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# Dynamic Responsiveness in the U.S. Senate

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*I develop a theory of dynamic responsiveness that suggests that parties that win elections choose candidates who are more extreme and parties that lose elections choose candidates who are more moderate. Moreover, the size of past victories matters. Close elections yield little change, but landslides yield larger changes in the candidates offered by both parties. I test this theory by analyzing the relationship between Republican vote share in U.S. Senate elections and the ideology of candidates offered in the subsequent election. The results show that Republican (Democratic) victories in past elections yield candidates who are more (less) conservative in subsequent elections, and the effect is proportional to the margin of victory. This suggests that parties or candidates pay attention to past election returns. One major implication is that parties may remain polarized in spite of their responsiveness to the median voter.*

Elections are the core feature of democratic government. In theory, they allow voters to choose candidates who will respond to their desires. For example, Miller and Stokes (1963) find that members of Congress are ideologically predisposed to agree with voters in their districts and Mayhew (1974) and Fenno (1978) note that they frequently abandon their party positions in order to appeal to their constituents. More recently, several authors find that the government is responsive to general shifts in public opinion (Bartels 1991; Jackson and King 1989; Page and Shapiro 1992; Stimson, Mackuen, and Erikson 1995) and specific district interests (Ansolabehere, Snyder, and Stewart 2001a; Fiorina 1977; King 1997). These authors carefully establish the relationship between constituent interests and politician behavior and assert that the incentive to gain or retain office drives the relationship. Yet if elections are the key to responsiveness, it raises interesting questions. Do parties pay attention to election outcomes? If so, how do they respond?

I argue that parties respond dynamically to past elections in the following way: winning parties move toward the extremes to satisfy their own preferences while losers move toward the center in order to improve their chances of winning the next election.<sup>1</sup> This is because

previous election results give parties district-specific information about the location of the median voter. In a two-party contest on a single-issue dimension with proximity voters, parties know that the median voter is closer to the winning candidate than the losing candidate. They also know that the median voter is closer to the candidate who wins by a wide margin than a candidate who only barely wins against the same opponent. Therefore, when parties observe an election outcome they should update their beliefs in the direction of the winning party's preference and the magnitude of the change should be increasing in the margin of victory. These updated beliefs will change the ideology of candidates offered by both parties in the next election. For example, if the left wins a close election, both parties will update their beliefs about the location of the voter slightly to the left and will offer slightly more liberal candidates in the next election. If the left wins in a landslide, candidates from both parties will be noticeably more liberal in the next election.

I test this theory of dynamic responsiveness by analyzing the relationship between Republican vote share in U.S. Senate elections and the ideology of candidates offered in the subsequent election. The results show that Republican (Democratic) victories in past elections yield candidates

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<sup>1</sup>This dynamic has also been suggested in the literature on presidential mandates (see Conley 2001; Kramer 1977; Stigler 1972; Stone 1980).

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who are more (less) conservative in subsequent elections, and the effect is proportional to the margin of victory. This suggests that parties and/or candidates pay attention to past election returns and change their behavior in a way that privileges winning party candidates who are more extreme and losing party candidates who are more moderate in the next election.

One major implication of these dynamics is that parties may remain polarized in spite of their sensitivity to the preferences of the median voter. This might help to explain an important puzzle in American politics. Several scholars argue that politicians are responsive to the views of their constituents (Ansolabehere, Snyder, and Stewart 2001a; Fenno 1978; Fiorina 1977; King 1997; Mayhew 1974; Miller and Stokes 1963), and this ought to imply convergence toward the median voter (Stokes 1999). However, parties and candidates tend to remain ideologically polarized (Hetherington 2001; Iversen 1994; Layman and Carsey 2002). The theory of dynamic responsiveness suggests a reason for this phenomenon. If candidates from losing parties adjust by moving toward the center, while candidates from winning parties adjust by moving toward the extremes, then as a district becomes more conservative (liberal) it will tend to be represented by more conservative (liberal) politicians. This will also produce a cross-sectional relationship—more conservative (liberal) districts will tend to be represented by more conservative (liberal) politicians. However, this process does not necessarily yield convergence. The fact that *both* parties tend to shift in the same direction means that they may or may not get any closer to one another. Thus polarization may persist indefinitely.

The rest of this article proceeds as follows. First, I develop a theory of dynamic responsiveness by analyzing the effect of learning from previous elections on competition between two policy-motivated parties. The formal version of this argument is presented elsewhere, so I focus on the intuition and present a thought experiment. The next section describes the data and the method of analysis used. Then I detail results of the basic model for the U.S. Senate and other models that incorporate controls for incumbency, partisanship, the economy, institutional balancing, national shifts in public mood, and omitted variables related to state ideology. Finally, I summarize the results and discuss some implications for future work.

## A Theory of Dynamic Responsiveness

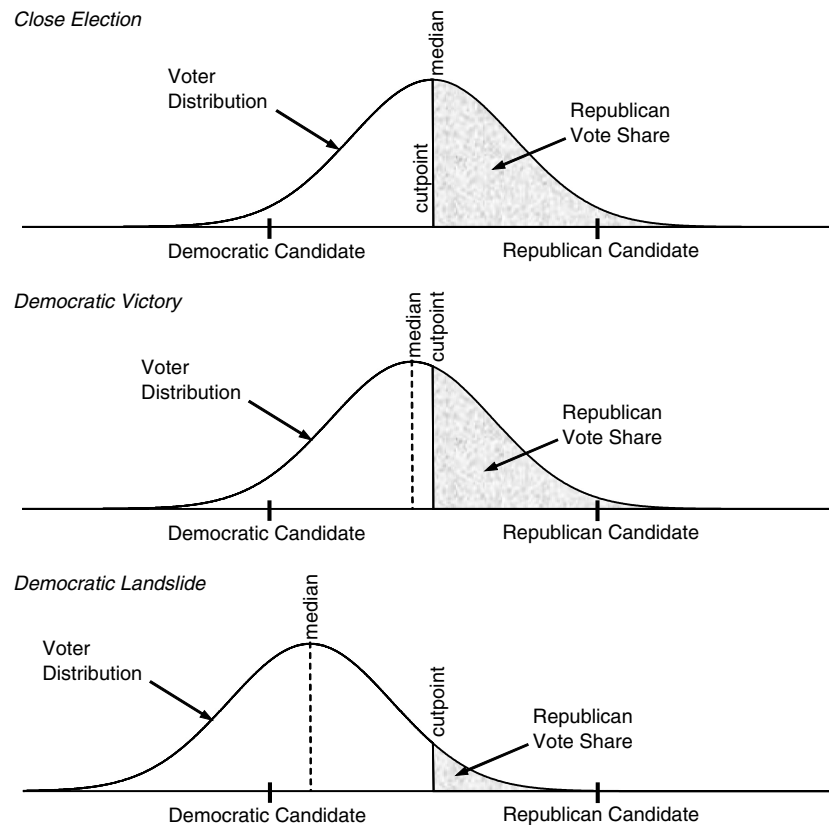
Parties have access to a lot of information about the electorate (Alvarez 1997). However, they probably do not have

perfect information about the precise voter distribution because preferences change over time (Stimson, Mackuen, and Erikson 1995), variable turnout generates uncertainty about who will actually vote (Calvert 1985; Morton 1993), and pre-election polls are not precise. Previous election results may help parties find the median voter in two ways. First, elections produce a winner and a loser. Assuming that voters choose the candidate closest to them in a single dimension issue space, a candidate who wins an election will be ideologically closer to the median voter than a candidate who loses. Second, elections also produce a margin of victory. A candidate who wins in a landslide is likely to be located closer to the median voter than one who only barely wins against the same opponent.

Figure 1 illustrates this point. Imagine a hypothetical election between a Democratic candidate and a Republican candidate in which the voter distribution is not known. Under proximity voting, voters choose the closest candidate, so we can draw a *cutpoint* that is exactly halfway between the two candidates. All voters on the left of the cutpoint choose the Democratic candidate and all voters on the right choose the Republican candidate. The vote share for the Republican (Democrat) is simply the area under the voter distribution to the right (left) of the cutpoint. When the election is very close (top of Figure 1), it implies that the median voter is centered near the cutpoint since the median divides the electorate in half. A moderate Democratic victory (middle of Figure 1) suggests that the voter distribution is centered slightly to the left of the cutpoint. This is because some voters to the right of the median voter must have chosen the Democrat and are therefore to the left of the cutpoint. Thus, the median voter must lie slightly closer to the Democrat than the Republican. If the Democrat wins in a landslide (bottom of Figure 1), then the voter distribution is centered far to the left of the cutpoint, implying that the Democratic candidate lies *much* closer to the median voter than the Republican.

How do these changes in beliefs about the median voter affect party behavior? If parties are policy motivated and uncertain about the voter distribution, then they face a tradeoff that ties their actions to the location of the median voter (Calvert 1985; Osborne 1995; Roemer 2001; Wittman 1977). These parties want to implement their preferred policy, but they also want to win the election. Their beliefs about the voter distribution influence their choice because it affects their beliefs about the probability of winning. Smirnov and Fowler (2003) extend this literature, showing that when beliefs about the location of the median voter shift, the equilibrium candidates chosen by policy-motivated parties will shift in the same direction and monotonically in the size of the shift. Rather than

**FIGURE 1 Relationship Between the Margin of Victory and the Voter Distribution**



*Note:* The top figure shows the voter distribution implied by a close election. The middle figure shows the location of the voter distribution implied by a slight Democratic victory. The bottom figure shows the voter distribution implied by a Democratic landslide.

repeating the formal analysis here, consider the following thought experiment. Suppose a liberal Democrat beats a conservative Republican. As shown above, both parties can use the election results to infer that the median voter was closer to the Democrat than the Republican. The Democrats know they could have supported a more liberal candidate and still could have won the election. Similarly, the Republicans know that their candidate was too far from the median voter and would only have been competitive if she were more liberal. The lesson *both parties* draw is that they should have chosen more liberal candidates. If the parties apply this lesson to the next election, then the candidates of both parties will tend to be more liberal.

Of course, the vote share matters, too. If the Democrats won in a landslide they could have proposed a *much* more liberal candidate. If the Republicans lost in a landslide they would have needed to be *much* more lib-

eral to compete. Thus any change in candidates due to updated beliefs about the location of the median voter is likely to be increasing in the margin of victory. One might argue that this reasoning is nonstrategic. After all, if the Republicans know that the Democrats are going to shift left, then they might be able to win the next election by merely staying put. However, knowing that the Republicans know that, the Democrats would have an incentive to shift closer to their own preferences but not so much that they dramatically decrease the probability of winning the next election. Even when strategic reasoning is extended to full common knowledge, Smirnov and Fowler (2003) show that both parties tend to shift in the direction of the median voter.

Thus, election results may have a direct impact on the candidates chosen by both parties. If parties are *dynamically responsive* to the outcome of the previous election, then candidates from *both* parties should become more

liberal when the Democrats win, more conservative when the Republicans win, and the size of the change in ideology should be increasing in the size of the margin of victory.

The analysis up to this point has been based on the simplifying assumption that parties are unitary actors who choose candidates to represent the best tradeoff between their preferred policies and their probability of winning the election.<sup>2</sup> However, we can relax this assumption. Suppose instead that each party is an aggregation of ideologically similar individuals and potential candidates from their ranks *self-select* by deciding whether or not to vie for nomination (Jacobson and Kernell 1981). A party victory in the previous contest means that potential candidates from that party think they are more likely to win the next general election because the median voter has shifted in their direction. However, these candidates must also win their party's nomination. If they think that the previous victory means party members will support a candidate more faithful to their preferences, then extreme candidates are *more* likely and moderate candidates are *less* likely to vie for and win the nomination. Symmetrically, candidates from the party that lost the previous election are now more likely to lose the general election because the median voter has shifted away from them. If they think the party will support a candidate who is more electable, then moderate candidates are *more* likely and extreme candidates are *less* likely to vie for and win nomination. Thus, relaxing the assumption of parties as unitary actors still yields the same result. Candidates from the party that won the previous election will tend to become more extreme while candidates from the losing party will tend to become more moderate.

## Data and Analysis

To test the theory of dynamic responsiveness, I need ideology scores for party candidates in a two-party system. Many scholars have used interest group assessments of candidates like ADA scores. These scores may have good internal validity for a specific congress, but comparisons across congresses are problematic (Grosceclose, Levitt, and Snyder 1999). Therefore, several authors have turned to roll-call records to impute ideology positions across leg-

<sup>2</sup>Another implicit assumption is that parties tend to have polarized preferences. A wide variety of measures of ideology tend to corroborate this assumption—party leaders and candidates have preferences that are more extreme than rank-and-file party members (Hetherington 2001; Iversen 1994; Layman and Carsey 2002) who are in turn more extreme than the median voter (Abramowitz and Saunders 1998; DiMaggio, Evans, and Bryson 1996).

islatures (e.g., Ansolabehere, Snyder, and Stewart 2001b; Poole and Rosenthal 1997). Poole (1998) specifically addresses not only the problem of longitudinal comparability, but also the problem of comparability across branches of government. I use the first dimension<sup>3</sup> of his “Common Space” scores (based on the NOMINATE methodology), which rank candidates from most liberal to most conservative. An additional advantage of using ideology scores based on voting records is that it implicitly controls for candidate quality—every candidate in the data set has held office at least once. This is important since some studies have shown a relationship between candidate quality and election results (Jacobson and Kernell 1981).

Common Space scores are available for the House and Senate for candidates with voting records from 1937 to 2000. Those with voting records are those who won, so the availability of scores for candidates who did not win in the House is limited to losers who later won House elections. However, candidates who lose elections for the Senate frequently have voting records from their service in the House. I therefore focus my attention on elections in the Senate.<sup>4</sup> I also need a source for election results, so I match Common Space Scores to Senate candidates in the “Candidate Name and Constituency Totals, 1788–1990” file (ICPSR 0002) and FEC election results for 1992–2000. Election results are used to calculate Republican vote share as a percent of the vote gained by Republicans and Democrats.<sup>5</sup>

Of 2,295 Democrat and Republican candidates, only 1,285 have Common Space Scores. Moreover, in order to measure the *change* in candidate ideology between elections, we must have the Common Space Score of the party's previous candidate in the state. Only 1,233 of these have Common Space scores. Because missing data in each of these variables overlaps, there are only 968 cases where the Common Space score of both the current and previous party candidate are observed.<sup>6</sup> The number of cases

<sup>3</sup>Poole notes that the first dimension explains 85% of the variation in roll-call votes, so restricting analysis to a single dimension may not be completely unrealistic.

<sup>4</sup>Another difficulty with using House data is the decennial redistricting that takes place. Shifting district boundaries would weaken the relationship between the median voter implied by the previous election and the location of the median voter in the newly formed district.

<sup>5</sup>Only elections in which both a Democrat and a Republican run are used (i.e., election results when one candidate runs election unopposed are excluded).

<sup>6</sup>Because of overlap in the six year terms, these cases can be divided into three groups. In 424 cases the previous election occurred two years ago, in 384 cases the previous election occurred four years ago, and in the remaining cases there was an irregular time interval due to a special election in the current or the former period.

is further reduced when we introduce controls (see the appendix for a comparison of descriptive statistics when data are completely and incompletely observed).

Most authors ignore problems related to missing data (King et al. 2001) but it can cause bias in model estimates if the data are not missing completely at random. Pairwise correlations between model variables and a missing data indicator are insignificant with two notable exceptions. First, there is an incumbency bias—challengers in the current and previous election are underrepresented in the data since they frequently do not have voting records while incumbents nearly always do. Second, there is a slight partisan bias—Democrats are slightly overrepresented as are Republican losses in the previous election. Interaction terms in the models that follow show that the relationship between change in ideology and previous Republican vote share is not different for the overrepresented and underrepresented groups. Thus missing data should not be a cause for concern.

## Results

Table 1 shows the first three versions of the model. The dependent variable for all models is change in ideology for U.S. Senate candidates running in elections from 1936 to 2000. This is the Common Space score of the current can-

didate minus the Common Space score for the candidate from the same party in the previous election. Each model also includes the vote share for the Republican candidate in the previous election. Recall that Common Space scores increase with the conservatism of the candidate. If parties use information about past elections to update their beliefs about the location of the median voter, then there should be a positive relationship between Republican vote share in the last election and the change in candidate ideology. Large wins for the Republicans should push candidates to the right and large losses for the Republicans should push candidates to the left.

Model 1a is the most basic version of the model with no controls. Notice that the coefficient on the previous Republican vote share is positive and significant. This coefficient indicates that higher Republican vote share in the previous election yields more conservative candidates in the next election. To interpret the coefficient, I simulate first differences (see King, Tomz, and Wittenberg 2000) by estimating the expected change in candidate ideology when other variables are held at their means and the vote share is increased by the average magnitude observed in the data (see the appendix). The ideology variable is somewhat abstract (what does it mean to become 0.1 more conservative?), so I express the change in ideology as a percent of the average magnitude of change in ideology observed in the data (see the appendix). In other words,

**TABLE 1** Effect of Previous Elections on Candidate Ideology in U.S. Senate Elections, 1936–2000

<i>Independent Variables</i>	<i>Dependent Variable</i> Change in Candidate Ideology		
	(1a)	(1b)	(1c)
Previous Republican Vote Share from Election Two Years Ago	0.21** (0.07)	—	0.21** (0.07)
Previous Republican Vote Share from Election Four Years Ago	—	−0.05 (0.08)	—
Candidate's Party Lost Previous Election	—	—	−0.04 (0.15)
Candidate's Party Lost Previous Election* Previous Republican Vote Share	—	—	0.13 (0.31)
Intercept	−0.11** (0.03)	−0.07* (0.04)	−0.11* (0.03)
Adjusted R <sup>2</sup>	0.02	0.01	0.02
N	424	384	424

*Note:* Dependent variable is change in ideology of U.S. Senate candidates, 1936–2000. Ideology is measured using the first dimension of Poole's (1998) Common Space Scores. Coefficient estimates are from OLS with heteroskedastic-consistent standard errors (in parentheses). \*p < .05, \*\*p < .01.

how much of the average change in ideology will be caused by the average change in vote share from one election to the next? Simulations from Model 1a suggest that an average increase in Republican vote share yields a shift to the right that is 28% (+/-17%) the size of the average shift in ideology. To make the point qualitatively, this would be like switching from Christopher Dodd to John Edwards, from Dianne Feinstein to Charles Robb, from John McCain to Orin Hatch, or from Paul Coverdell to Strom Thurmond.

An alternative explanation for these results is regression to the mean. Suppose parties do not respond to past vote share. Instead, Democratic candidates are drawn randomly from a distribution with a mean at the moderate left and Republican candidates are drawn randomly from a distribution with a mean at the moderate right. Suppose further that an extreme liberal candidate is drawn for the Democratic Party. Simple regression to the mean suggests that the next candidate will be more conservative. At the same time, an extreme liberal Democrat is more likely than a moderate Democrat to lose in a landslide. Thus a landslide conservative victory would be associated with a shift to the right. Similarly, suppose a very centrist Democrat is drawn. A centrist is likely to win a large share of the vote and regression to the mean suggests the next candidate would be more liberal. Thus a big liberal victory would be associated with a shift to the left. By symmetry, regression to the mean might explain the association for Republicans, too.

Fortunately, we can use the data to determine whether dynamic responsiveness or regression to the mean is driving the results. In the U.S. Senate each state's two Senators have terms that normally overlap by two or four years. Thus, in some states the most recent election took place two years ago while in others it took place four years ago. If the regression to the mean argument is true, then there should be an association between vote share in the previous election and ideology in the current election, *regardless of how long ago it took place*. An extremist in an election four years ago should lose just as badly as an extremist in an election two years ago, and reversion to the mean should be just as strong. In contrast, the dynamic responsiveness argument suggests that the relationship might be *stronger for more recent elections*. If the voter distribution tends to change over time then newer information about it will be more relevant than older information. Moreover, as time passes there are more sources of information that affect party estimates of the voter distribution, which decreases the relative contribution of information gleaned from the most recent Senate election. In particular, major elections occur every two years and give parties a lot of informa-

tion even if there is no U.S. Senate election in a given state.

Model 1a in Table 1 shows the effect of vote share on candidate ideology when the previous election took place two years ago, while Model 1b shows the effect when the most recent election occurred four years ago. Notice that the effect of vote share from two years ago is significant but the vote share from four years ago is not. These results suggest that regression to the mean is not driving the relationship. Otherwise, there would be a similar relationship between vote share and ideology for both elections. These results also suggest that candidates only respond to the previous election if it was very recent. Thus, in the models that follow I will focus only on cases where the most recent election was held two years ago.

Notice that the basic model does not distinguish between candidates from parties that won the previous election and candidates from parties that lost. This is problematic because it is possible that winning and losing parties react differently to the previous margin of victory. For example, Macy (1995) argues that people use a "win-stay/lose-shift" heuristic to adapt to a changing environment. When a strategy works, they repeat it. When it does not work, they search for a new strategy. If parties use such a heuristic then they should respond to vote share in previous elections when they lose, but not when they win. Model 1c tests the difference between winners and losers by including a variable that indicates when a candidate's party lost the previous election and an interaction term with the vote share. Neither of these coefficients is significant, suggesting that there is no statistically meaningful difference between winners and losers. Thus winning and losing parties apparently react similarly to previous elections. Winners move toward their extremes and losers move toward the center.

## Dynamic Responsiveness and Incumbency

So far this has been an extremely stylized story about parties. One aspect that is notably missing is the effect of incumbency. In theory, incumbency should not affect dynamic responsiveness—incumbents should be under pressure to shift with the margin of victory just like challengers. An incumbent who stays put while her constituency moves to the extreme risks facing a primary challenge from a more extreme candidate. However, Fiorina (1977) and Jacobson (1991) have noted that incumbents

**TABLE 2** Effect of Previous Elections, Incumbency, and Partisanship on Candidate Ideology in U.S. Senate Elections, 1936–2000

<i>Independent Variables</i>	<i>Dependent Variable</i> Change in Candidate Ideology				
	(2a)	(2b)	(2c)	(2d)	(2e)
Previous Republican Vote Share	0.21*	0.27**	0.41*	0.28*	0.32**
	(0.09)	(0.10)	(0.18)	(0.12)	(0.08)
Challenger	-0.02	—	—	—	—
	(0.07)	—	—	—	—
Challenger*	0.03	—	—	—	—
Previous Republican Vote Share	(0.14)	—	—	—	—
Open Seat in Previous Election	—	-0.17	—	—	—
	—	(0.15)	—	—	—
Open Seat in Previous Election*	—	0.06	—	—	—
Previous Republican Vote Share	—	(0.07)	—	—	—
Democrat Won Previous Election	—	—	0.12	—	—
	—	—	(0.12)	—	—
Dem. Won Previous Election*	—	—	-0.20	—	—
Previous Republican Vote Share	—	—	(0.22)	—	—
Democrat	—	—	—	0.04	—
	—	—	—	(0.08)	—
Democrat*	—	—	—	-0.08	—
Previous Republican Vote Share	—	—	—	(0.16)	—
Northeast Republican	—	—	—	—	-0.11**
	—	—	—	—	(0.03)
Southern Democrat	—	—	—	—	0.08*
	—	—	—	—	(0.03)
Intercept	-0.10**	-0.12**	-0.23**	-0.14*	-0.16**
	(0.04)	(0.04)	(0.11)	(0.07)	(0.04)
Adjusted R <sup>2</sup>	0.02	0.03	0.02	0.02	0.05
N	424	424	424	424	424

*Note:* Dependent variable is change in the ideology of candidates for the U.S. Senate, 1936–2000. Ideology is measured using the first dimension of Poole's (1998) Common Space scores. Coefficient estimates are from OLS with heteroskedastic-consistent standard errors (in parentheses). \* $p < .05$ , \*\* $p < .01$ .

are relatively insulated from their constituents, and several other scholars argue that they do not change their behavior over time, in spite of changes in district interests (Arnold 1990; Poole 2003; Poole and Rosenthal 1997; Stone 1980). If so, then this implies that incumbents might not respond to election results.

To test the effect of incumbency on dynamic responsiveness, Model 2a in Table 2 includes a dummy variable for challengers. The challenger variable is also interacted with past Republican vote share to see if incumbents and challengers respond differently to past election results. Notice that the coefficients on the challenger dummy and the interaction term are not significant, suggesting that challengers and incumbents react similarly to the previous election.

Another important feature among incumbents is their ability to retain office. Several authors have written on the incumbency advantage (e.g., Gelman and King 1990), noting that it is very difficult for challengers to beat incumbents. Moreover, voters in races between incumbents and challengers may be focused on a variety of other factors relating to the incumbent's performance besides ideology.<sup>7</sup> If so, then parties and candidates might discount information obtained from previous elections in which incumbents stood for office. After all, the incumbent might be able to win in spite of his or her

<sup>7</sup>For example, the retrospective voting literature shows that economic performance—and not ideology—determines the fate of many incumbents (Atkeson and Partin 1995; Fiorina 1978).



ideology, meaning that an election between a challenger and an incumbent is less relevant for providing information about the voter distribution than an open-seat election.

To test the importance of incumbency in the *previous* election, Model 2b in Table 2 includes a dummy variable indicating when the previous election was for an open seat. This variable is also interacted with past Republican vote share to see if incumbency affects the way candidates use information from the previous election. The coefficients on the open-seat dummy and the interaction term are not significant. These results suggest that ideology is thought to be an important factor in all elections, even in races with incumbents.

### Dynamic Responsiveness and Partisanship

Another important variable to consider is partisanship. For example, it is possible that the ideology of candidates is simply affected by the party who won the previous election but not the vote share. If so, then a past Democratic victory would cause a fixed shift to the left, a past Republican victory would cause a fixed shift to the right, and ideology would be invariant with the size of the victory. Model 2c introduces a dummy variable for a Democratic victory in the previous election to control for this possibility. It also includes an interaction term to see if the partisan identity of the previous winner affects how candidates react to vote share. Notice that the coefficient on vote share is large and significant but the coefficients on the dummy and interaction term are not. This suggests that winning and losing have no independent effect on change in ideology. Apparently size matters in electoral competition.

In the previous models Democrats and Republicans are lumped together, but what if they respond to vote share differently? Perhaps one party is responsive to the vote share while the other is not. Model 2d introduces a dummy variable for Democratic candidates and interacts it with previous Republican vote share to see if Democrats and Republicans respond differently to the previous election. The coefficients on these additional variables are insignificant, suggesting that candidates from both parties respond similarly to the previous election.

Thus, partisanship in general does not seem to affect change in ideology. However, students of American politics are keen to point out that candidate ideology within the parties often varies by region. In particular, models frequently control for the independent effect that south-

ern Democrats and northeast Republicans have on the relationship in question. Model 2e includes these combinations of region and party and finds both to be significant. However, they do not affect the main result that candidates respond to the previous election outcome. In fact, Model 2e suggests an even stronger result—an average increase in Republican vote share yields a shift to the right that is 45% (+/–18%) the size of the average shift in ideology.

### Dynamic Responsiveness and Institutional Factors

Incumbency and partisanship are not the only factors that may influence change in ideology. Parties must also consider the institutional context in which they are competing. For example, the state of the economy has a strong effect on the likelihood that the incumbent party will win the Presidency (Bartels and Zaller 2001). Incumbent senators from the President's party may be similarly affected. However, it is unclear whether a bad economy causes candidates to moderate toward the center or shift toward the left or right. Model 3a in Table 3 includes a variable for real disposable income (RDI) growth for senatorial candidates who belong to the current President's party and an interaction term to separate the effect for Democrats and Republicans. The sign on both variables is negative and the coefficient on the interaction term is insignificant. The combined effect, however, is significant and suggests that candidates from the incumbent party shift left when the economy is bad, *regardless of partisan orientation*. Notice that even with this control, the effect of vote share remains significant.

Senate candidates may also be affected by the partisanship of the President. Alesina and Rosenthal (1995) suggest that voters attempt to balance the outcome of elections for President and the Senate. If so, then parties may choose Senate candidates in order to counteract the ideology of the President. Model 3b includes the partisanship of the President and an interaction term to separate the effect for Presidential and midterm elections. The coefficient on the partisanship variable is positive and significant, indicating that candidates shift more to the right when the President is a Democrat than when he is a Republican. Thus there does appear to be some balancing activity, but the coefficient on the interaction term is insignificant suggesting the effect does not change much for midterm elections. Adding these controls does not change the significant relationship between vote share and candidate ideology.

**TABLE 3** Effect of Previous Elections, Public Ideology, and Institutional Factors on Candidate Ideology in U.S. Senate Elections, 1936–2000

<i>Independent Variables</i>	<i>Dependent Variable</i> Change in Candidate Ideology					
	(3a)	(3b)	(3c)	(3d)	(3e)	(3f)
Previous Republican Vote Share	0.27** (0.07)	0.27** (0.07)	0.27** (0.07)	0.25** (0.07)	0.30** (0.10)	0.23** (0.09)
Northeast Republican	-0.11** (0.03)	-0.12** (0.03)	-0.13** (0.03)	-0.11** (0.03)	-0.11** (0.03)	-0.10** (0.03)
Southern Democrat	0.06 (0.03)	0.06 (0.03)	0.07* (0.03)	0.05 (0.04)	0.07 (0.04)	0.00 (0.06)
Real Disposable Income Growth if Candidate Is from President's Party	-0.94 (0.49)	-1.55** (0.37)	-1.26** (0.40)	-1.42** (0.59)	-1.80** (0.39)	-1.36** (0.44)
RDI Growth if Candidate Is from President's Party* Democrat	-0.68 (0.53)	—	—	—	—	—
Democratic President	—	0.04* (0.02)	0.03 (0.02)	0.04 (0.02)	0.02 (0.02)	0.06 (0.13)
Democratic President*	—	-0.01 (0.03)	—	—	—	—
Non-Presidential Election Year	—	—	—	—	—	—
Mean Senate Ideology	—	—	0.13 (0.16)	—	—	—
Public Mood	—	—	—	0.09 (0.19)	—	—
Republican Vote Share for President	—	—	—	—	0.01 (0.14)	—
State and year dummies	—	—	—	—	—	(omitted)
Intercept	-0.11** (0.03)	-0.13* (0.03)	-0.13* (0.03)	-0.17 (0.12)	-0.14* (0.06)	-0.07 (0.07)
Adjusted R <sup>2</sup>	0.11	0.11	0.09	0.17	0.18	0.38
N	420	420	395	308	350	420

*Note:* Dependent variable is change in ideology of U.S. Senate candidates, 1936–2000. Ideology is measured using the first dimension of Poole's (1998) Common Space Scores. Coefficient estimates are from OLS with heteroskedastic-consistent standard errors (in parentheses). Model 3f includes state and year dummies (coefficient estimates for 80 state and year variables not shown). \*p < .05, \*\*p < .01.

## Dynamic Responsiveness and Ideology

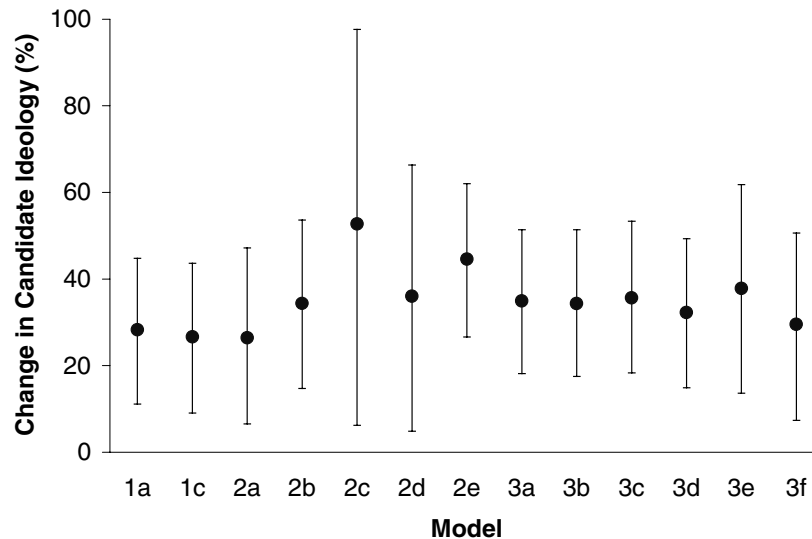
Another important set of controls relates to broader trends in ideology. For example, recently the nation has become more conservative at the same time the Republican party has been winning more elections. This might cause a spurious correlation between change in ideology and vote share at the state level if we do not control for the broader trends. Thus, model 3c includes a variable for the mean ideology of the Senate, and Model 3d includes Stimson's measure of the "public policy mood."<sup>8</sup> The re-

sults show that neither of these measures is significantly related to change in ideology. Nor does including them in the model change the effect of previous Republican vote share.

Another possibility is that other factors have been omitted that are relevant to the location of the median voter. I control for this by including the contemporaneous vote share of the Republican President in each state. This variable has frequently been used as a proxy for state ideology (e.g., Ansolabehere, Snyder, and Stewart 2001a)—thus one might expect it to diminish the impact of the vote share variable since it may also be correlated with the location of the median voter. Model 3e shows that the President's vote share has no effect on change in ideology. Even more importantly, including the President's vote share in the model does not noticeably diminish the

<sup>8</sup>Mean Senate ideology is based on Common Space scores. Public policy mood data is available at James Stimson's website: <http://www.unc.edu/~jstimson/>.

**FIGURE 2** Effect of an Average Change in Republican Vote Share on Candidate Ideology in U.S. Senate Elections



*Note:* Values show the effect of an average-sized change in vote share (as observed in the data) on the magnitude of change in candidate ideology (as a percent of the average-sized change in ideology observed in the data). Estimates are based on simulated first differences (see King et al. 2001). The model number refers to the models shown in Tables 1–3. Error bars show 95% confidence intervals.

size or the significance of the coefficient on the Senate candidate's vote share. An average increase in Republican vote share yields a shift to the right that is 38% (+/–24%) the size of the average shift in ideology.

Finally, there may be other region-specific or temporal factors not considered here that affect ideology. For example, some states tend to be more conservative while others tend to be more liberal. I control for this by including a dummy variable for each state. Or perhaps there is a cross-state push to the left or right in response to some idiosyncratic event or the national strategic institutional context in certain years. I control for this by including a dummy variable for each year. Model 3f shows that when these controls are added, the coefficient on previous Republican vote share remains large and significant.<sup>9</sup>

## Summary and Discussion

Using national policy mood measures and aggregate seat totals, Stimson, Mackuen, and Erikson show that the U.S. Senate “works like a textbook representation mechanism: Senate elections are responsive to public opinion, and then

<sup>9</sup>Models with either state dummies alone or year dummies alone yield substantively identical results.

new membership produces expected policy outcomes” (1995, 54). However, they do not analyze the electoral mechanism that produces such an outcome. This article elaborates on this mechanism by developing a theory about the link between election results and candidate ideology. Parties use past election results to update their beliefs about the location of the median voter and then adjust the candidates they offer accordingly. If the median moves right (left), Republican vote share increases (decreases) and causes both parties to move proportionally to the right (left).

Testing this theory, I find that past elections have a dynamic impact on the ideology of future political candidates. Winning parties tend to offer candidates who are more extreme in the next election and losing parties tend to offer candidates who are more moderate. Moreover, the size of the victory matters. Close elections yield small changes in the ideology of future candidates, while landslides yield larger changes. Figure 2 summarizes the estimated effect sizes from all models presented. It shows that an average increase in Republican vote share yields a shift to the right that is about one-quarter to one-half the size of the average shift in ideology.

Note that the estimates in Figure 2 are relatively consistent for a variety of specifications. Model 1c shows that winners and losers do not differ in how they react to

previous vote share. Model 2a compares the effect of previous elections on incumbents and challengers. Both are equally responsive to previous vote share. Model 2b further suggests that candidates do not discount the importance of previous elections in which an incumbent stood for office. Model 2c shows that size matters—vote share remains important even when a dummy for victory is included. Models 2d and 2e indicate that partisan orientation does not affect the way parties respond to vote share, even when controlling for significant regional changes in the parties. Finally, Models 3a–3f show that previous election results remain important even when controlling for the economy, institutional balancing, mean ideology in the Senate, national shifts in public mood, and omitted variables related to state ideology. These findings suggest a potential cause for persistent polarization in American politics. The literature on responsiveness has typically been somewhat puzzled by polarization. If politicians are responsive to the views of their constituents (Ansolabehere, Snyder, and Stewart 2001a; Fenno 1978; Fiorina 1977; King 1997; Mayhew 1974; Miller and Stokes 1963) then informally this ought to imply convergence (Stokes 1999). Yet parties and candidates remain polarized (Hetherington 2001; Iversen 1994; Layman and Carsey 2002). The theory of dynamic responsiveness suggests a solution. Losing parties adjust by moving toward the center, *but winners move toward the extremes*. Thus, as a district becomes more conservative (liberal) it will tend to be represented by more conservative (liberal) politicians, producing the relationship between district and politician ideology that has been noted in the literature on responsiveness. However, this process does not yield convergence. If both parties shift *with* the median voter rather than *toward* the median voter, then they may or may not get any closer to one another. Thus polarization may persist indefinitely.

Though the findings in this article lend support to a theory of dynamic responsiveness, they do not identify the agents responsible for reacting to previous elections. I have described the process as one in which parties observe past election results and then choose new candidates based on information they provide about the location of the median voter. However, it is also possible that control of the process may be more dispersed—candidates themselves may exhibit self-selection by avoiding contests they think they will lose. For example, if past election results indicate the median has shifted to the right, candidates in the left wing of the right party may be less likely to run because they believe they have a lower probability of winning their primary. Future work should focus on identifying whether party leaders or potential candidates are conscious of a relationship between past electoral margins and the ideology of future candidates.

Finally, future work should also develop the formal aspects of dynamic responsiveness. It is not obvious that a shift in the median voter should cause both parties to shift. After all, if the losing party knows that the winning party is going to shift to its extreme then it may simply stay put to increase its own probability of winning without sacrificing its own preferences. In a formal model of policy-motivated parties that are uncertain about the location of the median voter, Smirnov and Fowler (2003) show that both parties do shift in the direction of the winner's preferences. However, this effort may not necessarily apply in contexts where divergence is caused by other factors like the threat of entry (Greenberg and Shepsle 1987; Palfrey 1984). The empirical results in this article should motivate formal theorists to extend their models to explore the relationship between updated beliefs implied by past vote shares and the positions parties choose to take.

### Appendix: Summary Statistics

Variable	Model	Completely Observed Cases					Incompletely Observed Cases				
		N	Mean	S.D.	Min	Max	N	Mean	S.D.	Min	Max
Change in Ideology ( <i>Magnitude</i> of Change in Ideology)	all	424	0.01	0.20	-0.69	0.73	544	0.02	0.20	-0.66	0.73
Republican Vote Share ( <i>Magnitude</i> of Change in Republican Vote Share)*	all	424	0.14	0.14	0.00	0.73	544	0.15	0.14	0.00	0.73
Candidate's Party Lost Previous Election**	1c	424	0.47	0.12	0.10	0.80	1,450	0.48	0.13	0.10	0.80
Challenger**	2a	424	0.17	0.14	0.00	0.75	1,450	0.16	0.17	0.00	0.77
Previous Challenger**	2b	424	0.22	0.41	0	1	2,146	0.63	0.48	0	1
Previous Republican Loss**	2c	424	0.45	0.50	0	1	2,146	0.74	0.44	0	1
Democrat**	2d	424	0.41	0.49	0	1	1,812	0.75	0.43	0	1
Northeast Republican	2e, 3a-3f	424	0.59	0.49	0	1	2,146	0.35	0.48	0	1
Southern Democrat	2e, 3a-3f	424	0.55	0.50	0	1	2,146	0.50	0.50	0	1
RDI Growth if Candidate Is from President's Party	3a-3f	424	0.08	0.27	0	1	2,146	0.06	0.23	0	1
Democratic President	3b-3f	424	0.10	0.30	0	1	2,146	0.10	0.30	0	1
Mean Senate Ideology	3c	420	0.01	0.03	-0.15	0.11	1,612	0.01	0.04	-0.15	0.11
Public Mood	3d	424	0.54	0.50	0	1	2,146	0.55	0.50	0	1
Republican Vote Share for President	3e	395	-0.02	0.06	-0.10	0.09	1,396	-0.02	0.06	-0.10	0.09
		308	0.60	0.05	0.51	0.69	1,081	0.61	0.05	0.51	0.70
		350	0.52	0.10	0.13	0.77	1,187	0.50	0.12	0.03	0.80

\*This variable is the *absolute value* of the within-state change in Republican vote share between the previous election and the current election. In other words, what is the size (not direction) of change in vote share from one election to the next?

\*\*Dependent variable is not missing completely at random with respect to these variables.

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