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ORIGINAL ARTICLE

Partisan communication in two-stage elections: the effect of primaries on intra-campaign positional shifts in congressional elections

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Abstract
The influence of congressional primary elections on candidate positioning remains disputed and poorly understood. We test whether candidates communicate artificially "extreme" positions during the nomination, as revealed by moderation following a primary defeat. We apply a scaling method based on candidates language on Twitter to estimate positions of 988 candidates in contested US House of Representatives primaries in 2020 over time, demonstrating validity against NOMINATE ($r > 0.93$) where possible. Losing Democratic candidates moderated significantly after their primary defeat, indicating strategic position-taking for perceived electoral benefit, where the nomination contest induced artificially "extreme" communication. We find no such effect among Republicans. These findings have implications for candidate strategy in two-stage elections and provide further evidence of elite partisan asymmetry.

Keywords: Congress; candidate positioning; polarization; primary elections; text-as-data; text and content analysis

1. Introduction

To become a member of Congress, most candidates must win two elections, with distinct incentives, actors, and electorates in each. Though positional differences between parties primary and general electorates appear minimal (Abramowitz, 2008; Hirano and Snyder, 2019; Sides *et al.*, 2020), policy demanders active in the party network play an important role during the nomination (Cohen *et al.*, 2008; Masket, 2009; Bawn *et al.*, 2012) and have distinct and "extreme"[1] preferences (Saunders and Abramowitz, 2004; Hill and Huber, 2017; Kujala, 2019). Candidates must therefore appeal to non-centrist groups in the party network to become the nominee (Fiorina *et al.*, 2005) before attempting to garner wider support among a general electorate who prefer moderate candidates (Ansolabehere *et al.*, 2001) and punish extremism (Canes-Wrone *et al.*, 2002). Accordingly, candidates are presented with a *strategic positioning dilemma* (Brady *et al.*, 2007) across the electoral cycle: which constituency should they appeal to?

Some research suggests that candidates move away from the center in primaries (Burden, 2001; Brady *et al.*, 2007), but a systematic study of candidate positions across a primary and general election cycle remains lacking, in part due to the limited availability of positional time series data of elected officials and losing candidates. Traditional ideal point estimates are only available

[1]We use the term "extreme" here in line with the established use in the primary election literature (e.g., Hall, 2015). "Extremism" may result from positions far from the "center," greater consistency, or some combination of these.

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for elected members of Congress (McCarty *et al.*, 2006) or aggregated across an entire election cycle (Bonica, 2014). To fill this gap, we measure changes in candidate positions both during and after the primary using an original dataset of dynamic social media-based positions. We use supervised machine learning (Goet, 2019; Green *et al.*, 2020) to identify the liberal–conservative axis of 2,500,000 tweets by 988 candidates running for the US House of Representatives in 2020. We validate our measure using NOMINATE scores of candidates in the sample who had ever served in Congress, our scores correlate at 0.93.

We use this measure to test candidate responses to the strategic positioning dilemma over the electoral cycle. Importantly for our design, our method enables us to continue positioning candidates after they lose a primary. Given that voters punish inconsistency (Canes-Wrone *et al.*, 2002), we expect that primary winners will maintain positions taken during the primary to prevent accusations of "flip-flopping." We argue instead that positional adaptation will only be observed among primary *losers* after their defeats, and use this movement to identify whether candidates took artificial positions during the nomination, comparing their communication during the primary campaign with their positions after they lose. In doing so, we test the adaptative rather than the selective effect of the nomination process—our interest is in the change in candidate behavior rather than election outcomes—and hypothesize that losing candidates will moderate after a primary defeat. In this paper, we focus solely on the candidate side of the dilemma, we are explicitly not capturing voter responses to or reception of candidate positioning.

Among Democratic candidates, losing a primary was clearly associated with moderation following a defeat, suggesting the adoption of artificial or strategic positions during the nomination. This finding aligns with other scholarship about candidate behavior in two-stage elections (Burden, 2001; Brady *et al.*, 2007) and similar research on rhetorical position-shifting by presidential primary winners (Acree *et al.*, 2020). We find no equivalent shift in the position of losing Republican candidates, indicating limited strategic position-taking and continued support for "conservative" sentiment even when electoral incentives were absent. The party-level differences are likely explained by the asymmetric nature of the Republican and Democratic parties (Hacker and Pierson, 2006; Theriault, 2013; Grossmann and Hopkins, 2016). Our findings are significant at both the party and candidate levels, and when we restrict our analyses to tweets that explicitly contain policy content.

We proceed as follows: First, we review the literature on strategic positioning in campaign communication. Second, we consider the ability of existing measures to fully answer our question, introducing our scaling technique based on Twitter text. Next, we present our data and findings. Finally, we discuss explanations and implications of our results at both the party and candidate levels.

2. Candidate incentives in primaries

Before candidates can compete in a general election, they must first earn the party's nomination. To win the nomination, candidates must appease various party stakeholders or "policy demanders" (Bawn *et al.*, 2012). Both theoretical expectations (May, 1973) and empirical evidence (Converse, 1964; Abramowitz, 2010) indicate that these groups—by virtue of being highly engaged and politically active—hold positions away from the center and prioritize candidates positional congruence in their selection criteria.

Primary voters do not appear to share the distinct preferences of these policy demanders, with empirical studies of both presidential (Norrander, 1989; Abramowitz, 2008) and congressional primary electorates (Hirano and Snyder, 2019; Sides *et al.*, 2020) finding little or no positional differences between primary and general election party voters. Despite these findings, primary electorates are frequently characterized as extreme by scholars (Burden, 2001; Fiorina *et al.*, 2005; Kamarck, 2014) and politicians (Keisling, 2010; Schumer, 2014) alike. Here, the *perceptions* of political actors are of particular importance given our focus on candidate behavior, where

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candidates might adopt artificial positions because they believe that primary voters hold non-centrist preferences with which they try to align. DeCrescenzo (2020) finds that elites behave as if primary voters want ideological candidates, despite limited evidence that these voters express any such preference.

Yet, winning a primary is not only dependent on positional alignment with voters. In presidential contests, Cohen *et al.* (2008) document the influence of party elites during the nomination. At the congressional level, Hassell (2018) similarly finds that actors in the party network play a key role in candidate selection. The UCLA school of parties (especially Bawn *et al.*, 2012) highlights the importance of "policy demanders"—including donors, activists, interest groups, and even friendly partisan media—in determining candidate selection outcomes. In part because US nominations are comparatively inclusive and decentralized (Hazan and Rahat, 2010; Cowburn and Kerr, 2023), formal party organizations have been "hollowed out" (Schlozman and Rosenfeld, 2019), transferring power from electability-focused formal structures toward comparatively non-centrist and policy-oriented "informal party organizations" (Masket, 2009). Alignment with these groups can help candidates secure the nomination in several ways.

Fundraising is a key indicator of a primary campaign's viability. Donors—and large donors in particular—hold more extreme and consistent positions than primary voters (Kujala, 2019), with distinct preferences and policy positions from non-donors (Gilens, 2009). In short, "Democratic contributors are more liberal than other Democrats and Republican contributors are more conservative than other Republicans" (Hill and Huber, 2017, 10) and donate to proximate candidates (Bonica, 2014). Consequently, non-centrist position-taking aligns with an increased ability to raise funds in both primary and general elections (Ensley, 2009).

Activists form an integral part of a wider network (Bawn *et al.*, 2012) and are a vital resource during the nomination process (Masket, 2009) constituting primary campaigns on the ground. Like donors, these partisans are further from the political center than primary electorates (Saunders and Abramowitz, 2004; Hill and Huber, 2017). Interest groups can play a similar role, with evidence that candidates with interest group support have had increased success in congressional nominations in recent years (Manento, 2019). Both activists and interest groups hold distinct positions on the issues they care about and seek assurances that candidates are positionally aligned during the nomination. Providing assurances to multiple groups can pull candidates away from the center in a process of "conflict extension" (Layman *et al.*, 2010), with evidence that primary candidates who receive more interest group support take positions further from the center (La Raja and Schaffner, 2015; Manento, 2019). The proliferation of partisan media may have further elevated ideological candidates through favorable coverage to an audience of party sympathizers (Heft *et al.*, 2021).

Taken together, these factors help explain why candidates further from the center appear to be preferred even when primary electorates are moderate (Cooper and Munger, 2000; Chen and Yang, 2002). Consequently, there may be considerable benefit to candidates who can communicate non-centrist positions during the nomination.

2.1. Communication and positional change

Legislators signal preferences through roll-call voting (Canes-Wrone *et al.*, 2002) and other candidates need to make alternative credible claims of positions, such as by differentiating themselves through their policies, behavior, or language. Intra-party positioning may include drawing support from aligned allies, attacking a primary opponent on ideological grounds, or associating with an ideological faction (Blum, 2020). These types of differentiation are difficult to change during an election cycle. Perceptions of candidates' positions may also be based on information obtained prior to the election, giving campaigns limited ability to shift over time. Candidates may also perceive strategic disadvantages of moving positions, such as being labeled as inconsistent or of "flip-flopping," which voters are liable to punish (DeBacker, 2008). Under the assumptions

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of the strategic positioning dilemma, we expect candidates to adopt non-median positions during the primary, with limited moderation of nominees in general election campaigns due to the electoral penalties attached to moving position. Because we do not expect primary winners to adapt their positions, we focus on losing candidates' positional adaptation after primary defeats to empirically identify artificial positioning during the primary.

Political communication—including press statements, interviews, and social media activity—allows more flexibility, enabling candidates not only to alter their policy positions but also to change emphasis (Meyer and Wagner, 2019). Candidates can reposition not only by changing their stances on issues but also by changing the issues that they talk about (Budge and Farlie, 1983). Candidates who present themselves away from the center in their policy positions are also non-centrist in their communication, demonstrated here by the alignment of positions derived from voting behavior and social media communication for candidates in our data who ever served in Congress.

Most losing candidates in our sample did not run for alternative public office following their defeat. Though most—not all—remained active partisans, relatively few faced continued deliberation or public votes on their positions. Some candidates ran for or continued to hold local public office, but the vast majority did not. We consider losers' social media communication after the primary as the best available approximation of "sincere" preferences. We recognize that even this communication does not take place in a vacuum, as unsuccessful candidates likely wish to remain in good standing with their party, either to run for public office again or to hold an appointed position. Yet, social media posts likely play a minimal role in fulfilling these goals, and, though we acknowledge that candidates will not want to communicate anything that causes reputational damage, they are likely less strategic than contributions in party meetings or other formal venues. We also recognize that the dominant linguistic frames used by party leaders and other elites likely influence candidate communication but minimize the extent of such effects by comparing candidates' positions against themselves across a relatively short period. Empirically, we also expect that these strategic considerations likely decrease rather than accentuate positional movement compared to (unobservable) communication absent *any* external incentives.

3. Measuring elite positions

To determine whether candidates communicate artificial positions in primaries, we require positions *over time*. Common measures of positional estimation based on roll-call votes (Poole and Rosenthal, 1985) or campaign donations (Bonica, 2014) are either not available for all candidates or fail to provide the required temporal granularity. We therefore use an alternative measure placing candidates and officeholders on the same dimension by scaling social media communication. Social media allow political elites to communicate directly with potential voters in public. Twitter in particular has developed into an important campaign tool for parties and politicians that has gained substantial scholarly attention (Russell, 2018; Barbera *et al.*, 2019; Cowburn and Oswald, 2020; Cowburn and Knüpfer, 2023). Tweets have become part of the news cycle and Twitter is now a rich source of information about the thematic emphases of politicians and their positions. In line with established literature on the subject (see e.g., Boireau, 2014; Ceron, 2016; Sältzer, 2020), we analyze Twitter text to position candidates over time. Unsupervised text classification methods include Wordfish, which enables comparisons of election manifestos (Slapin and Proksch, 2008) and political speeches (Lauderdale and Herzog, 2016). One challenge of these approaches is a lack of agreement that the extracted dimensions relate to political ideology. Supervised text analysis ensures a correct understanding of the underlying dimension but requires "training data" to teach algorithms which text aligns with different positions. Since ideology is continuous rather than categorical, methods such as Wordscores (Laver *et al.*, 2003) use scaling, but set fixed endpoints using anchor documents. Similar approaches have also been applied to

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newspapers (Gentzkow and Shapiro, 2010) and television channels (Martin and McCrain, 2019). To identify the dimension of partisan conflict, Goet (2019) and Green *et al.* (2020) use supervised learning on party labels to identify positions. We follow this approach here.

3.1. Data

We collected the timelines of social media accounts of candidates running as a Republican or Democrat in a contested primary for the US House of Representatives in 2020. In line with the established literature (Boatright, 2013, 2014), we consider primaries as contested when two same-party candidates feature on a ballot. Twitter accounts were collected based on a search list created by sourcing ballotpedia.com. We restricted our sample to candidates in contested primaries with identifiable Twitter accounts who tweeted regularly enough for us to position them both before and after their primary election date. We include positional data from 988 of the total of 1772 candidates that stood in a contested primary as a Democrat or Republican for the US House of Representatives in the 2020 election cycle. Our sample is heavily skewed toward candidates with a realistic chance of winning the nomination, where a large proportion of excluded candidates did not raise money or actively campaign and received single-digit vote shares. Unsurprisingly, higher-performing candidates were more likely to have an active social media presence.[2] Our data include candidates from 49 states, as Louisiana does not hold congressional primaries.[3]

Accounts were cross-referenced with manually collected candidate data (Cowburn, 2022), compiled throughout the 2020 primary cycle using certified data from state's websites. Tweets were collected using the Twitter API implementation rtweet (Kearney, 2018) for all candidates with Twitter accounts in June 2020. Having gathered the list of accounts in June, we constructed our dataset between June 2020 and March 2021. To prepare the data, we removed all URLs, lower-cased, and cleaned for HTML code (such as emojis). We removed names, punctuation, numbers, and Quanteda's (Benoit *et al.*, 2018) default English stopword lists to reduce computational requirements. We remove all hashtags and mentions in our main analysis after comparing validity across specifications (see supplementary materials).

3.2. Positions from Twitter text

Following Goet (2019) and Green *et al.* (2020) we use a supervised machine learning model to estimate candidates' positions in Euclidean space (Laver *et al.*, 2003; Slapin and Proksch, 2008). We classify each candidate based on their party identification using a Naïve Bayes classifier. Our model uses a bag-of-words approach to predict the party membership of each candidate. Each word in the dataset is assigned a partisan value which can then be applied to any document to score how "partisan" it is. Traditional classifiers use binary classification to estimate the outcome, but, because we want a continuous measure, we use the (normalized) relative log-likelihood, giving a score that a document has a certain partisan "identity." In the case of individual positions (as in the validation) this "document" is all tweets by a candidate in a given period.

Uncertainty. One disadvantage of this approach is the absence of confidence intervals. As the model estimates the likelihood of a text's partisanship, there is no natural interpretation of uncertainty. We can quantify how dependent the results are on specific cases and features, for example,

[2]Other studies of congressional primaries restrict inclusion based on vote share thresholds (Boatright, 2013, 2014) or advocate for financial measures (Thomsen, 2021). Restricting based on social media presence is analogous and excludes many of the same long-shot candidates.

[3]Given only eight districts in California or Washington featured same-party (Democratic) general elections we include these states. We repeat our main analysis without these districts in the supplementary material.

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if a candidate uses specific terminology in a manner distinct from their colleagues and changes the meaning. To account for this possibility, we compute *bootstrapped* positions. Instead of computing a single Naïve Bayes model, we resample all data by drawing 90 percent of them 400 times, rerunning the model, and storing the term weights. When predicting the positions of documents, we again predict 400 positions, computing the standard deviation to get an approximation of error. The results are normally distributed positions around a mean, allowing us to quantify potential uncertainty.

To apply our data to our research question we compute candidate positions at different time points, before and after their respective primaries. We use a three-step process: training the Naïve Bayes model, computing positions of members of congress, validating these positions, and aggregating the data at different levels. We predict the party membership of a validation set of 30 percent of candidates using the other 70 percent as training data. We achieve an accuracy of 0.946, precision of 0.955, recall of 0.926, and F1 score of 0.940, indicating that the model is very good at predicting candidates' partisan affiliation.[4] Having trained the model at the individual level, we then apply the weights of these terms to tweets aggregated at the candidate level, the candidate level before and after the primary, and the party level over time (weeks). In other words, we train the model on partisan difference and then estimate the degree of partisanship.

Challenges of this approach include variation in the quantity of candidate-level data, with some candidates rarely tweeting and others so active that their tweets are capped by the API rate limitations Twitter imposes (3200 tweets). Perhaps most importantly, our dataset includes a combination of political tweets mixed with apolitical tweets that do not indicate position. This mix of content has the potential to produce problems when scaling positions, where higher rates of non-political tweets could result in candidates being interpreted as moving toward the center (Grimmer and Stewart, 2013). We deal with this problem explicitly by also applying our model to policy-related tweets only.

Our approach has several advantages. We use the simplest possible model, driven by our desire to avoid overfitting, as a model that was too tuned to classify partisanship might neglect intra-party differences. A second advantage is the computational requirements where, because of the speed of Naïve Bayes, large bootstraps can still run on a single computer. This type of model also does not require stop criteria or a loss metric as it is solved on the document feature matrix (DFM), meaning it does not need to converge in the way that a deep learning model would.

External validity. Introducing a new measurement for a latent construct requires external validation, we demonstrate our scores' predictive validity against other known estimates of congressional candidates. Given that one motivation for this study is the absence of such measures for all candidates, we compare our results with a subset of our data. The most widely used measure is NOMINATE (Poole and Rosenthal, 1985), based on members' roll-call voting in Congress. Of course, this measure is only available for members who have ever served in Congress. If these members are positioned in a meaningful way that captures the underlying dimension, other candidates placed on the same dimension should also align. In total, we validate our measure using over 2,000,000 Tweets by 518 members of Congress.

Figure 1 shows this validation, with NOMINATE scores on the x-axis. The y-axis shows the average positions predicted by Twitter communication over the entire electoral cycle. To increase the number of data points against which to validate, and to give our model a hard test, we also include US senators and incumbent representatives who retired in 2020 in this plot. Our model was not trained on these members' tweets, providing an ideal independent corpus against which to validate.[5]

[4]We also include the results of ten-fold cross-validation in the supplementary materials.

[5]Senators' data are only used for validation and do not feature in our main analyses.

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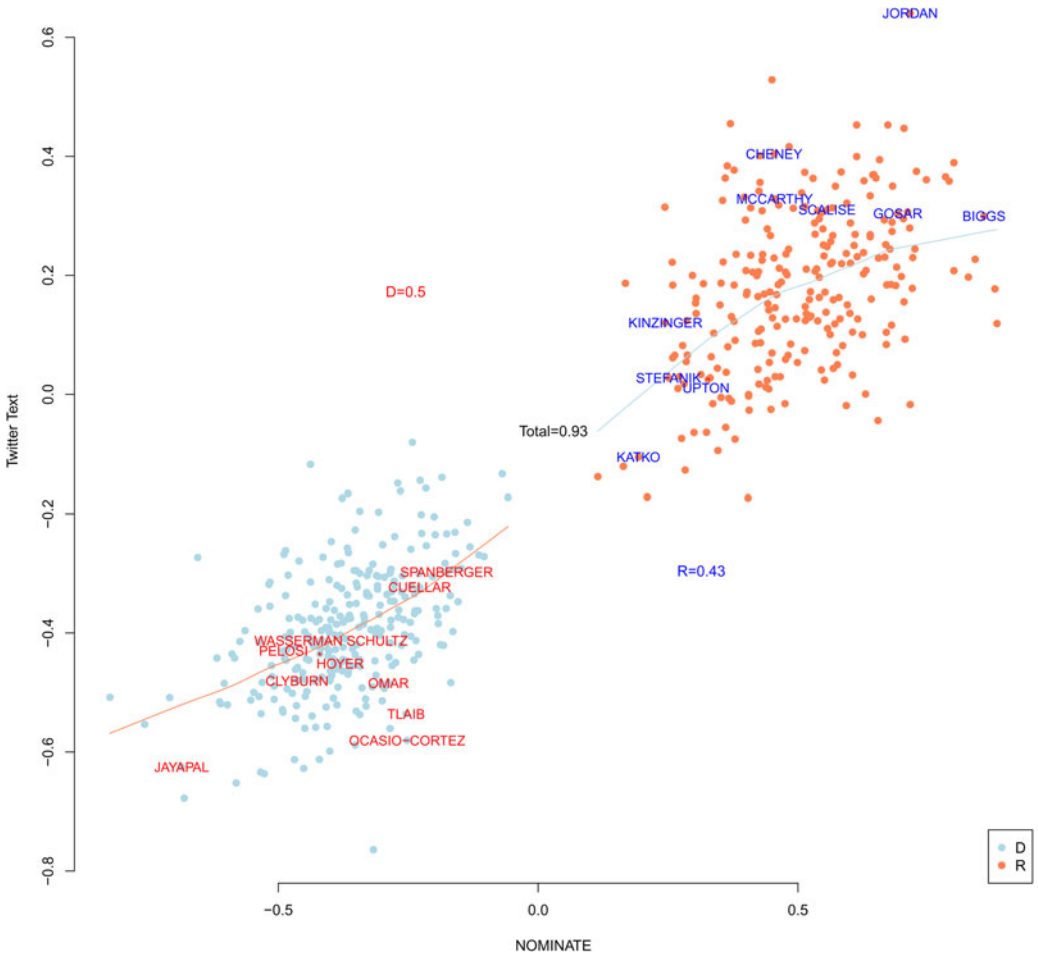

Figure 1. Validation against NOMINATE for members of Congress.

The overall correlation is 0.93, with higher intra-party correlations than alternative recognized scaling measures such as follower network scores (Barbera, 2015) or CFscores (see Barber, 2022). We also demonstrate semantic validity by labeling some notable representatives' positions. In both parties, representatives who are commonly perceived as "moderates"—including Abigail Spanberger, Henry Cuellar, John Katko, and Fred Upton—are also moderate by our measure. Similarly, representatives such as Pramila Jayapal and Jim Jordan, viewed as highly liberal and conservative respectively, are away from the center on our scale. In addition, Democratic representatives such as Alexandria Ocasio-Cortez and Rashida Tlaib, who are incorrectly positioned as moderates by NOMINATE due to their opposition to some Democratic bills,[6] are positioned as more liberal under our measure. These correlations give confidence that our measure is aligned with the liberal–conservative dimension structuring roll-call voting behavior, and suggest that in some cases where they differ, our measure may even serve as a more accurate proxy for ideology than NOMINATE.

Semantic validity. Though we obtain predictive validity by comparing the positions generated with roll-call votes, we need to qualify our analysis by understanding the language that identifies our

[6]See Lewis (2022) for details

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dimension. To do so, we interpret influential words that produce scores further from the center. Our measure can be said to have semantic validity if these scores are associated with parties' positions, campaign rhetoric, or policy issues.

Figure 2 shows the terms for each end of the dimension surrounding the positions estimated in Figure 1 that occur more than 1000 times in the entire corpus of tweets. Positions from Figure 1 are shown in the center of Figure 2. The lower (higher) the position of a word on the *y*-axis, the more indicative it is for the Democratic (Republican) Party and contributes to a score further to the left (right). Accordingly, representatives that tweet a lot about "illegals" and "rioters" receive scores further to the right than those who tweet about more moderate identifying terms such as "manufacturers" or "regulations." The positions of words on the *x*-axis are for presentation purposes only and have no substantive meaning. Figure 2 demonstrates that the terms that score

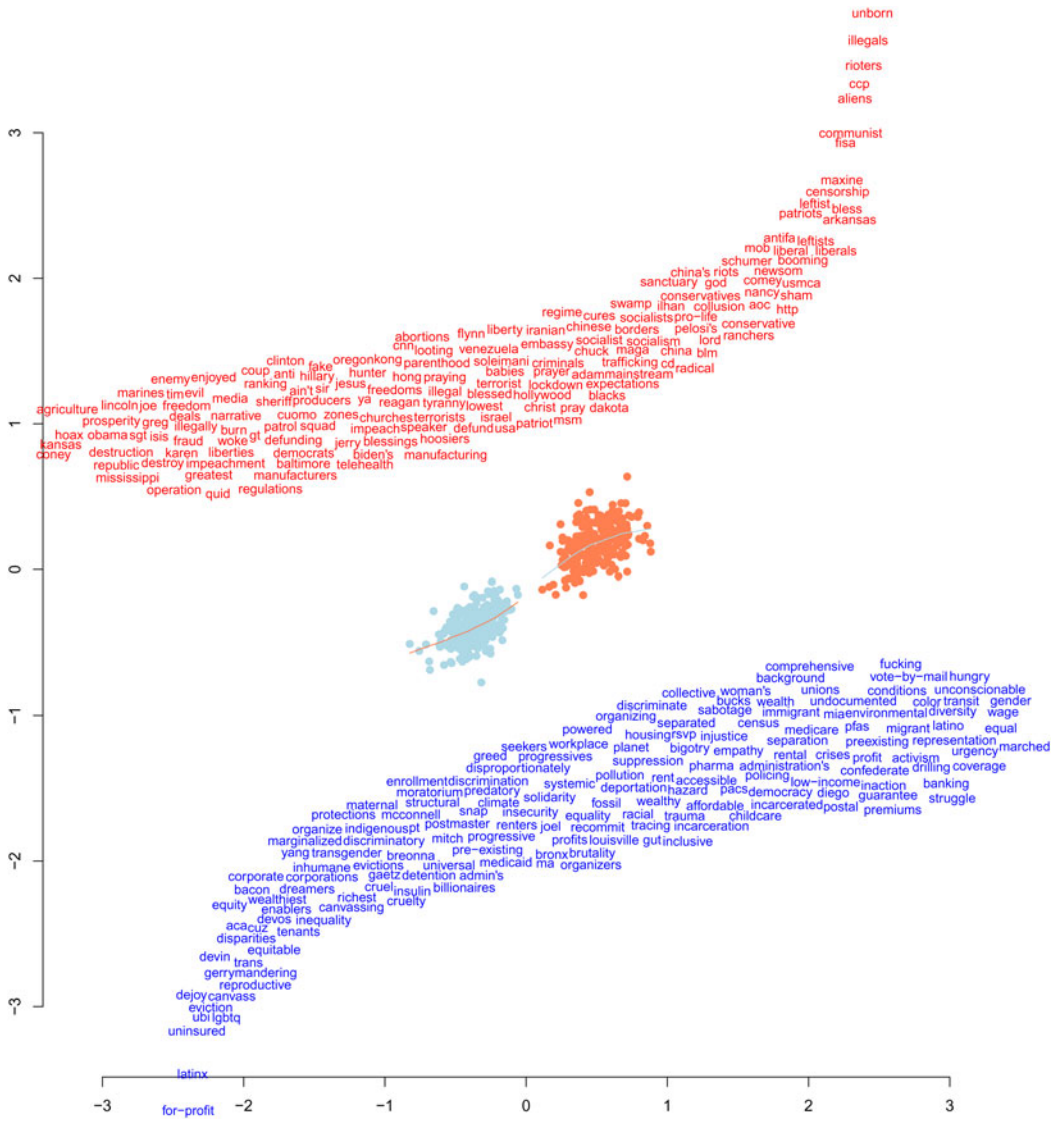

Figure 2. Validation with terms.

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highly in either a liberal or conservative direction are in line with partisan expectations, where terms at the bottom would be words expected to be used by Democrats and terms at the top of the figure expected to be used by Republicans. In other words, Figure 2 indicates that our approach has semantic validity.

These terms can broadly be grouped into three categories: policy-related, own-party rhetoric, and negative terms. Policy-related terms to the right included "illegals," "censorship," and "unborn." Republican own-party rhetorical terms included "patriots" and "conservatives." The terms "rioters," "communist," and "leftist" were used by Republican candidates to talk negatively about the Democratic Party and their supporters and were similarly scored to the right. Liberal policy-related terms included "uninsured," "ubi," and "for-profit." Democratic own-party rhetorical terms included "canvass" and "progressive," and terms such as "lgbtq" and "trans" referred to demographic groups who favor the party. The terms "inhumane" and "cruelty" were negative liberal identifiers. Given that the terms at each end of our scale can be broadly understood as having a partisan valence, we can say that our approach has semantic validity.

4. Findings

Following validation, we trust the model to infer positions. In our first analysis, we produce a model at the party level and focus on dynamics over time. To test the effect of primaries, we are not interested in the date, but the *relative* time to or since candidates' respective primaries. Because states hold nomination contests on different dates, we center the time around each intra-party election, using a time-to-primary variable for each tweet as weeks before or after the primary. We then aggregate at the following levels: party, whether the candidate won their primary, and time-to-primary (weeks). Each observation is the aggregate of terms used by members of a party who won or lost the nomination at the same relative time before or after their primary.[7]

4.1. Shifting after the primary: the party perspective

Figure 3 shows the positions of winning and losing candidates in both parties as groups aggregated by week to or from their respective primary. As the figure indicates, Democratic candidates who do not become the nominee shift their position *toward the center* directly after their primary. Republican losers do not moderate following primary defeats.

To test the statistical significance of this effect, we run a comparative interrupted time series analysis (ITS) with the below specification (see also Linden, 2015). Our data are repeated observations of candidates' communication positions and we expect positions to change following the "intervention"; the primary election date. We use a (comparative) ITS model given the obvious differences between many candidates who win and lose primary elections. Many candidates who win primary elections are either incumbent members of Congress or highly experienced and well-financed challengers. In contrast, many primary losers receive little to no support from party elites, have little financial support, and may be relatively unknown. Put simply, we conceive that there are too many differences between winning and losing primary candidates to control for, even using approaches such as matching, synthetic controls, or propensity score weighting. Instead, we use an ITS which allows us to compare groups and compare candidates' positions to themselves prior to the intervention. We do not expect primary winners to moderate immediately after the primary in this design. Conversely, we expect that losing candidates will be more moderate after the primary than they were during the nomination. Using an ITS rather than a two-way fixed effects model also allows us to include group characteristics that change gradually during the election cycle. Given that our data-generating process is independent for each time period, we do not include lagged variables in our models (see also

[7]As a placebo test, we also randomized this date. See supplementary material for details.

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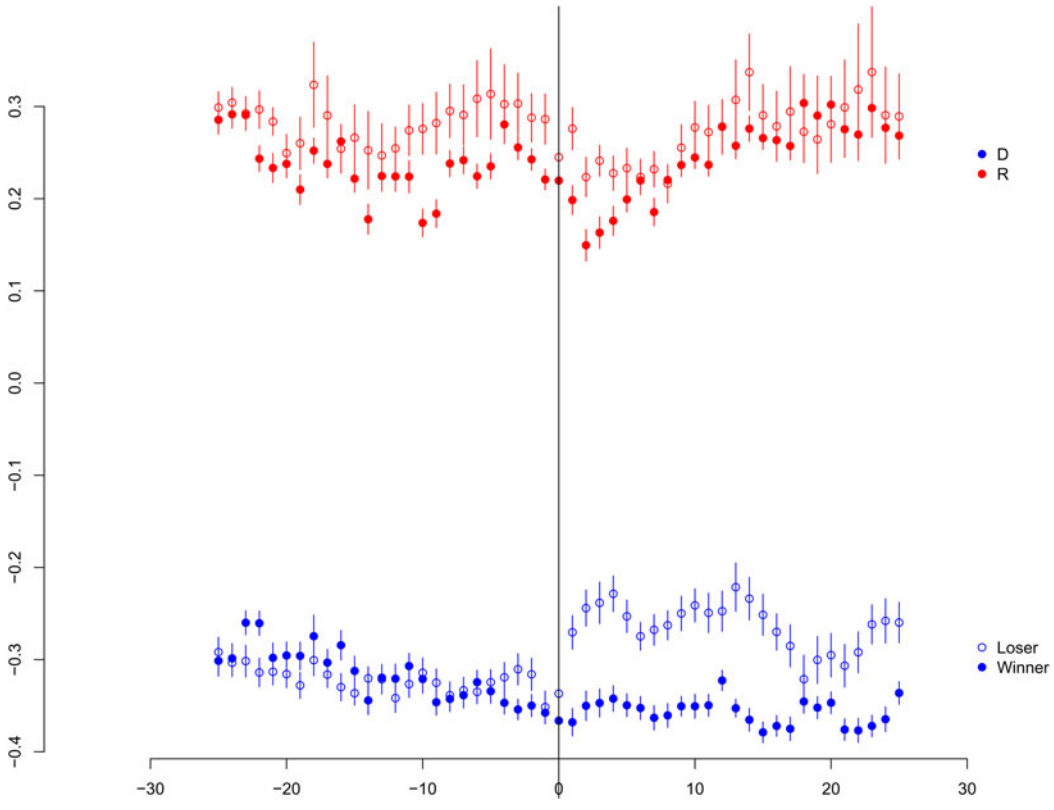

Figure 3. Party level positions over time.

Warner, 2019).[8] One drawback of this design is that the differences—both between winners and losers, and losers versus themselves in the previous period—mean our results are associational, and we cannot infer that the presence of the primary is what *caused* candidates to adopt artificial positions. We run separate models by party, with the following specification for our first models:

$$Y_{it} = \beta_0 + \beta_1 T_t + \beta_2 X_t + \beta_3 X_t T_t + \beta_4 Z_i + \beta_5 Z_i T_t + \beta_6 Z_i X_t + \beta_7 Z_i X_t T_t + \varepsilon_t$$

Where Y_{it} is candidate position Y given membership of group[9] i measured at week t. T_t is the time in weeks to or since the primary. X_t is a dummy variable representing the primary election, where pre-primary observations take the value zero and post-primary observations the value one. $X_t T_t$ is the interaction term between post-primary and time, meaning β_2 is the immediate change following the primary and β_3 gives the ongoing movement among all observations. Z_i is the group we expect to moderate, which takes the value one if a candidate lost and zero if a candidate won their primary. Coefficients β_4 to β_7 are the same as β_0 to β_3 interacted with losing (Z_i), meaning β_6 gives the immediate change among losing candidates immediately after the primary and β_7 gives

[8]Empirically our data are independent at each time point, where the communication for a given week is not the result of communication beforehand. Yet, theoretical and empirical literature indicates that candidates benefit from positional consistency. Though our dependent variable does not depend linearly on its own previous values, we expect these values to be correlated. We therefore demonstrate the robustness of our findings by including a lagged version of candidate positions in the supplementary material.

[9]Democratic winners, Democratic losers, Republican winners, Republican losers.

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Table 1. ITS results: party level

	All candidates		Losers only	
	Democrats	Republicans	Democrats	Republicans
Time (T_t)	−0.003***	−0.001***	−0.001**	0.000
	(0.000)	(0.001)	(0.000)	(0.001)
Post-primary (X_t)	0.009	−0.044***	0.093***	−0.053***
	(0.009)	(0.014)	(0.010)	(0.013)
Post-primary : time (X_tT_t)	0.003***	0.007***	−0.000	0.003***
	(0.001)	(0.001)	(0.001)	(0.001)
Loser (Z_i)	0.025***	0.064***		
	(0.009)	(0.013)		
Loser : time (Z_iT_t)	0.002***	0.001		
	(0.001)	(0.001)		
Loser : post-primary (Z_iX_t)	0.084***	−0.009		
	(0.013)	(0.020)		
Loser : post-primary : time ($Z_iX_tT_t$)	−0.003***	−0.003*		
	(0.001)	(0.001)		
Intercept	−0.387***	0.190***	−0.362***	0.254***
	(0.006)	(0.010)	(0.007)	(0.009)
N	102	102	51	51
R^2	0.846	0.608	0.765	0.368
Adjusted R^2	0.834	0.579	0.750	0.328
Residual Std. error	0.016	0.025	0.018	0.024
	(df = 94)	(df = 94)	(df = 47)	(df = 47)
F statistic	73.747***	20.851***	50.927***	9.138***
	(df = 7; 94)	(df = 7; 94)	(df = 3; 47)	(df = 3; 47)

Note: Newey–West standard errors shown in parentheses.
*p < 0.1; **p < 0.05; ***p < 0.01.

the ongoing movement following the primary. We expect moderation from losing candidates immediately after they lose their primary, meaning β_6 (Z_iX_t) is our main object of interest for the first models.[10]

Given that our goal is not the causal identification of differences between winners and losers, we also include a second set of models that are restricted to losing candidates only. These models take the same form as the above specification with the removal of the loser variable Z_i and subsequent interactions, meaning X_t is the object of interest in these models. Our first models indicate how losing candidates were positioned relative to winners in the same week, whereas the second set of models identify how candidates moved relative to themselves in the previous period.

One potential issue with cross-sectional time series data is non-stationarity, where conditional means are dependent on the time period and where a variable has a unit root. To demonstrate that our models have $I(0)$ balance (Pickup and Kellstedt, 2022) and to understand the order of integration we perform (augmented) Dickey–Fuller (Dickey and Fuller, 1979) tests on each of the four groups' dependent variables, with results reported in the supplementary material. In each case, our tests return significant values, indicating no unit root on the left-hand side of our models. We also account for variation in the trend stationary dependent variable by including T_t in our specification. Of our independent variables, both the primary (X_t) and winning or losing (Z_i) do not contain a stochastic component. The only term on the right-hand side of our equation that is stochastic is the error term; we demonstrate that the estimated errors (residuals) are indeed white noise in a further series of Dickey–Fuller tests, with the results reported in the supplementary material. These tests indicate that our equation is $I(0)$ balanced.

In line with the visual trend depicted in Figure 3, our first model in Table 1 shows that Democratic losers became significantly more moderate than winners immediately after the

[10]We use Newey–West standard errors to account for potential heteroskedasticity and serial autocorrelation.

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primary (Z_iX_t). In contrast to the weak time trend, the effect is almost 5 percent of the total range of the variable, this is the strongest identifier of position other than partisanship. In other words, losers shift their position after their primary relative to winners, and this shift is more than 20 times greater than the average weekly positional change (T_t). Losing Democratic candidates were more moderate than winners prior to the primary (Z_i) yet moved much further rightward following the primary (Z_iX_t). All other Democratic coefficients in this first model are substantively close to zero.

For Republican losers, Table 1 indicates no significant moderation following primary defeats relative to primary winners (Z_iX_t). It appears that Republican winners moderate slightly after the primary (X_t) then quickly move back toward their pre-primary positions in subsequent weeks (X_tT_t), also seen in Figure 3. Across the whole period, losing Republican primary candidates are consistently further to the right than winners (Z_i). All other coefficients in this first model are substantively close to zero.

In the second set of models, we consider the position of losers after the primary compared to their positions during the primary, indicated by the post-primary coefficient (X_t). Among Democratic losers, our finding is virtually unchanged, with Democratic candidates again positioned significantly further to the right immediately after the primary compared to their previous positions. Among Republicans, we also see evidence of moderation of losers in the immediate post-primary period as compared to their position during the primary. As depicted visually in Figure 3, it appears that all Republicans moderated immediately after the primary and then returned to their original positions over time. This movement is substantively far smaller than among losing Democrats.

Unsurprisingly, partisanship—shown here in the form of the intercept—is the strongest predictor of position for candidates in both parties. At the party level, we find a clear moderating effect among losing Democratic candidates.

4.2. Robustness to the changing salience of non-political tweets

One identifiable problem of ideal point estimation over time is the changing salience of features that contribute to the dimension (Grimmer and Stewart, 2013). The appearance of moderation may stem from movement toward more centrist content—ideological moderation—or a reduction of political or policy-related content. Accordingly, it might be that candidates are merely tweeting less about politics and turning their account into a private platform after they lose a primary rather than continuing to discuss politics.

To ensure the robustness of our approach to this problem, we apply our method to a subset of explicitly policy-related tweets. To do so, we hand-coded a random set of 1200 tweets using three categories; political (y/n), policy-related (y/n), and policy area (using policy fields established in the Comparative Agendas Project). Though the sample was too small to analyze policy areas individually, roughly half of the tweets in the sample were policy-related. We then trained a classifier for these tweets, using an English-language Bidirectional Encoder Representations from Transformers (BERT) (Devlin *et al.*, 2019) model, which achieves a satisfactory F1 score of 0.8. We use this model to predict whether all 2,500,000 tweets in our original sample were policy-related (again, roughly half were) and estimate positions.[11] We then re-ran our analyses on this subset.

The results are shown in Table 2 and align with our main finding, with substantively significant moderation among Democratic losers after the primary, either compared to Democratic winners in the same period or to themselves during the primary. Movement immediately after the primary is again more than 20 times the size of the average weekly movement and is the strongest

[11]We repeated this process with political (y/n). Because roughly 90 percent of tweets were coded as political, this variable had limited analytical application.

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Table 2. ITS results: policy tweets only

	All candidates		Losers only	
	Democrats	Republicans	Democrats	Republicans
Time (T_t)	−0.003***	−0.001	−0.000	−0.000
	(0.001)	(0.001)	(0.001)	(0.001)
Post-primary (X_t)	0.020*	−0.040***	0.059***	−0.024
	(0.011)	(0.015)	(0.011)	(0.020)
Post-primary : time (X_tT_t)	0.001	0.006***	−0.002**	0.002
	(0.001)	(0.002)	(0.001)	(0.001)
Loser (Z_i)	−0.003	0.033***		
	(0.009)	(0.019)		
Loser : time (Z_iT_t)	0.002***	0.000		
	(0.001)	(0.001)		
Loser : post-primary (Z_iX_t)	0.041***	0.001		
	(0.014)	(0.028)		
Loser : post-primary : time ($Z_iX_tT_t$)	−0.002***	−0.002		
	(0.001)	(0.002)		
Intercept	−0.342***	0.211***	−0.456***	0.152***
	(0.026)	(0.038)	(0.007)	(0.013)
N	102	102	51	51
R^2	0.851	0.610	0.534	0.055
Adjusted R^2	0.839	0.576	0.504	−0.005
Residual Std. error	0.016	0.025	0.019	0.035
	(df = 93)	(df = 93)	(df = 47)	(df = 47)
F statistic	66.578***	18.157***	17.937***	0.910
	(df = 8; 93)	(df = 8; 93)	(df = 3; 47)	(df = 3; 47)

Note: Newey–West standard errors shown in parentheses.
*p < 0.1; **p < 0.05; ***p < 0.01.

indicator of position other than partisanship. Our finding that Republican losers were more moderate after than during the primary is no longer significant when restricted to policy tweets, suggesting that this finding was at least partly the result of a shift in focus. This additional analysis gives confidence that our main result for Democrats is not an artifact of the changing saliency of policy-related tweets after primary defeats and is instead evidence of positional adaptation by losing candidates.[12]

4.3. Individual-level robustness

To avoid the ecological fallacy, we also analyze the individual level. We do not have enough tweets at the individual level to reliably compute positions in the same density as at the party level[13] meaning we instead aggregate candidates' positions before and after their primary to enable the direct comparison of candidate-level movement. In this model, we control for incumbency given that incumbents may face additional pressures and incentives to maintain their positions because they have political records to uphold which can be held accountable by voters and opposition candidates. Given that district partisanship influences positional incentives in both primary and general elections, we control using *The Cook Political Report*'s (2017) partisan voting index (PVI), rescaled to a +/− Republican lean.[14]

Figure 4 shows the individual-level results. These models use the difference (movement) in candidates' positions before and after their primary as the dependent variable, where positive coefficients indicate rightward movement and negative coefficients indicate leftward movement. We test using two dependent variables: absolute movement, and a variable of *significant*

[12]We again demonstrate stationarity and $I(0)$ balance by conducting Dickey–Fuller tests on our dependent variables and residuals in this subset, see supplementary material.

[13]The number of candidates positioned is also reduced from 988 to 886.

[14]We repeat this analysis without controls in the supplementary material, our results are unchanged.

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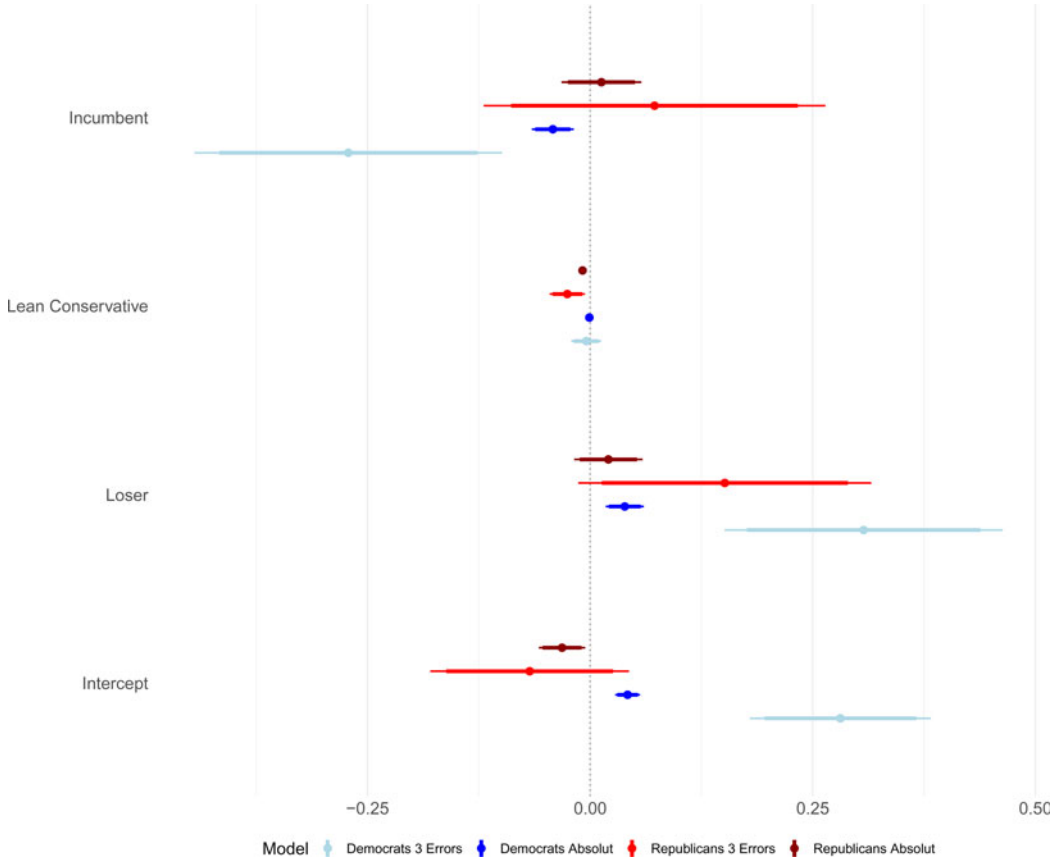

Figure 4. Individual-level movement.

movement. This variable takes the value 1 if a candidate moves rightward three standard error confidence intervals and the value −1 if a candidate moves left to the same degree.

In line with our party-level findings, Democratic losers took more moderate positions after the primary in both individual-level models, giving further confidence in our party-level findings. Republican losers also move slightly to the right, but the effect is not statistically significant. As in the party-level model, partisanship—the intercept—indicates moderation among all candidates at the individual level following the primary. Democratic incumbents moved slightly to the left at the individual level, with no significant effect among Republicans. District partisanship had no relationship to Democratic positioning and a small but significant association for Republicans, who took less conservative positions in districts that were less favored for the party.

5. Discussion

Our results indicate that primaries are associated with artificial position-taking among Democratic candidates only. We interpret these findings as support for the strategic positioning dilemma among Democratic candidates, who adopted artificial positions during the primary which they did not continue to hold once absent the (perceived) incentives to do so. Among Republican candidates, we find minimal evidence of artificial positioning, suggesting that communication during the primary was done out of conviction rather than for perceived advantage. Absent electoral incentives, losing Republican primary candidates continued to communicate highly conservative positions.

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The moderation of losing Democratic candidates after the primary indicates our theorized effect that intra-party competition is associated with artificial extremism during the nomination. Grossmann and Hopkins (2016) suggest that the Democratic Party is a diverse coalition of group-oriented actors. Rather than being defined by ideological conflict, candidates advocate for different groups which are understood primarily in terms of demographics and identity. Consequently, Democratic candidates are less frequently ideological purists and so may be more comfortable adapting their positions. Because ideology is not a central binding force in the party, candidates are able to be more flexible and change positions than their Republican counterparts. If candidates perceive that important policy demanders are to their left, they may have additional incentives to adopt artificial positions during the nomination. The Democratic Party might therefore recruit more strategic candidates or be more selective in recruitment by actively seeking out candidates who can adapt positions. The ability to be flexible and strategically appeal to many of the diverse interest groups that make up the Democratic Party appears one important characteristic sought out by party elites and policy demanders in the party network who play a central role in candidate recruitment (Cohen *et al.*, 2008; Hassell, 2018). These groups prefer candidates with a broad appeal during the nomination process (Masket, 2020), in part out of necessity because the party needs to carry some swing or even marginally Republican-favored districts in general elections to control the House. In short, recruitment strategies matter and are likely asymmetric (Maestas and Stewart, 2012). Intra-party power struggles likely provide further incentives for Democrats to moderate after a primary. Though progressives have made recent gains, the Democratic Party remains dominated by "establishment" center-left moderates, meaning losing candidates who want to continue a career in the party are wise to moderate to appeal to like-minded individuals.

For Republicans, our results align with scholarship that positions candidates for Congress as more extreme, or at least more ideologically consistent, than other groups and voters in their party (Bafumi and Herron, 2010; Barber, 2016). These results run counter to the expectations of the strategic positioning dilemma. Candidates in the Republican Party take non-centrist positions out of conviction both during and after the primary, where losing a primary was not associated with moderation. That losing Republicans largely continue to communicate non-centrist positions likely reflects a reality where the only candidates running are located so firmly on the right of the political spectrum that they perceive little concern over strategic positioning during the nomination. This explanation aligns with scholarship indicating that the Republican Party has moved sharply rightward in recent years (Hacker and Pierson, 2006; Mann and Ornstein, 2012; Theriault, 2013), meaning losing primary candidates have less incentive to moderate to help their future career in the party. Republican partisans are also less tolerant of elite positional heterogeneity (Dunn, 2021), meaning party elites and other actors in the formal party organization may be more disposed to recruit loyal (or sincere) believers who hold consistent positions away from the political center. Given the (perceived) position of primary voters and policy demanders in the party, moderate Republicans may simply decide that running for Congress is not worthwhile (Thomsen, 2017). Institutional biases in general elections—including aggressive Republican gerrymandering in the previous redistricting cycle and the electorally inefficient clustering of Democratic voters in urban districts—may also have furthered a perception among Republican policy demanders and primary voters that candidates on the right of the political spectrum are electorally viable.

Given that our analysis is conducted over a single electoral cycle, we must also consider the relative effect of 2020 electoral conditions on the two parties. Boatright and Moscardelli (2018) demonstrate that congressional primaries have a "presidential pulse." In 2020, the Democratic Party was favored to win the presidency and expected a strong down-ballot performance, with higher numbers of primary candidates as a result. Higher levels of primary competition may have served as a further incentive to induce Democratic candidates to adopt artificial positions.

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The party-level differences may also relate to demographic and ideological differences between Twitter and non-Twitter users. Twitter users are Democratic-leaning and disproportionately come from demographic groups which favor the party, such as young college-educated Whites with higher incomes (Wojcik and Hughes, 2019). Even among Democratic partisans, those on Twitter tend to hold more progressive or left-leaning positions (Cohn and Quealy, 2019), with fewer moderates active on social media (Hawkins *et al.*, 2018). Democratic primary candidates may therefore have communicated positions on Twitter to appeal to a section of the electorate that they—correctly—perceived as non-centrist. In contrast, Republican candidates may perceive that fewer of their primary voters are on Twitter and so use the platform to communicate to journalists and media outlets, other candidates, or party figures.

Asymmetries in the parties' financial structures may further explain our findings. Basedau and Kollner show that "centripetal tendencies are better avoided when the channels of party finance are controlled by the party leadership" (2005, 19), and recent literature highlights clear partisan differences in this regard. Boatright and Albert (2021) show that independent expenditures were not particularly prevalent in financing primary challengers to Democratic incumbents in 2018. Assuming a similar pattern in 2020, the tighter financial control of the formal institutions of the Democratic Party may have incentivized losing candidates to moderate to retain favor with party leadership and advance their political careers. The asymmetric structure of media ecosystems, with greater pressure from the right and far-right of the ideological spectrum (Heft *et al.*, 2021), may also have induced Republican candidates to maintain conservative positions. Pierson and Schickler (2020) find that meso-institutional structures pull Republicans away from the center more than Democrats. One interpretation of our findings is that these structures continue to affect Republicans' positions following primary defeats.

For general election voters, these results are not encouraging when considered in terms of spatial models of voting. Given that we find limited evidence of moderation among primary winners in either party,[15] voters in November appear to have been presented with polarized *choices*—as theorized by Fiorina *et al.* (2005)—albeit for contrasting partisan reasons, with Democratic candidates having strategically adopted artificial positioning during the nomination and Republicans sincerely holding non-centrist positions out of conviction. Non-moderation of Democratic primary winners may indicate a perception among candidates that they must continue to hew to the preferences of policy demanders beyond the primary or reflect candidates' beliefs about the electoral risks associated with moving positions between a primary and general election. Among Republicans, our data suggest limited adaptation, and positions appear more deeply ingrained in the preferences of candidates.

6. Conclusion

We find that losing Democratic candidates moderate after the primary. We argue that this is evidence that candidates communicated artificial positions during the nomination to try and align with key policy demanders and the perceived positions of their primary voters during the nomination. Losing Republican candidates did not moderate following their primary defeats. These results align with scholarship indicating asymmetry in the ideological positions (Hacker and Pierson, 2006; Theriault, 2013) and identities (Grossmann and Hopkins, 2016) of the two major parties and the policy demanders active during the nomination process within each. These differences provide distinct partisan constraints and incentives to candidates both during and after primary elections.

The debate over whether primaries contribute to polarization in Congress is ongoing (Fiorina *et al.*, 2005; Abramowitz, 2010; Sides *et al.*, 2020), yet, many studies only consider this question in terms of a selective effect from primary voters. We demonstrate a further way in which contested

[15]This result aligns with the expectations and findings in Brady *et al.* (2007).

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nominations may exacerbate partisan conflict in Congress: the adaptation of candidate positions during the nomination phase of the election cycle. If many candidates perceive that communicating artificial positions is beneficial during the primary and then feel compelled to maintain those positions during the general election, voters in November will be presented with more polarized choices as a result of the nomination process.

We find little movement among nominees in either party once they are selected, a potentially positive normative finding in terms of representation. Regardless of whether candidates adopt sincere or strategic positions, primary winners communicate positions in general election campaigns that are consonant with their positions during the nomination. How candidates communicate in a primary is at least consistent with what they advocate when they become the nominee—and, potentially, indicative of the policies they will support in Congress. This finding contrasts with the image of politicians as pandering to different groups for their own benefit (Lippmann, 1955; Jacobs and Shapiro, 2000).

Supplementary material. The supplementary material for this article can be found at https://doi.org/10.1017/psrm.2023.62. To obtain replication material for this article, please visit https://doi.org/10.7910/DVN/.

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