

Parsing Party Polarization in Congress ^{*}

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Abstract

A vast literature documents growing ideological divisions between the parties in the contemporary U.S. Congress based on estimates from roll-call voting behavior (such as DW-NOMINATE). We revisit theoretical and empirical claims about the nature of partisan polarization by addressing concerns raised in recent scholarship about the comparability and interpretation of roll call estimates over time. We leverage data from candidate surveys that allow us to hold the policy agenda constant from 1996 to 2008. We show that the replacement of relatively moderate legislators with more ideologically extreme legislators, driven almost entirely by Republicans, explains virtually all of the recent growth in partisan polarization. We further show that these patterns are explained mostly by increased polarization over social issues and link our findings to changes in the congressional agenda. Our results have important substantive and methodological implications for evaluating sources of legislative polarization and using roll call-based measures in empirical applications.

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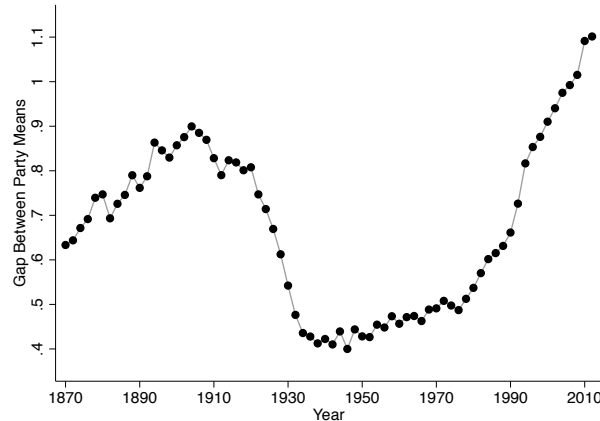
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It is impossible to overstate the centrality of polarization in scholarship on contemporary American politics. Our understanding of elite polarization reflects the patterns in Figure 1, which displays the differences between Republican and Democratic voting records in Congress using DW-NOMINATE scores developed by Keith Poole and Howard Rosenthal. The scores document historic and ever-increasing levels of party polarization in recent decades, with Republican legislators increasingly conservative and Democratic legislators increasingly liberal.¹ The patterns documented by DW-NOMINATE scores have generated scholarship dedicated to understanding its implications for American democracy (e.g., Cameron 2002; Sinclair 2014).

Figure 1: Increasing Polarization in Congress, DW-NOMINATE Scores

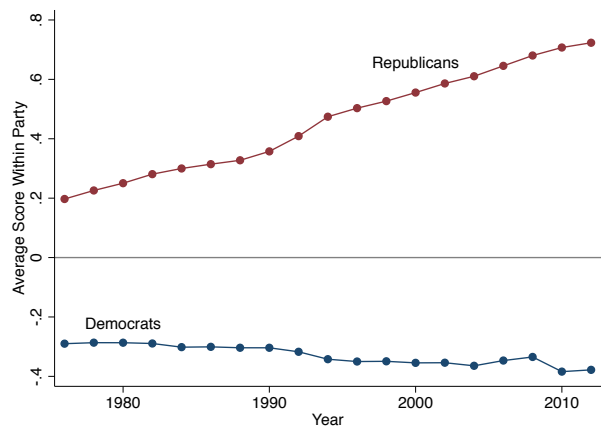


Each point indicates the differences between the parties' mean DW-NOMINATE scores, with higher values along the vertical axis indicating greater party polarization. DW-NOMINATE scores for individual legislators range from -1 to 1.

A closer examination of DW-NOMINATE scores reveals two especially important patterns. First, increases in polarization have been asymmetric, as Republicans have exhibited greater movement in the conservative direction than Democrats have moved in the liberal direction. Republicans' movement toward the ideological extremes thereby accounts for a disproportionate share of increased polarization. This is clear in Figure 2, which displays the mean DW-NOMINATE scores for each party over the last four decades.

¹Polarization may vary across issue areas; see Jochim and Jones (2012).

Figure 2: Asymmetric Polarization, DW-NOMINATE Scores



Recent polarization as measured by DW-NOMINATE has been asymmetric, driven mainly by increasing extremism among Republicans.

Second, the recent increase in polarization reflects both adaptation among incumbents and member replacement. Simple calculations based on DW-NOMINATE scores indicate that within-legislator movement by members of Congress—that is, changing voting records among legislators such that their voting records become more extreme over time—accounts for roughly half of the increase, and the other half is the result of replacement, in which incoming members of Congress are more ideologically extreme than the legislators they succeeded.²

In this paper, we revisit theoretical and empirical claims about partisan polarization in the contemporary United States Congress. To do so, we build upon recent conceptual and methodological criticisms of roll call-based estimates of legislative behavior, particularly those from DW-NOMINATE. For instance, the potential conflation of ideological and partisan conflict (Caughey and Schickler 2016; Lee 2016) raises the possibility that DW-NOMINATE scores overstate the issue-based disagreement between legislators of opposite parties (c.f. McCarty 2016). Moreover, changes in the underlying legislative agendas and issues can complicate efforts to make com-

²Studies using a variety of measures and methods generally agree that adaptation and replacement both have been important drivers of congressional polarization, though they differ somewhat in their assessments of the relative contributions of each (Bonica 2014; Theriault 2008).

parisons across time (Bateman and Lapinski 2016; Bateman, Clinton, and Lapinski 2017; Clinton, Katznelson, and Lapinski 2016). This concern arises because the nature of the items on which legislators cast votes can produce roll call estimates that indicate partisan polarization absent preference change.

We study congressional polarization from 1996 to 2008, a period in which polarization increased sharply (see Figure 1). We use data from candidate surveys to characterize legislators' public positions. We first show that the DW-NOMINATE scores for the legislators in our sample exhibit similar trends in polarization as Congress as a whole during this period. Using these data, we construct a fixed agenda across time with a consistent battery of questions on a comprehensive range of issue areas. We then compare patterns of polarization on the fixed agenda to those documented with congressional roll call votes and evaluate how well polarization is explained by adaptation and replacement. Holding constant the issue agenda on which legislators express preferences, we present evidence that, first, legislators are ideologically consistent across their time in office. That is, we find no evidence that ideological adaptation is an important contributor to polarization in the United States Congress. Second, the replacement of relatively moderate legislators by more ideologically extreme legislators, driven almost entirely by Republicans, explains virtually all of the recent growth in polarization. Third, these patterns are explained mostly by increased polarization over social issues, while we find little evidence of growing partisan differences over economic issues or foreign policy. Our findings indicate that while increased partisan polarization is not simply an artifact of a changing congressional agenda, the distribution of issues on the agenda may affect observed levels of polarization in roll call voting behavior. The results also have several substantive and methodological implications for evaluating legislative polarization and using roll call-based measures in empirical applications.

Congressional Polarization: Empirical and Conceptual Issues

Evaluating congressional polarization depends on the quality of the measures used to characterize voting behavior in Congress. However, because the composition of Congress and the agenda on which it votes changes over time, producing estimates of congressional voting patterns that are comparable across different congressional terms requires additional assumptions. Common-space DW-NOMINATE scores allow researchers to directly compare voting patterns in the House and Senate and across time by assuming that legislative behavior is constant over time such that each legislator has the same ideal point estimate throughout their congressional career whether they served two terms or 20. In contrast, standard DW-NOMINATE scores (displayed in Figures 1 and 2) report separate estimates for the House and Senate (i.e., they are not directly comparable across chambers) but allow legislators' ideal points to change over time following a linear trend. Any changes in a legislator's behavior over time are smoothed evenly across their terms in office.³ While this assumption may be reasonable in many contexts, the dramatic increase in polarization in recent decades raises questions about the timing and magnitude of potential changes in legislative voting behavior for which DW-NOMINATE scores may be ill-suited for answering.

Beyond the methodological issues and technical assumptions required for estimating temporal changes in legislative voting behavior, interpreting roll call-based estimates across time requires assumptions about their substantive meaning. Scholars have recently raised two sets of questions about substantive interpretations of DW-NOMINATE scores over time. A first objection concerns the dimension of conflict characterized by DW-NOMINATE scores. By assumption, scores estimated along a single dimension are said to reflect the liberal-conservative continuum, such that more negative scores represent legislators with more liberal ideologies while more positive scores reflect more conservative preferences. In evaluating polarization between parties in

³Party switchers are an exception and are treated as separate legislators pre- and post-switch, though their within-party movement is constrained by the linear trend.

Congress, larger differences between the parties' members are commonly interpreted as evidence of increased ideological disagreement. Lee (2016, 126) challenges this interpretation, arguing that "scholars should let go of the idea that the level of party conflict in congressional roll call voting is a reliable indicator of the ideological distance between the two parties' positions on national issues." That is, simply because members of opposite parties disagree at increasing rates does not necessarily mean that those disagreements are ideological. As Bateman, Clinton, and Lapinski (2017) point out, it is difficult to identify whether increased disagreement between legislators reflects an increase in ideological polarization without accounting for the policy content of the votes. In contrast, McCarty (2016) presents evidence that persistent partisan differences in DW-NOMINATE scores reflect substantive ideological disagreement.

A second issue concerns whether potential shifts in estimates of legislative ideology are attributable to changing preferences or the content of the legislative agenda. Roll-call based measures, including DW-NOMINATE, confront the challenge of identifying comparable estimates over time when agendas and political context change along with them (Clinton, Katznelson, and Lapinski 2016). For instance, as McCarty (2011, 79) points out, "Despite the fact that D-NOMINATE produces a scale on which Ted Kennedy can be compared to John Kennedy and Harry Truman, some caution is obviously warranted in making too much of these comparisons ... Being liberal in 1939 meant something different than liberal in 1959 or in 2009. So one has to interpret NOMINATE scores in different eras relative to the policy agendas and debates of each." Just as interest groups may oversample key votes which divide legislators across parties (Snyder 1992), conflict between congressional parties could change the composition of the legislative agenda, with votes intentionally chosen to separate the parties. As Clinton, Katznelson, and Lapinski (2016) show, changes in the agenda can produce patterns that appear to be polarization absent preference divergence. This is a particularly vexing problem given the likelihood that the same factors which may contribute to greater ideological disagreement between the parties may strengthen the incentives for majority parties to wield greater power over the agenda.

We address these issues in the context of the 105th through the 111th House. Though DW-NOMINATE scores indicate that partisan polarization increased dramatically during this time period, we re-examine the evidence for polarization and parse its growth while holding constant the content of the agenda on which legislators express preferences.

Potential Explanations for Rising Polarization

Studies of Congress provide several potential explanations for rising levels of ideological polarization. First, ideological adaptation—within-member changes in roll call voting behavior—in the ideologically extreme direction could increase party divergence. Theriault (2008) argues that adaptation among incumbents accounts for approximately a third of recent increases in congressional polarization in both chambers. Studying the House, Ladewig (2010, 509) links the decline of competitive districts to greater polarization; at the member level, he argues that increasing electoral safety causes legislators “to indulge their own personal ideology over that of their reelection ideology.” Likewise, Bonica (2014, 7) argues that ideological adaptation is the “primary driver” of Senate polarization beginning with the 105th Congress. The adaptation hypothesis contrasts with Poole (2007), who argues that for most of American history, legislators have been ideologically consistent throughout their careers, questioning the plausibility of ideological adaptation as a major contributor to growing polarization.⁴ Replacement could also contribute to polarization, as incumbents who retire or are defeated are replaced by more ideologically extreme legislators. According to Theriault (2008), member replacement is responsible for about two-thirds of the increase in polarization in the House, and accounts for almost all of the rise in polarization in the Senate since 1978 (Theriault and Rohde 2011).

Other explanations center on changes in legislative organization and agenda control. Since

⁴Poole (2007) acknowledges that this was less true for portions of the nineteenth century and Caughey and Schickler (2016) show it was less true for the 1930s.

Republicans took control of Congress after the 1994 elections, party leaders exert greater control over the selection of committee chairs and seek stronger party discipline. The congressional agendas have also changed over this period, with some issues represented more than others (Jochim and Jones 2012) and presidential agenda items receiving greater numbers of votes while also dividing the parties (Lee 2008, 2009). If some agenda items invite greater partisan conflict than others, and those items comprise an increasing share of the congressional agenda, changes to the legislative agenda could generate patterns that appear to indicate greater polarization even in the absence of changes in the distribution of legislators' preferences. According to Lee (2008, 199), changes in the Senate agenda from 1981 to 2004 account for more than a third of the increase in polarization in that chamber.

Evaluating potential explanations for polarization, however, is limited by the empirical and conceptual issues related to DW-NOMINATE scores outlined above. Without a clearer idea about whether the patterns shown in Figures 1 and 2 reflect genuine ideological divergence, changes in the underlying agenda, or something else, it is difficult to evaluate proposed explanations for the observed patterns. At the individual level, understanding whether legislators systematically change their voting records during their terms has important implications for linking incumbency to political representation and accountability. At the aggregate level, identifying the sources of partisan polarization in Congress sheds light on the roots of political gridlock and provides context for the normative implications of these developments.

Data and Measures

If Congress were to hold votes term after term on an identical set of issues, it would be straightforward to evaluate the extent to which the two parties exhibit increased preference divergence. Because the agenda would be held constant in this setting, we could attribute any observed differences in the estimated locations of Democrats and Republicans to changes in roll call voting patterns rather than to changes in the issues on which legislators cast votes. Furthermore, this

would allow us to discern whether divergence between the parties results from within-member adaptation relative to the replacement of exiting members with new legislators. Of course, such a scenario is infeasible, yet our data source represents a reasonably close approximation to this ideal scenario.

We characterize legislators' issue preferences using data from Project Vote Smart's National Political Awareness Test (NPAT).⁵ Project Vote Smart describes the NPAT as "a collaborative effort between Vote Smart and over 200 political scientists, journalists, and leaders from across the political spectrum. The issues included on the Test are the top concerns of the American people and are likely to come up in the next legislative session." The survey is administered to all state and federal candidates in even-numbered years. While its content changes somewhat over time as new questions are occasionally included and others are sometimes discontinued, the core set of issues and questions used to gauge candidate positions on these issues are consistent across time. The content of the NPAT questionnaire regularly includes the following issues: abortion, spending on a range of foreign and domestic policy areas, taxes, the balanced budget amendment, campaign finance, voting regulations, same-sex marriage, government ethics reform, death penalty, prison reforms, criminal sentencing policies, drug policies, education, employment, environmental and energy policy, gun policy, health care, immigration, international policy, trade, national security issues, social security reforms, technology and communication issues, welfare and poverty policies, and federalism.

Our use of NPAT data to construct a constant agenda for legislators serving in Congress is similar to its use by Shor and McCarty (2010), who study voting patterns in state legislatures. As those authors note, a major challenge in making comparisons from roll call votes across state legislatures is that the agendas differ significantly across them. Shor and McCarty (2010) use NPAT to address this comparability issue by leveraging the similarity in NPAT items across states. Our application is substantively similar in that we use the NPAT data to address the comparability

⁵The NPAT was renamed as the National Political Courage Test in 2008.

issue across congressional sessions (rather than states).

On the Representativeness of NPAT Respondents

Given the near universal focus of scholars on roll-call based measures of polarization despite the limitations of such measures (e.g., an evolving agenda), leveraging an alternative data source provides a new lens through which we can examine polarization. Because we are interested in studying within-legislator change in expressed preferences, we include in our data all House candidates who completed the NPAT at least twice between 1996 and 2008. Altogether, our sample includes 698 House candidates who completed the NPAT survey at least twice, of whom served in Congress. This latter figure represents about 28% of unique legislators who served between the 105th and 111th congresses.

While the NPAT data allow us to hold the agenda fixed, the primary trade-off relative to using roll-call data is that survey participants comprise a non-representative, convenience sample of congressional legislators. Montagnes and Rogowski (2015, table 1) show that NPAT respondents (and the districts in which they ran) between 1996 and 2006 were broadly representative on district partisanship, electoral competitiveness, the presence of quality challengers, and whether the seat was held by a first-term incumbent, though campaign expenditures (for both challengers and incumbents) were lower for NPAT respondents relative to non-respondents. For our purposes, the main selection criterion that could serve as a potential confounder is the ideology of legislators who chose to complete the survey. If our sample is more moderate (or more extreme) than the population of legislators who served during this time period, our results may not generalize to it.⁶

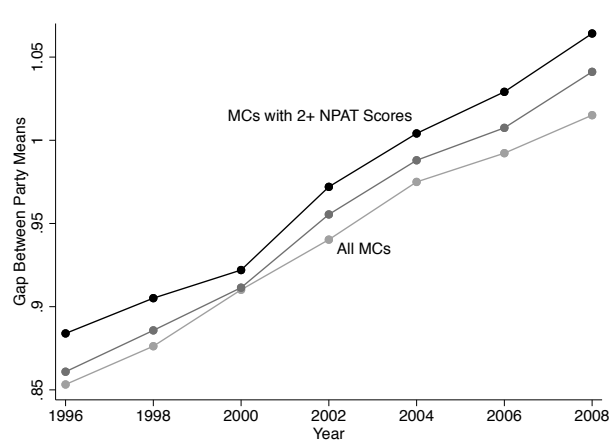
⁶We would also be concerned if our sample consisted of legislators who exhibited different degrees of preference change relative to those who did not complete the survey. For instance, if legislators' decisions to complete the NPAT were correlated with the stability of their preferences across time, our findings may not apply to legislators who did not complete the NPAT. Unfortu-

Fortunately, however, aggregate patterns of congressional polarization between 1996 and 2008 are almost perfectly reflected by the legislators who completed the NPAT. Recall that Figure 1 showed a marked increase in congressional polarization over the last several decades. Figure 3 displays the growth in polarization in roll-call voting based on DW-NOMINATE scores for the period of our study. The figure displays three trends: one for all House members (light gray), one for those members with one or more NPAT scores (medium gray), and one for those members with two or more NPAT scores (black). (Note that this last subset is the group we will use to study the presence of within-member adaptation.) All three trends exhibit a clear increase in polarization of a similar magnitude (about 0.15 units on the DW-NOMINATE scale). Importantly, the increase in polarization for the sample of legislators with two or more NPAT scores is almost identical to the growth in polarization among all members. Thus, even though ours is purely a convenience sample, it is not a particularly strange sample with respect to the phenomenon we study. The legislators in our data are slightly more polarized than average both at the beginning and at the end of our period of study, but they exhibit the same increase in polarization as the entire Congress.

Estimation

To make the NPAT survey data amenable to standard methods for analyzing roll call data, we follow existing studies (e.g., Ansolabehere, Snyder, and Stewart 2001; Marshall and Peress 2018) and transform the items into binary decisions. Many items are naturally binary—for instance, most batteries of issue questions on the survey instruct respondents to “indicate which principles you support (if any) concerning X”—so we code candidates as supporting the policy if they indicate support, and we code them as not supporting the position otherwise. This is the most naturally, we do not have a way of evaluating preference change among non-respondents but we acknowledge this possibility and its implications for the generalizability of our conclusions.

Figure 3: Trends in Polarization in DW-NOMINATE Scores by whether Members Completed the NPAT



This figure displays the difference in the party means in DW-NOMINATE scores for all House members, only House members who completed the NPAT survey at least once, and only House members who completed the NPAT survey multiple times.

common format used for most issue areas. The items on taxes and spending follow a different format, asking whether the candidate wants to “greatly increase,” “slightly increase,” “maintain,” “slightly decrease,” “greatly decrease,” or “eliminate entirely” the taxes or spending on X. We turn each of these items into six decisions, and each candidate is coded as supporting exactly one of the decisions and opposing all of the others.⁷ The last type of question asks, “do you support

⁷We also experimented with coding the items as follows: if candidate A responds “greatly increase” then he/she is coded as supporting *both* the “greatly increase” and the “slightly increase” decisions on X but opposing all others; if A responds “slightly increase” then he/she is coded as supporting only the “slightly increase” decision on X and opposing all others; if A responds “maintain” status quo then he/she is coded as supporting only the “maintain” decision on X and opposing all others; if A responds “slightly decrease” then he/she is coded as supporting only the “slightly decrease” decision on X and opposing all others; if A responds “greatly decrease” then he/she is coded as supporting *both* the “greatly decrease” and the “slightly decrease” decisions on X but opposing all others; and if A responds “eliminate” then he/she is coded as supporting the “eliminate,” the “greatly increase,” and the “slightly increase” decisions on X but opposing all

X” and allows three possible responses—“yes,” “no,” or “undecided.” We turn each of these items into three decisions, and each candidate is coded as supporting exactly one of the decisions and opposing all of the others.⁸ Altogether, our matrix contains entries for legislators’ responses to 134 questions distributed across a wide range of issue areas.⁹

We use these NPAT data to characterize the expressed preferences of legislators and candidates from 1996 to 2008 in a common space. Specifically, we estimate the W-NOMINATE model on the matrix of zeroes and ones (and missing values) described above for each candidate i in year t , where candidates were included as separate entries each time they completed the survey.¹⁰ For example, then-Rep. Mike Pence completed the NPAT survey in 2002, 2004, and 2008 and his responses for each year are entered in separate rows. Therefore, the identical questions asked across years “bridge” the resulting estimates into a common space. For our primary analyses, we hold the agenda constant by using only those NPAT survey questions that appeared in each of the seven election years in our study. Because we (1) jointly estimate the scores for candidates in all years and (2) use only the NPAT survey items that were asked in each year of our study, any observed differences in a legislator’s estimates across time are due to differences in the legislator’s expressed issue preferences. We call the resulting first dimension scores the

others. The results are essentially unchanged with this coding scheme.

⁸Additionally, we experimented with simply coding the undecided responses as missing and the results are again essentially unchanged.

⁹Appendix A.1 shows the distribution of questions across issue categories. Each issue is not represented evenly across the NPAT, and therefore our aggregate estimates of legislative preferences will reflect their preferences on the issues that are better represented. Below we also present results that distinguish across issue areas.

¹⁰In contrast with W-NOMINATE roll call scores, our use of the W-NOMINATE algorithm allows us to compare legislative preferences across time because our matrix includes separate entries for legislators and candidates for each year.

NPAT W-NOMINATE scores or, more briefly, NPAT scores.

Importantly, these data and the scores they generate address complementary aspects of recent criticisms made of DW-NOMINATE scores. First, the stability in the questions across a period of time where the ideological nature of congressional voting is well-understood addresses concerns about the content of the agenda and the interpretation of the scores produced by legislative votes (Bateman and Lapinski 2016; Bateman, Clinton, and Lapinski 2017). Second, because our data consist entirely of policy positions, we largely avoid conflating issue disagreements with party-based conflict (Caughey and Schickler 2016; Lee 2016).

We supplement our estimates of legislative preferences via the W-NOMINATE algorithm with simpler scores that reflect the fraction of times each candidate made the “conservative” choice across the issue questions. We determine whether one or zero is the conservative choice on each item by comparing the fraction of “one” responses among Republicans to the fraction of “one” responses among Democrats; when the former is larger we call one the conservative choice on the decision, and when the latter is larger we call zero the conservative choice. Using this procedure, we characterize each legislator’s issue positions with the proportion of issues on which the legislator supported the conservative position. Though this measurement strategy does not account for variation in the degree to which various issues meaningfully distinguish between Democrats and Republicans (as represented by the discrimination parameter in item-response models), it has the appealing properties of being easily implemented and interpretable. The benefits of this approach will be especially clear when we distinguish polarization across issue areas. We refer to the resulting scores as the NPAT Linear Conservative Probability Scores.¹¹ While we report results from our main analyses using the W-NOMINATE NPAT scores, we obtain substantively similar results when using the NPAT Linear Conservative Scores. These results are displayed in Appendix A.2.

¹¹These scores are distinct from *conservative vote probabilities* estimated by Fowler and Hall (2013).

Interpreting NPAT Responses

A key component of our analysis involves studying *within*-candidate changes in NPAT scores over time. Our claim is that candidate responses to NPAT reflect their personal and electorally-induced policy positions, such that any temporal changes in their responses on the same items reflect a change in preferences. We are agnostic about the degree to which our measures reflect members' personal preferences versus constituency influences; both are likely present, as they are in congressional roll-call voting patterns. While legislators may generally exhibit consistent voting patterns over their careers in Congress (Poole 2007), politicians do, sometimes, change their positions on key policy issues, quite publicly. Media reports frequently call attention to instances in which legislators changed their minds on high-salience policy issues. During the period under study, for instance, the media reported on Senator John McCain's change in position on President George W. Bush's tax cuts, offshore oil drilling, and flying the Confederate flag.¹² Similarly, Representative Glenn Posard changed his position on the assault weapons ban¹³ while then-Representative Richard Burr changed his position on NAFTA.¹⁴ And, more recently, Senator Rob Portman changed his position on gay marriage.¹⁵ Given the public nature of the NPAT, it seems reasonable to suspect that changes in candidates' responses to its questions indeed reflect changes in their policy preferences.

Several additional analyses support our interpretation of changes in NPAT responses as evi-

¹²See, e.g., <http://politicalticker.blogs.cnn.com/2008/10/21/fact-check-was-mccain-once-against-bush-tax-cuts/>, <http://www.cnn.com/2008/POLITICS/06/17/mccain.energy/>, and <https://www.nytimes.com/2000/04/20/us/after-campaigning-on-candor-mccain-admits-he-lacked-it-on-confederate-flag-issue.html>, respectively.

¹³See <https://www.chicagotribune.com/news/ct-xpm-1997-05-23-9705230057-story.html>.

¹⁴See <https://www.mcclatchydc.com/news/politics-government/congress/article96382297.html>.

¹⁵See <https://www.politico.com/story/2013/03/rob-portman-gay-marriage-stance-088903>.

dence of changes in issue positions. We examine whether changes in issue positions correspond with various political or policy “shocks.” For instance, do candidates stop supporting a policy after it appears to be failing or has become unpopular? Do candidates stop supporting decreased taxes after large tax cuts are passed? More generally, do many candidates stop wanting more of policy X after a law is passed providing a substantial amount of X? If candidates’ positions change systematically following these political developments, we suspect the NPAT responses contain the candidates’ genuine policy beliefs.

Consider first the responses to questions that asked about candidates’ budgetary preferences for Defense Intelligence Operations. The number of candidates supporting an increase in spending on Defense Intelligence Operations jumped dramatically between 2000 and 2002, in the wake of the September 11, 2001 terrorist attacks. In 1996, 1998, and 2000, only 21% of candidates supported the decision to slightly increase or greatly increase spending on this item, while in 2002, 2004, and 2006 over 70% of candidates supported an increase. Of course, some of this change is due to new candidates with different views. However, between 2000 and 2002, 69 out of 139 candidates (44%) switched from not supporting to supporting the decision to increase spending (either slightly or greatly) on this item. Only three candidates switched in the opposite direction. No other year exhibits a change anywhere near this large. In addition, four years later, the changes in responses were not only much smaller but also roughly equal in direction; between 2004 and 2006, 14 out of 134 candidates (10%) switched from not supporting to supporting the decision to increase spending (either “slightly” or “greatly”) on this item, while 15 candidates (11%) switched in the opposition direction.

A second example involves responses to the item: “Should the United States withdraw its troops from Iraq?” In 2004, only 31% of candidates responded “yes” to this item, but in 2006, after more than two years of occupation and casualties dealing with the insurgency, civil war, and sectarian violence, support for the administration’s policy had declined sharply and 59% of candidates responded “yes.” Again, some of this change is due to the emergence of new candidates

with different policy views. But a significant number of candidates also changed their responses—22% changed their response from “no” or “uncertain” in 2004 to “yes” in 2006, while only a single candidate switched in the opposite direction.

A third example involves tax policy before and after the large tax cuts of 2001 (and 2003). After 2001, there was a sharp increase in support for increasing taxes (either “greatly” or “slightly”) on high-income households (more than \$150,000). Only 22% of candidates in 1996, 1998, and 2000 supported increased taxes for high income earners; however, after the 2001 tax cuts were passed, the number of candidates who expressed increasing taxes for high-income households increased to 41% among those running in 2002, 2004, and 2006. We find the same patterns within candidates. Before 2001, 23 out of 264 candidates (9%) changed their responses between years in the direction of reducing or maintaining taxes on this group, while only 14 candidates (5%) switched in favor of increasing their taxes. The pattern is reversed after 2001. Between 2000 and 2002, 17 out of 128 candidates (13%) changed from opposing to supporting an increase in taxes on this group, while only 3 candidates (2%) changed in the opposite direction. Between 2002 and 2004, the corresponding figures are 16 out of 147 (11%) and 5 out of 147 (3%), respectively; and between 2004 and 2006, the corresponding figures are 11 out of 124 (9%) and 2 out of 124 (2%).

Overall, these patterns suggest that many candidates responded to the widespread perception that the Bush tax cuts benefited high-income households the most. They are also consistent with the hypothesis that after the large tax cuts were passed, some candidates saw less need for further cuts, particularly given that the tax cuts had resulted in large federal deficits. In Appendix A.3, we consider two other “shocks” to the policy environment: Medicare Part D and the minimum wage increase. In both cases, we document similarly sensible patterns of movement in candidate positions in response to these changes.

In sum, responses to the NPAT appear to reflect candidates’ genuine policy beliefs. These patterns also provide strong face validity to the idea that candidates report different issue positions on the survey when their issue positions in fact change. Thus, the NPAT data should allow us

to measure the extent to which members of Congress change their policy views to adopt more extreme, polarized positions on a fixed policy agenda.

Results: Do Legislators Change Positions Over Time?

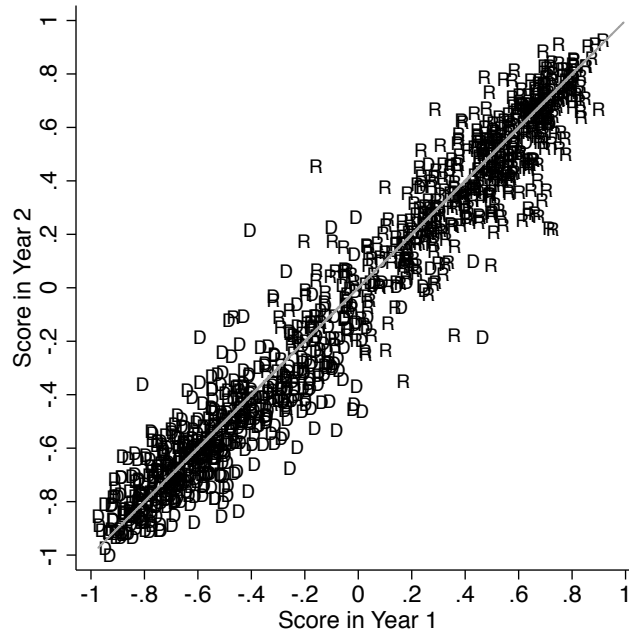
We first analyze changes in individual candidates' NPAT scores over time. Among candidates who completed the NPAT survey at least twice, we compare their scores in all available pairs of years that are one or two elections apart, i.e., 1996-1998, 1998-2000, 2000-2002, 2002-2004, 2004-2006, 1996-2000, 1998-2002, 2000-2004, and 2002-2006. For each pair of years we consider all candidates who filled out the NPAT survey in both years.

Figure 4 displays these patterns, pooling across all years. The x -axis is each candidate's score in year t and the y -axis is each candidate's score in year $t+2$ or $t+4$ (if $t+2$ is not available). Republicans are indicated with an 'R' and Democrats with a 'D.' In all plots, the diagonal line shown is the 45-degree line. The first important finding is that candidates' NPAT scores rarely change substantially over time as the scores for most candidates are clustered tightly around the 45-degree line. Moreover, to the extent candidates do substantially change their positions across time, these patterns are found mostly among candidates who did not successfully win office. Figure A.3 shows that we find even stronger evidence of ideological consistency among candidates who were successfully elected to Congress.

Even more importantly, Figure 4 shows that candidates do not exhibit *systematic* changes in their expressed preferences between successive elections that would contribute to increased polarization. That is, while legislators may occasionally modify their positions on specific issues (as we documented above), there is no tendency for conservatives to become systematically more conservative between years t and $t+2$ or $t+4$, and no tendency for liberals to become even more liberal. There is no mass of points above the 45-degree line to the right of the zero point (which we would observe if conservative candidates were becoming more conservative over time), nor is there a mass of points below the 45-degree line to the left of the zero point (which there would

be if liberal candidates were becoming more liberal over time).

Figure 4: NPAT W-NOMINATE Scores for Candidates with 2+ Scores, All Pairs Pooled



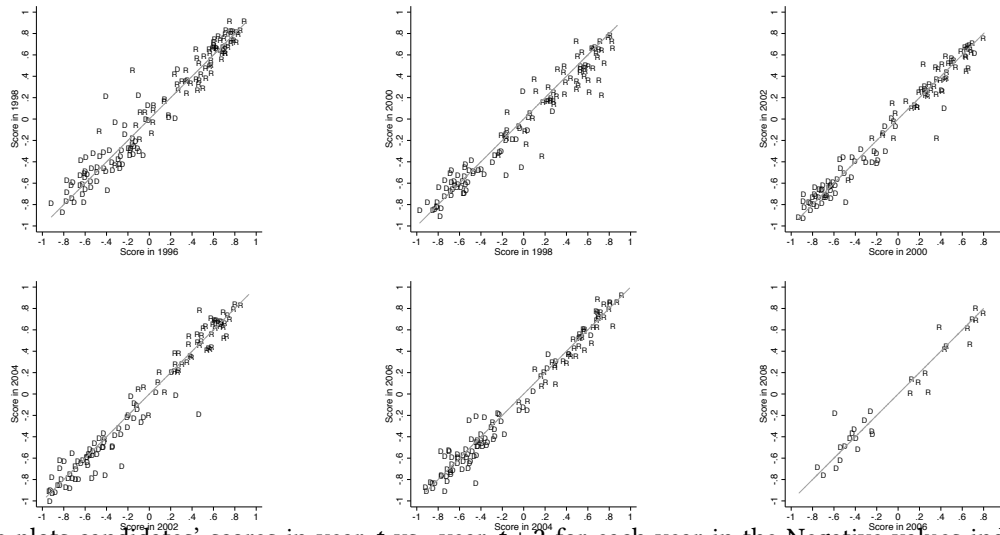
This figure plots candidates' scores in year t vs. year $t+2$ or $t+4$. Negative values indicate liberal candidates and positive values indicate conservative candidates.

These patterns are quite robust across each pair of years in our study. Figure 5 compares NPAT scores for candidates who completed the NPAT survey in years t and $t+2$ for each election year. Not only are candidate positions in year $t+2$ highly correlated with their positions in year t , but they are nearly identical in substantive terms.

The comparisons above provide evidence that individual candidates exhibit little ideological movement over time. These findings suggest that ideological adaptation among legislators probably is not an important contributor to increased polarization as Democrats do not drift in the liberal direction, nor do Republicans drift in the conservative direction.

We extend these comparisons to the aggregate pools of candidates who sought office between 1996 and 2008. We test whether, on average, candidates' scores in year 2 were different from their scores in year 1. The results of these comparisons and the accompanying t -tests are

Figure 5: NPAT W-NOMINATE Scores for Candidates with 2+ Scores, by Each Pair of Years



This figure plots candidates' scores in year t vs. year $t + 2$ for each year in the Negative values indicate liberal candidates and positive values indicate conservative candidates.

shown in Table 1. The top panel presents results that aggregate across Democratic and Republican candidates. The first row of entries shows results when comparing scores for candidates that completed the survey in successive election years; for instance, 1996 and 1998, or 2004 and 2006. Overall, the mean difference between the candidates' scores was nearly zero—0.004—with a t -statistic of 0.626, indicating that we cannot reject the null hypothesis of no difference between the candidates' ideological scores in years t and $t+2$. The second row of entries shows results for candidates who completed the surveys one or more elections apart, which results in a somewhat larger sample. As this comparison includes candidates whose NPAT responses were provided with more than two years between them, this may allow us to detect preference change that may occur in a gradual fashion. However, the mean difference between candidates' scores in year t and a future election year was virtually identical in magnitude (0.003) and is again statistically indistinguishable from zero.

Because it is possible that the aggregate analyses obscure directional differences among Republicans and Democrats, the middle and bottom panels distinguish Republican and Democratic

candidates, respectively. We continue to find little evidence of ideological movement among candidates from either party. The middle panel shows that on average Republican candidates exhibited movement of 0.008 units in the ideologically conservative direction, and 0.007 units when including Republican candidates surveyed more than one election year apart. Neither of these mean differences is statistically significant, however. The bottom panel shows even less evidence of ideological movement among Democrats, as both set of comparisons detected no average change in position at three decimal places.

Table 1: Do Candidates Change NPAT Scores Over Time?

Case	Difference	t-Statistic	# Obs.
<i>Both major parties</i>			
Year 2 – Year 1 = 2	0.004	0.626	611
Year 2 – Year 1 \geq 2	0.003	0.551	698
<i>Republican</i>			
Year 2 – Year 1 = 2	0.008	0.861	290
Year 2 – Year 1 \geq 2	0.007	0.804	327
<i>Democrats</i>			
Year 2 – Year 1 = 2	0.000	0.013	321
Year 2 – Year 1 \geq 2	-0.000	-0.024	371

At both the individual and aggregate levels, congressional candidates who sought office between 1996 and 2008 did not meaningfully change their ideological positions across time. These findings are robust to the exclusion of losing candidates (see Table A.4) and when collapsing the average change in position among candidates who were in the data more than twice (see Table A.5). We also compare ideological change between losing and winning candidates. Using both the W-NOMINATE scores and Linear Conservative scores, we find little evidence that losing candidates exhibited ideological change across elections (see Table A.6), or that the degree of ideological change systematically varied between winning and losing candidates (see Table A.7). These findings for unsuccessful candidates provide dynamic evidence consistent with the

cross-sectional results in Ansolabehere, Snyder, and Stewart (2001), who find that unsuccessful candidates ideologies' are not responsive to district preferences. Collectively, these findings establish that within-legislator change in ideological positions cannot be an important contributor to increasing polarization within the U.S. Congress.

Evaluating Polarization via Replacement

Next, we compare the ideological positions of legislators who *joined* Congress between 1996 and 2008 to those who *exited* Congress during this time period (and had entered prior to 1996). We characterize the latter group as *joiners* and the former group as *leavers*. We examine whether new members of Congress were systematically more extreme relative to the legislators who left Congress during the same period. Because our results above indicate that member-level *adaptation* was likely not an important contributor to growing polarization documented in Congress on the basis of roll-call voting scores, we focus instead on how *replacement* may have contributed to it.

The results are shown in Table 2. The top panel shows results for Republicans and the bottom panel shows results for Democrats. The entries in the top row compare roll-call based estimates from DW-NOMINATE scores among all Republicans who joined and exited Congress between 1996 and 2008. Overall, Republicans who joined Congress between 1996 and 2008 had significantly more extreme roll call scores than exiting Republicans. The average roll call estimate for the former was 0.642, compared with 0.501 for the latter. Therefore, new Republican members of Congress were 0.141 units more extreme relative to exiting members, and the *t*-statistic associated with this difference is 7.959.

The second row in the top panel performs the same comparison on Republican legislators who completed the NPAT survey in at least one election year among those who joined ($n=50$) and exited ($n=85$) Congress during this period. The mean roll-call scores for this subset of legislators are quite similar to those for the entire pool of joining and exiting Republicans, again

showing that the Republicans who entered Congress during this period and are in our NPAT data are significantly more conservative than Republicans who left Congress during this period and completed the NPAT survey. The third row in the top panel shows the average NPAT scores for these same groups of Republicans. The average NPAT-based scores for Republicans who entered Congress between 1996 and 2008 was 0.446 compared with 0.340 among those who left Congress during this period. (Recall that we cannot directly compare the roll call scores with NPAT scores because they are estimated on different scales and using different data.) The difference between these mean values is also statistically significant, indicating that Republican legislators who entered Congress between 1996 and 2008 were systematically more conservative than those who left during the same time. Moreover, because we have held constant the battery of survey questions when estimating our NPAT scores, these patterns reflect genuine ideological differences rather than resulting from potential changes in the congressional agenda during this period.

We find less evidence, however, that entering Democrats were systematically more extreme than exiting Democrats. In comparing roll call scores among all Democrats who joined and left during this period, in fact, we find that the joiners (-0.289) were less liberal than the leavers (-0.322). Among Democratic legislators who completed the NPAT, however, the entering legislators had somewhat more liberal voting records compared to exiting legislators; however, the difference is small in magnitude (-0.025 units) and not statistically distinguishable from zero (t -statistic of -0.933). We reach a similar conclusion when comparing the NPAT scores among Democrats who joined and exited Congress during this time period; while the new legislators were somewhat more liberal (-0.384) than those who left (-0.342), the magnitude of the difference is considerably smaller in magnitude than it is among Republicans and is not statistically significant.

The results in Table 2 support several conclusions. First, they demonstrate that—on the basis of their roll call voting scores—the sample of legislators who completed the NPAT is not obviously different from the legislators who did not complete it. This finding helps justify our focus on NPAT respondents as a means of reaching broader conclusions about polarization in the

Table 2: Are New MCs More Extreme than Departing MCs?

Case	Joiner Mean	Leaver Mean	Diff. in Means	t-Stat.	# MCs Joining	# MCs Leaving
<i>Republicans</i>						
Roll-Call Score, all MCs	0.642	0.500	0.141	7.973	194	149
Roll-Call Score, MCs with NPAT	0.602	0.499	0.103	3.410	50	85
NPAT Score, MCs with NPAT	0.446	0.341	0.105	2.249	50	85
<i>Democrats</i>						
Roll-Call Score, all MCs	-0.289	-0.322	0.033	1.955	209	96
Roll-Call Score, MCs with NPAT	-0.349	-0.324	-0.025	-0.933	61	48
NPAT Score, MCs with NPAT	-0.384	-0.342	-0.042	-0.869	61	48

contemporary Congress. Second, the data provide some evidence that legislators who entered Congress between 1996 and 2008 were systematically more extreme relative to the members who left Congress during this same time period. While we do not have sufficient data to match new members of Congress relative to the legislators from their district whom they replaced, these findings do indicate that, in the aggregate, newly elected legislators contributed to increased ideological polarization within Congress. Third, these patterns are more pronounced among Republicans, among whom we find the strongest evidence that newly elected members were more ideologically extreme relative to the legislators who left Congress during this period. New members vote differently on roll calls than exiting members and these differences are reflected in their responses to the NPAT.

Table 3 evaluates the implications of the patterns shown above for estimates of polarization in the House. The top row compares the DW-NOMINATE estimates of roll call voting behavior for the 44 Republican members who served in the U.S. for the entire period between 1996 and 2008. According to these estimates, this group of legislators exhibited considerable within-legislator ideological movement across this period. The average DW-NOMINATE score for these legislators in 1996 was 0.538 compared with 0.636 in 2008. This difference in means is statistically significant with a t -statistic of 2.736. As the second row shows, we find similar patterns when focusing on

the 27 Republican legislators who were in Congress across this period and completed the NPAT survey. On average, roll call-based estimates characterize these legislators as 0.085 units more conservative in 2008 than they were in 1996, and this difference is statistically significant.

We find little evidence of a similar trend to the ideological left among Democrats. The average difference between Democrats' roll call scores in 1996 and 2008 is small in magnitude (-0.012) and not statistically distinguishable from zero. We find the same pattern when focusing just on those Democrats who served the entire period between 1996 and 2008 and who completed the NPAT.

Table 3: Within-Member Changes in Roll Call Scores

Case	1996 Mean	2008 Mean	Diff. in Means	t-Stat.	# MCs
<i>Republicans</i>					
All MCs	0.538	0.636	0.098	2.736	44
MCs with NPAT	0.511	0.596	0.085	2.185	27
<i>Democrats</i>					
All MCs	-0.421	-0.433	-0.012	-0.617	69
MCs with NPAT	-0.411	-0.428	-0.017	-0.729	53

Our analyses of NPAT data produce two main conclusions. First, we find no evidence that members of Congress change their overall ideological positions during their time in office. While legislators do occasionally update their views on specific issues, members of Congress in our study did not become systematically more ideologically extreme during their time in office. Consistent with Poole's (2007) contention that members of Congress "die in their ideological boots", our analyses show that ideological adaptation among legislators cannot explain increasing patterns of partisan polarization in the contemporary Congress.

This finding calls into question some widely-used measures of legislative behavior which show that legislators *do* change their voting patterns over time. As our analyses have shown, DW-NOMINATE scores show that sitting members of Congress—particularly Republicans—became more ideologically extreme while our NPAT scores provide a portrait of overwhelming ideologi-

cal stability. At the aggregate level, the evolution documented by DW-NOMINATE scores forms an important empirical basis for claims about rising levels of partisan polarization in Congress. But the inconsistency between the patterns we document and those reflected in DW-NOMINATE scores suggests that the methodological assumptions or substantive interpretations of the scores may create a misleading depiction of legislative voting behavior if taken at face value. One possibility, consistent with our findings, is that the nature of the legislative agenda on which members vote has changed such that more recent votes reflect issues on which the parties are more clearly divided. The observational equivalence of changing preferences and shifting agendas are well-documented in scholarship on estimating legislator ideologies from roll call data (e.g., Clinton, Jackman, and Rivers 2004).¹⁶

Second, we do find evidence that relatively moderate legislators who have exited Congress in recent years have been replaced by more ideologically extreme legislators. This is particularly the case among Republicans and is consistent with other research based on DW-NOMINATE and related scores which depict the asymmetric polarization of Congress over the last several decades, with Republicans lurching to the ideological right at a greater rate than Democrats have more to the ideological left. To be clear, though, we find that this pattern of asymmetric polarization is driven by the replacement of moderates with extremists—not by the ideological adaptation of longer-serving legislators. Consistent with the general pattern documented by DW-NOMINATE, we conclude that the contemporary Congress is more polarized than it was in past decades, as the ideological composition of legislators who have been first elected to Congress since 1996 is more ideologically extreme relative to the legislators who left during the same period.

¹⁶A second, and not mutually exclusive, possibility is that the technical assumptions required to generate dynamic estimates of legislative behavior that are comparable across the entire history of the U.S. Congress are too stringent to interpret the resulting measures in a cardinal fashion.

Polarization across Issue Areas

We explore how the patterns shown above vary across issue areas. As Jochim and Jones (2012) show, for instance, polarization in roll call voting patterns over the last several decades has occurred at varying rates. Therefore, we distinguish the questions in the NPAT surveys across issue categories. We group questions using the following categories: economic issues, which includes questions on the budget, taxes, welfare, social security, health insurance, and employment; cultural issues, which includes abortion, drugs, affirmative action, and education; national defense; criminal justice; environment; government reform; trade; and international aid.

To perform this analysis, we must use a different estimation strategy than W-NOMINATE. First, for some issues there are only a few questions associated with them, and estimates produced with procedures like W-NOMINATE can be unstable with a smaller number of items. Second, even if we were able to use W-NOMINATE to scale legislators' responses to each issue area, the resulting estimates would not be comparable because they would not be estimated in the same ideological space. We would thus be unable to compare patterns in polarization across issue areas, which is our substantive goal. Instead, we compute NPAT Linear Conservative Scores for legislators' positions in each issue area. Before proceeding, we emphasize that our main findings shown above are replicated with the NPAT Linear Conservative Scores when using all of the questions on the NPAT survey, which provides assurance in the reliability of this measurement strategy for the issue-specific context. We included questions that appeared on at least five of the seven years of the NPAT survey so that we have sufficient coverage of issue areas.

Table 4 compares positions on eight issues for Democrats and Republicans.¹⁷ Similar to the

¹⁷We are limited to studying issues that were on the agenda throughout the period we study. Of course, it is possible that the emergence of new issues that divide legislators across party lines could also increase polarization. By design, we are unable to examine this possibility since we are holding the composition of the agenda fixed. Yet this is precisely the scenario that makes it

analyses in Table 2, we distinguish the positions of legislators who joined Congress between 1996 and 2008 (*Joiner mean*) with legislators who left Congress during the same period (*Leaver mean*). The issue categories are described in each row. We note, however, that the number of items used to measure legislator ideology varies substantially across them.¹⁸ We have the largest number of items, for instance, for economic (195) and defense (48) issues, and relatively few items for government reform and international aid (4 questions for each).¹⁹

The issue-by-issue comparison reveals several novel patterns. First, we find no evidence of greater partisan polarization via replacement on economic issues. While new Republican members were more conservative than Republicans who left Congress during this period, this difference is substantively small and not statistically significant. The difference between entering and exiting Democrats is even smaller and is also not statistically significant. Second, we find the strongest evidence of increasing polarization on cultural issues, where Republicans who left Congress were replaced by significantly more conservative Republicans while Democrats who left Congress during this period were replaced by Democrats who were substantially more liberal on cultural issues. As an illustration of the growing polarization on cultural issues, consider that the partisan difference between the mean conservative probability scores among exiting Republicans and Democrats was 0.243 (0.594–0.351). The partisan difference on these issues was 0.408 among Republicans and Democrats who entered Congress during this period (0.687–0.279),

difficult to make inferences about changing levels of polarization across time, as it is not clear from dynamic measures how these new issues contribute to changes in party ideologies.

¹⁸This variation implies varying measurement uncertainty across each issue area, which advises caution against comparing changes across issues.

¹⁹The large number of items for economic issues mostly reflects the nature of the questions related to taxes and spending, where we created six dichotomous questions from each six-point scale, as described above. Therefore, we have approximately 40 unique questions for economic issues, and about 8 unique questions for defense issues.

which amounts to a 67 percent increase in polarization on this issue.

Among Republicans, we also find that more moderate members were replaced by more extreme members on the environment, government reform, and defense, although the differences for the latter two issues are not statistically distinguishable from zero. Newly entering Republicans were somewhat more moderate than the legislators they replaced on crime, international trade, and international aid, though none of these differences is statistically significant.

Among Democrats, however, newly entering members were significantly more liberal than exiting members on crime, international trade, and international aid. They were also more liberal than exiting members on the environment, although this difference is not statistically significant. Interestingly, new Democrats were significantly more *conservative* than exiting Democrats on national defense, possibly because the post-9/11 wars induced a conservative response (see Howell and Rogowski 2013), at least through 2004. Finally, newly entering Democrats were more conservative than the legislators they replaced on government issues, but this difference is not statistically significant.

The results in Table 4 suggest that the composition of the legislative agenda affects how we understand polarization. While Figure 2 and Table 2 show that Republican legislators have been disproportionate contributors to congressional polarization, a different issue agenda—composed, perhaps, of more issues involving international trade and aid—could have produced different substantive findings, including either no change in polarization, or increasing congressional polarization driven primarily by Democrats. Because the underlying level of partisan disagreement varies across issues, the relative presence of these issues on the congressional agenda will affect the polarization observed from legislative voting records.

Congressional Polarization and the Issue Agenda

We connect our issue-specific findings to the congressional agenda. If legislators are more polarized on some issues than others, and the issues on which they are polarized comprise an

**Table 4: Are New MCs More Extreme than Departing MCs?
NPAT Scores on Different Issue Bundles
(Linear Conservative Probability Scores)**

Case	Joiner Mean	Leaver Mean	Diff. in Means	t-Stat.	# MCs Joining	# MCs Leaving	# of Items
<i>Republicans</i>							
Economic Issues	0.494	0.484	0.010	0.875	51	87	195
Cultural Issues	0.687	0.594	0.093	3.262	51	87	18
Defense Issues	0.575	0.559	0.015	1.049	51	87	48
Environmental Issues	0.705	0.547	0.158	3.343	51	85	5
Crime Issues	0.716	0.759	-0.043	-1.178	51	87	6
Govt Reform Issues	0.692	0.620	0.073	1.909	51	85	4
International Trade	0.505	0.521	-0.015	-0.591	51	86	15
International Aid	0.456	0.486	-0.029	-0.803	45	79	4
<i>Democrats</i>							
Economic Issues	0.337	0.337	-0.001	-0.089	63	48	195
Cultural Issues	0.279	0.351	-0.072	-2.844	63	48	18
Defense Issues	0.495	0.445	0.049	3.167	63	48	48
Environmental Issues	0.149	0.223	-0.074	-1.776	63	48	5
Crime Issues	0.299	0.420	-0.122	-2.484	63	48	6
Govt Reform Issues	0.413	0.381	0.033	1.005	63	46	4
International Trade	0.312	0.381	-0.069	-2.670	63	48	15
International Aid	0.334	0.453	-0.119	-3.633	60	43	4

increasingly large share of the legislative agenda, then roll call-based measures may overestimate the true extent of ideological disagreement. To do so, we examined the composition of the congressional agenda over the past four decades. We distinguished roll call votes based on the issue categories developed by Peltzman (1984).²⁰ For simplicity, we collapsed the Peltzman issue codings into six categories that broadly reflect the issue categories used in our analyses of NPAT responses: Budget and economic regulation; social policy; government organization; internal and procedural votes; national defense; and foreign policy.²¹

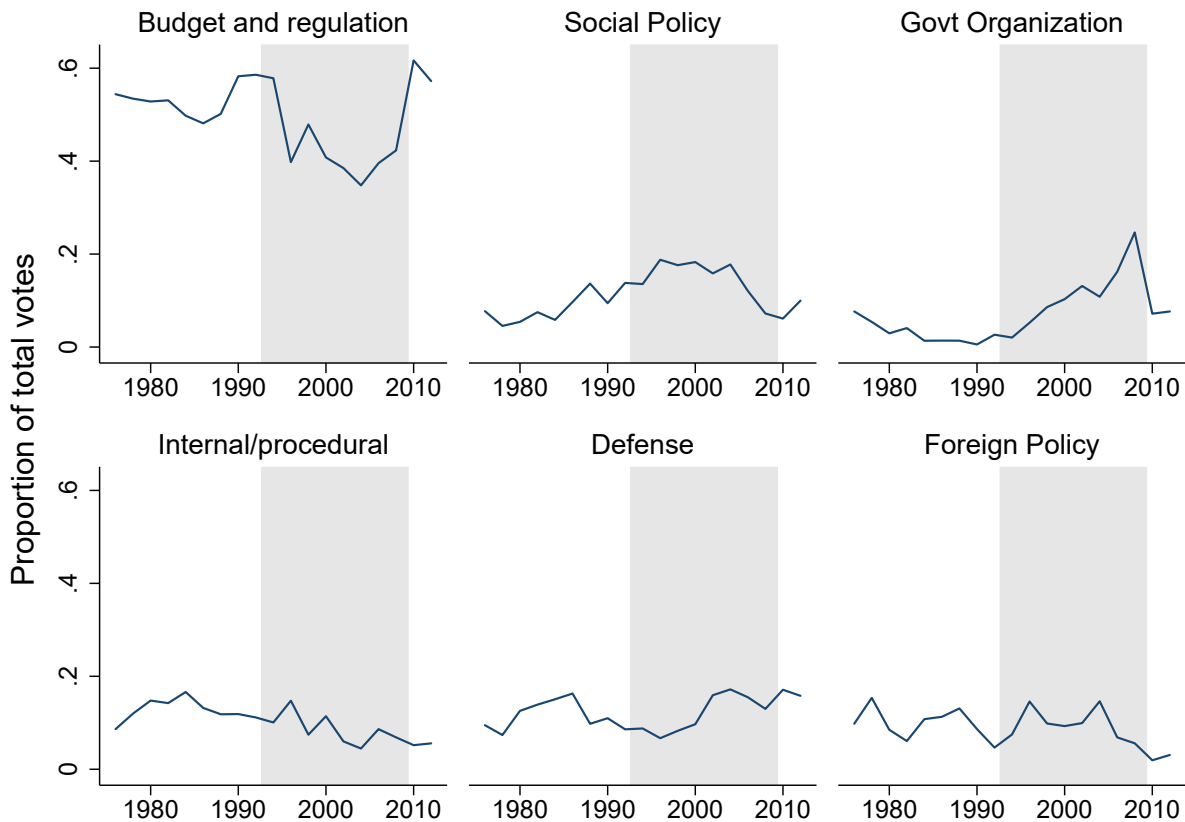
Figure 6 displays the proportion of all roll call votes in each issue category across congresses. The years shown along the *x*-axis reflect the years in which each congress was elected, and the vertical bars bracket the years contained in our NPAT analysis. The figure reveals substantial variation across issue areas and years. On average, for instance, 49 percent of roll call votes in a given Congress concern budgetary policy and economic regulation. However, as the top-left plot shows, this figure varies quite a bit, from a low of 35 percent in the 109th (2005-06) Congress to a high of 62 percent in the 112th (2011-12) Congress. Interestingly, given the findings above, the proportion of roll call votes on budgetary matters was at a low point (for this time series) during the period of our analysis. Moreover, as the top-center plot shows, the proportion of votes held

²⁰These scores have been extended through the contemporary Congress and are available at: Lewis, Jeffrey B., Keith Poole, Howard Rosenthal, Adam Boche, Aaron Rudkin, and Luke Sonnet (2019). *Voteview: Congressional Roll-Call Votes Database*. <https://voteview.com/>.

²¹These issue codes are available at https://voteview.com/articles/issue_codes. *Budget and economic regulation* combines Budget General Interest, Budget Special Interest, Regulation General Interest, and Regulation Special Interest; *National defense* combines Defense Policy Budget and Defense Policy Resolutions; *Foreign policy* combines Foreign Policy Budget and Foreign Policy Regulations. Social policy, government organization, and internal and procedural votes were all defined from the relevant Peltzman issue code for each. We omitted the Indian Affairs and D.C. categories because only a very small number of votes were held for these issues.

on social policy was at a relative high-point during the period of our study. Between the 105th and 111th congresses, about 15 percent of roll call votes were on social policy matters, while this figure typically hovered around nine percent for the other congresses represented in Figure 6. We also see temporal variation in the representation of the other issues on the legislative agenda. It is notable that the proportion of internal and procedural issues appears to have declined rather steadily across time, which suggests that the growing presence of these issues on the agenda is not a compelling explanation for the rise in legislative polarization.

Figure 6: Issue Composition of the Congress Agenda, 1977–2014



This figure plots the proportion of roll call votes cast in the U.S. House between 1977 and 2014 across issue areas. The x-axis characterizes the election year in which each Congress was elected.

While Figure 6 does not provide a dispositive account of why congressional polarization has varied over time, the data show that the composition of the legislative agenda varies from one

congress to another. To the extent that underlying partisan disagreement on these issues varies, as our findings suggest they do, then scholars should take seriously the nature of the agenda as a potential contributor to the patterns of polarization expressed by roll call-based estimates. Moreover, we note that issue composition is not the only way that the agenda may be related to polarization; for instance, the increasing presence of relatively moderate or more extreme roll call proposals can also induce patterns of polarization that may not accurately reflect the underlying level of ideological disagreement among legislators.

Conclusion

The broadest finding from our analysis is that the growing polarization observed in congressional roll-call voting is not exclusively an artifact of a changing legislative agenda. When we hold the agenda fixed, we still document patterns of a growing gap between the two parties. Furthermore, we find evidence of asymmetric polarization: the gap between the two parties results from the average Republican becoming substantially more conservative while we find less evidence that the average Democrat has become substantially more liberal. To the extent the legislative agenda has changed over time, perhaps in ways that increasingly divides the parties, it is not generating patterns of partisan polarization that would not otherwise exist.

However, some of the patterns we observe are inconsistent with past analyses that use roll-call measures. In particular, we do not find evidence that members become systematically more extreme throughout their tenure, whereas other literature finds that this within-member ideological adaptation explains about half of the increase in polarization. Our findings suggest that roll-call measures, such as DW-NOMINATE, may overstate the degree to which the parties are ideologically polarized. Instead, at least some of the growth in roll-call polarization is likely due to the changing agenda, increasing party pressure, or both.

In additional analyses, we extend our findings to state legislatures using NPAT data for state legislative candidates in 1996 and 1998 using only the questions that are common across states

and appear in both years.²² Though limited to two election years, the patterns are quite similar to those for the U.S. House, with legislators exhibiting a high degree of ideological consistency across election cycles. These findings represent a first step toward “parsing” polarization in state legislatures to study how replacement, adaptation, and agenda control affect polarization in those institutions.

Our findings have both substantive and methodological implications. Substantively, the results suggest that members of Congress continue to have electoral incentives to reflect the preferences of their constituencies. Even as aggregate polarization increases, individual legislators do not meaningfully deviate from the ideological positions they adopted in earlier terms. Our results further indicate the need for greater attention to the contributions of agenda control and party pressure to contemporary patterns of polarization. As previous scholarship has recognized, to the extent different and/or more divisive issues comprise a greater share of legislative agenda, our substantive inferences about the preferences of individual legislators and the ideological composition of party caucuses risk conflating genuine preference change with agenda change.

Methodologically, our results imply that researchers should exercise caution when employing DW-NOMINATE scores in empirical analyses. Inferences about variation in partisan polarization and about the effects of institutional and constituency changes on legislative voting behavior may be flawed when employing measures that overstate the extent of ideological adaptation among legislators or smooth any changes across time. Instead, the assumptions of ideological stability used to generate common-space DW-NOMINATE scores and related measures may be more easily satisfied. While we do not generalize our findings beyond the U.S. Congress, these measurement implications apply to other contexts, including subnational legislatures and judicial settings.

²²See Appendix A.5.

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ONLINE APPENDIX

Robustness Checks and Supplementary Analyses for
Parsing Party Polarization in Congress

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A.1 NPAT Survey Details

Table A.1: Distribution of NPAT Questions across Issue Areas

Issue	# Questions
Abortion	5
Affirmative action	3
Budget (across various domestic programs)	30
Crime	1
Education	3
Environment	2
Government reform	2
Guns	1
Health care	1
Immigration	2
National defense	30
Taxes	54

A.2 Fraction Conservative Scores

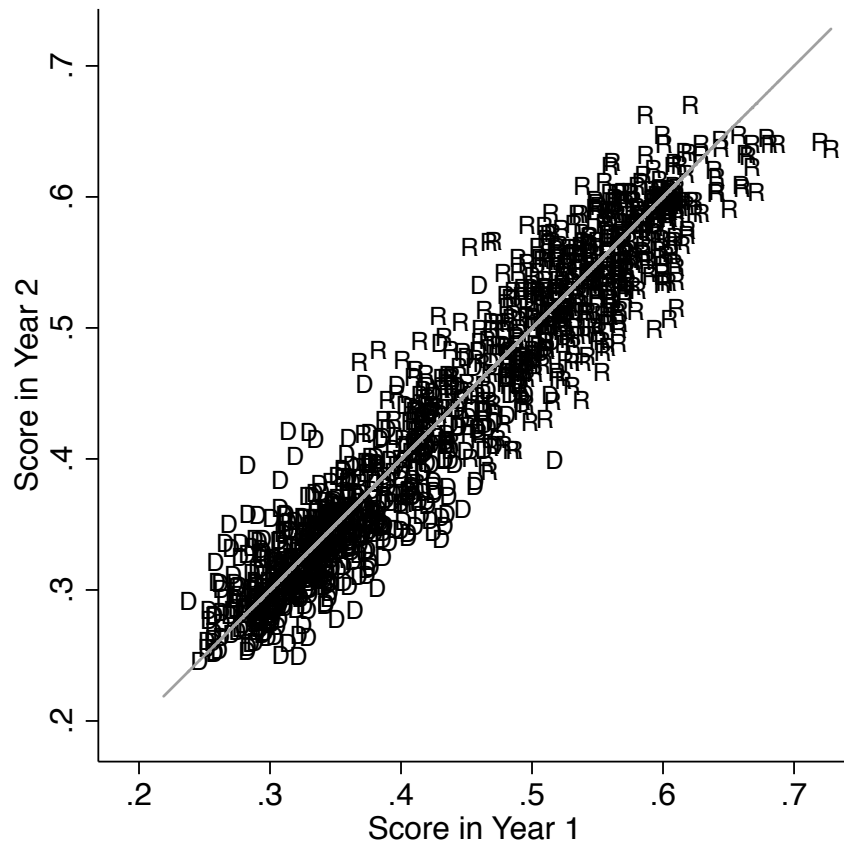


Figure A.1: Year 2 vs. Year 1 NPAT Fraction Conservative Scores for Candidates with 2+ Scores, All Pairs Pooled

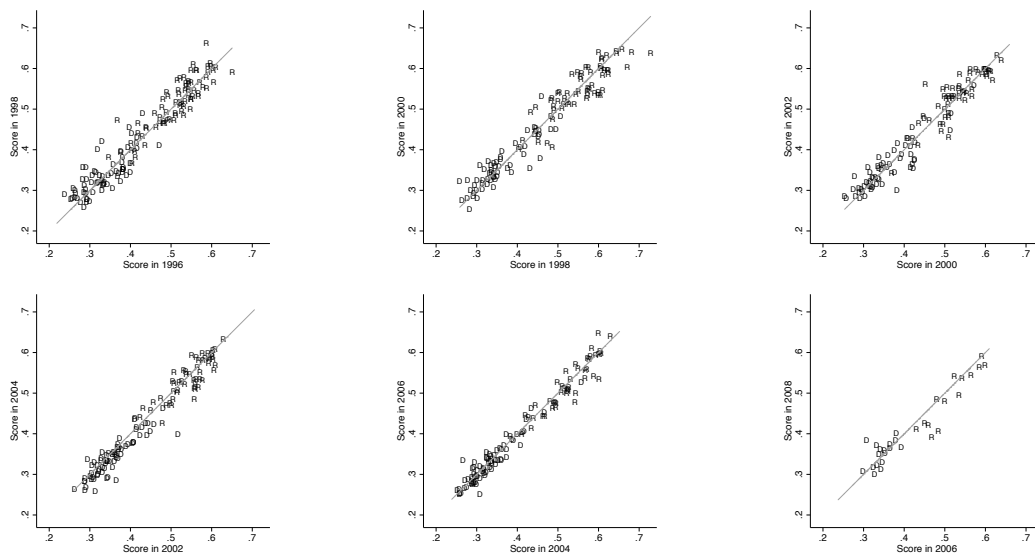


Figure A.2: Year 2 vs. Year 1 NPAT Fraction Conservative Scores for Candidates with 2+ Scores, By Year Pair

**Table A.2: Do Candidates Change NPAT Scores Over Time?
(Linear Conservative Probability Scores)**

Case	Difference	t-Statistic	# Obs.
<i>Both major parties</i>			
Year 2 – Year 1 = 2	0.023	2.761	611
Year 2 – Year 1 \geq 2	0.022	2.798	698
<i>Republican</i>			
Year 2 – Year 1 = 2	0.031	2.292	290
Year 2 – Year 1 \geq 2	0.030	2.281	327
<i>Democrats</i>			
Year 2 – Year 1 = 2	0.016	1.563	321
Year 2 – Year 1 \geq 2	0.016	1.630	371

**Table A.3: Are New MCs More Extreme than Departing MCs?
(Linear Conservative Probability Scores)**

Case	Joiner Mean	Leaver Mean	Diff. in Means	t-Stat.	# MCs Joining	# MCs Leaving
<i>Republicans</i>						
NPAT Score, MCs with NPAT	0.494	0.346	0.149	2.590	50	86
<i>Democrats</i>						
NPAT Score, MCs with NPAT	-0.358	-0.399	0.042	0.783	61	48

A.3 Changing Positions

Medicare Part D

The prescription drug benefit for Medicare recipients (Medicare part D), passed in 2003, is another interesting case. The relevant item in the NPAT survey asks candidates whether they “support expanding prescription drug coverage under Medicare.” Between 2000 and 2002, 13 out of 124 candidates (10.5%) switched from not supporting to supporting expansion, while only 4 candidates (3%) switched in the opposite direction. After 2003 the pattern is reversed. Between 2002 and 2004, 24 out of 149 candidates (16%) switched from supporting to not supporting expansion, while only 4 candidates (3%) switched in the opposite direction. Between 2004 and 2006, 18 out of 145 candidates (12%) switched from supporting to not supporting expansion, while only 7 candidates (5%) switched in the opposite direction.

The Minimum Wage

A final case is the minimum wage. The federal minimum wage increased by 21% between 1996 and 1998, from \$4.25 to \$5.15. It remained unchanged until 2008. Between 1996 and 1998, 23 candidates out of 173 (13%) switched from supporting to not supporting an increase in the minimum wage, while only 2 candidates (1%) switched in the opposite direction. This is the only pair of years in which an imbalance of this sort occurs. In all other cases where a large number of candidates change positions on this issue, they increase their support for the minimum wage. Between 1998 and 2000, 28 candidates out of 164 (17%) switched from not supporting to supporting an increase in the minimum wage, while only 3 candidates (2%) switched in the opposite direction. Similarly, between 2004 and 2006, 18 candidates out of 149 (12%) switched from not supporting to supporting an increase in the minimum wage, while only 1 candidate (1%) switched in the opposite direction. Both of these pairs occurred during periods in which the minimum wage was fixed in nominal terms and therefore decreasing in real terms.

A.4 Robustness checks: Within-member movement

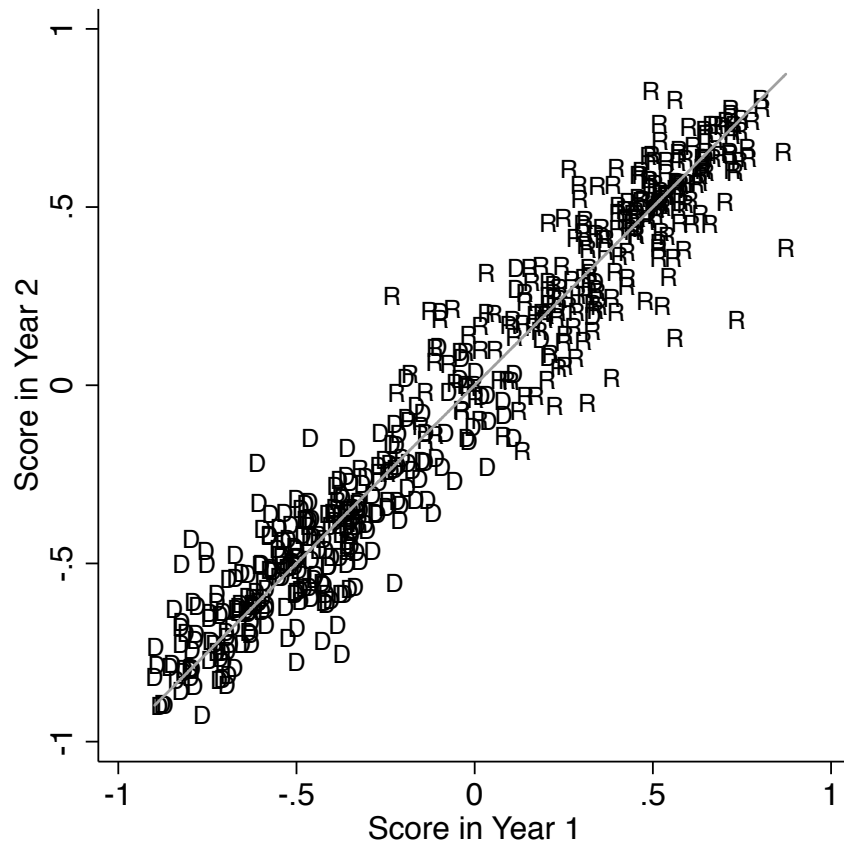


Figure A.3: NPAT W-NOMINATE Scores for Candidates with 2+ Scores, All Pairs Pooled. This figure plots candidates' scores in year t vs. year $t+2$ or $t+4$. Negative values indicate liberal candidates and positive values indicate conservative candidates.

Table A.4: Do Candidates Change NPAT Scores Over Time?

Case	Difference	t-Statistic	# Obs.
<i>Both major parties</i>			
Year 2 – Year 1 = 2	0.002	0.336	456
Year 2 – Year 1 \geq 2	0.001	0.092	518
<i>Republican</i>			
Year 2 – Year 1 = 2	0.005	0.511	220
Year 2 – Year 1 \geq 2	0.002	0.197	245
<i>Democrats</i>			
Year 2 – Year 1 = 2	-0.001	-0.079	236
Year 2 – Year 1 \geq 2	-0.001	-0.078	273

Table A.5: Do Candidates Change NPAT Scores Over Time? (Collapsed Data)

Case	Difference	t-Statistic	# Obs.
<i>Both major parties</i>			
Year 2 – Year 1 = 2	0.009	1.178	334
Year 2 – Year 1 \geq 2	0.008	1.018	370
<i>Republican</i>			
Year 2 – Year 1 = 2	0.014	1.184	159
Year 2 – Year 1 \geq 2	0.011	0.945	175
<i>Democrats</i>			
Year 2 – Year 1 = 2	0.005	0.494	175
Year 2 – Year 1 \geq 2	0.005	0.492	195

Table A.6: Do Candidates Change NPAT Scores Over Time? (Unsuccessful candidates)

Case	Difference	t-Statistic	# Obs.
Panel A: W-NOMINATE NPAT Scores			
<i>Both major parties</i>			
Year 2 – Year 1 = 2	0.009	0.562	155
Year 2 – Year 1 \geq 2	0.011	0.728	180
<i>Republicans</i>			
Year 2 – Year 1 = 2	0.017	0.741	70
Year 2 – Year 1 \geq 2	0.022	1.038	82
<i>Democrats</i>			
Year 2 – Year 1 = 2	0.002	0.095	85
Year 2 – Year 1 \geq 2	0.001	0.046	98
Panel B: Linear Probability NPAT Scores			
<i>Both major parties</i>			
Year 2 – Year 1 = 2	0.033	1.669	155
Year 2 – Year 1 \geq 2	0.033	1.810	180
<i>Republicans</i>			
Year 2 – Year 1 = 2	0.038	1.260	70
Year 2 – Year 1 \geq 2	0.041	1.387	82
<i>Democrats</i>			
Year 2 – Year 1 = 2	0.029	1.099	85
Year 2 – Year 1 \geq 2	0.027	1.160	98

Table A.7: Do Candidates Change NPAT Scores Over Time? (Comparing successful and unsuccessful candidates)

Case	Difference	t-Statistic
Panel A: W-NOMINATE NPAT Scores		
<i>Both major parties</i>		
Year 2 – Year 1 = 2	0.009	0.498
Year 2 – Year 1 \geq 2	0.011	0.776
<i>Republicans</i>		
Year 2 – Year 1 = 2	0.017	0.584
Year 2 – Year 1 \geq 2	0.022	1.036
<i>Democrats</i>		
Year 2 – Year 1 = 2	0.002	0.146
Year 2 – Year 1 \geq 2	0.001	0.087
Panel B: Linear Probability NPAT Scores		
<i>Both major parties</i>		
Year 2 – Year 1 = 2	0.033	0.638
Year 2 – Year 1 \geq 2	0.033	0.804
<i>Republicans</i>		
Year 2 – Year 1 = 2	0.038	0.256
Year 2 – Year 1 \geq 2	0.041	0.480
<i>Democrats</i>		
Year 2 – Year 1 = 2	0.029	0.718
Year 2 – Year 1 \geq 2	0.027	0.703

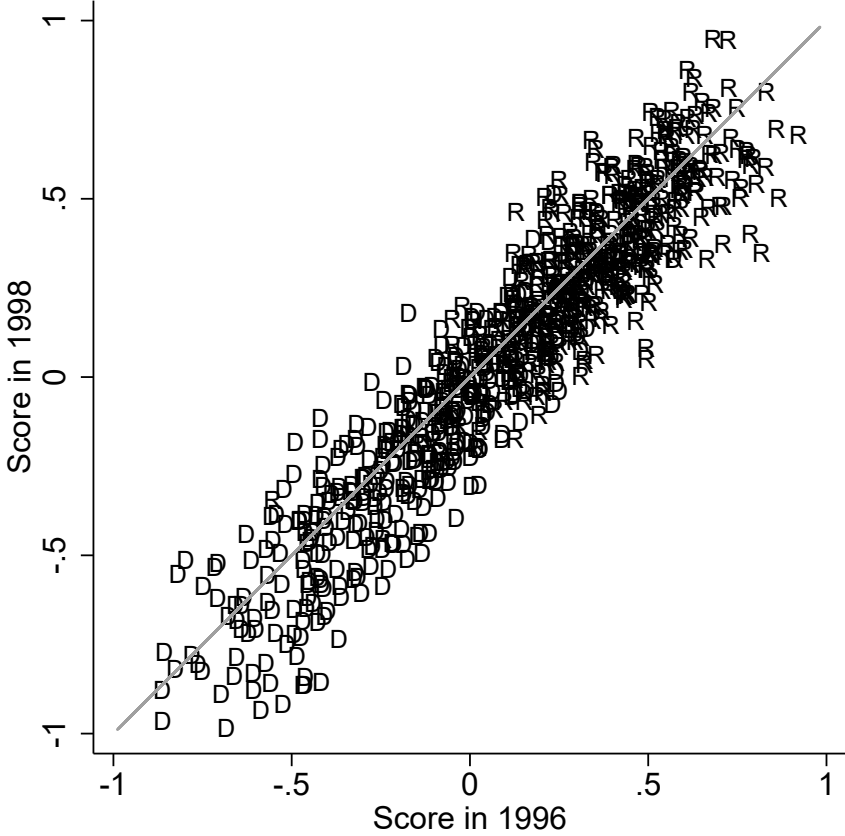
A.5 State Legislatures

Shor and McCarty (2010) show that partisan polarization extends to state legislatures, but their data also show considerable variation across states in both levels and trends. By assumption, and in contrast with DW-NOMINATE scores, legislators in their data are constrained to have a constant roll call score across time.

We computed NPAT Fraction Conservative Scores for all state legislative candidates in 1996 and 1998 analogous to those above for the U.S. Congress, using only the questions that are common across states and appear in both years. In Figure A.4, we plot the 1998 scores against the 1996 scores, for those legislators with scores in both years. Consistent with our analysis of Congress, the points lie clustered tightly around the 45 degree line, and there is no signs of systematic movement toward polarization—i.e., no clustering of points above the 45 degree line among the candidate with relatively conservative scores in 1996, and no clustering of points below the 45 degree line among the candidates with relatively liberal scores in 1996.

Though limited to two election years, the patterns in Figure A.4 are quite similar to those for members of the U.S. House. The high degree of ideological consistency across time provides empirical justification for the estimation assumptions used by Shor and McCarty (2010). Substantively, the patterns suggest that within-member adaptation is unlikely to be an important contributor to varying patterns of partisan polarization in state legislatures. We suspect, then, that “parsing” the polarization in state legislatures will produce patterns similar to those we found above for Congress.

Figure A.4: NPAT W-NOMINATE Scores for State Legislative Candidates, 1996 and 1998



This figure plots candidates' scores in 1996 vs. 1998. Negative values indicate liberal candidates and positive values indicate conservative candidates.