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Reconciling Candidate Extremism and Spatial Voting

We propose a modified spatial-voting rule to explain why congressional candidates adopt more extreme ideological positions than their constituents' preferences. Our model accepts the standard spatial-voting model with one critical exception: voters in the same party as a candidate tolerate extremism without imposing an electoral penalty. This, in turn, creates "leeway" for candidates to adopt extreme positions as they increasingly depend on voters from their own party. Electoral simulations demonstrate that a key election-level implication of this model is that it explains candidate polarization without relying on institutional factors like primary elections. Finally, we show that asymmetry in perceptual bias is one possible mechanism and that real-world patterns of ideological representation are consistent with our simulation results.

Spatial-voting models address a broad range of questions of interest to students of electoral democracy by linking voter choice, candidate (or party) behavior, and representation. Because voters choose the candidate closer to their ideological preferences, candidates in two-party races have incentives to respond to the median voter in the electorate. Recent advances in our ability to place candidates and voters in a common ideological space make it possible to test the power of the spatial model to explain voting choice (Boudreau et al. 2015; Jessee 2012; Joesten and Stone 2014; Shor and Rogowski 2018; Simas 2013). All of these studies show a strong effect of spatial distance on vote choice. However, many of these same studies demonstrate that candidates in American politics diverge to a striking degree from median voter preferences (Bafumi and Herron 2010; Stone 2017). Divergence or polarization does not necessarily mean that voters do not choose based on the spatial model since the only requirement of such models is that voters choose the closer of opposing candidates. However, it

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remains a puzzle why candidates would consistently adopt extreme positions if voters reward more moderate candidates.

Voter- and candidate-side explanations of candidate divergence are common in the literature. Voter-side explanations include competing models of issue voting such as the directional model and those that emphasize other considerations such as valence or party identification that may grant candidates some discretion to depart from the median voter in the ideological positions they take (Adams et al. 2005; Grofman 1985; Lacy and Paolino 1998; Rabinowitz and Macdonald 1989). Candidate-side explanations range from those that emphasize candidates' own preferences (perhaps coupled with voter indifference or lack of awareness) to those that emphasize responsiveness to subconstituencies such as primary voters or activists and financial contributors who have extreme preferences relative to the median voter (Aldrich 1983; Aranson and Ordeshook 1972; Bawn et al. 2012; Coleman 1972; Kujala, Forthcoming).

In this article, we reconcile evidence of a strong relationship between the spatial-voting rule and candidate choice that appears to reward candidate moderation with the macrolevel pattern of party polarization, including "excessive" polarization whereby candidates adopt positions more extreme than their partisan supporters in the electorate. We do this by proposing a modification to the class of spatial models that allow for the biasing effect of party identification (Adams et al. 2005; Jessee 2012). Our model accepts the logic of these partisan spatial models with one key innovation: partisans are less responsive, or even unresponsive, to the ideological positions and extremism of candidates in their own party.

Our presentation proceeds as follows: first, we explain the difference between the standard, symmetric, spatial model and our model, which is an asymmetric, party-conditioned model of voting choice. Next, we argue that under the conditions of voters following the asymmetric rule and of electorates with party pluralities, candidates in the plurality party have substantial leeway[1] to adopt more extreme ideological positions than if voters were standard spatial voters. After discussing our data sources drawn from surveys of House and Senate elections, we present evidence supporting the asymmetric over the symmetric spatial-voting rule. With this evidence in hand, we then move to simulations demonstrating increased leeway for candidates' ideological position taking as their plurality of partisan supporters increases. Next, we show real-world patterns of representation in the House that fit

the simulation results in that candidates in both parties moderate from extremist positions relative to their partisan supporters' positions as their partisan plurality shrinks. We conclude by discussing a possible mechanism for asymmetric voting and with evidence that voters' perceptions of candidate position taking is more responsive to variation in opposite- than same-party candidates.

Symmetric Voter Response Models

Consider an individual voter with an ideological preference (ideal point) of x_i who is deciding between two candidates. The Democratic candidate has a location of x^D, and the Republican candidate's location is x^R.[2] The standard spatial model assumes that the probability of voting for the Democrat increases as the voter becomes relatively closer to the Democratic candidate and further away from the Republican candidate. The Democratic candidate's relative proximity advantage is:

$$\left|x_i - x^R\right| - \left|x_i - x^D\right|.$$

In this formulation, if the voter is closer to the Democratic candidate, the value of the rule is positive and predicts a vote (or a greater probability of voting) for the Democrat. If the voter is closer to the Republican candidate, the expression is negative and predicts a vote for the Republican. Empirically, the weight that voters attach to relative proximity can be estimated with a logit model:

$$p(Democratic\,Vote) = p(D) = logit\left[\beta_0 + \beta_1 * \left(\left|x_i - x^R\right| - \left|x_i - x^D\right|\right)\right]. \quad (1)$$

This expression specifies a symmetric voter response to candidates' ideological positions because for all voters the model assumes equal weight (or influence) of the distance from each candidate (β_1). The only considerations for the voter are the distances of the candidates from her preferred position, with each candidate's distance equally influential.[3]

A significant modification to the spatial model of voting choice recognizes the importance of party identification (Adams et al. 2005; Jessee 2012). Whereas the implicit assumption in Equation (1) is that party identification is endogenous to

the spatial-voting rule, the model specified in Equation (2) makes room for an independent effect of party identification while also incorporating the symmetric spatial-voting rule:

$$p(D) = logit\left[\beta_0 + \beta_1 * \left(\left|x_i - x^R\right| - \left|x_i - x^D\right|\right) + \beta_2 * PID_i\right]. \quad (2)$$

Models like Equation (2) that include party identification remain symmetric in their spatial effects because the spatial term is unchanged.

An Asymmetric Voter Response Model

Given the strength and prominence of party identification in models of voting choice, it would hardly be surprising if it conditions the effects of other covariates.[4] The fundamental claim of the asymmetric partisan-modified model we propose is that party identification exerts a strong conditioning effect on the spatial-voting rule in addition to exerting a direct effect on candidate choice. Because of well-established effects of partisanship on voters' perceptions, beliefs, and information processing, we consider the possibility of partisan heterogeneity resulting from voters' perceptions of candidates and candidate position taking.

Voters may tolerate extremism—that is, they are less responsive to the ideological locations—of candidates in their own party by failing to recognize it. The notion that voters place less weight on the ideological positioning of candidates from their own party is consistent with motivated reasoning based on partisanship (Lodge and Taber 2013). Sniderman and Stiglitz's (2012) "Latitude Principle" also provides support for this kind of modification to the symmetric spatial rule. By their logic, voters support extremist candidates in their own party as long as the "Order Rule" (the Democratic candidate is to the left of the Republican) applies. Under this condition (which applies to every race in both our Senate and House data sets) candidates enjoy a "reputational premium" because of a general agreement partisans have with the policy commitments of their party.

Partisan polarization could create a context in which voters tolerate extremism in candidates from their own party, while stimulating wariness about opposing candidates' positions. Loss-aversion theories would predict that wariness of the opposition could lead to closer monitoring of opposite-party candidate

positioning because of the threat they pose in a polarized system. This is consistent with recent work by Hall and Thompson (2018) showing that extremist candidates mobilize the opposition party's voters more than their own base.

To facilitate the description of our model, instead of considering the probability of voting Democratic (as opposed to Republican) as in Equations (1) and (2), we focus on the probability of voting for the candidate who shares the voter's partisanship (as opposed to defecting and voting for the other party's candidate)[5]:

$$p(S) = logit\left[\beta_0 + \beta_1 * \left(\left|x_i - x^O\right| - \left|x_i - x^S\right|\right)\right]. \tag{3}$$

In Equation (3), $p(S)$ is the probability of voting for the candidate of the same party as the voter, x^O is the ideological location of the other party's candidate, and x^S is the ideological location of the candidate of the voter's party.[6] The model in Equation (3) is symmetric like Equation (2) because the effect of distance from one's own party's candidate is equal in magnitude to the effect of distance from the other party's candidate (β_1).

The model we propose allows (but does not require) voters to discount the effect of distance from their own party's candidate:

$$p(S) = logit\left[\beta_0 + \beta_1 * \left|x_i - x^O\right| + \beta_2 * \left|x_i - x^S\right|\right]. \tag{4}$$

In Equation (4), the proximity rule suggests that $\beta_1 > 0$ as increasing distance from the other party's candidate increases the probability of voting for one's own party's candidate. Likewise, the proximity rule suggests that $\beta_2 < 0$ as increasing distance from one's own party's candidate lowers the probability of voting for her. If voters weigh proximity symmetrically, then the positive effect of distance from the other party's candidate (β_1) will be offset by the negative effect of distance from one's own party's candidate (β_2) such that $\beta_1 + \beta_2 = 0$. For the reasons described above, we hypothesize that the effect of distance from the other party's candidate will be greater in magnitude than the effect of distance from one's own party's candidate. This implies that $\beta_1 + \beta_2 > 0$, and perhaps even that $\beta_2 = 0$. If $\beta_2 = 0$, then voters place no weight at all on ideological distance from their own party's candidate.[7]

It is important to note that Equation (4) does not stack the deck in favor of the asymmetric model. It allows for asymmetric responses, but it does not impose them. If the symmetric spatial model is a better model, then when we estimate the asymmetric model the difference in the estimated magnitudes of β_1 and β_2 should be statistically indistinguishable from zero. To the extent that they are not, there is asymmetry in responses with the particular nature of asymmetry revealed in the coefficient estimates. If we can confirm the asymmetric modification to the standard spatial-voting rule, then as we will show with our subsequent electoral simulations, there is a basis for a reconciliation between (some) voters following the spatial logic when voting while (most) candidates polarize.[8]

Implications for Candidate Polarization

If voters follow the asymmetric party-conditioned rule in Equation (4), the implications for candidate behavior are significant. For candidates running in districts where one's partisans are a plurality, we will show that when voters utilize the asymmetric voting rule there is substantially more leeway for those candidates to adopt extreme positions, compared with candidates seeking election from voters following the standard, partisan-modified symmetric spatial rule in Equation (2). Since most House members and many Senators are chosen by electorates in which partisans of their party outnumber those of the other party, we demonstrate most candidates are free to adopt positions even more extreme than their partisan supporters' preferences.

Leeway to adopt extreme positions does not necessarily mean that candidates and office holders will be extreme. We assume, however, that politicians run to advance their own policy goals, as well as winning elections (Wittman 1983). Let us further assume that candidates have personal ideological preferences more extreme than those of their own (median) partisan identifiers in their constituencies. This is plausible because candidates emerge from the activist strata within their parties.[9] Intuitively, it would seem that if voters employ an asymmetric spatial logic, then the electoral costs of adopting extreme ideological positions for many candidates would be lower than if voters rely on a symmetric response model. The reason is that in districts dominated by voters from a single party, candidates from that party may be able to be less responsive to those voters' ideological preferences with

less fear of losing support. As districts include smaller pluralities or minorities of a candidate's own partisans, the responsiveness of independents and opposing partisans in the electorate to candidate moderation should pull candidates toward the center. In these districts, the equilibrium position of candidates should be between their partisans' policy preferences and those of the district or state median voter, just as Coleman (1972) and Aranson and Ordeshook (1972) predicted.

Our analysis proceeds as follows: after explaining the sources of the congressional election data we employ, we estimate symmetric and asymmetric spatial models of voting. We demonstrate that an asymmetric model of spatial voting conditioned on party identification provides a better explanation of individuals' voting choices in these elections. Next, we present election simulations to compare the conditions under which candidates have more leeway to adopt extreme ideological positions relative to their electoral medians under the asymmetric compared with the symmetric spatial-voting model. The results show how much leeway candidates have to adopt extreme ideological positions when voters employ the asymmetric spatial-voting rule. Furthermore, we show that real-world district ideological representation is consistent with the simulation results. Finally, we present evidence consistent with the claim that perceptual distortions grounded in voters' party identification provide at least a partial mechanism explaining voters' reliance on the asymmetric spatial-voting rule.

Data Sources

To assess empirically our asymmetric modification to the spatial-voting model, we analyze vote choice in House and Senate elections. For purposes of comparison and simplicity, we focus on the 7-point scale of "symbolic" ideology that ranges from "very liberal" (coded as −3) to "very conservative" (coded as +3). For our analysis of voting in Senate elections, we rely on the 2010, 2012, and 2014 Cooperative Congressional Election Study (CCES) surveys (Ansolabehere 2012, 2013; Ansolabehere and Schaffner 2015). These surveys were conducted online and include about 70,000 self-reported voters across nearly 100 elections. The sampling method uses a "matched random-sampling methodology" for approximating a representative sample from a nonrandomly selected pool of respondents. For our purposes, in addition to vote choice, party identification, and ideological location, the key items

are those that ask respondents to place both Senate candidates on the same 7-point scale on which they place themselves. To minimize the problems of projection and other biases that creep into individual-level ideological placements, we measure the locations of Senate candidates with mean placements (Adams et al. 2004).

We also analyze the 2010 US House elections from the University of California, Davis Election Study. Data, survey instruments and other information about the study are on the project website.[10] The study included surveys of panels of "expert informants" in each sample district who reported on candidates' ideological and issue positions, as well as the conduct of the campaigns, and candidates' valence characteristics, among other aspects of the district and political context in the 2010 elections (Stone 2017). Informants placed candidates on exactly the same ideological and issue items that mass-survey respondents provided self-placements in the 2010 CCES Common Content and University of California, Davis module constituent surveys.[11] The study included 150 US House districts in which Democratic and Republican candidates opposed each other in the general election.[12]

Empirical Results

Table 1 reports the results from estimating the symmetric spatial model of voting for one's own party's candidate as opposed to the other party's candidate. As described above, the models are for Democratic and Republican party identifiers and partisan leaners only. Pure independents are excluded.[13] Consistent with existing research at the presidential and congressional level (Jessee 2012; Shor and Rogowski 2018), we find evidence of both the effect of partisanship and spatial voting. The partisanship effect is revealed in estimated constants ($\hat{\beta}_0$) which are 1.87 and 2.20 for the House and Senate models, respectively ($p < .01$). These quantities indicate the estimated logit of voting for one's own party's candidate when voters' distances from the two candidates are the same. If there was no effect of party identification, then $\beta_0 = 0$, which implies that for a hypothetical voter in an open-seat race who is the same distance from both candidates—located at the midpoint between them—the probability of voting for one's own party's candidate would be a coin toss (.50). With estimates of $\beta_0 > 0$, the predicted probability of same party voting are significantly greater than .50.[14]

Spatial voting is evident in Table 1 in the estimates of the effects of ideological distance from the candidates. By imposing

TABLE 1
Logit Parameter Estimates of Symmetric Spatial Voting Models

Variable	House Elections	Senate Elections
Distance from other party's candidate ($\hat{\beta}_1$)	.47**	.49**
	(.03)	(.02)
Distance from own party's candidate ($\hat{\beta}_1$)	−.47**	−.49**
	(.03)	(.02)
Constant ($\hat{\beta}_0$)	1.87**	2.20**
	(.13)	(.04)
Log-likelihood	−2,070	−13,049
Pseudo R^2	.15	.11
N	11,468	61,541

Notes: See Equation (3) in the main text. Dependent variable is voting for one's own party's candidate as opposed to the other party's candidate. Model is estimated for Democratic and Republican party identifiers and leaners only. Pure independents are excluded. Robust standard errors in parentheses and estimated based on clustering by district or state. Incumbency and district-sample design controls included but not reported.

*$p < .10$; **$p < .01$.

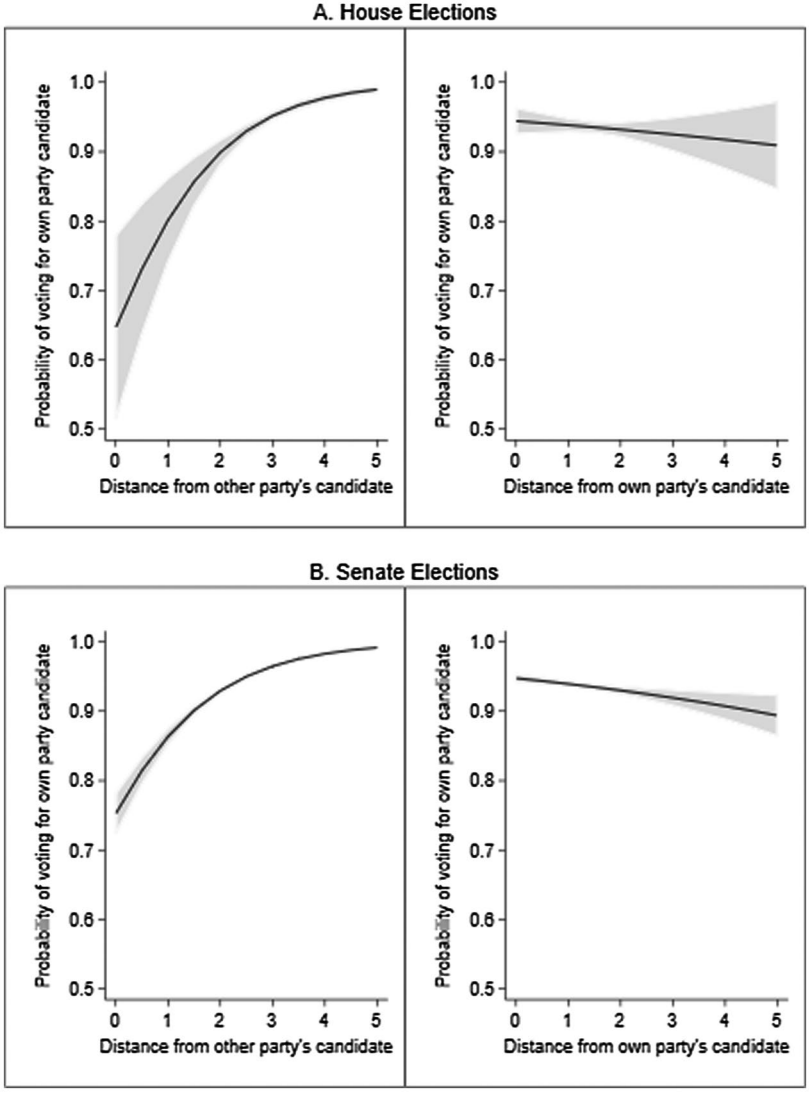
TABLE 2
Logit Parameter Estimates of Asymmetric Spatial Voting Models

Variable	House Elections	Senate Elections
Distance from other party's candidate ($\hat{\beta}_1$)	.79**	.73**
	(.11)	(.04)
Distance from own party's candidate ($\hat{\beta}_2$)	−.11	−.16**
	(.12)	(.05)
Constant ($\hat{\beta}_0$)	.57	1.28**
	(.42)	(.11)
$\hat{\beta}_1 + \hat{\beta}_2$	.68**	.57**
	(.22)	(.07)
Log-likelihood	−2,050	−12,867
Pseudo R^2	.15	.12
N	11,468	61,541

Notes: See Equation (4) in the main text. Dependent variable is voting for one's own party's candidate as opposed to the other party's candidate. Model is estimated for Democratic and Republican party identifiers and leaners only. Pure independents are excluded. Robust standard errors in parentheses and estimated based on clustering by district or state. Incumbency and district-sample design controls included but not reported.

*$p < .10$; **$p < .01$.

FIGURE 1
Estimates of Asymmetric Spatial Voting



Note: Based on Equation (4) and empirical estimates in Table 2.

symmetry on the effects (Equation 3) for each type of election (House and Senate), the magnitudes of the estimated effects of distances from the candidates are identical, but with opposite signs.

Across election types, the magnitudes are almost the same in the House (.47) and Senate (.49) models (both $p < .01$). Increasing distance from the other party's candidate is associated with a greater probability of voting for the candidate from one's own party's while increasing distance from one's own party's candidate is associated with a decreased probability of doing so.

Estimating the symmetric spatial model imposes the constraint that the effects of distances from the candidates are of equal magnitudes. To assess that assumption and allow for asymmetric effects, we relax that constraint as specified in Equation (4). When we do so, we find clear evidence of asymmetric effects as shown in Table 2. Whereas the symmetric model produced estimated effects of .47 in magnitude for House elections, Table 2 indicates the effect of distance from the other party's candidate is .79, and the effect of distance from one's own party's candidate is just −.11. Similar asymmetry is evident in the Senate data with corresponding estimates of .73 and −.16. The estimates differences in magnitudes ($\hat{\beta}_1 + \hat{\beta}_2$)—the degree of asymmetry—are .68 (House) and .57 (Senate), and for both, the null hypothesis of no asymmetry can easily be rejected ($p < .01$).[15]

The asymmetry in parameter estimates is shown in Figure 1 with Panel A displaying the House estimates and Panel B showing the Senate estimates. On the left side of each panel, the relationship between distance from the other party's candidate and the probability of voting for one's own party's candidate is shown. As voters' distances from the other party's candidate increases, the probabilities of voting for one's own party's candidate increases by about 35 (House) and 25 (Senate) percentage points. In contrast, the effects of growing distances from one's own party's candidate lowers those probabilities by considerably less—about 5 percentage points in both types of elections, although in the House elections it may be zero as the null hypothesis of no effect cannot be rejected at conventional levels of statistical significance.

Simulating the Implications of Symmetric vs. Asymmetric Voting Rules

To investigate the consequences of symmetric and asymmetric voting for partisan election outcomes, we conducted a series of electoral simulations. One set of simulations is based on an electorate composed of voters who follow an asymmetric spatial-voting rule, and another is based on an electorate whose voters

follow a symmetric rule. Because the partisan balance of a district is a key factor influencing outcomes and our intuition that the partisan balance of a district would influence electoral consequences of asymmetric versus symmetric voting, our simulations also take into account partisanship.

We began our simulations by creating a series of hypothetical districts, each with 5,000 voters. Across all districts, we specified 10% of voters as independents and varied the percentage of Democrats from 35% to 55% and thus Republicans from 55% to 35%. Overall, then, the districts ranged from a 20 percentage point margin favoring the Republican party to a 20 point margin favoring the Democrats. Given the well-known association between party identification and ideology, we specified that Democrats, independents, and Republicans had mean ideological locations of −1.25, 0, and +1.25, respectively, on an ideological scale ranging from −3 (the most liberal) to +3 (the most conservative).[16]

For the candidates' ideological locations, we fixed the Republican candidate's location at +1.5 on a 7-point scale ranging from −3 (the most liberal) to +3 (the most conservative). We varied the location of the Democratic candidate from being 1.5 points more extreme than the Republican (a location of −3 on the scale) to 1.5 points more moderate (a location of 0).

To assess the consequences of voters employing asymmetric and symmetric voting rules, we simulated 10,000 elections in each district for each voting rule (for 20,000 elections total in each district). In each election in each district we computed each voter's probability of voting for the Democratic candidate and then made a random draw from a binomial distribution with that probability to determine whether the voter cast her ballot for the Democrat or the Republican. The voter's probability of voting Democratic was based on a logit model that included influences of party identification, ideological distances from the candidates, and a stochastic term intended to capture other short-term and election-specific factors that influence voting but are uncorrelated with partisanship and ideological distances (e.g., the candidates' valence differential).

With voters indexed by i and districts indexed by j, under symmetrical voting the logit model of voting for the Democratic candidate was:

$$logit_{ij} = \ln\left[\frac{p(D)_{ij}}{1-p(D)_{ij}}\right] = 2.0 - .5 * \left|x_{ij} - x_j^D\right| + .5 * \left|x_{ij} - x_j^R\right| + ST_j \ \left[\text{for Democratic partisans}\right],$$

$$logit_{ij} = \ln\left[\frac{p(D)_{ij}}{1-p(D)_{ij}}\right] = 0.0 - .5 * \left|x_{ij} - x_j^D\right| + .5 * \left|x_{ij} - x_j^R\right| + ST_j \ \left[\text{for independents}\right],$$

$$logit_{ij} = \ln\left[\frac{p(D)_{ij}}{1-p(D)_{ij}}\right] = -2.0 - .5 * \left|x_{ij} - x_j^D\right| + .5 * \left|x_{ij} - x_j^R\right| + ST_j \ \left[\text{for Republican partisans}\right].$$

For every voter i in each election j, party identification was one cause of vote choice as indicated by the constants, +2.0 for Democrats, 0 for independents, and −2.0 for Republicans.[17] Symmetry in spatial voting is imposed by making the effect of distances from candidates equal in magnitude (.5) but opposite in sign.[18] The model also includes an election-specific effect that was fixed for all voters within a district for a given election but varied across districts and elections and is therefore viewed as a short-term factor (ST_j).[19]

The asymmetric voting models were almost identical to the symmetrical ones, with one critical difference. For Democratic partisans we changed the effect of distance from the Democratic candidate to 0, and for Republican partisans we changed the effect of distance from the Republican candidate to 0. Thus, while partisans continued to be influenced by distance from the other party's candidates, they were no longer influenced by distance from their own party's candidate. The model becomes asymmetric in spatial voting for partisans with the voting rule for independents unchanged (and symmetrical):

$$logit_{ij} = \ln\left[\frac{p(D)_{ij}}{1-p(D)_{ij}}\right] = 2.0 + .5 * \left|x_{ij} - x_j^R\right| + ST_j \ \left[\text{for Democratic partisans}\right],$$

$$logit_{ij} = \ln\left[\frac{p(D)_{ij}}{1-p(D)_{ij}}\right] = 0.0 - .5 * \left|x_{ij} - x_j^D\right| + .5 * \left|x_{ij} - x_j^R\right| + ST_j \ \left[\text{for independents}\right],$$

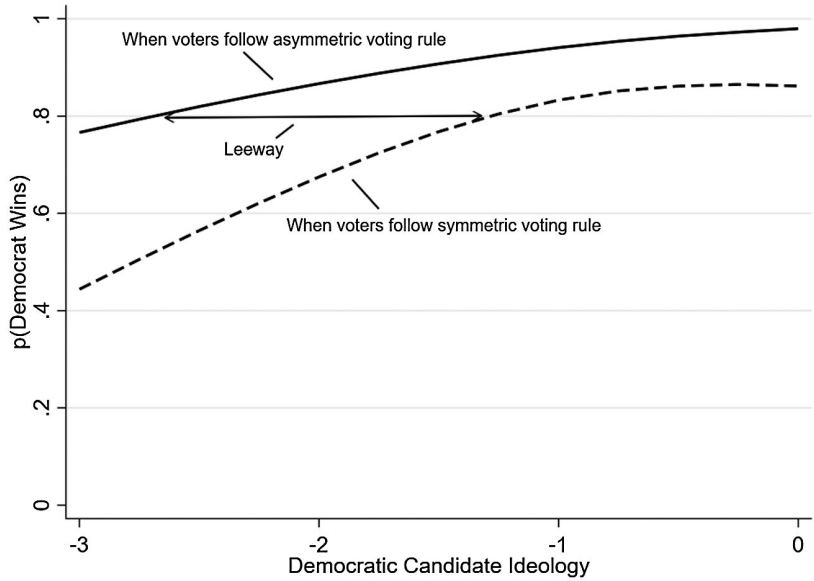
$$logit_{ij} = \ln\left[\frac{p(D)_{ij}}{1-p(D)_{ij}}\right] = -2.0 - .5 * \left|x_{ij} - x_j^D\right| + ST_j \ \left[\text{for Republican partisans}\right].$$

After computing the voters' choices, we aggregated their votes to compute the election winner. As mentioned above, for each district we repeated the process 5,000 times under symmetrical voting and another 5,000 times for asymmetrical voting. Given our interest in how candidates' locations influence their chances of winning under both voting rules, we compute the proportion of the 5,000 elections won by the Democratic candidate and refer to that quantity as the Democratic candidate's probability of winning. (The Republican candidate's probability of winning is, of course, one minus this quantity).

The simulations allow us to estimate how electoral outcomes depend on whether partisans employ symmetric or asymmetric spatial-voting rules across a variety of electoral contexts defined by district partisanship and candidate locations. Of primary interest to us are the implications for ideological polarization between the parties resulting from leeway candidates have to adopt extreme positions. Consider Figure 2, in which we display the effect of Democratic candidates' ideological positions on the probability the Democrat wins the election. Because the partisan makeup of the district has a strong impact on which party wins in the real world as well as in our simulation, we hold that constant in the figure, with a 10 percentage point partisan advantage for the Democratic Party.[20] When voters follow the asymmetric rule, the more moderate the Democratic candidate, the greater the probability of victory (the solid line in the figure). Under these conditions, Democrats who adopt the extreme position of −3 on the ideological scale have a probability of winning of just under .8 (.77) against a Republican positioned at +1.5 on the scale. Their chances improve to a virtual certainty of winning (.98) if they moderate to 0.

The situation is very different for Democratic candidates in the same highly favorable districts when facing voters who follow the symmetric spatial-voting rule. Even though the symmetric model includes party identification, Democratic candidates under this condition (dashed line) suffer a much more substantial electoral penalty for adopting extreme ideological positions. When

FIGURE 2
Simulation Results (Democratic partisan advantage = 10%; Republican candidate located at +1.5)



Note: Based on simulation models described in text.

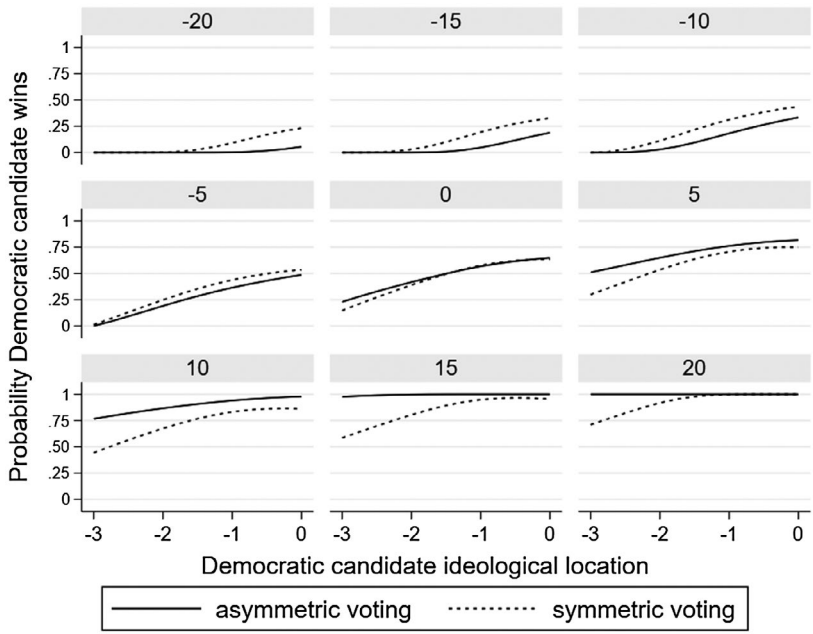
the Democratic candidate is an extreme liberal (−3 on the scale), the probability of winning is less than .50 (.45), but increases 40 percentage points to .86 when the Democrat moves to 0 on the scale. Thus moderation pays greater dividends for the Democratic candidate when districts are full of symmetric-rule following voters. Also important, for every value of Democratic candidate ideology, the probability of the Democrat winning when voters use the asymmetric rule is higher than when voters use the symmetric voting rule.

The simulation results shown in Figure 2 may also be used to illustrate what we mean by "leeway." Suppose that a candidate wants to adopt as extreme an ideological location as possible while achieving a probability of winning that is at least p. Leeway refers to the difference in the positions that a candidate would adopt when running in districts composed of voters employing the two voting rules (for a designated level of district partisanship). For example, consider the leeway when p = .80 in the district where the Democratic Party has a 10-point advantage in partisanship.

As shown in Figure 2, if the Democratic candidate is facing an electorate employing the symmetric voting rule, the Democrat will adopt a position of about −1.3 (the most extreme position available where p is at least .80). If, instead, voters employ the asymmetric voting rule, then the Democrat can locate at a position of −2.6 and still reach $p = .80$. Leeway in this case is 1.3 because the candidate can adopt a position 1.3 units more extreme when facing an asymmetric voting electorate instead of a symmetric voting one.

The freedom of the Democratic candidate to adopt a more extreme ideological position when voters employ the asymmetric voting rule—the existence of "positive leeway"—is a notable feature of the simulations. However, the simulations also make clear the limits of asymmetric voting for producing leeway. This is evident in Figure 3, which shows how the probability of the Democratic candidate winning varies across districts ranging

FIGURE 3
Simulation Results by Democratic District Partisan Advantage



Note: Numbers at the top of each figure indicate the percentage-point Democratic plurality, from −20 (a 20-point Republican advantage in the partisan composition of the district), to to +20 (a 20-point Democratic advantage in the partisan makeup of the district). While the ideological location of the Democratic candidate varies from −3 to 0 across the simulations, the location of the Republican candidate remains fixed at +1.5.

from one where the partisan balances favors the Democrats by 20 points ($margin = 20$) to one where district partisanship favors the Republicans by 20 points ($margin = -20$). As we did for Figure 2, for each district we show the probability of the Democratic candidate winning as the Democratic candidate's position varies from −3 to 0 (while the Republican candidate's position remains fixed at 1.5) under the two voting rules. (Note: The results in Figure 2 are replicated in Figure 3 in the "$margin = 10$" panel.)

Before considering how leeway varies across electoral contexts, we note two basic features of the results, neither of which is surprising. First, across all districts and both voting rules, there is an electoral payoff to ideological moderation. Although the magnitudes of the effects vary, the probability of the Democratic candidate winning increases as she moves from an extremely liberal position (−3) to the center of the ideological scale (0). This is evident by the upward sloping lines in all of the figures.[21] Second, the probability of the Democratic candidate winning increases as a district becomes more Democratic in partisanship. When Republicans outnumber Democrats by 20 percentage points ($margin = -20$) the probability of the Democratic candidate winning are virtually nil under both voting rules. But, by the time the partisan makeup of the district favors the Democrats by 20 points ($margin = +20$), the probability of the Democratic candidate winning is overwhelming, especially under the asymmetric rule.

For our purposes, the critical issue is how leeway varies across electoral contexts. Figure 3 makes clear that when the partisan balance of the district favors the Democrats ($margin = 5, 10, 15, 20$), for any probability (p) of winning, the Democratic candidate can adopt a more extreme position if voters cast ballots based on the asymmetric spatial-voting rule rather than the symmetric one; there is always positive leeway. And, when voters use the asymmetric voting rule, as a district becomes more Democratic in partisanship, the electoral penalty for ideological extremism is all but eliminated. For example, when Democrats outnumber Republicans by 15 percentage points, the Democratic candidate has a .97 probability of winning when she locates at the most extreme liberal position (−3). Under asymmetric voting, then, the electoral incentive for a candidate to moderate her position to increase the probability of winning virtually disappears.

In contrast, even in a district that favors the Democrats by 20 percentage points, there remains a noticeable electoral penalty for ideological extremism when voters rely on the symmetric special

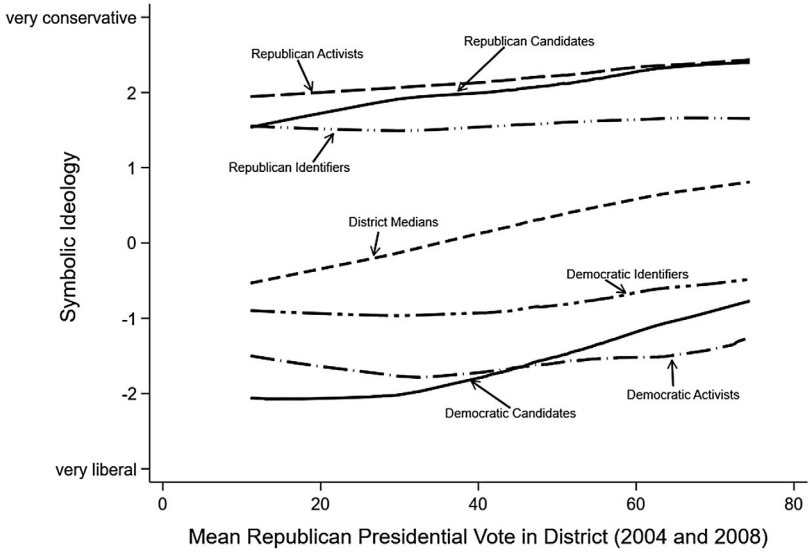
voting rule. In such a district, against a Republican located at 1.5, the probability of the Democratic candidate winning if she positions herself at the middle of the ideological scale (0) is .99 which drops to .71 if she instead locates at the extreme liberal position (−3).

The pattern evident in Figure 3 for districts where the partisan balance favors the Democrats does not generalize to all districts. In fact, the pattern is reversed in districts where the Democratic candidate is at a partisan disadvantage. In these districts, the probability of the Democratic candidate winning improves when voters employ the symmetric voting rule. While the probability of the Democratic candidate winning is almost always below .5 in these districts, there are more gains from ideological moderation if voters employ the symmetric voting rule rather than the asymmetric one. Thus district partisanship is not only an important cause of outcomes, it also determines how the competing voters' spatial rules influence the incentives for ideological extremism and moderation.

Real-World Implications for District Ideological Representation

Our empirical analysis has provided evidence in favor of the asymmetric voting rule as a model of vote choice. And, our simulations have shown the consequences of the asymmetric spatial-voting rule for producing leeway in candidates' ideological positions. Can we demonstrate that candidate positioning in the real world comports with our analyses? Both the puzzle of polarization and our expectations for its resolution are clear. The puzzle is the pronounced tendency of congressional candidates to adopt extreme ideological positions—frequently more extreme even than the preferences of their own copartisans in their electorates—when evidence from voting studies shows their voters have a preference for the more moderate candidate. Our answer is in the asymmetric model for districts dominated by copartisans. In our revised spatial model, voters vote at very high rates for the candidate in their party irrespective of how ideologically extreme that candidate is. Independent and opposing partisans do respond to candidates' positions consistent with the spatial rule, increasing the probability of voting for candidates closer to their preferences and decreasing the probability of voting for candidates who are more distant. Therefore, in districts with sufficiently large partisan pluralities, candidates may adopt more extreme ideological positions, perhaps

FIGURE 4
Candidate Position Taking Compared with Party Activists, Identifiers, and District Median Voters, 2010 House Elections



even more extreme than their copartisans in their districts. In districts more balanced in their partisanship, candidates are incentivized to adopt less extreme positions.

Figure 4 shows a pattern of district ideological representation in 2010 consistent with these expectations. All actors plotted in the figure are located on the same 7-point liberal-conservative scale.[22] Not surprisingly, district ideological medians are strongly related to the partisan makeup of districts as measured by the mean Republican presidential vote share in districts. Thus, as districts are more Republican in their presidential voting, they also tend to be more conservative in their ideological preferences. The figure also includes the mean preferences of Democratic and Republican identifiers within the districts, as well as the mean ideological preferences of party activists and candidates.

Note three characteristics of the data in Figure 4. First, just as we would expect, district-wide medians are relatively moderate, while partisan constituents are more extreme, and party activists are still more ideologically extreme. Second, as noted, there is a clear tendency for district medians to be more conservative as district partisanship shifts to the right. In contrast, the tendency for

partisans and activists to shift to the right with district partisanship is much weaker. This suggests that the principal reason for the shift to the right of district-wide medians is due primarily to the partisan composition of districts, rather than to partisans within the district being more conservative in Republican districts.

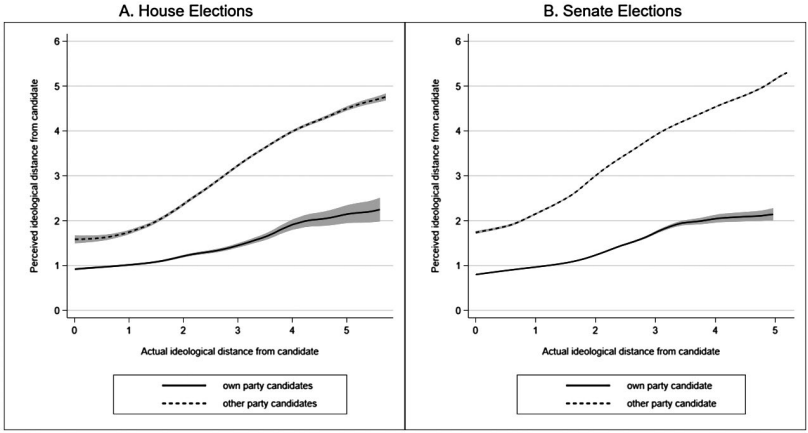
Finally, and most relevant to our argument, in districts dominated by Democrats (as indicated by district presidential vote shares), Democratic candidates in the 2010 elections were apparently more extreme even than activists in their districts. Even if we do not put too much weight on the differences between activists and candidates in these districts, there is a clear tendency for Democratic candidates to moderate their positions as the partisan makeup of their district is less favorable. This pattern fits with the simulations: Democrats have the most leeway to take extreme positions in districts where their own partisans dominate. Of course, not all Democrats in this situation have the same extreme position, but there is no doubt that as a group they adopt more extreme positions than those from less congenial districts. The same tendency is evident (though less pronounced) among Republican candidates. In short, the pattern of real-world district ideological representation fits the twin predictions of our analysis: candidates in districts with favorable partisan pluralities have leeway to adopt extreme ideological positions; candidates in less favorable districts have incentives to adopt less extreme positions.[23]

A Perceptual Mechanism

The logic behind the perceptual mechanism is simple: partisan bias in the perception of candidate locations may blind voters to the ideological distance between their ideological preferences and the positions of candidates in their own party. Simultaneously, suspicion of the opposition in a polarized party system may cause voters to be more attentive and responsive to their ideological distances from candidates in the opposing party. This difference in how candidates are perceived could help explain why voters tolerate ideological distance resulting from the extremism of candidates in their own party, while they reward the moderation of candidates in the opposing party.

Figure 5 provides support for the claim that ideological proximity to opposing candidates is perceived quite differently by voters in the candidates' party as compared with opposing partisans. For the House (Panel A) and the Senate (Panel B), the figure shows

FIGURE 5
Perceived and Actual Ideological Distances from Congressional Candidates



Note: Relationships estimated with local polynomial smoothing. See the main text for descriptions of how actual and perceived distances are measured.

the relationship between actual ideological and perceived ideological distances for candidates of one's own party and candidates of the other party.[24] As demonstrated by the steeper slopes for candidates of the other party, the figure shows a markedly stronger relationship between actual and perceived distance when voters are placing the other party's candidates compared to when they are placing their own party's candidates. In addition, for any given level of actual distance, voters always perceive their own party's candidate as closer than the other party's candidate. These results support the conclusion that the relative lack of response by voters to the ideological extremism of candidates in their own party is not merely a matter of their tolerance of that extremism. It is also substantially due to perceptual errors that occur when voters assess the positions of candidates in their own party, compared with when they place candidates in the opposing party.

We can add one more test relevant to our understanding of the perceptual mechanism behind the asymmetric spatial-voting rule.[25] The 2006 CCES survey was unique in that it not only asked respondents to indicate how they would vote on a series of policy issues on which Senators actually cast roll-call votes; the survey also asked respondents to indicate how they thought their senators had actually voted.[26] Table 3 shows how the distribution of

TABLE 3
Voters' Perceptions of Senators' Roll Call Voting

Voter Perception of Senator's Roll Call Vote	Voter/Senator of Same Party (%)	Voter/Senator of Different Party (%)
Correct perception	45	53
Incorrect perception	12	13
Voter responds Don't Know	43	34

Notes: Cell entries are averages across the seven roll call votes asked about in the 2006 CCES. The pattern shown in the table is evident across all seven individual roll calls.

responses varied by partisanship (averaged across the seven policy issues asked about). First, note that the percentage of "Don't Know" responses is 9 points lower when voters and Senators are in different parties. That gap is complemented by the 8 percentage point higher rate of correct perceptions of Senators' roll-call votes when voters and Senators are of different parties. The rates of incorrect perceptions are almost the same across groups (12% and 13%). These results are consistent with the view that voters are more vigilant and wary of candidates of the other party compared to candidates of their own party.

Conclusion

We have proposed a modification to the standard model of spatial voting for two reasons. First, it provides a more realistic understanding of how citizens actually vote, taking into better account the effect spatial distance on ballot choice. Second, the asymmetric spatial rule offers a solution to the puzzle of why candidates polarize in response to electorates composed of spatial voters by reconciling models of voter behavior and candidate position taking. The dynamic relationship between voter and candidate behavior is one of the chief appeals of spatial models, but the real-world prevalence of candidate extremism has been difficult to square with evidence that voters reward relative moderation among opposing candidates.

An important implication of our analysis is that it modifies both spatial and partisan models of voting choice such that candidate polarization or extremism is fully consistent with a parsimonious model of voting choice. There is no need to introduce institutional features such as direct primaries (or variation in

nomination rules more generally) to explain candidate extremism. Nor is there a need to assume that all voters are poorly informed or blind to candidate position taking to account for an equilibrium in which most candidates adopt extreme positions.[27] In the model, voters are not hyperrational spatial voters, nor are they blindly loyal partisans. And, although the model provides substantial leeway to candidates to adopt extreme positions, especially when their electorates are sufficiently partisan, there are limits to the degree of extremism we should see. For one thing, moderation is rewarded in the model, even in districts that have a substantial partisan advantage in the winner's favor. The reward is not as great as it would be if voters were symmetric spatial deciders, but there is a gain in the probability of winning associated with moderation, even in districts with a clear partisan majority.

If voters in our model are not "hyperrational" spatial voters, can we think of them as rational in some broader sense? Voters with limited information may quite reasonably defer to candidates in their own party on the grounds that they generally agree with that party's policy commitments. Even extreme candidates help advance that agenda, especially in a polarized world where they are opposed by equally extreme candidates in the opposition party. Independents, who lack a commitment to either party, assess the policy positions of opposing candidates and support the closer candidate, just as traditional spatial models expect. This is an important constraint on candidate position taking, which encourages moderation especially in party-balanced electorates. That partisan voters reward candidates from the opposite party who adopt positions closer to their own preferences is further indication that they are motivated by policy concerns and are sensitive to candidates in the opposite party who deviate from the dominant ideological culture of that party. Even though these partisan voters do not deviate entirely from their party inclination, their willingness to defect to a modest degree may promote opportunities for cross-party cooperation in Congress, even in a regime of deep partisan division.

Replication Materials

Highton, Benjamin, and Walter J. Stone. 2020. Replication Data for: Reconciling Candidate Extremism and Spatial Voting. Version 1. Distributed by Cambridge, MA: Harvard Dataverse. https://doi.org/10.7910/DVN/R7L9T9.

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NOTES

Thanks to Jim Adams, Ken Kollman, and Jordan Kujala for advice and comments on this article. The National Science Foundation supported the UC Davis Election Study, the data for our analysis of the 2010 US House elections (SES-0852387).

1. Fenno (1978) uses "leeway" to explain how incumbents who have built sufficient trust with their constituents are able to vote in what they believe are in their constituents' interests even when their vote deviates from constituents' expressed preferences. The leeway that results from trust allows incumbents to employ this "trustee" model of representation (Pitkin 1967) without electoral penalty. Here, we also analyze leeway—the leeway that results from partisans holding candidates from their own party less accountable for their ideological positions than candidates from the opposing party.

2. In spatial models, sometimes candidates are denoted by their relative ideological positions ("Liberal" and "Conservative"). Here we identify them by party given our empirical application to the US Congress. As a practical matter, all Democratic candidates in our House and Senate data are more liberal than their Republican opponents, so designating the candidates by party is equivalent to identifying them by their relative ideological locations.

3. As described below, our empirical models also take into account incumbency.

4. It is not difficult to find examples in the literature of scholars positing heterogeneous effects of voting-choice covariates conditioned on party identification (e.g., Bonneau and Cann 2015; Campbell et al. 2011; Hibbing and Alford 1981). Note that this is a departure from spatial models such as Jessee (2012) that posit a strong partisan effect increasing the probability of voting for a candidate in the voter's party but do not treat partisanship as conditioning the effect of spatial voting.

5. Below we describe how we deal with the relatively small number of voters who are pure independents. We treat independent leaners as partisans.

6. With this formulation, the direct effect of party identification is picked up in the intercept/constant (β_0). If partisans favor candidates of their own party—conditional on relative proximity—then $\beta_0 > 0$.

7. Linear and quadratic specifications of distance have been used in previous research. A possible objection to the use of the linear specification here is that the asymmetry we theorize in our model may be an artifact due to misspecification as quadratic distances naturally produce asymmetry in linear effects. However, in supplemental analyses, we find that the empirical results remain the same if we specify quadratic distances.

8. A very different modification to the traditional spatial model is offered by Buchler (2018), which also reconciles spatial voting with incumbent extremism, but it does so by incorporating a model of party "preference-preserving" agenda behavior with spatial voting in response to bundles of roll-call votes by legislative incumbents. Our model reconciles spatial voting with candidate extremism with a simpler modification to the traditional spatial-voting rule that focuses on the behavior of voters with consequences for leeway in candidate position taking.

9. This assumption ducks the question of whether extremist candidates respond to contributors, activists, or others whose preferences are more extreme than the party's rank and file (Kujala, Forthcoming), in favor of the simple assumption that candidates themselves share these extreme preferences and seek to advance them in office if the electoral costs of doing so are low. Whether the impulse toward extreme stands results from candidates' own preferences or those of "extreme policy demanders" (Bawn et al. 2012) does not affect the implications of our analysis.

10. See http://electionstudy.ucdavis.edu/. For additional details, see also Maestas et al. (2014).

11. An advantage of using informants (averaging about 31 per district) in this way is that their candidate placements and ratings are completely independent of constituents' perceptions. In our analysis of data from this study, we employ mean placements by informants (corrected for partisan bias prior to aggregation) to identify the ideological positions of candidates (Maestas et al. 2014).

12. A replication comparing the symmetric with the asymmetric spatial model using an operational ideology measure is shown in the online supporting information.

13. Following existing research on congressional elections, the models also include an incumbency variable coded −1 (incumbent is the other party's candidate), 0 (open seat), and +1 (incumbent is the own party's candidate).

14. The probability of voting for the candidate of the voter's party when the voter is the same distance from both candidates in House elections is .87, and in Senate elections, it is .90.

15. A party-identification effects remains evident, but as opposed to the symmetric model, its magnitude varies. For a voter whose distances from both candidates are identical $\left(d = \left|x_i - x^O\right| = \left|x_i - x^S\right|\right)$, $\widehat{logit} = \hat{\beta}_0 + d * \hat{\beta}_1 + d * \hat{\beta}_2$. For example, a Republican House voter located at +1 on the ideological scale in an open-seat election between a Democrat located at −1 and a Republican located at +3 has a distance of 2 from each candidate ($d = 2$). Based on the estimates in

Table 2, the logit of the Republican voter voting for the Republican candidate is: $.57 + 2 * .79 - 2 * .11 = 1.93$. This produces a probability of voting Republican of .87—considerably higher than what one would expect in the absence of an effect of partisanship (.50).

16. The standard deviation of ideology for all three groups was set to 1.25. This and the other parameters of the model are roughly based on values observed in our data and empirical models and were selected to keep the model parsimonious.

17. Across House and Senate elections, the average value of the constant for the symmetrical models in Table 1 is 2.04. The constant for Democratic partisans is positive as the dependent variable is voting for the Democratic candidate (the candidate of one's own party) and the constant for Republican partisans is negative given that voting for the Democratic candidate represents—for Republicans—voting for the candidate of the other party. As shown in the online supporting information, in symmetric models of vote choice among independents in House and Senate elections the estimated constants were close to 0 as would be expected for a group of voters without partisan leanings.

18. The estimated magnitudes of spatial distances in the symmetrical models in Table 1 are .47 and .49. As shown in the online supporting information, in symmetrical models of spatial voting among independents the estimates were .49 (House) and .60 (Senate).

19. The short-term election-specific effects are drawn from a uniform distribution ranging from −1 to +1 to give candidates of both parties an equal chance to benefit (or be hurt from) the short-term election-specific effects.

20. In other words, the simulation results in Figure 4 are for a hypothetical district where 50% of voters are Democrats, 40% are Republicans, and 10% are independents.

21. The upward slope is imperceptible in districts that strongly favor the Democratic Party (+15 and +20) because with such a large partisan advantage, the probability of the Democratic candidate winning even when she is extremely liberal (ideology = −3) is nearly 1.0.

22. District median preferences are estimated as the mean ideology scores in pooled CCES district samples from 2006 and 2010. Activists are located based on the personal ideological preferences of informants in each sample district (Stone 2017, 193). Candidates' positions are estimated from district informants' placements of the candidates in their districts, after adjusting for partisan bias (Maestas et al. 2014).

23. Overall, since most Members are elected from districts with favorable partisan pluralities in their party, the average Representative is considerably more extreme than partisan identifiers in their districts.

24. In the House data, we estimate "actual" distances between voters and candidates by using informants' placements of the candidates. In the Senate data, we determine the positions of candidates by using the mean placement by the CCES respondents.

25. We grateful to an anonymous referee who suggested this test.

26. The issues were abortion, stem cell research, Iraq troop withdrawal, immigration, minimum wage, capital gains taxes, and free trade.

27. Our model also nicely complements recent empirical work on candidate extremism (Hall 2015; Hall and Thompson 2018). This work finds an electoral penalty in general elections for ideological extremism because of an asymmetric turnout effect: "extremists appear to activate the opposing party's base more than their own" (Hall and Thompson 2018, 209). This is yet another example of how people are less responsive to the behavior of candidates of their own party and more responsive to the behavior of candidates from the other party.

REFERENCES

Adams, James F., Benjamin G. Bishin, and Jay K. Dow. 2004. "Representation in Congressional Campaigns: Evidence for Discounting/Directional Voting in U.S. Senate Elections." *Journal of Politics* 66: 348–73.

Adams, James F., Samuell Merrill III, and Bernard Grofman. 2005. *A Unified Theory of Party Competition*. Cambridge: Cambridge University Press.

Aldrich, John H. 1983. "A Downsian Spatial Model with Party Activism." *American Political Science Review* 77: 974–90.

Ansolabehere, Stephen. 2012. *Cooperative Congressional Election Study, 2010*. Cambridge, MA: H. University.

Ansolabehere, Stephen. 2013. *Cooperative Congressional Election Study, 2012*. Cambridge, MA: H. University.

Ansolabehere, Stephen, and Brian F. Schaffner. 2015. *Cooperative Congressional Election Study, 2014*. Cambridge, MA: H. University.

Aranson, Peter H., and Peter C. Ordeshook. 1972. "Spatial Strategies for Sequential Elections." In *Probability Models of Collective Decision Making*, ed. R. G. Niemi and H. F. Weisberg, 298–331. Columbus, OH: Charles E. Merrill.

Bafumi, Joseph, and Michael C. Herron. 2010. "Leapfrog Representation and Extremism: A Study of American Voters and Their Members in Congress." *American Political Science Review* 104: 519–42.

Bawn, Kathleen, Martin Cohen, David Karol, Seth Masket, Hans Noel, and John Zaller. 2012. "A Theory of Political Parties: Groups, Policy Demands and Nominations in American Politics." *Perspectives on Politics* 10: 571–97.

Bonneau, Chris W., and Damon M. Cann. 2015. "Party Identification and Vote Choice in Partisan and Nonpartisan Elections." *Political Behavior* 37: 43–66.

Boudreau, Cheryl, Christopher S. Elmendorf, and Scott A. MacKenzie. 2015. "Lost in Space? Information Shortcuts, Spatial voting, and Local Government Representation." *Political Research Quarterly* 68: 843–55.

Buchler, Justin. 2018. *Incremental Polarization: A Unified Spatial Theory of Legislative Elections, Parties and Roll Call Voting*. New York: Oxford University Press.

Campbell, David E., John C. Green, and Geoffrey C. Layman. 2011. "The Party Faithful: Partisan Images, Candidate Religion, and the Electoral Impact of Party Identification." *American Journal of Political Science* 55: 42–58.

Coleman, James S. 1972. "The Positions of Political Parties in Elections." In *Probability Models of Collective Decision Making*, edited by R. G. Niemi and H. F. Weisberg, 332–57. Columbus, OH: Charles E. Merrill.

Fenno, Richard F Jr. 1978. *Home Style: House Members in their Districts*. Boston: Little Brown.

Grofman, Bernard. 1985. "The Neglected Role of the Status Quo in Models of Issue Voting." *Journal of Politics* 47: 229–37.

Hall, Andrew B. 2015. "What Happens When Extremists Win Primaries?" *American Political Science Review* 109: 18–42.

Hall, Andrew B., and Daniel M. Thompson. 2018. "Who Punishes Extremist Nominees? Candidate Ideology and Turning Out the Base in US Elections." *American Political Science Review* 112: 509–24.

Hibbing, John R., and John R. Alford. 1981. "The Electoral Impact of Economic Conditions: Who is Held Responsible?" *American Journal of Political Science* 25: 423–39.

Jessee, Stephen A. 2012. *Ideology and Spatial Voting in American Elections*. New York: Cambridge University Press.

Joesten, Danielle A., and Walter J. Stone. 2014. "Reassessing Proximity Voting: Expertise, Party, and Choice in Congressional elections." *Journal of Politics* 76: 740–53.

Kujala, Jordan. Forthcoming. "Donors, Primary Elections, and Polarization in the United States." *American Journal of Political Science*. https://doi.org/10.1111/ajps.12477.

Lacy, Dean, and Philip Paolino. 1998. "Downsian Voting and the Separation of Powers." *American Journal of Political Science* 42: 1180–99.

Lodge, Milton, and Charles S. Taber. 2013. *The Rationalizing Voter*. New York, NY: Cambridge University Press.

Maestas, Cherie D., Matthew K. Buttice, and Walter J. Stone. 2014. "Extracting Wisdom from Experts and Small Crowds: Strategies for Improving Informant-Based Measures of Political Concepts." *Political Analysis* 22: 354–73.

Pitkin, Hannah Fenichel. 1967. *The Concept of Representation*. Berkeley, CA: University of California Press.

Rabinowitz, George, and Stuart Elaine Macdonald. 1989. "A Directional Theory of Issue Voting." *American Political Science Review* 83: 93–121.

Shor, Boris, and Jon C. Rogowski. 2018. "Ideology and the US Congressional Vote." *Political Science Research and Methods* 6: 323–41.

Simas, Elizabeth N. 2013. "Proximity Voting in the 2010 U.S. House Elections." *Electoral Studies* 32: 708–17.

Sniderman, Paul M., and Edward H. Stiglitz. 2012. *The Reputational Premium: A Theory of Party Identification and Policy Reasoning*. Princeton: Princeton University Press.

Stone, Walter J. 2017. *Candidates and Voters: Ideology, Valence, and Representation in U.S. Elections*. New York, NY: Cambridge University Press.

Wittman, Donald. 1983. "Candidate Motivation: A Synthesis of Alternative Theories." *American Political Science Review* 77: 142–57.

Supporting Information

Additional supporting information may be found in the online version of this article at the publisher's web site:

Table A1. Logit Parameter Estimates of Symmetric Spatial Voting Models (Latent Ideology Measures)
Table A2. Logit Estimates of Symmetric Spatial-Choice Model among Pure Independents

Supplementary Appendix

Reconciling Candidate Extremism and Spatial Voting

Table of Contents

Replication Based on Latent Ideology Measures

Although the ideological self-identification, or symbolic ideology, item is widely used in electoral studies, many recent tests of the spatial model have employed latent ideology measures based on survey respondent and candidate position estimates constructed from responses to multiple issue items. These measures have several advantages over the symbolic measure employed in the text, including the fact that multi-item measures tend to be more reliable than single-item measures, and the possibility that the symbolic-response categories may be subject to bias, especially by mass survey respondents. We employ the symbolic liberal-conservative item in our tests because of the large sample sizes available in the CCES surveys and in the sample districts in the UC Davis informant study. The purpose of this section is to demonstrate that the asymmetric model applies when measures of latent ideology are employed instead.

The informant survey in the UC Davis study asked informants to place both major-party candidates running in their district on six issues: tax reform, immigration reform, gay marriage, the war in Afghanistan, increased government regulation to reduce pollution, and health care reform. Each issue item on the informant survey was asked in exactly the same format of constituent respondents in the double UC Davis module (survey N = 2000) conducted in the sample districts. Items were posed with opposing positions on each issue anchoring the extremes, with self-placements by mass survey respondents or candidate placements by district informants on 7-point scales (the wording of each issue question and the anchoring policy alternatives are presented at the end of this memo). These issue items were not included on the CCES Common Content survey in 2010.

The latent items, both candidate placements and respondent self-placements, are simple means of the items, with the candidate placements corrected for partisan bias among district expert informants prior to calculating the mean score for each candidate in each district. We have experimented with factor scores that permit variable weighting of the issue items in constructing the latent candidate and mass-

sample measures, but the correlations with the unweighted mean measures are uniformly high, so we have retained the simpler coding scheme.

In general, there is evidence consistent with Ellis and Stimson (2012) and other critics of the symbolic item that the multi-item scale is a somewhat better measure, although the two measures are highly correlated. The correlation between the latent and symbolic items in the module survey is .74, while the correlation between the relative candidate proximity measures constructed from the symbolic and latent measures is .88. As we would expect based on bias in the electorate against the term "liberal" the mean score on the latent item is to the left of the mean score on the symbolic item (-.02 vs. .26).

Table SA1 reports replications of the symmetric and asymmetric models based on voter-candidate distance scores calculated from latent ideology measures employing the aforementioned six issue items. The critical results are consistent with the analysis presented in the paper, including a significant improvement in the fit of the asymmetric vs. symmetric partisan model (by likelihood ratio test; $p < .001$). This analysis confirms a strong effect of ideological distance from the opposing candidate's position, alongside no significant response to distance from the candidate in the same party as the voter. Moreover, these results are not somehow dependent on relying on a symbolic ideology measure as opposed to one employing a latent or "operational" measure of ideology.

< Table SA1 >

Symmetric Spatial-Choice Model for Pure Independents

Table SA2 reports the coefficients on ideological distance terms for pure independents. As expected, the results show strong symmetric effects. As described in the main text, these estimates guided our decisions about setting the parameters for the electoral simulations.

< Table SA2 >

Question Wording of Informant Issue Items

All items are scored on 7-point scales ranging between the anchoring extremes. Survey respondent question wordings were identical, except that the prompt asked the respondent to "place yourself" on the scale.

Gay marriage: Some people believe that marriage should only be legal between a man and a woman, while others believe that same-sex marriage should also be legal. On the 1 – 7 scale below, where would you place: (the Democratic/Republican candidate's name running in your district): Outlaw gay marriage; Legalize gay marriage.

Environment: Some people believe that the government should decrease its regulation of the environment. Others believe that the government should increase its regulation of the environment. On the 1 – 7 scale below, where would you place: (the Democratic/Republican candidate's name running in your district): Decrease environmental regulation/Increase environmental regulation.

Health care reform: Some people think that the health-care reform bill passed earlier this year should be repealed because providing health insurance is not the government's job. Others feel that health-care reform should be extended so that government insurance covers everyone. On the 1 – 7 scale below, where would you place: (the Democratic/Republican candidate's name running in your district): Repeal health care reform/Universal governmental insurance.

Immigration: Some people believe that illegal immigrants in the U.S. should be given a path to citizenship if they have a job; others believe that illegal immigrants should be forced to return to their home country. On the 1 – 7 scale below, where would you place: (the Democratic/Republican candidate's name running in your district): Provide path to US citizenship/Force to return home.

War in Afghanistan: Some people think it is important to withdraw U.S. troops from Afghanistan even if Afghanistan is not fully safe and secure. Others feel that U.S. troops should remain in Afghanistan for as long as it takes to make Afghanistan secure, even if this is a long time. On the 1 – 7 scale below, where

would you place: (the Democratic/Republican candidate's name running in your district): Immediate withdrawal/Stay as long as necessary

Tax reform: Some people believe the U.S. should reform the tax code by increasing income taxes on the wealthy. Others believe we should reform the tax code by reducing taxes further for everyone. On the 1 – 7 scale below, where would you place: (the Democratic/Republican candidate's name running in your district): Increase taxes on wealthy/Further tax reductions for everyone.

Table A1
Logit Parameter Estimates of Symmetric Spatial Voting Models (Latent Ideology Measures)

Variable	Symmetric Model	Asymmetric Model
Distance from other party's candidate	.70**	1.77**
	(.10)	(.25)
Distance from own party's candidate	-.70**	.43
	(.10)	(.30)
Constant ($\hat{\beta}_0$)	2.34**	-1.50**
	(.36)	(.91)
$\hat{\beta}_1 + \hat{\beta}_2$		1.34**
		(.20)
Log-likelihood	-143	-134
Pseudo R^2	.22	.27
N	1,306	1,306

Notes: Dependent variable is voting for one's own party's candidate as opposed to the other party's candidate. Model is estimated for Democratic and Republican party identifiers and leaners only. Pure independents are excluded. Robust standard errors in parentheses and estimated based on clustering by district. Incumbency and district-sample design controls included but not reported. ** indicates p<.01.

Table A2.
Logit Estimates of Symmetric Spatial-Choice Model among Pure Independents

Variable	House Elections	Senate Elections
Distance from Democratic candidate	.49**	.49**
	(.05)	(.08)
Distance from Republican candidate	-.49**	-.49**
	(.17)	(.08)
Constant ($\hat{\beta}_0$)	.50**	-.02
	(.19)	(.07)
Log-likelihood	-560	-4,102
Pseudo R^2	.16	.15
N	1,009	6,861

Notes: Dependent variable is coded 1 for those voting for Republican candidate. Models are estimated for non-leaner Independents only. Robust standard errors in parentheses and estimated based on clustering by district or state. Incumbency and district-sample design controls included but not reported. ** indicates $p<.01$; * indicates $p<.05$.