

# Political Style at Westminster

## The Changing Role of Seniority in Making Members of Parliament as Boring As Ever\*

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### Abstract

We consider the merits of claims that Members of Parliament (MPs) in the UK have become more ‘boring’ over time—that is, less distinctive from one another in terms of their speech and style. We review theory and previous findings in the area, and note their ambiguity in predictions on this matter. We then provide an efficient new measurement model of distinctiveness that extends traditional efforts to statistically characterize the ‘style’ of authors, and apply it to a corpus of *Hansard* speeches from 1935 to 2013. In the aggregate, we find no evidence for the claim of increased boringness. But this hides intriguing covariate effects: at the MP level, panel regression results demonstrate that, on average, more senior backbenchers tend to be less interesting in speech terms. We also show, however, that this pattern is changing: in recent times, it is less experienced MPs who speak most distinctively.

Software available here: <https://github.com/patperry/style-text/>

Word Count: 3952 (excluding Supporting Information)

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# 1 Introduction

Floccinaucinihilipilification is not a word regularly encountered in the House of Commons; between 1803 and the present day, it was uttered just twice. The first time was in 1947, by the Member of Parliament (MP) for Caithness and Sutherland; subsequently, it was used in 2012 by Jacob Rees-Moog, MP for North Devon. So apparently interesting was the second invoking of the term that it earned Rees-Mogg an interview on the BBC’s current affairs program, *The Daily Politics*. That such an event was deemed newsworthy speaks to a broader, popular concern with modern Westminster politics. In particular, that contemporary MPs are too ‘on message’, sound the same, and are thus ‘boring’—especially compared to the ‘big beasts’ of yesteryear. Thus Cowley and Stuart (2004, 211) (citing Cowley 2002) note that Labour backbenchers of the Blair period were “variously described as sheep, poodles, clones, robots or—most bizarrely of all—daleks.”

The academic assessment of the relative historical distinctiveness of contemporary MPs has been nuanced but its findings point in opposite directions. On the one hand, some scholars note that ‘rebellious’ behavior (on roll calls) is generally increasing—moving the UK away from the traditional Westminster archetype of pliant backbenchers. Furthermore, we observe that MPs increasingly seem to play to constituency preferences, rather than the party line, on at least some votes (Vivyan and Wagner, 2012; Hanretty, Lauderdale and Vivyan, 2017). Relatedly, MPs try to cultivate a personal vote separate to their party (Jackson and Lilleker, 2011), although the size of the effect is debatable (Eggers and Spirling, 2017). But we *also* observe that MPs are more ‘professional’ (Rush, 2001) and career oriented (King, 1981) than in the past. To the extent that being distinctive in one’s parliamentary behavior is likely to be costly to ministerial ambitions (Kam, 2009), and more MPs have such ambitions, we should expect to see less of it, on average, over time.

British legislators have unusual latitude to speak freely in debates (Proksch and Slapin, 2012). Given the above though, our predictions for how they use those opportunities—and how that has changed over time—are ambiguous. That is, there are good reasons to imagine they have become *more* or *less* distinctive, in accordance with the relative weight one places on the forces noted

above. What complicates the picture considerably is that there are likely *within career* effects but these are also ambiguous. On the one hand, we see that more senior MPs are more likely to engage in distinctive or rebellious behavior (Benedetto and Hix, 2007); on the other, we know that the longer they serve, the more members become socialized to its norms and expectations (Rush and Giddings, 2011).

This short paper speaks to these ambiguities—historical and within career—as they pertain to speech behavior. To do this, we use a dataset of three million speeches (1935–2013), and a new way of estimating how ‘distinctive’ backbench MPs are over-time, in aggregate and individually. Intuitively, MPs are ‘interesting’ if they can be easily identified from their speeches relative to other members; they are ‘boring’ if their words do not mark them out. Ultimately, we find no evidence that MPs are becoming less interesting as a whole. To the extent that service matters, it typically has a negative effect: that is, senior MPs tend to be more ‘boring’, junior ones are more ‘interesting’. Yet we also show that this relationship is changing: in particular, that since the 1990s, more experienced members are emerging as the most distinctive legislators in the Commons.

## **2 Competing Pressures in Westminster Systems**

The ‘textbook’ account of Westminster systems notes that they have a strong executive, to which backbenchers on both government and opposition sides are supplicant (Kam, 2009; Lijphart, 2012). Exactly what drives MP decisions on roll calls, speeches and other behaviors is debatable, but there is a broad consensus that at least two factors matter. First, is ministerial ambition; since backbenchers want to become frontbenchers (see Rush and Childs, 2004, for discussion of survey evidence), and the party leadership controls access to this resource, MPs tend to toe the party line (Rush, 2001). Evidence of this mechanism comes in two forms. For one, it is clear that ‘rebellious’—i.e. not following the whips’ instructions—is not beneficial to one’s career (Cowley, 2002). Relatedly, scholars have found that ‘rebels’ are those passed over for promotion, or unlikely to ever be ministers for other reasons (Benedetto and Hix, 2007). Of course, career incentives are

not the only ones at play in ensuring compliance with leadership commands. Thus, Crowe (1986) and Rush and Giddings (2011) present evidence of ‘socialization’ by which incoming MPs learn the ropes in terms of both Commons procedure and with respect to more general expectations of behavior. Beyond the carrot of cabinet office, there is some evidence that communication of preferences is a two-way street: party leaders listen privately to the policy concerns that their troops have (Norton, 1999; Cowley and Childs, 2003) and are otherwise constrained by backbench opinions in terms of central personnel choices (Kam et al., 2010).

Unlike in the US (e.g. Ansolabehere, Snyder and Stewart, 2001; Canes-Wrone, Brady and Cogan, 2002), the forces of political life in Westminster systems are thought to mitigate against notions of ‘dyadic representation’ (Weissberg, 1978)—that is, the notion that MPs might seek to legislate in a way that reflects political preferences of their constituents. In the United Kingdom, where politics become increasingly ‘national’ after the Great Reform Act (Cox, 1987) scholars have historically emphasized the importance of decidedly non-local factors in deciding voter minds when selecting a local representative. These include (national) party identification in conjunction with class (e.g. Butler and Stokes, 1969; Heath et al., 1991) and perceptions of leader competence (e.g. Green and Hobolt, 2008). In line with this skepticism about the effects of local connections, while MPs have long done service in their constituencies (Cain, Ferejohn and Fiorina, 1987; Norton and Wood, 1993; Searing, 1994), evidence that it matters for re-election performance has not been readily forthcoming (Gaines, 1998; Eggers and Spirling, 2017).

With the above in mind, it is surprising that there is any reason at all for MPs to seek to be different to one another. But this ignores recent trends in voter and politician behavior. Scholars note that citizens in advanced democracies are generally less attached to major parties than they used to be, and Britain is no exception (Clarke and Stewart, 1998). Perhaps because of this (or perhaps despite it), MPs became more rebellious from the 1960s onwards (Norton, 1975, 1980). Modern MPs, especially Labour ones, disobey the whip more often, and on more important matters, than is commonly realized (Cowley, 2002). And they rebel strategically, at least as regards their status as government or opposition at a given time (Slapin et al., 2017). Furthermore, there

is evidence that MPs do, in fact, attempt to respond to constituent opinion on important issues (Hanretty, Lauderdale and Vivyan, 2017) and that voting particular ways at Westminster may have a positive, if weak, effect on their popularity at home (Pattie, Fieldhouse and Johnston, 1994). It is also apparently the case that rebellion itself is rewarded (Vivyan and Wagner, 2012), and those who defy their leadership are more recognizable in surveys than those who don't (Kam, 2009). In keeping with these self-promotional efforts, MPs seek to actively manage their personal 'brand' via social media (Jackson and Lilleker, 2011).

Matching these behavioral changes, and possibly a cause of the same, are changes to the sociological make-up of the House of Commons. Since the mid-1850s, parliament has become more 'professional' (Rush, 2001). Members are increasingly "career" politicians (in the sense of King, 1981) and view their positions as full time jobs. Since the 1960s, MPs are increasingly drawn from the university educated middle-classes and whatever distinctions traditionally existed between Labour and Conservative backgrounds are now much weaker (Norris and Lovenduski, 1995; Heath, 2015). At least part of this trend is the increasing tendency to draw MPs from the ranks of 'special advisors' and other professional party workers (Shaw, 2001).

To summarize, MPs are under competing pressures. On the one hand, they need to behave to be accepted by their peers and promoted. On the other, this may mean they miss out on opportunities to win over local constituents. And if that happens, they may cease to be MPs at all. In that sense, professionalisation cuts both ways: optimistically, it implies MPs have better 'streetwise' knowledge of the political environment in which they operate, perhaps facilitating more independent thought and action. More pessimistically, it may imply less diversity in terms of ideology and style, twinned with more dependence on a party apparatus through on which they have always depended for advancement. To know how these forces play out, we need a valid measure of speech 'style' for MPs.

### 3 Measuring Style

To measure ‘interestingness’, we rely on the basic principle of ‘stylometry’—that authors have idiosyncratic markers in the documents they produce. The typical goal in that literature is detecting the most likely author of a given text of uncertain origin, by way of the candidate authors’ known preferences in word use. In terms of applications to politics, the work of Mosteller and Wallace (1963; 1964) is well-known. Their challenge was to identify the most likely author—Madison or Hamilton—of twelve ‘disputed’ *Federalist Papers* papers. They found overwhelming evidence for Madison. Using similar methods, Airoidi et al. (2006) and Airoidi, Fienberg and Skinner (2007) investigate the empirical claim that Ronald Reagan may not have authored a series of radio addresses he gave in the 1970s.

Our strategy here is broadly similar in that we care about the distinctiveness of one speaker/author (MP) relative to another. But in detail it differs markedly. In particular, our interest is obviously not in identifying origins of texts: we have labels for all our data (in terms of the MP giving the speech). Instead, authors/speakers are our focus, and the extent to which any linguistic features exist that mark them apart from one another.

#### 3.1 Our Conception of Style

To see the intuition, note that in the case of Mosteller and Wallace what is of interest is the comparison of two probabilities for an unlabeled text. The model implies some probability the paper was written by Madison given the counts of the words ( $\mathbf{w}$ ) it contains,  $\text{Pr}(\text{Madison}|\mathbf{w})$ . That is then compared with the probability the essay is, conditioned on its contents, from Hamilton,  $\text{Pr}(\text{Hamilton}|\mathbf{w})$ . Subject to some mathematical housekeeping, the larger of these probabilities then yields the author prediction.

But in our application, we care about how different Madison is from Hamilton *in general* for all the (labeled) data. To fix ideas, suppose we have an essay we know Madison wrote. Given the words it contains, our model can still provide us with an *estimate* of the probability Madison

penned it: while we know the true probability to be one, the model will give us an in-sample prediction (which is not one). We can do the same thing for Hamilton for that given Madison speech: obtain a model probability that Hamilton wrote it (though we know the true probability to be zero) by plugging in Hamilton’s word-use tendencies from the essays which we know *he* wrote. Suppose that we do this for every one of Madison’s known texts. If, in general, the predicted probability that Madison wrote them is much higher than the predicted probability Hamilton wrote them, we have *prima facie* evidence that the authors differ in style terms. That is, the model is finding features that enables it to distinguish one author from the other for the Madison documents. But if the Madison essays have predicted probabilities that are always similar for Madison and Hamilton, then the opposite lesson applies: the model simply cannot distinguish between the two men as most plausible authors for the selection of texts. To summarize, and in keeping with our simple statement of the problem, we are interested in the ‘distinctiveness of Madison’  $\mathbb{D}_M$ . We now generalize this to an arbitrary number of essays (speeches) and authors (MPs).

### 3.2 Our Formulation of Style

In Supporting Information A we give a mathematical derivation of our style model; for now, we give a non-technical intuition that builds on the logic laid out above.

1. For a given session of parliament, each member’s speeches are summarized as a vector with word counts for every one of the tokens spoken by any MP in that session. These counts are converted into *probabilities* by simply dividing them by the length of the vectors (which are the size of the vocabulary used in a given parliamentary session). For convenience, those probabilities are then logged, to produce a vector  $\eta_s$  where  $s$  denotes a specific MP.
2. To compare MP  $s$  with MP  $t$  as a pair for a given word in a random speech  $i$  that one of them gave, we subtract the value of  $\eta_s$  from  $\eta_t$  for that word in the speech (multiplied by the number of times that word is used in the speech). If this number is ‘large’ then  $t$  is *distinctive* relative to  $s$  in her use of this word. We can take the average of this quantity over

all the words in the vocabulary to get a more general measure of the distinctiveness of  $t$ .

3. For the random speech  $i$ , we generalize this measure to all members—that is, we produce a number that compares  $t$  to everyone else pairwise—by taking the average of the quantity in (2) *over all speakers*. The second generalization is *over all speeches* given by  $t$  which essentially requires summing the (average) distinctiveness per word and dividing out by the number of speeches  $t$  gave.

This quantity has a Bayesian interpretation, but in essence represents the evidence that a given speaker (relative to all others) produced the words she spoke—averaged over all words, all speeches and all possible pairwise comparisons to other members. It comes with several caveats, about which we are candid in Supporting Information B. We take this model to data.

## 4 Data

Our data originates with Rheault et al. (2016), and consists of approximately three million speeches in the House of Commons, for the years 1935–2013. Importantly, there is meta-data pertaining to party membership and ministerial position. We calculate the *experience* of a given MP as being the number of sessions they have served in parliament since their first speech.<sup>1</sup> We also introduce a variable that records whether or not an MP has ever been *demoted* from ministerial office.

For the purposes of this paper, we are only interested in MPs that actually speak (at least ten times) in a given session and in particular we are focussed on government *backbenchers*. That is, our analysis of style pertains to MPs that are in the governing party (the party of the Prime Minister), but who do not hold ministerial office. This allows us to compare like-with-like over time in terms of the incentives we believe MPs have, even though power shifts across the chamber.

In Supporting Information C we give more details regarding the averages and ranges of (average) values of our data by session. A take-away there is that the (average) means and medians are

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<sup>1</sup>We augment the data with information on when—what session—the MPs speaking in the first period of the data entered parliament.

generally very close, implying little skew in these variables.

## 5 Results: Validation, Aggregates and Effects of Service

Our measure of distinctiveness borrows from a long tradition in social science in statistics—but is it any good? To assess this, we produced a top-20 ‘most interesting’ and bottom-20 ‘most boring’ list for the parliamentary sessions either side of Blair’s landslide in the 1997 general election. This has the advantage of being a period in which (a) control of the Commons switched (from Conservative to Labour), meaning we have variation in the party of the backbenchers in question and (b) we have a number of academic accounts which help ground our understanding of MP behavior during this time (Cowley, 2002; Spirling and Quinn, 2010; Kellermann, 2012).

We use a *convergent validity* approach insofar as we compare our measure to another (computed independently) and show they are correlated. In particular, for each MP on our lists, we searched for their name in the historical online record of the *Guardian* newspaper for the relevant session period. The idea here is that (objectively) more boring MPs should be mentioned less than more interesting ones. We give fuller details in Supporting Information D, and we openly acknowledge there are some important caveats to our comparisons—for example, we had to adjust our searches in cases which would otherwise be misleading owing to e.g. common names. Nonetheless, we find that newspaper reports agree with our assessment: our more interesting MPs are discussed more, and our more boring ones are discussed less (and this difference is statistically significant).

### 5.1 Time Series: Distinctiveness is Not Decreasing

For every session in the aggregate, it is trivial to produce an average (median or mean) distinctiveness score, along with a variance. In Figure 1 we do exactly that. Two observations are immediate. First, as demonstrated in the top panel, the median distinctiveness of MPs doesn’t appear to decrease over time. At the very least, the points and the solid [red] lowess of the same seem fairly

stable and certainly not moving downwards. This is also true of the mean (shown via the broken [blue] lowess curve). Indeed, if anything, these averages appear to be *increasing*. For completeness, we also plot the tails of the distribution of scores. These are the broken lines at the top and bottom of the upper plot. While they show some variance, there is no obvious trend in the extremes.

Nor does it seem to be the case that MPs are, on average, becoming more or less spread out in terms of their distinctiveness. This can be seen in the lower plot which reports the variance of the scores over time. The spread decreases until around 1975 (note [red] lowess), before rising again to reach a level approaching the beginning of the data. Of course, plots can be misleading. But formal statistical examinations suggest initial impressions are correct. Standard tests—Cox-Stuart (Cox and Stuart, 1955) and Mann-Kendall (Mann, 1945; Kendall, 1975) (both  $p < 0.01$ )—reveal no presence of a ‘trend’ in the medians. To summarize then, the average MP has not become more or less distinctive in terms of style over the past 80 years.

Possibly, assessing ‘average’ MPs is unfair test in the sense that the ‘real’ action of decline is at the top end of the distribution: that is, is it the maverick outliers who have disappeared. This is unlikely. For one thing, by the same tests as mentioned above, the 90th, 95th and 97.5th percentiles show no trend at all. There is a trend in the lowest percentile we checked—the 2.5th—but it is upwards, not downwards.

## **5.2 Model Inference: Serving Longer Makes You More Boring**

Of course, aggregates can oversimplify: it’s possible that over time the relationship between being distinctive and other MP features has changed in such a way as to disguise something more profound. To look at this possibility, we begin with panel regressions. Here, the cross-section time series is MP-by-session, and is unbalanced since members only serve for a limited number of years. As noted above, we have two covariates (in addition to the fixed effects) for predicting distinctiveness: experience (in session terms) and whether the MP has ever been demoted from government front-bench responsibilities.

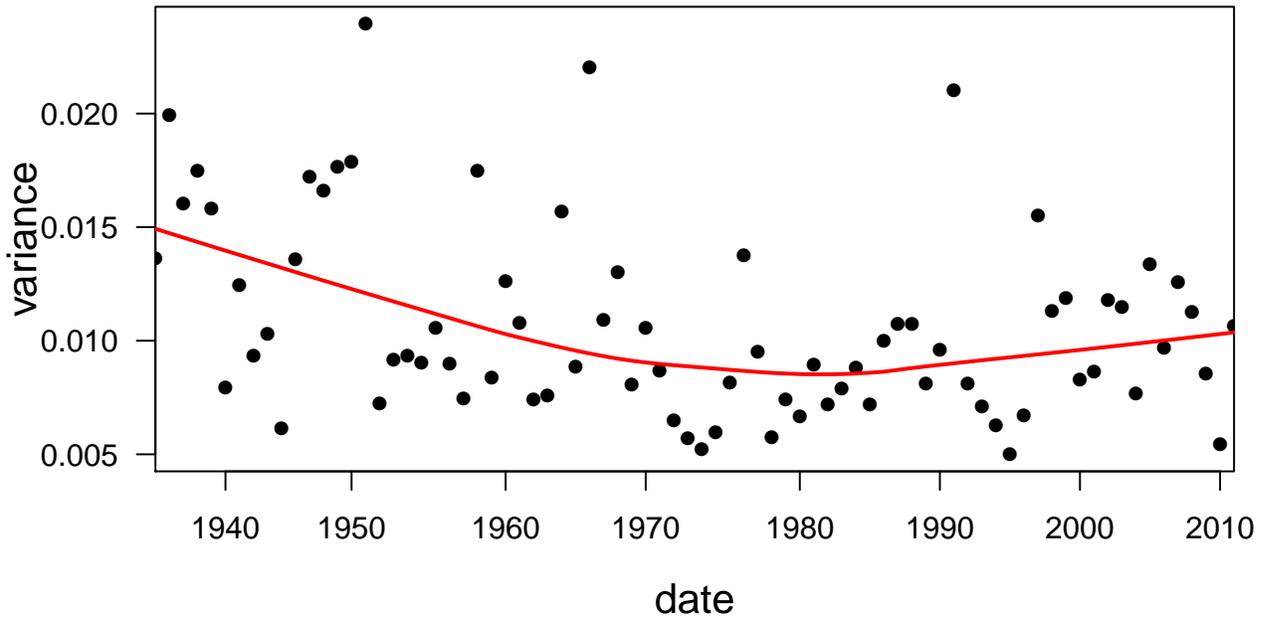
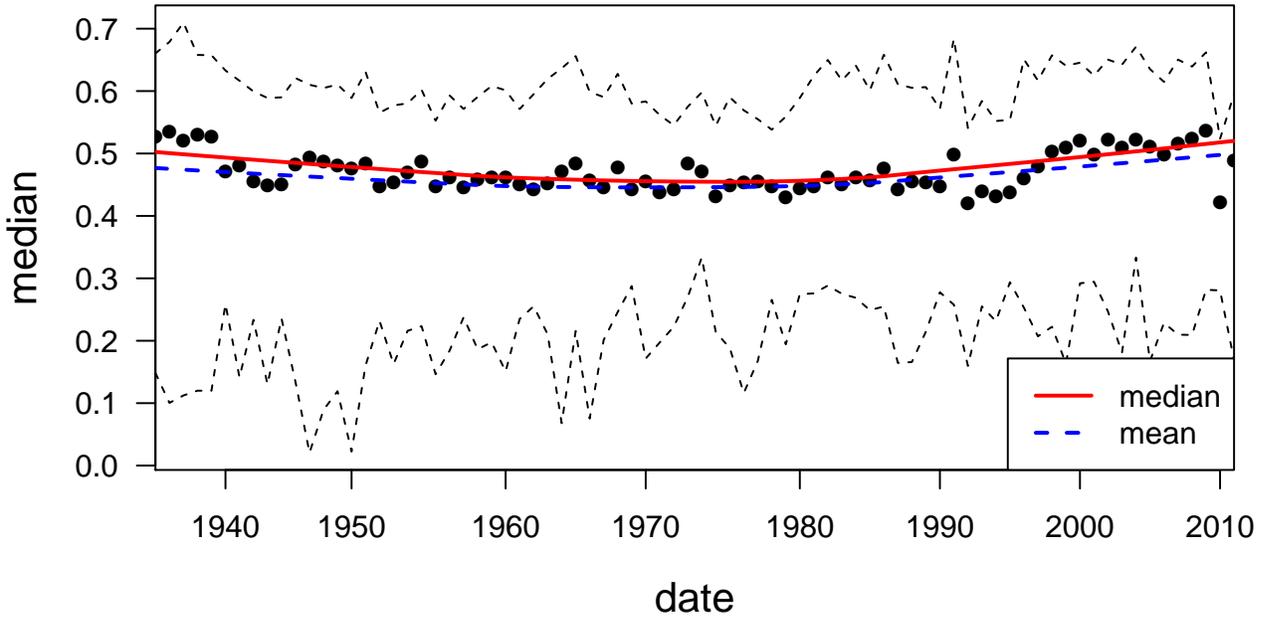


Figure 1: Time series of distinctiveness. In the top panel, the points represent the median, while the solid [red] line represents the lowess of the same. The [blue] broken line is the mean. The [black] broken lines at the top at bottom of the plot are the (empirical) 2.5th and 97.5th percentiles of the data. The bottom panel is the variance over time, plotted with a lowess.

In Table 1 we report the results from three specifications. In Column (1) the relevant regression is *pooled*: that is, we treat the entire sample of MPs as a cross-section and provide OLS estimates for the coefficients on the same. In Column (2) we add MP-level (i.e. unit-level) fixed effects. In Column (3), we use MP-level and session-level (that is, time) fixed effects. The results of an *F*-test and a Baltagi and Li (1990) Lagrange-Multiplier test suggest that time fixed effects are indeed warranted in this case.

Table 1: Effect of experience and demotion on distinctiveness of MPs. The first model pools all observations. The second adopts a panel structure with MP-fixed effects. The third uses MP-fixed and session-fixed effects.

<i>Dependent variable: distinctiveness</i>			
	(1)	(2)	(3)
experience	−0.0004*** (0.0001)	−0.001*** (0.0001)	−0.002*** (0.0003)
demoted	0.005 (0.003)	−0.001 (0.005)	0.003 (0.005)
constant	0.461*** (0.001)		
MP-fixed effects	✗	✓	✓
Session-fixed effects	✗	✗	✓
Observations	15,159	15,159	15,159
R <sup>2</sup>	0.001	0.007	0.051
F Statistic	5.735*** (df = 2; 15156)	44.971*** (df = 2; 12665)	8.698*** (df = 78; 12589)

Note: \*\*\* $p < 0.01$

Regardless of the specification, there is a negative effect of experience on distinctiveness ( $p < 0.01$ ).<sup>2</sup> That is, as MPs serve longer terms, they become less and less interesting (relative to others) in terms of their speech. Being demoted at some point does not seem to change this dynamic. In terms of the substantive size of this effect, a one standard deviation increase in experience (around

<sup>2</sup>As a robustness test, we also fit the panel regression using heteroscedastic ‘robust’ standard errors (in the sense of White, 1980). This makes no difference to our conclusions. Nor does, in addition, correcting for potential autocorrelation (in the sense of Arellano, 1987).

9 sessions) decreases distinctiveness by around 0.02 (around one fifth of that variable's standard deviation). So these effects are not huge.

### **5.3 Model Inference: The Effect of Seniority is Changing**

In Figure 2, we report our final set of findings. Now, we divide the data into periods of uninterrupted party rule by one party. For each period, we record the coefficient on the experience of government party backbenchers in terms of its effects on distinctiveness. This point estimate is plotted via a letter symbolizing (L)abour or (C)onservative control at the time, and each estimate is plotted at the beginning of the period in question. Thus, for example, the Conservative control of the Premiership that began in 1979 and ended in 1997 is marked by a coefficient in 1979. For each regression, we report the 95% confidence interval on the figure. We see immediately that for the vast majority of our data, the effect of seniority is negative: that is, the coefficient is less than zero, implying that more senior members are less distinctive. This switches during the Blair government, with a positive coefficient for that period; it continues into the coalition government, though in that particular case the coefficient is not distinguishable from zero.

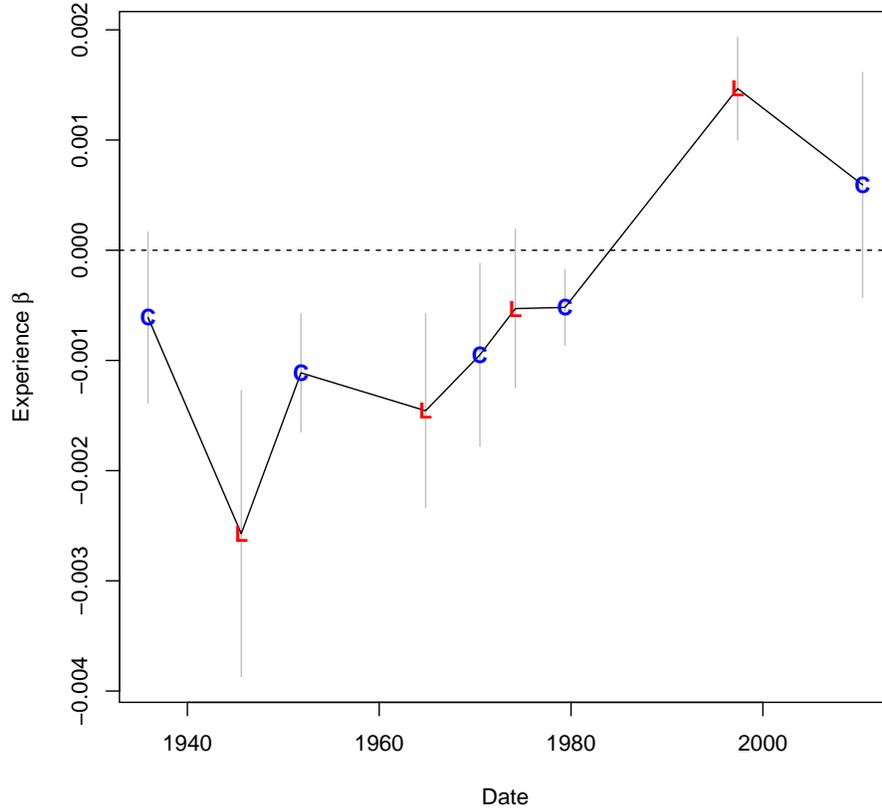


Figure 2: Effect of longer service on distinctiveness, over time. Data is broken up into periods of uninterrupted one party rule, with one coefficient (and 95% confidence interval) per period.

## 6 Discussion

Exactly what behavior is desirable in MPs has been debated at least since the time of Edmund Burke’s ‘Speech to the Electors of Bristol’ in 1774. Modern voters are not consistently clear about their preferences either: on the one hand, they say they like independent-minded MPs willing to express their positions (Vivyan and Wagner, 2015); on the other, they generally make their voting decisions based on other factors, such as party leader reputations for competence (Green and Jennings, 2012). Given this ambiguity, it is unclear whether MP distinctiveness (from others) is likely to be electorally helpful or not. Regardless, a first step in the process of investigation is measuring ‘style’, validating that measure, and using it to draw aggregate and individual-level

conclusions about how MPs have or have not changed over time.

Here we found there is very little evidence that MPs are becoming less interesting over time. Perhaps there are fewer ‘big beasts’, but most MPs are as different or as similar to their colleagues as they ever were: since 1935, the diversity of ways that MPs express their views is essentially constant. More interestingly perhaps, the effect of seniority is changing. We showed that for most of the 20th Century, longer-serving backbenchers tended to be less distinctive. But, at least since the Blair victory in 1997, the pattern is different: perhaps due to the intake of young MPs more solely focussed on career promotion, it is older MPs who emerge as more interesting speakers.

This latter finding is in line with work on the determinants of rebellion in recent times, from the likes of Cowley and Childs (2003) and Benedetto and Hix (2007). Therein weathered MPs beyond the risk-set for promotion, tend to be less compliant. Perhaps we are seeing the side-lining of socialization as the traditionally dominant force in MP careers (Eggers and Spirling, 2016). In that case, it would be interesting to know more about *what* distinctive MPs choose to talk about: is it simply a matter of linguistic choices, or something more related to topics of debate? And, presumably, we would like to know more about *who* is speaking differently, in terms of their (re)election prospects, their career histories, their ideological positions and so on. We leave such efforts for future work.

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# Supporting Information

## A Mathematical Derivation of the Style Estimator

Consider the context  $c$  of a particular parliamentary session. Let  $S_c$  denote the reference set of speakers for this context: all speaking back-benchers from the governing party with at least 10 speeches. Let  $t$  denote the target speaker, any member of  $S_c$ . Our formal goal is to define the distinctiveness of speaker  $t$  relative to speaker set  $S_c$  in context  $c$ . For the purposes of defining the distinctiveness measure, we suppose that each speaker  $s$  belongs to a unique context  $c(s)$ ; a member appearing in two parliamentary sessions is treated as two speakers.<sup>3</sup>

To start, we will need a probabilistic model relating a speaker to the text of a speech. For purposes that will become clear momentarily, recall that a word ‘type’ is a distinct entity or concept in a text, while a word ‘token’ is an instance of that entity. Thus, the phrase ‘Dog eat dog world’ contains four tokens (the words), but only three types (the second dog is conceptually similar to the first).

We begin, by reducing the text of each speech to a sequence of word tokens drawn from fixed vocabulary  $V_c$  specific to the context  $c$ . In our application,  $V_c$  is the total set of word types for session  $c$ . That is, the union of the types used by all the MPs who speak during that period. We ignore all spoken words outside this vocabulary. Let  $I_s$  denote the set of all speeches from speaker  $s$ . For speech  $i \in I_s$  and word type  $v \in V_c$ , let  $x_{iv}$  denote the number of word tokens in speech  $i$  equal to  $v$ ; let  $n_i = \sum_{v \in V_c} x_{iv}$  denote the length of speech  $i$ .

Our first simplifying assumption is that each speaker  $s \in S_c$  has a set of word type probabilities that determine how speeches from  $s$  are generated. It will be convenient to parameterize these probabilities in terms of their natural logarithms. Specifically, take a particular speech  $i$  given by speaker  $s \in S_c$ . Let  $w$  denote a randomly-chosen word token from this speech, and suppose that the probability that this word is  $v \in V_c$  in terms of its logarithm by

$$\log \Pr(w = v | s) = \eta_{sv},$$

the same for all speeches by  $s$  in context  $c$ . Denote the speaker-specific vector of such log-probabilities by  $\eta_s$ .

Suppose that we know  $\eta_s$  for each speaker (or that we have estimated these vectors using speakers’ empirical word frequencies). Our next task will be to use these quantities together with the speeches from context  $c$  to define the distinctiveness of each speaker.

To define the distinctiveness of target speaker  $t$  with respect to reference set  $S_c$  in context  $c$ , we start by taking the simple case where the reference set contains only two speakers,  $S_c = \{s, t\}$ , and the context contains only a single speech,  $i$ . Suppose that we randomly pick a word token from speech  $i$ . If, on the basis of this token, it is easy to identify whether  $t$  is the speaker, then we will say that  $t$  is distinctive. If, on the other hand, it is difficult to identify whether  $t$  is the speaker, then we will say that  $t$  is typical (not distinctive). In particular, suppose that we randomly pick word type  $v$  from the speech. Using Bayes’ rule and equal prior probabilities for whether  $s$  or  $t$  is the speaker, the log posterior odds ratio that  $t$  is the speaker are given by  $(\eta_{tv} - \eta_{sv})$ . The expected

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<sup>3</sup>This is simply for measurement purposes in the sense that we have to define the unit of observation: when making *inferences* from the data below, we will use fixed effects to look at within MP variation.

value of this quantity for a random word type drawn from speech  $i$  is

$$\frac{1}{n_i} \sum_{v \in V_c} x_{iv} (\eta_{tv} - \eta_{sv}).$$

We define this quantity as the distinctiveness of target speaker  $t$  relative to reference set  $\{s, t\}$  in the context of speech  $i$ .

With the simple case covered, it is straightforward to generalize our distinctiveness measure to larger reference speaker sets and larger contexts. In the first direction, for an arbitrary reference set  $S_c$  containing  $t$ , we take the average pairwise distinctiveness for a randomly chosen alternative  $s \in S_c$ :

$$\frac{1}{|S_c|} \sum_{s \in S_c} \left\{ \frac{1}{n_i} \sum_{v \in V_c} x_{iv} (\eta_{tv} - \eta_{sv}) \right\},$$

where  $|S_c|$  denotes the size of set  $S_c$ . The second generalization, to larger reference sets, can be obtained by taking the expectation over a randomly-chosen speech  $i \in I_t$ . This gives our final measure of distinctiveness, which, after re-arranging the sums, can be expressed as

$$\mathbb{D}_t = \mathbb{D}_t(S_c; I_t) = \frac{1}{|I_t|} \frac{1}{|S_c|} \sum_{i \in I_t} \sum_{s \in S_c} \sum_{v \in V_c} f_{iv} (\eta_{tv} - \eta_{sv}),$$

where  $f_{iv} = x_{iv}/n_i$ . We can further simplify this expression by defining

$$\bar{f}_{tv} = (1/|I_t|) \sum_{i \in I_t} f_{iv} \quad \bar{\eta}_{cv} = (1/|S_c|) \sum_{s \in S_c} \eta_{sv}.$$

In this case,

$$\mathbb{D}_t = \sum_{v \in V_c} \bar{f}_{tv} (\eta_{tv} - \bar{\eta}_{cv}).$$

With this final expression we can compute  $\mathbb{D}_t$  by taking the difference between  $\eta_t$  and the average  $\eta_s$  over all speakers  $s \in S_c$ , then taking the dot product with the empirical frequencies  $\bar{f}_{tv}$  computed from target speaker's speeches  $I_t$ . It is  $\mathbb{D}_t$  that becomes our 'distinctiveness' dependent variable in what follows.

## A.1 Standard Errors

The distinctiveness measure  $\mathbb{D}_t = \mathbb{D}_t(S_c; I_t)$  is an empirical average over all observed speeches  $I_t$  by the target speaker  $t$  and all other speakers in the context  $S_c$  of the quantity  $\sum_{v \in V_c} f_{iv} (\eta_{tv} - \eta_{sv})$ . There are at least three sources of variability in that affect  $\mathbb{D}_t$ :

1. The observed speeches  $I_t$  can be considered as a sample of all speeches that could have been delivered by the target  $t$  in the same context.
2. The reference speakers  $S_c$  (in our context, the other back-benchers in the governing party) can be considered a sample of all potential reference speakers that could have been present.
3. The speaker-specific log word type frequencies  $\eta_{sv}$  are estimates based on empirical frequencies; these estimates depend on the actual observed speeches by  $s$ , which, again, can be

considered as a sample of all potential speakers by  $s$ .

To assess the variability in our computed value in  $\mathbb{D}_t$  we make the simplifying approximation that the largest sources of variability come from the random process that determined  $I_t$  and  $S_c$ ; we ignore variability in determining the estimates of  $\eta_{sv}$ .

Set  $D_{is} = \sum_{v \in V_c} f_{iv}(\eta_{tv} - \eta_{sv})$ . The quantity  $\mathbb{D}_t$  is an average of  $D_{is}$  over sets  $I_t$  and  $S_c$ . We will condition on the sizes of the sets  $I_t$  and  $S_c$  but otherwise we will treat these sets as random. Specifically, set  $n = |I_t|$  and  $m = |S_c|$ ; take  $I_t$  to be a set of independent identical draws from some population  $\mathbb{I}_t$  and take  $S_c$  to be a set of  $m$  independent draws from some population  $\mathbb{S}_c$ . Treat  $D_{is}$  as a deterministic function of the speech  $i \in \mathbb{I}_t$  and the speaker  $s \in \mathbb{S}_c$ .

To assess the uncertainty in  $\mathbb{D}_t$  due to the variability in  $I_t$  and  $S_c$  first define for each  $i \in \mathbb{I}_t$ .

$$D_i(S) = \frac{1}{m} \sum_{s \in S} D_{is}$$

If  $S$  is a set of size  $m$  drawn independently and identically from population  $\mathbb{S}_t$  then define the expectation and variance over random  $S$  as

$$\mathbb{E}\{D_i(S)\} = \mu_i, \quad \text{var}\{D_i(S)\} = \frac{\sigma_i^2}{m}.$$

where  $\mu_i$  and  $\sigma_i^2$  are the mean and variance of  $D_{is}$  as  $s$  ranges over population  $\mathbb{S}_c$ .

Express the distinctiveness over a random set speaker set  $S$  of size  $m$  drawn as before and a random speech set  $I$  of size  $n$  drawn independently and identically from population  $\mathbb{I}_t$  as a random variable

$$D = D(I, S) = \frac{1}{n} \sum_{i \in I} D_i(S).$$

Note that  $\mathbb{D}_t = D(I_t, S_c)$ . Now,  $\text{var}(D) = \mathbb{E}\{\text{var}(D | I)\} + \text{var}\{\mathbb{E}(D | I)\}$ , where the outer expectation and variance on the right hand side are over the random set  $I$ . Using the independence of the speeches yields

$$\mathbb{E}(D | I) = \frac{1}{n} \sum_{i \in I} \mu_i, \quad \text{var}(D | I) = \frac{1}{n^2} \sum_{i \in I} \frac{\sigma_i^2}{m}.$$

Hence,

$$\text{var}(D) = \frac{1}{n} \text{var}(\mu_i) + \frac{1}{nm} \mathbb{E}(\sigma_i^2),$$

the variance and expectation being computed over a random  $i$  drawn from population  $\mathbb{I}_t$ . Define estimate  $\hat{\mu}_i = D_i(S_c)$  and set  $\hat{\sigma}_i^2$  to be the empirical variance of  $D_{is}$  as  $s$  ranges over  $S_c$ . We estimate  $\text{var}(\mu_i)$  by the empirical variance of  $\hat{\mu}_i$  and we estimate  $\mathbb{E}(\sigma_i^2)$  by the empirical mean of  $\hat{\sigma}_i^2$ . This gives us an estimate of the variance of  $\mathbb{D}_t$ ; we use the square root of this quantity as a standard error for  $\mathbb{D}_t$ .

## B Caveats Regarding our Style Estimates

With reference to the main text, and Supporting Information A, we stress the following about our estimates of distinctiveness:

1. **Relative Distinctiveness** It is impossible to talk about how “distinctive” a speaker is in an *absolute* sense. We can only measure her distinctiveness relative to a particular reference set of speakers. In the case of Mosteller and Wallace (1963), Madison was distinctive relative to the reference set that contains Madison and Hamilton. But Madison need not be distinctive relative to other contemporaries.
2. **Distinctiveness heterogenous *within* members** Even for a fixed reference set, a speaker can exhibit varying degrees of distinctiveness depending on the speech. Over a session of parliament, any given member will give some largely procedural speeches and some essentially free-form speeches. For the procedural speeches, the members tend to speak in the same manner; for the others, the members exhibit more heterogeneity in the speaking style. Any given member, in the context of a procedural speech, will not exhibit particularly distinctive style. In the context of open debate, she may exhibit a markedly different style and level of distinctiveness relative to her peers. Even for the same speaker and reference set, distinctiveness can vary depending on the speech.
3. **Convergence Assumptions and Validation** A reliable measure of distinctiveness should have the property that with enough data, it converges to a fixed value. In this paper, we define the distinctiveness of target speaker  $t$  relative to reference speaker set  $S_c$  in context  $c$ . The context  $c$  will be a particular parliamentary session, and the reference set  $S_c$  will be the set of members from the same session with the same party as  $t$ . We have at our disposal a set of speeches drawn from this context. We define distinctiveness such that, provided certain independence assumptions are in force, the measure converges in probability to a fixed value as the number of speeches from context  $c$  increases. To the extent that our assumptions are reasonable approximations of reality, our measure will accurately quantify distinctiveness. Even when our assumptions are unreasonable, it may still be the case that our distinctiveness measure approximates that which we hope to capture. We rely on external validation to argue this case.

## C Variable Summaries

In Table 2, for each variable, we take the *mean* over all (Government party, backbench) MPs in a session, and then report various summaries of those means.

Description	Minimum	Median	Mean	Max
Experience	2.40	10.06	9.97	15.82
Proportion Demoted	0.00	0.08	0.13	0.31
Distinctiveness	0.41	0.45	0.46	0.52
Average number of speeches per MP (per career)	1.00	43.48	59.37	731.24
Average number of speeches per MP (per session)	21.59	63.43	62.90	152.20
Total speeches per session	10256	30186	29787	72145
Speaking MPs per session	334.00	480.00	469.50	521.00
Mean Speech Length	132.60	194.20	187.90	232.40

Table 2: Summaries for variables in our data

## D Validation

For each MP  $t$ , in each session, we have an estimate of their distinctiveness  $\mathbb{D}_t$ . To validate these estimates, we consider their extrema—their minimums and maximums. In the subsection tables below, we list the twenty names of the MPs who were most interesting and most boring for two sessions: one in 1995–1996 and one in 1998–1999—thus, either side of the Blair landslide. We also list the number of mentions of each MP in the *Guardian* newspaper archives (via ProQuest) for the same period. In the ‘Comments’ we note some special handling required in some cases before using the data obtained from the online counts. Note that we typically searched for the person’s (professional) first name and last name together (as a bigram), except where described differently.

### D.1 Tory Backbenchers, 1995–1996

Comparing the counts from Tables 3 and 4, a Wilcoxon Signed-rank test returns a statistically significant result for the former having a higher mean ( $p < 0.01$ ). More substantively, we note the presence of several well-known Eurosceptics in Table 3. These include three of the so-called ‘Maastricht Rebels’: Tony Marlow, Nicholas Budgen and Teddy Taylor. We also see Bill Cash (MP for Stafford) who founded the European Foundation, an anti-EU think-tank. Andrew Hunter and Eric Pickles were sceptics at this time too. John Redwood, our most interesting backbencher and the most reported upon, challenged John Major for the leadership of the Conservative Party in July 1995. Among the least interesting MPs, Edwina Currie is perhaps the only one (other than Seb Coe and Winston Churchill who have high numbers of hits for reasons unrelated to their politics) worthy of further comment. Currie had been controversial cabinet minister (forced to resign in 1988), and by the mid-1990s was a novelist with two popular tomes written. This, no doubt, inflates her mentions in the *Guardian* newspaper.

Table 3: Most interesting MPs November 1, 1995–October, 31, 1996 in parliament, by our measure.

Name	Guardian Mentions	Handling Notes
John Redwood	245	
David Knox	8	
Tony Marlow	24	
Eric Pickles	4	
Simon Commbs	2	
Michael Brown	21	
Eric Sykes	7	
Anthony Steen	5	
David Mellor	171	
Andrew Hunter	15	
Barry Field	10	
Nicholas Budgen	16	
Robert Hughes	33	
William Cash	64	
David Wilshire	11	
Bob Dunn	11	
Charles Goodson-Wickes	8	
Teddy Taylor	45	
Rhodes Boyson	36	
David Amess	13	

Table 4: Most boring MPs November 1, 1998–October, 31, 1996 in parliament, by our measure.

Name	Guardian Mentions	Handling Notes
Andrew Bowden	2	
Tom Arnold	11	
Colin Shepherd	0	
Malcolm Thornton	0	
Peter Fry	0	
Winston Churchill	173	Removed for being namesake of famous figure.
Kenneth Carlisle	0	
Robert Jackson	1	
Stephen Day	2	
Giles Brandreth	19	
Edwina Currie	74	
Tim Sainsbury	8	
Sebastian Coe	62	Removed for being world famous athlete.
David Mitchell	17	
Michael Jopling	10	
Michael Marshall	5	
Robert Banks	13	
Fergus Montgomery	2	
Dudley Smith	7	
Geoffrey Johnson Smith	22	

## D.2 Labour Backbenchers, 1998–1999

Comparing the counts from Tables 5 and 6, a Wilcoxon Signed-rank test returns a statistically significant result for the former having a higher mean ( $p < 0.01$ ). More substantively, we note the presence of several Labour ‘rebels’ among the most distinct. These include Tony Benn, Ken Livingstone, Roger Berry and Tam Dalyell, all of whom consistently voted against the Labour government’s plan to reform the welfare state. The list also includes George Galloway and Dennis Canavan, both of whom would ultimately leave the Labour party and run for election under other labels. The set of least interesting MPs contains no obvious ‘stars’, albeit we remove Kevin Hughes (MP for Doncaster North) on the basis that he was the namesake of a DJ who was routinely listed in the *Guardian*’s radio programming guide.

Table 5: Most interesting MPs November 1, 1998–October, 31, 1999 in parliament, by our measure.

Name	Guardian Mentions	Handling Notes
Ivan Lewis	1	
Geraint Davies	4	
Barry Jones	5	
Stuart Bell	21	
Tony Benn	163	
Martin Linton	10	
Chris Pond	3	
Douglas Alexander	12	
Ken Livingstone	241	
Roger Berry	5	
Dennis Canavan	32	
Christopher Leslie	10	
Dale Campbell-Savours	10	
David Hinchliffe	12	
Denzil Davies	1	
George Galloway	28	
Patrick Hall	1	
Tam Dalyell	7	
Mark Fisher	17	
Maria Eagle	10	

Table 6: Most boring MPs November 1, 1998–October, 31, 1999 in parliament, by our measure.

Name	Guardian Mentions	Handling Notes
Irene Adams	2	Removed for being namesake of radio DJ at time.
David Taylor	15	
Kevin Hughes	118	
Jimmy Hood	5	
Ann Coffey	1	
Andy Reed	6	
Win Griffiths	2	
Christine Butler	0	
Andy King	6	
Brian Donohoe	1	
Paul Clark	3	
Bill Michie	1	
Michael Foster	10	
Christine Russell	1	
David Stewart	11	
Piera Khabra	2	
Ernie Ross	15	
John Gunnell	0	
Allan Rogers	2	
Ivan Henderson	2	