## **2.2 Political Equality and Communicative Representation**

I contend that, if the policy opinions and factual beliefs of citizens are indeed endogenous to elite political communication, then any measure of the political power exerted by an individual citizen must also consider their presence and influence within public political debate, and thus over public opinion. This is because the presence and influence that any individual citizen has within public debate – even if only indirectly, via their representative(s) – materially affects their opportunities to influence political outcomes, via their influence on the opinions of others. As the political power possessed by each citizen is constituted by their opportunities to influence political decisions, it follows that their presence and influence within public debate (or their ‘communicative power’) is a core component of any measure of their effective political power over other citizens, including their representatives. It also follows that an equal distribution of communicative power is a prerequisite for the full realization of political equality.

Moreover, I contend that the degree of ‘communicative representation’ in a polity reflects, and is therefore informative about, how communicative power is distributed in that polity. Here, I define the level of communicative representation in a polity as the extent to which speech by elite actors proportionately reflects, *and* responds to changes

in, the entire distribution of individual preferences on each issue.<sup>8</sup> If communicative representation is low, it must be the case that elite actors with preferences shared by a subset of the electorate have disproportionate presence in public debate, providing them and those whose views they reflect greater opportunity than others to influence public opinion, and ultimately, political outcomes. On the other hand, high communicative representation would imply that elite opinions have a presence and influence in public debate largely in proportion to the number of citizens who share these views, implying a more equal distribution of communicative power among citizens.

The aforementioned logic holds even though the views of citizens that are therefore being represented by elites are, inevitably, themselves formed endogenously, through political and other processes. At any given moment, insofar as changes in the opinions of any individual citizen on any issue are as likely to be reflected in subsequent elite speech as changes in the preferences of other citizens, we can say that that individual has equal communicative power to all other individuals in that polity – in that, as an individual, they have as much presence and influence within public debate as any other citizen at that moment. This is true even if the policy opinions and beliefs that the individual concerned currently espouses reflect the opinions and information they have received from others within their social and political environment.

It is important to stress that a high degree of communicative representation thereby constitutes a necessary but not sufficient condition for equality of political power. This is because the opportunities citizens have to influence political decisions are also affected by other parameters governing the processes that link public opinion and policy outcomes

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<sup>8</sup>The meaning of the term ‘representation’ is highly contested, and has been used to describe a wide range of citizen-elite interactions and linkages (Mansbridge, 2003; Saward, 2010; Wolkenstein and Wrátil, 2021). I use the term ‘communicative representation’ here so as to draw an analogy with the level of ‘electoral representation’ that obtains in a polity, and to link with the empirical literature that understands this as mainly about congruence and responsiveness.

– for example, the institutions that influence how bills become law. Moreover, the criteria that have been focal within empirical research on representation – such as policy responsiveness, the strength of the economic vote, or improved descriptive representation – present complementary conditions which are also necessary but not sufficient conditions for political equality.

### **2.3 Costs of Communicative Representation**

However, even if we accept that the degree of communicative representation in a polity is informative regarding the nature and extent of political inequality, there are undoubtedly costs associated with improving communicative representation as well. Improving communicative representation may require that we increase, for instance, the presence and influence of nativists or authoritarians in public debate, or the representation of opinions which would be inadmissible in an ideal deliberative setting (for not being based in fact or being exclusionary). It would also demand that we do not over-represent the views of experts within public debate, even at the cost of the public interest. By increasing the communicative power of those with illiberal and anti-democratic views, it may threaten democratic stability and cohesion. Moreover, research suggests that there are substantial differences between citizens’ ‘fully informed’ preferences and those they express in surveys (Althaus, 1998; Luskin, Fishkin and Jowell, 2002) – compounding doubts as to whether focusing on the representation of citizens’ *actual* (uninformed) preferences is wise.

For these and other reasons, most, if not all, democratic theorists reject a ‘simple responsiveness criterion for democratic quality’ (Sabl, 2015, 349). Responding to some of these concerns, deliberative democrats have instead stressed the need for institutions and practices that might, through ‘the force of the better argument’ (Habermas, 1996, 103), reduce the prevalence of the least informed and moral opinions in the electorate (Mansbridge, 2003, 524). Knowing themselves and others to be less than fully informed

or moral, voters may not even *demand* perfect communicative representation from their representatives. A theory of representation attentive to how voters *want* to be represented – as Rehfeld (2009) argues is important, for instance – might want to incorporate and respond to these concerns.

## 2.4 The Value of Communicative Representation

Nonetheless, I argue that a more equal distribution of communicative power, and thus improved communicative representation, is nonetheless a worthwhile normative objective, albeit one that should not be prioritised over all other normative objectives.

My argument proceeds in two steps. First, any arguments against equalizing communicative power which rely on claims regarding the epistemic or moral inferiority of some citizens also imply reservations about equalizing the non-communicative power of those citizens as well. Second, many standard arguments for political equality imply that we should equalize both communicative power *and* non-communicative power. In this sense, discussions about the equality of communicative and non-communicative power are inseparable, and turn on each other. Therefore, a commitment to egalitarian principles – based on, for instance, a commitment to equal moral respect for all persons – entails a commitment to equalizing communicative power alongside non-communicative power.

First, consider the view that citizens with illiberal, anti-democratic, nativist, or poorly informed opinions should have less communicative power than others, because of the implications for democratic stability or for the quality of policy-making. It is immediate that the same concerns arise when it comes to equalizing the *non*-communicative political power held by these citizens as well. For instance, eliminating bans against fascist and other anti-democratic political associations would increase the voting power of citizens who support these parties, but also has potential consequences for minority rights and democratic stability in those societies.

Second, many standard arguments for political equality evidently imply that we should strive for equality of both communicative *and* non-communicative power.<sup>9</sup> The first of these arguments follows from the recognition that, in any society, there is widespread, inevitable and reasonable disagreement over the ranking of different moral priorities, as well as over the nature of the expertise relevant for resolving this disagreement. Then, there can be no ‘generally acceptable view of expertise’ (Valentini, 2013, 184) – an observation that underlies, for example, the ‘disagreement objection’ used to criticise epistocratic proposals (Christiano, 2008; Landa and Pevnick, 2020). An implication of this claim is that there can also be no generally acceptable basis by which we can determine who should have more or less (communicative or non-communicative) political power – as this requires reasonable agreement on, for instance, standards for competence, expertise or virtue. This also responds to the challenge that we are not morally obligated to respond to ‘unconsidered’ public opinion, as agreement on whose opinions are more ‘considered’ also presupposes an agreement on expertise that cannot be reached. Then, a commitment to equal respect for persons – a core prior commitment within the liberal tradition – demands that we also commit to equalizing communicative power.

A second (epistemic) argument for political equality builds on the claim that more egalitarian decision-making procedures are ultimately better at accessing moral and po-

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<sup>9</sup> Many prominent thinkers have argued that equal consideration, rather than equal power, is a more compelling and coherent understanding of political equality (Anderson, 1999; Verba, 2003) – due to the built-in asymmetric distribution of ‘vertical’ power between citizens and elected officials in representative democracies. However, I contend that if we interpret the aspiration to equal political power as an aspiration towards equal *opportunities* to influence political decision-making (as in Viehoff, 2019), then the requirements of ‘equal consideration’ and ‘equal power’ appear more similar (e.g. reducing inequalities in political participation or descriptive representation, as discussed by Beramendi, Besley and Levi, 2022). Moreover, if we accept Sidney Verba’s definition of equal consideration as a scenario where ‘voices are equally expressed and given an equal hearing’ (Verba 2003, 677), then equal communicative power even appears to be a *pre-requisite* for equal consideration.

litical truths than, for instance, epistocratic procedures, as they draw on a wider range of perspectives, heuristics and reasons (Bohman, 2006; Estlund, 2008). Notably, Landemore (2012) has argued that the higher ‘cognitive diversity’ of a randomly selected group of individuals will lead that group to outperform a group of individuals selected by ability – the ‘Diversity Trumps Ability’ theorem. Insofar as we accept this or related claims, it follows that improved communicative representation should also increase the diversity of elite discourse (and possibly also of elites themselves), even as it reduces the communicative power of experts.

A third (also epistemic) argument for political equality builds on the claim that any system which awards greater political influence to individuals based on some agreed notion of competence – such as education – inevitably introduces bias, and thus also has epistemic costs. This is because, even if the individuals thus selected are entirely altruistically motivated, their perspectives will inevitably be biased by the characteristics and interests (aside from competence) that they also do not share with the public at large. This reasoning underlies the ‘demographic objection’ to many epistocratic proposals (Estlund 2008, 215; see also Christiano 2008, 120-21). As an unequal distribution of communicative power means elite speech must be dominated by the perspectives of a minority of citizens (who, inevitably, differ from the general public on some characteristics), it follows that low communicative representation entails similar epistemic costs. Then, cumulatively, whether the epistemic advantages of improved communicative representation outweigh the costs of reduced expert influence is not immediate.

A fourth and final argument for political equality emphasizes a different instrumental value of democratic decision-making: as the best available means for preventing elite entrenchment, and thus resisting state capture by minority interests. This argument has most recently been made by Bagg (2018), who observes that several core institutional features of democracy – such as competitive elections – render state capture more diffi-

cult than in non-democracies. To this, I add that improved communicative representation provides one more line of defence against state capture. By definition, low communicative representation means that the viewpoints of certain groups are *over*-represented within elite discourse, and so disproportionately influential on public opinion. This provides existing elites, and those individuals who share their views, disproportionate opportunity to influence public opinion in a favorable direction – potentially facilitating their continued political dominance and the potential (mis)use of the state in defense of their own narrow interests. High communicative representation, on the other hand, mitigates these risks to a significant degree.

Then, insofar as we accept any or all of these four arguments as valid, it follows that egalitarian considerations should motivate us to pursue a more equal distribution of both communicative *and* non-communicative power.

## **2.5 Some Additional Challenges**

Finally, I consider and argue against two additional counter-arguments to my defense of communicative power as a key component of political power, and of the value of my understanding of communicative representation more broadly.

### **The Quantity vs. Quality of Opinions**

The first challenge is the claim that the quality, and not just the quantity, of opinions should be considered when determining the extent of communicative representation in a polity. That is, rather than requiring proportional representation of all views on all issues in elite speech, political equality is consistent with higher quality opinions receiving more elite representation, and so having more influence over public opinion. This is because, ultimately, higher quality opinions will have more influence on public opinion, as, through ‘the unforced force of the better argument’ (Habermas, 1996, 306), good reasons are more

likely to defeat bad ones. Moreover, this operates without undermining the equal standing of all involved, as this occurs through deliberation and by consent rather than coercion.

I have three responses to this challenge. First, I observe that it is unclear that we should expect good reasons to necessarily, or even more often, defeat bad ones when ideal deliberative conditions do not obtain (as seems unlikely, outside of specific settings like mini-publics). Second, consequently, we must judge which opinions are higher quality without observing which are more likely to survive the ‘force of the better argument’. This returns us to the problem of arriving at a reasonable agreement regarding the quality of different opinions, which presupposes some reasonable agreement on general expertise (as above).

Third, suppose for a moment that ideal deliberative conditions do generally obtain in elite fora (e.g. in legislatures), and so the disproportionate representation of certain opinions by elites reflects their greater quality. If so, then we should expect these opinions to ultimately grow in prevalence among the general public, as elites successfully persuade citizens of their merits. Then, high communicative representation will ultimately be consistent with the predominance of higher quality opinions in elite speech.

Alternatively, suppose instead that much of the general public is not persuaded by the opinions disproportionately expressed in elite speech (even if this is due to poor quality deliberation in the public sphere). Then, asking that elites disproportionately represent particular viewpoints nonetheless, and asking citizens to accept this distribution of communicative power as legitimate, would require that citizens ‘blindly defer’ to the judgments of these elites, without knowing that they would have arrived at the same conclusions following the same deliberations (Lafont, 2020).<sup>10</sup> As such, it stands in tension with the requirements of political equality.

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<sup>10</sup>Lafont (2020) makes this argument in the context oflottocratic minipublics, but it also applies here.



## Communicative Sufficiency as an Alternative Criterion

A second challenge to my argument is the view that, for political equality to be realized, it is sufficient to ensure that each possible viewpoint receives some consideration, rather than proportionate consideration. In other words, the requirements of equal communicative power can be met via communicative *sufficiency* rather than communicative representation. However, I contend that, in order to ensure each individual has an equal opportunity to influence public opinion, and therefore political decisions, only the proportionate representation of opinions will do.

This is because, all else equal, it seems natural that the probability an individual will be persuaded by an opinion increases in the frequency with which they hear that opinion. Then, if an individuals' opinions receive less than proportional representation in elite discourse, it follows that they have less communicative power than individuals whose views are then disproportionately aired. This intuition is supported by research on mass communication and persuasion which finds that the 'accessibility' of a consideration or frame increases with repeated exposure, especially for less knowledgeable individuals (Iyengar et al., 1984; Chong and Druckman, 2007). It is also consistent with findings that voters are far more likely to change their opinions when exposed to skewed rather than balanced messaging (Druckman, Peterson and Slothuus, 2013; O'Grady, 2022).

The point remains that the pursuit of equal communicative power may have negative consequences for other valuable outcomes, such as the epistemic quality of policy-making, democratic stability or societal cohesion. However, I have argued that, to the extent that we prize political equality, equal communicative power, and thereby communicative representation, is a normatively desirable objective. This is not to say that there are no legitimate grounds on which we can argue for an unequal distribution of communicative power in some cases. However, I contend that this debate should turn on the importance we assign to egalitarian commitments *in general* vis-a-vis other normative objectives, and

on the existence of reasonable grounds for prioritizing other objectives in some cases – a debate which is beyond the scope of this article.

### 3 Measuring Communicative Representation

My proposed measure of communicative representation has two components: communicative congruence – the proportionate reflection of the entire distribution of voter preferences, across issues, in elite speech – and communicative responsiveness – that changes in the distribution of voter preferences (appear to) produce corresponding changes in the preferences expressed in elite discourse.

The extent of communicative congruence and communicative responsiveness on various political issues in a country can be calculated by combining survey data on voter opinion on these issues and text data on elite speech on these issues. Using established text scaling methods, the discourse of an elite actor (e.g. a legislator or journalist) on a particular issue, can be situated on a ideological scale – measuring, for instance, how left or right-wing their discourse is on this issue. By combining this with survey data on public opinion and using a bridging approach I discuss below, elite discourse on various issues can be compared with public opinion on those issues. For instance, we can infer the fraction of the public that is more left-wing on an issue than the opinion expressed by an individual elite actor, or the fraction of elite discourse overall that is more left-wing on an issue than the views held by much of the public.

Then, for each issue, by combining data on elite discourse and survey data on public opinion from multiple time periods within a country, we can calculate the level of communicative congruence and responsiveness which obtains on that issue. In brief, communicative congruence is the extent to which, in a given time period and country, the distribution of elite discourse on an issue ideologically mirrors the distribution of public opinion on that issue. Communicative responsiveness is the extent to which changes

in public opinion on an issue are followed by similar changes in elite discourse. As I discuss below, it is also possible to use this approach to measure the relative communicative power of various social groups: that is, the extent to which elite discourse mirrors and responds to changes in the preferences of particular groups.

Evidently, in order to measure communicative congruence, responsiveness and the distribution of communicative power in practice, we need to select sources of elite discourse to compare to public opinion. In this article, I consider legislative discourse (specifically discourse in the UK House of Commons) as a proxy for the distribution of elite discourse in the UK. I justify the use of discourse in the legislature as a rough proxy for elite discourse below, although analysis of other elite discourse, such as discourse in election campaigns, or on traditional and social media, is in principle possible and warranted.

Combining this legislative speech data with survey data on public opinion, and measuring communicative congruence and responsiveness on an issue, ultimately involves six distinct steps, which I now describe in detail. These are: (1) identifying the distribution of voter preferences on that issue; (2) identifying elite speech on that issue in a particular domain; (3) estimating the ideological slant of elite speech on that issue using text scaling methods; (4) rescaling elite speech and voter preferences so that they are on the same, comparable, scale; (5) calculating communicative congruence using the distribution of voter preferences and elite speech on the issue; (6) measuring the correlation between (lagged) changes in the distribution of voter preferences and changes in elite speech.

Ultimately, this enterprise enables us to gather information on a key aspect of political inequality that is not already evident from analyses of electoral representation that draw on, for instance, comparisons of changes in citizen opinion and legislator preferences (measured in elite surveys), legislative behavior (measured in roll call votes), or policy outcomes. One reason is that, particularly in systems with high party discipline, a greater diversity of views can be, and are, expressed by elite actors in public fora than are typically

expressed in legislative behavior and policy outcomes alone (due to the agenda-setting powers of governments, for example). As a result, measures of political inequality that are based solely on the correspondence between citizen opinion and legislative behavior or policy outcomes may understate the degree to which diverse opinions are represented within political debate.

Second, the elite actors (including legislators) who have the most presence and influence in public debate – and so, the most communicative power – are not necessarily those who have the most *de jure* political power. For instance, in single-party governments with weak committee systems, cabinet members may have a near-monopoly on the power to translate the policy preferences of (some) citizens into law. However, even in such contexts, other legislators will still have the capacity to influence public opinion, and so the future direction of policy-making, through their speeches inside parliament, on the campaign trail, or in interviews with media outlets. Certain individuals or groups of individuals may have, or seize, more opportunities to do so than others. The same holds for other elite actors, such as journalists, or other prominent public figures. This in turn awards disproportionate communicative power to those citizens who share their views, even if those citizens are politically disadvantaged in other respects. My proposed measure of communicative representation allows us to identify some of these discrepancies.

### **Step 1: Measuring Voter Preferences on an Issue**

To first measure the preferences of voters on a range of issues, I use survey data, using sampling weights where available to ensure that the distribution of preferences I obtain is representative of the electorate at large. Ideally, survey questions where respondents were asked to place themselves as well as political parties on specific issues are preferred, as we can then use voter placements of parties to anchor legislators and voters on the

same scale (Step 4). Such questions are commonly included in national election studies (e.g. the British Election Study, the German Longitudinal Election Study, and the American National Election Study) as well as some cross-national studies (e.g. the European Election Study).

## **Step 2: Identifying Elite Speech on that Issue**

In order to study elite speech on these issues in the same time frame, I use legislative speech as a proxy for elite speech, as this has already been labelled and digitized by researchers for a large number of countries and years – for instance, in the ParlSpeech dataset (Rauh and Schwalbach, 2020) or the ParLEE Plenary Speeches dataset (Sylvester, Greene and Ebing, 2022). Thus, a similar approach can easily be allowed to other issues, countries and periods for which labelled and digitized legislative speech data exists. However, in principle, the same approach (Steps 3-6) can straightforwardly be applied to elite speech by other actors and in other domains as well (e.g. press statements by political parties, social media output, or mass media content).

Unlike political communication through various media outlets, legislative speech is not ‘public-facing’ and so ostensibly intended to communicate one’s policy positions to other legislators, not the public at large. Then, it might appear an odd forum in which to evaluate the presence and influence of opinions within public debate. However, most previous research on the politics of parliamentary debate has argued that legislators principally use legislative speech as a means of ‘public communication’, to ‘send policy signals when competing for votes’ (Proksch and Slapin 2015, 21; see also Bäck and Debus 2016), and so speak with the intention of having key extracts from their speeches disseminated to the broader public by their parties, journalists, as well as through their own social media accounts. Researchers have also identified various correlates of parliamentary speech which are hard to understand except if legislative speech is understood as public com-

munication, an effort to either reveal or justify one’s political positions to the electorate (Martin and Vanberg, 2008; Herzog and Benoit, 2015). Thus, while legislative speech is far from the only important domain through which elites may influence public opinion, it still constitutes an important domain through which influential members of the political elite (legislators) communicate with, and so potentially influence the opinions of, the general public.

### **Step 3: Estimating the Ideological Slant of Elite Speech**

In order to estimate the policy preferences on an issue expressed in each legislator’s parliamentary speech, we require text scaling methods. In this article, I employ Wordscores, a supervised text scaling procedure (Laver, Benoit and Garry, 2003; Lowe, 2008). Wordscores compares a set of texts whose positions are unknown (“virgin texts”) with texts whose positions on a scale are assumed to be known to the analyst *a priori* (reference texts). Virgin documents are then scored based on their similarity to the reference texts in terms of their word usage – in particular, the frequency with which they use words also used in the reference texts. In my case, for each issue and period, generating these reference texts requires identifying legislators whose speeches can be considered to express the extreme left and extreme right positions on that issue. Wordscores has previously been successfully applied to a variety of political text corpora (Klemmensen, Hobolt and Hansen, 2007; Klüver, 2009; Hjorth et al., 2015), including parliamentary speech on welfare spending in the UK (O’Grady, 2019). In Section 4 and in Appendix A, I also present several pieces of evidence validating its performance in my case.<sup>11</sup>

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<sup>11</sup>An alternative might be an unsupervised text scaling procedure, like Wordfish (Slapin and Proksch, 2008) or Wordshoal (Lauderdale and Herzog, 2016). While these procedures have performed well in a number of contexts, I found that they performed poorly in my case, with Wordscores producing a more plausible ordering of legislators on both issues.

#### **Step 4: Jointly Scaling Voter Preferences and Legislator Speech**

In order to compare the distribution of voter preferences on an issue with the distribution of preferences expressed in legislator speech, we must place the two on a common scale. I do this by creating hypothetical anchor legislators who are assigned a score on both the Wordscores scale (of legislator speech) and on the survey response scale (of voter opinions) on each issue and for each period. I then use these anchor legislators to map all other legislators to a position on the survey response scale, based on the position of their speech on the Wordscores scale.

For each issue and period, I first create two anchor legislators who represent hypothetical extreme left and right legislators. I assign these two legislators positions on the survey response scale equal to the extremes of those scales, and Wordscores positions equal to the weighted average of scores received by extreme left and right legislators on those issues (again weighted by words spoken). These extreme left and right legislators are also those legislators whose speech was used to generate reference texts for the Wordscores procedure.

I also generate several additional anchor legislators corresponding to ‘typical’ members of parties in the system concerned. These legislators are assigned positions on the survey response scale based on how attentive survey respondents placed their parties, on average, on that issue and in that period.<sup>12</sup> Specifically, for each issue and period, I assigned these legislators a score on the Wordscores scale equal to the weighted average of all Wordscore scores received by legislators from the same party in that period (weighted by number of words spoken).

Finally, for each period and issue, I run a bivariate linear OLS regression regressing the survey response positions of these anchor legislators on their Wordscores positions. The

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<sup>12</sup>For this analysis, ‘attentive individuals’ were those who were among the top 25% of respondents in terms of self-reported political attention in each wave.

resulting estimates provide a linear mapping from the Wordscores scale to the survey response scale, for each period and issue, which I then use to place all legislators on the survey response scale, based on their estimated positions on the Wordscores scale. This approach assumes, first, that the rank ordering of legislators on the Wordscores scale reflects their ideological location on the survey response scale, as revealed in their parliamentary speech, and second, that the loss of cardinal information from a linear mapping between the two scales is minimal. In Appendix A.3, I discuss evidence that both these assumptions seem reasonable in my case.

My approach differs from earlier efforts to ‘bridge’ or jointly scale legislators and voters developed by scholars of American politics and subsequently applied to other contexts like Europe (Bakker et al., 2014) and Latin America (Saiegh, 2015) – whereby two disjoint sets of roll call or survey data are connected using common survey items. However, these approaches all require joint surveys of elites and voters, limiting us to cases where such surveys already exist, or requiring new and costly data collection efforts. Although less precise, an advantage of my approach is that it only requires surveys where voters are asked to place parties *and* themselves on the same issue, allowing us to use historical survey data to locate legislators and voters on a common scale across a much larger number of countries, years and issues, including backwards in time.

### **Step 5: Measuring Communicative Congruence**

As my interest is in the representation of voter preferences in political *speech*, I compare the distribution of voter preferences on each issue to the estimated distribution of legislative *discourse* on this issue. I do this by reporting the proportion of legislative speech delivered by legislators assigned to different bins on the survey response scale, and not only the proportion of legislators assigned to each bin. This gives greater weight to the expressed preferences of legislators who had more floor time – for instance, party leaders



and frontbenchers (Proksch and Slapin, 2015) – and consequently, more presence and influence in public debate.

Based on this information, to summarize the level of communicative congruence that exists between legislators and voters on a particular issue, I develop a measure of ‘communicative malapportionment’. This measure builds on that of electoral malapportionment proposed by Samuels and Snyder (2001), and is calculated using the following formula:

$$M_{jt} = \frac{1}{2} \sum_{i=1}^N |D_{ijt} - v_{ijt}| \quad (1)$$

where  $M_t$  denotes the degree of communicative malapportionment that exists in country  $j$  at time  $t$ ,  $i$  denotes the bins on the survey response scale,  $D_{ijt}$  the proportion of legislative discourse in each bin  $i$  at time  $t$ , and  $v_{ijt}$  the proportion of voters placing themselves in each bin  $i$  at time  $t$ . This quantity captures the proportion of legislative speech on an issue that is delivered by legislators who would not have received any floor time if there were perfect communicative congruence on that issue.

### **Step 6: Measuring Communicative Responsiveness**

However, communicative congruence alone is insufficient as an indicator of the distribution of communicative power in a polity, as we might observe high levels of congruence just because opinions are highly endogenous and communicative power is monopolized by elites. For this reason, we must also analyze the level of communicative responsiveness on each issue – or, the extent to which changes in the distribution of voter preferences (appear to) produce corresponding changes in the distribution of legislative speech. This provides us with an indication of how much the congruence we observe is driven by elite influence on public opinion rather than vice versa.

To facilitate this analysis, I compute legislators’ ‘gap responsiveness’ to voters, by regressing the change in the proportion of legislative speech in each bin between periods

$t_0$  and  $t_1$  on the gap between the proportion of legislative speech and the proportion of voters in that bin in period  $t_0$ . This captures whether legislator speech in subsequent periods moves towards the preferences of voters who were especially under-represented in speech in the previous period, so as to reduce the extent of under-representation of these voters in subsequent periods. As such, if there is a high level of gap responsiveness, legislative speech tends to evolve over time in a direction that diminishes the overall level of communicative malapportionment.

It is important to note that this measure of responsiveness is still likely to be biased due to the very endogeneity of public opinion that we are concerned with. For example, legislators and voters may both be responding to the views of experts, and so my measures of responsiveness do not capture the true level of communicative responsiveness by legislators to voters (a form of ‘omitted variable bias’). This ‘endogeneity problem’ is distinct from the issue that was the focus of Section 2, which concerned the implications of opinion endogeneity for the distribution of political power within a polity.

However, for two reasons, bias of this kind does not pose a significant problem for my measures of communicative representation. First of all, my use of lags when measuring responsiveness addresses the most likely sources of omitted variable bias, such as factors that shift legislator opinion either before or simultaneously with that of voters (e.g. the influence of expert opinions or the media on both). Second, although my estimates of communicative responsiveness are likely biased, they are almost certainly biased upwards (by forces causing legislator and voter opinion to trend in a similar direction that are not captured by these lags). The only circumstances under which we might observe low communicative responsiveness when the true value is high is if there are factors pulling legislator and voter opinion in opposite directions. However, in those circumstances, we should also observe low communicative congruence. Therefore, even if these measures do not provide unbiased estimates of the true level of communicative representation on an

issue, a finding of low communicative representation (i.e. low communicative congruence *and* responsiveness) is still informative about inequalities of communicative power.

### **Additional Statistics**

I also propose two additional statistics that provide deeper insight into the degree and sources of unequal communicative representation in a polity.

First, as a measure of relative communicative presence, I calculate the extent to which different opinions and social groups are over-represented in legislative speech relative to their numbers in the electorate as a whole. The relative communicative presence  $p_i$  of opinion group  $i$  (where an opinion group is e.g. voters who place themselves at ‘2’ on immigration) is given by:

$$p_i = \frac{\text{fraction of legislators with opinion } i}{\text{fraction of voters with opinion } i}$$

The relative communicative presence  $P_j$  of a social group  $j$  is then:

$$P_j = \sum_i p_i \times \text{fraction of social group } j \text{ with opinion } i$$

This measure relates closely to the measure of ‘relative opinion presence’ developed by Basu and Heberer (2023), and can be interpreted similarly. When the relative communicative presence a group has is below 1, members of the group are under-represented in legislative speech relative to the representation received by a typical voter. Conversely, when it is above 1, the group is over-represented in speech relative to the typical voter.<sup>13</sup>

However, as with communicative representation overall, we may find that a social

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<sup>13</sup>As an example, if we calculate that graduates have a relative communicative presence of 1.48, this means that the preferences of graduates receive 48% more representation in legislative speech than would be warranted by their numbers within the electorate.

group has disproportionate communicative presence relative to another merely because the opinions of its members are especially influenced by, and therefore similar to, those expressed by elites. For this reason, I also calculate the extent to which legislators respond disproportionately in their speech to changes in the opinions of particular social groups – i.e. their ‘relative communicative responsiveness’ to different social groups. This is calculated by the same approach as ‘gap responsiveness’, discussed above, except that the gap that changes in legislative speech are regressed upon is the gap between the percentage of legislative speech and the percent of a sub-group at each position, rather than the gap between the percent of speech and the percent of all voters at each position. These measures of the relative communicative presence of a group, and of legislators’ relative communicative responsiveness to that group, are cumulatively informative regarding that group’s ‘relative communicative power’.

## 4 Communicative Representation in the UK

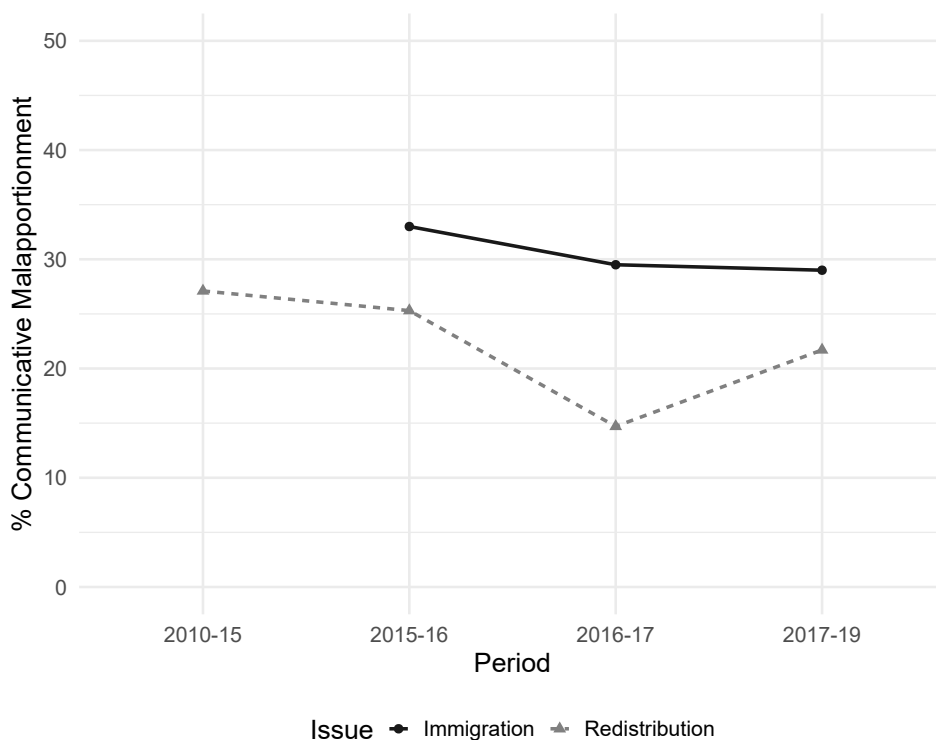
In this article, as proof of concept, I analyze communicative representation on redistribution and immigration in the UK between 2010 and 2019 – a time frame which includes three general elections, four governments, and one fateful referendum on Britain’s membership of the European Union. In this period, immigration and redistribution constituted two salient and cross-cutting dimensions of political conflict in the UK. Moreover, voters were repeatedly asked their views on these issues in the British Election Study at this time, enabling an over-time analysis of communicative representation on these issues.

I split the years between 2010 and 2019 into four distinct sub-periods, punctuated by changes of government: May 2010 to May 2015 (Conservative-Liberal Democrat coalition government); May 2015 to June 2016 (Conservative majority government led by David Cameron); June 2016 to June 2017 (Conservative majority government led by Theresa May); June 2017 to July 2019 (Conservative minority government led by Theresa May).

This tumultuous period in British politics also witnessed the election of Jeremy Corbyn as leader of the Labour party, a longstanding rebel on the left of the party. Details on the application of the empirical strategy described in Section 3 to this case, including information on data sources, the scaling of legislator speech using Wordscores, and the choice of anchor legislators for bridging, are reported in Appendix A. Appendix A also presents several validation checks for the resulting estimates.

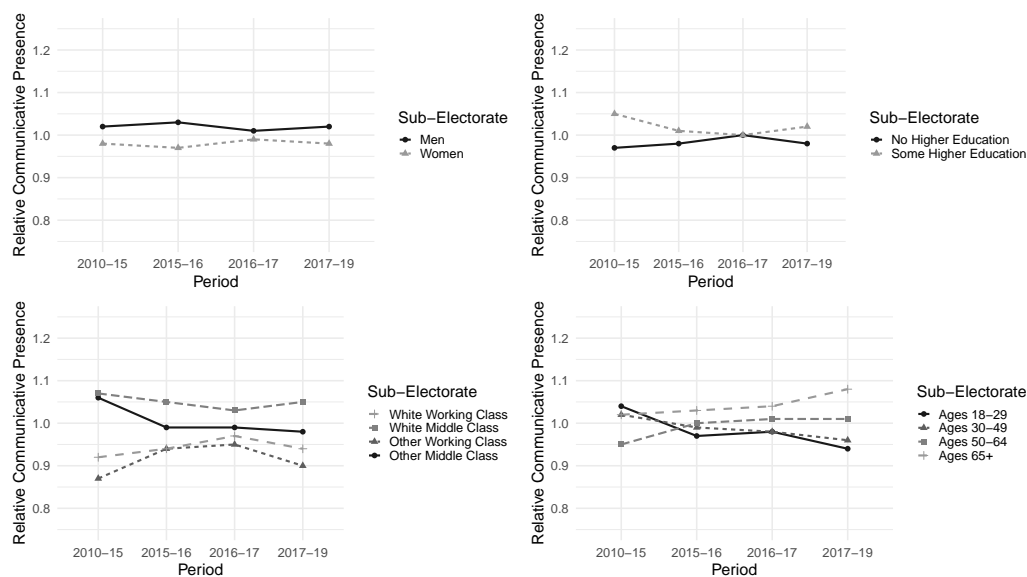
Figure 1 presents the estimated level of communicative malapportionment in the UK between 2010 and 2019, on redistribution (in grey) and on immigration (in black). These estimates are generated by comparing the proportion of legislators and voters assigned to each bin on the survey response scale, according to the formula given in equation (1). In Appendix B, I also present the full estimated distributions of citizen preferences, the expressed preferences of speaking legislators, and the preferences expressed in legislative discourse, calculated by the approach described in Section 3.

Figure 1: Communicative Malapportionment in the UK, 2010-2019



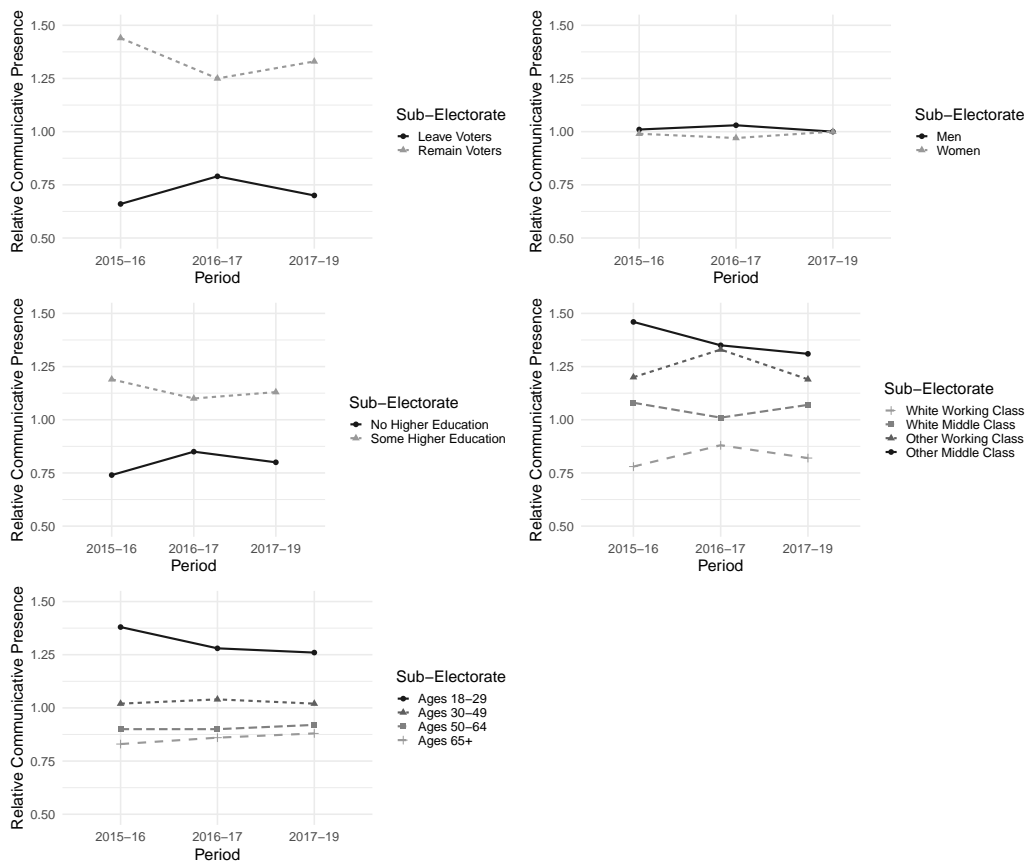
I find evidence of significant communicative malapportionment on both issues, but a higher level of malapportionment throughout on immigration as compared with redistribution. In both cases, communicative malapportionment appears to decline slightly over the period considered. In particular, while 27.1% of legislative speech on redistribution could be attributed to malapportionment in 2010-15 – or speech delivered by legislators who would not have received any floor time if there was perfect communicative congruence on this issue – this decreases somewhat to 25.3% in 2015-16, and even further to 14.7% in 2016-2017 and 21.7% in 2017-19. Meanwhile, I estimate 33.0% of legislative speech on immigration as reflecting malapportionment in 2015-16, decreasing to 29.5% in 2016-17 and 29.0% in 2017-19.

Figure 2: Relative Communicative Presence of UK Sub-Electorates on Redistribution



Next, in order to obtain deeper insight into the sources of this communicative malapportionment that we observe, Figures 2 and 3 plot trends in the relative communicative presence of different sub-electorates in this period, on redistribution and immigration respectively. As discussed in Section 3, the relative communicative presence of a sub-electorate captures the extent to which the opinions of members of a particular group are over- or under-represented in legislative speech relative to the opinions of a typical voter,

Figure 3: Relative Communicative Presence of UK Sub-Electorates on Immigration



and so their numbers in the electorate as a whole.

Overall, we find higher disparities in relative communicative presence on immigration compared with redistribution, consistent with the patterns in communicative malapportionment already observed (ref. Figure 1). Yet, there are also some commonalities in the relative communicative presence of various sub-electorates across the two issues. On both immigration and redistribution, we find that the opinions of men and of high education voters are over-represented in legislative speech, relative to those of women and of low education voters.

These differences are especially stark when it comes to education, and especially on the issue of immigration: I find, across this period that the (more right-wing) opinions of low education voters on the issue received, on average, 20% less representation than their numbers would warrant, whereas the (more left-wing) opinions of high education voters received about 15% *more* representation than warranted.<sup>14</sup> This disparity is only slightly smaller than that which I uncover based on voters' Brexit vote intention (recalled vote after 2016) – with the views of Leave voters receiving, on average, about 30% less representation than warranted, and those of Remain voters receiving, on average, about 35% more representation than warranted.

On the other hand, patterns in relative communicative presence by age and by ethnicity and social class are less consistent across the two issues. I find that the (more

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<sup>14</sup>These patterns build, in turn, on patterns in the relative communicative presence of different opinions in parliamentary speech in this period, reported in Figures B.3 and B.4 in Appendix B. In Figure B.4, I show that left-wing opinions on immigration are consistently over-represented throughout. Moreover, I also find that low education voters are substantially more conservative on the immigration issue than are high education voters. In 2015, I estimate that almost 50% of voters without any higher education selected the most right-wing option when asked whether the UK should allow in many fewer or many more immigrants; this response was chosen by half as many (25%) voters with some higher education. The full distributions of opinions on each issue by sub-electorate and period are available on request.



left-wing) opinions of working class British voters on redistribution are slightly under-represented in legislative speech throughout, though by a slightly smaller margin after 2015. This is especially the case for working class voters of ethnic minority origin, who report more left-wing preferences on redistribution than any other sub-electorate. Even after the election of Jeremy Corbyn as Labour leader, the opinions of ethnic minority working class voters receive 5-10% less representation in parliamentary speech than warranted by their numbers. However, on immigration, the (more left-wing) views of this sub-electorate are significantly over-represented throughout, receiving, on average, about 25% more representation in parliamentary speech than warranted by their numbers. In a similar vein, although I do not identify substantial inequalities of relative communicative presence on the redistribution issue by age, I find very large disparities by age on the immigration issue – with the (more left-wing) views of young voters on immigration receiving, on average, about 30% *more* representation than warranted by their numbers, and the (more right-wing) views of elderly voters receiving, on average, about 15% *less*.

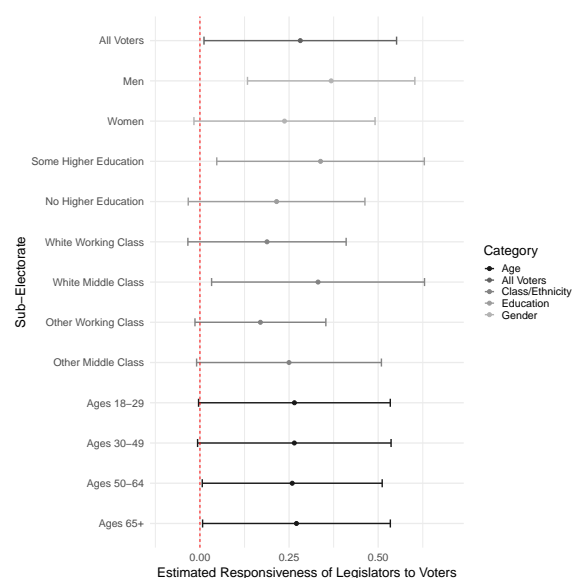
However, as discussed in Section 3, we cannot draw strong inferences about the relative communicative power of different groups, or about the level of communicative representation overall, based on measures of communicative malapportionment (or congruence) and relative communicative presence alone. For instance, it may be that the level of communicative malapportionment we observe is lower than warranted because opinions are highly endogenous and communicative power is monopolized by elites. Similarly, it may be that the views of men are over-represented in legislative speech because their opinions are especially influenced by, and therefore similar to, those expressed by elites. For this reason, I also estimate legislators' communicative *responsiveness* to voters following the approach described in Section 3.

Figure 4 presents the results from these regression analyses (reported in full in Appendix B.2), displaying the estimated communicative ('gap') responsiveness of legislators

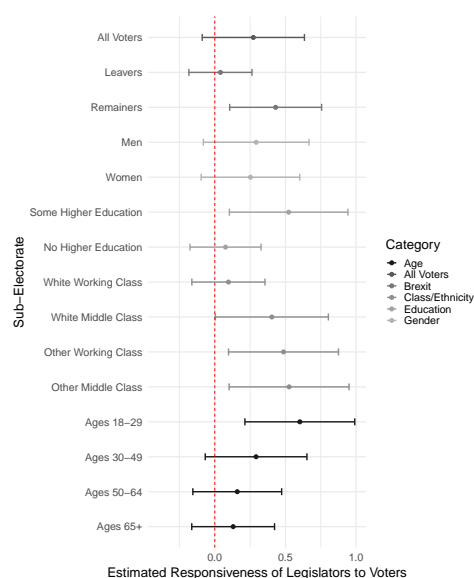
overall (i.e. to all voters), as well as to individual sub-electorates, on redistribution and on immigration respectively. We find some evidence for legislators’ overall communicative responsiveness to voters. The estimated coefficient on responsiveness is almost identical across the two issues, but only statistically significant at the 5% level on redistribution. However, our analyses of communicative responsiveness on immigration rely on fewer periods, and therefore observations, potentially explaining this result.<sup>15</sup>

Figure 4: Communicative Responsiveness of Legislators to UK Voters, 2010-2019

(a) Issue: Redistribution



(b) Issue: Immigration



At the same time, my estimates of legislators’ relative communicative responsiveness to different sub-electorates clearly indicate that legislative speech is much more responsive to some sub-electorates than to others. To a remarkable extent, it turns out that legislative speech is relatively more responsive to changes in the opinions held by the same groups that also have more relative communicative presence on an issue. For example, legislative speech is much more responsive to changes in the opinions of high education voters on both issues, a group that also have high relative communicative pres-

<sup>15</sup>In many cases, the estimated coefficients on responsiveness for immigration are still statistically significant at the 10% level (ref. Table B.1 in Appendix B.2.)

ence on both issues. This consistent pattern is confirmed by a Spearman’s correlation test, where I estimate a (highly statistically significant) rank-order correlation between a group’s (average) relative communicative presence and legislators’ relative communicative responsiveness to that group of 0.76 ( $p < 0.001$ ).<sup>16</sup>

These results suggest that these measures *are* cumulatively informative about a group’s relative communicative power, as there is no obvious (other) reason to expect these measures of congruence and responsiveness to be so highly correlated. As with relative communicative presence, we sometimes find that legislators are more responsive to the views of a group on one issue compared with the other. For instance, we find that legislative speech responds much more strongly to changes in the opinions of ethnic minority voters and young voters on immigration, and to those of white middle class voters on redistribution. However – as these groups also have disproportionate relative communicative presence on the same issues – these results may reflect that the relative power of these groups to influence elite communication differs across issues. This may occur, for instance, if the immigration issue is much more salient to ethnic minorities and young voters, and redistribution to white middle class voters.

Overall, these patterns align well with previous research on unequal representation in established democracies, including in the UK. The disconnect between the socio-economic background of most British parliamentarians – overwhelmingly degree-holders from middle and upper-class backgrounds – and the backgrounds of their constituents has previously been documented (O’Grady, 2019), and similar patterns have been observed in the Netherlands (Hakhverdian, 2015) and Germany (Elsässer, Hense and Schäfer, 2021) as well. The descriptive under-representation of working-class and low education voters

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<sup>16</sup>A Pearson’s correlation test still estimates a moderately high correlation between these two quantities ( $\rho = 0.43$ ,  $p < 0.05$ ). However, as my estimates of groups’ relative communicative presence are far from normally distributed, the Spearman correlation test is arguably more robust to outliers than the Pearson correlation in my case.

in parliament – which may, in turn, lead legislators to be especially poorly informed about their views (Broockman and Skovron, 2018; Benoit-Pilet et al., 2023) – may be one factor contributing to their poor communicative representation in parliament.

## 5 Conclusion

How should we evaluate the distribution of political power in a polity, if public opinion both influences and is influenced by elite communication? I have argued that the possibility of such ‘opinion endogeneity’ introduces additional sources of political inequality, which have hitherto received little attention in the literature on representation. As a result, existing research on political inequality and representation in democracies overlooks a key component of the distribution of effective political power within a polity: communicative power.

In this article, I have argued that a full consideration of how effective political power is distributed in a polity must thus therefore take into account inequalities in communicative power as well. The extent of this inequality is captured by the degree of ‘communicative representation’ in that polity – or the degree to which, across issues, political communication by elite actors proportionately reflects, as well as responds to, the opinions of individual citizens. Moreover, I introduce an empirical strategy for measuring how far communicative representation, thus defined, obtains in actually existing polities. Finally, to illustrate the feasibility and validity of my suggested empirical strategy, I apply this approach to characterize the level of communicative representation on two key issues, redistribution and immigration, in the United Kingdom (UK) between 2010 and 2019. I find evidence of significant communicative malapportionment on both issues, as well as some overall communicative responsiveness. I also identify significant inequalities in relative communicative power, particularly based on gender and education.

In future work, researchers could build on these efforts to examine and compare pat-

terns in communicative representation across a larger number of countries, issues and years. Based on such analyses, future research could explore the correlates of any variation in performance that we observe, broadening our understanding of the sources of variation in political inequality. Although I rely on legislative speech as a proxy for elite discourse in this article, my approach can, in principle, be straightforwardly applied to elite communication by other actors and in other domains as well. By doing so, one could assemble a fuller picture of inequalities in communicative power within a polity, taking into account a broader range of elite actors and fora for public political debate.

Moreover, the measure of communicative representation developed in this article introduces a strategy to evaluate which groups currently have disproportionately little influence over public opinion, and by how much. This can also help us evaluate the effectiveness of various strategies which have been proposed to reduce political inequality (or to identify new ones). This includes strategies such as deliberative innovations, proposals to enhance ‘recursivity’ in the representative relationship, or descriptive representation (Phillips, 1995; Mansbridge, 2022).

For example, deliberative bodies have been found to be contaminated by pre-existing inequalities to some degree (Gerber et al., 2018; Parthasarathy, Rao and Palaniswamy, 2019). Analyses of communicative representation within deliberative assemblies, and of the relative communicative power of different groups in these assemblies, could help us identify inequalities over public opinion within these fora. The same applies to proposals to improve descriptive representation (such as quotas) or recursive representation (such as particular town hall formats). An assessment of imbalances of power over public opinion may help identify when particular reforms have not translated into improved communicative power. It may also reveal constituencies which are particularly marginalized in terms of their relative communicative power, and who may especially benefit from increased representation.

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# Online Appendix

## A Data and Empirical Strategy for UK Analysis

### A.1 Measuring the Preferences of British Voters

To measure the preferences of British voters on redistribution and immigration in this period, I use data from the British Election Study (waves 1, 7, 11 and 14, fielded in February–March 2014, April–May 2016, April–May 2017 and May 2018 respectively). Specifically, I analyze responses to the following two questions:

- Some people feel that government should make much greater efforts to make people’s incomes more equal. Other people feel that government should be much less concerned about how equal people’s incomes are. Where would you place yourself and the political parties on this scale? (0 = extreme left)
- Some people think that the UK should allow *many more* immigrants to come to the UK to live and others think that the UK should allow *many fewer* immigrants. Where would you place yourself and the parties on this scale? (0 = extreme right)

The question on immigration is only available from wave 7 (2016) onwards. In both cases, respondents were presented with an 11 point scale (0 to 10). I use the sampling weights provided to ensure that the distribution of preferences I obtain is representative of the British electorate.

In every wave, the BES also includes information on respondents’ gender, their highest educational qualification (wave 1) or university attendance (wave 7 onwards), ethnicity, social grade and age, as well as their vote intention/recalled vote choice in the 2016 Brexit referendum. I use this information to divide respondents into sub-electorates based on

their gender (male vs. female)<sup>17</sup>, education (some vs. no higher education), social class and ethnicity, age, and Brexit vote intention/choice (Leave vs. Remain). Individuals belonging to households with the social grades A, B and C1 were classed as ‘middle class’, and those from C2, D and E households, classed as Meanwhile, when dividing respondents into sub-electorate by ethnicity, white British respondents were considered ‘white’, and all others (including, for instance, those of white European background) were classed as ‘other’.

## A.2 Measuring the Preferences Expressed in British Legislative Speech

To measure the preferences expressed on these issues in elite speech, I rely on the ParlEE Plenary Speeches dataset (Sylvester, Greene and Ebing, 2022). The ParlEE dataset contains all speeches which were delivered in the UK House of Commons in this period, already classified by topic at the sentence-level according to the Comparative Agendas Project coding scheme (Froio, Bevan and Jennings, 2017). To identify relevant speeches, I first extract sentences classified as relating to immigration, macroeconomics and social welfare. As the CAP scheme does not specifically identify speech on redistribution, to reduce measurement error, I ultimately base my estimates of legislator expressed preferences on this issue to references to redistribution within these extracts.<sup>18</sup>

As discussed in Section 3, to apply Wordscores, we need to first to identify legislators taking an extreme position on each issue, whose speeches can then be used as reference texts. To represent the extreme pro-redistribution position, I constructed a reference document containing all speeches made by members of the “Socialist Campaign Group”

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<sup>17</sup>The few respondents who refused to answer this question were classed as female.

<sup>18</sup>Specifically, I extract ten word windows surrounding mentions of “tax\*”, “\*fair\*”, “benefit\*”, “poverty”, “\*justice”, “unjust”, “inequality”, “unequal”, “taxpayer”, “rich\*”, “redistribut\*”, “austerity”, “cuts”, “universal credit”.

(SCG) of Labour MPs between 2010 and 2019.<sup>19</sup> The SCG is an organized faction within the Labour party, generally considered to include legislators espousing views on the far left of the party, including on redistribution (Cowley, 2002). In this period, it included Jeremy Corbyn, leader of the Labour party between 2015 and 2019, and other prominent figures on the Labour left, such as Diane Abbott, John McDonnell, and Dennis Skinner. A total of 34 Labour MPs were part of the SCG at some point during this period. To anchor the other end of the spectrum on redistribution, I use speeches made by members of the ‘Free Enterprise Group’ (FEG), an organized faction of Thatcherite MPs within the Conservative party, founded in 2011. 65 Conservative MPs were linked to the FEG at some point during this period, including prominent right-wing MPs such as Liz Truss, Kwasi Kwarteng, Nadhim Zahawi and Priti Patel.

To represent the extreme left position on immigration, I use speeches by legislators who voted against the 2014 Immigration Act, which enshrined in law various policies intended to help identify and deport illegal immigrants residing in the UK. Only 18 legislators voted against (of whom two lost their seats in 2015), as the official Labour party position on the vote was to abstain on the third reading of the bill.<sup>20</sup> Meanwhile, to represent the extreme right position on immigration, I use speeches by the 60 still-serving legislators who supported Nigel Mill’s 2014 amendment to extend transitional controls on Romanian and Bulgarian migrants to Britain – an amendment mainly supported by the Conservative party’s *right* flank (along with assorted representatives from the Democratic Unionist Party) – legislators who thought that the Conservative party’s proposed restrictions on future immigration did not go far enough. Prominent members of this group included Philip Hollobone, formerly member of a group which supported the voluntary

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<sup>19</sup>Pooling all speeches into a single document maximizes the length and linguistic diversity of the reference document, which improves the performance of Wordscores (Lowe, 2008; O’Grady, 2019).

<sup>20</sup>Their number included some prominent members of the SCG, like Jeremy Corbyn and Diane Abbott, as well as some MPs from the Scottish National Party and Plaid Cymru.



repatriation of ethnic minorities, as well as Douglas Carswell, who defected to the radical right party UKIP in 2014.

### **A.3 Jointly Scaling UK Voter Preferences and Legislator Speech**

As discussed in Section 3, in order to compare the distributions of legislator speech and voter preferences on an issue, we need to place them on a common scale. In order to apply the approach described in Section 3, I create six hypothetical anchor legislators who are assigned a score on both the Wordscores scale (of legislator speech) and on the 11 point BES scale (of voter opinions) on each issue and for each period. I then use these six anchor legislators to map all other legislators to a position on the BES scale, based on the position of their speech on the Wordscores scale. Four of these anchor legislators correspond to ‘typical’ members of the four major British parties – Labour, the Conservatives, the Liberal Democrats and the Scottish National Party. I assign positions on the BES scale for these four anchor legislators based on how attentive BES survey respondents placed these four parties, on average, on the BES scale for that issue and in the relevant survey wave. Specifically, I assign these four anchor legislators a score on the Wordscores scale equal to the weighted average of all Wordscore scores received by legislators from the same party in that period (weighted by number of words spoken).

For each issue and period, I also create two additional anchor legislators representing hypothetical extreme left and right legislators. I assign these two legislators BES positions equal to the extreme of the BES survey scales, and Wordscores positions equal to the weighted average of scores received by extreme left and right legislators on those issues (again weighted by words spoken).<sup>21</sup> Finally, for each period and issue, I run a bivariate linear OLS regression regressing the BES positions of these six anchor legislators on

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<sup>21</sup>For example, in each period, I construct a hypothetical extreme left legislator on redistribution by taking the weighted average of scores received by SCG MPs in that period. This legislator is assigned a score of 0 on the BES scale, representing the most extreme left survey response on redistribution.

their Wordscores positions. The resulting estimates provide a linear mapping from the Wordscores scale to the BES scale, for each period and issue, which I then use to place all legislators on the BES scale, based on their estimated positions on the Wordscores scale.

#### **A.4 Validation of Wordscores Estimates**

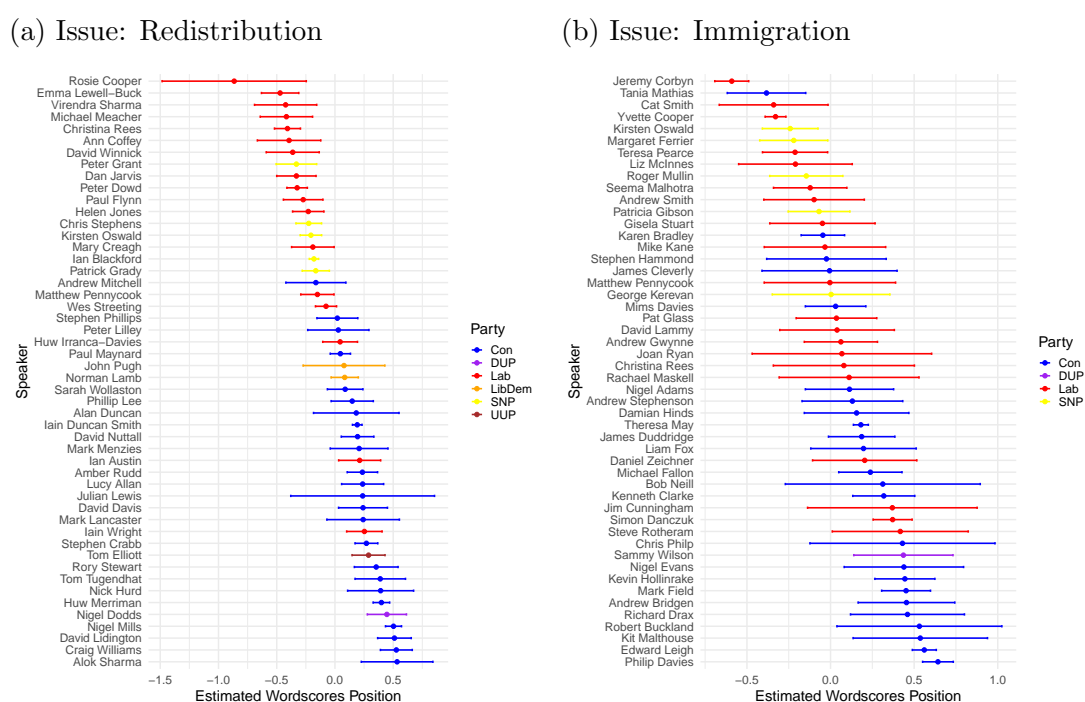
As already discussed in Section 3, this approach assumes, first, that the rank ordering of legislators on the Wordscores scale reflects their ideological location on the BES survey scale, as revealed in their parliamentary speech. I find that this assumption seems reasonable in my case, based on two further analyses.

First, I inspect and report the estimated location of 50 *randomly-selected* MPs on each issue for the 2015-16 period (the first period in which voters were asked their opinion on both issues by the British Election Study). The results of these analyses, together with 95% confidence intervals (narrower for MPs who spoke the most), are presented in Figure A.1. MPs' party affiliations are also indicated in the figure. On both issues, a more left-wing position is represented by a more negative location on the Wordscores scale.

In line with expectations, the left-end of both issue scales are dominated by MPs from Labour and the (also center-left) Scottish National Party; meanwhile, Conservative MPs (and the odd Unionist MP) dominate on the right-end of the scales. On redistribution, the left-end includes well-known members of the Labour left or 'soft-left' who were *not* members of the Socialist Campaign Group – such as Virendra Sharma, Peter Dowd and David Winnick – and therefore whose positions were freely estimated. On the right, in addition to some members of the Free Enterprise Group (such as Rory Stewart), we also find Iain Duncan Smith and Stephen Crabb, both of whom led the Department for Work and Pensions while a range of welfare cuts were being implemented. On the left on immigration, in addition to Jeremy Corbyn (who voted against the 2014 Immigra-

tion Act), we also find individuals such as Cat Smith, a Socialist Campaign Group MP only elected in 2015, and also associated with pro-immigration and pro-refugee positions. Meanwhile, the right of the scale on immigration includes several MPs who supported the Mills amendment in 2014 (such as Richard Drax, Mark Field, and Mills himself), but also individuals elected later who were also closely associated with anti-immigrant positions (for example, Kevin Hollinrake).

Figure A.1: Estimated Wordscores Locations for Selected MPs, May 2015–June 2016



Second, I also compare the estimated Wordscores positions for selected groups of MPs with known divergent views on these issues. In each case, box-and-whisker plots are used to illustrate the distribution of estimated scores for each group. First, Figure A.2 compares estimates on each issues for MPs affiliated with four different parties, focusing on the 2015-2016 period for redistribution and the 2017-2019 period on immigration.<sup>22</sup> It is immediate that Conservative MPs typically used more anti-redistribution and anti-

<sup>22</sup>I find similar patterns in the other periods as well – results available on request

immigration rhetoric than MPs representing other parties, as might be expected. We also observe a larger partisan divide on rhetoric when it comes to redistribution than on immigration, also as expected.

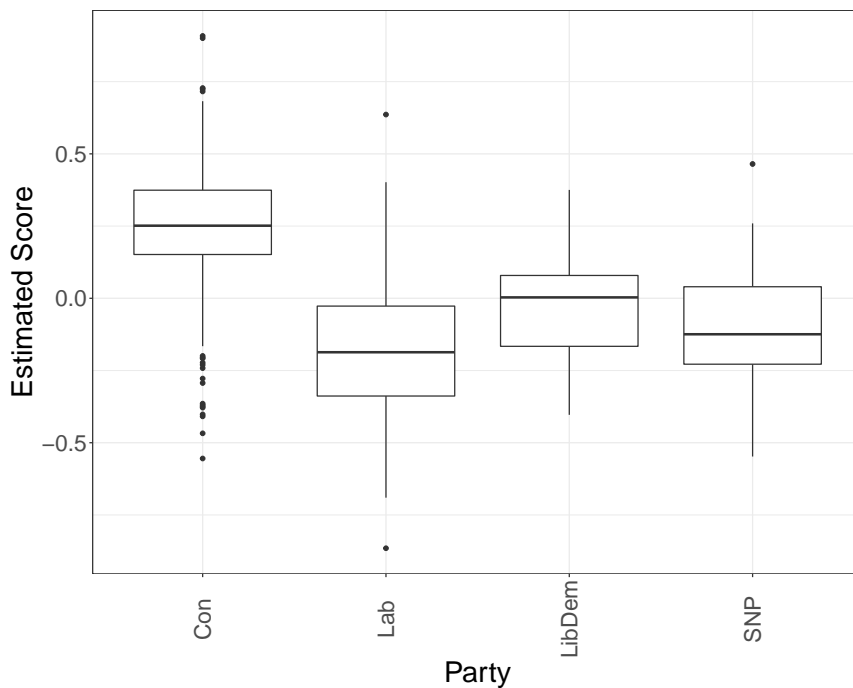
Next, Figure A.3 presents the estimated Wordscores positions for groups of MPs who voted differently in key divisions relating to redistribution and immigration in this period. First, panel (a) compares Labour MPs who abstained on the Second Reading of the Welfare Reform and Work Bill in July 2015 to those who rebelled against the party line (to abstain) by voting against the bill. The bill included plans for an additional £12 billion in welfare cuts, and was opposed by many Socialist Campaign Group MPs (including Jeremy Corbyn), as well as some prominent ‘soft-left’ Labour MPs, such as Sadiq Khan and David Lammy. In line with expectations, we find that Labour MPs who opposed these cuts expressed more pro-redistribution rhetoric in the same parliament than those Labour MPs who abstained on the bill.

Second, panels (b) and (c) in Figure A.3 compare groups of MPs who voted differently on two key Brexit ‘indicative votes’ in March 2019: votes on a proposal to leave the European Union (EU) without a deal, and to revoke Article 50, bringing the Brexit process to a halt, if MPs did not explicitly support a ‘No Deal’ exit from the EU. These votes were scheduled in end-March 2019 after the failure of a series of ‘meaningful votes’ on the terms of Britain’s exit from the European Union.

MPs were not whipped on these votes, and were able to vote simultaneously on eight options in total. The debate over the terms of ‘Brexit’ did not line up exactly with the debate over immigration numbers and controls in the UK at the time, and we should not expect individuals’ views on these topics to be perfectly correlated (for example, Jeremy Corbyn, known for his pro-immigration views and rhetoric, had also expressed some Eurosceptic views in the past). However, many of those who voted for Brexit (MPs or ordinary voters), and particularly those who favored the ‘hard Brexit’ that would follow

Figure A.2: Estimated Wordscores Locations by Party

(a) MPs on Redistribution, June 2015–June 2016



(b) MPs on Immigration, June 2017–July 2019

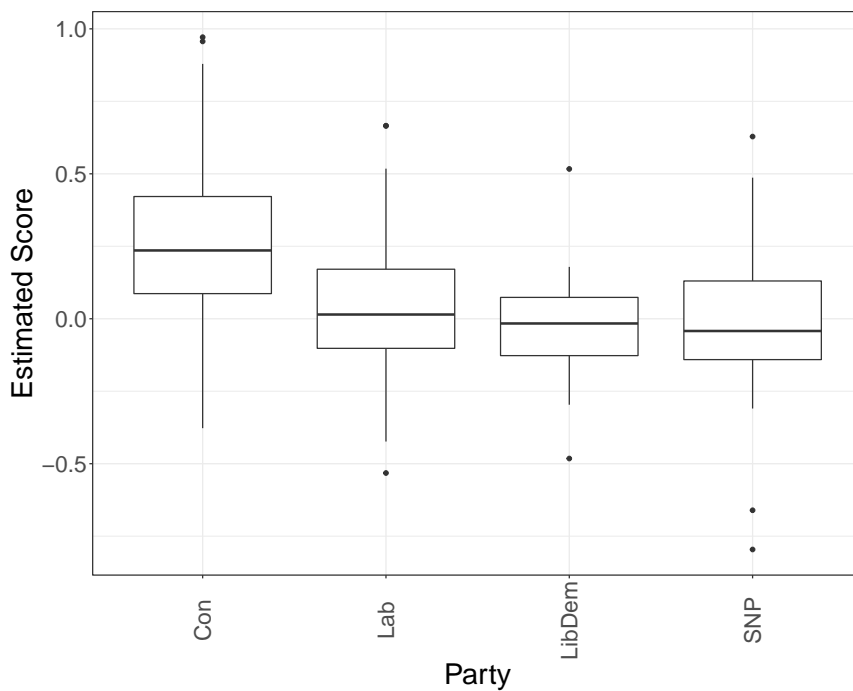
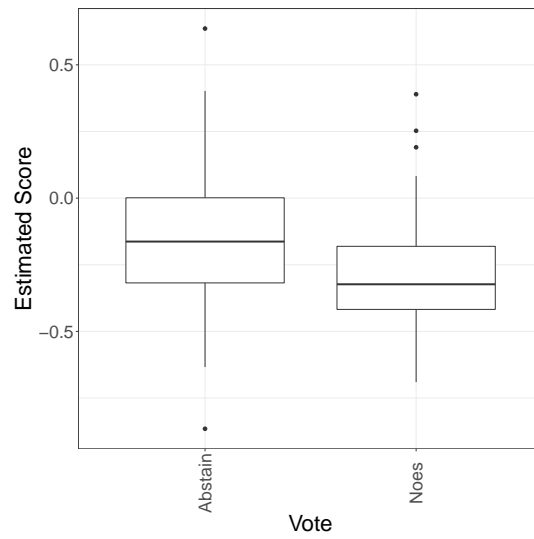
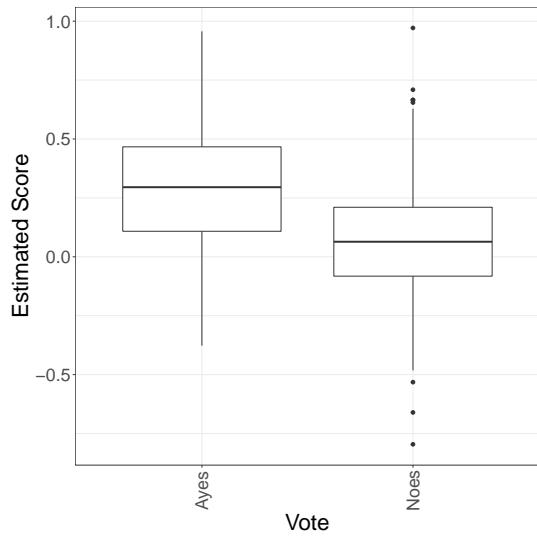


Figure A.3: Estimated Wordscores Locations by Vote on Key Divisions

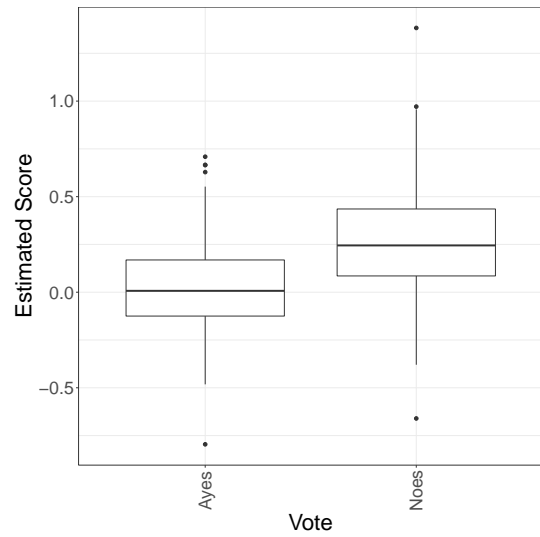
(a) Labour MP Votes on Welfare Reform and Work Bill



(b) March 2019 Vote on No Deal



(c) March 2019 Vote on Revoking Article 50



from no deal, supported this option because they favored stricter controls on both the numbers and terms of (European) immigration into the UK. Meanwhile, advocates of continued Britain’s continued membership of the single market were necessarily committed to continued free movement from the European Union. Given this, we would expect MPs who voted in favor of ‘No Deal’ in March 2019 to be those who had been using more anti-immigration rhetoric in that period (and vice versa), and MPs who voted in favor of revoking Article 50 to be those who were using more pro-immigration rhetoric in this period (and vice versa).<sup>23</sup> Reassuringly, this is exactly what we find in panels (b) and (c) of Figure A.3, respectively.

Finally, my approach also relies on a second assumption: that the loss of cardinal information from a linear mapping between the two scales is minimal. This also seems a reasonable assumption in my case, as I consistently find that the proportion of variance in the BES locations of anchor MPs explained by a linear mapping from their Wordscores locations is above 0.9, and in most cases above 0.95. Moreover – and in part, as a consequence — using a non-linear (quadratic or cubic) mapping does not qualitatively change the results (available on request).

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<sup>23</sup>Wordscores estimates for MPs who abstained on these votes are not shown, as their motives are harder to interpret.

## B Additional Results

### B.1 Comparing Voter Preferences and Legislative Speech

Figures B.1 and B.2 plot the estimated distribution of citizen preferences, the preferences expressed by speaking legislators, and of legislative discourse on redistribution and immigration, respectively, calculated according to the strategy discussed in Section 3. For each bin on the survey response scale, the proportion of Labour voters and MPs is given in red; Conservative voters and MPs in blue, and abstainers or those linked to other parties are given in gray. In both cases, the patterns we observe provide considerable face validity to the overall approach. Meanwhile, Figures B.3 and B.4 report the (logged) relative communicative presence of different opinions on redistribution and immigration, respectively, in parliamentary speech in this period.

First, consider Figure B.1. We observe a clear partisan divide in the preferences expressed by speaking legislators and in legislative discourse, with Labour MPs taking a consistently more pro-redistribution line than Conservative MPs – as may be expected on what is typically considered to be the primary dimension of political conflict in the UK. The partisan divide in redistributive preferences among voters is less clear cut, particularly after the 2016 EU referendum, in line with evidence of growing partisan realignment along Leave/Remain lines during this period (Fieldhouse et al., 2021; Ford et al., 2021). Particularly during the 2010-2015 coalition government, center-right redistributive preferences appear over-represented in parliamentary speech. Notably, we observe an increase in improvement in the representation of the most pro-redistribution voters after the election of left-wing stalwart Jeremy Corbyn as leader of the Labour party in 2015. Although 17.5% of voters selected the most left-wing position on redistribution in 2014, this position was represented by less than 5% of legislators and legislative discourse in the 2010-15 parliament. Parliamentary representation of such views approximately doubles after 2015,



and increases further after the 2016 EU referendum, when SCG members were elevated to the shadow cabinet in greater numbers.<sup>24</sup> Consistent with these patterns, Figure B.3 shows that center-right opinions on redistribution are over-represented throughout, while the representation of left-wing views improves after 2015. Moreover, I find that while 27.1% of legislative speech on redistribution could be attributed to malapportionment in 2010-15 – or speech delivered by legislators who would not have received any floor time if there was perfect communicative congruence on this issue. This decreases somewhat to 25.3% in 2015-16, and even further to 14.7% in 2016-2017 and 21.7% in 2017-19 (ref. Figure 1).

Turning to immigration (ref. Figure B.2), we observe greater evidence of communicative malapportionment throughout (as in Figure 1). Across parliaments, we observe that a substantial section of the British electorate favored the view that the UK should admit ‘many fewer’ immigrants than currently (35% of the electorate in 2016, diminishing to 25% of the electorate by 2018). However, prior to the 2016 referendum, this view is consistently expressed by fewer than 10% of speaking legislators and by an even smaller proportion of legislative discourse. Meanwhile, center-left and left-wing opinions on immigration receive disproportionate attention in parliament, including after 2016 (also confirmed by Figure B.4). However, parliamentary representation of extreme right views on immigration more than doubles between 2016 and 2017, possibly due to the increased political salience of immigration, and also greater elite awareness of the prevalence of anti-immigration views within the British electorate (though this is not matched by the same increase in anti-immigrant parliamentary discourse). At the same time, the proportion of voters supporting no change to levels of immigration to the UK – presumably, continued free movement from the EU – also increases during this period, from about 15% of the electorate in 2014 to more than 20% of the electorate in 2018. This coin-

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<sup>24</sup>Following a large number of resignations from the first Corbyn shadow cabinet after the 2016 referendum outcome, for which many Labour MPs blamed Corbyn to some degree.

Figure B.1: Comparing Voter Preferences and Legislative Speech on Redistribution

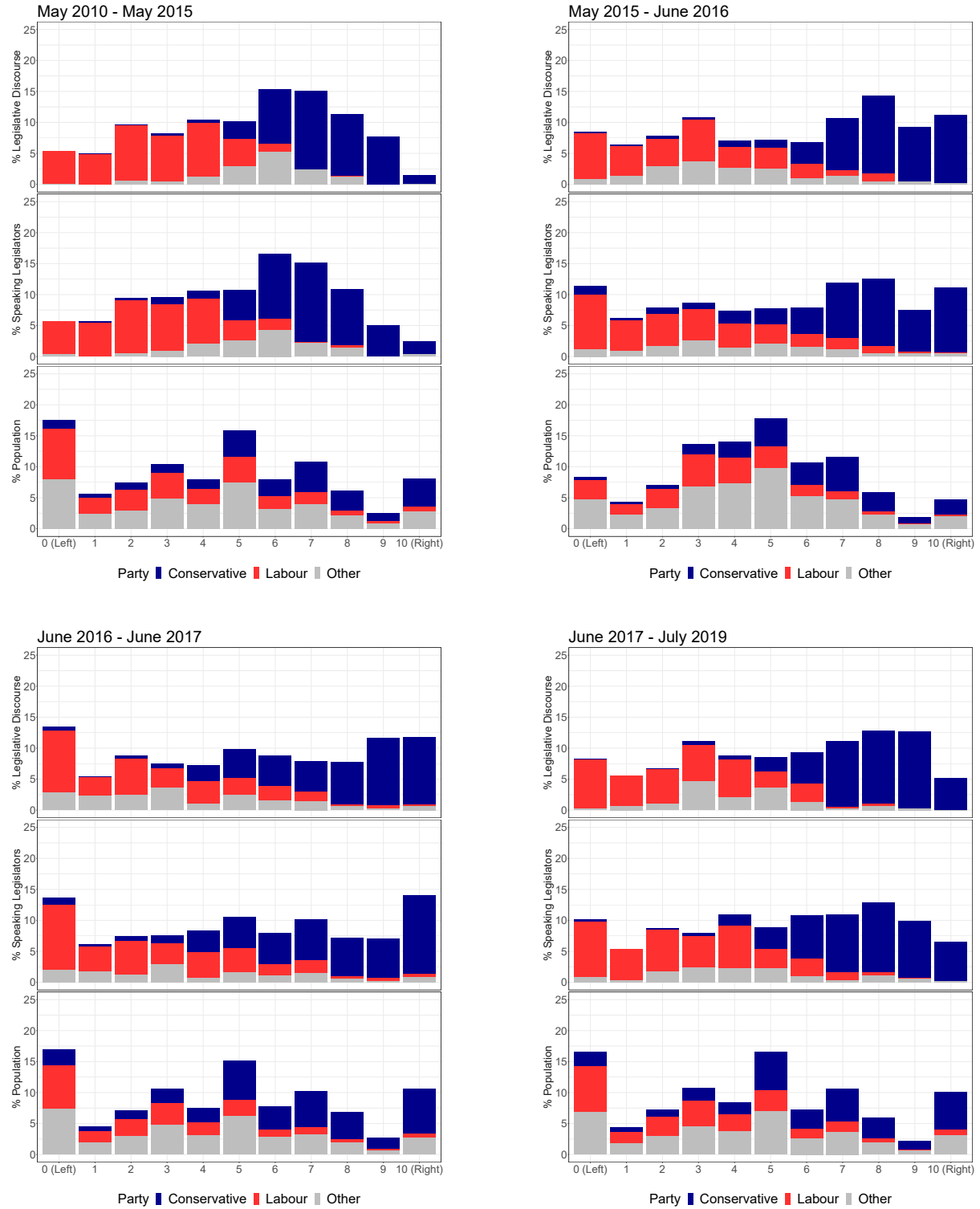
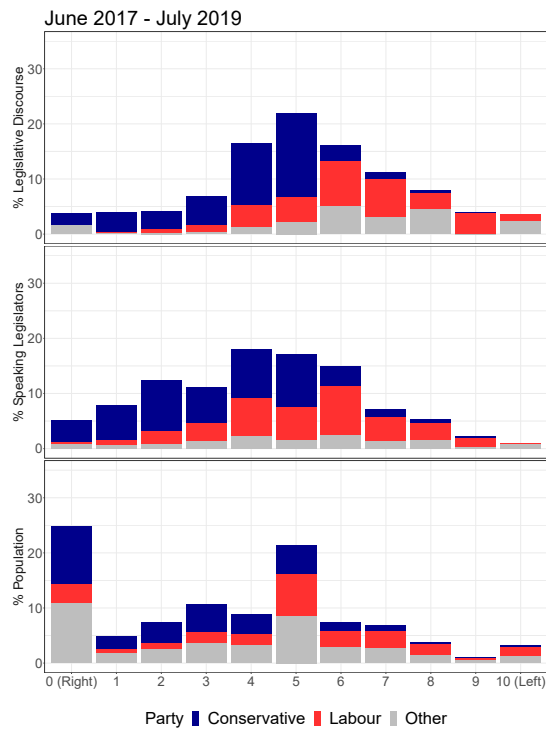
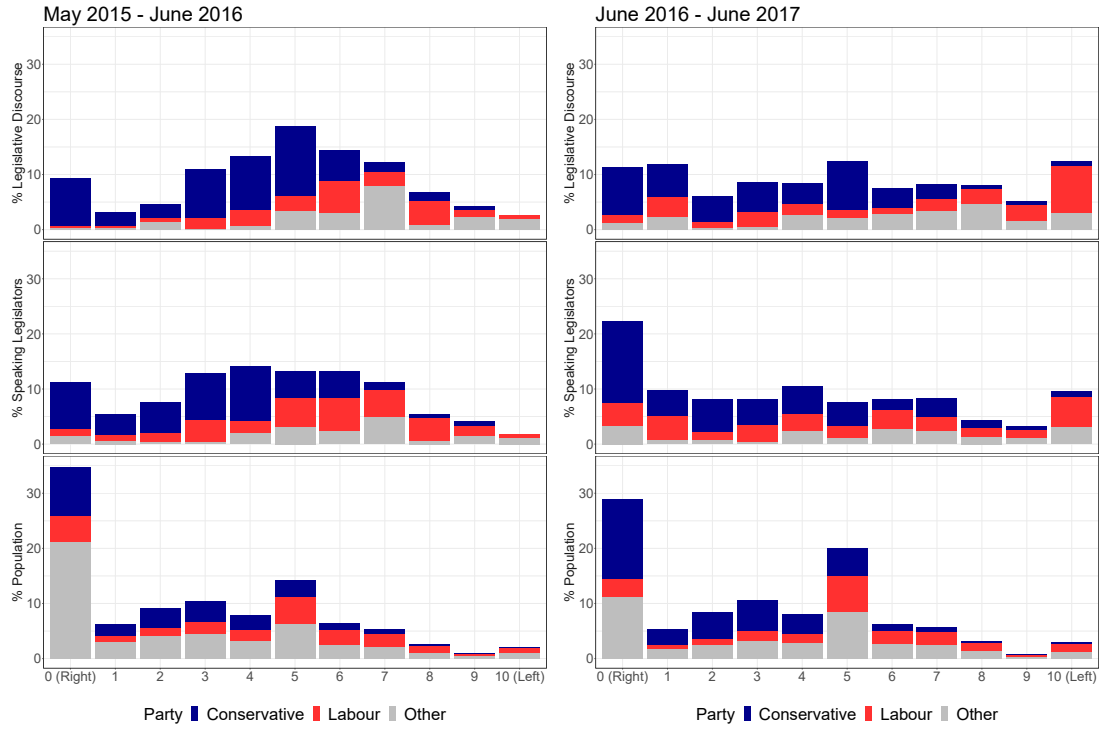


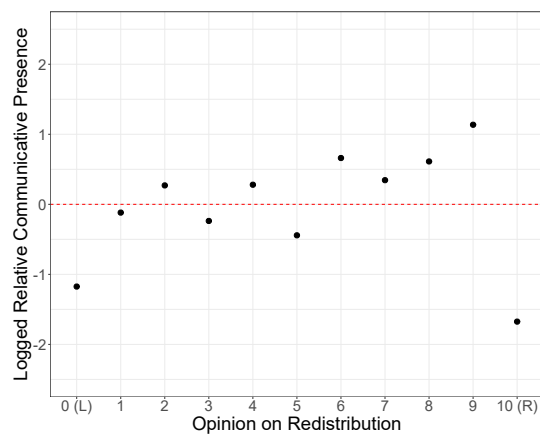
Figure B.2: Comparing Voter Preferences and Legislative Speech on Immigration



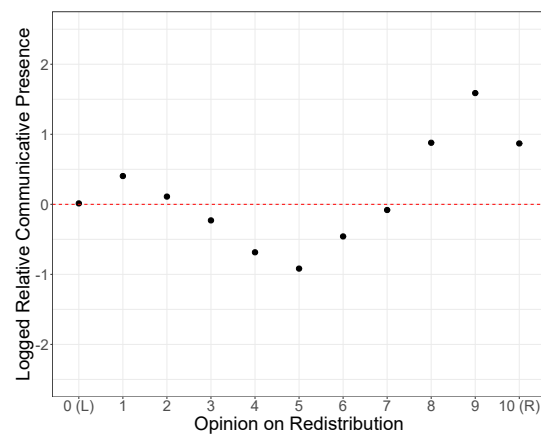
cides with improved representation of such views in the 2017-19 parliament. In line with these patterns, we also find that communicative malapportionment was somewhat higher throughout on immigration than on redistribution, with 33.0% of legislative speech on immigration reflecting malapportionment in 2015-16, decreasing to 29.5% in 2016-17 and 29.0% in 2017-19.

Figure B.3: Relative Communicative Presence of Opinions on Redistribution in the UK

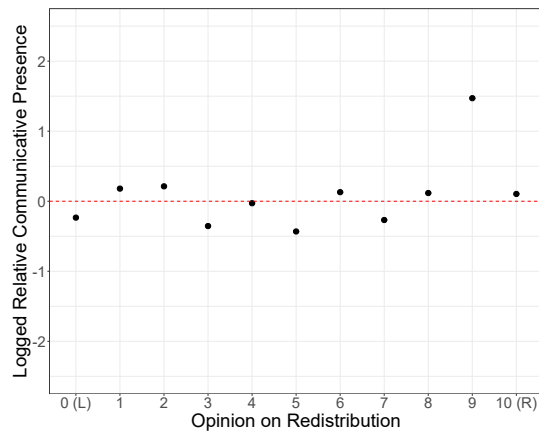
(a) May 2010 – May 2015



(b) May 2015 – June 2016



(c) June 2016 – June 2017



(d) June 2017 – July 2019

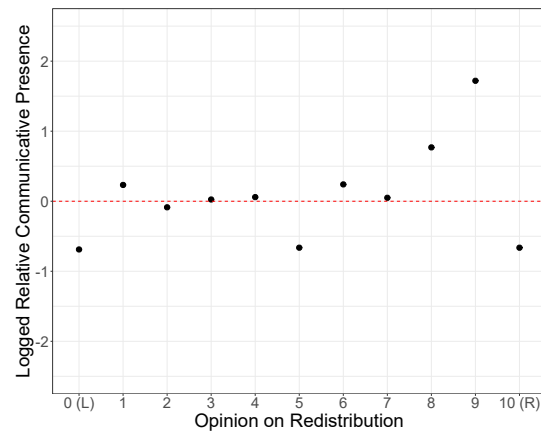
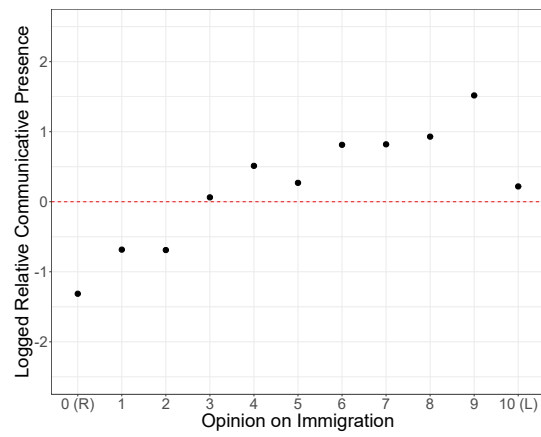
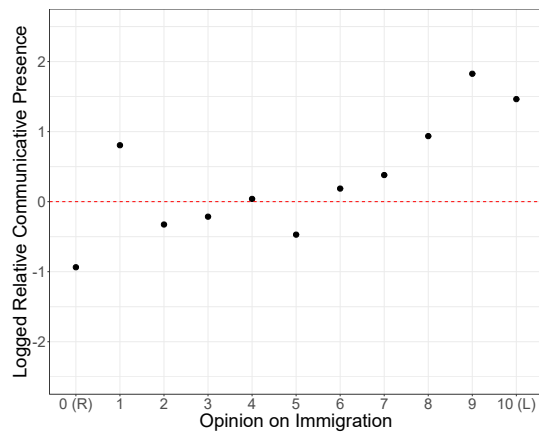


Figure B.4: Relative Communicative Presence of Opinions on Immigration in the UK

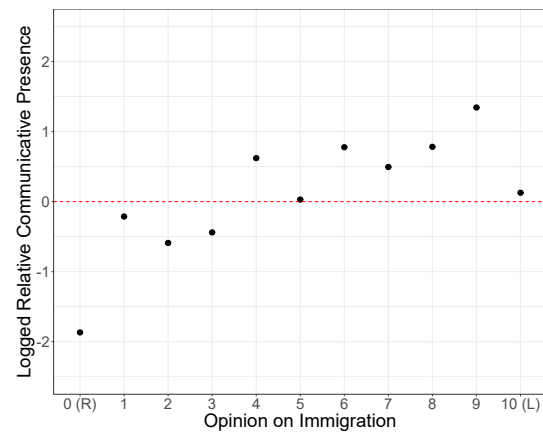
(a) May 2015 – June 2016



(b) June 2016 – June 2017



(c) June 2017 – July 2019



## **B.2 Regression Results**

Table B.1 presents results from regression analyses estimating the overall communicative responsiveness of legislators to voters by issue, as well as their relative communicative responsiveness to particular sub-electorates. Overall communicative responsiveness and relative communicative responsiveness are measured as described in Section 3.

Table B.1: Legislators' Communicative Responsiveness to UK Voters, 2010-2019

Dependent Variable: $\Delta$ % Legislative Speech in Bin $i$ at $t_i$ ; Issue: Redistribution													
	(1) All Voters	(2) Men	(3) Women	(4) Some HE	(5) No HE	(6) WWC	(7) WMC	(8) Other WC	(9) Other MC	(10) Ages 18-29	(11) Ages 30-49	(12) Ages 50-64	(13) Ages 65+
Representation Gap in Bin $i$ at $t_0$	0.281* (0.138)	0.368** (0.120)	0.237* (0.130)	0.338* (0.149)	0.215* (0.126)	0.188 (0.113)	0.331* (0.152)	0.170* (0.094)	0.250* (0.132)	0.265* (0.137)	0.265* (0.138)	0.259 (0.129)	0.271* (0.134)
Constant	0.014 (0.643)	0.019 (0.600)	0.012 (0.651)	0.017 (0.634)	0.011 (0.655)	0.010 (0.656)	0.017 (0.638)	0.009 (0.651)	0.013 (0.648)	0.014 (0.647)	0.014 (0.648)	0.013 (0.644)	0.014 (0.644)
Observations	33	33	33	33	33	33	33	33	33	33	33	33	33
R <sup>2</sup>	0.119	0.234	0.098	0.143	0.085	0.082	0.132	0.096	0.103	0.107	0.106	0.115	0.116
Adjusted R <sup>2</sup>	0.090	0.209	0.068	0.116	0.056	0.052	0.104	0.066	0.074	0.079	0.077	0.087	0.087

\*p<0.1; \*\*p<0.05; \*\*\*p<0.01

Dependent variable: $\Delta$ % Legislative Speech in Bin $i$ at $t_i$ ; Issue: Redistribution															
	(1) All Voters	(2) Men	(3) Women	(4) Some HE	(5) No HE	(6) WWC	(7) WMC	(8) Other WC	(9) Other MC	(10) Ages 18-29	(11) Ages 30-49	(12) Ages 50-64	(13) Ages 65+	(14) Leavers	(15) Remainers
Representation Gap in Bin $i$ at $t_0$	0.273 (0.185)	0.293 (0.191)	0.252 (0.178)	0.523* (0.214)	0.076 (0.128)	0.097 (0.132)	0.404 (0.204)	0.486* (0.198)	0.526* (0.216)	0.602** (0.198)	0.292 (0.184)	0.159 (0.160)	0.130 (0.149)	0.040 (0.114)	0.431* (0.166)
Constant	-0.000 (1.241)	0.000 (1.236)	0.000 (1.246)	-0.000 (1.147)	-0.000 (1.295)	-0.000 (1.290)	0.000 (1.195)	0.000 (1.146)	0.000 (1.148)	-0.000 (1.081)	0.000 (1.231)	-0.000 (1.276)	-0.000 (1.283)	-0.000 (1.303)	-0.000 (1.130)
Observations	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22
R <sup>2</sup>	0.098	0.106	0.091	0.230	0.017	0.026	0.164	0.231	0.228	0.315	0.112	0.047	0.036	0.006	0.252
Adjusted R <sup>2</sup>	0.053	0.061	0.046	0.191	-0.032	-0.023	0.122	0.192	0.189	0.281	0.068	-0.001	-0.012	-0.044	0.214

\*p<0.1; \*\*p<0.05; \*\*\*p<0.01

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