

# All (Mayoral) Politics is Local?

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## **Abstract**

One of the defining characteristics of modern politics in the United States is the increasing nationalization of elite- and voter-level behavior. Relying on measures of electoral vote shares, previous research has found evidence indicating a significant amount of state-level nationalization. Using an alternative source of data – the political rhetoric used by mayors, state governors, and Members of Congress on Twitter – we examine and compare the amount of between-office nationalization throughout the federal system. We find that gubernatorial rhetoric closely matches that of Members of Congress but that there are substantial differences in the topics and content of mayoral speech. These results suggest that, on average, American mayors have largely remained focused on their local mandate. More broadly, our findings suggest a limit to which American politics has become nationalized – in some cases, all politics remains local.

# 1 Introduction

At the heart of the republican ideal in the United States is the notion that elected officials properly represent those to whom they are electorally accountable. That is, elected officials in a well-functioning democratic setting are expected to articulate the preferences and desires of the governed. Numerous studies of democratic representation compare some measure of aggregate constituency preferences with some measure of elite behavior or outcomes (see, e.g., Esaiasson and Wlezien, 2016). Given the nature of American federalism, this implies that local officials should be concerned with representing and articulating the preferences of citizens at the local level while federal officials should be comparatively more concerned with national-level policies.

However, recent scholarship suggests that all levels of American politics have become increasingly nationalized. Evidence for such a nationalization effect has been found in U.S. House, Senate, and gubernatorial elections (Carson and Sievert, 2018; Sievert and McKee, 2019; Aleman and Kellam, 2008). Thus, rather than being contested over local issues that are of importance to each respective constituency, political campaigns are largely focused on national issues (Hopkins, 2018). While it is true that local constituencies care about national issues and political competition, the stakes of nationalized local politics are high. Indeed, a nationalized style of local politics often comes at the expense of a focus on the local issues that are typically of greater importance to citizens. With the majority of Americans engaging most frequently with the goods and services provided by local governments (e.g. parks, roads, sanitation service), the nationalization of American elections has the potential to weaken both governmental representation and provision at the most local level.<sup>1</sup>

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<sup>1</sup>A recent report by The Brookings Institution found that, as of 2017, state and local governments “collected and spent amounts equal to 13.1 percent and 14.7 percent of GDP, respectively.” Moreover, the increased transfer of federal funds to state and local governments has given these subnational governments a large role in overseeing the “efficient and effective use of public funds.” The full report can be found at

In this study, we examine the extent to which the nationalization of American politics has affected mayoral and gubernatorial representation. Presiding over the most local forms of government within the federal system and managing the government services with which citizens interact most frequently, both mayors and governors have substantial influence over the daily lives of their citizens. Accordingly, understanding whether these elected officials have shifted their focus toward national issues and away from the needs of their local constituencies is of tremendous importance. To address this question, we depart from typical studies of nationalization by analyzing patterns of elite speech with respect to topic similarity via the Twitter social media platform rather than election results. Adopting this measurement strategy allows us to both validate existing findings from the literature on the nationalization of American politics as well as to introduce new metrics that capture differences in the behavior of political elites themselves.

We collect a unique dataset of 404,049 tweets from U.S. mayors, 102,670 tweets from governors, and nearly 965,000 tweets from Members of Congress. Constructing multiple measures of nationalization, we analyze this data both in terms of partisanship as well as topic similarity. Our results show that mayors – regardless of party – talk about qualitatively different subjects than their co-partisans in Congress. Governors, by contrast, are more rhetorically in line with Members of Congress. Mayoral offices focus predominantly on local issues. Such a finding complements work suggesting that the polarization and partisan antipathy that is pervasive within the context of national politics is largely absent at the most local levels of government (Jensen et al., 2019). We also present results that indicate that the degree to which mayors discuss national issues rather than local issues is dependent upon the size of the city over which they govern (consistent with their exposure to national trends) and the number of years they have been in office (consistent with their ability to ignore national pressures). As the population size of a city increases, mayors are more likely

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<https://www.brookings.edu/research/nine-facts-about-state-and-local-policy/>.

to engage in nationalized political rhetoric. More time spent in office, on the other hand, is associated with lower amounts of nationalized rhetoric. These results are robust to the inclusion of individual mayoral traits and political preferences, as well as a series of city-level covariates.

This paper proceeds as follows. First, we characterize recent work on the nationalization of American elections and develop a theory linking governors and mayors to nationalized behavior manifested through elite speech. Next, we present a novel series of results based on tweet analyses suggesting that while gubernatorial rhetoric resembles the type of speech typically found among national politicians, American mayors are less partisan and less nationalized than their Congressional counterparts. We proceed to show how mayors' comparatively lower levels of nationalized rhetoric vary as a function of individual mayor- and city-level covariates. Finally, we conclude with a discussion about the implications of our results for democratic governance.

## **2 Elections, Accountability, and Nationalization**

While canonical models suggest that voters make rational decisions about candidates within each electoral context (see, e.g., Downs, 1957), recent evidence suggests that American political behavior has become increasingly nationalized (Hopkins, 2018; Abramowitz and Webster, 2016). Nationalization, as typically conceptualized by the literature, conventionally refers to one of two things. In one case, nationalization refers to the process whereby voters judge politicians – regardless of the electoral level – by their evaluations of the national parties. In the second case, nationalization occurs when state and local elections are largely fought over national (largely symbolic) issues. Among other causes, these two different forms of nationalization are thought to occur when parties offer similar candidates across electoral levels or the media market changes in a way that prioritizes national over local news (Hopkins, 2018;

Martin and McCrain, 2019). To the extent that this nationalization phenomenon causes state and local officials to prioritize national interests and the concerns of ideologically-motivated donor bases to the exclusion of the local citizenry's needs, as Hopkins (2018) suggests, the nationalization of American politics has the potential to drastically alter the relationship between citizens and their elected officials at the local level.

The existing literature on the growing nationalization of American politics has largely focused on U.S. House and Senate elections (see, e.g., Carson and Sievert, 2018; Aleman and Kellam, 2008). Jacobson (2015), for instance, notes that the incumbency advantage in American politics, long seen as the source of high re-election rates across the country, has been declining over time, and the explanatory power of partisanship in predicting election outcomes for House elections has increased tremendously. Such a shift indicates that Americans today care less about the specific person who represents them and more about the partisan balance of power in Congress. This implies that, unlike in earlier eras, it is increasingly difficult for politicians to court the "personal vote" in their districts (Mayhew, 1974; Fenno, 1978).

Outside of federal elections, scholars have focused almost entirely on how the nationalization of American politics has affected gubernatorial elections. Hopkins (2018) shows that the state-level correlation between voting for the Democratic presidential candidate and the Democratic gubernatorial candidate has increased considerably over time. Nearly thirty years ago, the correlation between voting patterns at these two electoral levels was a moderately strong .61. By 2010, the correlation had strengthened to just under .9. A similar relationship exists between the percentage of the two-party vote accruing to the Democratic presidential candidate and the percentage of the votes received by the Democratic gubernatorial candidate (see also, Sievert and McKee, 2019). These relationships are also found in state legislative elections, albeit inconsistently. For instance, Rogers (2016) finds that presidential approval shapes how voters view their state legislators: voters will cast their ballots "for

the state legislative challenger instead of the member of the president’s party” when they are displeased with the president’s job performance. Related work finds that this dynamic of nationalized candidate evaluations is most pronounced when national polarization is high (Zingher and Richman, 2018). However, contrary to the phenomenon of the nationalization of American elections, others have found that state legislators are largely responsive to their constituencies (Fourinaies and Hall, 2018) and that one-third of counties in the United States tend to vote for one party for president and another for state legislature (Trounstine, 2017).

Mayors may be somewhat immune from these national trends: voters cast ballots in mayoral elections based upon retrospective local economic conditions, such as local unemployment, and this effect typically dwarfs the effect of national economic conditions (Hopkins and Pettingill, 2017). That voters are casting ballots for mayors in a way that does not necessarily channel national political trends suggests that mayoral representation may be based on local, not national, politics. Relevant for this project, moreover, they find that “[i]n cities with their own TV stations and newspapers, there is a robust relationship between city-level unemployment and the [electoral] performance of the incumbent mayor” (Hopkins and Pettingill, 2017). That information about local economic conditions changes political behavior, particularly relative to national economic conditions, suggests that mayoral politics remains more focused on local issues.

## **Governors, Mayors, and Nationalized Political Speech**

That the existing literature measures nationalization by examining the correlation between partisan vote shares at various levels of the federal electoral system is sensible as elections allow citizens to hold elected officials accountable for their actions in office (Ferejohn, 1986; Fearon, 1999; Fiorina, 1981), ensure proper representation (Verba, Schlozman and Brady, 1995), and provide an avenue for expressive political participation (Hamlin and Jennings, 2011). Yet while this approach has been useful in establishing the rise of nationalized political

competition, it necessarily focuses on *voter* behavior just as much – if not more – than *elite* behavior. Because we are interested here in the nationalized behavior of political elites, we need a measure that is less dependent upon the actions of the mass public. For this reason, we measure nationalization by examining the similarity in mayoral and gubernatorial speech with Members of Congress, captured via Twitter.

Why might politicians use social media? A politician’s social media content is a component of their strategic communication plan to engage with constituents (as well as a broader audience) directly, as well as indirectly as a mediated message. In this sense, Twitter is similar to press releases, news stories, or interviews. Twitter is a particularly important medium for politicians, as Twitter followers are likely to be opinion leaders within their districts – as well as journalists, activists, and local politicians – who convey what they read on Twitter to a broader audience of constituents.<sup>2</sup> In the same way that we understand press releases and campaign speeches as providing useful data on elite communication to constituents, we expect politicians to use Twitter to cultivate constituent support and signal their priorities as lawmakers (Grimmer and Westwood, 2012). Importantly for our purposes, social media provides us with an opportunity to capture and record a component of this strategic communication plan.

That communication is a key component of strategic elite-level communication in modern politics has been shown by numerous scholars. One study, for instance, found that Republican officials tend to use veiled religious language that appeals to white evangelical Protestants. This “GOP Code” is designed to both signify a politician’s in-group partisan membership and solidify the support of sympathetic voters (Calfano and Djupe, 2009). Additionally, research has shown that politicians are increasingly and deliberately engaging in

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<sup>2</sup>Approximately 22% of US adults use Twitter, but Twitter users are younger, more educated and more likely to be Democrats than general public, according the Pew Internet and American Life Project. <https://www.pewresearch.org/internet/2019/04/24/sizing-up-twitter-users/>

speech that seeks to outrage and belittle the opposing political party and its supporters. This verbal strategy, which Grimmer (2013) refers to as “partisan taunting,” is yet another way that political elites seek to signal their in-group membership to their supporters in the electorate.

In addition to being used to signal in-group membership and taunt political opponents, politicians strategically speak about those issues and policies where their party is traditionally seen by the electorate as being more competent than the opposing party. Indeed, voters stereotypically assign issue positions to Democratic and Republican elites (Goggin and Theodoridis, 2017). The assignment of these stereotypes largely occurs due to the notion of “issue ownership,” where one party is so deeply – and durably – focused on a particular issue that they are viewed by the electorate as “owning” that issue (see, e.g., Petrocik, 1996). By “repeatedly and consistently addressing problems stemming from [the owned] issues over time,” candidates (and their associated party) can gain an electoral advantage (Banda, 2016).

Speech, then, has been shown to be an important aspect of politicians’ presentational style. We extend this logic by arguing that, if they are experiencing the forces of nationalization, mayors and governors should be using rhetoric and patterns of speech that are similar to their congressional counterparts. Moreover, if these more locally-focused offices are nationalized, mayors and governors should be discussing the same topics as their co-partisans in Congress.

While analyzing nationalization via elite speech on Twitter seems appealing, one potential problem with this approach is that citizens are not uniformly on Twitter. In fact, most citizens are not active on the social networking platform. Accordingly, it is possible that mayors and governors are engaging in nationalized rhetoric but no one observes this. However, such a concern appears to be unfounded. Studies have shown that those individuals who are not on Twitter are nevertheless exposed to politicians’ tweets via journalists’



coverage of political affairs. Indeed, because journalists view tweets as newsworthy they oftentimes quote from politicians' tweets – or link directly to the tweet itself – when writing their articles (McGregor and Molyneux, 2018; Lawrence et al., 2014). Accordingly, it is possible for citizens who are not themselves users of Twitter to still come across tweets from their political representatives.

While using nationalized rhetoric does not necessarily inhibit governors and mayors from engaging in locally-focused policy, there are still costs associated with a politician's decision to focus his or her rhetoric on national issues. Indeed, one of the most important aspects of politicians' careers pertains to the ways in which they present themselves to the electorate (Fenno, 1978). Adopting a presentational style that focuses largely on national politics will lead voters to assume that the politician cares largely about national issues. Focusing on local issues, by contrast, will lead voters to assume that a politician is most concerned with issues of local importance. Regardless of actual policy output and legislative focus, how a politician chooses to present themselves to the electorate is a decision of great consequence.

As a measure of nationalization, we expect governors to be engaging in rhetoric – and discussing topics – similar to their co-partisans in Congress. Such an expectation comports with the existing literature, which argues that governors have become nationalized along both of the dimensions described above. Indeed, governors are often evaluated by the electorate through the lens of national politics and gubernatorial elections are increasingly fought over national issues. In addition to changes in the media landscape, one potential reason to expect governors to engage in nationalized rhetoric is that governors often have ambitions for higher office. Governors frequently are candidates for President of the United States, and 17 presidents have previously held a state's governorship (Shapiro and Lawrence, 2015). Engaging in nationalized rhetoric, then, is a potential way for governors to engage with issues of broad importance and build their national brand in preparation for a presidential bid.

In addition to their tendency to harbor ambitions for higher office, we expect governors

to use nationalized rhetoric due to the nature of intraparty federalism. As Hopkins (2018) notes, the demise of the patronage era made state political parties increasingly dependent upon national party organizations for money and support. Such a top-down organizational structure changes the incentive structure for both state parties and state-level politicians, forcing a more national focus over more a regional approach. Such a shift has been exacerbated by the end of the solidly Democratic south and the polarization of state legislatures, two trends which have made state politics more similar to national political competition (Shor and McCarty, 2011; Hopkins, 2018).

There is less of an *ex ante* reason to assume that mayors engage in nationalized rhetoric. In fact, mayors may be qualitatively different than statewide and, in particular, national politicians. Mayoral partisanship is associated with different issues than partisanship at a national level, and mayoral offices may be sufficiently local such that national partisanship does not affect voting nor decision-making (Adrian, 1952). Additionally, mayoral governments are focused on evaluating what can be built where, on public goods such as streets and sanitation, and on public safety (Oliver, 2012). As a result of such a mandate, then, there may be less time and fewer opportunities for mayors to engage in nationalized political rhetoric. Further, according to Gerber and Hopkins (2011), “the presence of Republican mayors in overwhelmingly Democratic cities – consider Rudolph Giuliani in New York or Richard Riordan in Los Angeles – provides a hint that partisanship may function differently at the local level.” Finally, mayoral elections do not necessarily occur at the same time as national campaigns, and thus may not benefit from the media market trends that align gubernatorial campaigns with national issues. Lacking these electoral incentives, mayors may be more likely to abjure nationalized rhetoric and focus their speech on local issues.

Nevertheless, there are compelling pieces of evidence to indicate that mayoral representation can and does align with national political agendas. Indeed, mayoral fiscal preferences are known to align with their partisan labels (Einstein and Glick, 2018), and partisan control

of local government is predictive of local government spending at both the county level (Per-cival, Johnson and Neiman, 2009; Choi et al., 2010; de Benedictis-Kessner and Warshaw, 2018; Ybarra and Krebs, 2010) and the mayoral level (Tausanovitch and Warshaw, 2014; Einstein and Kogan, 2015; de Benedictis-Kessner and Warshaw, 2016, 2018).<sup>3</sup>

Accordingly, understanding whether mayors engage in nationalized rhetoric and the situations under which they do so are important – and unanswered – questions. We theorize that mayors’ representational style is distinct from congressional representation, and moreover that we will be able to evaluate these differences in representational style via elite speech on Twitter. However, we also expect that a mayor’s likelihood of engaging in nationalized rhetoric will vary based off of certain mayoral and city-level covariates.

It is possible that mayors who represent cities with a strong partisan tilt will be more likely to use nationalized political rhetoric, which is in accordance with Grimmer’s (2013) theory of polarized elite rhetoric. Drawing on a similar logic, we expect that mayors who govern over a city that leans heavily toward one of the two major parties should feel less constrained in their ability to speak out on partisan and national issues. On the other hand, those mayors who govern over cities with a more heterogeneous partisan makeup should focus their rhetoric on more local, non-partisan issues. Additionally, we should expect that those mayors who are “misaligned” with the partisan makeup of their city – that is, a Democrat (Republican) governing a city comprised largely of Republicans (Democrats) – should use less nationalized rhetoric than those whose partisan affiliation matches the partisan leanings of their city. Such an expectation is rooted in a mayor’s desire for re-election. When governing over a city that leans toward the opposing political party, a “misaligned” mayor will avoid speaking on nationalized partisan issues for fear of antagonizing his or her local constituents. Broadly speaking, then, we expect that mayors will use nationalized rhetoric

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<sup>3</sup>Earlier work did not necessarily support this finding (Ferreira and Gyourko, 2009; Gerber and Hopkins, 2011).

when the partisan makeup of their city allows them to do so.

Moreover, in line with the approach in de Benedictis-Kessner and Warshaw (2018), we also expect that mayors' use of nationalized rhetoric will depend upon the institutional and population features of their city. We expect mayors to be more nationalized in their rhetoric when their city employs a city manager, as city managers engage in more of the apolitical day-to-day activities of running a city. Freed from the requirements of such activities, mayors whose city employs a city manager should have more time to engage in nationalized political rhetoric while still ensuring that the day-to-day business of his or her city is addressed. Finally, we expect the degree to which mayors engage in nationalized rhetoric to be increasing in the size of their city's population. As a city's population increases each individual becomes less likely to have any form of personal engagement with the mayor's office. As a result, mayors will have less of an incentive to discuss local and personal issues and will have a greater opportunity to focus on national issues.

### 3 Twitter Data

In order to examine the extent to which the nationalization of American politics has affected gubernatorial and mayoral behavior, we collected Twitter data for mayors, governors, and members of the U.S. House of Representatives.

To begin, we collected the official Twitter handle for every mayor who is a member in the United States Conference of Mayors as of May 2018.<sup>4</sup> Though mayors are not uniformly on Twitter, we obtained Twitter handles for 587 mayors (this amounts to 42% of the mayors eligible for inclusion in our study).<sup>5</sup> To avoid any biases that may be introduced by infrequent

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<sup>4</sup>The United States Conference of Mayors is the official non-partisan organization of cities with populations of at least 30,000. We chose this sample because we anticipated that mayors of medium to large-sized cities have access to Facebook and Twitter and possibly even staff to help monitor these accounts.

<sup>5</sup>We first collected official accounts, and if an official account was not available, we then used a campaign

Twitter users, we excluded all mayors who posted less than 100 tweets from our data. This left us with a sample of 370 mayors, amounting to 27% of all mayors in the United States Conference of Mayors. In late December 2018, we scraped the previous 3,200 tweets for each of these Twitter handles.<sup>6</sup> Our focus is on tweets that were posted by the user, so we excluded all re-tweets from our analyses. This process generated a total of 404,049 tweets from our sample of mayors. Because our aim is to compare mayoral rhetoric with more nationalized speech, we collected 102,670 tweets from 49 governors and 964,810 tweets from 475 Members of Congress using an identical collection protocol.<sup>7</sup> In all cases, our tweets were collected while the mayor, governor, or Member of Congress was in office.

For our sample of mayors, we also collected individual-level attributes. This includes mayors' gender, racial identification, and length of term in office; we add to this the percentage of the vote share they received in their most recent election, as well as each mayor's partisan affiliation. This data was obtained from a combination of mayors' campaign websites and newspaper biographies of the mayors or of the mayoral election, or inferred from the mayor's collection of endorsements or source of campaign funds. For example, a mayor who received endorsements from prominent national Democrats was classified as a Democrat. On the other hand, a mayor who received funding from conservative political action groups would be classified as a Republican. Though many mayoral offices in the United States are non-partisan, the approach we use here allows us to obtain a reasonable estimate as to each mayor's partisan affiliation. Accordingly, our data—by construction—contains no non-partisan mayors.

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account.

<sup>6</sup>This is the maximum number of tweets we were allowed to get due to Twitter's API limit. We were able to get 200 tweets in each request. For each of our targeted politicians, we continued sending requests until we reached the 3,200 limit or their total tweet limit.

<sup>7</sup>The Governor of Alaska, Mike Dunleavy, has a private Twitter account which we were unable to scrape – we are otherwise able to collect all gubernatorial Twitter data.

We also collected information on the institutional features of each city in our dataset. This includes indicators for whether the city government operates with a mayor-council system or a council-manager system, as well as whether the city employs a city manager. In mayor-council systems, a city’s mayor is elected separately from the city council and oftentimes acts as the city’s chief executive officer. Council-manager systems, by contrast, select the city’s mayor from within the city council. Under the council-manager system of local government, the mayor is comparatively weak and the day-to-day operations of the city are overseen by an appointed or elected city manager. Though all city-manager forms of government contain a city manager, city managers are also occasionally used in mayor-council systems.

To these individual- and institutional-level variables we added information on the demographic composition of each city. Using data from the most recent American Community Survey (ACS) estimates, we collected the mean age of the residents of each city, as well as the percentage of male and female residents. We also collected information on the percentage of Black and Hispanic residents, as well as the percentage of individuals who own or rent their homes. We added to this data proxy measures of each city’s election results for the 2016 presidential election. These estimates are constructed by using county-level presidential election returns that are weighted by the percentage of the city that is in each county. A summary of the mayoral data can be seen in Table 1 in the Online Appendix.

## 4 Quantifying text data

In order to compare political rhetoric across mayoral, gubernatorial, and congressional offices, we consider two distinct strategies for text representation – first, a representation based on the presence or absence of specific words/phrases (the *vocabulary*), and second, a topic-based representation. We describe each of these approaches below.

**Word/phrase vector representation** Research over the last two decades in machine learning has established that simple representations of documents in terms of either presence or absence, or adjusted frequency, of terms in a given vocabulary can be coupled with regularized linear models to produce accurate out-of-sample predictions in both classification and regression settings. For our models, we first establish the vocabulary (the set of all phrases that will be considered). This is done using standard text analytics methodology. First, we apply a pipeline of tokenization (breaking a sentence or stream of text into *tokens*, usually words, although there are many specific cases that must be dealt with – for example, apostrophes used for different purposes), stopword removal (eliminating common words like *the*, *and*, *or*), and lemmatization (combining inflected forms of the same word – for example, *going*, *go*, *went* all become *go*). We then combine the reduced representation into *bigrams* (sequences of two words that appear next to each other).<sup>8</sup> We only consider bigrams that appear in at least three different documents in the data. We use the generic term *document* to refer to a single instance depending on the unit of analysis (typically an individual’s entire set of tweets). Finally, each document is represented by the TF-IDF (*term frequency inverse document frequency*) reweighting of how many times each bigram appears (this is analogous to weighting by the number of times that bigram appears in the document divided by the number of documents in which that bigram appears at least once).

**Topic representation** Topic models are typically generative models, where the text generating process is assumed to be that each document has a particular distribution over topics, and each topic has a distribution over words (note that the language of documents and words is again generic; in our case, documents are typically aggregated Twitter feeds and words are single words as opposed to bigrams, as in the word vector representation above). A

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<sup>8</sup>This preserves some information about the relative positions between adjacent words, and has been shown to improve the performance of classification models over models that use single words only in multiple sentiment analysis tasks (Wang and Manning, 2012).

document is generated by repeatedly first sampling a topic from its topic distribution, and then sampling a word from that topic’s word distribution (note that this loses sequence information, but is consistent with the “bag of words” style of document modeling). We use latent Dirichlet allocation (LDA)<sup>9</sup> to learn topic models.

For both types of representations of our text, we use regularized logistic regression as our learning algorithm when using them for prediction; while simple, this method (sometimes called “maximum entropy”) has had tremendous success in text analytics. So, for example, we can view the machine learning problem of predicting whether a Twitter user is a mayor or Member of Congress as follows. Given a set of  $n$  instances of the form  $(\mathbf{x}_i, y_i)$ , where  $\mathbf{x}_i$  is the word vector or topic vector representation of the document, and  $y_i$  is the office label (0 for mayor and 1 for Member of Congress), return a function  $h(\mathbf{x})$ . For the classification problem, we require  $h$  to return a real number between 0 and 1 that can be interpreted as the probability of being a Member of Congress. We use L2 regularized logistic regression in this case (thus  $h$  is the maximizer of the sum of the log likelihood and an L2 penalty on the weights). Letting  $\mathbf{w}$  be the weight vector representation of  $h$ , the objective function that is maximized is then  $\ln \prod_i \Pr(y_i | \mathbf{x}_i, \mathbf{w}) - \lambda \|\mathbf{w}\|_2^2$ .

## 5 Empirical Analyses

Our main empirical strategy is to use quantifications of the text produced by different types of political actors in order to analyze how similar they are to each other in terms of their Twitter rhetoric. Our first set of analyses focuses on measuring differences between these

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<sup>9</sup>Structural topic models (Roberts et al., 2013) incorporate covariates (e.g. time or author) of the source text data in topic models. However, we are using the representation in the topic space to create a useful measure of distance. In this case we do not want to allow the model to condition on these covariates since they may contribute to the distances. Therefore we use a standard LDA model, which only uses text data for training.



actors in topic space, while the second set leverages the ease or difficulty of predicting individual membership in a particular group as a measure of how similar two groups are.

## **Topic differences: Mayors, Governors, and Members of Congress**

We begin by conducting two distinct analyses to evaluate the presence of nationalization in gubernatorial and mayoral Twitter speech. To understand the degree to which mayors engage in nationalized rhetoric, we analyze content differences between three different groups of politicians: mayors, governors, and Members of Congress. If mayors and Members of Congress post similar content, this suggests that mayoral Twitter speech is nationalized – that is, mayoral content is more addressed to issues of the United States as a whole and less specific to their constituents.

We start with a simple validity check on the plausibility of our hypotheses. We separately infer topic models using latent Dirichlet allocation (Blei, Ng and Jordan, 2003) on Members of Congress’ tweets, governors’ tweets, and mayors’ tweets and visually inspect the words associated with all topics. We list some of these for illustration in Table 1.<sup>10</sup> The columns in Table 1 denote various offices, while the rows indicate unique topics generated by our LDA model. We can see that, at least to a quick human inspection, the congressional twitter topics are more “national” than mayors’. Mayoral topics include terms such as “community, family, city, fire” and congressional topics include terms such as “bipartisan, american, economy, health.” Gubernatorial topics more closely resemble those of Members of Congress.<sup>11</sup>

### **Differences in Topic Distributions: Direct Measurement**

We now turn to a more systematic investigation of topic differences. Our first strategy is to calculate average distances between all the individuals in our dataset in topic space, and

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<sup>10</sup>Using 26 topics.

<sup>11</sup>Full word lists by topic are available in Tables 4-9 in the Appendix.

Table 1: Congress vs. Governor vs. Mayor tweet topics

	Congress	Governor	Mayor
Rep	new, economic, energy, job, impact, economy, growth, center, development, ...	thank, service, honored, honor, woman, veteran, grateful, men, ...	via, need, vote, must, plan, budget, doral, real, million, ...
	national, security, safe, stay, final, article, social, keeping, war, ...	school, student, education, high, program, college, career, training, opportunity, ...	job, bring, power, watching, april, air, stress, crime, field, ...
	tax, business, job, small, plan, american, cut, reform, family, ...	health, new, care, help, public, support, plan, provide, safety, ...	police, public, fire, officer, city, service, department, mesa, safety, ...
	president, obama, must, another, administration, trump, trade, iran, ...	business, economic, state, best, top, city, development, small, nation, ...	mayor, state, city, excited, early, election, top, official, governor, ...
	bill, passed, act, house, legislation, bipartisan, funding, help, senate, ...	speaking, trade, visiting, industry, fighting, maine, international, mission, farmer, ...	park, love, open, street, saturday, city, west, summer, neighborhood, ...
Dem	make, take, gun, sure, violence, action, check, story, share, ...	law, gun, legislation, safety, bill, north, sign, violence, ...	new, park, project, downtown, south, water, road, street, area, ...
	health, care, million, access, business, small, insurance, center, affordable, ...	governor, dayton, cooper, statement, malloy, puerto, today, session, hurricane, ...	city, night, hall, open, free, town, tomorrow, last, center, ...
	trump, president, read, policy, child, administration, statement, full, family, ...	tax, pay, order, cut, executive, plan, middle, fair, state, ...	holiday, tree, entire, law, number, keeping, judge, enforcement, ceremony, ...
	tax, cut, american, gop, family, bill, pay, middle, working, ...	job, business, economic, new, investment, program, economy, create, help, ...	school, student, congrats, high, ready, housing, getting, affordable, boston, ...
job, good, worker, change, fair, economy, climate, company, drug, ...	energy, climate, clean, change, state, step, way, future, public, ...	youth, street, opening, program, grand, fair, ty, question, city, ...	

then compare the distributions of differences between different types of individuals (where the types are mayors, governors, and Members of Congress).

Since the LDA training process is known to be unstable (Koltcov, Koltsova and Nikolenko, 2014), we first train 100 different topic models (based on different random initializations), and then represent each individual according to each of these 100 topic models. When we use the term “distance,” we mean the average of the 100 different distances computed between two individuals in this manner. The distance itself is the Jensen-Shannon divergence (Fuglede and Topsoe, 2004), a standard measure of distance between probability distributions, which

is derived by symmetrizing and smoothing the Kullback-Leibler divergence.

Another point worth noting is that we must adjust for frequency of tweeting. Training LDA models directly on all data from all individuals would bias the topics learned towards active users. There is no standard methodology yet for directly comparing documents of different lengths (Hongyu Gong and Xiong, 2018), so we employ the simple approach of randomly sub-sampling 100 tweets from each of the individuals and concatenating these 100 tweets into a single document representing each individual.<sup>12</sup>

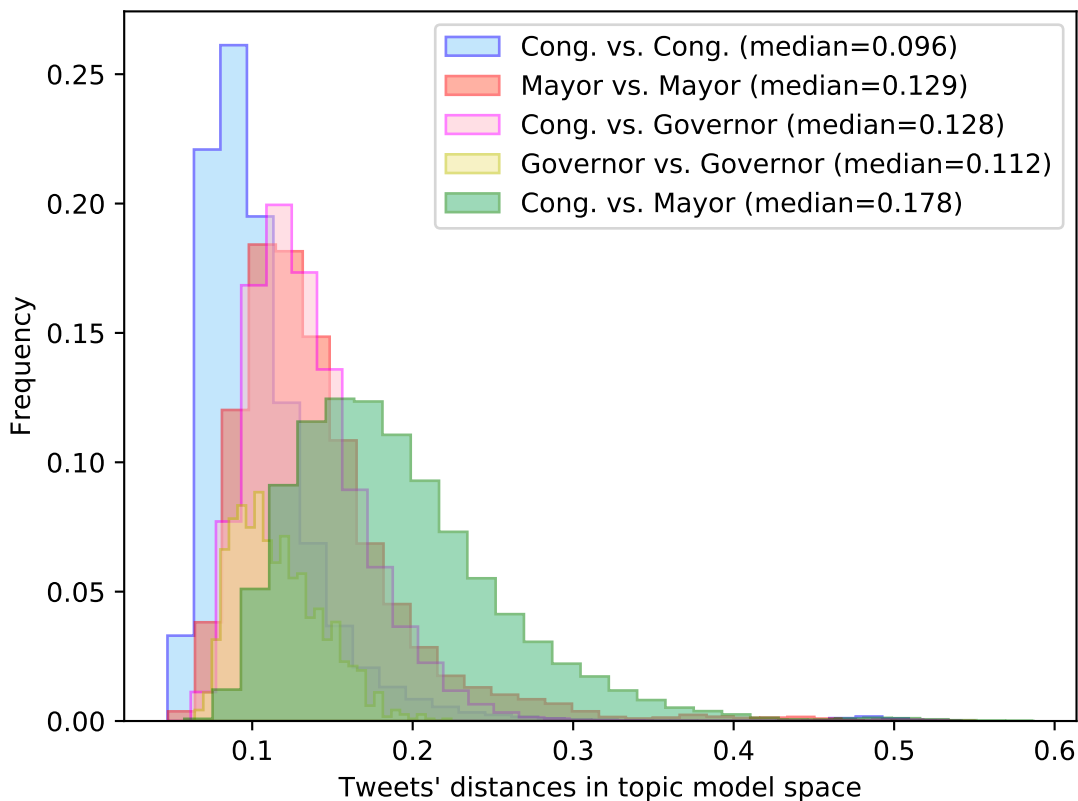


Figure 1: Histogram of topic distances.

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<sup>12</sup>An implementation note: We use the *gensim* package for LDA (Řehůřek and Sojka, 2010) with 26 topics (based on optimizing the cross-validated coherence score – see the Appendix for more details). Each model is trained for 45 epochs. All other settings are the package defaults.

The results of this analysis are presented in Figure 1. Some insights stand out immediately simply from visual inspection of the figure. First, the distributions of differences *within* each type of individual are much tighter, with smaller means and medians, than the distribution of differences between Members of Congress and mayors (in green), which exhibits a much heavier tail of high distances. Second, there is a similar phenomenon even when comparing the distribution of differences between (1) Members of Congress and governors and (2) members of Congress and mayors. The former distribution is tighter, with a lower mean and median, and much thinner tail.<sup>13</sup>

These results suggest that Members of Congress and mayors systematically focus their Twitter rhetoric on different topics. Further, the finding that the distance between governors and Members of Congress is smaller than the distance between mayors and Members of Congress indicates that governors are likely using more nationalized rhetoric than mayors. Of course, this does not mean that mayoral use of Twitter is devoid of nationalized rhetoric. Indeed, a comparison with a truly apolitical group (Premier League soccer players) shows that, as one would expect, the distance between soccer players and Members of Congress is greater still than that between mayors and Members of Congress (see the Online Appendix for details). This suggests that mayoral rhetoric does, in fact, exhibit a degree (albeit a moderate one) of nationalization – this is to be expected, as the mayoral group and the congressional group are both producing political speech.

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<sup>13</sup>Paired t-tests show that the mean of the difference in distances is significantly higher for the comparison between members of Congress and mayors than for any of the other four distributions, and two-sample Kolmogorov-Smirnov test results also indicate that the distribution of differences between members of Congress and mayors is statistically distinguishable from each of the others using 95% confidence intervals.

## Differences in Topic Distributions: Predictability of Type

The analysis above examines differences in topic distributions by directly measuring these differences. We can approach the problem in another way as well, by asking whether choice of topics to tweet about allows us to reliably distinguish mayors and Members of Congress. The simplest way to understand our test is as follows: given (anonymous) information on only the distribution of topics a Twitter user tweets about, can we distinguish whether that Twitter user is a Member of Congress or a mayor? If we can, this strengthens our case that mayors and Members of Congress use different rhetorical strategies in communicating on Twitter.

We use a machine learning pipeline for this test. We use the 100 different topic models described above to first represent each Member of Congress and each mayor in the same way as above. Thus, in each model, each individual is represented as a 26-dimensional *feature vector*  $\mathbf{x}_i$  paired with a *label*  $y_i \in \{0, 1\}$ . Each element of  $\mathbf{x}_i$  reflects the proportion of their Twitter language assigned by the model to that specific topic.  $y_i$  is 0 if individual  $i$  is a mayor and 1 if a Member of Congress. For each of the 100 topic models, we run 5-fold cross-validation to perform out-of-sample classification of each individual. Cross-validation operates by randomly permuting the data, separating it into  $k$  (in our case  $k = 5$ ) “folds” and then repeatedly training a classification model  $f : \mathbf{X} \rightarrow [0, 1]$  on  $k - 1$  of the folds and then scoring the examples in the remaining fold using  $f$ . In our case, we simply use logistic regression to learn  $f$  from the 4 folds each time.

We measure the performance of the classifier using the area under the ROC curve (AUC). This is a commonly used measure that can be applied to classifiers that produce ordered scores of any kind (rather than just binary or categorical predictions), preferable to accuracy because it accounts better for imbalanced datasets. The AUC can be interpreted as the probability that a positive ( $y_i = 1$ ) example chosen uniformly at random from the positive population will be scored higher by  $f$  than a negative ( $y_i = 0$ ) example chosen uniformly at

random from the negative population. If 90% of examples are positive, an accuracy of 90% is misleadingly high, since it can be achieved by always guessing positive, but an AUC score of 0.9 demonstrates good performance.<sup>14</sup>

We find that the average area under the ROC curve (AUC) over the 100 different topic models is  $0.9849 \pm 0.0004$ . This is stunningly high. It shows that mayors can be *very easily distinguished* (out-of-sample) from Members of Congress simply by comparing topic distributions. It further demonstrates the gap between mayoral and congressional rhetoric on Twitter.

## Variation in Nationalized Mayoral Rhetoric

### Measuring Similarity to Congressional Speech: The CS Score

While the preceding analyses suggest that gubernatorial rhetoric closely matches that of Members of Congress, mayors appear to be using a different rhetorical style. However, these results do not indicate that *all* mayors are similarly focused on local issues. In fact, it is possible that some mayors use language more similar to congressional and gubernatorial rhetoric than others. Examining the sources of variation in nationalized mayoral rhetoric is the task to which we now turn.

We start by using the insights from the predictability of type (mayor or Member of Congress) to define a precise measure of nationalized rhetoric, as expressed by mayors. We call this measure the **Congressional Similarity (CS) Score**. We again use the machine learning task of learning a classifier to distinguish between Members of Congress and mayors. Our intuition behind this process is that mayors who score closer to Members of Congress are more similar to them, and therefore are more likely to be nationalized in their use of rhetoric.

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<sup>14</sup>We apply DeLong’s method to compute the standard deviation of the AUC (DeLong, DeLong and Clarke-Pearson, 1988).

After training an LDA model and representing each mayor and Member of Congress in the topic space, for each mayor  $i$  we train a logistic regression classifier based on the documents corresponding to all other mayors (labeled as 0) and Members of Congress (labeled as 1). We then predict the probability that mayor  $i$  is a Member of Congress using this leave-one-out model (importantly, the mayor is not in the training set used to build the logistic scoring function), and consider that prediction the CS score.<sup>15</sup>

### **Association between congressional similarity and covariates**

To begin to understand the sources of variation in nationalized mayoral rhetoric, we looked for associations between covariates collected about mayors, their city’s institutions, and the constituents they represent and the degree of nationalized mayoral rhetoric. As our metric of mayoral nationalization, we use our measure of similarity to Congressional rhetoric, the CS score defined above. The greater the CS score, the more similar the mayor’s rhetoric is to the more nationalized political speech of Members of Congress.

To examine the sources of heterogeneity in mayoral rhetoric, we regress the CS score on indicator variables for institutions (city manager, mayor-council system, etc.), the total number of years the mayor has served in office, the city population (re-scaled in units of 100,000), and the vote share won by the mayor in the previous election.<sup>16</sup> We present models with and without additional covariates – we can also control (among other things) for mayoral race, gender, and party – in Table 2. We also control for city-level partisanship in

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<sup>15</sup>The following mayoral Twitter IDs have topic distributions most similar to Members of Congress: may-orcorymason, patownhall, joshfryday, mayorcooper, and edsachs. Those who are most different include: mayorlozanobp, atchison4mayor, mayormcleod, bethlehemmayor, ananforoakpark.

<sup>16</sup>In cases where a city’s mayor is appointed to the position by the city council, we treat the mayor’s vote share in the previous election as the percentage of the vote they received in their most recent election to the city council.

two different ways. In one operationalization, city partisanship is captured by the city-level percentage of the Democratic presidential vote in 2016. In the second measure, we calculate the absolute value of the difference of this measure from 50. Higher values on this measure indicate a city that is highly Democratic or Republican. Thus, while the former measure captures the raw city-level partisanship, the second measure captures city-level partisan extremity. We also present results from models that contain additional city-level covariates. In one specification, we include the mean age of the city’s residents, the percentage of the city that is male, the percentage of the city that is White, and the percentage of the city that is Black. In a final specification, we add the percentage of residents who own their home – a measure of social capital – to the aforementioned variables. Though the empirical strategy we use here does not allow us to make any causal claims, the relationships we show nevertheless help us better understand the sources of variation in nationalized mayoral rhetoric.

As shown in Table 2, we find that the number of years a mayor has served in office is negatively associated with nationalized rhetoric. This suggests that longer-serving mayors are more focused on their citizens’ local needs than their counterparts who have less experience in office. Additionally, we find a positive relationship between our city population variable and nationalized rhetoric. This indicates that, as a city’s population increases, mayoral speech more closely mirrors that of a congressional representative. This lends support to our theoretical expectation that, because citizens of larger cities are less likely to experience any form of personal contact with their mayor, mayors can adopt a more nationalized representational style. Because this relationship persists even when we control for city-level sociodemographic factors, this finding is likely driven by something that is inherently different about larger cities and *not* by some factor that happens to correlate with cities with a large population. Finally, we find no statistically significant relationship between operating under a council-manager system and nationalized rhetoric (with the exception of one model



specification), and only slight evidence of a relationship between employing a city manager and nationalized rhetoric. The coefficient for employing a city manager is only significant in four out of the seven model specifications and, when it is statistically significant, it is only at the  $p < .1$  level.

Similarly, we find no statistically significant relationship between city-level partisanship and nationalized mayoral rhetoric in all but one model specification. For the most part, it appears as if neither the city’s Democratic presidential vote share in 2016 nor its partisan extremity are associated with a greater amount of nationalized mayoral speech. However, recall from Section 2 that part of our theoretical expectation is that mayors who govern over a city that is not in line with their own partisan leaning will use less nationalized rhetoric than those whose partisan affiliation matches the partisan leaning of their city. To examine whether this is the case, we re-estimated the model shown in Table 2, Column 7, but included a dummy variable indicating whether or not a mayor is “misaligned.” This variable takes on a value of one if the mayor is a Republican (Democrat) governing a city that gave more (less) than 50% of its vote share to Hillary Clinton in 2016 and a zero otherwise. In no case does this variable reach any conventional level of statistical significance. Moreover, we find no partisan differences in terms of mayoral misalignment and the use of nationalized rhetoric. These abridged results are shown in Table 3; the full table can be found in the Online Appendix.<sup>17</sup>

While the results presented above should be interpreted with caution, as we are limited to a small set of mayors, it is encouraging that we observe similar results regardless of the model specification. Among the set of variables measuring mayoral demographics, only gender and partisanship are meaningful predictors of using rhetoric that is similar to Members of

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<sup>17</sup>Because our measure of misalignment is constructed using a city’s Democratic vote share, we do not condition on city partisanship in these models. However, the results do not change upon the inclusion of either of our two measures of city partisanship.

Congressional Similarity

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Years in office	-0.003** (0.001)	-0.003*** (0.001)	-0.003*** (0.001)	-0.003*** (0.001)	-0.003*** (0.001)	-0.003*** (0.001)	-0.003*** (0.001)
City population	0.008*** (0.002)	0.006*** (0.002)	0.007*** (0.002)	0.005*** (0.002)	0.006*** (0.002)	0.005** (0.002)	0.005*** (0.002)
Previous vote share	-0.0002 (0.0003)	-0.0002 (0.0002)	-0.0002 (0.0002)	-0.0003 (0.0003)	-0.0003 (0.0003)	-0.0003 (0.0003)	-0.0003 (0.0003)
Council-Manager System	-0.035* (0.019)	-0.028 (0.019)	-0.029 (0.019)	-0.031 (0.019)	-0.031 (0.019)	-0.030 (0.019)	-0.030 (0.019)
City Manager	0.025 (0.019)	0.026 (0.019)	0.028 (0.019)	0.032* (0.019)	0.032* (0.019)	0.032* (0.019)	0.033* (0.019)
White		0.007 (0.013)	0.005 (0.013)	0.019 (0.014)	0.018 (0.014)	0.018 (0.014)	0.017 (0.014)
Male		0.034*** (0.012)	0.035*** (0.012)	0.034*** (0.012)	0.034*** (0.012)	0.033*** (0.012)	0.033*** (0.012)
Republican		-0.023** (0.011)	-0.029*** (0.011)	-0.021* (0.012)	-0.027** (0.011)	-0.018 (0.012)	-0.023* (0.012)
City Partisanship							
Democratic Pres. Share, 2016		0.001 (0.0004)		0.001* (0.0004)	0.001 (0.001)	0.001 (0.0004)	0.001 (0.001)
Pres. Share Extremity			0.001 (0.001)	0.001 (0.001)	0.001 (0.001)		0.001 (0.001)
Mean Age (city)				-0.002 (0.001)	-0.001 (0.001)	-0.001 (0.001)	-0.001 (0.001)
Pct. Male (city)				-0.0004 (0.004)	-0.0004 (0.004)	-0.001 (0.004)	-0.001 (0.004)
Pct. White (city)				-0.00002 (0.0005)	-0.0003 (0.0004)	-0.00001 (0.0005)	-0.0002 (0.0004)
Pct. Black (city)				0.001 (0.0005)	0.0003 (0.0005)	0.001 (0.0005)	0.0003 (0.0005)
Pct. Own home (city)						-0.0003 (0.0005)	-0.0004 (0.0005)
Constant	0.270*** (0.019)	0.219*** (0.031)	0.247*** (0.022)	0.285 (0.207)	0.319 (0.207)	0.302 (0.209)	0.337 (0.208)
N	359	358	358	354	354	354	354
R <sup>2</sup>	0.082	0.123	0.120	0.142	0.138	0.143	0.139

\*p < .1; \*\*p < .05; \*\*\*p < .01

Table 2: Coefficients for Congressional Similarity

	Congressional Similarity		
	(1)	(2)	(3)
Misaligned Mayor	-0.001 (0.011)	0.002 (0.011)	0.0004 (0.015)
Republican		-0.024* (0.012)	-0.025 (0.016)
Misaligned Mayor X Republican			0.002 (0.023)
Constant	0.339 (0.209)	0.342 (0.208)	0.341 (0.209)
Controls?	✓	✓	✓
N	354	354	354
R <sup>2</sup>	0.127	0.137	0.137

\*p < .1; \*\*p < .05; \*\*\*p < .01

Table 3: Misaligned Mayors and Nationalized Rhetoric

Congress. Though there are many potential reasons why these variables are associated with nationalized mayoral rhetoric, two possibilities seem likely. First, there are noted gender differences when it comes to the decision to run for political office. While women tend to run for office out of a desire to work on fixing problems, men appear to be more motivated by the pursuit of power (Schneider et al., 2015). This pursuit of power and of higher office could be driving men’s use of great nationalized rhetoric vis-à-vis women. That Republican mayors tend to use less nationalized rhetoric than others is likely due to the nature of Republican political thought. Indeed, because Republicanism tends to prioritize state and local control over a strong national government, Republican mayors are more likely to focus on the needs and issues facing their local communities. However, we stress that these are merely potential reasons for the relationship between gender, partisanship, and nationalized mayoral rhetoric. Moreover, we are cautious about over-interpreting the meaning behind these associations as we did not have an *ex ante* theoretical reason to expect that a mayor’s gender of partisan affiliation would alter their level of nationalized rhetoric. More precisely determining the

theoretical linkages between these variables is something that we leave for future research.

## Nationalization and Partisanship

Given the amount of evidence suggesting increases in both partisanship and polarization in American politics, one might wonder whether our preceding examination of nationalized rhetoric is simply capturing an aspect of shared partisanship across officeholders throughout the federal system. To determine whether this is the case, we ran two separate analyses. First, we trained a linear regression model on the Twitter records of Members of Congress, with the target being the first dimension of their DW-Nominate score. We then used this model to estimate mayors' partisanship. The AUC obtained when predicting mayoral partisanship is  $0.7788 \pm 0.0251$ . In comparison, the AUC obtained when predicting congressional partisanship is much higher –  $0.9938 \pm 0.0027$ , indicating an almost perfect predictor. This suggests that it is more difficult to detect partisan cues in the rhetoric of local issues, compared with the rhetoric surrounding national issues.

Our second analysis pertains to the association between nationalization and the partisan nature of mayoral rhetoric. To examine the relationship between mayoral partisan and nationalized rhetoric, we first define a mayoral partisanship (MP) score analogous to the CS score used in our earlier analyses. We then train a single regression model of partisanship solely on the tweet documents of each Member of Congress, with the first dimension of their DW-Nominate score as the regression target. We apply the coefficients from this model to each mayor  $i$  to arrive at a measure of partisanship,  $m_i$ . Finally, since  $m_i$  is signed based on ideology, we de-mean it based on the actual partisanship of the mayor. Thus, our measure is:

$$\text{pm}_i = |m_i - \text{median}(m_k)|$$

where the index  $k$  is over the co-partisan mayors of  $i$ . We call  $\text{pm}_i$  the MP score.

Regressing MP scores against CS scores (shown in Figure 4 in the Online Appendix) shows that there is a correlation between using rhetoric that mirrors that used by Members of Congress and a mayor’s partisanship “level” – measured by the ease of predicting, based on tweets, whether a mayor belongs to the Republican or Democratic Party. However, it is also clear that neither fully explains the other. Accordingly, the “locality” of mayoral speech does not appear to be solely a function of staying away from major national partisan debates. Nationalization and partisan polarization are distinct phenomena.

## 6 Conclusion & Discussion

Among the deleterious consequences of the nationalization of American politics is the concern that elites’ focus on national issues comes at the expense of attending to more pressing, locally-based problems. The results we have presented suggest that, while there is variation, mayors have largely remained focused on local issues and use less nationalized speech than governors and Members of Congress. The degree to which citizens’ preferences and needs are represented by their elected officials is an important barometer of the health of a democratic society. In the case of the United States, which has experienced a considerable amount of political nationalization over the past few decades (Hopkins, 2018), this metric has trended in a negative direction at the federal and gubernatorial levels. However, our analyses suggest that there is room for optimism about the vibrancy of representation provided by mayors. Unlike elected officials at other levels of government, the average American mayor currently appears to be unaffected by the nationalization of American politics. On the contrary, mayoral rhetoric tends to remain focused on the needs and concerns of the local citizenry. This finding persists even when controlling for a multitude of mayoral- and city-level covariates.

However, our results also suggest that mayors do not uniformly focus on local issues. Nationalized mayoral rhetoric is more likely to occur among mayors who govern cities with a

large population. Such a finding likely arises because a large municipal population diminishes the likelihood that any citizen has a personal experience or point of contact with his or her mayor. As a result, mayors are freer to engage in national rhetoric and abjure local issues. Though plausible, such an explanation is only one potential reason that we observe a relationship between city size and nationalized mayoral rhetoric. Future work should more thoroughly examine the mechanism linking a city's population to mayoral representational style.

One final concern pertains to the durability of these results. The nationalization of American elections did not suddenly develop and alter congressional and gubernatorial behavior. In reality, the nationalization of American elections has been a secular process that has resulted from the complex interplay of ideological realignment, partisan sorting, and a changing media environment. Whether these trends in nationalization will eventually affect mayors, or whether Americans' most immediate chief executives will remain focused on their local mandate, is a question that can only be answered in time.

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