Partisan Agenda Control and the Dimensionality of Congress

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Abstract

Recent studies have questioned the familiar characterization of congressional voting as unidimensional (Crespin and Rohde 2010; Roberts et al. 2008). We argue that majority parties use of negative agenda control can lead to multidimensional congresses appearing unidimensional. We evaluate this argument by examining the relationship between measures of unidimensionality and various measures of party control for the House of Representatives from 1875 to 1997, at both the roll call and congress level. Our findings help to clarify why a single dimension might explain a large amount of the variance in voting data, even if latent ideology is multidimensional.

Introduction

On December 29, 1845, the United States Congress formally voted to accept Texas into the Union. The vote led to a conflict with Mexico over the location of the Texas border and, subsequently, war. The war was aggressively prosecuted by President James K. Polk, and it strained the sectional relationship between Northern and Southern Democrats over the expansion of slavery. However, as was the case in the past, House Democrats were able to put their party first and suppress the slavery issue throughout much of the first session of the 29th Congress.

In the waning days of the first session, it appeared that the war with Mexico was coming to an end. On August 8th, Polk submitted a message to the House requesting two million dollars for negotiations with Mexico regarding the cession of more territory. To this, Representative David Wilmot (D-PA) attached his famous Proviso which prevented slavery in all lands acquired from Mexico. The proviso drew the wrath of Southerners and split both the Democratic and Whig parties along sectional lines (Silbey 2005). The president assailed Wilmot and his Democratic supporters, accusing them of "divid[ing] and distract[ing] the Democratic Party (Silbey 2005, 128)." Wilmot's amendment revealed differences among the Democrats along a second dimension and led to four years of sectional conflict over slavery-related issues.

Roughly one-hundred and fifty years later, political observers were shocked when the Republican Party picked up 54 seats to take control of the 104th House (1995-1997). It was the first time the Republicans held the U.S. House of Representatives in fifty years. The newly-elected Speaker, Newt Gingrich (R-GA), aimed to solidify his majority by centralizing chamber power and controlling votes on the floor. He weakened committee chairs by instituting term limits and ignoring the norm of choosing committee chairmen via seniority. Instead, he opted to replace committee chairs with more loyal members (see e.g. Sinclair 2006).

Gingrich accomplished his restructuring despite considerable disagreements among his party's rank and file (notably, sectional battles between more liberal northeast Republicans and conservative Southerners). Those disagreements were masked by strong, centralized control of voting on the floor. Gingrich and other leaders decided what came to the floor, and importantly, the manner in which it would be amended and debated. This kept the party "on message," by restricting the types of issues being considered and blocking moderate proposals from a vote. The end result of the agenda control was a party successfully passing all but one of its provisions in the "Contract with America," a document used in the 1994 election to outline Republican goals.[1] Given this success, ideological divisions within the party *appeared* to be minimal.

The preceding episodes illustrate how changes in a party's capacity to control the agenda can potentially suppress the number of policy dimensions observed in Congress. Specifically, the open-amendment process of the 29th Congress, combined with a relatively dispersed chamber leadership, facilitated the passage of the Wilmot Proviso. Since the process allowed Wilmot to make any proposal, he was able to generate a horizontal "cut line"[2] that cleanly divided the yeas and nays by region (see Figure 7.8 of Poole and Rosenthal 1997, 161). Thus, the proviso opened up higher dimensions.[3] Conversely, the relatively tight agenda-control

[1]Only a constitutional amendment providing for legislative term limits failed to garner the necessary two-thirds support in the House. However, the contract was met with solid resistance by the Senate and the president. Only two of its provisions were passed by the Senate and signed into law by the president. Those two provisions – one banning unfunded mandates and another requiring that a series of laws be applied to members of Congress – were fairly uncontroversial (Critchlow 2004).

[2]In a two dimensional space, a cut line separates yea voters on one side of the line from nay voters on the other. Typically, abstentions are treated as missing data.

[3]Indeed, the five votes on Polk's proposal prior to the addition of the Wilmot Proviso featured cut lines with relatively vertical angles (average absolute angle of 61.62 degrees) and relatively high majority party cohesion (89.86% of majority party Democrats voted together). Conversely, the three recorded votes on the proposal after the addition of the Wilmot Proviso featured more horizontal cut lines (average absolute angle of 30.76 degrees) and low majority party cohesion (53.14% of majority party Democrats voted together). These three recorded votes were on the motion to table the bill with the Proviso, the final passage of the bill and a motion to reconsider the final passage vote. The Wilmot Proviso itself was adopted via unrecorded teller vote 83 to 64 (see *Congressional Globe*, 29th Congress, August 12, 1846, 1217).

exercised by Gingrich in the 104th House would have prevented any proposals highlighting second dimensional differences.

The link between partisan capacity to control the legislative agenda and observed dimensionality is of profound importance to observers of American politics. The unidimensionality assumption serves as the primary basis for the ideological labels (e.g. "liberal," "moderate," "conservative") that are frequently used by politicians, pundits and academics. These labels also serve as useful cues for members of the electorate looking to reduce the informational costs of voting. Furthermore, unidimensionality is a key assumption in many studies of congressional decision making and interbranch relations. It aligns legislators on a single liberal-conservative scale and allows scholars to apply various extensions of the median voter theorem.

We examine the potential relationship between partisan agenda control and observed dimensionality in Congress using a three-fold approach. First, we use a hypothetical example to show how negative agenda control can theoretically reduce the number of dimensions detected by standard scaling techniques. Second, we look for empirical evidence that negative agenda control affects dimensionality. Using a dataset of all recorded roll call votes in the House of Representatives from 1875 to 1997, we find that the absolute angle of cut lines is larger for special rule and amendment votes during eras where the majority party enjoyed stronger control of the Rules Committee. This suggests that strong parties may have artificially reduced the dimensionality observed. Finally, we examine the relationship between measures of the presence of a second dimension and majority party cohesion on roll calls in a separate, congress-level regression. Those regressions suggest that greater cohesiveness among the majority party suppresses a second dimension. Perhaps such agenda control plays an important role in suppressing latent issue dimensions more generally. The next section reviews the literature on dimensionality in greater detail.

Literature

The primary goal for many political scientists is to accurately describe the conditions and factors that facilitate policy change. That debate was substantially altered by the introduction of Poole and Rosenthal's NOMINATE procedure (Poole and Rosenthal 1985; 1991; 1997; 2007). NOMINATE uses maximum likelihood estimation to unfold binary choice data into a policy space with a pre-specified number of dimensions. The appropriate number of dimensions are determined by a number of techniques, including the classic "left-elbow" test using the eigenvalues from the double-centered, legislator agreement score matrix. It can also be determined by examining the aggregate proportional reduction of error (APRE) for each additional dimension.[4] Those measures indicate the amount of unique variation explained by each dimension and the errors reduced by each dimension, respectively. Bayesians use similar techniques (Clinton et al. 2004). Because one can always improve the fit by increasing the number of dimensions, there is no statistically justifiable test for the appropriate number of dimensions. Instead, the typical rule of thumb is to look for a left elbow in a scree plot or to see if the increase in the APRE from adding an additional dimension appears large. Poole and Rosenthal use both techniques and conclude that throughout congressional history "one dimension captures most of the spatial information while a second dimension makes a marginal but important addition to the model" (Poole and Rosenthal 1991, 230). They further claim that their unidimensionality finding is particularly pronounced in the modern era.

[4] $APRE = 1 - \frac{\sum_{j=1}^{n}(\text{minority vote} - \text{classification errors})_j}{\sum_{j=1}^{n}(\text{minority vote})_j}$, where classification errors are the number of votes incorrectly predicted for a particular roll call. The idea behind APRE is to determine the amount of error reduced by the spatial estimation over a particular baseline. In this case, the baseline is the number of votes in the minority. Without any prior information, the only method to guarantee more correct than false predictions on any given roll call would be to assign everyone the majority vote on that roll call. Hence the number of minority votes represents the number of errors from such a practice. A positive (negative) value for APRE implies fewer (more) total misclassifications than the naive vote-with-the-majority scheme, with an upper bound of 1 in the case of perfect classification.

While their dimensionality analysis had its critics,[5] political scientists and other observers of Congress often assume that American politics is unidimensional and use Poole and Rosenthal's first dimensional NOMINATE scores for their studies. For example, Krehbiel (1998) employs the scores to demonstrate the importance of institutional decision-rules in Congress, like the veto override and filibuster pivots. Cox and McCubbins (2005) utilize the scores to show that the majority party plays a primal role in dictating policy output in the House. And NOMINATE has been used to test theories of presidential veto-bargaining (Cameron 2000) calculate the ideology of lower court judges (Epstein et al. 2007), and to evaluate theories of bureaucratic decision-making (Bertelli and Grose 2009). In short, for many scholars, a single dimension of ideal points serves as a proxy for legislator ideology.[6]

Given the wide spread use of unidimensional ideology scores, recent work which calls the application of the unidimensionality assumption into question deserves special attention. Crespin and Rohde (2010) evaluate recorded roll call votes on all thirteen annual appropriation bills from 1987 to 2003. After applying the NOMINATE procedure to each group of issues, they report that several of the issue areas are multidimensional and that a single member does not vote in a consistent one-dimensional pattern across issue areas. This finding is consistent with earlier work by Hurwitz, Moiles and Rohde (2001), which found evidence of multidimensional voting on agriculture appropriations bills in the 104th Congress (1995-1997).

[5] Wilcox and Clausen (1991) claim there are at least two reasons to keep policy dimensions separate, even if a single dimension explains a large amount of the variance. First, multiple dimensions allow researchers to observe new dimensions developing and old dimensions converging. Second, they allow scholars to identify legislators (or groups of legislators) who diverge from pure ideological voting.

[6] To both of these ends, NOMINATE served as a more reliable tool than interest group scores, which had been the primary tool for political observers and scholars. These interest group scores were generally derived from a non-random selection of a few recorded roll call votes. They often led to serious statistical biases that artificially polarized legislators. Frequently, such biases serve the interest groups' ideological needs. See for example Jackson and Kingdon (1992) and Lynch (2005).

In his 2007 book, Smith argued that a substantial portion of "key votes" varied along a different dimension than the ultimate final passage vote.[7] Building off of this finding, Roberts, Haptonstahl and Smith (2008) apply optimal classification to roll call votes from 1955 to 1994. They demonstrate higher levels of dimensionality at the individual bill level and argue that such distinctions are reduced when voting is aggregated to the level of an entire Congress. Much like Crespin and Rohde, the authors argue that scholars should refrain fully concluding that Congress is unidimensional.

Aldrich et al. (2010) provide a different explanation for the low dimensionality of Congress. Through the use of simulations, they show that greater ideological divisions between the two parties in multidimensional space can reduce the estimated number of dimensions. Furthermore, distributive politics may affect the number of estimated dimensions, partly because distributive politics implies that ideological positions are ignored. Although they provide no empirical evidence of the conjectures they simulate, their theoretical argument compliments the argument made here.

We contribute to this literature by offering a different explanation for the apparent unidimensionality of Congress. Rather than claiming that aggregating issue areas or increasing divisions between the two parties can reduce the number of estimated dimensions, we argue that observed dimensionality can be altered by the majority party's use of negative agenda control (Cox and McCubbins 2005). By simply preventing votes that would divide the majority party from reaching the floor, parties have the power to reduce observed dimensionality. This party-based argument is similar to two studies by Jenkins (1999; 2000), which suggest that strong parties played a role in explaining why members serving in the party-controlled United States Congress had more stable and predictable voting patterns than those same individuals did when they served in the party-less Confederate House. We extend these studies

[7]Smith (2007) uses *Congressional Quarterly*'s listing of "key votes" to draw this determination. This listing is designed to capture the votes that had the most consequential impact on congressional policy output (as judged by the editors of *Congressional Quarterly*). Frequently, they occur on amendments and rules (such as cloture) as opposed to final passage.

by identifying negative agenda control as a key mechanism by which parties influence these voting patterns. We evaluate our conjecture theoretically and empirically. The next section outlines our theory in greater detail.

Theory

Our theory of negative agenda control is analogous to a teacher trying to evaluate learning among his/her students. If the teacher does not ask questions which differentiate D and F students, he/she will not observe differences in their learning and will likely categorize them the same. Similarly, if members of Congress are not asked questions which differentiate their positions on higher dimensions, then differences between members on those dimensions will not be observed. Empirical techniques which determine dimensionality may indicate that one dimension is appropriate even if more dimensions are latent. In a sense, roll call voting is equivalent to asking questions. If questions that vary along a second, or higher, dimension are not asked, then the only variation observed will be along a dimension where questions *are* asked.

As a point of departure, assume that Cox and McCubbins (2005) are right. Leaders of the majority party will use the Rules Committee and the power of scheduling to keep votes that divide the party off the floor and out of the roll call record. "Cartel members," they write, "expect those appointed to agenda setting offices to *always* obey 'the first commandment of party leadership' – *Thou shalt not aid bills that will split thy party*" (ibid., p. 24, emphasis in original). Dennis Hastert, the longest serving Republican Speaker of the House, practiced this motto. He said, "the job of Speaker is not to expedite legislation that runs counter to the majority of his majority.... On each piece of legislation, I actively seek to bring our party together. I do not feel comfortable scheduling any controversial legislation unless we know we have the votes on our side first."[8]

[8] "Address by Speaker of the House J. Dennis Hastert," November 12, 2003, The Dirksen Congressional Center (*http://www.congresslink.org/print_basics_histmats_hastert.htm*).

We argue that this type of negative agenda control could dampen the number of dimensions observed by researchers. For our purposes it does not matter whether party leaders are motivated by fiduciary responsibilities, i.e., they prevent votes that split the party because the party expects them to do so (Cox and McCubbins 2005, pp. 27–29), or because they believe it will bring policy closer to their ideal points. All leaders have to do is practice this motto and prevent roll calls that divide the majority party. If leaders are sufficiently committed to this goal, and sufficiently successful at it, then they will unintentionally reduce the number of dimensions detected by standard methods of ideal point estimation.[9]

[Figure 1 About Here]

To see this, consider an extreme case. Figure 1a depicts two ellipses which show the extremities of two, non-overlapping parties in two dimensional space. M marks the majority party while the minority party is unmarked. Now suppose the leaders of M had sufficient knowledge, ability, and desire to never allow a vote that divided any part of M. Meaning, all members of M would have to be on the same side of any cut line for a vote to make it to the floor and to be recorded as a roll call. Because W-NOMINATE, and other ideal point estimation techniques, need some voters to dissent in order for a roll call to be useful for the estimation, some members of the minority party must be on the opposite side of the cut lines used in estimation.[10] Combined, this limits the angle of possible cut lines in the estimation to those within θ degrees. Cut lines with angles in the complement, θ^c, would not be included in the roll call matrix. Although θ^c has a limited number of degrees, preventing such cut lines would limit the ability of researchers to detect variation between voters along

[9]Snyder (1992) makes a somewhat similar argument by showing that committee gatekeeping could make roll call data seem artificially unidimensional. However, he assumes that all voting is perfectly parallel to one of the dimensions and that each dimension has a committee acting as gatekeeper for the dimension (Rosenthal 1992). Our model does not require such restrictions on voting. It only requires party leaders to want to avoid splitting the majority party and to have the information needed to do so. In this sense, some readers may find our theory simpler and more realistic than Snyder's.

[10]For example, the default used by W-NOMINATE is that at least 2.5% of the voters must be on each side of a cut line. For 435 members that would be 11 people, which would come, in our case, from the minority party.

the NS line. Of course, it would not entirely eliminate such variation because horizontal cut lines that did not go through M would still be permissable and still capture some variation along in the NS direction. In contrast, permissable cut lines would readily differentiate the voters along a WE line of variation. That variation would be almost entirely within the minority party or between various members of the minority party and the majority party as a whole. Such a scenario would limit the variation explained by a second dimension and estimate largely as a single dimensional model with the first dimension perpendicular to the NS line, as shown in Figure 1b.

Of course the degree to which negative agenda control dampens observed dimensionality depends on several factors, including 1) how unified the majority party must be in order for its leaders to allow a bill to the floor and into the roll call record and 2) what percentage of the bills must be unified according to the majority party leadership. If some bill are less visible than others, then majority party leaders may not want to pay the costs of censoring all party-splitting bills equally. Hence, they may allow some bills that split the majority party, making extreme cases like Figure 1b unlikely.

To demonstrate how this type of negative agenda control can reduce the number of estimated dimensions with more realistic parameters, consider a second example, simulated in three steps. First, we assume a sample legislature that contains members with strong ideological differences on both the first and second dimensions. Second, we generate hypothetical motions for these legislators to consider. Third, we estimate spatial positions using the roll call matrix generated by the hypothetical votes. We do this for two treatments: (1) a treatment that includes all possible motions with no agenda control filtering and (2) a treatment that uses a set of motions which have been filtered in fashion that mimics the effect of negative agenda control. We expect that legislators voting on measures filtered by negative agenda control will show less evidence of second dimensional differences than the legislators voting without such filtering. We expect this difference despite the fact that our control and treatment groups begin with the same set of two-dimensional ideal points.

Our sample legislature is ideal points estimated for the 85th Congress (1957-1959). Poole and Rosenthal (1997) identify the 85th Congress as a Congress with a clear second dimension related to civil rights. We will assume that the ideal points estimated for this Congress are the "true" ideological positions of the members of our synthetic House. We do not assume they represent the true positions empirically. The top two frames of Figure 2 depict the ideal points estimated for the 85th House using W-NOMINATE. Blue cross hairs indicate members of the majority party (Democrats) on the left, and red cross hairs indicate members of the minority party (Republicans) on the right.

[Figure 2 About Here]

To generate measures upon which our legislators will vote, we randomly draw $30,000$ cut lines from a uniform distribution and store them in a list to be used across treatment conditions.[11] To simulate voting with no agenda control, the House votes on the first 500 cut lines that also have enough dissent for the roll call to be included by W-NOMINATE, 12 people in our case.[12] If the roll call has less than 12 dissenters, it would be excluded by W-NOMINATE for being too unanimous. We preempt that exclusion and limit our cuts lines to cases where at least 12 people are on both sides of an issue. This explains why there are no cut lines on the outer edges of either frame. The cut lines for the no agenda control example are displayed in the top-left frame of Figure 2.

To show what might happen with negative agenda control, the same House votes on 500 cut lines drawn from the same list, but in this case a cut line must meet an additional condition to be included in the analysis – the majority party must be at least 80% unified on

[11]The distribution of cut lines was created by randomly drawing two points from a uniform distribution over a -1.5 to 1.5 square. We then create a cut line from the line segment between the two points, calculate slopes, angles, and y-intercepts. We considered other methods of creating random cut lines included drawing the two points from the edge of the unit circle or from two of the four edges of a unit square. All three methods produced similar results.

[12]Because these data are only used as an illustration, we made no attempt to remove members who represented the same district because one member vacated a seat before the end of his/her term. Hence, our study contained 443 members, 238 of which were from the majority party.

at least 90% of the roll call votes. In other words, the first 50 cut lines (10%) are the same as the no agenda control treatment, but the next 450 cut lines (90%) are drawn from a row further down the list of randomly drawn cut lines if the cut line on the row divides less than 20% of the majority party. This is displayed on the top right panel of Figure 2. There is a low density of cut lines around the majority party under negative agenda control, because this treatment filters out many of the cut lines that would split the majority party.

We then use the ideal points and cut lines appearing in the top two frames of Figure 2 as inputs for our two treatments. We use a script, written by the authors in C, that allows each member to vote on the 500 roll calls separately and create an $N \times R$ roll call matrix for each treatment.[13] We then apply W-NOMINATE to the matrix to produce the estimated ideal points and estimated cut lines appearing in the middle frames of Figure 2.

A couple of observations are worth noting. First, there are visual differences between the input and output for each condition. Compared to the input, the estimated ideal points are rotated counter-clockwise. This occurred even though we used the minimum representative on the first dimension and the maximum representative on the second dimension as the restrictions. Rotations are expected, so this should not be a concern. Also, ideal points for the minority party are more spread out in the output than they are in the input, while ideal points for the majority party are more narrowly distributed in the output than in the input. Both effects are exacerbated with negative agenda control. Moreover, the estimated cut lines in condition B are not bunched up in the space between the two parties like the latent cut lines on the right-top of the figure, suggesting that negative agenda control may *not* be easily recognized by the naked eye.

Second, the treatment creates noticeable differences in the angle of the estimated cut lines. Without negative agenda control, the average absolute angle of the cut line is 51.14 degrees (with a standard deviation of 28.09 degrees). With negative agenda control, the

[13]The script assigns ideal points on the north (or east) side of a cut line a yea vote and ideal points on the south (or west) side of the cut line as a nay vote for all cut lines. Left and top restrictions used in W-NOMINATE come from the ideal points at each extreme.

average absolute angle is 54.29 degrees (with a standard deviation of 25.70 degrees). The difference of the two means is significant at the .05 level. In this example, negative agenda control increases the angle of the estimated cut line, because keeping the majority party unified and requiring at least 12 votes on both sides implies that many of the permissable votes, albeit not all, will separate the two parties. That makes a large portion of the latent cut lines parallel to each other. Because that set of cut lines is large, it explains a considerable proportion of the variation and largely determines the primary dimension. This holds true regardless of the direction in which the parties vary.[14] Hence, measures of dimensionality are more likely to show stronger indications of a single dimension when cut lines are filtered.

Third, consistent with this argument, the plots of the normalized eigenvalues of the double centered agreement score matrix beneath each graph indicate that two dimensions "may" be appropriate for the example with no agenda control, while one dimension is appropriate for the example with negative agenda control. In the former case, the normalized eigenvalue of the second dimension is roughly 0.22. Under the negative agenda control condition it falls to roughly 0.12. Since both cases have either one or two dimensions, the difference can be summarized by the ratio of the second eigenvalue to the first, as shown under each of the scree plots. A smaller ratio indicates greater tendency toward unidimensionality than a larger ratio.

To put these numbers in context, compare them to the smallest and largest eigenvalue ratios in our dataset (our data is described in the next section). For the 85th House (1957-1959), a potentially two dimensional House, the ratio of the second eigenvalue to the first is 0.48. For the 104th House (1995-1997), widely believed to be a unidimensional House, the ratio is 0.05. This represents an 89% decrease between the extremes of our data. For our simulated House with no agenda control the ratio of the second eigenvalue to the first is 0.23.

[14]For example, if we moved every member of the minority party up one unit on the second dimension but keep their first dimensional coordinates the same, then most of the variation between the two parties would be on the second dimension. In this case the average angle of the estimated cut lines are larger for negative agenda control than for no control, even though the average angle of the inputs is significantly smaller for negative agenda control than for no control.

With negative agenda control the ratio is 0.12 (a 48% decrease). Although the decrease in the ratio is not as large as the decrease between the extremes of our data, it is substantial.

Keep in mind that the only difference between the two cases is that some of the cut lines (i.e. roll call votes) are subject to negative agenda control under the second treatment. Hence, it should be easy to see that negative agenda control "can" affect the average angle of the estimated cut lines as well as the estimated number of dimensions. If a chamber were to consider proposals determined by stochastic events under one scenario and proposals screened by the majority party under another, then the dimensionality of the estimated issue space might change, even if the latent ideology of the members remained the same. Researchers might apply single dimensional theories, like the median voter theorem or Krehbiel's pivotal politics, when they are not appropriate. And they would fail to see potential coalitions in the data that are not possible in a single dimensional model.

To get a rough idea about the degree to which increments of negative agenda control might affect the estimated number of dimensions for a Congress, we extended the analysis to different levels of majority party cohesion on different proportions of roll call votes (see Figure 3). Each frame of Figure 3 depicts ideal points from the 85th House and cut lines randomly drawn under the conditions specified by the rows and columns of the figure.

[Figure 3 About Here]

The rows vary by the percentage of roll calls controlled by the majority party and the columns vary by the percentage of the majority party members that must agree for the roll call to be considered "controlled" (majority cohesion). For example, the case in row 50% and column 60% is one where the majority party must remain at least 60% unified on at least 50% of the roll call votes. The cut lines from each of these frames are then used as inputs along with the ideal points of the 85th House to create a roll call matrix. The roll call matrix is then used to estimate ideal points and eigenvalues using W-NOMINATE (as before). Figure 3 depicts the inputs. Two of these frames have been shown previously. The bottom-middle (90%, 80%) frame of Figure 3 is identical to the top-right frame of Figure 2,

and the top-left frame of Figure 3 (50%, 60%) is very similar to the top-left frame of Figure 2.

Underneath each of the frames is the ratio of the second eigenvalue to the first. Again, this ratio indicates the tendency to describe the House as either unidimensional or bi-dimensional with smaller values indicating greater signs of unidimensionality. As the figure clearly shows, everything else equal, increasing the cohesiveness of the majority party decreases the ratio of the second eigenvalue to the first. That is, it makes a researcher more likely to conclude that the House is unidimensional, even though the latent ideal points are two dimensional in each case. As the proportion of roll calls filtered increases from only 50% of the roll calls to 90% of the roll calls, the appearance of unidimensionality also increases. Taken together, this shows that parties can theoretically increase the unidimensionality of voting through negative agenda control. Such an increase may be entirely unintentional.

At first glance, it may seem unlikely that a majority party could keep itself as unified as done in this figure. Keep in mind, however, that at least 50% of the majority party will be united on any roll call. That's why the top-left frame in Figure 3 is almost identical to the no agenda control condition in top-left frame of Figure 2. *Moreover, for the observed congresses in our empirical study, the average percentage of the majority party in agreement on any roll call is* 85.3%. *That's comparable to the bottom middle frame of Figure 3 and the majority party filtering in Figure 2.* Furthermore, 22% of the roll calls during this period have at least 99% of the majority party in agreement (i.e., at least 99% majority coherence). Hence, some of the stronger conditions depicted in these figures may not be far fetched.

Empirical Analysis

The preceding section suggests that, theoretically, negative agenda control can have an important role in determining the number of observed dimensions. To test this conjecture empirically, we create two specifications. The first uses a roll call as the unit of analysis to

determine whether partisanship and majority party cohesiveness increases the angle of the cut lines. The second uses individual congresses as the unit of analysis to determine whether evidence of a second dimension is related to majority cohesiveness. Our data ranges from the 44th House to the 104th House (1875-1997). Poole and Rosenthal (1997) estimate either one or two dimensions for each House during this period.

Roll Call Level Analysis

We argue that, all else equal, strong majority parties – through the use of special rules and the control of the amendment process – should be able to keep votes that divide the majority party off the agenda and increase the estimated slopes of the cut lines (make more vertical cut lines) with respect to the major axis of rotation. Increasing the slopes of the estimated cut lines reduces the variance observed in the second dimension even though it does not eliminate the variance altogether.[15]

We evaluate this argument using the $21,899$ cut lines estimated between 1875 and 1997 for all U.S. Houses and the following specification:

$$\begin{aligned} angle &= \beta_0 + \beta_1\ partisan\ era + \beta_2\ special\ rule + \beta_3\ amendment \\ &+ \beta_4\ partisan\ era \times special\ rule + \beta_5\ partisan\ era \times amendment \\ &+ \beta_6\ majority\ cohesion + \beta_7\ divided\ government + \beta_8\ civil\ rights + \epsilon. \end{aligned} \quad (1)$$

The dependent variable, *angle*, is the absolute angle of the cut line estimated by Carroll et al. (2009) using DW-NOMINATE.[16] These values range from 0 to 90 degrees exclusive, with larger numbers indicating steeper slopes. We opt to use angles rather than slopes for two

[15]The only cut lines that absolutely fail to differentiate ideal points in a second dimensions are cut lines with absolute slopes of exactly 90 degrees with respect to the primary axis of variation. Even if all cut lines had absolute angles greater than 80 degrees, there would still be some revelation of a second dimension.

[16]Keep in mind that the angles described in this section are estimated cut line angles (outputs in the previous section). It is possible that the primary axis of variation which generated the data (inputs in the previous section) is at an angle other than zero.

reasons. First, doing so mitigates magnitude problems stemming from extreme observations. Second, we believe empirical relationships are easier to discuss using angles.

[Table 1 About Here]

The first independent variable, *partisan era*, is a dummy variable for eras where the majority party exercised tight control over the Rules Committee. This coding scheme largely follows work done by Galloway (1976), Cox and McCubbins (2002), and Finocchiaro and Rohde (2008), though the coding is our own.[17] Table 1 provides a complete list of these codes. Because a strong party era should increase the average absolute angle of an estimated cut line, we expect $\beta_1 > 0$.

Our second independent variable, *special rule*, is a dummy variable for whether the roll call was a vote on a special rule.[18] Values used in this variable were originally coded by Rhode (1991) and extended to earlier years by Lawrence, Maltzman and Smith (2006). Crespin (2010) argues that parties control special rules even if they don't control the substantive votes considered under those rules. Hence, we expect $\beta_2 > 0$.

Our third independent variable, *amendment*, is a dummy variable indicating whether the roll call was any type of amendment,[19] compiled from Rhode (1991) and Lawrence, Maltzman and Smith (2006). Because amendments provide an opportunity for members of the floor to affect the outcome, they indicate cases where party leaders are not controlling the vote, which should lead to less vertical cut lines on the margin. Hence, we expect $\beta_3 < 0$.

[17] If a vote occurred during the first era of speaker dominance – from the 55th (1897-1899) to 61st House (1909-1911) – or in the post-Rules Committee Reform era – after the 93rd House (1969-1971) – the dummy variable was coded 1; otherwise it was coded 0. Because the revolt against Speaker Cannon, which effectively ended the Era of Speaker Hegemony, occurred one year into the 61st Congress, we also considered coding the 61st Congress as a 0, which did not alter our findings.

[18] This variable was coded 1 if the vote was on a special rule, a special order, an amendment to a special rule, or a previous question motion on a special rule; 0 otherwise.

[19] The variable is coded 1 if the vote was on a first degree amendment, an amendment to a substitute, a committee amendment, an amendment to a committee amendment or a second degree amendment; 0 otherwise.

Our fourth and fifth independent variables are two interaction terms which indicate whether the marginal effects of special rules and amendments were more dramatic during partisan eras compared to non-partisan eras. Presumably, special rules (and amendments) would be more vertical during partisan eras, indicating that partisanship can make special rules (and amendments) even more vertical. Because *partisan era* and *special rules* are both dummy variables, β_2 by itself represents the marginal effect of a special rule in a non-partisan era. The marginal effect of special rules in a partisan era is indicated by $\beta_2 + \beta_4$. If special rules have a positive relationship with cut line angles in a non-partisan era, and an even steeper relationship in a partisan era, then we would expect $\beta_2 + \beta_4 > \beta_2 > 0$.

Although we have no way of knowing whether the majority party filtered a particular roll call, we do know the percentage of the majority party in agreement on any particular roll call. Our sixth independent variable, *majority cohesion*, measures the percent of the majority party in agreement on the roll call. *Majority cohesion* does not require more than half of each party to be on the opposite sides of a roll call, as in a traditional party unity vote. Instead, it simply measures the percentage of the majority party members who agree to a roll call, among those who attend.[20] We argue that high levels of majority party cohesion on a roll call vote should lead to more vertical cut lines for the roll call. The causality does not go the other way around.[21] Therefore we expect $\beta_6 > 0$.

Our remaining independent variables are a series of controls. *Divided government* is a dummy variable equal to 1 if either the Senate or the president comes from a different party than the House; 0 otherwise. During periods of divided government, the majority party is often politically forced to consider legislation on the chamber floor that is supported by

[20]The variable was coded by dividing the number of aye or nays votes cast by the majority of the majority party by the total number of votes cast by the majority party. This variable ranges from 50 for a completely party-splitting vote to 100 for a vote with perfect cohesion.

[21]Even on a single dimension, vertical cut lines may divide the majority party or make it look cohesive. The difference depends on where the cut line intersects the x-axis. Hence, the angle of the cut lines cannot cause majority party cohesion.

the branch controlled by the opposing party. These measures are more likely to split the majority party than bills considered during unified control. Given this, we expect $\beta_7 < 0$.

Civil rights is a dummy variable indicating whether the vote was on a civil rights issue, as coded by Poole and Rosenthal <www.voteview.com>. From the late-19th to mid-20th century, this centered on issues like voting rights and school desegregation. Poole and Rosenthal argue that the divide on civil rights issues is largely responsible for a second dimension during the period of our study. As such, cut line angles on these roll calls should be smaller than average, and we expect $\beta_8 < 0$.

Congress-Level Analysis

Our second test of the theory examines the relationship between observed dimensionality and the cohesiveness of the majority party more directly. Our theory suggests that when the majority party is more cohesive, the variance by the second dimension becomes smaller (as illustrated by comparing the columns of Figure 2). We evaluate this conjecture using the 61 Houses between 1875 and 1997 and the following specification:

$$\begin{aligned} \textit{unidimensionality} &= \beta_0 + \beta_1 \textit{ majority cohesion} + \beta_2 \textit{ partisan era} + \beta_3 \textit{ divided government} \\ &+ \beta_4 \textit{ civil rights} + \beta_5 \textit{ majority percentage} + u. \end{aligned} \tag{2}$$

This specification is very similar to the previous one except for three changes. First, the unit of analysis is a congress, not a roll call.

Second, the dependent variable, *unidimensionality*, is the tendency toward unidimensionality in the data reduction technique which we measure in one of two ways. The first is the ratio of the eigenvalue of the second dimension to the eigenvalue of the first dimension. As argued earlier, smaller values of this ratio indicate greater reason to conclude unidimensionality from a principle components analysis. The second is the difference in the APRE scores of the second dimension and the first dimension. This is one of the measures Poole

and Rosenthal use to indicate unidimensionality in their seminal work (1997, 48-51). Again, smaller values of this difference indicate greater tendencies toward unidimensionality.

[Figure 4 About Here]

One might think that both measures decline over time, simply because more recent congresses show stronger signs of unidimensionality than older congresses. Although this is partly true for the most recent fifth of our data, Figure 4 shows that both measures exhibit considerable variation, and neither trend with time. The eigenvalue ratio exhibits greater swings than the APRE difference largely because the two measures are on different scales. If the measures were graphed separately, the APRE difference would exhibit similar swings, though there would still be noticeable differences in the measures. For example, in the early years of our data the eigenvalue ratio peaks during the 52nd Congress in 1891 while the APRE difference peaks during the 53rd Congress in 1893. We use both measures, separately, as a robustness check.

Third, the remaining variables are the same as described previously, except *special rule* and *amendment* are no longer included in the analysis, *civil rights* measures the proportion of roll calls on civil rights in each House, and *majority cohesion* is the "average" percentage of the majority party in agreement on each roll call in a particular congress. Since low levels of the dependent variable are consistent with increased unidimensionality, as opposed to cut line angles where increased angles are consistent with increased unidimensionality, the expected signs of the coefficients in this model are reversed from the previous analysis.

Specification Issues

We estimate both regressions using ordinary least squares. Because unobserved differences between congresses can bias our results with roll calls used as the unit of analysis, we include dummy variables for each congress, except the 104th, in the roll call level regression.

We use Huber-White robust standard errors to account for potential heteroskedasticity in both specifications.

Results

Roll Call Level Analysis

The results using roll calls as the unit of analysis are presented in Table 2. To save space, the estimated coefficients for the congress dummies are not reported in the table.[22] Including congressional dummies controls for unobserved differences between congresses that might bias estimates, such as the size of the majority party or measures of polarization.

[Table 2 About Here]

Our partisan variables perform largely as expected. For example, partisan era has a strong, positive effect on cut line angles. If the vote is not on a special rule or an amendment, then a discrete change from a non-partisan era to a partisan era can increase the average cut line angle 17.2 degrees. This alone demonstrates that strong parties can be responsible for the steepness of the cut line angle in final passage votes, procedural votes, and other non-special rule votes when other important factors, such as civil rights legislation, are controlled. As argued previously, steeper cut line angles lead to greater tendencies toward unidimensionality.

The effect of special rules during a non-partisan era does not reach significance. This suggests that, in a non-partisan era, the angle of a special rule vote is roughly the same as the angle of a vote on a typical issue. However, the interaction between partisan era and special rules suggest that the angle of a special rule is greater in a partisan era. In a partisan

[22] With two exceptions, we get similar results with the dummy variables for each congress excluded, or with them replaced by clustered standard errors. The exceptions are partisan era has a smaller, though still statistically significant effect, and divided government has a small effect that is no longer significant at the .05 level.

era, a special rule is a little more than 4.2 degrees steeper than a non-special rule vote on the margin.[23] This suggests that again, party strength causes more vertical angles, particularly among special rule votes.

Contrary to our initial hypothesis, amendments during a non-partisan era have a significant and positive effect. During a non-partisan era, amendment votes are roughly 2.8 degrees steeper than non-amendment votes. In partisan eras, amendment votes are 4.3 degrees steeper than non-amendment votes.[24] Perhaps this occurs because most amendments allowed into the roll call record are those which keep the majority party together and estimate as more vertical cut lines. Amendments that reveal second dimension differences are even more likely to be left off the agenda in periods of strong party control.

The level of majority cohesion on a vote also has a strong effect on the angle of the cut line. As parties vote more cohesively, the angle of cut line increases sharply. For each percentage point increase in party cohesiveness, the average cut line angle increases a half of a degree. Moving from a perfectly divided majority party (*party unity* = 50%) to a majority party in complete agreement (*majority cohesion* = 100%), increases the angle of the cut lines 25 degrees. An explanation for this is outlined in our theory section. Most roll calls that unite the majority party while keeping at least 2.5% of the voters in dissent (roughly 11 voters) pit the majority party against the minority party and make cut lines more vertical. This does not mean that all cut lines *must* be vertical. There can be roll calls that keep the majority party unified, attain the minimum number of dissenters, and produce fairly horizontal cut lines (as shown in the bottom-right frame of Figure 3). But such cases should become more rare with greater unification of the majority party. As a result, if a majority party makes strong use of committees, rules, and other techniques to prevent it from splitting, then issues will appear unidimensional even if a latent second dimension

[23]Recall, the marginal effect of the special rule under a partisan era is $\beta_2 + \beta_4$. This sum is 4.3, with a conditional standard error of $\sqrt{var(\hat{\beta}_2) + var(\hat{\beta}_4) + 2cov(\beta_2, \beta_4)} = 0.610$.

[24]The conditional standard error of this relationship is 0.416, which suggests that the marginal effect of an amendment vote is significant during a partisan era.

exists. Such an effect is independent of partisan eras, special rules, and amendments which are controlled in the regression.

The control variables perform largely as hypothesized. The negative and significant coefficient for divided government suggests the average cut line under *divided government* is less steep than when the three branches of government are unified. This is consistent with the notion that Houses are forced to vote on measures that internally divide the majority party during divided government. In addition, *civil rights* is negative and significant, as expected. Civil rights bills are far more likely to cause internal divisions among the parties and contribute to cut line angles that are flatter than non-civil rights legislation. Votes on civil rights issues see more than an 5 degree reduction in the average angle of cut lines compared to non-civil rights issues, suggesting that they may contribute to the detection of a second dimension.

Congress-Level Analysis

Our second set of results examines the relationship between unidimensionality and majority cohesion more directly. The left column of Table 3 shows the results with the eigenvalue ratio as the dependent variable and the right column shows the results with the APRE difference as the dependent variable.

[Table 3 About Here]

In both columns the average percentage of the majority party in agreement on a roll call is negative and significant consistent with our primary hypothesis. As the majority party becomes increasingly unified, either through negative agenda control or other means, the second dimension explains less unique variance and a unidimensional depiction becomes increasingly appropriate. For each additional percent that the majority party is in agreement, the ratio of the second eigenvalue to the first decreases by .008 and the difference in the APREs decreases by .002. Both differences are less than 2% of the observed range. Although

the magnitudes of these changes are small, they are significant. Keeping the party cohesive prevents questions which show differences between members of the majority party from being asked, just like failing to ask questions which differentiate D and F students will prevent teachers from observing educational differences between those students. Without such questions, the roll call data cannot demonstrate differences along a second dimension even if a latent second dimension might exist.

On the margin, partisan eras diminish the importance of a second dimension as well. In eras where the parties are strong, the eigenvalue ratio and the APRE difference are both significantly smaller than in eras where parties are weak. This indicates that party strength has a direct effect on reducing dimensionality that is independent of the cohesiveness of the majority party. Recording motions as voice votes rather than roll call votes could explain such an independent effect.

The coefficients for divided government, civil rights, and the percentage of seats controlled by the majority party are all insignificant, suggesting that these variables have little effect on the estimated number of dimensions. Perhaps the reason that the percentage of civil right bills does not have a significant effect is that civil rights legislation makes up a small percentage of the roll call votes in any House. The average House only devotes 1.5% of its roll calls to civil rights. The percentage of civil rights bills may have been too small to affect our measure of a second dimension.

Conclusion

Scholars have done an impressive job explaining and predicting the roll call votes of legislators. The contributions of NOMINATE and other ideal point estimation techniques have played a major role in advancing our understanding of Congress, the judiciary, and the legislative processes more generally. Most scholars assume a single dimension in their studies, in part because seminal work suggests that American politics is single dimensional.

However, the empirical and theoretical results presented in this paper suggest something different. The ideology of politicians actually might be multidimensional in periods claimed to be unidimensional, but partisan agenda control suppresses the observed variation along those higher dimensions. We believe this finding has several important implications.

First, scholars should be wary of concluding that congressional ideology is undeniably unidimensional. Instead of claiming that there is only one dimension upon which all politics lie, they should conclude that higher dimensions can be reduced to lower dimensions when leaders try to keep the majority party unified. By limiting the types of roll call votes that are considered by the floor, parties may inadvertently prevent the revelation of higher dimensions. Such a result is consistent with recent scholarship on congressional dimensionality which suggests that specific issue areas can be explained as multidimensional, even though much of congressional decisions are unidimensional as a whole (Crespin and Rohde 2010; Roberts et al. 2008; Aldrich et al. 2010). Our paper offers a more complete explanation for why higher dimensions might be suppressed. A single dimension may simply be a data reduction of an n-dimensional process, partly suppressed by majority parties trying to keep their brand name unified.

Second, one theory that seeks to explain the stability of outcomes in the U.S. Congress is structurally induced equilibrium (SIE). As originally laid out by Sheplse (1979) and Shepsle and Weingast (1981) the high cost of vote cycling and instability that result from a multidimensional spatial voting may create the need for institutions that ameliorate such problems. These theorists argue that the primary institution which addresses the problem is the committee system, which divides legislation into single dimensional issues and assigns each dimension to a committee. Because each member maintains a norm of reciprocity and that norm is mutually advantageous, the floor typically defers to committees. Stability is further maintained by ordering the agenda so that the status quo is considered last.

SIE theory holds a justifiably important place in the study of legislative institutions. Our paper compliments its findings. Rather than suggesting that Congress omnisciently splits

multidimensional issues into single dimensional issues when it assigns bills to committees, our paper suggests that parties, not committees, are the source of stability. Leaders that try to make the majority party more unified on congressional roll call votes through the classic use of whips or control from the rules committee might unconsciously ameliorate the importance of higher dimensions. In other words, simply keeping the majority party together might partly explain congressional stability in light of the so-called "chaos theorem" (McKelvey 1976; Schofield 1978).

Third, this paper touches on the debate over the role of political parties in Congress. We suggest that the majority party can play an important role in dictating policy outcomes. Consistent with recent work by Finocchiaro and Rohde (2008), we find that this control is a conditional one. Specifically, the majority appears successful in influencing the angle of roll call cut lines on certain types of votes, but only when it holds the procedural capacity to control the Rules Committee or it assigns effective whips.

Perhaps an example will help illustrate the third point. Like many Speakers before him, Newt Gingrich kept his party unified during the first several months of his Speakership. With a slim majority, he realized that he had to keep his party voting as a unified whole if the Republicans were going to accomplish their goals. But when President Clinton attacked the Republicans for shutting down the government in the fall of 1995, the Republican coalition began to divide. Moderate Republicans felt uneasy about some of the more serious spending cuts and social programs proposed by the social conservatives from their party. Perhaps this is why the ratio of the second eigenvalue to the first increased from 0.045 in the first session of the 104th Congress, when the party was fully unified, to 0.074 in the second session, when the majority party began to crack. Signs of a second dimension were barely noticeable in both cases, but failure to fully prevent votes on divisive roll calls in the second session may have allowed a second dimension to be subtly revealed. If more divisive issues were considered, the ideology of the 104th Congress might have been just as multidimensional as that of earlier congresses.

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Figure 1: Perfect Negative Agenda Control

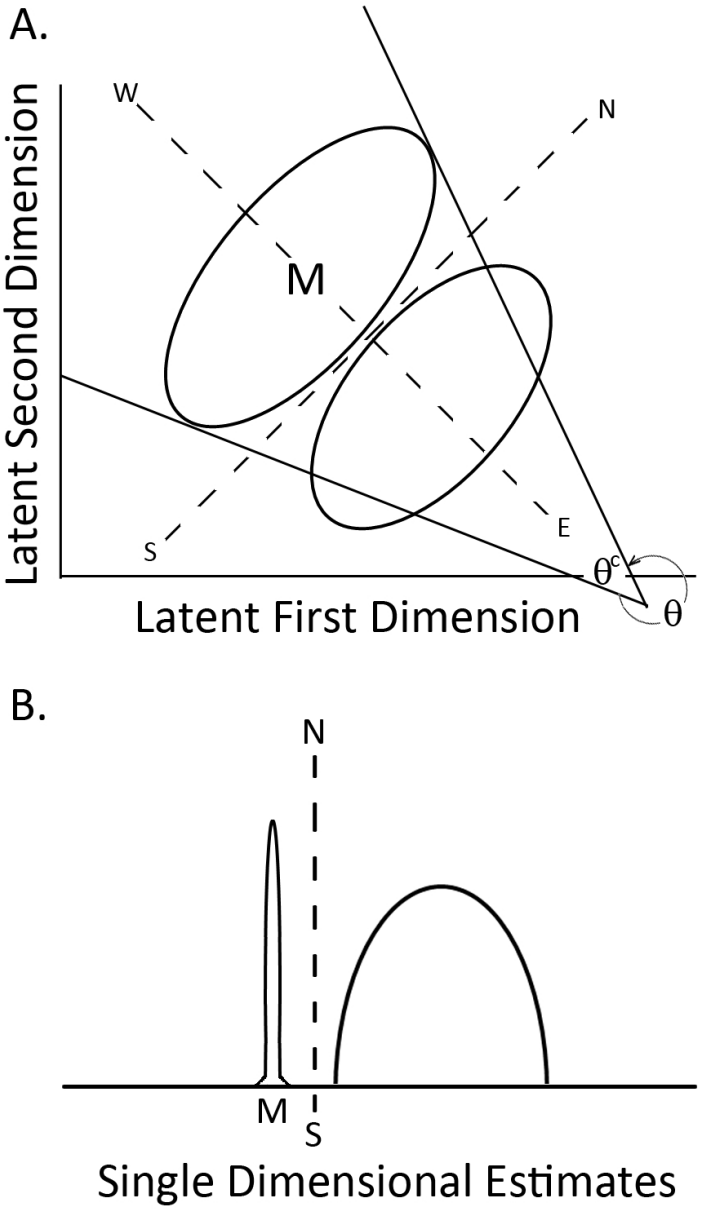


Figure 2: An Example of Negative Agenda Control and Dimensionality

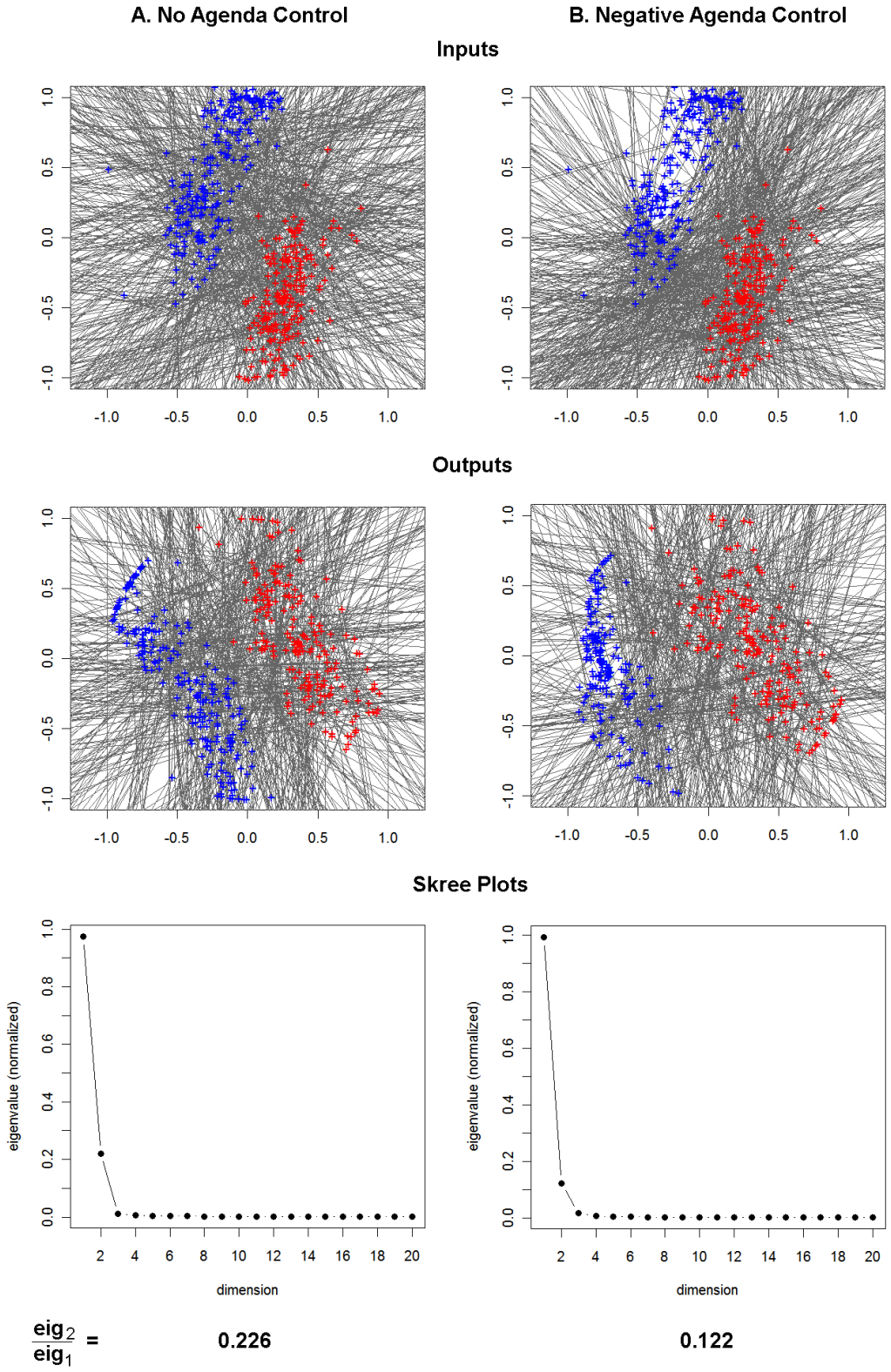


Figure 3: Varying Degrees of Agenda Control and Dimensionality

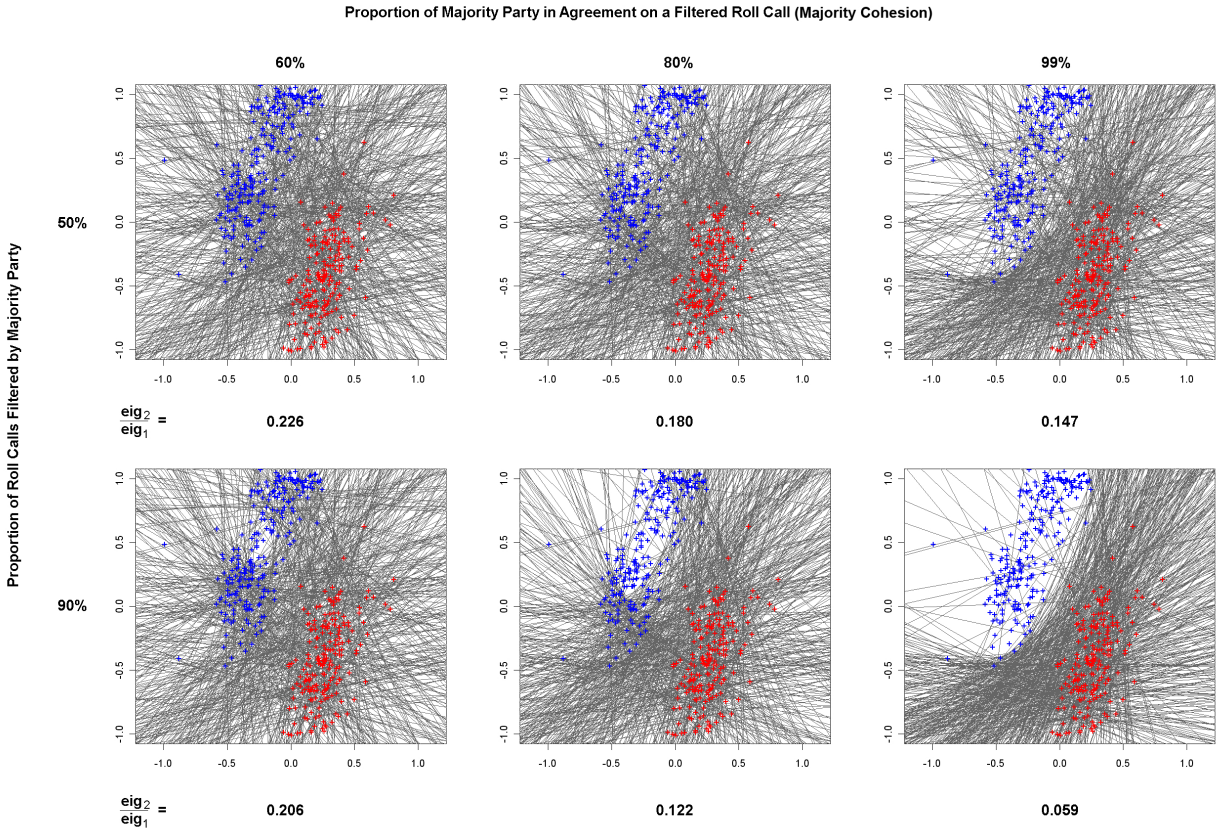
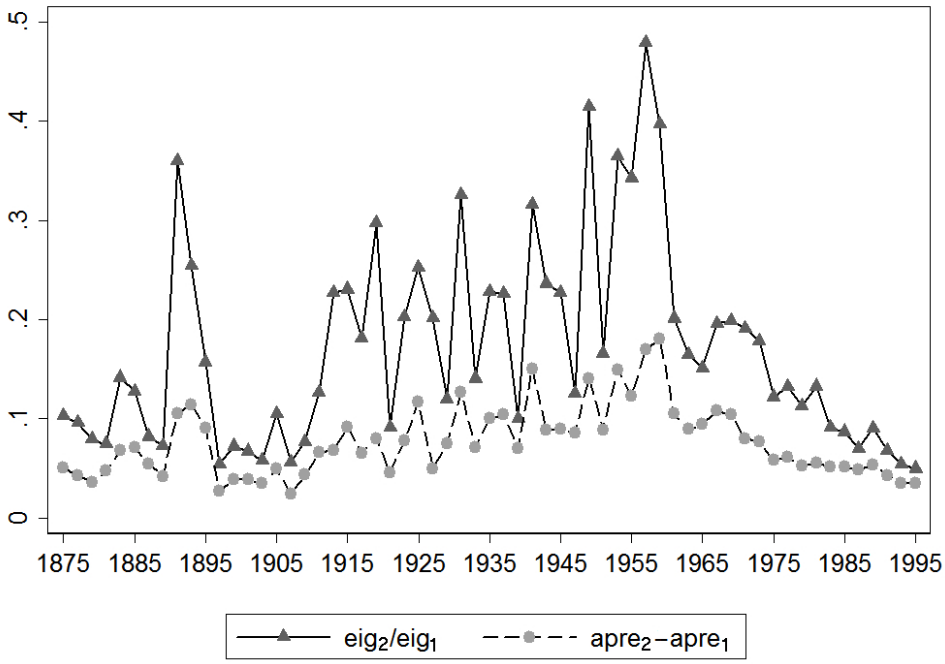


Figure 4: Eigenvalue Ratios and Reduction in Error across Time



Note: This figure reports the explanatory power of the second dimension over time using two measures. The first is the ratio of the eigenvalue of the second dimension to the eigenvalue of the first dimension. The second is the difference in the aggregate proportional reduction of error between the second and the first dimensions.

Table 1: Eras of Majority Party Dominance on the Rules Committee, 1875-1996

Era	Years	Code
Gilded Era	1875-1897	0
Speaker Hegemony	1897-1911	1
Democratic Control	1911-1921	0
Republican Dominance	1921-1933	0
New Deal Era	1933-1937	0
Conservative Coalition	1937-1973	0
Post-Reform Era	1973-1994	1
Republican Revolution	1994-1996	1

Notes: Eras where the majority party exercised tight control over the Rules Committee were coded as 1; 0 otherwise.

Table 2: Estimates of Party Effects on Cut Line Angles

partisan era	17.192*
(dummy)	(3.358)
special rule	0.149
(dummy)	(0.899)
amendment	2.838*
(dummy)	(0.577)
partisan era ×	4.146*
special rule	(1.085)
partisan era ×	1.428*
amendment	(0.704)
divided government	-6.469*
(dummy)	(1.920)
majority cohesion	0.504*
	(0.010)
civil rights	-5.384*
(dummy)	(1.129)
constant	5.659*
	(2.960)
	(congress dummies)
N	21,889
R^2	.163

Notes: The table reports least squares estimates, with *unconditional*, robust standard errors in parentheses. Roll call votes are the units of analysis. Estimates include dummy variables (not reported) for each individual Congress with a dummy variable for the 104th Congress excluded.

$*$ significant at the .05 level.

Table 3: Estimates of Party Effects on Dimensionality

	$eigen_2/eigen_1$	$apre_2 - apre_1$
percentage of majority	-0.008*	-0.002*
party in agreement	(0.002)	(0.001)
partisan era	-0.076*	-0.030*
(dummy)	(0.017)	(0.006)
divided government	-0.020	-0.007
(dummy)	(0.022)	(0.008)
civil rights	0.696	0.413
(proportion)	(0.653)	(0.232)
majority party seat	-0.100	0.002
percentage	(0.178)	(0.061)
constant	0.921*	0.282*
	(0.274)	(0.100)
N	61	61
R^2	.428	.485

Notes: The table reports least squares estimates, with robust standard errors in parentheses. Congress is the unit of analysis.

$*$ significant at the .05 level.