Dimensions, Issues, and Bills: Appropriations Voting on the House Floor

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One of the fundamental findings in the congressional literature is that one or sometimes two dimensions can successfully describe roll call voting. In this paper we investigate if we can reach the same conclusions about low dimensionality when we divide the roll call agenda into subsets of relatively homogeneous subject matter. We are also interested in the degree to which the same ordering of representatives is yielded across these different groups of votes. To conduct our analysis we focus on all roll calls on the 13 annual appropriations bills across eight congresses. When we concentrate on these smaller issue areas, we find that voting is multidimensional and members do not vote in a consistent ideological fashion across issue areas.

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Introduction

Few developments in the last quarter century have had as much impact on congressional research as the creation of the NOMINATE procedure for roll-call analysis by Keith Poole and Howard Rosenthal (1997, 2007). Poole and Rosenthal employed the technique, based on a simple spatial model with probabilistic voting, to recover legislators' positions and roll call outcomes across the entire history of congressional voting. Based on this analysis, they conclude that "[c]ongressional roll call voting, throughout most of American history, has had a simple structure. A two-dimensional spatial model that allows for a linear time trend accounts for most of roll call voting," (Poole and Rosenthal 2007: 70). Moreover, results for congresses over the last few decades yield an even simpler picture of a Congress that reflects a "polarized, unidimensional world" (Poole and Rosenthal 2007: 318).

If these and the other results of Poole and Rosenthal's work based on the NOMINATE procedure – alone, jointly, and with coauthors – were the sum total of their impact, the consequences of their efforts would have been substantial. There was, however, much more. They made available to the research community their roll call data, their NOMINATE results, and the software to permit other scholars to create their own roll call analyses. Many researchers took advantage of this professional generosity and used the data and techniques to enrich substantially our knowledge of legislative politics in the U.S. and around the world, as well as to expand the applications to the study of courts and regulatory agencies.

In this paper we intend to follow in these footsteps by taking a finer-grained look at roll calls in the contemporary House of Representatives. Specifically, our interest is in whether the same conclusions about low dimensionality are reached when we divide the roll call agenda into subsets of relatively homogeneous subject matter and compute NOMINATE scores separately within each group. Perhaps more importantly, we are also interested in the degree to which the same ordering of representatives is yielded by the NOMINATE procedure across these different groups of votes. To conduct this analysis we focus on all roll calls on the 13 annual appropriations bills (one from each House Appropriations subcommittee) across eight congresses. Appropriations roll calls are particularly suitable for this analysis because the jurisdictions of the Appropriations subcommittees were the same during these 16 years. Collectively the thirteen bills cover the whole policy spectrum of congressional policy making, but each subcommittee's individual jurisdiction is comparatively homogeneous.

If we find that voting is multidimensional or members do not vote in a similar fashion across issues, then there may be consequences for many areas of congressional research that rely on measuring member's preferences. For example, scholars have used a version of the NOMINATE procedure based on all roll call votes in a congress to predict behavior or measure pivot points on specific issues such as the inclusion of treaty reservations (Auerswald and Maltzman 2003), tobacco and alcoholic beverages (Taylor 2003), women's and reproductive issues (Swers 1998), free trade (Crichlow 2002) and voting for presidential candidates (Jenkins and Sala 1998). The idea of issue-specific versus general voting scores is present in the committee preference outlier debates (Weingast and Marshall 1988, Krehbiel 1991, Gilligan and Krehbiel 1990, Hall and Groffman 1990, Groseclose 1994, Krehbiel 1994, Cox and McCubbins 1993, Shepsle and Weingast 1995). The divided government and gridlock literature relies on measures of distance between the President and key players in the House and Senate (Mayhew 1991, Kelly 1993, Fiorina 1996, Edwards, Barrett and Peake 1997, Brady and Volden 1998, Binder 1999). Measuring the correct pivot point is also an important variable in studies related to "killer amendments" since the killer amendments are often on an issue separate from the underlying bill.[1] Finally, chamber and party medians are vital to some of the foundational works in legislative politics (Cox and McCubbins 1993, 2005, 2007, Krehbiel 1991, 1998).[2]

Although these works do not all rely on NOMINATE, each of them either implicitly or explicitly share the fundamental problems related to dimensionality and measuring the preferences of elected officials. As such, we do not cite these works to make the case that their conclusions no longer stand or that anyone should diminish their contributions. Instead we cite them to demonstrate that the points we discuss below echo throughout many of the seminal works on institutional politics.

As we will make clear below, our purpose here is not to contest or criticize the NOMINATE technique or the main substantive conclusions drawn from its use.[3] Rather we hope that by employing this additional perspective we will be able to enrich the knowledge gleaned from the technique and offer some caveats about some of the uses to which the NOMINATE results have been put.

Expectations Guiding the Analysis

As we noted above, Poole and Rosenthal's long-term analysis of congressional voting concluded that at most times low dimensionality accurately describes the voting patterns, and that more recently one dimension dominates. Yet even within this broad and convincing generalization there are nuances. The authors make clear that at certain times the explanatory

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[1] A partial list of killer amendment research includes Riker (1982), Poole and Rosenthal (1997), Wilkerson (1999), Gilmour (2001), Jenkins and Munger (2003) and Finocchiaro and Jenkins (2008).

[2] See Poole and Rosenthal 2007: Chapter 11 for a more complete discussion of "The NOMINATE Literature."

[3] See Koford (1989), Poole, Rosenthal and Koford (1991), and Rosenthal (1992) for a debate about the NOMINATE techniques and dimensionality.

power of the first dimension declined and the impact of the second dimension became more substantial (Poole and Rosenthal 2007: 65). This was especially true during the breakup of the party systems around 1820 and 1860, but it was also somewhat characteristic of longer periods like the years after World War II (which Poole and Rosenthal [2007: 54-55] characterize as the "three-party system"). The authors note that these variations are largely the consequence of the increased saliency of race as an issue. In addition, there were more than a few congresses outside these isolated periods of highest second-dimension importance in which there were subsets of roll calls that were significantly influenced by the second dimension. For example, there were five congresses between 1969 and 1981 in which the House had between 12 and 32 such roll calls, dealing with either agriculture or public works. Yet in other congresses adjacent in time to these, there were fewer than 10 such votes on either issue (Poole and Rosenthal 2007: 59).

Moreover, other research indicates that the picture of the unidimensional Congress may need at least some minor qualification. Hurwitz, Moiles, and Rohde (2001) analyzed voting on agriculture issues in the 104th House on the heels of the Republican takeover of Congress after the 1994 elections. Note that this was not one of the congresses in which the second dimension was prominent, but rather one in which the first dimension classified correctly about 90 percent of the votes (Poole and Rosenthal 2007: 65). Yet within this generally unidimensional, highly polarized Congress fraught with partisan conflict, different patterns were also visible. In 1995 and 1996, the Republican Party leadership in the House sought to enact a major reorientation of agriculture policy. As a consequence there was a set of roll calls that tested support for these initiatives, plus another set that involved efforts by representatives from agricultural districts to protect particular benefits or mitigate the magnitude of cuts in support programs. What is clear from this analysis is that some of the roll calls produced divisions that fell almost perfectly along party lines, and thus were prototypical first-dimension votes. These were the roll calls that involved the attempts at overall policy change. On the other hand, the votes dealing with particular support programs generally yielded voting patterns that completely cut across party lines, with similar yea-nay divisions within each party. Obviously the same first dimension could not account for these other patterns.[4]

One point that Hurwitz, Moiles, and Rohde focused on was that it was unusual for the House to vote on the individual distributive issues that produced the cross-cutting patterns. But this is not the same thing as saying that the interests and cleavages that produced the cross-cutting divisions were not present in other congresses. One possible reason that the number of roll calls on which a second dimension was important varied considerable from one Congress to another is that in some Congresses few if any roll calls were taken on the issue(s) that produced the unusual divisions in the second congress compared to the first. In essence, it is possible for preferences to be multidimensional, but these preferences do not reveal themselves because the issues do not receive enough roll calls to show up during normal analyses. For example, it is likely that votes dealing with the Vietnam War would show up as a second dimension issue. However, since most of the votes on this issue were amendments offered in the Committee of the Whole before the era of recorded teller votes on amendments, the second dimension would never reveal itself. Although the roll call votes may lead us to believe that *voting* is unidimensional, we should not necessarily conclude that *preferences* are unidimensional as well. To explore this possibility and to examine its effects on conclusions about the dimensionality of voting, one would have to find a way to isolate sets of roll calls that would exhibit sufficient variation in

[4] Potoski and Talbert (2000) and Talbert and Potoski (2002) find multiple dimensions elsewhere in the legislative agenda such as co-sponsorship networks and policy outputs.

subject matter. The annually repeated appropriations process appeared to offer the opportunity to do just that, by pooling votes from consecutive congresses.

The key to this effort was assuring sufficient comparability across years. Each year the House Appropriations Committee reports one bill from each of its subcommittees, dealing with annual appropriations for the programs within that subcommittee's jurisdiction.[5] Moreover, during the period on which we focus (the 100th through the 107th congresses, 1987-2003), the jurisdictions of the subcommittees stayed the same. Thus we could be sure that the subject matter of the votes within each jurisdiction would be more similar to each other than to the roll calls from another subcommittee. By this device we hoped to get a larger number of roll calls linked to crosscutting issues than would be the case by analyzing a single congress. From such data we could discover how much variation in positions members exhibited from one issue to another and the degrees to which we can characterize these separate issues by low dimensionality.

Data and Methods

In order to test our expectations regarding variations in member voting behavior across different issue areas, we analyze all floor roll call votes on the bills stemming from the subcommittees of the House Committee on Appropriations. Traditionally, Congress annually considers a separate bill for each of these subcommittees.[6] Until 2005 when the House and Senate reorganized some of the subcommittees, there were 13 separate subcommittees, each with

[5] In addition the Committee also reports supplemental, special, and omnibus bills that involve multiple subcommittee jurisdictions. Because of the diversity of the subject matters involved in these bills, we do not include them in our analysis.

[6] Sometimes, the Congress rolls some of the separate bills into one or several omnibus spending bills. See CRS Report 97-84 for more information on the Appropriations process.

a defined jurisdiction. Some cover a specific issue, such as Transportation, while others can be responsible for developing spending levels for multiple government agencies such as the subcommittee on Veterans Affairs, Housing and Urban Development and Independent Agencies. Table 1 gives the names of each of the subcommittees which are descriptive enough so that we can get a good sense of their jurisdictions. So, while the underlying issue is always spending, the objects of spending can vary dramatically.

To isolate the appropriate votes, we employed the Roll Call Voting dataset originally created by Rohde (1991). Although others generally use this dataset to determine the vote type of a particular roll call, there is also an issue type code for each vote. Within the issue type coding, it separates out legislative issues from appropriations issues. For example, the dataset codes a vote dealing with the Department of Defense building the MX missile differently from a vote on an amendment to the National Security appropriations bill to fund (or not fund) the missile. This way, we can be sure we only include appropriations matters in this particular dataset. Further, each of the subcommittees has its own unique code or set of codes so it was relatively simple to pull out the appropriate votes.

Since we will use the W-NOMINATE procedure developed by Poole and Rosenthal (1997) to scale the roll call votes, we need enough votes for each of the 13 jurisdictions. Generally, about 100 votes are needed to have much confidence in the NOMINATE scores. To get a sufficient number of roll-call votes, we collected data from the 100th through the 107th Congress and formed 14 roll call matrices, one for each of the subcommittees and an additional one that includes all appropriations votes. If a member served in all of the eight congresses, we concatenated the votes from those congresses. If a member did not serve across our entire dataset, they received a code of 0 “Not in Congress at the time of the Roll Call” for all of those votes. This is the same value a member would receive if they were serving at the time, but happened to miss a vote.[7] We then estimate the NOMINATE scores separately for each of the 14 matrices. Because we do not estimate the scores within the same matrix and anchored using similar members (see Rivers 2003, and Bailey and Chang 2001 for an explanation of this technique), individual scores are *not* directly comparable across the subcommittees. However, we feel that comparing a member's rank in terms of overall liberal or conservativeness is appropriate. Although combining votes across Congresses can be problematic, because we are including a specific set of votes dealing with similar issue areas and those areas are constant over time, we feel the gains from our technique outweigh any shortfalls.

Table 1 also lists the number of votes we scale for each of the subcommittees. For all but one area, military construction, we were able to code a sufficient number of votes (about 100). Since there were only 53 votes on bills from this subcommittee, we will exercise caution in drawing any inferences for this area of appropriations. However, as we will show below, the results are not specific to any one particular subcommittee. Further, because comparing any member's NOMINATE score across the different areas can be problematic, most of our results either rely on comparing sets of members where members are coded into equally sized groups based on their relative ideology or on a system of rank ordering.

Analysis

Arguably, there is no one piece of evidence or "smoking gun" that will prove that voting patterns vary significantly depending on the issue at hand. So, in order to demonstrate that the median members of Congress can vary across different issue areas and that these areas may be

[7] We are indebted to Keith Poole for suggesting this technique and for offering advice on the number of roll calls required for a dependable scale.

multidimensional, we have devised tables and figures that present the data in various ways. Some of our analysis will focus on members around the median of the scale, while others will look at the full set of members. While no one aspect of the presentation is likely to make our case conclusively, and while each may have some weakness, we believe that the cumulative effect of the evidence makes a convincing case in support of our argument.

Comparing Medians

Our initial analysis will compare medians across each of the 13 subcommittees as well as the "all appropriations" category. The median of the chamber, or party, has become a critical variable in much of the congressional literature associated with partisan politics (See e.g. Cox and McCubbins 1993, 2005, 2007 or Krehbiel 1998). If the median is not consistent across issue areas then future researchers should think carefully about how they measure this cut-point, especially if the research is issue specific.

One way to compare medians would be to determine *the* median member for each set of votes and compare her placement across all the issue areas. However, since NOMINATE scores are estimates and there is a degree of uncertainty associated with each score (see Lewis and Poole 2004), declaring one member the median of the chamber or party is probably not the best approach. Instead of picking one median, we divide a subset of members into an odd number of equally sized groups and then compare the placement of the members in the median group for one issue area to their relative placement in all the other sets of votes. This approach has the advantage of placing the least demands on the data, relying only on ordinality.

Since the median can be a relative position depending on the set of members at hand, we only work with the subset of members who have NOMINATE scores on each of the subcommittee measures as well as a score for all appropriations votes. If a member did not have a score for any of the 14 measures, we dropped them from this portion of the analysis. Once we obtained the initial subset, we then ordered the remaining members from the most liberal to the most conservative on each of the sets of votes and then placed them into equally sized groups.[8] We placed the most liberal members in the first group and the most conservative in the last. Based on the sample size (437) and number of groups (11), we then deemed the 6th group the median group of the "chamber", the 3rd the Democratic median group and the 9th the Republican median group. Once we know who is in the median group for any set of votes, we can then determine if the same members are in the median group for other sets of votes. If voting is perfectly consistent across issues, then we would expect the members in the median group for one set of votes to be the same for the others. If voting is not consistent, then members who fall into the median group for one set of votes may "move" to different groups for other types of votes.

We begin our analysis of median comparisons with Table 2. Here we determined the set of 40 members who were in the median or sixth group for the "all appropriations" category and report a set of summary statistics for their placement across each of the 13 subcommittee sets of votes. If voting is perfectly consistent then the mean group statistic, minimum, and maximum should all be 6 and the standard deviation would then be zero. According to the results in Table 2, this is not the case. For example, the members who were in the median group for the all appropriations votes category had a mean group score of 6.5 on the agriculture subcommittee votes. This suggests that, on average, members who were in the median for all appropriations voted in a more conservative fashion on agriculture votes. For each of the subcommittee

[8] In actuality, some groups contained 39 members while others contained 40 due to the sample size and number of groups.

measures, the mean group score is close to 6, as we would expect since *most* members should vote in a similar fashion across issues. However, this does not mean *all* members vote in a consistent fashion. The standard deviation statistic gives us a measure of spread around the mean and since we are working with a uniform distribution one standard deviation corresponds to one group or 40 members. In eight of the 13 cases, the standard deviation is at or above 1 demonstrating that there is considerable degree of movement around the mean. This implies that members who were in the median for the all appropriations category did not all shift to the left or to the right on the other issues, rather some are now voting more conservatively and some are voting more liberally. Finally, the minimum and maximum statistics demonstrate that median members from one category can vote in either a liberal or conservative fashion on another set of votes. Some members who were in group 6 on the "all appropriations" scale ranged from a low of group 2 on Defense appropriations to a high of group 11 for Energy and Military Construction. The final row in the table displays the mean of the measures for each of the 13 subcommittees.

To put these measures in perspective, we can follow a member who falls into the median for all votes and see where they score on the different subsets. Chris Shays (R – CT) was in the median grouping for all appropriations votes as well as for Foreign, HUD, Interior, Labor, and Military Construction. In contrast, when it comes to voting on Agriculture appropriations, Shays falls into the 10th grouping. Since there are 40 members in each group, this is a difference of at least 120 members to the right for Shays. For Defense appropriations, Shays falls into the 2nd

grouping. If we were to compare his voting on Agriculture to Defense, he moved at least 280 members from the right to the left![9] Clearly, all members do not vote the same across all issues.

Table 2 also displays similar statistics for the Democratic and Republican Party medians. Again we see similar patterns with means near the party median but standard deviations near 1 and ranges of minimums and maximums averaging about 4. In a few cases, especially for the Democrats, the ranges are quite large. For example, Patricia Schroeder (D – CO) was among the median members of her *party* for all appropriations votes but was near the median of the *chamber* for Agriculture appropriations voting. Three Democrats, Ron Coleman (D – TX), Steny Hoyer (D – MD) and Eddie Bernice Johnson (D – TX) were at their party median for all appropriations votes but one group to the *right* of the chamber median for Defense appropriations. Some Republicans exhibited similar voting patterns.

In Table 3, we present the average means, standard deviations, minimums and maximums for the median groups for each of the appropriation categories on all of the other subcommittee votes. This allows us to compare how the members from the median groups in one subcommittee area voted across each of the other issue areas. For example, the median group on Agriculture appropriations voting had a mean group score of 6.5 on each of the other issues with a standard deviation of 1.4. The average minimum and maximum was 3.3 and 9.6 across the other 12 subcommittees. For each of the 13 subcommittees, the average standard deviation was above 1 and there was clear movement into different groups by individual members. Again, it seems reasonable to conclude that the medians can change depending on the particular issue area. Although we do not go into detail for each individual member on these tables, based on

[9] These are conservative estimates because it assumes, for instance, that Shays is the most conservative member in group 6 and the least conservative in group 10. Even though there is some uncertainty associated with each score, this movement of at least 280 members is telling.

this evidence we can begin to make the claim that some, but not all, members may have different types of voting behavior depending on the issue at hand. That is, not all members are conservative, or liberal, across all issues. Although we do not explore it in great detail here, the variations in voting behavior may be a function of district characteristics or in some cases, a member's own personal ideology.

Dimensionality

Our theoretical argument also suggests that when we look at smaller issue areas, voting may not be explained by only one or two dimensions. This hypothesis runs contrary to what Poole and Rosenthal found in the larger aggregates. To examine this question, we created a series of Skree plots of the eigenvalues of the double-centered agreement score matrix (Figure 1) and present the fit statistics for each of our categories (Table 4). In each case, we provide an example of one dimensional voting constructed from all of the roll call votes from the 104th Congress. In the examples, the first dimension explains nearly all of the variation in the data. In the one-dimensional example in Figure 1, the sharp "elbow" at the second dimension gives a good indication that the data are one-dimensional. This is not the case for any of the 13 subcommittees or when we create scores from all the appropriations votes. Because there are over 1700 votes in the "all appropriations votes" category, and it too does not appear unidimensional, we have some evidence that the higher dimensionality in the sub-committee bills are not a function of a relatively low number of votes.

For example, the plot for the energy subcommittee suggests voting is explained by more than one and probably more than two dimensions. Thinking about energy policy, we can imagine a situation that pits members representing oil producing districts against corn or ethanol farmers while we also have members representing districts where the auto industry is a big employer. Also in the mix are other legislators who represent constituents who want to pay as little as possible for gasoline and finally some members whose constituents may actually want to see the price of gas rise in order to promote more environmentally sound policy such as hydrogen technology. So, while on the surface energy policy may look simple, in reality it is probably not the case. Votes on several of the other subcommittees such as Agriculture, Defense, Transportation and Treasury also appear not to be one-dimensional.

Another way to explore the dimensionality in the data is to examine fit statistics for our categories. Table 4 presents the percent correctly classified and the aggregate proportional reduction in error for the first five dimensions. Here, the evidence does not point as strongly towards a multidimensional explanation. For each of our categories, the first dimension correctly classifies over 80% of the votes and adding additional dimensions does not appear to significantly improve the fit of the model. In terms of changes in the aggregate PRE, we see in some instances that adding additional dimensions reduce the number of errors. For example, on Agriculture votes, the difference between the aggregate PRE for the first and second dimensions is 0.15 and the difference between the first and fifth is 0.22. On energy votes, the difference between the first and fifth dimension is .26. Taking the evidence in Figure 1 and Table 4 together, it appears that voting may be multidimensional but adding additional dimensions to the estimations does not significantly improve the fit of the model.

Comparisons of Ordinal Rankings by Subcommittee

Turning to the subcommittee-specific rankings of members, an appropriate initial comparison is to assess the degree to which the rankings are similar from one subcommittee to another. One way to do this is to again place members into groups, and then compare the groupings pair-wise across subcommittees. Unlike the median comparison where an odd number of groups are necessary we place members here into ten equal groups (or deciles) for each subcommittee. Table 5 presents the comparison for the Energy and Defense subcommittees, portraying the percentage of the total of 605 members that falls in each cell.[10] If there were absolutely no relationship between the two rankings, we would expect one percent of the members to appear in each cell. It is readily apparent that the rankings are more related than that. Looking down the main diagonal of the table, one can see that most cells contain considerably more than one percent of the members, especially near the endpoints. With no relationship the ten cells on the diagonal should contain ten percent of the members. In actuality they contain 25.5 percent. Moreover, if we broaden our expectations to include the additional eighteen cells that are within one rank either way of the diagonal, 60.8 percent of the members appear in those 28 cells. Thus there is clearly an underlying structure that ties the two scales together. On the other hand, the comparison of the two scales clearly does not reveal that they are identical or even nearly so. The "within one rank" standard of similarity is a fairly generous one, and yet fully 39.2 percent of the members' scores differ by more than that.

We selected the Energy-Defense pairing in Table 5 precisely because it exhibits considerable divergence, but even the most similar pairs of rankings reveal enough differentiation to be analytically interesting. Table 6 shows the paired ranks for the D.C. and Labor subcommittees. Here fully 42.7 percent of the members fall on the diagonal, and 90 percent lie within one rank of the diagonal. That is a considerably stronger relationship than the

[10] If a member did not have a score on either of the two categories they were deleted from the analysis.

previous comparison, but still ten percent of the members differ by more than the generous one-rank standard.

Table 7 lists all the pairings of subcommittees, showing for each pair the proportion of the members whose scores are more than one decile different. Of the 78 comparisons, 38 (or 49 percent) have one-fourth or more of the members differing by more than one rank, and another 16 of the pairs (20 percent) have 20 to 24.9 percent of the members meeting that standard. In our view, these comparisons demonstrate the accuracy of our expectations that a focus on a more fine-grained comparison of scales of members' positions would reveal that at this level there is considerable differentiation. The common underlying structure that dominates the results from the congress-by-congress NOMINATE scales constructed by Poole and Rosenthal is still visible in these comparisons. Also visible, however is substantial differentiation between the rankings based on jurisdiction-specific groups of roll calls. At this level of specificity, the "one-dimensional" characterization cannot be sustained.

Correlation of Ranks

As a final example of members voting differently across the sub-committees, we present a matrix of spearman correlations based on a ranking of members from the most liberal to the most conservative in Table 8.[11] If members voted the same across each of the sub-committees, then correlations would all be 1. In this case, 45 of the correlations are higher than 90%, 27 are between 80 and 89.9 and six are between 70 and 79.9. The large number of correlations over 90 suggests that members do vote in a similar fashion, but the correlation is not perfect.

[11] An analogous figure using Kendal's Tau reveals similar patterns but with lower levels.

In order to present a better visualization of the correlation results, we performed an eigenvalue-eigenvector decomposition of the Spearman correlation matrix presented in Table 8 and then created a scatter plot of the first two eigenvectors shown in Figure 2. As we expected based on the relatively low correlations from Table 8, voting on Defense appropriations is a clear outlier. In fact, if we go back and examine the Defense category from our other analyses it presents a higher degree of variability compared to the other subcommittees. When we compared members in the median group from the all appropriations votes category with how they ranked in the other categories in Table 2, the standard deviation on Defense votes was the highest at 1.9. Referring back to Table 3, the members who are in the median grouping for Defense have an average minimum ranking of 2.1 and maximum ranking of 11.0. This means that members who are at the median for Defense appropriations votes are some of the most liberal *and* conservative members for votes on many of the other categories. This result is also indicated by the high percentages from Table 7. When we compare Defense voting with Agriculture voting, a full 42 percent of members are more than off the diagonal of the cross-tab. At the very least, there is strong evidence that defense appropriations voting is different when compared to voting on the other appropriation issues.

Conclusion

At the onset of this paper, we argued that while Congress as a whole can largely be described with one or maybe two dimensions, this does not necessarily mean that every issue can be neatly placed on a single dimension. By combining enough votes on a series of issue areas, we were able to demonstrate that some issues are multidimensional and members do not always vote in a consistent fashion on all issues. Through the lens of appropriations voting, we provided evidence that members can be close to the chamber median on one type of bill, but then be far from that median on other bills. After grouping members into deciles based on voting on the 13 subcommittee bills and then comparing the deciles across bills, we found that these changes in voting patterns are not just present at the medians. Although there is a strong correlation between voting behavior on the different bills, there were still a significant number of members who may be voting in a more or less conservative fashion depending on the issue at hand. In terms of dimensionality, a visual inspection of skree plots indicates that appropriations votes do not have the sharp "elbow" that we see in a plot that can more straightforwardly be described as a one dimensional set of votes.

Based on these results, we argue that when we examine a finer grain of issues and more importantly include a sufficient number of votes, some issues can be described as multidimensional. Due to the structure of agenda control, these issue areas rarely reveal themselves in conventional measures of voting behavior because these are the types of votes that party leaders want to keep from coming to the floor. For example, in the era leading up to the collapse of the Whig Party, a gag order effectively kept any debate on slavery off of the table. This does not mean that the parties were not divided on the issue, only that votes dealing with slavery did not make it to the floor. Once the congress was forced to vote on allowing free and slave states to enter the union, for instance, then the second dimension became more dominate. The same story could be told about the Vietnam era. The parties were not necessarily internally consistent on issues dealing with the war. However, because the House took most of the votes on Vietnam in the Committee of the Whole, and not on the floor as recorded votes, we cannot use scaling procedures to call the war a second dimension issue. Based on our results, it is important to keep in mind that just because the votes are not recorded, does not mean *preferences* are not multidimensional.

We need to be clear, however, and state that our results do not contradict the original findings of Poole and Rosenthal. It is still the case that when grouped together, the votes taken over the course of a congress can be described by one and maybe two dimensions. Further, because we base our results on statistics derived from the NOMINATE technique we are also not questioning the value of the procedure. With that in mind, we conclude by offering some advice for future research. If the question at hand deals with general patterns of decision making, then using voting scores that incorporate all votes is probably a safe bet. But, when the research design calls for predicting behavior or is examining medians and pivots on specific bills, then our results suggest that the overall measures are probably not correct and a more fine grained measure should be used. We will leave it up to future research to develop those measures and techniques.

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Table 1 - Appropriations Subcommittees and Total Number of Roll Calls

Subcommittee	Number of Votes
Agriculture, Rural Development, FDA and Related Agencies	142
Commerce, Justice, State and Judiciary	184
District of Columbia	100
Energy and Water Development	116
Foreign Operations, Export Financing and Related Programs	139
Interior	236
Labor, Health and Human Services, and Education	151
Legislative	118
Military Construction	53
National Security (Defense)	93
Transportation	93
Treasury, Postal Service and General Government	145
Veterans Affairs, Housing and Urban Development and Independent Agencies	191
All Appropriations Votes	1761

Table 2 - All Appropriation Median Members Compared to Subcommittee Voting

Committee	Chamber Median				Democratic Median				Republican Median			
	Mean Group	S.D.	Min	Max	Mean Group	S.D.	Min	Max	Mean Group	S.D.	Min	Max
Ag.	6.5	1.3	3	10	3.0	1.1	1	6	8.9	1.2	6	11
Comm.	6.1	0.6	5	7	2.8	0.9	1	4	9.0	0.8	8	10
D.C.	6.0	1.0	4	8	2.7	1.1	1	4	9.3	1.1	7	11
Defense	6.2	1.9	2	9	3.4	1.7	1	7	9.0	1.8	4	11
Energy	6.6	1.6	4	11	2.9	1.4	1	6	8.9	1.3	7	11
Foreign Affairs	6.1	1.0	4	9	2.9	1.0	1	5	9.3	1.1	7	11
HUD	6.0	0.7	4	8	3.0	0.7	1	4	9.2	0.8	8	11
Interior	6.1	0.7	5	8	3.0	0.7	2	5	9.0	0.8	7	10
Labor	6.1	0.6	5	8	2.7	1.0	1	5	9.0	0.7	7	10
Leg. Branch	6.3	1.1	5	10	3.0	1.3	1	5	9.2	1.2	7	11
Military Const.	6.5	1.7	3	11	3.0	1.4	1	5	9.1	1.4	6	11
Transportation	6.4	1.1	4	9	2.9	1.2	1	5	9.0	1.1	7	11
Treasury	6.0	0.8	4	8	2.8	1.0	1	4	9.3	0.9	7	11
Average:	6.2	1.1	4.0	8.9	2.9	1.1	1.1	5.0	9.1	1.1	6.8	10.8

Note – This table reports summary statistics on subcommittee voting for the set of members who scored in the median group of 11 groupings on all appropriations votes. The respective median groups were 6, 3 and 9 on all appropriations votes.

Table 3 – Descriptive Statistics for Subcommittee Median Group on all other Subcommittees

Committee	Chamber Median			
	Mean	S.D.	Min	Max
Ag.	6.5	1.4	3.3	9.6
Comm.	6.4	1.2	3.9	9.3
D.C.	6.2	1.5	3.4	9.6
Defense	6.8	2.2	2.1	11.0
Energy	6.2	1.6	2.2	9.3
Foreign Affairs	6.2	1.4	3.3	9.3
HUD	6.3	1.3	3.8	9.7
Interior	6.4	1.3	3.7	9.3
Labor	6.3	1.3	3.7	9.3
Leg. Branch	6.3	1.4	3.1	10.3
Military Const.	6.8	2.1	3.5	10.9
Transportation	6.6	1.3	4.2	9.6
Treasury	6.2	1.4	3.7	9.6

Note – In each case, the median group is group 6. We compare the members in the median group on each subcommittee with their average group placement on each of the other issue areas.

Figure 1 – Eigenvalues of Double Centered Squared Distance Matrix

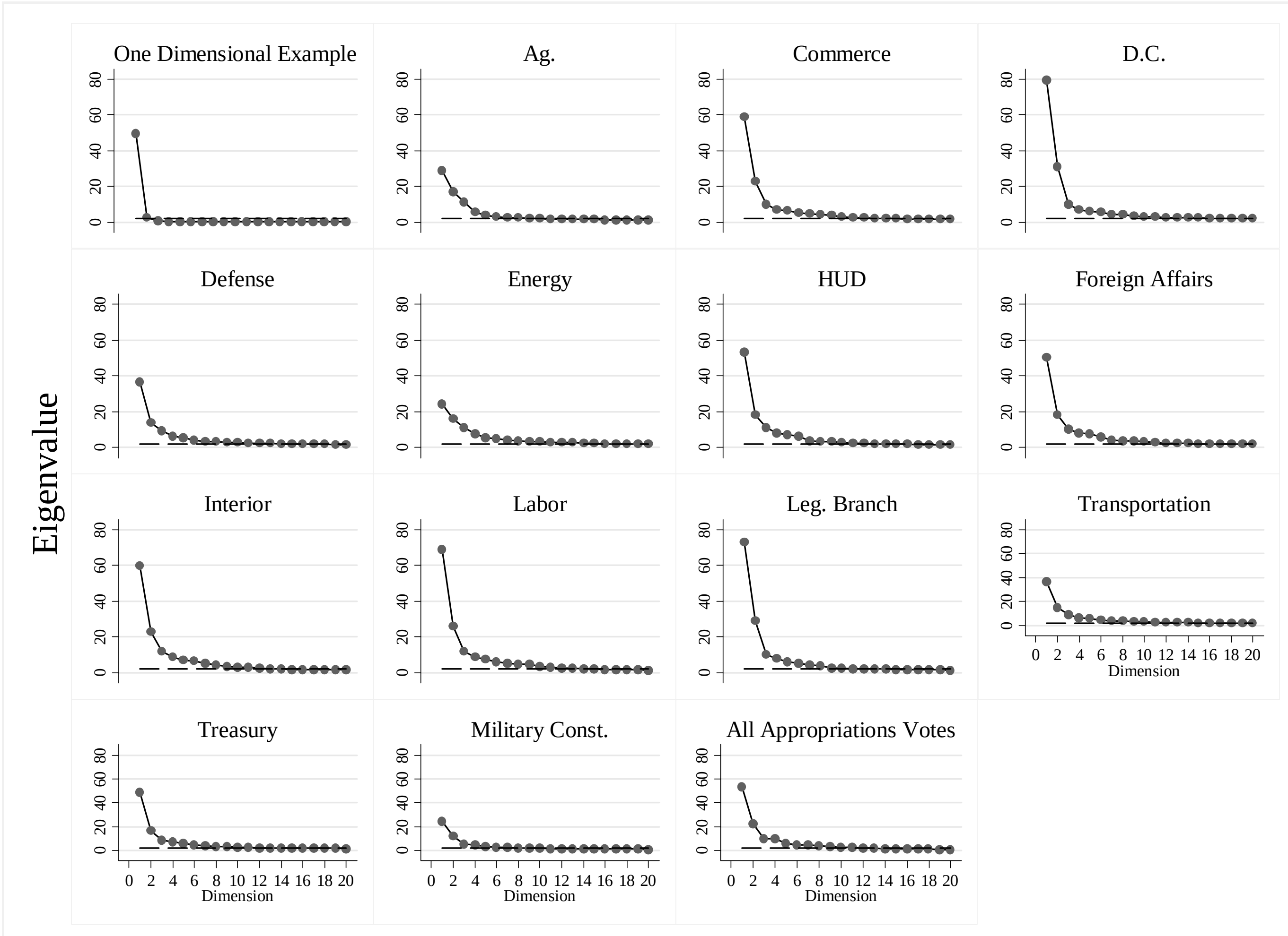

Table 4 - W-NOMINATE Fit Statistics for First Five Dimensions

	% Correctly Classified					Aggregate PRE				
Dimension	1st	2nd	3rd	4th	5th	1st	2nd	3rd	4th	5th
<u>Subcommittee</u>										
Ag.	82.8	87.2	88.3	89.1	89.6	.44	.59	.62	.65	.66
Comm.	86.2	87.5	88.6	89.5	90.1	.60	.64	.67	.70	.71
D.C.	88.8	91.1	92.0	93.0	93.7	.73	.79	.81	.83	.85
Defense	87.4	89.7	90.8	91.6	92.3	.56	.65	.69	.71	.74
Energy	81.6	86.1	87.3	88.3	89.0	.35	.50	.55	.58	.61
Foreign Affairs	85.4	88.5	90.3	91.0	91.8	.58	.67	.72	.74	.76
HUD	85.8	88.2	89.3	89.7	90.5	.60	.67	.70	.71	.73
Interior	85.1	87.7	88.9	89.7	90.2	.59	.67	.70	.72	.73
Labor	90.3	92.2	93.1	93.7	94.0	.71	.77	.80	.81	.82
Leg. Branch	91.4	93.0	93.6	94.2	94.7	.76	.80	.82	.84	.86
Military Const.	87.3	91.1	92.2	93.3	94.2	.54	.67	.72	.75	.79
Transportation	86.6	88.2	89.3	90.3	91.0	.53	.59	.63	.66	.69
Treasury	84.8	86.9	89.5	90.6	91.2	.56	.62	.69	.73	.75
All Appropriations Votes	85.3	87.0	87.9	88.2	88.6	.56	.61	.64	.65	.66
Example (104th Congress)	88.7	89.9	90.6	91.0	91.3	.68	.72	.74	.75	.76

Table 5 – Defense and Energy Decile Comparison

		Defense									
		1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Energy	**1**	5.8	2.6	1.3	0.5					0.2	
	2	2.1	3.1	2.3	0.7	1.0		0.2			
	3	0.7	2.6	2.3	1.5	0.8	0.7	0.3			
	4	0.8	0.3	1.2	2.3	2.8	1.2	1.5	0.2		
	5	0.2	0.7	0.7	2.8	0.8	1.5	1.2	0.7	0.2	
	6	0.2	0.3	0.8	1.0	1.3	1.5	1.3	2.0	1.0	0.3
	7		0.2	0.5	0.3	1.2	1.5	1.7	1.7	2.0	0.8
	8		0.2	0.2	0.2	1.5	1.0	1.8	1.8	2.0	2.6
	9			0.5	0.3	0.5	1.0	0.8	1.7	3.1	3.1
	10	0.2		0.3	0.3	0.2	1.7	1.2	2.1	1.5	3.1

Note – cell entries represent the percent of members in each of the decile pairs. There are 605 total members with scores in both of these committees. Lower deciles represent more liberal scores.

Table 6 – Labor and D.C. Decile Comparison

		Labor									
		1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
D.C.	**1**	5.3	3.3	1.0	0.1	0.3					
	2	3.8	3.2	2.8	0.1	0.1					
	3	0.7	1.8	4.5	2.5	0.6					
	4	0.3	0.8	1.8	4.2	2.4	0.4	0.1			
	5			0.6	2.9	4.6	1.7	0.1	0.1		
	6				0.3	2.6	4.6	1.9	0.4		0.1
	7					0.1	3.1	3.5	2.6	0.4	0.3
	8						0.8	2.8	3.5	2.4	0.4
	9							0.7	3.1	3.6	2.6
	10							0.4	0.6	3.3	5.7

Note – cell entries represent the percent of members in each of the decile pairs. There are 719 total members with scores in both of these committees. Lower deciles represent more liberal scores

Table 7 - Percent of Members More Than 1 Group Off Center

	Ag.	Comm.	D.C.	Defense	Energy	Foreign Affairs	HUD	Interior	Labor	Leg. Branch	Military Const.	Trans.	Treasury
Ag.													
Comm.	17.0												
D.C.	24.2	16.4											
Defense	42.0	36.3	32.8										
Energy	26.0	25.2	35.0	39.0									
Foreign Affairs	26.0	19.6	14.3	36.6	33.0								
HUD	17.7	15.7	21.8	34.6	22.5	21.1							
Interior	23.9	13.5	15.0	34.3	26.2	16.4	11.3						
Labor	19.3	11.8	10.0	34.1	28.9	13.9	15.6	10.8					
Leg. Branch	23.4	18.7	25.5	45.5	28.9	30.0	25.6	23.6	23.1				
Military Const.	30.2	27.0	32.3	31.6	31.8	33.0	27.7	26.8	30.4	34.1			
Transportation	23.1	18.1	28.8	40.7	27.2	29.0	21.5	21.4	20.6	21.4	31.4		
Treasury	21.3	12.7	19.2	37.7	28.0	18.9	17.5	14.9	15.5	20.1	29.1	21.0	

Table 8 - Spearman Correlation of Ranks

	Ag.	Comm.	D.C.	Defense	Energy	Foreign Affairs	HUD	Interior	Labor	Leg. Branch	Military Const.	Trans.	Treasury
Ag.													
Comm.	0.94												
D.C.	0.89	0.94											
Defense	0.74	0.78	0.81										
Energy	0.91	0.91	0.87	0.76									
Foreign Affairs	0.89	0.94	0.94	0.81	0.87								
HUD	0.93	0.95	0.93	0.81	0.92	0.93							
Interior	0.92	0.96	0.94	0.83	0.90	0.95	0.96						
Labor	0.93	0.97	0.96	0.80	0.90	0.95	0.95	0.96					
Leg. Branch	0.90	0.93	0.90	0.73	0.88	0.88	0.91	0.90	0.91				
Military Const.	0.84	0.85	0.84	0.85	0.85	0.84	0.86	0.86	0.85	0.83			
Transportation	0.93	0.94	0.90	0.75	0.91	0.89	0.94	0.92	0.93	0.92	0.83		
Treasury	0.92	0.96	0.94	0.79	0.89	0.94	0.94	0.95	0.96	0.92	0.85	0.92	

Figure 2 – Plot of First Two Eigenvectors of the Spearman Correlation Matrix