

News Sharing on Social Media: Mapping the Ideology of News Media, Politicians, and the Mass Public

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This article examines the information sharing behavior of US politicians and the mass public by mapping the ideological sharing space of political news on social media. As data, we use the near-universal currency of online information exchange: web links. We introduce a methodological approach and statistical software to unify the measurement of ideology on social media platforms by using sharing data to jointly estimate the ideology of news media organizations, politicians, and the mass public. Empirically, we investigate the electoral incentives that members of Congress have to share ideologically polarizing information online. We show that the more competitive an election is, the less likely politicians are to share ideologically polarizing information. This finding has important implications for our understanding of the role of election pressures as constraints on sharing behavior in our highly polarized information ecosystem.

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1 Introduction

Political information is increasingly consumed online. In the US, a majority of voting age citizens under the age of fifty report frequently consuming political news through online sources (Shearer, 2019). The salience and importance of online news consumption and sharing are large, with much debate about online political behavior centering around the ideological orientation of such information. Politicians have, for instance, expressed concern about the consumption of news media content that does not challenge the public’s ideological viewpoints (echo chambers) (e.g. BBC News, 2017); the skewing of ideological content by social media and search algorithms (filter bubbles) (e.g. Kang et al., 2018); and the suppression of political commentary by social media companies based on its ideological leanings (e.g. Herrman and Isaac, 2016).

Yet researchers currently lack a unified statistical framework and software to measure and assess the ideological leanings of news media and commentary shared on social media platforms and that of those who share it. As a result, it can be challenging to understand the ideological underpinnings of the news and commentary that politicians and the mass public share, or to map the ideological structure of the online news media environment. This article aims to remedy this by introducing a statistical measurement model and software that unifies measurement strategies across social media platforms by using as data, web links (URLs), the fundamental building blocks of online information sharing. The model allows us to calculate common-scale estimates of three important quantities of interest: (1) the ideology of politicians, (2) the ideology of ordinary users, and (3) the ideology of the news media and commentary that they share.

To do so, we build on seminal work in the field that seeks to measure ideology through news sharing or social media data (e.g. Gentzkow and Shapiro, 2011; Barberá et al., 2015; Bond and Messing, 2015; Bakshy, Messing and Adamic, 2015) by introducing an approach that provides a number of key advantages. First, unlike a number of past approaches, the measurement strategy is agnostic to social media platform. Because links to news media

and commentary are widely shared across social media platforms, our approach can be applied to data from any current or future social media platform that allows link-sharing (e.g. Facebook, Twitter/X, Threads, Reddit). Second, our approach does not require labeled data, e.g. partisan or ideological labels of news media outlets or the users who share information. Third, our approach enables examination of the ideology of politicians based on their online *behavior* on social media, and thus in a space freer from the constraints imposed by legislative agendas that may be out of politicians’ control or by the machinery of party discipline that can influence roll-call voting. Fourth, the approach allows researchers to capture the extent that users and politicians share ideologically diverse or narrow information, with implications for studying behaviors that might promote or discourage polarization or echo chambers. Finally, our approach permits researchers to estimate the ideology of little-known political candidates who have no previous voting records (the typical data used to estimate the ideology of legislators).

Substantively, we document four important facts about sharing of political information in the US. First, we demonstrate that politically interested citizens—not politicians—share the majority of ideologically polarized political news and commentary online. Second, we show that news content shared by politicians is an exceptionally strong signal of political ideology and partisanship: knowing the news that politicians share nearly perfectly separates politicians by party in the US. Third, we show that there are strong within-party differences in the sharing of ideologically polarized information: politicians from within the Democratic and Republican parties who are on the ideological extremes (1) share much more information in general than their more moderate peers, and (2) share more ideologically extreme news and commentary. Collectively, this results in an over-representation of polarizing information from politicians on social media. Finally, we show that polarized information sharing is empirically linked to electoral incentives: politicians in districts that are not electorally competitive are more likely to share polarizing news and commentary, and more likely to share news and commentary overall. In other words, the constraints that govern electoral

competition in the US are associated with a less polarized political information environment.

2 Unifying the study of social media and news media ideology

Few methodological research programs have been more important for testing theories of political behavior than those seeking to measure and understand the ideology of political actors and its consequences. The measurement of ideology on social media has focused primarily on politicians and users.¹

In the political science literature, two well-known and related measurement techniques use the behavior of social media users to measure the ideology of users and political actors (Barberá, 2015a; Bond and Messing, 2015). Data used in these works are roughly analogous: Barberá (2015a) uses data that capture the political actors that ordinary users ‘follow’ on Twitter, and Bond and Messing (2015) use data that capture which political actors ordinary users ‘endorse’ on Facebook. Models developed for these data rely on a homophily assumption: that social media users are more likely to follow or endorse political actors who they perceive as close to themselves ideologically. As Bond and Messing (2015) and Barberá (2015a) show, spatial models of ideology that rely on this assumption work very well in practice. These approaches to understanding the ideological ecosystem on social media have spurred a wealth of important applied research concerning a wide range of online political behaviors (e.g. Bail et al., 2018; Pennycook et al., 2021).

Strategies for estimating the ideology of news media have a longer pedigree (Groeling, 2013). These include, for example, measurement models using news editorial agreement with Supreme court justices on individual cases (Ho and Quinn, 2008); using ideological labels from one domain (e.g. voting records) to estimate the ideology with supervising learning methods in another (e.g. Martin and Yurukoglu, 2017; Gentzkow and Shapiro, 2010); crowd-sourcing perceptions of news media ideology (e.g. Budak, Goel and Rao, 2016); using the

¹Sharing behavior in specific empirical applications has been examined by, for example, Golovchenko et al. (2020), Aruguete, Calvo and Ventura (2023), and Green et al. (2021).

proportions of self-reported liberals or conservatives sharing stories from a given news site (Gentzkow and Shapiro, 2011; Bakshy, Messing and Adamic, 2015); and measuring the screen time of political actors on television news media (Kim, Lelkes and McCrain, 2022).

Here, we seek to unify approaches to measuring the ideology of social media users, politicians, and news media by using sharing of web links, the near-universal currency of social media information exchange. Using these data has a number of theoretical, empirical, and practical benefits. First, web links are ubiquitous across social media platforms. This allows for a platform-agnostic measure of ideology, enabling calculation of common-scale estimates within and across platforms, and obviating the need for idiosyncratic approaches to any specific platform.

Second, sharing of web links on social media is central to communication among and between politicians and the public, and has been used, for example, by foreign actors to interfere in democratic elections. Information sharing is thus an important area of substantive interest for understanding day-to-day political discourse and other areas, such as in international relations.

Third, ideology as estimated from sharing data is a *behavioral* measure of ideology for both users and politicians. Previous approaches, by comparison, have primarily examined political ideology indirectly, relying on social media users' perceptions of politicians, such as through users' following or endorsement choices. These measures are important in their own right: user perceptions are critical to understanding behavior online. Data from politicians' sharing behavior, however, provide an important avenue for investigating the communication strategies of campaigns and constituent-politician interactions. A related practical benefit (shown empirically below) is that we can precisely estimate the ideology of politicians using only their own social media behaviors, thus avoiding data collection from, for instance, the millions of the users who may interact with them.

Fourth, the relatively high frequency of link sharing by politicians facilitates investigation into changes in behavior and ideology across time, an important but challenging area

of research. It allows, for example, inquiry into whether social media leads to political polarization among individuals over time or whether the ideology of sharing behavior changes closer to elections or in response to high-profile events.

Finally, using sharing behavior of news media allows us to map the structure of news media ideology based on how news media are used in practice. This behavioral approach is similar to that of, among others, [Gentzkow and Shapiro \(2011\)](#), [Bakshy, Messing and Adamic \(2015\)](#) and [Messing, van Kessel and Hughes \(2017\)](#), who estimate news media ideology by using sharing or viewing behavior by users with a known, i.e. labeled, partisanship or ideology. The model present below, however, does not require existing measures of partisanship or ideology in another domain, such as voting behavior in Congress or ideological self-reports. As detailed in the following section, we can map a common-scale ideological space for users, politicians, and news media based on sharing behavioral data alone.

3 Data and statistical model

Data. As noted above, the approach we introduce can be applied to any social media platform on which users share political web links. For validation and analysis, however, we use data from Twitter. Our reasons are fourfold. First, the vast majority of US members of Congress have Twitter accounts (99%) and share news media as part of their daily political communications. This allows us to validate model estimates to those from roll-call voting data. Second, and more pragmatically, Twitter provided relatively straightforward access to these data from politicians and ordinary users. Third, although Twitter is lesser used than other large platforms, citizens are more likely to report regularly consuming news from it than any of other social media platform ([Pew Research Center, 2022](#)), and it remains a major platform for consuming timely information from citizens’ political representatives. Lastly, the most widely applied method in political science research for the measurement of ideology on social media was developed for Twitter data ([Barberá, 2015a](#)). Using Twitter

data thus allows us to compare our results to those from other approaches.

To collect our data, we manually searched, inspected, and compiled a list of the Twitter accounts of US members of the 116th Congress;² state governors; members of the executive and cabinet; and accounts associated with prominent unelected members of the Democratic and Republican parties. This resulted in 1,134 accounts from 687 political actors. Some politicians maintain multiple Twitter accounts (e.g. @TedCruz, @RepTedCruz), which may vary, for instance, in the extent that each is used by politicians themselves and their communications staff. Because formal differences between accounts is unknown, and we assume that staffers post in ways consistent with the politicians whom they represent, we combine data from any politician who maintains multiple accounts. We then define the set of national news media organizations online as all sites that provide news or commentary about US national politics. This includes sites from television media (e.g. [cnn.com](#); [foxnews.com](#)), traditional print journalism (e.g. [nytimes.com](#); [wsj.com](#)), and commentary (e.g. [nationalreview.com](#); [newrepublic.com](#)). In total, the list of national media organizations contains 221 web domains (see Appendix D).³

To compare the sharing behavior of politicians to that of citizens, we collect data from a sample of politically engaged ordinary users on Twitter. We follow the procedure used by Barberá (2015a), who defines the population of minimally politically engaged users as those who follow a researcher-defined number of politicians. We define our population of interest as users geo-located to the US who follow one or more politicians; who have sent at least 100 tweets; and have at least 25 followers. For validation and analysis, we take a random sample of 10,000 users from this population. We note that compared to the general Twitter population, the resulting sample will be users who are more interested in politics than others. They thus may be more ideologically extreme than other users (Barberá and

²Tweets included are any post available from each politician’s timeline from the end of the 116th Congress (January 3, 2021) back to 2015.

³The list was collected manually by examining lists of news media sites on websites providing such listings; by examining web links shared by politicians; and by traversing recommended news media accounts as recommended by Twitter. The list is unlikely to be exhaustive, but should contain the vast majority of meaningful political news websites.

	thenation.com	huffingtonpost.com	washingtonpost.com	wsj.com	foxnews.com	breitbart.com	...
Ted Cruz (R)	0	1	156	204	464	195	...
Mitch McConnell (R)	0	2	67	53	37	0	...
Susan Collins (R)	0	1	8	4	0	0	...
Joe Manchin (D)	0	4	13	2	3	0	...
Alexandria Ocasio-Cortez (D)	27	6	65	5	2	0	...
Bernie Sanders (I)	71	110	373	40	1	0	...
⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮

Table 1: Example of social media user-news media domain count matrix. This table shows the number of news stories shared by six well-known members of Congress from six news media organizations across the ideological spectrum.

Rivero, 2015); may be less willing to compromise on issues (Smith et al., 2020); and because they will be more politically interested in general, will likely share more political news than other users.

We collect all tweets made available by Twitter from each political actor and politically engaged Twitter user. We then extract all web links from each tweet and expand any shortened links. Among all links included in tweets by political actors, 25% are links to national news sites, and among the sample of politically engaged users, 13% are national news links.⁴ For analysis, we exclude links included in the quoted portion of ‘quote tweets’ (18% of URLs from politicians; 26% from users). Quote tweets are those in which a user cites another tweet to comment on it, and are often used to criticize or satirize its content. In total, 73% of users tweeted at least one link to a national news story.

We present in Figure 1 the fifty most tweeted of these national political news domains as a proportion of all such domains. As the figure shows, the most frequently shared links are to well-known traditional print news (e.g. New York Times, Washington Post, Wall Street Journal), and the major television media organizations (e.g. CNN, FOX News, NBC, ABC). By contrast, only a few periodicals dedicated to political commentary (e.g. The New Yorker, The Weekly Standard) find themselves among the most frequently shared domains.

To aggregate these data, for all users $i = 1, \dots, N$ and media domains $m = 1, \dots, M$, we generate an $N \times M$ count matrix whereby each cell represents the number of times that a user i tweeted a story from media organization m . By example, Table 1 presents a sub-

⁴Tweets by political actors contain 0.4 news links on average; those by politically interested users, 24%.

A. US Members of Congress



B. Ordinary users



Figure 1: The 50 most tweeted national news media domains as a percentage of all news domains shared.

matrix of data from six well-known Republicans and Democrats and five news sites. As these data show clearly, Republican politicians are more likely to tweet links to media stories right of center (foxnews.com; breitbart.com) than they are those left of center (thenation.com; huffingtonpost.com), and vice versa for Democrats. In terms of the frequency of sharing news, in Figure 2 we show that politicians share news media frequently, and tweets by politicians are more likely to include a link to a news media story compared to politically engaged Twitter users. Member of Congress share, on average 0.08 news links per tweet, whereas users share roughly 0.04 news links per tweet.

Statistical model. Here, we develop a measurement model to estimate the ideology of (1) news media shared by politicians and users, and (2) the ideology of those users and

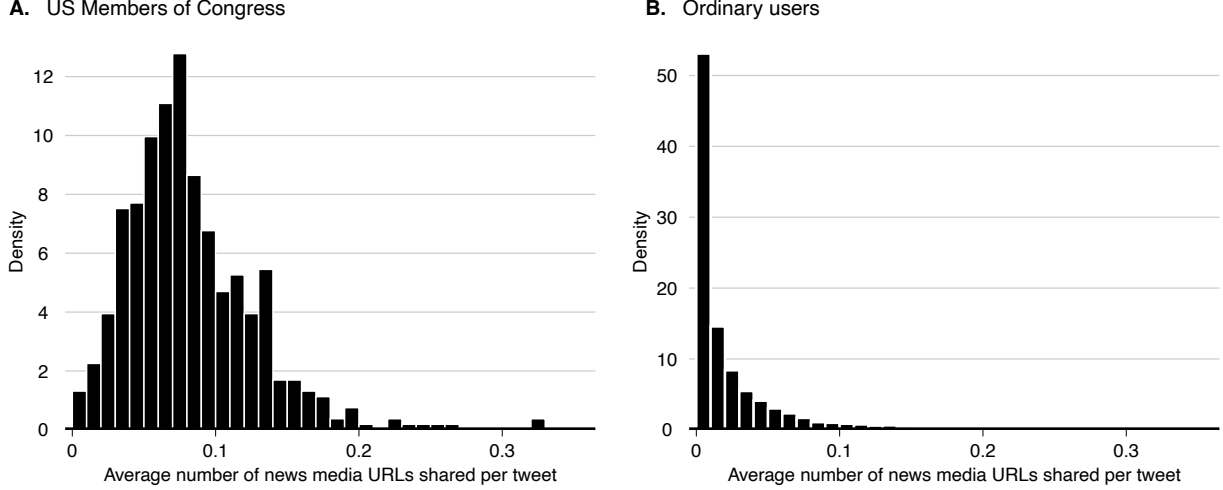


Figure 2: Histograms of the mean number of news media stories (per tweet) shared by members of Congress and politically interested users on Twitter.

politicians themselves. Consistent with the data described above, let y_{img} denote the count of the media site $m = 1, \dots, M$ shared by a user or politician $i = 1, \dots, N$ who is affiliated with the group $g \in \{D, R, U\}$ (Democrat politicians, Republican politicians, ordinary users). Concretely, y_{img} denotes the value of a single cell in [Table 1](#), where the columns represent the media organizations m , and rows the users/actors i affiliated with group g .⁵

We model these data by using two latent variables as the primary quantities of interest. The first, θ_{ig} , denotes the ideology of user i (affiliated with group g); the second, ζ_m , the ideology of media site m . As shorthand, we refer to both sets parameters as *media scores*, making clear by context whether we are referring to the ideology of individual users or news media. We model the data, y_{img} , as arising from a negative binomial (count) distribution:

$$y_{img} \sim \text{NegBin}(\pi_{img}, \omega_m) \quad (1)$$

$$\pi_{img} = \exp(\alpha_i + \gamma_m - \|\theta_i - \zeta_m\|^2), \quad (2)$$

where α_i denotes a user-specific intercept, γ_m denotes a domain-specific intercept, and ω_m

⁵In principle, researchers can disaggregate data from each news organization at the news article level to estimate ideology at the article-level. The scale of data required for this, however, is substantial (e.g. [González-Bailón et al., 2023](#)), and thus beyond the empirical scope of this paper.

denotes a news site dispersion parameter. Concretely, α_i represents the relative extent that a given user shares news in general, and γ_m represents the relative extent to which a given news media domain is shared (i.e., its popularity).

The term containing our quantities of interest, $-||\theta_i - \zeta_m||^2$, captures the notion that the larger the distance between the ideology of a given user (θ_i) and a given news media organization (ζ_m), the less likely that user is to share links to its content. The substantive meaning of the parameters, θ and ζ , are thus assumed to represent the political ideology of those sharing news links.

We note that this ideological component of news-sharing will stem from a variety of decisions regarding the specific news articles that politicians and users share, and thus be the result of a mix of strategic, personal, and idiosyncratic reasons. As we show in one of the empirical application below, for example, politicians may have electoral incentives to share more ideologically moderate or extreme news content. Politicians may also share news content, for example, to attract political attention; because it positively highlights their own political behaviors; to make public their positions on issues; to highlight criticisms of another party; or to shape public opinion. Ordinary users may also share more ideologically moderate or extreme content for reasons related to affective polarization (e.g, hyper-partisan news that undermines or humiliates out-partisans); to gain positive feedback from other users; or to share breaking news. Finally, we also note that people select into the news that they read and that which they are exposed on social media as a result of whom they follow/friend and because of algorithmic filtering. The homophily assumption (as it is in related measurement models for political behavioral data) thus means in practice that much of the variation in these behaviors is assumed to be related to the ideological proximity of the user to the news content that they share.

Lastly, ω_m represents the extent that sharing a news media site is predictable based on the difference between the ideology of the user and a news site. This allows for the fact that sharing news from some media organizations will be stronger ideological signals

(e.g. explicitly partisan sites) than others (e.g. broadly consumed mainstream media) (see Appendix C).

We estimate the parameters of this measurement model in a Bayesian framework, placing priors on each group of parameters, and setting constraints as necessary for model identification. In particular, the user- and domain-specific intercepts are each given common distributions, $\alpha_i \sim \text{Normal}(\mu_\alpha, \sigma_\alpha)$ and $\gamma_i \sim \text{Normal}(0, \sigma_\gamma)$ respectively. We use group-level information about users, $g \in \{D, R, U\}$ (Democratic politicians, Republican politicians, ordinary users), by placing separate common prior distributions on the parameters denoting the ideology, θ_{ig} , of politicians who are members of the Democratic and Republican parties, $\theta_{iD} \sim \text{Normal}(\mu_\theta^{(D)}, \sigma_\theta^{(D)})$ and $\theta_{iR} \sim \text{Normal}(\mu_\theta^{(R)}, \sigma_\theta^{(R)})$ respectively.⁶ For identification, the prior distribution for the ideology of ordinary users is set as $\theta_{iU} \sim \text{Normal}(0, 1)$.⁷ The parameters denoting the ideology of media organizations, are given weakly informative prior distribution, $\zeta_m \sim \text{Normal}(0, 5)$. Finally, the dispersion parameters, ω_i , are given a common distribution $\omega_i \sim \text{InvGamma}(\omega_a, \omega_b)$.⁸

To identify the model, we need to address the problem of reflection invariance, which refers to the fact that the likelihood is invariant to multiplication of the parameters θ_{ig} and ζ_m by -1. We need, in other words, to fix the direction of the scale such that higher values of θ_{ig} and ζ_m indicate either liberal or conservative. There are a number of ways to achieve identification. Here, we follow [Jackman’s \(2001\)](#) practical solution of allowing the sampler to freely explore the posterior and settle in on one of the two scale directions. We then flip the scale after estimation (if required) such that low values of θ_{ig} indicate liberal, and high values, conservative.⁹ We implement this model as a statistical library for use by researchers in the statistical software R, and parallelize the sampler to greatly increase efficiency.

⁶Uniform prior distributions are placed on the hyperparameters $\mu_\theta^{(\cdot)}$ and $\sigma_\theta^{(\cdot)}$.

⁷Setting the prior $\theta_{iU} \sim \text{Normal}(0, 1)$ resolves the problem of additive aliasing caused by the fact that the likelihood is invariant to adding a constant to the parameters θ_{ig} and ζ_m .

⁸The hyperparameters ω_a and ω_b are given uniform priors, $\text{Uniform}(0, \infty)$.

⁹We run 6 chains per model, assessing convergence with \hat{R} statistics ([Gelman et al., 2014](#)).

4 Validation

We validate the model by examining the extent that members of Congress’s roll-call voting ideology (i.e. NOMINATE score) aligns with their media score as estimated from the news-sharing model, i.e. a test of convergent validity. Because our measure derives from politicians’ behavior, this substantively tests whether politicians whose voting behavior is ideologically extreme behave on social media in ways that broadcast more polarizing political information.

To test this, we fit our model using sharing data from only the political actors in our dataset: members of Congress, state governors, members of the executive, and actors linked to each party (e.g. party chairpersons, former presidents). We begin by showing in [Figure 3](#) histograms of the estimated ideology of members of Congress, by party, in the Senate and House separately. As the figure shows, politicians’ news-sharing behavior cleanly separates politicians from each party. In fact, no Republican (Democratic) members of Congress are estimated to be to the left (right) of their colleagues in the other party. However, because our model as specified in [Equation 1](#) and [2](#) uses separate hierarchical priors for Republican and Democratic politicians, it thus indirectly includes information about party affiliation. We thus fit an analogous model to remove this information by treating the ideology of all politicians as arising from a single common distribution. Dropping this information is not ideal because it is less efficient and thus will provide noisier estimates of politicians who do not post news media often. However, for validation it allows us to examine the extent that media sharing behavior alone—absent any indirect party information—differentiates political actors in ideological space. Results from this model are substantively equivalent (see Appendix B), with very slight overlap (4-7%) between the ideological distributions of Republican and Democratic politicians. Sharing of news by politicians, in other words, nearly perfectly signals the party to which they belong. This is important for two reasons. First, it provides strong face validity of our measurement approach. Second, substantively, it highlights the level of partisan polarization in news media use among politicians, such that ideology at the level of the media organization—even absent story content—is sufficient to

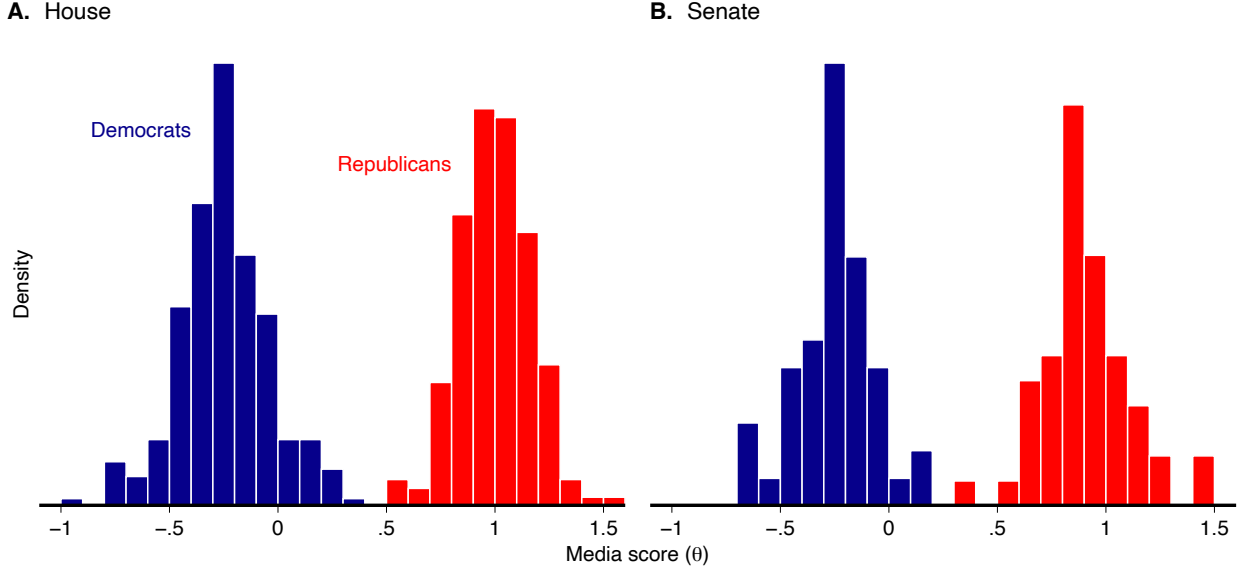


Figure 3: Histogram of the news-sharing ideology of members of Congress.

differentiate party members in the US.

If the news media shared by politicians on social media clearly differentiate between politicians of different parties, how well do they differentiate the ideology of politicians *within* each party? In [Figure 4](#) we compare media scores for members of Congress to their roll-call voting ideology (NOMINATE) ([Poole and Rosenthal, 1985](#); [Boche et al., 2018](#)). Both overall and within-party correlations are high. As the figure shows, the overall correlation between media score estimates and NOMINATE scores is extremely high ($\rho = 0.96$, $se = 0.01$).¹⁰ The within-party correlations between NOMINATE scores and ideology based on news media sharing are also high, both in the senate ($\rho_{\text{Dem.}} = 0.76$, $se = 0.10$ / $\rho_{\text{Rep.}} = 0.61$, $se = 0.11$) and in the house ($\rho_{\text{Dem.}} = 0.51$, $se = 0.06$ / $\rho_{\text{Rep.}} = 0.58$, $se = 0.06$).¹¹

Furthermore, in [Figure 4](#) we also show estimates for members of “The Squad”, a set of well-known vocal congresspersons (Alexandria Ocasio-Cortez, Ilhan Omar, Ayanna Pressley,

¹⁰Correlations across members of all parties can often be high, even if within-party correlations are low. For instance, applications of the WORDFISH procedure ([Slapin and Proksch, 2008](#)) to social media data can successfully classify legislators by party, but are somewhat less able to differentiate the ideology of legislators within parties ([Temporão et al., 2018](#)).

¹¹In Appendix G, we calculate these correlations using media scores calculated with only one year of Twitter data, showing that even with relatively little data, convergent validity is lower, but still relatively high and usable in applied research.

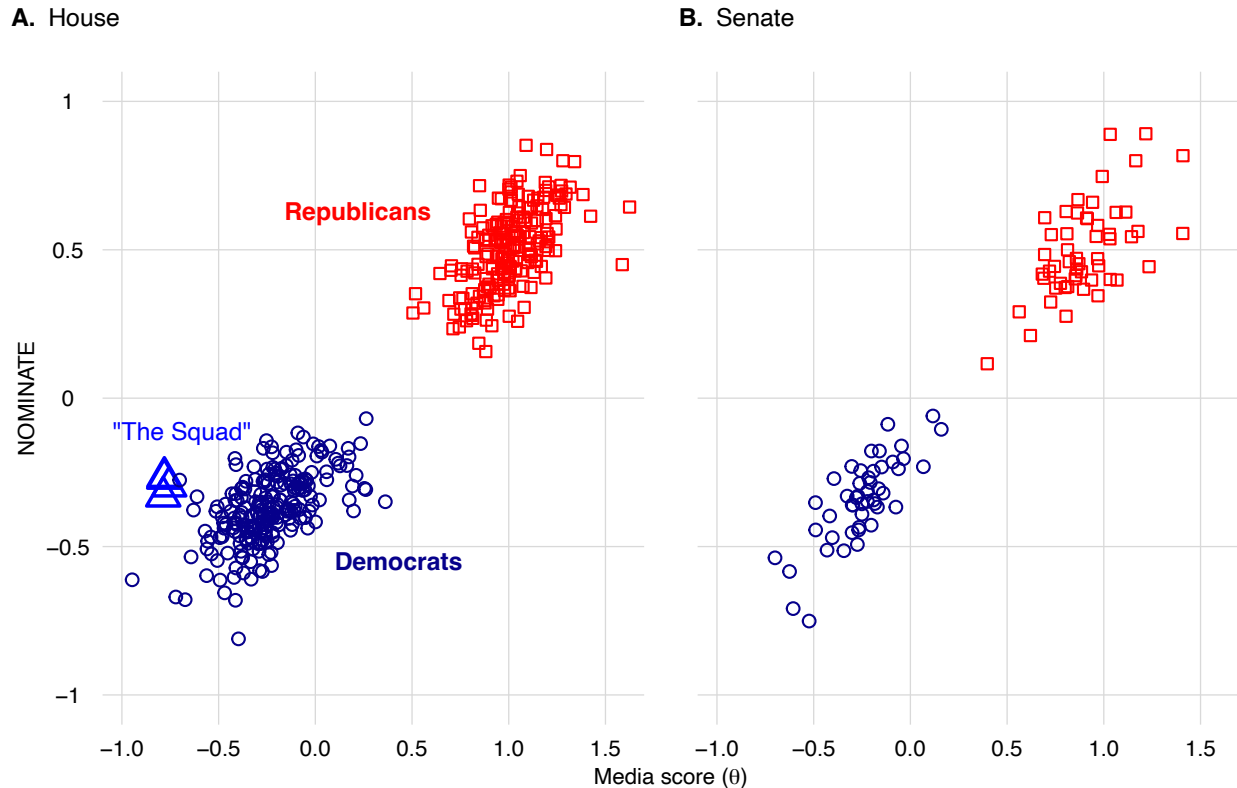


Figure 4: Comparison of the news-sharing ideology of members of Congress and their roll-call voting ideology nominate. Members of “The Squad” (in the 116th Congress) include Alexandria Ocasio-Cortez, Ilhan Omar, Ayanna Pressley, and Rashida Tlaib.

and Rashida Tlaib) associated with progressive causes on the left in the Democratic caucus. As the figure shows, whereas NOMINATE scores place them as centrist members of the Democratic Party, the Squad’s social media sharing behavior places them, as one might expect, far to the ideological left, left of 99% of all members of Congress.¹² Results for the conservative Freedom Caucus, which align with NOMINATE scores are provided in Appendix F.

We investigate the validity of our measurement approach for politically engaged Twitter users by using data from survey-linked social media data collected by YouGov during the 2016 US presidential campaign. These data consist of US respondents who agreed to provide their Twitter IDs for research and completed a survey containing questions concerning, for

¹²Recent work with roll-call voting has sought to address problems of low face validity of estimates for congresspersons such as those belonging to “The Squad” (Duck-Mayr and Montgomery, 2023). Results in Figure 4 thus bear out—from a behavioral measure in a different domain—that these congresspersons likely ‘should’ be found to the left of the vast majority of their colleagues.

example, election issues, ideological self-placement, and the strength of partisan identification with their preferred party. All tweets that respondents sent during the election period were collected and linked to respondents’ survey-based responses. Of the 1,341 respondents in the survey who sent at least one tweet during the 2016 campaign period, we examine data from the 481 who posted links to at least 5 national news media stories. In other words, among a sample of Twitter users generally, one might expect to obtain news-sharing estimates for roughly one-third of them. We fit the model to data from these respondents alongside those from politicians, and calculate the correlation between respondents’ news-sharing ideology and a set of survey-based measures: factor scores from eight issue position questions, ideological self-placement, and strength of partisan attachment (for question text, see Appendix H). The correlation between the ideology measure based on respondents’ social media news sharing and the survey-based measures are high ($\rho = 0.73$ on average). By comparison, the pairwise correlations between each pair of the three survey measures themselves is, on average, similar ($\rho = 0.64$, see Appendix A).

5 The ideology of online news media

One important feature of the model is that we not only obtain estimates of the ideology of politicians and users as a function of their behavior, but also estimates of the ideology of news media organizations. These estimates provide an important description of the US news media ecosystem based on how media are used by politicians and users. They are, in other words, a reflection of the ideology of the users who share articles from these media organizations.

To present these estimates, [Figure 5](#) provides media scores for the 150 online news media sites that are shared the most by members of Congress. A handful of well-known moderate and extreme news media organizations are bolded for reference. Overall, estimates of the ideology of news media organizations have high face validity, with alignment consistent with

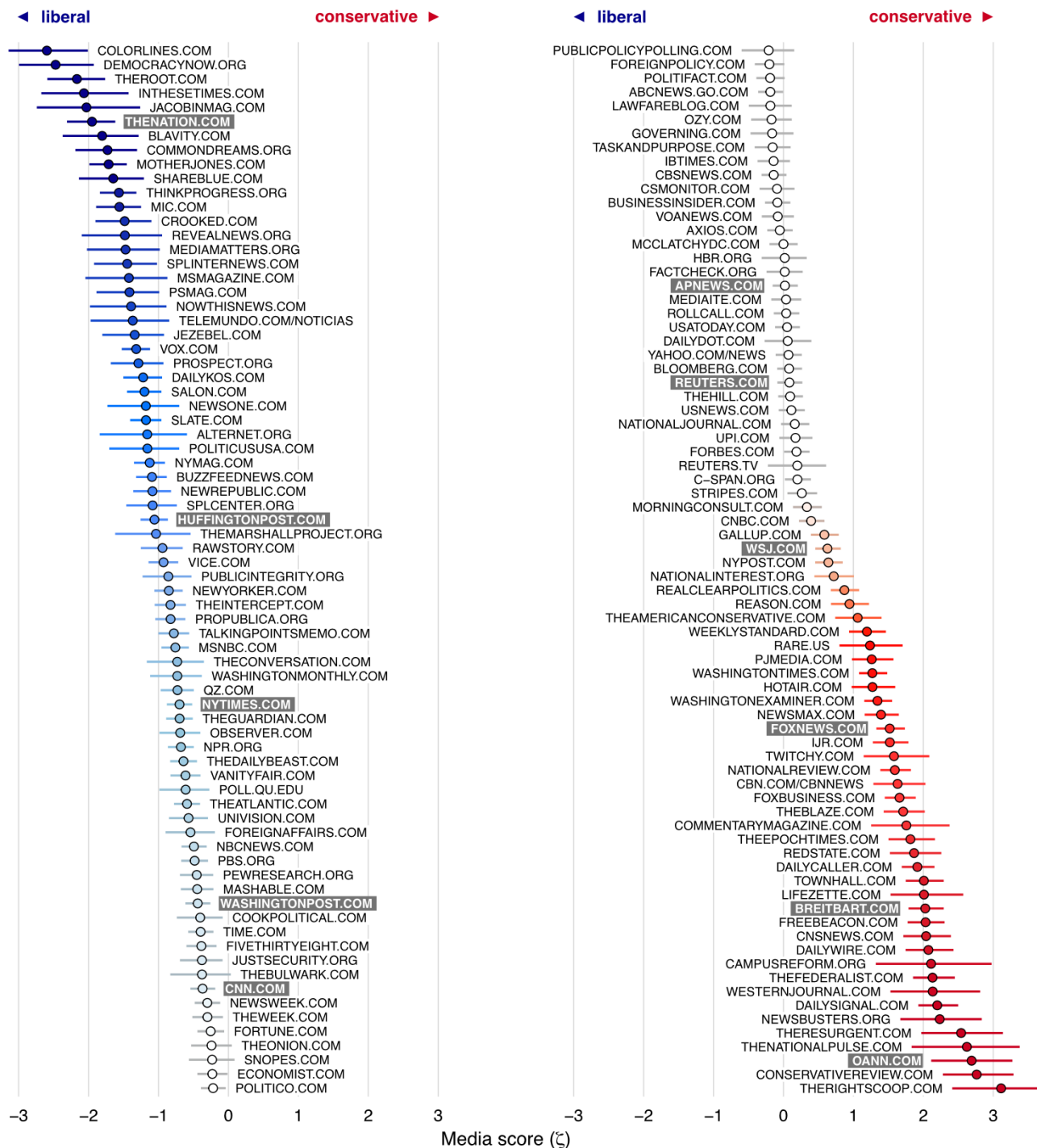


Figure 5: Ideology of news media organization as estimated from the news sharing behavior of members of Congress. Horizontal lines indicate 90% credible intervals. Media organizations highlighted in grey indicate a number of well-known media organizations across the ideological spectrum to facilitate face validity comparisons .

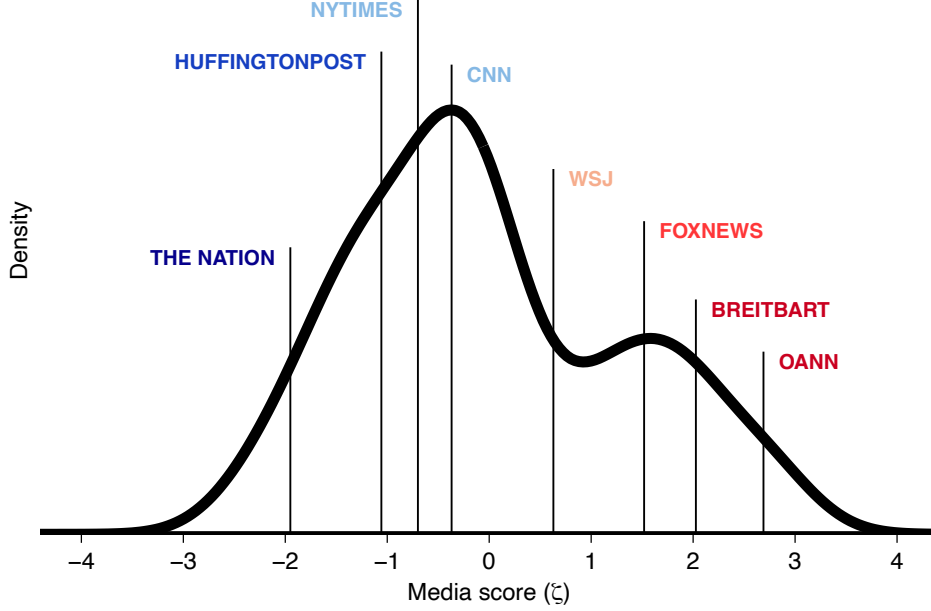


Figure 6: Density of the ideology of news media organizations as estimates from the news-sharing behavior of members of Congress. Named media organizations highlighted to facilitate substantive understanding of the distribution.

what observers of US politics and political news media might expect. For example, Breitbart News, the far right news organization prominent during the 2016 and 2020 US presidential elections is to the right of FOX News, which is to the right of the Wall Street Journal, the establishment center-right daily paper. On the left, the orderings have similar face validity. HuffPost and The Nation, for example, are to the left and far left respectively of the center-left New York Times, Washington Post, and CNN. Finally, the news wire services Reuters and Associated Press find themselves in the ideological center.¹³

Finally, the full ideological distribution of online news media is presented in **Figure 6**. As expected, given the ideological polarization of the politicians and the electorate, the figure clearly shows a bi-modal distribution, with many more politically liberal news outlets on the left, and a smaller but meaningful group of conservative media on the right.

¹³In Appendix C, we show the estimated values of the ω_m parameters for each news media organization, where we see larger values for the mainstream media sites such as *New York Times* and *FOX News*, suggesting that they are shared by more ideologically diverse sets of users than are smaller, more specialized sites.

6 Do politicians or the politically engaged public create more polarizing information environments on social media?

Among the most important questions in the study of online political behavior are those concerning the level and consequences of polarization. This pertains especially to political discourse and information sharing (e.g. Bakshy, Messing and Adamic, 2015; Barberá, 2015b; Bail et al., 2018). In offline arenas, such as voting behavior in Congress, research shows that members of Congress are heavily polarized ideologically and have become increasingly so over time (Hetherington, 2009). The literature is less clear on polarization among the general public (e.g. Fiorina and Abrams, 2008; Abramowitz, 2010). However, research suggests that US politicians are substantially more ideologically polarized than their constituents (e.g. Bafumi and Herron, 2010).

Yet whether online political behavior by politicians and the mass public who engage in politics matches conventional offline differences in ideological polarization is unknown. On the one hand, it may be that online political behavior naturally aligns with political attitudes and behaviors offline. On the other hand, communication of ideological positioning can vary across contexts for theoretically meaningful reasons. For instance, the constraints and incentives that determine how legislators vote on bills in Congress have been shown to differ from constraints and incentives that legislators face when discussing their positions on those bills and issues with constituents (e.g. Grimmer, 2013a,b; Cormack, 2016). Finally, members of the mass public who share political information will be different, for a variety of reasons, from the mass public generally. For example, the users who share political news will potentially be more affectively polarized than others, with more ideologically polarizing sharing behavior than (non-political) ordinary users. Furthermore, ordinary users—whether politically engaged or not—will also be less constrained by strategic considerations than politicians. Finally, Twitter users overall are shown to be more left-wing than the general public, and Democratic-identifying users shown to be less likely to want their representatives to compromise on the issues (Smith et al., 2020).

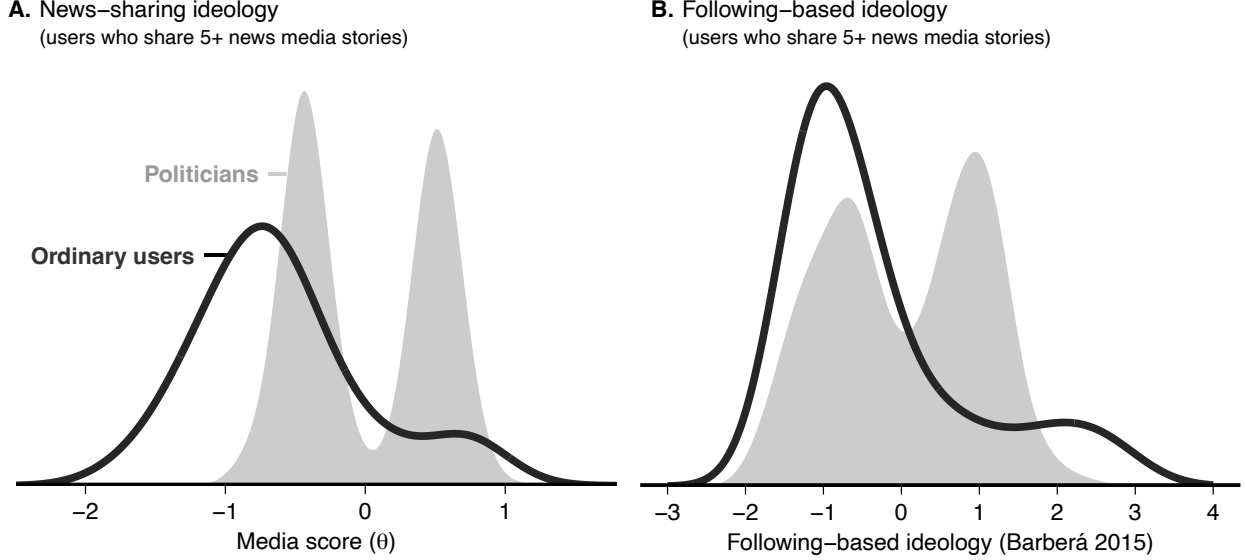


Figure 7: Ideology of politically engaged Twitter users and members of Congress as estimated using news sharing (media scores) and follower data (Barberá, 2015a) on Twitter. Panel (a) presents estimates of the ideology of politically engaged Twitter users (in black) and members of Congress (in gray) based on their news-sharing data. Panel (b) presents estimates using the method based on the following behavior of user introduced by Barberá (2015a) (from data collected in 2018).

However, despite the importance of understanding differences between the online behaviors of politicians and citizens, our empirical understanding of these differences remains relatively shallow. This is, in part, because current approaches to understanding politicians’ ideology tend to rely indirectly on ordinary users’ perceptions of them. The path-breaking research by Bond and Messing (2015) and Barberá (2015a), for instance, use the following and endorsement behaviors of ordinary Facebook and Twitter users to estimate politicians’ ideology, thus examining politicians indirectly through user behavior. One benefit of the measurement approach proposed herein is that it relies on equivalently measured behaviors from both politicians and users. This allows us to examine ideological polarization in online information sharing without relying on the behavior of users alone.

To investigate differences in the news media sharing ideology of politically engaged Twitter users and members of Congress, we present in Panel A of Figure 7 the distribution of media scores for politicians and politically engaged users on Twitter. As the figure shows, a large group of users on the left are estimated to be ideologically more liberal than the

left-most member of Congress. This suggests that many of these users on the left (i.e. presumably Democratic users) share news media that is more liberal than news media shared by members of Congress. On the right side of Panel A, we see a much smaller set of Twitter users whose ideology is estimated to be more conservative than the most right-most member of Congress. Stated differently, Democratic members of congress share much more moderate content than their co-partisans, while Republican members of congress and their co-partisans share mostly ideologically similar content.

We compare our estimates with those based on politically engaged Twitter users' following behavior ([Barberá, 2015a](#)), as shown in Panel B. Estimates in Panel B are presented for the same users as in Panel A. They suggest that, based on following data, a large set of Democratic legislators are to the left of the left mode of these users, and a large set of Republican legislators to the right of right mode of these users. Thus, unlike with sharing data, estimates from a following-based measure of ideology do not suggest that there is a large set of users to the left of the left-most Democratic politician. This highlights the fact that different measures can lead to different pictures of the ideological mapping of political actors and the politically engaged mass public. With following data, one captures what is effectively a perceptual measure of politicians' ideology based on how users perceive the ideological distance between themselves and politicians. By contrast, with sharing data, the ideological mapping of politicians and users is based on a behavior that is conducted equivalently by both politicians and politically engaged users on Twitter. Finally, as noted earlier, it is important to remember that estimates of the news-sharing ideology of users are for users who are politically interested (who follow at least one member of Congress) and who share news. In other words, our estimates are for users who regularly share political news on social media. Among users who show less interest in politics, media scores would likely show them to be more moderate. Importantly, however, it is these types of politically interested users who contribute to the political information ecosystem.

7 Does election competition constrain politicians from sharing ideologically polarizing news media?

We showed above that the ideology of politicians based on their sharing behavior is less polarized than that of politically engaged users who share news. What explains, however, variation in news-sharing ideology among politicians themselves? Answering this question is important because it highlights a key distinction between the behaviors of legislators as it relates to formal policy-making (voting) and as it relates to how legislators communicate their policies, attitudes, and goals to the public.

Furthermore, as [Barberá and Zeitzoff \(2018\)](#) show, politicians are increasingly using social media to communicate with the public both during and outside of election campaigns. As others have shown, politicians communicate with their constituents in ways that differ depending on factors independent of their voting behavior. [Grimmer \(2013a\)](#) shows, for example, that legislators in districts with a large proportion of constituents who are co-partisans tend to emphasize their positions on the issues, whereas those in more heterogeneous districts emphasize appropriations to avoid alienating voters on the other side of a given issue. Information environments can thus be collectively unrepresentative of politicians' views if politicians who take public positions on issues are primarily those on the ideological extremes. [Cormack \(2016\)](#) shows, similarly, that politicians are highly selective in the votes that they emphasize to voters, with legislators in districts with many co-partisans highlighting more ideologically extreme votes than legislators in districts with more uniform mixes of co-partisans and out-partisans.

Relatedly, in a social media context, if politicians in uncompetitive districts are more likely to share more ideologically extreme information and more political news generally, then the information ecosystem of political elites will be biased toward more ideologically polarizing sources. We investigate this empirically by testing whether electoral competitiveness is associated with how moderate or extreme the news-sharing ideology of legislators is in a given district or state. Theoretically, politicians who face stiffer competition in a general

election can be expected to have a more moderate news-sharing ideology—as a function of sharing less ideologically polarizing news media. This is because politicians in competitive elections will be wary of distancing themselves from moderate voters who may prove decisive. By contrast, politicians who face less electoral competition can be expected to be less constrained with respect to moderate voters, freer to express more polarized ideological leanings, and thus more likely to have a more extreme news-sharing ideology. Politicians in less competitive general elections can also be expected to be more fearful of primary election challengers from their ideological flanks. This creates incentives to appeal to primary voters through communications that emphasize the more extreme ideological leanings of co-partisan primary voters.

To test this, we measure district and state competitiveness by the difference in the vote share for Donald Trump and Hillary Clinton during the 2016 US presidential election in each district/state. We then compute a measure of partisan alignment by reversing the measure for Democratic politicians, such that high values for all politicians indicate a partisan gap favorable to each legislator, and low values indicate a less favorable partisan context. This is similar to the measure used by [Grimmer \(2013a\)](#) to examine partisan district alignment and position-taking by legislators in (offline) political communication. Empirically, we expect that the more favorable the partisan competitive landscape, the more likely a legislator will be to exhibit more ideologically extreme news sharing.

In Panel A of [Figure 8](#), we present the relationship between the news-sharing ideology of members of Congress and partisan alignment in their district or state. Upward and downward sloping lines represent linear regression models fit to data from Republican and Democratic politicians respectively. Consistent with expectations, as the partisan alignment of a politician’s district/state increases, so too does the ideological extremeness of their news sharing for both Republicans and Democrats. In Panel B of [Figure 8](#), we demonstrate the relationship between politicians’ news-sharing ideology and the number of news articles they share (we take the log due to large differences in sharing behavior between moderates

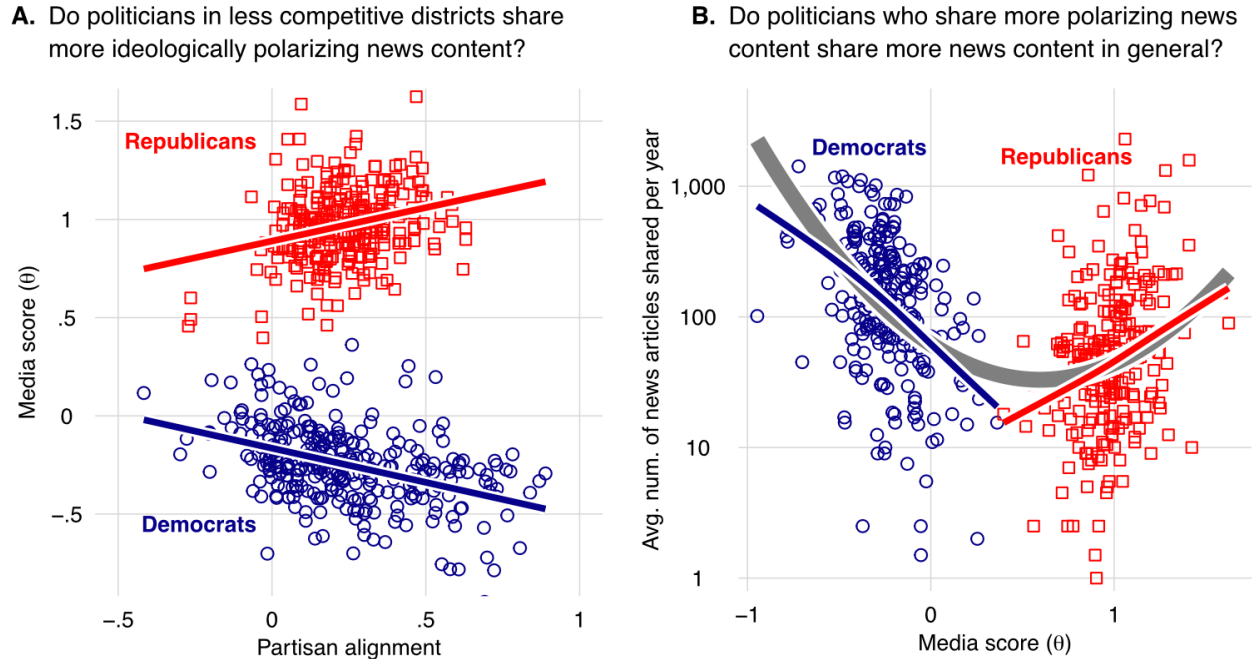


Figure 8: News sharing ideology and the district/state partisan alignment of US members of Congress and governors. Panel A compares how uncompetitive an electoral district is (how aligned in partisanship are its constituents to the politician who represents them) to the news-sharing ideology (media score) of that politician. Regression lines for members of each party shown for reference. Panel B compares the news-sharing ideology (media score) of politicians to the number of news stories they share on Twitter in general. Second-order polynomial regression line for all data, and regression lines by party shown for reference.

and those on the extremes). As Panel B shows, politicians with more ideologically extreme news-sharing behavior share substantially more political news media than do moderates.

To examine the relationship between competitiveness and news-sharing ideology more systematically, we fit OLS regression models where the outcome is the media score of a politician, and the variable of interest is the partisan alignment of his or her district or state. Results are presented in [Table 2](#). In the first model, we present the simple bivariate relationship, which shows that as the district/state-level partisan gap increases, so too does the extremeness of a politician’s news-sharing ideology. Results are similar in Model (2), which includes covariates for a politicians’ party and whether they are members of the House or Senate. In Models (3) and (4), we then test whether this pattern holds if we account for legislators’ voting-based ideology (NOMINATE score). As the result show, even when accounting for the ideology of legislators’ voting records, politicians who represent districts or

	DV: Ideological extremity of news sharing			
	(1)	(2)	(3)	(4)
District alignment	0.317 (0.041)	0.309 (0.042)	0.108 (0.041)	0.130 (0.044)
Republican		0.009 (0.016)	0.009 (0.015)	0.008 (0.015)
Senator		−0.017 (0.021)	−0.038 (0.019)	−0.036 (0.019)
Nominate score			0.691 (0.058)	0.591 (0.092)
Nominate score × Republican				0.161 (0.114)
Intercept	−0.078 (0.013)	−0.077 (0.016)	−0.025 (0.015)	−0.030 (0.016)
N	527	527	527	527

Standard errors in parentheses.

Table 2: Relationship between the ideological extremity of news sharing and district/state alignment. Standard errors in parentheses. All estimates of the coefficient “District alignment” are statistically significant at the 99% level.

states with higher partisan alignment exhibit more ideologically extreme information-sharing behavior online (estimates are statistically significant at the 99% level in all models).

These descriptive results thus suggest that politicians’ news-sharing strategies on social media are, in part, driven by legislators’ local electoral constraints. Consistent with findings by [Grimmer \(2013a\)](#) and [Cormack \(2016\)](#), politicians use social media as a communications platform to selectively emphasize information to appeal either to a local partisan audience or to a general one: whereas legislators with highly partisan-aligned audiences emphasize ideologically extreme information online, those with mixed audiences (competitive landscapes) emphasize more moderate content. As data in Panel B in [Figure 8](#) show, these more ideologically extreme members of Congress also share substantially more news media on social media, biasing aggregate representation of political information toward the ideological extremes.

8 Conclusion

Research into the attitudes and behaviors of politicians and users on social media has expanded rapidly in recent years. Much of this literature focuses either on the behaviors or discourse of political actors, or that of users. In this article, we provide a means to analyze the ideological foundations of the behaviors of politicians and users jointly by focusing on the sharing of news media links online, a mode of behavior common to both sets of actors. In doing so, we develop an estimator of ideology for both elite actors and the mass public that uses equivalent behaviors. Whereas other homophily-based measures of ideology estimate the ideology of elite actors based on public perceptions of those actors (i.e., which members of the public make the choice to follow those actors, or to contribute to them), our measure allows the behavior of elite actors themselves to determine their ideology. We note that the way these measures are computed also suggests that one could identify legislators whose behavior is distinct from their public perception. Because sharing information through links is possible on multiple social media platforms (Facebook, Twitter, Mastodon, or future services), the ideology of content sharing can be also examined within or across other platforms.

In the examples in this article, we empirically investigated the behavior of politicians and users on Twitter, both for ease of validating data from survey-linked users and from politicians, and because, as a platform heavily used by political elites, it is an important source of data for answering substantive research question. Nevertheless, social media platforms may implement unexpected restrictions on data, such as changes in monetary costs of access and the types of data available (e.g. recent changes to X/Twitter). With respect to Twitter—which remains an important forum for understanding politicians’ political behavior—relatively little data from political actors on Twitter may be required to calculate usable estimates of their news sharing ideology (see Appendix G) and we expect such data for members of Congress to continue to be available. More importantly, the method is, in principle, platform agnostic. Thus for social media platforms in the future, the method pre-

sented herein can be used to compute ideology scores so long as URL sharing is an affordance of the platform.

Other uses and extensions of the model are also possible. Sharing on social media of information analogous to news media could, for example, be used as supplemental data, and may perform similarly well if they contain strong ideological signals. For instance, links to channels of YouTube videos could straightforwardly be accommodated within the framework used herein. And we note that in the currently rare case that sharing data are especially large (e.g. [González-Bailón et al., 2023](#)), our measurement model can be extended to estimate news-sharing ideology at the level of the news article itself, either using the model as is, or, for instance, placing media organization priors on news-story ideology estimates. Finally, since our measure is based on what is frequent behavior by political elites, it also can, in principle, allow for measuring ideological change over time within relatively short intervals (e.g. before and after US primary elections). Extensions of the approach, for example, could include a dynamic component that captures changes in the ideology of news organizations and/or the users who share news (see, among others, [Martin and Quinn, 2002](#)).

Using the fact that politicians’ ideology can be estimated from their online sharing behavior allows us to inquire into the incentives that underlie politician’s online communications. Substantively, our results suggest that election competition may act as a constraint on politicians from sharing ideologically extreme news media. Institutional and judicial efforts to create more electoral competition (e.g. by overturning heavily gerrymandered districts [Kenny et al., 2023](#)) may thus have important indirect implications for the state of the polarized information online ecosystem.

The examination of news-sharing behavior is also central to a wide set of substantive questions in political science. Does the ideological extremeness of news-sharing change among the public and politicians during election campaigns? Is sharing by politicians during primary elections more polarized than during general elections? What is the ideological presentation of accounts controlled by foreign governments who seek to intervene in democratic elections?

Do political events shape who shares news and from what sources? Does the ideology of news-sharing vary across social media platforms, and why? What do the links to video channels (e.g. YouTube) on social media tell us about the users who share them and the channels themselves? Finally, with estimates of the ideology of news media organizations themselves, one can investigate, for example, the prevalence of ideological echo chambers by examining the ideology of consumed media; examine ideological algorithmic bias in social media feeds; or investigate incidental exposure to cross-cutting political content.

In future research, we hope that the approach introduced herein, and the accompanying statistical software, will provide researchers with the tools to help answer these and similar questions concerning online political behavior. We also hope our measure will allow for a richer study of congressional behavior and congressional candidate behavior. Just as measures such as NOMINATE scores (Poole and Rosenthal, 1985), donation-based DIME scores (Bonica, 2013), text-based measures (Slapin and Proksch, 2008), and social media perception-based measures (Barberá, 2015a; Messing and Westwood, 2014) (among others) have greatly expanded our understanding of political behavior off- and online, we hope that examining the ideological underpinning of online information-sharing will open further avenues for research into the study of behavior by politicians and the mass public.

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Online Appendix for

**“News Sharing on Social Media: Mapping the
Ideology of News Media Content, Politicians,
and the Mass Public”**

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A Validating estimates for ordinary users

To validate our news-sharing measure of ideology for ordinary users, we use a unique set of survey and social media data from a representative sample of Twitter users that were collected during the 2016 US presidential election campaign. The survey data were collected through the public opinion firm YouGov and consist of responses to a standard battery of political questions and the Twitter user names of respondents who gave permission for their survey responses be linked to their Twitter timelines.¹ These data are useful because they allow us to compare common attitudinal and partisan-based measures of ideology with our news-sharing measure as estimated from the news shared by respondents on social media. The survey and Twitter data were collected in 2016 and contain responses and social media posts from 1,341 respondents. However, many social media users are not, in general, politically engaged in their online behavior, and thus we use the subset of data from the 481 respondents (36%) who posted at least five links to national news media stories.²

To estimate the news-sharing ideology of survey respondents, we use data both from these respondents and from politicians (members of Congress, governors, members of executive) when fitting the model. Although the data collection periods for the YouGov respondents (2016) and politicians (2015-2021) differ, we include data from the latter to increase estimation precision (given the relatively small set of survey respondents). Nevertheless, despite temporal differences in collection periods, as we will see, estimates of the news-sharing ideology of ordinary users are highly correlated with survey-based measures from those same users.

We investigate the convergent validity of the social media news-sharing measure by examining its relationship with three separate survey-based measures of ideology and partisanship. First, we construct an issue-based ideological scale using survey responses to eight policy-related questions concerning issues salient during the 2016 US presidential campaign. These

¹The collection of these survey and social media data was approved by the New York University Institutional Review Board (IRB-12-9058).

²Sixty percent of respondents (808) posted at least one national news URL.

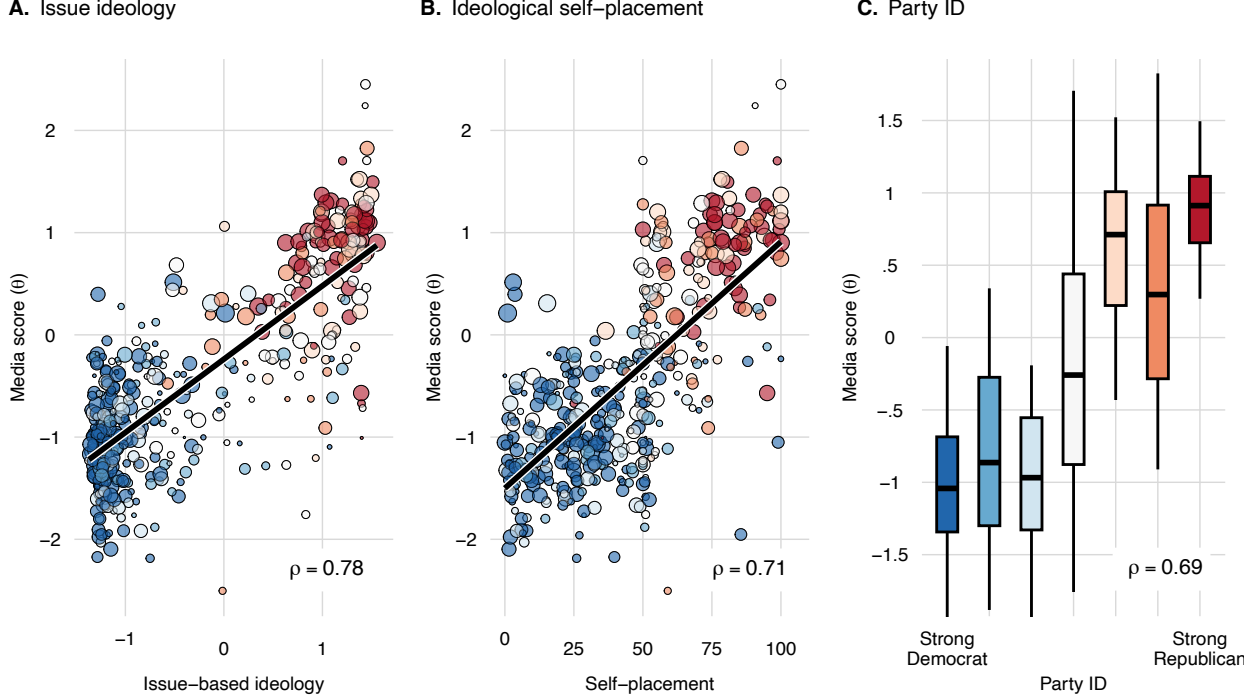


Figure A1: Comparison between the news-sharing and survey-based measures of political ideology. The three panels present the relationship between the social media news-sharing measure of ideology and the three survey-based measures.

questions concern, for example, attitudes toward building a wall on the border with Mexico, expanding the Affordable Care Act, and whether free trade is beneficial to the economy. From responses to the eight policy-related questions, we build a policy-based ideological index ($\alpha = 0.83$) (complete survey question text is available in [Appendix H](#)). Second, we use a measure of respondents’ judgments about their own ideology by using a standard ideological placement scale. Finally, we measure partisanship using a seven-item scale that ranges from “Strong Democrat” to “Strong Republican.”

We calibrate our expectations about the relationship between the news-sharing and survey measures of ideology by first calculating the correlation between each pair of survey-based measures. As one would expect, pairwise comparisons of measures based on survey data are relatively highly correlated, with an average correlation of 0.64.³ To examine the relationship between the news-sharing measure and each of the survey-based measures, we present these

³ $\rho^{(\text{self-placement, issues})} = 0.62, \text{ se} = 0.01 / \rho^{(\text{self-placement, party ID})} = 0.56 / \text{se} = 0.01, \rho^{(\text{issues, party ID})} = 0.73, \text{ se} = 0.01.$

data graphically in [Figure A1](#). In Panel A, we show that the strength of partisanship is highly correlated with the news-sharing measure of ideology, with independents (center box plot) finding themselves as centrists on the social media measure. In Panels B and C, we see that both the issue-based and self-placement ideological scales are similarly highly correlated with the link-based measure. Finally, as the correlations shown in each panel suggest, ideology as measured by news-sharing behavior is more highly correlated with each survey-based measure (on average, 0.73) as the survey-based measures are correlated between themselves (on average, 0.64, as noted above).

B Estimates with and without party-level priors

In the main article, we provide estimates of the news-sharing ideology of politicians using a model that includes political party-level information through a hierarchical prior on politicians' ideology scores. In other words, we set priors such that the ideology estimates for Democratic politicians, $\theta_{i,p=D}$, are given a common prior specific to Democrats:

$$\theta_{i,p=D} \sim \text{Normal}(\mu_{p=D}^{(\theta)}, \sigma_{p=D}^{(\theta)}), \quad (\text{A1})$$

and a prior for Republican politicians, $\theta_{i,p=R}$, a different common prior:

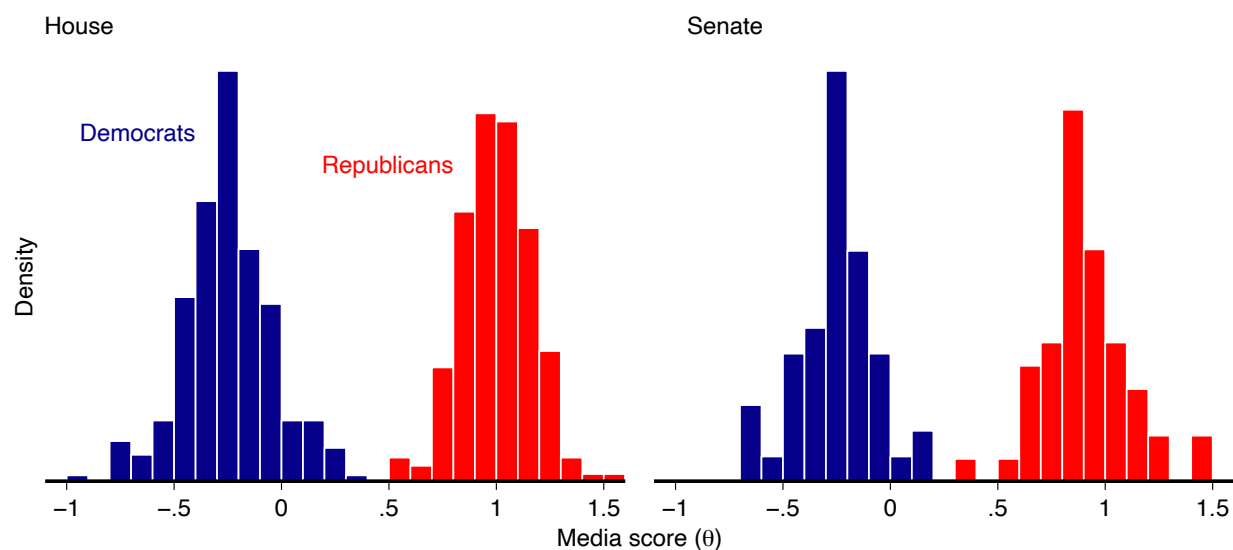
$$\theta_{i,p=R} \sim \text{Normal}(\mu_{p=R}^{(\theta)}, \sigma_{p=R}^{(\theta)}). \quad (\text{A2})$$

It is useful for estimation to include such information, especially when data are scarce, such as for politicians who share relatively little news. Nevertheless, it is also important to examine how well the model performs absent this party-level information by fitting a model that includes a prior on the ideology estimates, θ_{ip} that is common to all actors. We thus fit the same model as in the main article, but remove any party information by dropping the subscript p on θ_{ip} , thus setting all parameters θ_i to come from a common distribution:

$$\theta_i \sim \text{Normal}(\mu^{(\theta)}, \sigma^{(\theta)}). \quad (\text{A3})$$

The correlation between estimates with and without the party-level prior 0.99 (se = 0.004); 0.99 (se = 0.010) for the within-Democrat estimate; and 0.99 (se = 0.008) for the within-Republican estimate. The differences in the estimates are driven primarily by media score estimates from members of Congress who tweet very little and therefore are pulled in more strongly by the party-level prior. This is why the much smaller points shown in [Figure A3](#) are those that diverge most from the model with party-level priors on θ_{ip} .

A. With party-specific priors over theta



B. With common prior over theta (no party-specific priors)

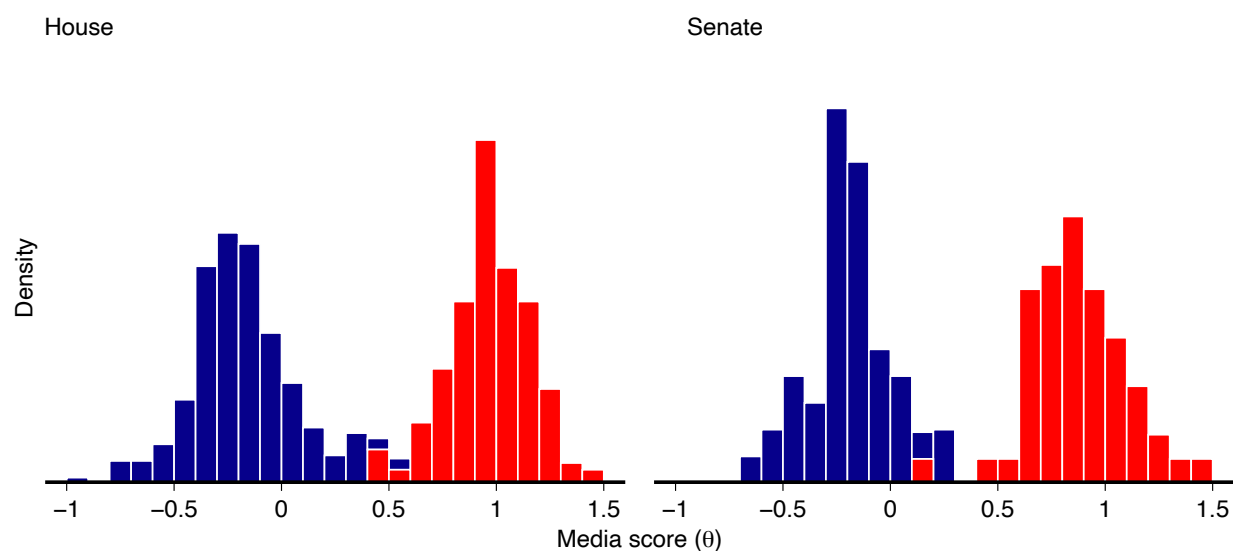


Figure A2: Histograms of the Ideology of Members of Congress Comparing a Model with a Party-level Prior to one with a Common Prior). This figure presents histograms of the ideology of Members of Congress as estimated from their social media news sharing behavior for a model *with* separate priors on the ideology parameters for Democratic and Republican politicians (top panel), and *without* party-level priors (bottom panel).

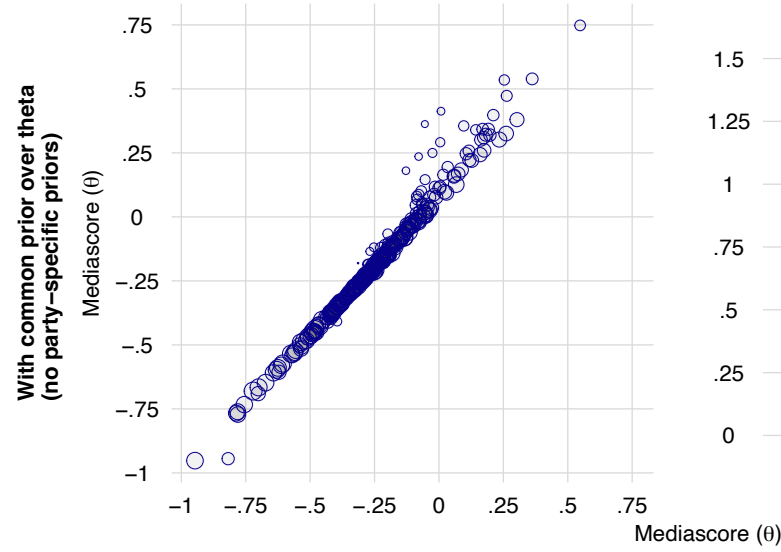
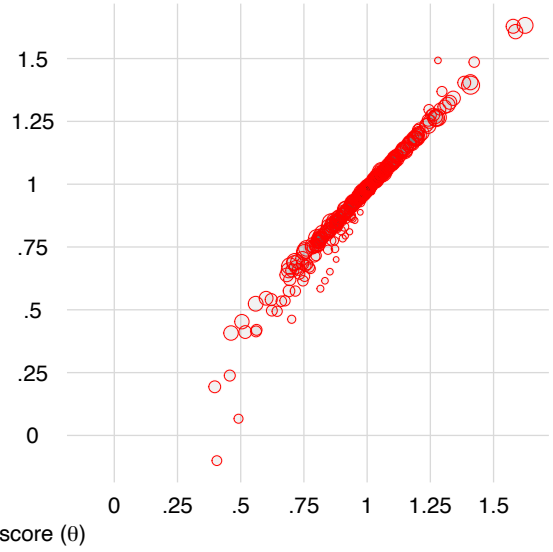
A. Democrats**B. Republicans****With party-specific prior over theta**

Figure A3: Scatterplot comparing Mediascore estimates for members of Congress from a model with party-level priors to one with a common prior). This figure presents differences in estimates of θ_i in a model with a common prior over all parameters θ_i (y axis), and a model with separate priors on θ_{ip} depending on whether a given politician is a Republican or Democrat (x axis). Point size is proportional to the number of national news media URLs shared by each politician.

C Ideological diversity in the sharing of national news media

The primary goal of the proposed model is to estimate the ideology of politicians, users, and news media organizations. The variance parameter, ω_m , however, also provides a substantively interesting quantity in that it indicates the extent to which political ideology drives sharing of a given news media domain: a larger value of ω_m indicates that the ideological distance between a user and news media site is less predictive of whether news media domain m is shared by users in general.⁴ For example, we might expect that larger, more general mainstream news organizations (e.g. nytimes.com, washingtonpost.com, wsj.com, foxnews.com) will be shared by users across the political spectrum in comparison to much more niche ideologically narrow news sites.

To investigate this, we present in [Figure A4](#) the estimates of ω_m for the 150 most frequently shared news organizations. In general, as expected, well-known large and medium-sized news organizations have values of ω_m that are the largest. For instance, the New York Times, Washington Post, and CNN have some of the largest estimated values of ω_m indicating that despite their ideological position, they are broadly shared across the ideological spectrum i.e., a user’s or politician’s ideological distance from these outlets is less predictive of whether they will be shared than the much more niche news media that have substantially smaller values of ω_m . Finally, we note that alternatively one could model these parameters at the user level (i.e. ω_i), to capture differences in the extent that some users are ideologically diverse in their sharing of news media, and others more ideologically narrow. However, the precision of such parameters would require relatively substantial amounts of data for each user (compared to the present data, in which there are many observations per media organization), and thus we in general prefer a model with the dispersion parameter modeled at the level of the media organization.

⁴Interpreting variance parameters for substantive reasons has been used in related work on scaling models (e.g. [Lauderdale, 2010](#); [Peterson and Spirling, 2018](#); [Eady and Loewen, 2021](#)).

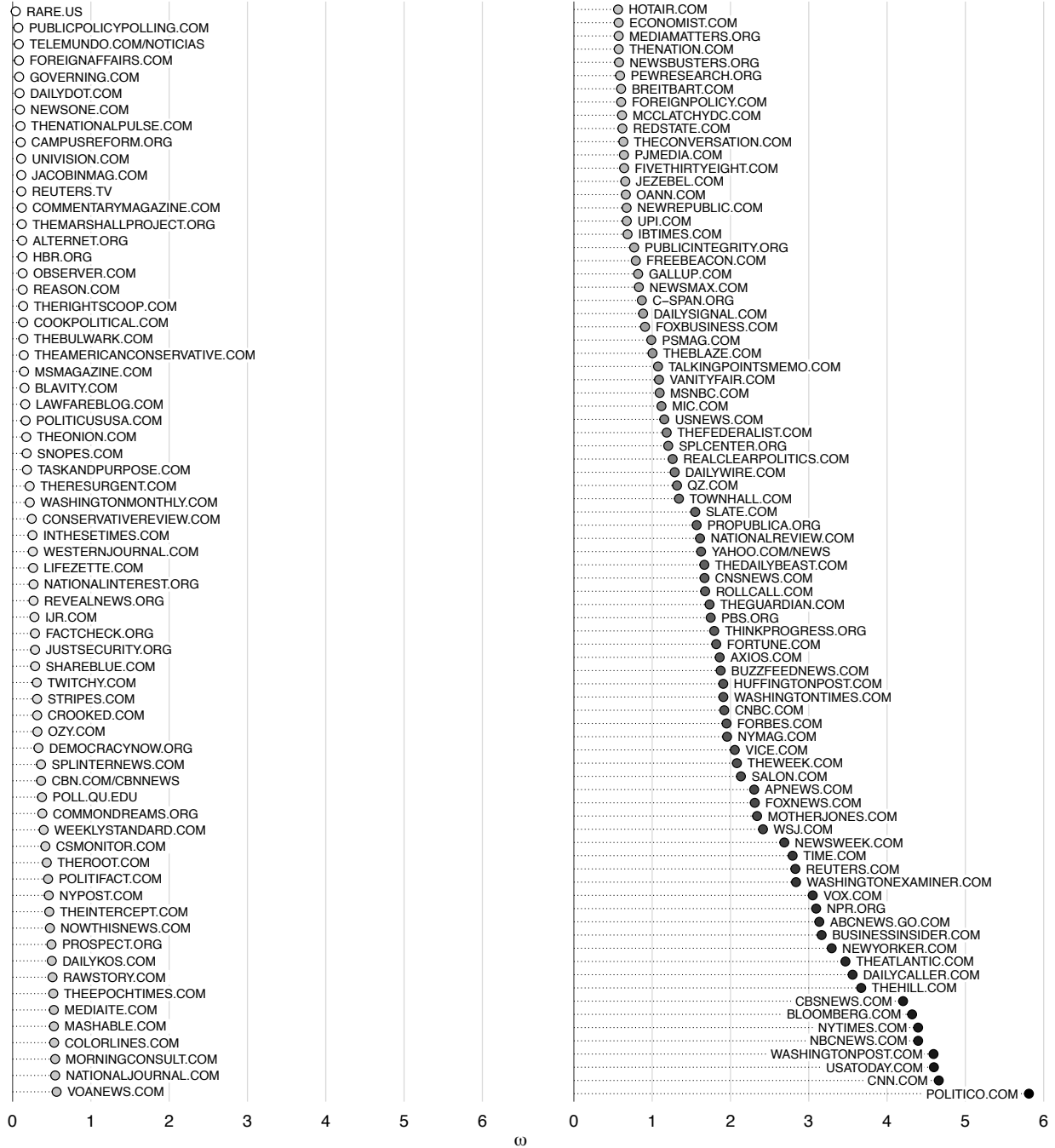


Figure A4: Variance parameters ω_m for the 150 most shared news domains. This graph shows the parameters ω_m for the 150 most frequently shared news media domains.

D List of national news media organizations

Table A1: List of national news domains

	News Media	Domain
1	ABC News	abcnews.go.com
2	Accuracy in Media	aim.org
3	AlterNet	alternet.org
4	American Conservative	theamericanconservative.com
5	American Prospect	prospect.org
6	American Spectator	spectator.org
7	American Thinker	americanthinker.com
8	Anti-Media	theantimedia.org
9	Associated Press	apnews.com
10	Atlanta Black Star	atlantablackstar.com
11	attn:	attn.com
12	Axios	axios.com
13	Bipartisan Report	bipartisanreport.com
14	BIZPAC Review	bizpacreview.com
15	Black America Web	blackamericaweb.com
16	Black News	blacknews.com
17	Blavity	blavity.com
18	Bloomberg	bloomberg.com
19	Boston Review	bostonreview.net
20	Breitbart	breitbart.com
21	Business Insider	businessinsider.com
22	Buzzfeed News	buzzfeednews.com
23	C-Span	c-span.org
24	Campus Reform	campusreform.org
25	CBS News	cbsnews.com
26	Christian Broadcasting Network	cbn.com/cbnnews
27	Christian Science Monitor	csmonitor.com
28	Circa	circa.com
29	City Journal	city-journal.org
30	CNBC	cnbc.com
31	CNN	cnn.com
32	Color Lines	colorlines.com
33	Columbia Journalism Review	cjr.org
34	Commentary	commentarymagazine.com
35	Common Dreams	commondreams.org
36	Conservative Review	conservativereview.com
37	Conservative Tribune	conservativetribune.com
38	Cook Political Report	cookpolitical.com

39	Counter Punch	counterpunch.org
40	CQ Roll Call	rollcall.com
41	Crisis Magazine	crisismagazine.com
42	Crooked Media	crooked.com
43	Crooks and Liars	crooksandliars.com
44	CRTV	crtv.com
45	Current Affairs	currentaffairs.org
46	Daily Kos	dailykos.com
47	Daily Signal	dailysignal.com
48	Daily Wire	dailywire.com
49	Democracy NOW!	democracynow.org
50	Dissent Magazine	dissentmagazine.org
51	Drudge Report	drudgereport.com
52	Elite Daily	elitedaily.com
53	Epoch Times	theepochtimes.com
54	FactCheck.org	factcheck.org
55	FAIR	fair.org
56	First Things	firstthings.com
57	FiveThirtyEight	fivethirtyeight.com
58	Forbes	forbes.com
59	Foreign Affairs	foreignaffairs.com
60	Foreign Policy	foreignpolicy.com
61	Fortune	fortune.com
62	Fox News	foxnews.com
63	Fox News Business	foxbusiness.com
64	Frontpage Mag	frontpagemag.com
65	Full Measure News	fullmeasure.news
66	Gallup News	gallup.com
67	GOOD	good.is
68	Governing	governing.com
69	Ground Truth	thegroundtruthproject.org
70	Harper's Magazine	harpers.org
71	Harvard Business Review	hbr.org
72	HLN	cnn.com/hln
73	HotAir	hotair.com
74	Huffington Post	huffingtonpost.com
75	In These Times	inthesetimes.com
76	Independent Journal Review	ijr.com
77	Infowars	infowars.com
78	Inquisitr	inquisitr.com
79	InstaPundit	instapundit.com
80	Intellihub News	intellihub.com
81	International Business Times	ibtimes.com
82	Jacobin	jacobinmag.com
83	Jezebel	jezebel.com

84	Just Security	justsecurity.org
85	Lawfare	lawfareblog.com
86	Levin TV	levintv.com
87	LifeZette	lifezette.com
88	Mad World News	madworldnews.com
89	Mashable Social Good	mashable.com
90	McClatchy	mcclatchydc.com
91	Media Matters	mediamatters.org
92	Media Research Center	mrc.org
93	Media Research Center CNS News	cnsnews.com
94	Media Research Center MRCTV	mrctv.org
95	Media Research Center Newsbusters	newsbusters.org
96	Mediaite	mediaite.com
97	Mic News	mic.com
98	Mint Press News	mintpressnews.com
99	Morning Consult	morningconsult.com
100	Mother Jones	motherjones.com
101	Ms. Magazine	msmagazine.com
102	MSNBC	msnbc.com
103	National Affairs	nationalaffairs.com
104	National Interest	nationalinterest.org
105	National Journal	nationaljournal.com
106	National Review	nationalreview.com
107	NBC News	nbcnews.com
108	New York Magazine	nymag.com
109	New York Observer	observer.com
110	Newsmax	newsmax.com
111	NewsOne	newsone.com
112	Newsweek	newsweek.com
113	Nieman Journalism Lab	niemanlab.org
114	Now This	nowthisnews.com
115	NPR	npr.org
116	One American News	oann.com
117	OZY	ozy.com
118	Pacific Standard	psmag.com
119	Palmer Report	palmerreport.com
120	PBS	pbs.org
121	PEW Research	pewresearch.org
122	PJ Media	pjmedia.com
123	Political Insider	thepoliticalinsider.com
124	Politico	politico.com
125	Politicus USA	politicususa.com
126	Politifact	politifact.com
127	Poynter	poynter.org
128	Project Veritas	projectveritas.com

129	Project Veritas Action	projectveritasaction.com
130	ProPublica	propublica.org
131	Public Policy Polling	publicpolicypolling.com
132	Quartz	qz.com
133	Quinnipiac Polling	poll.qu.edu
134	Rare	rare.us
135	Rasmussen Reports	rasmussenreports.com
136	Raw Story	rawstory.com
137	Real Clear Politics	realclearpolitics.com
138	Reason	reason.com
139	Red State	redstate.com
140	Reuters	reuters.com
141	Reuters TV	reuters.tv
142	Reveal	revealnews.org
143	Reverb Press	reverbpress.com
144	Revolver.News	revolver.news
145	Right Side Broadcasting Network	rsbn.tv
146	Right Wing News	rightwingnews.com
147	Right Wing Watch	rightwingwatch.org
148	Salon	salon.com
149	Share Blue	shareblue.com
150	Slate	slate.com
151	Snopes	snopes.com
152	Southern Poverty Law Center	splcenter.org
153	Splinter	splinternews.com
154	Stars and Stripes	stripes.com
155	Talking Points Memo	talkingpointsmemo.com
156	Task and Purpose	taskandpurpose.com
157	Telemundo Noticias	telemundo.com/noticias
158	The Atlantic	theatlantic.com
159	The Baffler	thebaffler.com
160	The Blaze	theblaze.com
161	The Bulwark	thebulwark.com
162	The Center for Public Integrity	publicintegrity.org
163	The Conversation US	theconversation.com
164	The Daily Banter	thedailybanter.com
165	The Daily Beast	thedailybeast.com
166	The Daily Caller	dailycaller.com
167	The Daily Dot	dailydot.com
168	The Dispatch	thedispatch.com
169	The Economist US	economist.com
170	The Federalist	thefederalist.com
171	The Guardian US	theguardian.com
172	The Hill	thehill.com
173	The Intercept	theintercept.com

174	The Marshall Project	themarshallproject.org
175	The McLaughlin Group	mclaughlin.com
176	The Nation	thenation.com
177	The National Pulse	thenationalpulse.com
178	The New Republic	newrepublic.com
179	The New York Post	nypost.com
181	The New York Times	nytimes.com
182	The New Yorker	newyorker.com
183	The Onion	theonion.com
184	The Politichicks	politichicks.com
185	The Progressive	progressive.org
186	The Real News	therealnews.com
187	The Resurgent	theresurgent.com
188	The Right Scoop	therightscoop.com
189	The Root	theroot.com
190	The Stream	stream.org
191	The Voice of America	voanews.com
192	The Week	theweek.com
193	The Weekly Standard	weeklystandard.com
194	The Young Turks	tytnetwork.com
195	Think Progress	thinkprogress.org
196	TIME	time.com
197	Townhall	townhall.com
198	True Pundit	truepundit.com
199	Truth Dig	truthdig.com
200	Truthout	truth-out.org
201	Twitchy Team	twitchy.com
202	United Press International	upi.com
203	Univision Noticias	univision.com
204	US News & World Report	usnews.com
205	USA Today	usatoday.com
206	Vanity Fair	vanityfair.com
207	VICE	vice.com
208	Vox	vox.com
209	Wall Street Journal	wsj.com
210	Washington Examiner	washingtonexaminer.com
211	Washington Free Beacon	freebeacon.com
212	Washington Monthly	washingtonmonthly.com
213	Washington Post	washingtonpost.com
214	Washington Times	washingtontimes.com
215	Western Journal	westernjournal.com
216	WND	wnd.com
217	World Affairs	worldaffairsjournal.org
218	World News Network	wn.com
219	World Politics Review	worldpoliticsreview.com

220	World Socialist Web Site	wsws.org
221	Yahoo News	yahoo.com/news

E Comparing estimates from Barberá (2015) between all users and users who share news media

In Figure 7 of the main article, we present side-by-side estimates of ideology of ordinary users and Members of Congress based on following behavior and on news-sharing behavior. In both panels of that figure, the estimates shown are for the same users. These users are those who both followed 3+ political actors Barberá (the follower-based model cutoff 2015) and who shared at least five news media articles (the Media score cut-off). To see differences between the follower-based estimates for users who share news and all users, we present this comparison in Figure A5. As the figure shows, the sort of users who share at least five news media articles are more polarized ideologically than the full set of users. Theoretically, this makes sense given that users who share political news are more likely to be politically engaged generally, which can be associated, for example, with more polarized ideological positioning (Argyle and Pope, 2022).

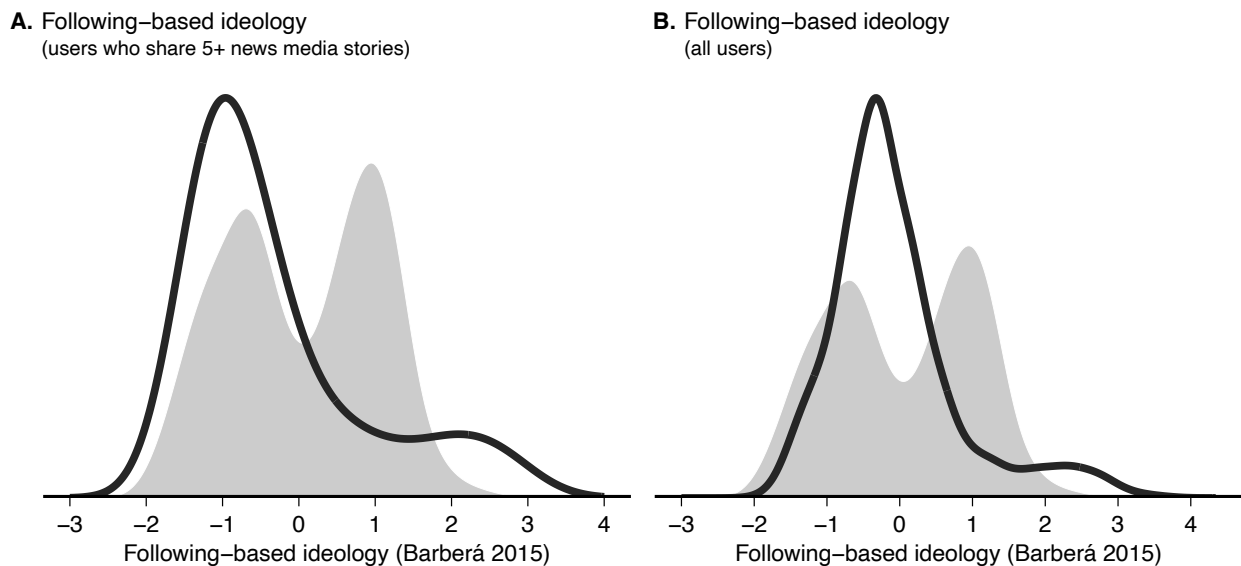


Figure A5: Comparison of follower-based ideology among users who share at least five news media URLs and all users. This figure presents density plots of the follower-based (Barberá, 2015) ideology of ordinary users and Members of Congress among users who have shared 5 (panel A) or more news media stories and all users (panel B). Panel A of this figure is equivalent to panel A in Figure 7 of the main article.

F Ideology estimates of The Squad and Freedom Caucus

In Figure 4 of the article, we show that media scores for politicians are highly correlated with their ideology as estimated from roll-call data (i.e. NOMINATE scores). We also demonstrate that members of “The Squad”—a vocal progressive caucus on the ideological left—are estimated further to the left of the vast majority of their colleague in the Democratic Party. The Squad’s placement to the far left has high face validity, being consistent with popular and expert perceptions of their positioning, even if roll-call estimates suggest that members of The Squad are centrist (Duck-Mayr and Montgomery, 2023).

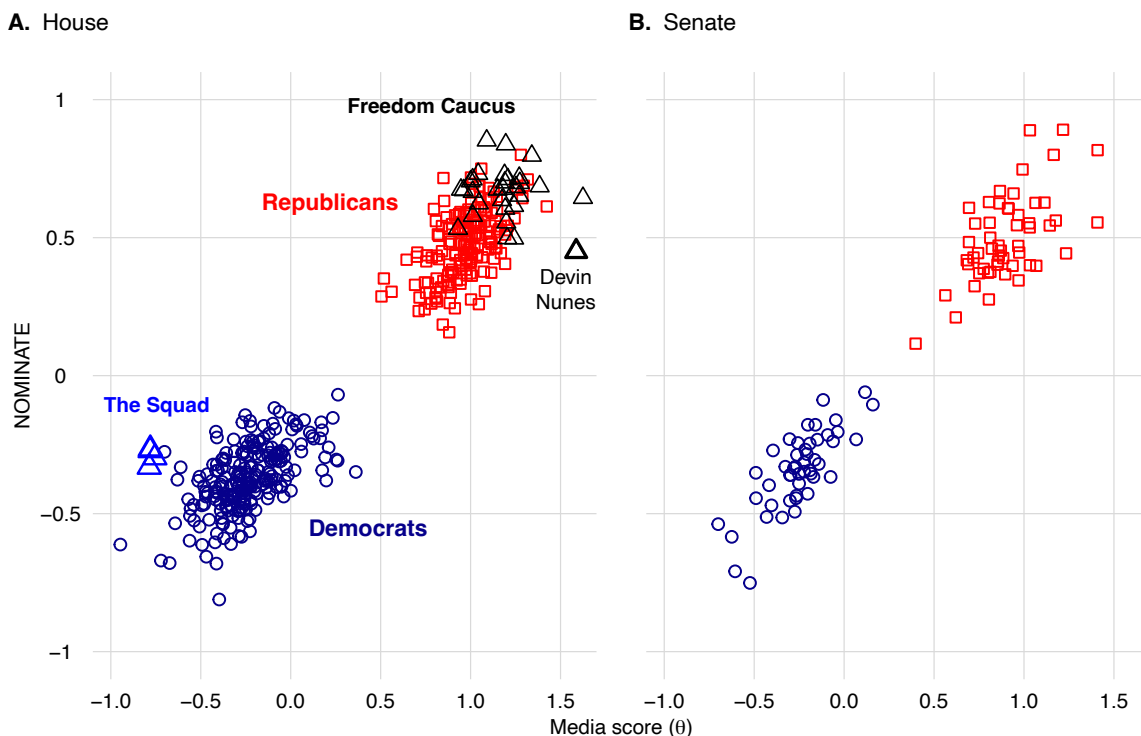


Figure A6: Ideology of Members of Congress from News-Sharing Compared to NOMINATE (Freedom Caucus & The Squad).

In Figure A6, we also show estimates for members of the right-wing “Freedom Caucus”, a caucus of the most conservative Republicans in the House. Estimates for members of the Freedom Caucus, as would be expected, are to the far right of most of their Republican colleagues, and consistent with their roll-call voting ideology. The largest outlier among Freedom Caucus members is Devin Nunes, whose voting record (NOMINATE) ideology is the

most moderate among Freedom Caucus members and his NOMINATE score is to the left of the median Republican member of Congress. This is theoretically consistent with his serving as a congressman in California in a relatively split Republican/Democratic district. In his public communications and position as chairman of the House Permanent Select Committee on Intelligence, however, Nunes was known as one of Donald Trump's most vocal and loyal supporters (Zengerle, 2018), eventually resigning from office to become the CEO of Donald Trump's "Trump Media and Technology Group." The member of the Freedom Caucus who is the furthest to the ideological right according to news-sharing behavior (furthest right triangle) is Louis Gohmert. He is also the furthest to the ideological right among all Republican politicians in the 116th Congress.

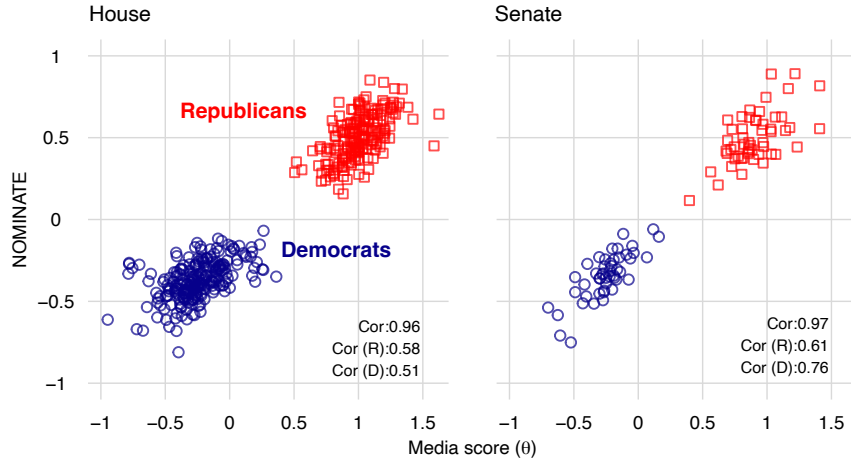
G Validity of media scores for members of Congress by year

In this section, we investigate the convergent validity of measures of ideology based on news-sharing when relatively little data are available. To do so, we estimate media scores for members of Congress separately with data from 2017, 2018, 2019, and 2020.⁵ Results are presented in [Figure A7](#). Panel A presents estimates as shown in Figure 4 from the main article, with high correlations between media scores and NOMINATE scores overall ($\rho = 0.96$, on average in the Senate and House) and within-party ($\rho = 0.62$, on average within the Democratic and Republican parties in each chamber). In Panel B, we report correlations between media scores computed by-year (i.e. using substantially less data) and NOMINATE scores. The correlations are lower per year, suggesting that with less data we are, unsurprisingly, unable to estimate the latent ideology variable as precisely as we can with the larger pooled dataset. However, the correlation between media scores is high overall ($\rho = 0.96$, in the Senate and House per year on average), with within-party correlations that are somewhat lower ($\rho = 0.47$, on average among Democratic and Republicans in each chamber). Thus while we lose precision, the estimates are clearly still meaningful. To give some sense of differences in the amount of data per politician in each sample, we note that the median number of news story URLs per politician in the pooled dataset (Panel A) is 258. In the data subsetting by year, the median number of shares per politician is 57 (Panel B).

We also compare media scores from each individual year of data to those calculated from the pooled data. This provides us with some idea of how closely a single year’s data might compare to a more ideal case in which many more data are available. The average overall correlation between estimates from each year’s data and the pooled data is $\rho = 0.98$; the average within-party correlation (calculated separately per chamber) is $\rho = 0.78$. Using one year’s worth of data will thus provide estimates that are relatively highly correlated with the same measure that was estimated with substantially more data. However, as noted above,

⁵As noted in the main article, the politicians we examine are from the 116th Congress, which ends after the end of 2020 (on January 3, 2021).

A. Complete dataset



B. Data subsetted by year

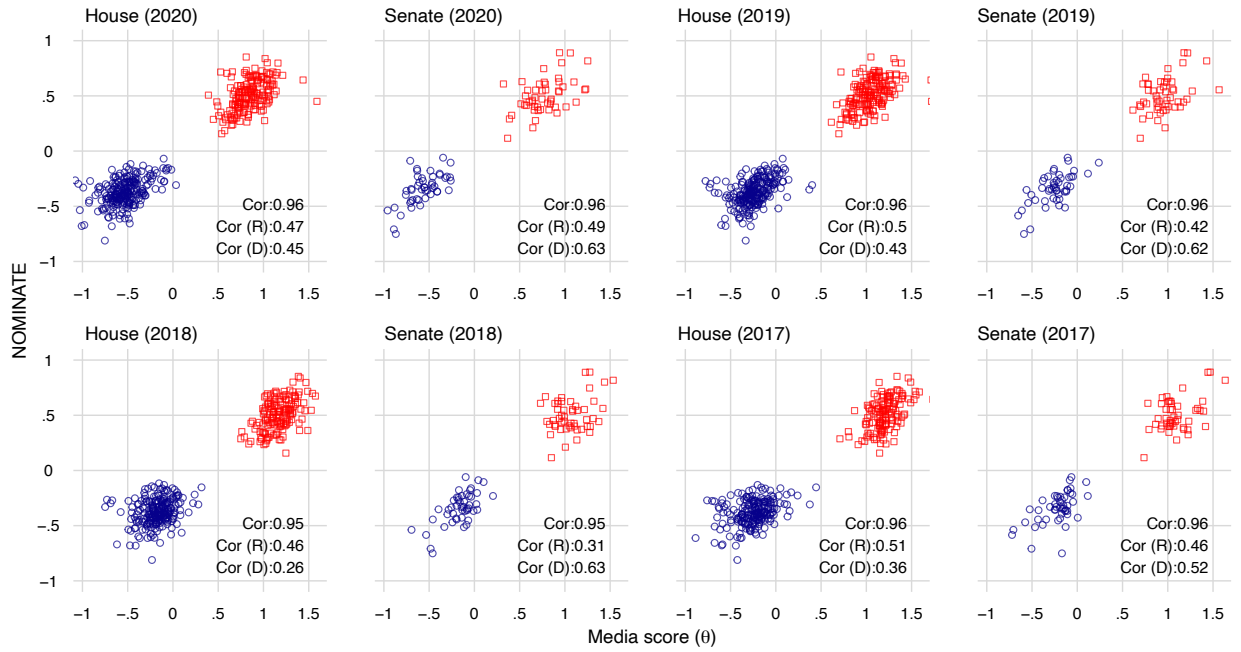


Figure A7: Ideology of Members of Congress from News-Sharing Compared to NOMINATE (per year).

convergent validity (assessed with roll-call voting ideology) will nevertheless be lower, a fact that researchers should bear in mind when applying the method described here in their own research.

Finally, more practically, one may wonder about the extent that having fewer data (e.g. a year's worth), may change the results of a substantive applied question of interest. To

examine this, we test whether the result from the main article regarding electoral competitiveness and the extremeness of ideology based on news sharing is replicable with data from only a single year of data. To do so, we replicate Model (4) from Table 2 in the main article, using estimates obtained from data from the years 2017 thru 2020 separately. Results are presented in [Table A2](#). Model (1) is a replication of the result with the pooled data (i.e. the same regression result as shown in the main article). Models 2–5 show the relationship between district co-partisan alignment and the ideology of members of Congress with media score estimates from separate years of data. As the results demonstrate, the magnitude and sign of the relationship of interest (district alignment) is similar in magnitude and sign across the models. And, as in the pooled model (Model 1), the estimated relationship between district co-partisan alignment and news-sharing ideology are statistically significant at the 95% level in Models 2–4. In sum, although using less data unsurprisingly results in lower convergent validity, the results from the applied example are nevertheless robust to using media score estimates from only a single year of data.

Table A2: Relationship between members of Congress’s ideological extremity, as measured by news-sharing, and district/state alignment (pooled and by year measures)

	DV: Ideological extremity as measured by news sharing				
	(1)	(2)	(3)	(4)	(5)
District alignment	0.130 (0.044)	0.156 (0.048)	0.154 (0.045)	0.100 (0.046)	0.065 (0.049)
Republican	0.008 (0.015)	0.008 (0.016)	0.003 (0.015)	0.010 (0.015)	0.012 (0.017)
Senator	−0.036 (0.019)	−0.017 (0.021)	−0.021 (0.019)	−0.056 (0.020)	−0.061 (0.021)
Nominate score	0.591 (0.092)	0.350 (0.099)	0.349 (0.092)	0.200 (0.095)	0.391 (0.103)
Nominate score × Republican	0.161 (0.114)	0.244 (0.124)	0.295 (0.116)	0.379 (0.120)	0.267 (0.131)
Intercept	−0.030 (0.016)	−0.043 (0.017)	−0.039 (0.016)	−0.018 (0.016)	−0.012 (0.018)
Data used to calculate media scores:	Pooled	2020	2019	2018	2017
N	527	496	496	474	440

H Survey questions from social-media-linked survey data

Below we present the question wording and response categories for the questions used to examine the relationship between the news-sharing measure of political ideology and the survey-based measures.

Issue-based ideological scale

To build the issue-based ideological scale, the survey indicators used were constructed from responses to the following 8 questions.

1. Immigration

As shown on the scale below, some people think that the U.S. should deport all illegal immigrants and others think we should instead provide them with a path to citizenship. And of course others have opinions in between, such as allowing illegal immigrants to obtain guest worker status.

Please place yourself on this scale. Then place each of the following national figures on the same scale. [0, 1, ..., 99, 100]

0: Deport all illegal immigrants back to their home countries

100: Provide all illegal immigrants an eventual path to citizenship

2. Building a wall

As shown on the scale below, some people think we should build a wall between the United States and Mexico, while others think that this would be a foolish waste of resources and not address real issues of immigration. And of course some people have opinions in between.

Please place yourself on this scale. Then place each of the following national figures on the same scale. [0, 1, ..., 99, 100]

0: Build a wall

100: Address immigration Issues via other means

3. Tariffs

As shown on the scale below, some people think that we should increase tariffs on goods from China to protect American jobs from unfair competition, others think that this would lead to a trade war that would harm the American economy and cost jobs. And of course some people have opinions in between.

Please place yourself on this scale. Then place each of the following national figures on the same scale. [0, 1, ..., 99, 100]

0: Increase tariffs on China

100: A trade war would cost jobs

4. Free trade

As shown on the scale below, some people think that we should reduce trade with other countries to protect American jobs from foreign competition, while others believe that we should increase trade to benefit American consumers and create more markets for American goods. And of course others have opinions in between.

Please place yourself on this scale. Then place each of the following national figures on the same scale. [0, 1, ..., 99, 100]

0: Reduce free trade with other countries

100: Increase free trade with other countries

5. Use of military force

As shown on the scale below, some people think that military force should be used only as a last resort, while other people think that military force is usually the best way to solve international problems. And of course, some other people have opinions somewhere in between.

Please place yourself on this scale. Then place each of the following national figures on the same scale. [0, 1, ..., 99, 100]

0: Military force should be used only as a last resort

100: Military force is usually the best way to solve international problems

6. Health care

The Affordable Care Act, signed into law by President Obama in 2010, restructured the U.S. health care system. As shown on the scale below, some people think that the health care law should be repealed entirely, while others think it should be expanded to cover more people and services. And of course, some other people have opinions somewhere in between, such as simply keeping the law as it is now.

Please place yourself on this scale. Then place each of the following national figures on the same scale. [0, 1, ..., 99, 100]

0: Completely repeal the entire health care law

100: Expand the health care law's coverage

7. Barring Muslims from entering the US

As shown on the scale below, some people think we should bar Muslims from entering the US to prevent terrorism, others think it is an essential aspect of the United States that we do not discriminate based on religion, and of course some people have opinions in between.

Please place yourself on this scale. Then place each of the following national figures on the same scale. [0, 1, ..., 99, 100]

0: Bar Muslims From Entering the US

100: Do Not Discriminate Based on Religion

8. Obamacare

As shown on the scale below, some people think we should repeal Obamacare and start over to handle health insurance, others think we should leave Obamacare in place, but expand coverage, and of course some people have opinions in between.

Please place yourself on this scale. Then place each of the following national figures on the same scale. [0, 1, ..., 99, 100]

0: Repeal Obamacare, Start Over

100: Keep Obamacare, Expand Coverage

Ideological self-placement

The ideological self-placement measure was collected from the following question:

As shown on the scale below, some people in the U.S. tend to identify more with the political left, while others tend to identify more with the political right. And of course, some other people have opinions somewhere in between. Please place yourself on this scale. Then place both of the U.S.'s two major parties on the same scale. Then, place each of the following candidates for president on the same scale. [0, 1, ..., 99, 100]

0: Far left

100: Far right

Party Identification

The party identification measure was collected from the following two-part (conditional) question:

Generally speaking, do you think of yourself as a ...

Democrat

Republican

Independent

Other

Not sure

The above question was followed by options to probe the strength of each respondent's partisanship:

Strong Democrat (if response was Democrat)

Not very strong Democrat (if response was Democrat)

Strong Republican (if response was Republican)

Not very strong Republican (if response was Republican)

The Democratic Party (if response was Independent or Other)

The Republican Party (if response was Independent or Other)

Neither (if response was Independent or Other)

Not sure (if response was Independent or Other)

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