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Center on Institutions and Governance Working Paper No. 5

Polarized America: The Dance of Ideology and Unequal Riches

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February 2005

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Chapter 2

The Polarization of the Politicians

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The fundamental transformation of American politics can be summed up by the recent history of a single Senate seat. In 1991, Pennsylvania's three-term senator John Heinz was killed in a light plane accident. A Republican, he compiled a moderate record as his party's leading supporter of environmental and labor union causes. In the special election that followed, the Republicans ran another relatively moderate candidate, Richard Thornburgh a former governor and US attorney general, against Harris Wofford, the interim senator. Wofford, who began his career as the first associate director of the Peace Corps, was significantly more liberal than Heinz or Thornburgh was conservative. In a campaign orchestrated by the then relatively unknown James Carville, Wofford ran a platform of fundamental reform of the U.S. Healthcare system. This electoral strategy was wildly successful as Thornburgh was beaten easily and healthcare became the "hot" issue going into the 1992 presidential elections.

Another upset in Pennsylvania occurred the following year when Rick Santorum defeated Doug Walgren, a long-term liberal Democrat congressman from the Pittsburgh area. In the House, Santorum compiled one of the most conservative voting records, placing himself well to the right of Heinz and the majority of Pennsylvania House Republicans. In spite of his conservatism, Santorum was able to move up to the Senate by defeating Wofford in 1996. So in a period of 5 years, this Senate seat went from one of the most moderate members of the U.S. Senate, to one of the most liberal Democrats, to one of the most conservative Republicans.

The Heinz-Wofford-Santorum transition from moderation to relative extremism has been repeated over and over again for the past 25 years. It is the process that has increasingly polarized American politics.

To go beyond the anecdotal, in this chapter we provide systematic evidence from the historical record of roll call voting in Congress to demonstrate that the behavior of members of Congress has in fact become highly polarized along a liberal-conservative ideological dimension. This surge in polarization arose after a long secular decline in polarization that began at the turn of the twentieth century and lasted until the late 1960s. Many in the Republican party led by President Eisenhower had accepted much of the New Deal welfare state, and Democrats and Republicans were solidly behind the foreign policies of anti-communism and containment. John F. Kennedy campaigned to increase defense spending. This consensus led to record levels of bi-partisanship and cooperation in Congress. However, this "consensus" was short-lived. By the mid-1970s, the Vietnam War signaled the end of bipartisan foreign policy, while sluggish economic performance led to serious consideration of alternatives to Keynesianism and the Welfare State.

Poole and Rosenthal documented the dramatic turnaround of the 1970s in their 1984 publication, "The Polarization of American Politics". They found that beginning in the mid-1970s politics became much more divisive with more Democrats staking out consistently liberal positions and more Republicans supporting exclusively conservative ones. The primary evidence in that study, which focused exclusive on the Senate, were ratings issued by interest groups such as the Americans for Democratic Action and the United States Chamber of Commerce.[1] However, in their 1997 volume, *Congress: A Political Economic History of Roll Call Voting,* Poole and Rosenthal validated their earlier analysis using evidence from roll call votes rather than interest group ratings. They further found that the polarization surge had continued unabated through the 100th

Congress (1987-88). This chapter documents that this surge has continued through 2004. Our data confirm the more casual observation of polarization in the conflict over aid to the contras in Nicaragua, the confirmation hearings and votes after the nominations of Robert Bork and Clarence Thomas to the Supreme Court, the rhetoric of the "Contract with America", the budget showdown between Speaker Gingrich and President Clinton in 1995, and the impeachment process in 1998-99.

Measuring Ideology and Polarization: A Quick Primer

How do we know that polarization has occurred? Every aficionado of American politics would label Ted Kennedy (D-MA) and Paul Wellstone (D-WI) as liberals, Sam Nunn (D-GA) and Jacob Javits (R-NY) as moderates, and Tom Delay (R-TX) and Jesse Helms (R-NC) as conservatives. But how does one discern that Jesse Helms is more conservative than Rick Santorum? And how do we know that Santorum is more conservative than Heinz since, obviously, the two men never served in Congress together? How do we locate Wellstone relative to someone even more remote, say William Jennings Bryan who denounced Republicans for crucifying mankind on a "cross of gold"?

Most political scientists traditionally have measured liberal-conservative positions by using the data provided by the interest group ratings of the Americans for Democratic Action, the League of Conservation Voters, or the U.S. Chamber of Commerce. Groups construct these ratings by choosing the roll call votes that are important to their legislative agendas and identify whether a yea or nay vote indicates support for the group's goals. Indices are then constructed from the proportion of votes a member cast in

favor of the group. As Poole and Rosenthal have shown (*Congress*, Ch. 8), these indices are highly robust across groups. This consistency results from the fact that the interest groups themselves are also polarized along the same liberal-conservative lines.

However, one important limitation in the use of these interest group scores is that they are designed primarily to assess differences among the legislators in a given congress. As such, they do not provide any direct information about the differences between legislators serving at different times, or even the behavior of the same legislator over the course of her career. To illustrate this problem, consider the following example. In 1998, both Helms and Santorum received perfect conservative scores of 0 from the ADA. Wellstone received a perfect liberal score of 100. Kennedy, at 95, did almost as well. In 1980, the ADA had Helms at 11 and Heinz at the moderate score of 50. So, to the extent to which the ADA measures really capture member ideology, we might use the "glue" provided by Helms to conclude that Santorum was more conservative than Heinz. The "glue" provided by overlapping cohorts of legislators is used systematically in the method of Groseclose, Levitt, and Snyder (1999). But there are additional problems with using interest group ratings. First, all group ratings are based on small, selective samples of roll calls that, in particular, tend to clump lots of legislators at the extreme scores of 0 or 100. This tends to obscure real differences among legislators as we saw with the zero ADA ratings of Helms and Santorum in 1998. (In 1997, Helms was again a 0, but Santorum was a 15, more in line with "Inside the Beltway Common Knowledge".) In fact there is evidence that groups may choose votes strategically in order to divide the legislative world into friends and foes (Snyder 1992). This creates an artificially large number of 0's and 100's. Second, since the ratings go from 0 to 100 every year, the

range of positions invariant across time. Not surprisingly, Barry Goldwater had a 0 rating in 1980. Was he equally as conservative as Helms and Santorum were in 1998?[2]

Given these problems, we can get much better measures of ideology from *scaling* methodologies that use all the roll call votes. These methodologies all assume that legislators make their choices in accordance with the spatial model of voting. In a spatial model, each legislator is assumed to have a position on the liberal-conservative dimension. This position is termed the ideal point. The ideal point is directly analogous to a rating if the interest group is more liberal or conservative than all of the legislators (Poole and Daniels, 1985; Poole and Rosenthal, 1997).

Just as the 435 representatives and 100 senators have ideal point locations in the spatial model, we assume that each roll call can be represented by "Yea" and "Nay" positions on the liberal-conservative scale. The underlying assumption of the spatial model is that each legislator votes "Yea" or "Nay" depending on which outcome location is closer to his ideal point. Of course, the legislator may make "mistakes" and depart from what would usually be expected as a result of pressures from campaign contributors, constituents, courage of conviction, or just plain randomness. Based on our assumptions of spatial voting with error, we can estimate the ideal points of the members of Congress directly from the hundreds or thousands of roll call choices made by each legislator.

To better understand how the spatial positions of legislators can be recovered from roll call votes, consider the following three-senator example. Suppose we observed only the following roll call voting patterns from Senators Kennedy, Specter, and Santorum.

	Kennedy	Specter	Santorum
1	YEA	NAY	NAY
2	YEA	YEA	NAY
3	NAY	YEA	YEA
4	NAY	NAY	YEA
5	YEA	YEA	YEA
6	NAY	NAY	NAY

Notice that all of these votes can be explained by a simple model were all senators are assigned an "ideal Point" on a left-right scale and every roll call is given a "cutpoint" which divided the senators who vote yea from those who vote nay. For example, if we assign ideal points such that Kennedy<Specter<Santorum, the first vote can be perfectly explained by a cutpoint between Kennedy and Specter, while the second vote can be explained a cutpoint between Specter and Santorum. In fact, all six votes can be explained in this way. Note that a scale with Santorum<Specter<Kennedy works just as well. However, a single cutpoint cannot explain votes 1-4 if the ideal points are ordered Specter<Kennedy<Santorum, Specter<Santorum<Kennedy, Santorum<Kennedy<Specter, or Kennedy<Santorum<Specter. Therefore, none of these orderings are consistent with a one-dimensional spatial model.

Since two orderings of ideal points work equally well, which one should we choose? Given that Kennedy espouses liberal (left) views and Santorum is known for his conservative (rightist), Kennedy<Specter<Santorum seems like a logical choice.

However, the real world is a rarely so well behaved to generate the nice patterns of the first 6 votes. What if we observed Santorum and Kennedy occasional vote together against Specter as in votes 7 and 8 below? Such votes can not be explained by the ordering Kennedy<Specter<Santorum.

	Kennedy	**Specter**	**Santorum**
7	YEA	NAY	YEA
8	NAY	YEA	NAY

If there are only a few votes like 7 and 8 (relative to votes 1-6), its reasonable to conclude that they may generated by more or less random factors outside the model. If there are many more votes like 1-6 than there are deviant votes, any procedure that maximizes likelihood or correct classification will still generate the ordinal ranking Kennedy<Specter<Santorum. But if we maximize the likelihood of observed votes, the frequency of the deviant votes provides additional information about nominal values of the ideal points. For example, if there are few votes pitting Santorum and Kennedy against Specter, a procedure that maximizes likelihood will place Santorum and Kennedy far apart to mimic the improbability that random events lead them to vote together. Alternatively, if the Santorum-Kennedy coalition were common, such a procedure will place them closer together consistent with the idea that small random events can lead to such a pattern.

It is easy to measure the success of the one-dimensional spatial model. In our example, the "classification success" is simply the proportion of explained votes (i.e.

types 1-6) of the total number of votes. Notice, however, that classification success will be inflated if there are lots of votes like 5 and 6. This is because any ranking of the Senators can explain these votes. Therefore, it is often useful to assess the spatial model against a null model where all senators are assumed to vote with the majority position. A sensible measure of the improvement of the spatial model over this "majority" model is the *Proportional Reduction in Error* (PRE). The PRE is defined as

$$\frac{\text{(Majority Errors - Spatial Errors)}}{\text{Majority Errors}}$$

In our three-senator example, there is a single majority error on votes 1-4 and 7-8 while there is a spatial error on votes 7 and 8. Thus, the PRE is the ratio of votes 1-4 to votes 1-4 and 7-8.

Sometimes there are so many votes like 7 and 8, that it becomes unreasonable to maintain that they are simply random. An alternative is to assume that the Santorum-Kennedy coalition forms because there is some other policy dimension on which they are closer together than they are to Specter. This is accommodated by estimating ideal points on a second dimension. In this example, a second dimension in which Santorum and Kennedy share a position distinct from Specter will explain votes 7 and 8. Therefore, both dimensions combined will explain all of the votes. Obviously, in a richer example with 100 senators rather than 3, two-dimensions will not explain all the votes, but the second dimension will typically add explanatory power.[3] In our discussions below, we will evaluate the importance of higher dimensions by measuring their incremental ability to correctly predict roll call votes.

A cottage industry of specific techniques for recovering ideal points has emerged in recent years. However, these variations differ not so much in spirit as in their technical assumptions.[4] In fact, patterns of polarization that we discuss below are robust as to how positions on the dimension are measured. Nevertheless, we rely on our DW-NOMINATE method (McCarty et al, 1997) because it is the only methodology that allows both for comparison of the dispersion of positions across time and for intertemporal change in the positions of individual legislators. That is, DW-NOMINATE solves the problem of comparability of Santorum and Goldwater. It also captures some major changes in position, such as the conservative to liberal journey of senator Wayne Morse of Oregon. To capture these latter effects, the DW-NOMINATE scores used in this book allow for a linear change in legislator position throughout a legislator's career. Therefore one can change from liberal to conservative but not back again. While restrictive, this assumption is not particularly important. As a matter of fact, for the period covered by this book, there are only very small changes in legislator positions (Poole and Rosenthal, 1997, pp 73-74). Large changes occur only for those legislators who switch parties (McCarty et al, 2000). To account for this, we estimate two separate ideological paths for these "party-switchers."

To match the common-language designation of liberals to the left and conservatives to the right, we adjust the DW-NOMINATE scores so that each members average score ranges from –1 to +1, with –1 being the most liberal position and +1 the most conservative. For the example that introduced this chapter, Heinz ended his career at 0.017, Wofford ended at a liberal -0.40, and his replacement, Santorum is currently located at a conservative +0.44.

As the comparison of Wofford and Santorum shows, party, at least as much as constituency, has a major influence on ideal points (McCarty et al, 2000). The biggest linear changes are indeed associated with legislators who change party during their careers. Morse, for example, moved from -.244 to -1.07. Each legislator adjusts his position, to some degree, as a function of party affiliation. Heinz may well have had a more liberal voting record had he been a Democrat. On the other hand, party is a much coarser measure than a DW-NOMINATE score. There is always substantial diversity of DW-NOMINATE positions within each party and, at times, ideological overlap between the parties.

Although the DW-NOMINATE scores were computed using all the roll calls in the history of the United States Congress, in this chapter we start all time series with the 46th Congress that was elected in 1878. This is the first Congress elected after the Presidential election of 1876 which ended Reconstruction and marks the restoration of a competitive, national two-party system. A second reason for beginning our time series analysis here is that the election of 1876 is the beginning of the most bi-polar period in American political history. As documented by C. Vann Woodward in *Reunion and Reaction* (1951), Samuel Tilden undoubtedly won the 1876 Presidential election but, a coalition of Republicans and Southern Democrats in Congress were able to award *all* the contested electoral votes to Rutherford B. Hayes and this enabled him to win the election. The southerners were rewarded with the withdrawal of the last of the Federal troops from the secessionist States. This essentially ended the reign of the pro-Civil Rights forces in the Republican Party and the post-Reconstruction Democrat-Republican party system

emerged. The ensuing Congresses near the end of the 19th Century were the most polarized in history and provide us with a benchmark to assess polarization in our times.

During most of the period treated in this book, a single liberal-conservative dimension does an excellent job of accounting for how members vote be it on minimum wages or the shopping list of issues represented by the Contract with America or a Clinton State of the Union. One way of directly measuring the predictive power of the liberal-conservative dimension is to compute the percentage of votes on which a legislator actually votes for the roll call alternative that is closest to her on the dimension. This "classification" success exceeds 84% across all Congresses since 1789. However, there is one issue area that clearly did not fit the standard liberal-conservative pattern -- civil rights for African-Americans. For much of the post-WWII era, the voting coalitions on racial issues were noticeably distinct from those of the other issues. This can be captured in our spatial model by a second dimension with Southern Democrats at one end and eastern liberal Republicans, such as Jacob Javits of New York, at the other. We find that it is important to allow for these two political dimensions in the middle of the twentieth century. Consequently, we present results for the two dimensional DW-NOMINATE estimations. Just as one-dimensional scores run from –1 to +1, in two dimensions a legislator's career average two-dimensional scores must lie within a unit circle.

The Decline and Surge of Polarization

From our estimates of legislator preferences and the corresponding measurement of polarization, we can identify five distinct, yet complementary, trends that characterize a fundamental transformation of recent American politics.

1. Almost all political conflict in Congress is expressed in liberal-conservative terms of the first dimension. Consequently, most roll call votes can be interpreted as splits on a basic liberal-conservative dimension. Other dimensions, such as a civil rights dimension, have largely vanished as the coalitions on those issues have increasingly begun to match those of the liberal-conservative dimension.
2. The dispersion of positions of members on the liberal-conservative dimension has increased. Compared to the 1960s, extreme conservative as well as extreme liberal positions are more likely to be represented in Congress.
3. The ideological composition of the two political parties have become more homogeneous. Intra-party differences such as those between northern and southern democrats have completely disappeared.
4. The positions of the average Democrat and average Republican member of Congress have become more widely separated. That is, the difference in the party means has increased over time.
5. There is less overlap in the positions of the parties. There are no longer any liberal Republicans or conservative Democrats. The moderates are vanishing.

As we indicated previously, this surge in polarization began in the 1970s. The decline in polarization that took place between the turn of the century and the 1960s just

reverses the pattern for the surge: a decline in classification, less dispersion, more intra-party heterogeneity, decrease in difference in party means, more overlap of positions. We now turn to documenting these points.

Roll call votes can be interpreted as splits on a basic liberal-conservative dimension. Other dimensions have vanished.

Figure 1 shows that in both chambers, the 2-Dimensional spatial model accounts for most individual voting decisions throughout this period. Classifications were highest at the turn of the century, exceeding 90 percent in the House and reaching nearly 90% in the Senate. In both chambers, classifications are once again approaching 90 percent. In the last three Congresses, classification is higher than at any time since the end of World War I.

Insert Figure 1 About Here

The very high rates of classification success we observe do not result simply because most votes in Congress are lopsided votes where members say "Hurrah". On the contrary, Congress has, as the figure indicates, had mostly divisive votes, with average winning majorities between 60 percent and 70 percent.

The high rate of classification success also does not result from an important second dimension. An important second dimension was present in both chambers at mid-century, as shown in figure 2. From the 1960s onward, however, the second dimension has abruptly declined in importance. In the Clinton and Bush II Congresses, it improves classification only by about one percent in the House and one-half of one percent in the Senate.[5] Clearly most roll call votes can now be viewed as splits on a single dimension. This dimension corresponds to popular conceptions of liberals versus conservatives.

Insert Figure 2 About Here

The positions of the average Democrat and average Republican member of Congress have become more widely separated.

Figures 3 and 4 show the means of the political parties on the first dimension for the Post-Reconstruction period for the House and Senate respectively.

Insert Figures 3 and 4 About Here

In both chambers, the Republicans became more moderate until the 1960s.[6] The Republican mean bottoms out in the 60s and then moves in a sharply conservative direction in the 70s. The pattern for the Democrats is almost exactly the opposite. Consequently, the two party means move closer together during the twentieth century until the 1970s and then move apart.

However, on the second dimension, this pattern reverses. As figure 2 shows, the second dimension is important to classification only during the period when the civil rights issue was active, from the 1930s through the 1960s. The party means separate during this period because Southern Democrats have conservative positions on race. But the lack of polarization on the first dimension in this period is not simply the consequence of the relevance of a second dimension. First dimension polarization starts its decline well before the civil rights issue arises. Moreover, as we explain later in the chapter, the decline and surge of polarization is found in the North, even when we completely ignore the votes of southerners.

The dispersion of positions of members on the first dimension has increased; the parties have become more homogeneous.

Since the mid 1970s, the dispersion of members of Congress has systematically increased in both chambers. The pattern is disclosed by figures 5 and 6. Dispersion is shown by the standard deviation for all members on the first dimension. The increasing standard deviation shows that members are tending to appear more at either the conservative end or the liberal end of the dimension. Moderates are vanishing. There is thus polarization along the dimension, but not as much as during the intense conflicts over regulatory policy and monetary policy at the end of the nineteenth century.

The figures also show that, at the same time, the parties are becoming more homogeneous. The standard deviations of both parties are falling precipitously, particularly in the Senate. The parties now represent polarized blocs; voting coalitions that cut across the blocs are infrequent.

Insert Figures 5 and 6 About Here

The results we have presented for standard deviations on the first dimension are validated by an approach that considers both dimensions simultaneously. For each pair of members of a chamber, one can compute the two-dimensional distance between the pair. For each party, we average these distances for all pairs in the party to get within party distances. We also average the distances for all pairs of one Republican and one Democrat to get between party distances. Like the overall standard deviation, between party distances decline until the 1970s and increase thereafter (see Figures 7 and 8). The within party distances fall, although not as precipitously as the standard deviations. These results demonstrate that the surge and decline of polarization persists, even when the civil rights dimension is explicitly taken into account.

Insert Figures 7 and 8 About Here

Vanishing Moderates

Moderates are vanishing from Congress. In fact, this is synonymous with polarization. One way to see the disappearance of moderates is to calculate the percentage of the total membership that have ideal points closer to the mean of the other party than to the mean of their own party. Figure 9 discloses a very clean pattern for the House. Almost no overlap until the late 1950s, a sharp increase in the 1960s, and a drop back to no overlap by the end of the 1990s. The story for the Senate is the same with an important exception. Overlap also increases in the 1920s. Progressive Republican senators from farm belt states frequently voted with the Democrats. There is a much smaller uptick in the House since the farm belt states have relatively few members of the House.

Insert Figure 9 About Here

Another way of looking at vanishing moderates is to note how many Democrats have ideal points to the right of the leftmost Republican. By this measure, there is no overlap at all in the past 3 Senates. Indeed, as the histogram in Figure 10 shows, the two parties in the 105th House (1997-98) are almost completely separated.

We have documented the surge and decline in polarization. What brought it about? In the remainder of this chapter, we examine a number of distinct hypotheses about the causes of the polarization surge. In this next section, we explore the extent to which changes in the link between constituency interests and congressional voting has changed during the surge. Importantly, given our arguments, we show that the congruence between constituency income and congressional voting has increased substantially.

However, we find that the increased link to constituency interest is only a part of the story. The surge in polarization cannot be solely explained by constituency characteristics. We find that for a given constituency, the difference between Democratic and Republican representatives has grown. We then consider many other hypotheses that others have proffered to explain polarization including those related the Southern realignment, enhanced capacities for party leadership, congressional apportionment, and primary elections. None of these gets closer to center stage than the chorus line.

Polarization and Representation

Political scientists and economists have often tackled the question of representation and accountability by examining how well characteristics of a given electoral constituency explain the behavior of their representatives. Essentially adopting the "delegate" position in Burke's famous dichotomy, these scholars have defined good representation occurs when a representative's behavior is strongly associated with measures of her constituencies preferences and interests.[7]

However when applied to roll call voting in the U.S. House, this perspective has shown that representative behavior deviates in large and systematic ways from the preferences of the average or median constituent. This finding persists even when the mismeasurement of constituency interests is not at issue.

For example, senators from the same state do not vote identically. Most obviously, senators from the same state but different parties pursue very different policy goals. The difference is picked up in their polarized DW-NOMINATE scores. If the two

senators are from the same party, they are, of course, more similar. Even here, however, there are differences. These differences occur even when the senators have similar DW-NOMINATE scores, like John Heinz and Arlen Specter, and not just when they differ sharply, like Rick Santorum and Arlen Specter. Poole and Rosenthal (1997) report that the ideological model in fact outperforms a model that scores a prediction failure only when two senators are from the same state and party but vote differently. In addition, Poole and Rosenthal estimated a version of DW-NOMINATE where they could study those aspects of roll call voting that were not "explained" by ideological position. They found that how the two senators from the same state deviated from ideology was correlated but that the correlations were not all that strong, even if the two senators were from the same party.

Congressional districts, being single-member do not allow the same natural experiment that is possible for the Senate. It is possible, however, to compare the voting behavior of a member to his or her successor. Poole and Romer (1993) found that same party replacements of House members had DW-NOMINATE scores that could be very different from those of their predecessors. True, a relatively liberal Democrat was likely to be replaced by another liberal Democrat. Nonetheless, the within district variation of same party replacements was about half the total variation of positions in the party. Thus, a representative has a great deal of latitude in either building a coalition of supporters or expressing his or her personal ideology.

Given that constituency interest fails to explain all, or even very much, of the variation in roll call voting behavior, scholars have focused on the important roles of party and ideology. While these factors play little role in a world of Burkean delegates or

Downsian competition, empirical studies have routinely verified their importance as a determinants of legislative behavior. Thus, instead of arguing that any one factor can explain legislative behavior, the literature has converged on debate about the relative importance of ideology, constituency and party as considerations in casting roll call votes. In this section, we take up this question to explore its implications for polarization. Our analysis reveals several important clues about polarization. This first and most important is that the contributions of party, constituency, and ideology in explaining roll call behavior have changed fairly dramatically over the past thirty years. Not surprisingly, given our results about polarization, the political party of the representative is a much more consequential factor in explaining her DW-NOMINATE score in 2004 than it was in the 1970s. However, as we will see, this is not because constituency factors are less important. In fact, if we measure constituency representation as the multiple correlation between constituency interests and a representative's behavior, representation has improved substantially. In other words, a set of simple constituency demographics better explain DW-NOMINATE scores now than they did 30 years ago. At first blush, the simultaneous increase in the importance of party and constituency seems counterintuitive. However, it is entirely consistent with polarization. Since most congressional voters are very ill informed about the specifics of their member's voting record, they vote very often on the basis of partisan cues and reputations. As the parties polarized, these cues became much more informative leading to the election of members with records more reflective of their districts.

Finally, we present evidence that the ideological component of congressional voting is not waning either. It is often hard to measure ideological directly or to

distinguish it from mismeasured constituency characteristics.[8] Therefore, we use the racial, ethnic, and gender identity of the representative as a proxy. We find that, even controlling for party and the ethnic and racial composition of the district, these factors are significant predictors of roll call voting behavior. This suggests that the incompleteness of accounts of polarization that focus primarily on increased partisan homogeneity.

A. Constituency, Party, and Ideology

To provide evidence for our claims, we estimate econometric models of the following form:

$$DW-NOMINATE_i = \alpha + \beta R_i + \boldsymbol{\gamma}\mathbf{C}_i + \boldsymbol{\delta}\mathbf{P}_i + \varepsilon_i$$

where

$R_i = 1$ if the representative of district i is a Republican and 0 otherwise

$\mathbf{C}_i$ is a vector of constituency characteristics of district i.

$\mathbf{P}_i$ is a vector of personal characteristics of the representative from district i

α, β, $\boldsymbol{\gamma}$, and $\boldsymbol{\delta}$ are the corresponding coefficients.

Before turning to the results, it is useful to discuss the interpretation of the basic model and several restricted versions. First, note that if we estimated the restricted model $\boldsymbol{\gamma} = 0, \boldsymbol{\delta} = 0$, the our estimate of β would reflect polarization as reflected by the difference in party means. However, in the restricted model with $\boldsymbol{\delta} = 0$, β can be interpreted as the polarization of the parties within a given district.[9] Thus, focusing on β in the restricted model helps to distinguish between two distinct hypotheses about polarization. The first hypothesis is that polarization has arisen because of better matching between

representatives and districts. In other words, conservative districts are more likely to elect Republicans and liberal districts are more likely to elect Democrats. In such a situation, we could observe an increase in polarization even if there were not more divergence in the candidates running in each individual district. Under this hypothesis, $\beta_{\delta=0}$ would not increase over time. The second hypothesis is that polarization has arisen because of greater divergence between the parties on the district level. Thus, for a given type of district, the Republican representatives are more conservative and the Democratic representatives are more liberal. This hypothesis predicts that $\beta_{\delta=0}$ should increase over time.

Now consider the effect of constituency characteristics $\mathbf{C}$. It is useful to distinguish between direct and indirect constituency effects. The direct effects represent impact of those characteristics controlling for the party of the member and the member's personal or ideological characteristics. They are estimated as γ in the unrestricted model. However, $\mathbf{C}$ has an indirect effect on the legislator's ideal point through its effects on the party and other characteristics of the representative. These indirect effects can be captured by comparing the direct effects and the estimates of $\gamma_{\delta=0,\beta=0}$ which capture the total effects. The distinction between total, direct, and indirect effects is also crucial in distinguishing among several arguments about the representational consequences polarization. If polarization is simply the result of parties fleeing the voters, we would expect to see a decline in the total effect of constituency variables. Alternatively, if politicians are responding to more extreme voter preferences, the direct effect of constituency would go up. An additional possibility reflects a mixture of these two extremes. Polarization may provide voters with clear choices, enhancing the correlation

between the representative's party and **C**. This increase the indirect effect, but not necessary the direct effect.

B. The Data

Below we present the results of the model for four different terms of the U.S. House of Representatives: the 93rd (1973-1974), the 98th (1983-1984), the 104th (1995-1996), and the 108th (2003-2004). These were chosen to roughly represent each of the past three decades.[10]

The main dependent variable for this analysis is each House member's first dimension DW-NOMINATE score. We include the scores for all members who vote a sufficient number of times to obtain a score. Thus, some districts will appear in the data set multiple times due to deaths and resignations.[11] Since the Democratic Speakers of the House rarely cast roll call votes, there are only 434 districts represented in the samples for the 93rd and 98th Houses. In our four samples, the only independent partisan in the House was Vermont's Bernard Sanders. Since he caucuses with Democrats, we treat him as one.

We deploy a number of congressional district characteristics which are complied by the decennial census. The measures were chosen on the basis of previous studies and consistency of measurement over time. The first characteristic is one that plays an important role in many of our arguments, median family income. For scaling purposes, we measure it in $1000 and adjust it to the price level of 2000 using the Labor Department's CPI-U series. We also measure the education level of the district. To do so, we compute the percentage of the district residents 25 years or older who have college

degrees and the percentage who graduated high school and attended some college. We also capture the ethnic and racial composition of the district by measuring the percentage of constituents who identify as African-American and the percentage who identify as Hispanic.[12] Finally, we control for America's historical regional cleavage with a indicator variable for districts in the South.[13] To capture ideological effects, we indicate a representative's membership in racial, ethnic, and gender groups.

C. Results

In Tables 1-4, we present the results of the full specification of the model along with two restricted versions which allow us to assess various hypotheses. In each table, model A contains only constituency characteristics. Thus, the coefficients from model A reflect the total effects of these factors. In model B, we add the indicator variable for the member's party. As discussed above, we can interpret the coefficient on party as the average within-district polarization. Finally, model C includes the full specification. Here we interpret the coefficients on personal characteristics as ideological effects and the coefficients on constituency characteristics as the direct effects of those variables.

Insert Tables 1-4 About Here

We begin with the most recent Congress, the 108th House, in Table 1. All of the constituency variables in model A are statistically significant. Family income, a southern location, and college attendance are correlated with more conservative scores while African-American and Hispanic constituents and college degrees lead to more liberal scores.[14] Even though model A is relatively sparse, it captures more than 35% of the variation in DW-NOMINATE scores. This is relatively strong explanatory power given that Poole and Romer's results about replacement suggest a low upper bound to the

explanatory power of constituency.[15] Moving to model B, we get an estimate of within-district polarization of .799. Comparing this number to the total difference in party means of .864, we find that differences in constituencies account for less than 10% of the total party polarization. In model C, we examine the role of personal characteristics. The results show that African-American and female members have significantly more liberal voting records, and the liberal effect for Hispanic members barely missing statistical significance. These results are perhaps only surprising to hardcore Downsians, but more interesting is the large mitigation in the constituency effects when the individual characteristics and party are included. For example, the coefficient on the percentage of African-Americans in the district drops by about 90% in absolute magnitude when party and individual characteristics are included. In fact, in the full model, the effect of African-American constituents is statistically zero.[16] This suggests that the representation of African-Americans comes almost entirely indirectly through the choice of party and through the ability to elect African-American members of Congress. Representation of Hispanics corresponds to a less dramatic version of the same story. The effects of income and education are also primarily indirect.

Given the baseline of the most recent Congress, we can conduct similar analyses of earlier terms to gather clues about polarization and the changing nature of congressional representation. Let's begin with an over time comparison of model A. The most striking thing is the increase over time in the total explanatory power of the constituency characteristics, rising from 19% to 36%. Thus, polarization does not seem to have made member's voting records less representative of their districts. It is important to note that this increase in explanatory power is not simply a product of the

Southern realignment. When we run the model on Northern and Southern districts separately, we obtain similar increases in R^2 from the 93rd to the 108th congress for both regions. In the North, the R^2 increased from .184 to .310 while the South witnesses an increase from .213 to .411. 2

In term of individual coefficients in Model A, two changes stand out. The first is that the effect of family income has risen substantially. In the 93rd and 98th Houses, the effect of income was negative and not statistically significant. However, in the 105th House, income is positive and significant and the effect is larger by the 108th. The income effect in 2004 is large in substantive terms. A two standard deviation increase in family income is associated with a .225 shift to the right, larger than the shift associated with reducing the percentage of African-Americans by the same two standard deviations. The second important shift is the leftward shift induced by higher education.

Moving to model B, we find pretty strong evidence polarization is not simply the better sorting of representative to districts. Our estimate of within-district polarization has risen from .588 to .799. However, this is not to say that the constituency sorting effects are non-existent. In the 93rd House, the unconditional difference in party means was essentially the same as our estimate of within-district polarization. This is because the constituency characteristics were much more weakly related to party of their representative in the 1970s than they are today.[17] This implies that partisan sorting has increased and is probably responsible for the increase in the total effects of the constituency variables. However, the increased sorting is dwarfed by the increased within district polarization.

When viewed over time, the results on member characteristics tell a mixed story. Cleary, Hispanic and female members generated more distinctive voting records over time. Neither the Hispanic or the female coefficients are significant in the 1970s and 1980s, but have become so more recently.[18] Surprisingly, however, African-American representatives have become less distinctive, controlling for party and constituency. Since we do not find a similar change for females and Hispanics, it would be hard to argue that this is due to greater Democratic party pressure for African-American representatives to conform. Much of the effect is the consequence of the departure of white Southern democrats so that the entire Democratic caucus votes more like the Congressional Black Caucus. It is also a reflection in the recent success that some African American candidates such as Sanford Bishop and Julia Carson in non-majority minority districts and the entrance of the post-Civil Rights generation of black leaders typified by Harold Ford Jr.[19]

D. Summary

While we argue in parts of this book that polarization has been elite driven, our results here suggest that it does have some basis in the preferences of voters. Polarization has not been associated in a decline, but rather a strengthening, of the association between the demographic characteristics of House districts and the voting behavior of their members. This is the result of the "choice, not an echo" benefit of polarization.

Also crucial to our primary arguments, we find that polarization has been associated with a strengthening of the relationship between the economic well-being of a district and the representative's ideal point. A non-factor in 1973, district income has

both a direct and indirect effect on the conservatism of the district's House member. In chapter 3, we find out the reason. Voters are increasingly voting their pocketbook.

Alternative Explanations

While this book is primarily focused on the links between political polarization and the unequal economic performance of the past 30 years, a number of other plausible arguments have been put forward to explain congressional polarization.

A. The Southern Realignment

When V. O. Key (1949) penned his classic *Southern Politics in State and Nation* the Democratic Party was monolithic in its control of southern local politics and was the only relevant intermediary between southerners and national politics. The southern Republican Party was, ironically, a more liberal alternative, but one available only to voters in mountainous, impoverished regions of Virginia, Kentucky, and Tennessee. The Democratic dominance of the south combined with the congressional seniority system and a party presidential nomination rule requiring a 2/3s majority (until 1936) guaranteed that the Democratic Party would do the south's bidding in national politics.

With the possible except of partisan polarization, no other change to the American polity is as important as the transformation of the Southern United States from the core of the Democratic Party to the reddest of Republican strongholds. The trajectory of these changes is revealed in Figures 11-14.

Insert Figures 11-14 About Here

The transition began with a shift in presidential voting with the Goldwater candidacy in 1964. By 1972, the South was solidly Republican. The only time after 1964 that a Democratic presidential performed better in the South than in the North was Jimmy Carter, a governor from the Deep South. Bill Clinton, another Southern governor, did relatively well in the South, but won his two elections on the basis of Northern votes. By 2000, another Southern Democratic presidential nominee lost his home state.

The realignment moved slowly down the ballot. While southern Republicans gradually increased their numbers in Congress, they did not obtain a majority of Southern seats in the House and Senate until the 1994 elections. While state and local politics long seemed immune to the Republican advance, the once formidable Democratic advantage in the southern state legislatures has been reduced to ten senate seats and a single lower house seat.

The conventional view is that the Southern Republican party was built upon a foundation of racial conservatism following the Democratic party's success in passing the 1964 Civil Rights Act and the 1965 Voting Rights Act. Without denying the importance of race in the realignment, we present evidence in the next chapter suggesting that the standard view may need to altered in important ways. As we show there, the changes in the South do not contradict, but complement, our basic story. It is important to keep in mind that many of the economic and demographic changes were magnified in the South. Economic growth in that region has been torrid for the past thirty years with its gains as unequally distributed as elsewhere. A cause and consequence of this growth has been the large migration of middle and upper class Whites who lacked old South enmity toward the GOP. Finally, with the exception of Texas and Florida, the South is only now

beginning to feel the effects of the new waves of immigration. So even without the additional factor of race, the conditions were ripe for the Southern polity to converge to that of the rest of the country.

In Table 5, we present some preliminary evidence that the Southern realignment was related somewhat to economics. By the early 1970s, the southern districts represented by Republicans were considerably more well-heeled than those represented by Democrats. The median family income was about $4500 greater in real terms in Republican districts than Democratic differences. By 2004, this income gap had grown to $8300. This suggests that the Republican gains were primarily the consolidation of control of high income districts rather than capturing middle and lower income districts.[20]

Insert Table 5 About Here

Whatever the cause of the Southern realignment, a major consequence of this shift in allegiances was that many of the moderate and conservative southern Democrats in Congress were replaced by conservative Republicans. Clearly, this contributed to the establishment of the Republicans as the conservative party. However, the realignment-induced replacement effect cannot be the whole story. In Figure 15, we show polarization measures for the entire House and for the House minus its southern members. The two series are very highly correlated and follow the same u-shaped trajectory. The figure suggests that polarization among non-southern legislators is the driving force. The South significantly dampened polarization through the 1970s and 1980s; total House polarization exceeds non-southern polarization only in the mid-1990s.

Insert Figure 15 About Here

Thus, a "southern" theory of polarization (or at least the simple version) founders on its inability to explain an equally prominent feature of the past 30 years: the disappearance of liberal Republicans outside the South. In 1973, the Senate had three Republicans positioned near the median Democrat, Clifford Case (NJ), Ed Brooke (MA) and Jacob Javits (NY). Their seats are currently held by Frank Lautenberg, John Kerry, and Charles Schumer, all of the liberal wing of the Democratic party. Other liberal Republicans seats from this year have been transmuted to the Republican right. Hugh Scott's (PA) seat is now held by Rick Santorum while Pat Roberts (KS) is Jim Pearson's current replacement.

A second hypothesis about the link between realignment and polarization centers on how the southern exodus to the Republican party altered the basic dimensions of political conflict. During the post-Reconstruction period two spatial dimensions account for between 85 and 90 percent of roll call voting decisions. The primary dimension divides the two major parties and the second dimension picks up regional divisions within the two major parties. As we have discussed, the first dimension is picking up, roughly speaking, the conflict between rich and poor. In contrast, during the civil rights conflicts of mid-twentieth century, the second dimension was based upon race – north versus south. However, since the early 1970s the importance of the second dimension has steadily declined with congressional voting becoming increasingly unidimensional. This is due to the fact that racial issues formerly divided both parties internally but now cease to do so. To demonstrate this point, we have compared the fit of the one-dimensional DW-NOMINATE model to the two-dimensional fit for votes on legislation related to civil rights. Figure 16 shows the aggregate proportional reduction in error

(APRE)[21] for the one-dimensional model and the incremental improvement of the two-dimensional model.

Insert Figure 16 About Here

Figure 16 shows that votes on civil rights fell along the first dimension until the late 1930s when a significant second dimension component appeared. This marked the reemergence of race on the political agenda in Congress. During the Post-Reconstruction period voting on civil rights for Blacks was effectively kept off the congressional agenda except for a scattering of votes on lynching. The elections of 1936 produced a majority of Northern Democrats in both houses of Congress. Consequently, votes on civil rights for Blacks became more numerous – anti-lynching, voting rights in the armed forces during World War II, and then basic civil rights laws. Since the late 1930s, the politics of race has been characterized by conflict on the second dimension (Poole and Rosenthal, 1997). However, beginning in the late 1950's, this second dimension began to disappear. The movement of this issue to the first dimension speeded up dramatically after the passage of the landmark 1964 Civil Rights Act and the election of a northern Democratic majority in the 1964 elections. The timing of this transition roughly corresponds to that documented by Carmines and Stimson (1989) who stress the effects of the 1958 congressional elections and 1960's civil rights legislation on polarization of American politics on the issue of race. While we concur on issues of timing, we disagree about the nature of the transformation. For Carmines and Stimson, American politics has become the politics of race, while we are suggesting that racial politics has become more like the rest of American politics. The trend towards increasing unidimensionality that began in the early 1970s in both the House and Senate cannot be adequately explained in terms of

partisan control of Congress, changes in congressional rules, or agenda selection effects. Rather it is clear that it must reflect a long-term change in the substance of party conflict. These trends closely track the exodus of the South from the national Democratic Party coalition. However, while realignment clearly changed the dimensionality of political conflict, it is not at all clear how the change in dimensionality generated greater polarization.

Even though the replacement and dimensionality stories are incomplete, the South is still an important part of the story. First, Perlstein (2002) identifies the South as an important organizational nucleus for the conservative movement which has come to dominate Republican party politics in the year since Goldwater's defeat in 1964. In the 1960s southern Republican congressmen were centrists typified by George H.W. Bush and Howard Baker (TN). However, many, if not all, of the southern Republican legislators elected to Congress in the 1970s and 1980s were conservatives who got their start in politics during Goldwater's campaign. The South provided fertile soil for a movement that eventually spread to the rest of the country. Secondly, had the Democratic party maintained the allegiance of Southern voters, the Republicans would have been denied an electoral majority for their low-tax and anti-regulation platform. The electoral cushion provided by Southern votes allowed the Republicans to pursue non-centrist policies and win elections. However, as will document in the next chapter, this occurred not because Southerners are voting against their economic interests. On the contrary, like other Americans, southerners split along income lines. The richer the southerner, the more likely the southerner is to vote Republican.

B. Partisan Reforms in Congress

Another forwarded explanation for polarization lies in the series of reforms undertaken in the House since the 1970s (see Rohde 1992). According to such accounts, power in the "textbook" congress was decentralized among its committees until a series of post-Watergate reforms strengthened the majority party caucus at the expense of committees.[22] Party power was further centralized in 1995 when Newt Gingrich and the Republican conference exercised enormous discretion in the selection of committee chairs and imposed term-limits on them.

The centralization of party power may effect polarization measured by NOMINATE scores in two ways. The first is to generate "artificial extremism" (Snyder 1992). Under this scenario, party leaders are using their agenda control to select issues on which to divide their partisans from the other side. In the extreme, if every vote is on a issue that divided Democrats and Republicans, the voting patterns may look extremely polarized even if the parties are not very far apart. Thus, polarization would be a statistical artifact. The second way increased party leadership might exacerbate polarization is if leaders were better able to force their moderate wings to vote with the party majority.

There are reasons to doubt the completeness of either of these claims on face validity. First, the explanations tend to very House-centered so that explaining the polarization of the Senate and various state legislatures becomes a much more tortured exercise. It is probably true that partisan leadership has become more prominent in the Senate but reform has been less ambitious than in the House. The Senate's supermajority requirement embedded in its cloture rule also make it extraordinarily difficult to pursue

the partisan strategies that would create artificial extremism. Secondly, these stories are hard to reconcile with the increase in constituency representation that we documented earlier. Nevertheless, its worthwhile to examine these hypotheses in some detail.

Since no one wants to read a book, less write one, about a statistical artifact, we begin with "artificial extremism" hypothesis. The idea of artificial extremism was first applied to the use of interest group ratings. Snyder (1992) shows that if the votes chosen by a group produce a distribution of cutting lines with a variance less than the distribution of legislator ideal points, the distribution of ratings will be artificially bimodal. However, there are many reasons to be confident that this is not a large problem for scaling techniques such as NOMINATE. First of all, unlike interest group rating, NOMINATE uses almost all votes in a given term to estimate each ideal point. While interest groups may select only those votes that divide friend from foe, no such selection bias exists when all votes are used. Thus, despite any increase in partisan control over the agenda, there are a wide variety of roll call cutpoints each term. The second reason artificial extremism is unlikely to be an issue lies in a key difference between interest group ratings and NOMINATE scalings. In an interest group rating, the distance between two legislators is directly proportional to the number of roll call cutpoints that separate them. However, since NOMINATE is based on maximum likelihood estimation this is generally not the case. So as long as the distribution of cutpoints is sufficiently wide, an increase in the density of cutting lines between the two parties will not necessarily lead to an increase in polarization.

To assuage any remaining concerns, we conduct the following experiment. We re-ran DW-NOMINATE for the 1st through the 105th Congresses *constraining each*

House to have the same distribution of roll call margins. The average distribution of margins for all 105 Houses was used as the common margin and the number of roll calls for each House was set equal to 400. The distribution is shown below:

ROLL CALL WEIGHTS

1	50 - 55	92	0.23
2	56 - 60	80	0.20
3	61 - 65	60	0.15
4	66 - 70	44	0.11
5	71 - 75	32	0.08
6	76 - 80	24	0.06
7	81 - 85	20	0.05
8	86 - 90	16	0.04
9	91 - 95	20	0.05
10	96 - 97.5	12	0.13

To construct the artificial data for each House we sampled each margin category *with replacement* to get the required number. For example, if for some House there were 75 roll calls with margins in the range 66 - 70 then 44 roll calls from those 75 were drawn with replacement. If there were no roll calls in the range then no roll calls could be included. But this caveat cannot affect our basic results about contemporary polarization since no House since the 78th (1943-44) had a missing margin.

Table 6 reports Pearson correlations between several of the polarization measures used in the chapter and the same measures computed from the artificial data. The correlations are over the 60 Houses studied in this book. It can be seen that the results are, from the standpoint of substantive interpretation, essentially identical. The lowest correlation is for the within party distances for the Republicans (0.854). The result is not surprising since the Republicans show almost no variance in the within party distances over time.

Insert Table 6 About Here

We thus find that the pattern of polarization would be essentially the same even if the agenda was held constant. Of course, this experiment does not prove that the level of polarization is not inflated by artificial extremism, but it casts grave doubts on the role of artificial extremism in the increase in polarization.

We turn now to the question of whether increased polarization is a reflection of the enhanced ability of party leaders to impose discipline on its members. This question has bedeviled the recent literature on legislative behavior due to the fact that increased party pressure is generally observationally equivalent to better matching of legislator preferences and party. In the previous section, we provided evidence that polarization was a combination of increased sorting and increased party effects. However, the analysis cannot distinguish between pressures internal to the legislature such as those from leaders and caucus majorities and those that are external emanating from primary electorates, partisan constituents, and contributors.

One approach to distinguishing between internal and external pressure is to look for "selective" party pressures on close or important votes. Essentially this approach seeks to determine the extent to which certain roll calls are more partisan than others and postulates that this variation is due to the activity of party leaders and whips. A version of the approach is first developed by Snyder and Groseclose (2000). Since, as they argue, rational leaders would expend little effort whipping on lopsided votes, those votes can be used as to estimate measures of preferences uncontaminated by party effects. Thus, after estimating legislator preferences using 65-35 or greater divisions, they regress each vote on the measure of preferences and a party dummy variable. They find that the party

variable is statistically significant on a large percentage of the close roll calls, but, as expected, on few lopsided ones.

In our paper, "The Hunt for Party Discipline" (2000), we criticize the Snyder-Groseclose approach on several methodological grounds and propose a different technique for uncovering selective party pressure. Our approach assumes that on each roll call there is a separate cutting line for each party. If there is no party effect, the two cutting lines will be identical, just as in the standard spatial model. However, if party discipline is applied, some Republicans to the left of the common cutpoint will vote with their party and some Democrats to the right will vote with theirs. The result is a separate cutpoint for each party. Since party discipline generally involves getting moderates to vote with extremists, the cutpoint for the Democrats should be to the right of the cutpoint for Republicans.

For a more concrete example, consider the one-dimensional spatial configuration. illustrated in Figure 17. If the cutpoint is constrained to be the same for both parties, this produces the standard spatial model. For example, in Figure 17, with a common cutpoint, there are three classification errors, legislators 3, 11, and 15. When each party can have its own cutpoint, this produces a model that allows for party discipline. Moderate Democrats to the right of some Republicans can vote with the majority of their party. Moderate Republicans to the left of some Democrats can vote with the majority of their party. The best cutpoint for the Republicans in Figure 17 remains the common cutpoint. Legislator 15 is the only R classification error. But the best cutpoint for the Democrats is to the right of the common cutpoint. The D cutpoint leaves only legislator 3 as a classification error for this party. Rather than estimate either the one-cutpoint model or

the two-point model via a metric technique, such as NOMINATE, one can simply find the joint rank order of legislators and cutpoints that minimizes classification error. Poole (2000) presents an efficient algorithm that very closely approximates the global maximum in correct classification. Note that this method, in contrast to regression methods such as Groseclose and Snyder, does not require a uniform adjustment in the ideal points of all members of a party. Only moderates would need to be disciplined. All that is required is a displacement of the cutpoint.

To assess the importance of selective party pressure, we simply compare the predictive success of the two-cutpoint model to that of a one-cutpoint model. When party pressure is important, the two cutpoint model should perform much better. The upshot of our results, reproduced in Figure 18, is that the correct classification gains of the two cutpoint model are modest and there is no evidence that selective party pressures have increased.[23]

Insert Figure 18 About Here

Of course, its entirely possible that even if the ability to apply selective pressures has not increased general party pressure (which would be reflected in each member's ideal point) has. But as we have already noted, it is impossible at this point to distinguish between general party effects that are internal to the legislature from those that are external. We can only hope to convince the reader that the preponderance of the evidence presented throughout the book speaks in favor of our externalist account.

B. Apportionment and Districting

Following the 2000 census reapportionment, congressional incumbents were all but invincible in the 2002 elections. Indeed two years later, almost all the incumbent who lost were beaten by other incumbents in contests engineered by the controversial Tom Delay-inspired mid-decade redistricting in Texas. These events have brought the politics of congressional districting under the punditry microscope.

As important as these controversies surrounding apportionment and districting are, it is not obvious that they are much more than a symptom of our political maladies rather than their causes. As polarization and partisanship have increased in the electorate, it would be surprising that congressional incumbents were not more secure, independent of how their districts are drawn. And clearly, the abandonment of the norms against redrawing the boundaries at mid-decade are hard to sustain when partisan balance is so even and the ideological stakes are so high.[24] However, the strongest argument against over-emphasizing the politics of apportionment is the fact that the United States Senate (which of course is never redistricted) has endured an almost identical history of polarization. However, it would be premature to dismiss a link between districting and polarization out of hand, as the last three post-apportionment elections (1982,1992, and 2002) have led to above average increases in the polarization in the House. Thus, it behooves us to take a closer look.[25]

Arguments about the role of congressional apportionment in enhancing legislative polarization tend to stress two factors. The first is the role of the creation of majority-minority districts designed to promote the election of racial and ethnic minorities to Congress. Creation of such districts often requires the concentration of black or Hispanic voters into districts where they constitute a large majority. A by-product of such

concentration is the "bleaching" of majority white districts by removing minority voters. The result is an increase of African-American and Hispanic representatives who anchor the left-end of the scale and conservative Republicans representing almost entirely white districts. While majority-minority districting undoubtedly has such effects, it is easy to overstate its significance in the big picture. First of all, very few states have majority-minority districts. More than 2/3s of the majority-minority districts are located in just 5 states: California, Florida, Illinois, New York, and Texas. In many of these cases, minority voters are sufficiently concentrated so that majority-minority districts can be formed easily with minimal effects on the boundaries of other districts. Eliminating these states from the calculations does not qualitatively alter the time series on polarization in the U.S. House.[26] There is a second reason to believe that racial gerrymandering has not had much of impact. Earlier in this chapter, we showed that while African-American legislators have much more liberal voting records, controlling for party, white representatives are not particularly sensitive to the size of the black population of their districts. Thus, even if the "bleaching" effect alters partisan balance it does not increase partisan polarization among white representatives.[27]

A second common argument about apportionment is that the opportunity and technical capacity to engage in partisan gerrymandering has gone up over time. Such partisan gerrymandering is assumed to create much more homogeneous congressional districts which accommodate more extreme legislators. Advocates of this hypothesis stress the near absence of incumbent losses in the previous two electoral cycles. In a less anecdotal vein, Cox and Katz analyze congressional elections in light of the landmark "one person, one vote" Supreme Court decision in *Baker v. Carr*. This decision forced

every state with more than one representative to redistrict after every decennial census. Cox and Katz show that the decision had a substantial impact on the rise of the incumbency. However, there are reasons to be skeptical of a large connection between partisan districting and polarization. The first reason is theoretical. A seat maximizing partisan gerrymander involves creating small majorities for the dominant party in a large number of districts and creating large majorities of the opposition party in a small number of districts. Thus, pure partisan gerrymanders should lead to more competitive than non-competitive districts. Consequently, Cox and Katz argue that the incumbency effect arose precisely where pure partisan gerrymanders were politically infeasible. They argue that when the dominant party cannot impose its districting preferences, the result is a cross-partisan compromise: incumbency-protection. Since such plans often involve enhancing the partisan homogeneity of districts, they have the potential to exacerbate polarization. However, such an effect is not obvious. As we discussed in chapter 2, our recent polarization is primarily manifested in new cohorts of legislators being more extreme than departing cohorts. The average ideological movement of incumbent politicians has been much smaller. Thus, by prolonging the careers of incumbents, incumbent-protecting gerrymanders may have impeded even greater polarization.

The final way in which apportionment may have contributed to polarization has not received nearly so much attention, but may be the most significant. Due to the shifts of population from the Northeast and the Middle Atlantic to the South and West, the last three decennial apportionments have results in a large net shift of seats to the Sunbelt. Following the 2000 census, the South gained five congressional seats and the Mountain West gained four. These gains were almost entirely at the expense of the middle Atlantic

and the industrial Midwest. Since the parties in the Sunbelt (especially in the once solid South) are more polarized than in Rust Belt, the result has been an increase in polarization due to the regional reallocation of seats. Tables 7a-d provides the mean DW-NOMINATE position of the Democratic and Republican members broken down by whether their state was a winner, a loser or was unaffected by reapportionment. In each of the last three apportionments, the mean difference between the parties in the seat-"winning" states is substantially larger than the partisan differences in "losing" and unaffected states. The last apportionment that this was not true was in 1970, just before the current wave of polarization began. Thus the major way in which reapportionment appears to influence polarization is not through partisan gerrymandering within states. The main effect comes through the reapportionment of seats across states that is forced by the decennial census.[28]

Inserts Tables 7a-d About Here

An important implication of all of the reapportionment based arguments is that the distribution of median voter preferences across districts is more polarized than the underlying distribution of preferences. However, there seems to be little evidence that the differences in those distributions is all that large. To illustrate this point, consider the distribution of presidential vote, a common measure of district partisanship and ideology. If the districting process is contributing to polarization, we would expect that the distribution of the presidential vote across districts to have "fatter" tails that the distribution of the vote across geographic units which are not subject to political manipulation. Figure 19 shows kernel density estimates of the distribution of the 2000 Bush vote across districts and across counties.[29] Contrary to the districting hypotheses,

these distributions are very similar. The densities in the tails of each distribution are almost identical. There are slightly fewer counties who voted 30% for Bush relative to districts and a few more very anti-Bush districts. This is presumably the effect of majority-minority districting However, it would be hard to argue that these small differences have very large aggregate effects.

Insert Figure 19 About Here

Given the lack of strong evidence of a link to districting in the House, we return to perhaps the biggest objection against such a link: the polarization of the Senate. Since the Senate is never reapportioned or redistricted, an apportionment story requires that polarization in the House cause polarization in the Senate. Its not clear what sort of mechanism underlying such an effect. It's possible that changes in House apportionment change the pool of viable Senate candidates, or that the effects of apportionment strengthened the hand of each party's extreme factions. However, any such mechanism would seem to require that changes in House polarization lead that of the Senate. In the spirit of a Granger causality test, we regressed biennial changes in Senate polarization on the contemporary change in House polarization and the lagged changes in House polarization for the post-World War II period.[30] The results are located in Table 8.

Insert Table 8 About Here

Only the contemporary change in House polarization, not its lagged values, are correlated with changes in the Senate series. Thus, we fail to reject the null hypothesis of no Granger causation. Similarly, we find little support of an effect of Senate polarization on House polarization.

While congressional apportionment is obviously an important determinant in the determining the quality of representative government, it plays but a bit part in our choreography.

B. Party Primaries and Polarization

Another of the most common folk explanations of political polarization lies in the role of primary elections to nominate congressional candidates. It is widely assumed that moderates have an increasingly difficult time winning their party's contests. Such a dynamic would then present increasingly stark choices to the general electorate.

This account has important limitations, however. The first is that the wide-spread adoption of the primary as a nomination device for Congress took place at the end of the 19th and the first half of the 20th century. As we have seen, this corresponds to an era of declining polarization. By the time polarization began escalating, primaries were nearly universal. So any general claim that primary elections are the major cause of polarization seems weak. However, it is still worth entertaining the idea that institutional differences in the selection of legislative candidates does contribute to polarization. Gerber and Morton (1998) provide evidence for the claim that laws dictating the ease in which independent voters can participate in partisan primaries has an important effect on the divergence of the general election candidates in congressional districts. They argue that those states which have "closed" primaries which allow registered partisans to vote in their party's primary produce much more polarized general elections than states which allow independents to vote in primaries and for partisans to vote in any party's primary. Since they cannot observe the positions of both candidates, they claim support for their

hypothesis by finding that winning candidates are more extreme relative to the district median in closed primary states. However, without calling into question their presentation of the evidence for this claim, it's not clear that such differences in primary laws have contributed much to polarization. First it is important to remember that factors which lead to greater within-district candidate divergence may or may not lead to greater system-wide party polarization. Such an effect requires that the more extreme Democratic nominees continue to win in liberal districts and the more extreme Republican nominees continue to win in conservative districts. Therefore, to test to see whether closed primaries increase polarization, we conduct a simple difference in means tests on the DW-NOMINATE scores from legislators nominated in closed primaries versus those in more open procedures. As Gerber and Morton do, we use Bott's (1990) classification of closed primary systems as of 1990 and conduct the test on the House and Senate elected that year. Table 9 presents the results for the House by party.

Insert Table 9 About Here

It appears that the closed system does indeed produce significantly more liberal Democrats but has little effect on the distribution of Republican House members. While polarization is therefore greater in states with closed primaries, the aggregate effect is small. Since only 35% of the House is elected under that system, its aggregate contribution to polarization is on the order of .03.

However, turning to Table 10 which conducts the same analysis for the Senate, we find little evidence for any effect. In fact, closed states produce more conservative Democrats, though the difference is not significant. The conservative effect on

Republicans is substantively large, but is not statistically significant due to the small sample size.

Insert Table 10 About Here

Finally, even if one could establish a cross-sectional relationship between primary systems and polarization, the fact that closed primary systems have not become more common suggests that it cannot explain the long term trends. Closed primaries should have been producing as much polarization in 1960 as they did in 1990.

Perhaps the source of the effect of primaries on polarization is not institutional but is rooted in changes in participation and behavior of the electorate. David King (2003) argues that the decline in participation in legislative primaries is the major culprit. He speculates that declining participation has made each party's primary electorate more homogeneous ideologically resulting in more extreme candidates. There are number of reasons to be skeptical of the primacy of such explanations. The first is that the claim that primary electorates have become more partisan over time is hard to verify directly. The National Election Study has not consistently queried voters specifically about their participation in primaries. King's deduction is based on a series of indirect claims:

1. Participation in congressional primaries has fallen
2. Partisans are more likely to participate in general elections
3. Therefore, they are most likely to continue participating in congressional primaries.
4. Partisan identifiers are more ideological
5. Therefore, the primary electorate has become more ideological.

Not an unreasonable chain of logic, but not a substitute for direct proof. The second cause for concern is that mechanism creating polarization is almost identical to the mechanism by which closed primaries are claimed to create it. Since closed primary electorates are the most partisan, Tables 9 and 10 would seem to cast doubt on King's hypothesis as well.

In the absence of direct confirmation or refutation of the hypothesis, we propose to use the natural variation in the size of the primary electorate induced by the presidential election cycle to test it. If smaller primary electorates contribute to polarization, we would expect to see the polarization indices increase following midterm elections. Table 11 reports the results of paired t-test matching the change in polarization (as measured by the difference in party means) following a presidential election with the change from the preceding midterm election for each election since 1972.

Insert Table 11 About Here

These results provide no support for the primary participation hypothesis. The increases in polarization associated with midterm elections are not significantly greater than those associated with presidential elections. Apart from the large increase associated with the 1994 midterm Republican take-over, the average increase is greater following presidential elections.

In summary, the evidence for the culpability of primaries is very thin.

Concluding Remarks

In this chapter, we have documented the rise of polarization in the two houses of Congress. We have ruled out a broad spectrum of alternative explanations of our finding. These range from method artifact to the political realignment of the American south. to

institutional changes within Congress and the structure of congressional elections and primaries. None of the alternatives provide a convincing theoretical explanation. Nor do they correlate empirically with the time-series of polarization. Certainly none of these alternatives is cheek to cheek with polarization as were the time series of inequality and immigration that we showed in chapter 1.

We did find, however, that constituency characteristics had become more linked to congressional ideology in recent decades and, in particular, that median income had become more linked to conservatism. We, therefore, turn to consider economic and demographic factors in the next three chapters.

Appendix

In this Appendix we outline our DW-NOMINATE (Dynamic, Weighted, Nominal Three-Step Estimation) procedure we use to estimate a simple spatial model of congressional roll call voting. A more detailed motivation of our spatial model can be found in Poole and Rosenthal (1997, chapters 1-4) and Poole (2004).

For readers familiar with our work, DW-NOMINATE is a dynamic version of W-NOMINATE (Poole and Rosenthal, 1997, chapter 2 appendix). It is very similar to our earlier D-NOMINATE procedure (Poole and Rosenthal, 1991). The only differences are that DW-NOMINATE is based upon normally distributed errors rather than logit errors and that each dimension has a distinct (salience) weight. When we began our research in 1982, computer memory and speeds were a non-trivial problem and we took the logit approach because it was computationally more tractable. We continued to use logit in our supercomputer work (1986-89) on D-NOMINATE. We make the change now because computer memory and speed are now minor impediments and the use of the normal distribution allows us to develop much more sophisticated models of correlated error. That work is currently underway.

Below we briefly describe DW-NOMINATE and report basic measures of fit along with a comparison to our D-NOMINATE results for the 1947-85 period. Since the estimation procedure – except for the differences just noted – is the same as D-NOMINATE, we refer the interested reader to Poole and Rosenthal (1991, 1996) which contain very detailed descriptions of D-NOMINATE and W-NOMINATE.

The Formal Model

Let T be the number of Congresses which are indexed by $t = 1,...,T$; s denote the number of policy dimensions ($k = 1,...,s$); p_t denote the number of legislators in Congress t ($i = 1,..., p_t$); q_t denote the number of roll call votes in Congress t ($j = 1,..., q_t$); and T_i denote the number of Congresses in which legislator i served ($t = 1,..., T_i$). Legislator i's coordinate on dimension k at time t is given by:

$$x_{ikt} = x_{ik0} + x_{ik1t} + x_{ik2t^2} + ... + x_{ikrt^v} \qquad \text{(A1)}$$

where v is the degree of the polynomial.

We will confine ourselves to estimating a constant (v = 0) and linear (v =1) model because in Poole and Rosenthal (1991) we found that higher order models, v = 2 and v = 3, added little explanatory power.

The two roll call outcome points can be written in terms of their midpoint and the distance between them; namely,

$$z_{jkyt} = z_{mjkt} - \delta_{jkt} \quad \text{and} \quad z_{jknt} = z_{mjkt} + \delta_{jkt}$$

where, for a yea vote, z_{jkyt} is the jth outcome coordinate on the kth dimension in Congress t. Similarly, z_{jknt} is the outcome coordinate for a nay vote. The midpoint is simply:

$$z_{mjkt} = \tfrac{1}{2}\left(z_{jkyt} + z_{jknt}\right)$$

and δ_{jkt} is <u>half</u> the "distance" between yea and nay points on the kth dimension (note that δ_{jkt} can be negative); that is

$$\delta_{jkt} = \tfrac{1}{2}\left(z_{jkyt} - z_{jknt}\right)$$

The outcome actually chosen by legislator *i* will be denoted as z_{jkct} and the corresponding outcome not chosen by legislator *i* by z_{jkbt}. This notation will greatly simply our presentation below.

The distance of legislator *i* to his chosen outcome, *c*, on roll call *j* at time *t* is:

$$d^2_{ijktc} = \sum_{k=1}^{s} \left(x_{ikt} - z_{jktc} \right)^2$$

Legislator *i*'s utility for his chosen outcome, *c*, on roll call j at time, *t*, is:

$$U_{ijtc} = u_{ijtc} + \varepsilon_{ijtc} = \beta \exp\left[-\sum_{k=1}^{s} w_k^2 d_{ijktc} \right] + \varepsilon_{ijtc} \qquad \text{(A2)}$$

where u_{ijtc} is the deterministic portion of the utility function and ε_{ijtc} is the stochastic portion. The parameter β is a signal-to-noise parameter. It determines the maximum height of the deterministic portion of the utility function. Since the stochastic portion is normally distributed with constant variance, β "adjusts" for the overall noise level. For example, if the choices by the legislators are close to random, β will be very small; if the choices by the legislators are almost exclusively a product of their positions in the policy space, β will be very large.

The probability that legislator *i* votes for his chosen outcome, *c*, is:

$$\Pr\left(U_{ijtc} > U_{ijtb} \right) = \Pr\left(\varepsilon_{ijtb} - \varepsilon_{ijtc} > u_{ijtc} - u_{ijtb} \right)$$

We make the standard assumption that the stochastic portion of the utility function is normally distributed with zero mean and variance of one-half so that the difference between two errors has a standard normal distribution; that is

$$\varepsilon_{ijtb} - \varepsilon_{ijtc} \sim N(0,1)$$

Hence, the probability that legislator *i* votes for his chosen outcome, *c*, can be written in terms of the distribution function of the normal; that is,

$$P_{ijtc} = \Pr\left(U_{ijtc} > U_{ijtb}\right) = \Phi\left\{\beta\left(\exp\left[-\sum_{k=1}^{s} w_k^2 d_{ijktc}\right] - \exp\left[-\sum_{k=1}^{s} w_k^2 d_{ijktb}\right]\right)\right\} \quad \text{(A3)}$$

If there is no missing data then the likelihood function is:

$$L = \prod_{t=1}^{T}\prod_{i=1}^{p_t}\prod_{j=1}^{q_t} P_{ijtc} \quad \text{(A4)}$$

To allow for missing data, let Q_t^i denote the set of roll calls for which legislator *i* voted at time *t*. (Votes include "pairs" and "announceds" as well as actual votes.) Following standard practice, we estimate parameters that maximize the log of the likelihood function. With missing data, this is:

$$\ln L = \sum_{t=1}^{T}\sum_{i=1}^{p_t}\sum_{j\in Q_t^i} \ln P_{ijtc} \quad \text{(A5)}$$

For the dynamic model without missing data, let p be the number of unique legislators who served during the *T* Congresses and, for convenience, assume that every legislator serves in at least $v + 1$ Congresses with $T > v$, then the number of parameters to be estimated in order to maximize equation (A5) is:

$$s\sum_{t=1}^{T} 2q_t + sp\left(v+1\right) + s + 1$$

That is, $2sq_t$ roll call coordinates for each Congress (the z_{mjkt} and δ_{jkt}), the $sp\left(v+1\right)$ polynomial coefficients for the *p* unique legislators (the x_{ik0}, x_{ik1}, …, x_{ikr}), the *s* dimensional (salience) weights $\left(w_1, w_2, ..., w_s\right)$, and β. In actual practice, we estimate fewer than $s\left(v+1\right)$ parameters for legislators with short periods of service.

The Estimation Algorithm

In our previous work (Poole and Rosenthal, 1991, 1996) we found that there was little temporal movement in legislator positions after World War II. Consequently, we only estimate the constant ($v = 0$) model – legislators have the same spatial position throughout their career – and the linear ($v = 1$) model. We cannot use conventional methods of maximizing equation (A5) because of the large number of parameters (see Table A1). Instead, we use an alternating algorithm in which the set of parameters is divided into three subsets. All the parameters are held fixed except for one subset which is estimated. Each subset of parameters is estimated in turn while the remaining parameters are held fixed. This alternating algorithm converges to a solution in which each subset of parameters is at an optimum given that the remaining parameters are held fixed.

In our algorithm we have three subsets of parameters — those for the legislators, the x_{ik0}, x_{ik1}, …, x_{ikr} – those for the roll calls, the z_{mjkt} and δ_{jkt} – and the utility function, the w_k and β. In outline form, the DW-NOMINATE algorithm has three basic steps:

Step 1: Estimate the z_{mjkt} and δ_{jkt}

Step 2: Estimate the x_{ik0}, x_{ik1}, …, x_{ikr}

Step 3: Estimate the w_k and β

Hence the acronym Dynamic, Weighted, Nominal Three-Step Estimation.

Steps 1, 2, and 3 form a global iteration. Global iterations are repeated until the parameters in the current iteration all correlate at .99 or better with the set estimated on the previous global iteration.

We were able to implement DW-NOMINATE for the post World War II period on Pentium PCs with large memories (a minimum of 64meg of RAM is required). Rather than writing one large program, we wrote separate, stand-alone, programs to implement each of the steps above. This was possible because we could use the D-NOMINATE results as starting coordinates for DW-NOMINATE (for the 80th through the 99th Congresses). Not surprisingly, this led to very quick convergence – only two global iterations were necessary for the House and Senate. The Pearson correlations between the coordinates from D-NOMINATE and DW-NOMINATE for the two-dimensional linear ($v = 1$) model for the House were .974 for the first dimension and .926 for the second dimension (the n was 8787 for the 80th through the 99th Houses). The corresponding correlations for the Senate were .964 and .913 respectively (the n was 2000 for the 80th through the 99th Senates).

For the two dimensional estimation, we departed from our D-NOMINATE approach of estimating one dimension at a time (see Poole and Rosenthal, 1996, chapter 2 appendix for details) in favor of estimating both dimensions simultaneously. We took this approach for two reasons. First, the D-NOMINATE one-dimension-at-a-time approach is very memory intensive. We had to use a supercomputer to estimate the D-NOMINATE model. Second, given the fact that the spatial model estimated by D-NOMINATE is the same as that outlined here save for the dimension (salience) weights, we were confident that the D-NOMINATE legislator coordinates would be very close to those that would be estimated by DW-NOMINATE. Consequently, performing Step 1 with the two dimensional D-NOMINATE coordinates would allow us to estimate the roll call coordinates on both dimensions quite easily. For the 100th through the 104th

Houses/Senates, we used coordinates from W-NOMINATE for starts. We retained the same constraints on our estimated coordinates that we used in D-NOMINATE; namely, the estimated legislator constant terms and roll call midpoints are constrained to lie within a hypersphere of radius one:

$$\sum_{k=1}^{s} x_{ik0}^2 \leq 1 \text{ and } \sum_{k=1}^{s} z_{mjkt}^2 \leq 1$$

We also constrain the salience weight of the first dimension to be equal to one; that is, $w_1 = 1$. As a practical matter, there is some interaction between the salience weights – the w_k – and β. Given the constraint on the legislator and roll call midpoints, we can set the first dimension weight equal to one and estimate the remaining weights on dimensions 2, 3, etc., and β will adjust to compensate.

We also depart from our D-NOMINATE approach by using numerical derivatives to find parameter estimates rather than the BHHH iterative technique (Berndt, Hall, Hall, and Hausman, 1974) employed in W-NOMINATE and D-NOMINATE.

In order to get standard errors for our converged parameters, we employ a variation of the standard technique of calculating the outer product matrix of the vector of partial derivatives; that is, let **g** be the vector of partial derivatives, then

$$\Delta = \sum \mathbf{g}\mathbf{g}'$$

where the sum is over the number of observations. However, in our problem, the matrix for the House of Representatives for the two dimensional model would be approximately 60,000 by 60,000 (see Table A1) and it is impractical to invert a matrix of that size. Consequently, we form Δ for each of the three subsets of parameters conditional on the other parameters being held fixed. Consequently, the standard errors produced for the

subsets of parameters given that the other parameters are held fixed, must be viewed as heuristic descriptive statistics (see Table A2). However, comparison of D-NOMINATE standard errors to those computed by bootstrap methods (Poole and Rosenthal, 1991, 1996) suggests that these not "econometrically correct" standard errors would be close to bootstrap standard errors.

Table 1: 108th House of Representatives

Variable	A	B	C
Republican		0.799	0.797
		0.017	0.016
Family Income in $1000	0.009	0.002	0.002
	0.003	0.001	0.001
% Black Constituents	-1.209	-0.261	-0.117
	0.130	0.055	0.086
% Hispanic Constituents	-0.574	-0.085	0.007
	0.115	0.047	0.065
% with Some College	2.077	0.545	0.526
	0.414	0.167	0.170
% College Degrees	-1.382	-0.473	-0.441
	0.366	0.146	0.147
Southern	0.355	0.144	0.133
	0.041	0.017	0.017
African-American Member			-0.095
			0.043
Hispanic Member			-0.071
			0.049
Female Member			-0.045
			0.021
N	440.000	440.000	440.000
r2	0.357	0.899	0.902

Table 2: 104th House of Representatives

Variable	A	B	C
Republican		0.732	0.728
		0.015	0.015
Family Income in $1000	0.005	-0.001	-0.001
	0.003	0.001	0.001
% Black Constituents	-1.108	-0.396	-0.175
	0.114	0.048	0.068
% Hispanic Constituents	-0.640	-0.208	-0.126
	0.120	0.048	0.069
% with Some College	1.853	0.709	0.694
	0.372	0.149	0.150
% College Degrees	-1.123	-0.489	-0.436
	0.388	0.154	0.151
Southern	0.262	0.127	0.117
	0.040	0.016	0.016
African-American Member			-0.169
			0.037
Hispanic Member			-0.070
			0.052
Female Member			-0.032
			0.022
N	445.000	445.000	445.000
R^2	0.308	0.892	0.898

Table 3: 98th House of Representatives

Variable	A	B	C
Republican		0.611	0.612
		0.017	0.017
Family Income in $1000	-0.002	0.001	0.000
	0.003	0.001	0.001
% Black Constituents	-0.898	-0.428	-0.238
	0.115	0.059	0.081
% Hispanic Constituents	-0.877	-0.347	-0.287
	0.151	0.077	0.099
% with Some College	1.618	0.856	0.896
	0.427	0.215	0.216
% College Degrees	-0.652	-0.981	-1.005
	0.479	0.240	0.238
Southern	0.204	0.222	0.194
	0.037	0.019	0.020
African-American Member			-0.182
			0.054
Hispanic Member			-0.036
			0.072
Female Member			-0.028
			0.035
N	437.000	437.000	437.000
r2	0.233	0.808	0.814

Table 4: 93rd House of Representatives

Variable	A	B	C
Republican		0.588	0.590
		0.018	0.018
Family Income in $1000	-0.002	-0.002	-0.003
	0.003	0.002	0.002
% Black Constituents	-0.782	-0.322	-0.046
	0.122	0.067	0.093
% Hispanic Constituents	-0.933	-0.332	-0.212
	0.178	0.098	0.125
% with Some College	1.943	0.902	0.930
	0.697	0.377	0.384
% College Degrees	0.099	-0.532	-0.390
	0.611	0.330	0.329
Southern	0.187	0.214	0.169
	0.043	0.023	0.025
African-American Member			-0.275
			0.066
Hispanic Member			-0.119
			0.101
Female Member			-0.017
			0.045
N	441.000	441.000	441.000
R^2	0.188	0.764	0.774

Table 5: Income and Party in Southern House Seats	
Southern House Seats	**Median Family Income in 2000$**
Republican Seats 93rd House	$38,629 (n= 37)
Democratic Seats 93rd House	$34,104 (n=83)
Difference	$ 4,525 t = 3.1874
Republican Seats 108th House	$49,355 (n=84)
Democratic Seats 108th House	$41,066 (n=57)
Difference	$ 8,288 t = 4.6631

Table 6. Comparison of Actual and Simulated Polarization Measures	
Data Series	**Pearson Correlation (R)**
1st Dimension Means	
Chamber	**0.973**
Republicans	**0.967**
Northern Democrats	**0.950**
Southern Democrats	**0.996**
Within and Between Party Distances	
Between	**0.992**
Republicans	**0.854**
Democrats	**0.984**

Table 7A: 2000 Reapportionment			
Apportionment Outcome	**Democrats**	**Republicans**	**Difference**
Loser	-.414	.421	.835
Unchanged	-.394	.438	.832
Winner	-.407	.544	.951

Table 7B: 1990 Reapportionment			
Apportionment Outcome	**Mean Democrat**	**Mean Republican**	**Difference**
Loser	-.374	.311	.685
Unchanged	-.263	.360	.623
Winner	-.324	.456	.780

Table 7C: 1980 Reapportionment			
Apportionment Outcome	**Mean Democrat**	**Mean Republican**	**Difference**
Loser	-.380	.250	.630
Unchanged	-.195	.315	.510
Winners	-.280	.424	.704

Table 7D: 1970 Reapportionment			
Apportionment Outcome	**Mean Democrat**	**Mean Republican**	**Difference**
Loser	-.371	.259	.630
Unchanged	-.225	.252	.477
Winners	-.266	.338	.604

Table 8: Change in Senate Polarization	
	Coefficient
Change in House Polarization at *t*	0.748
	(0.255)
Change in House Polarization at *t*-1	0.020
	(0.244)
Change in House Polarization at *t*-2	-0.008
	(0.214)
Constant	0.001
	(0.006)
N	27
R^2	.289

Table 9: Effect of Primary System on House Polarization		
System/Party	Democrats	Republicans
Closed	-.376 (n=86)	.387 (n=68)
Open/Mixed	-.302 (n=183)	.359 (n=99)
t-statistic	-3.011	1.091

Table 10: Effect of Primary System on Senate Polarization		
System/Party	Democrats	Republicans
Closed	-.315 (n=18)	.382 (n=14)
Open/Mixed	-.361 (n=40)	.288 (n=30)
t-statistic	1.079	1.248

Table 11: Change in Polarization Since 1972 by Election Type		
Election Type	**Average Change in Polarization**	**Standard Error**
Presidential	.021	.007
Midterm	.023	.010
t-value	-0.252	

Figure 1: Classification of Roll Call Votes, 1879-1998
Two-dimensional Linear DW-NOMINATE

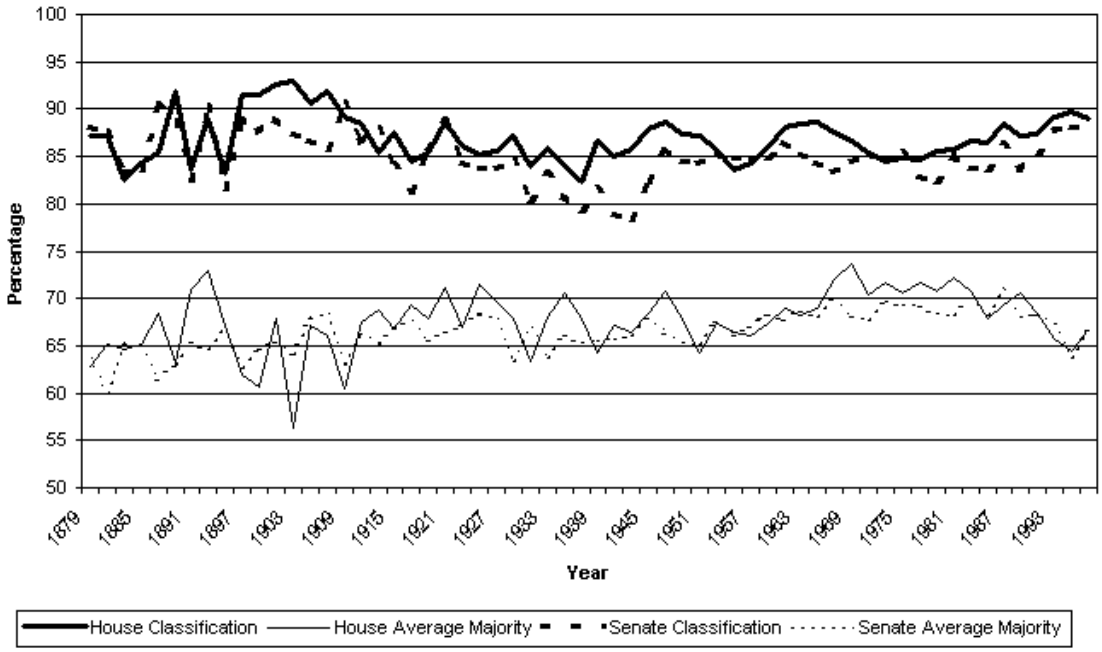


Figure 2: Classification Gain of 2nd Dimension

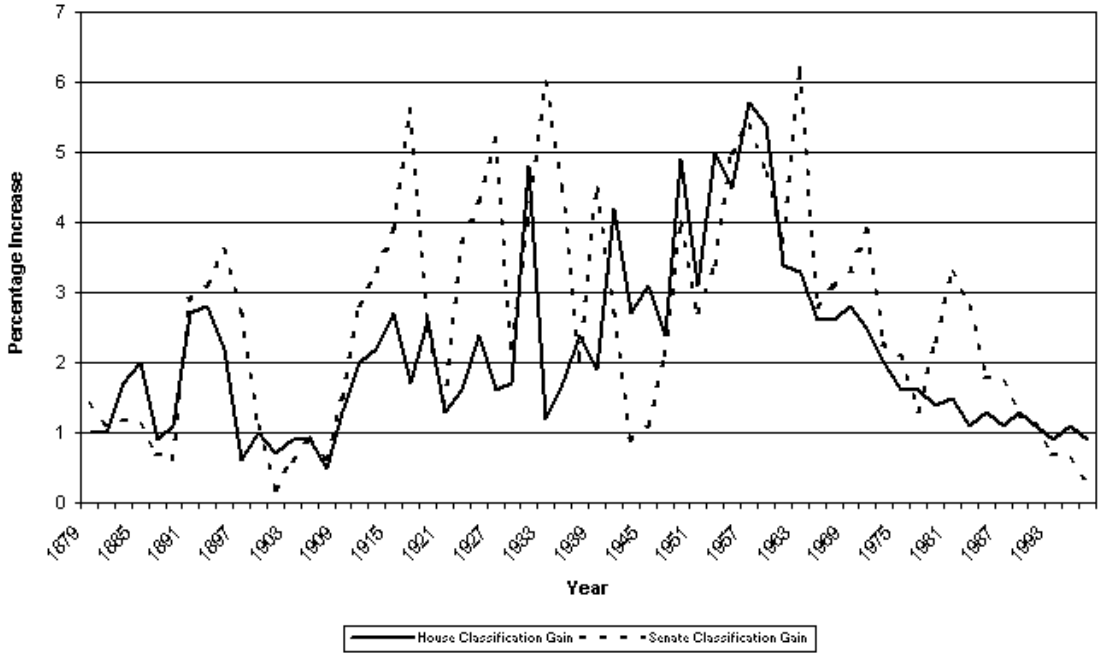


Figure 3: Mean House DW-NOMINATE Position

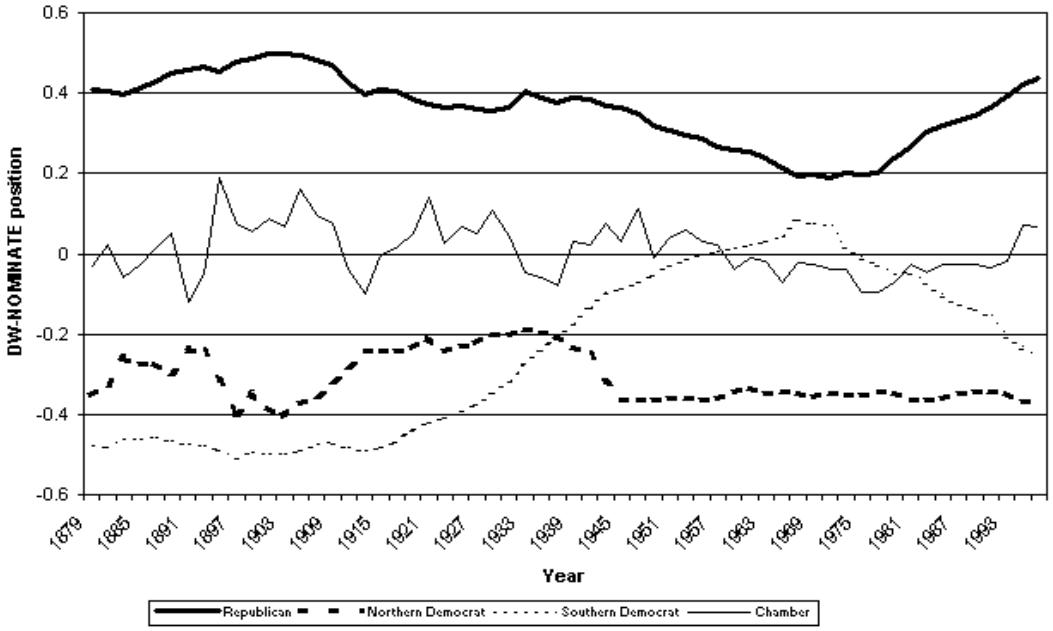


Figure 4: Mean Senate DW-NOMINATE Positions

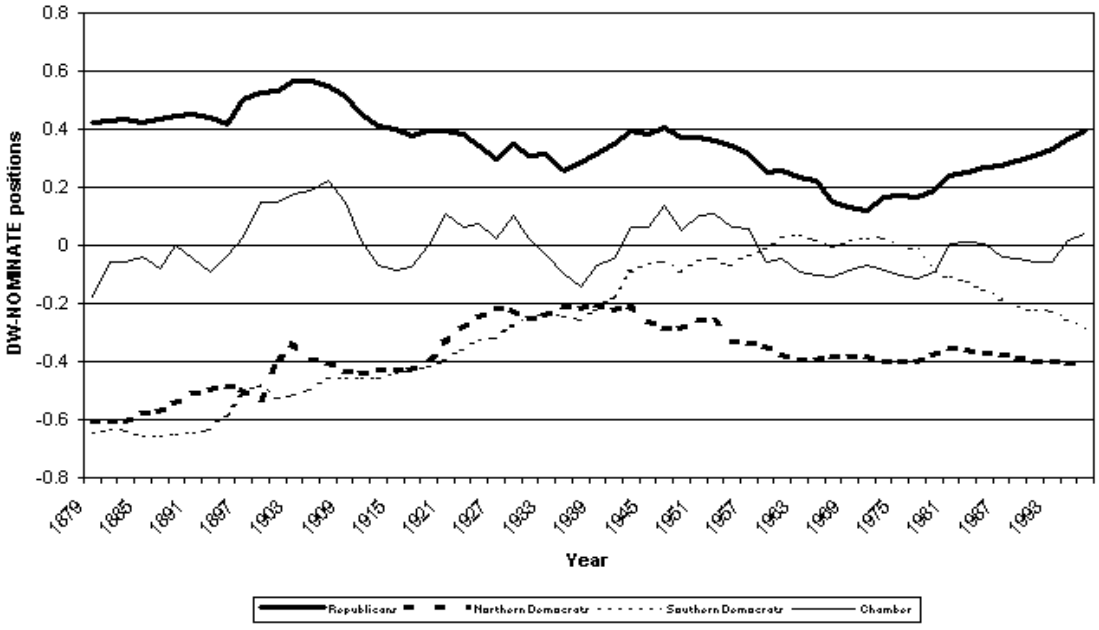


Figure 5: Standard Deviation of House DW-NOMINATE Positions

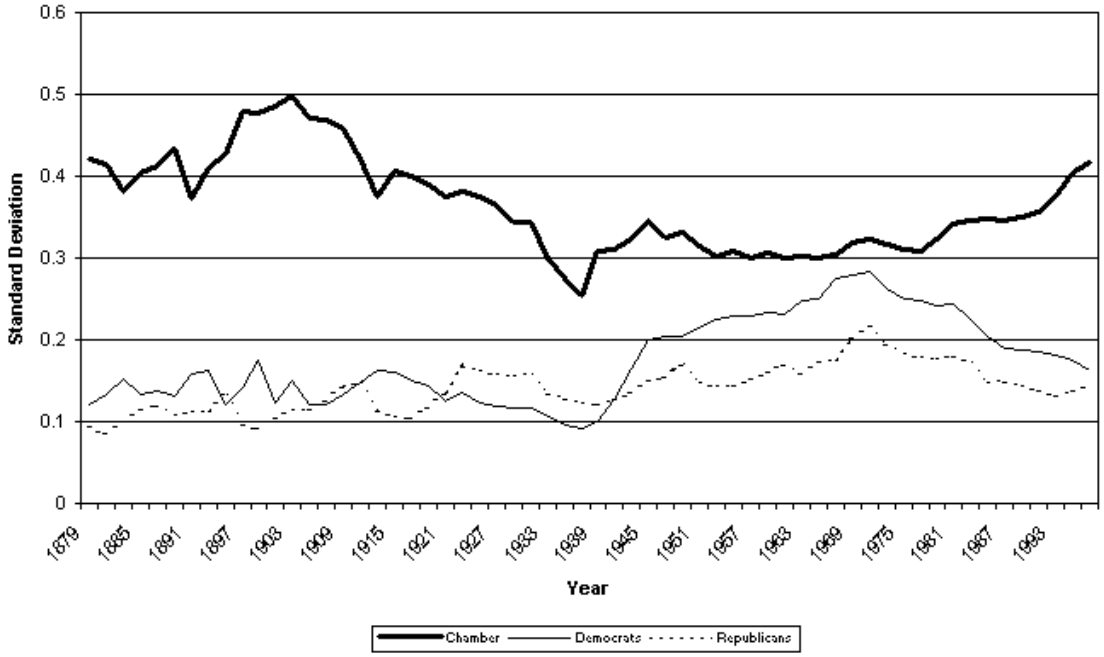


Figure 6: Standard Deviations of Senate DW-NOMINATE Positions

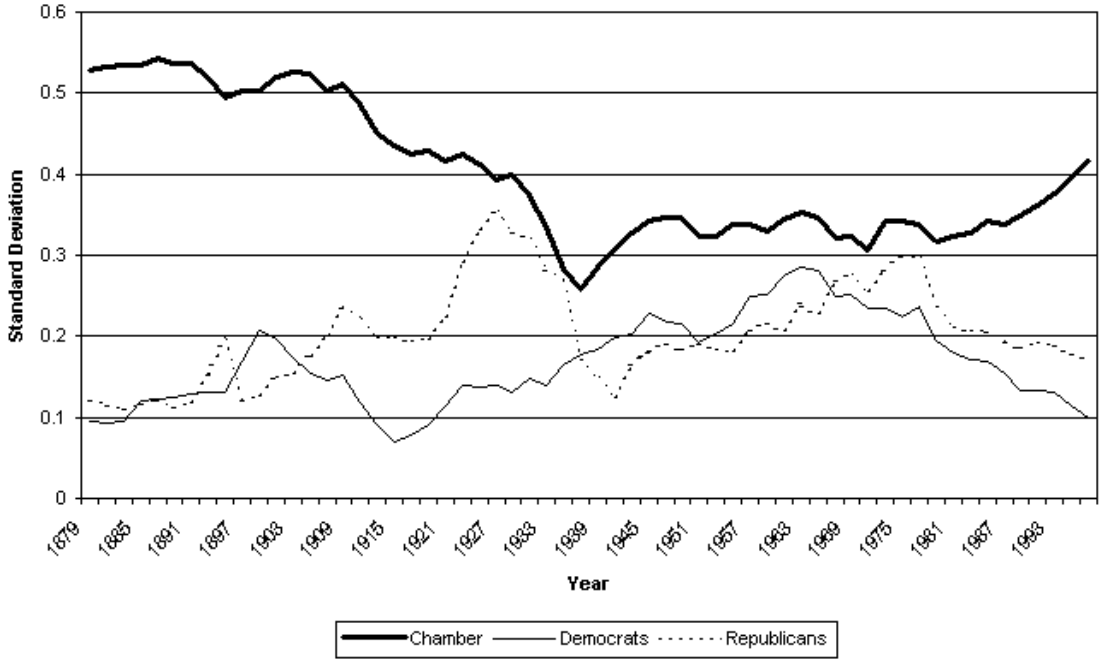


Figure 7: Average Two Dimension Differences in the House

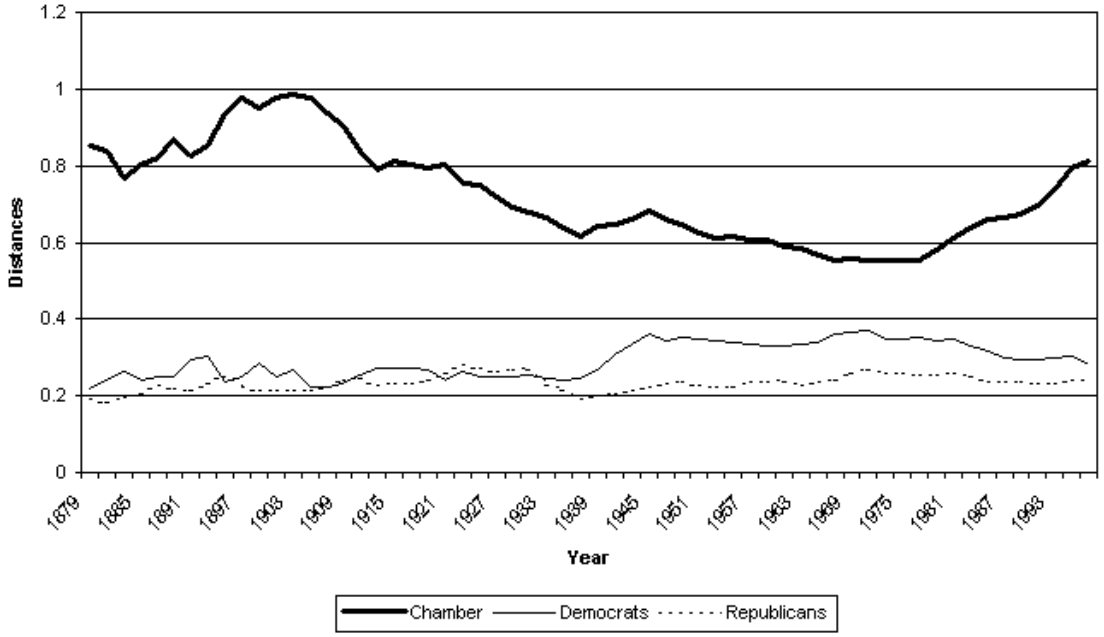


Figure 8: Average Two-Dimension Distances in Senate

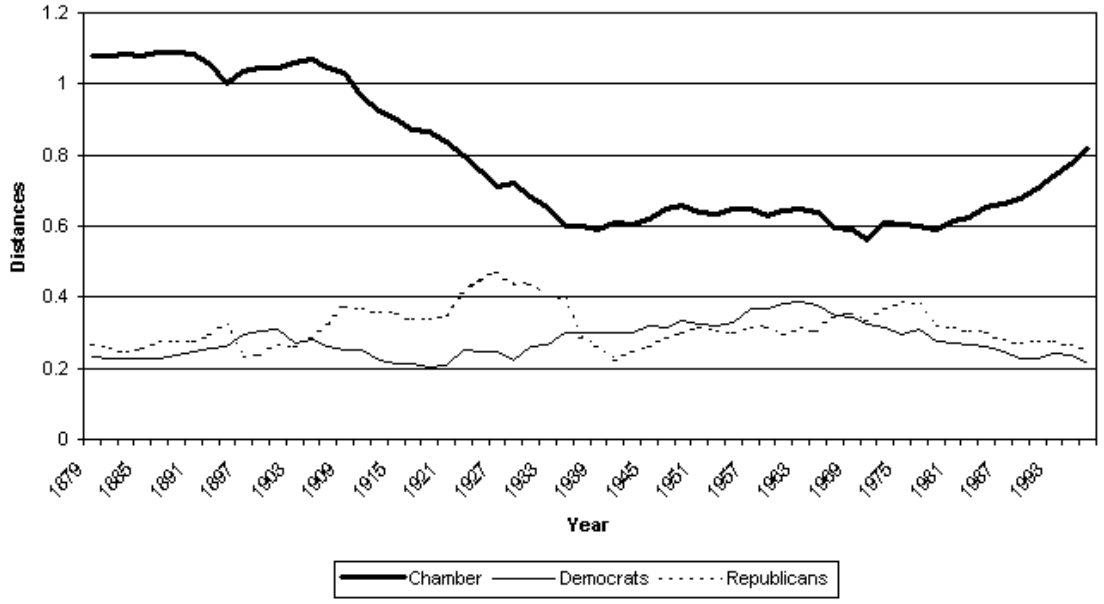


Figure 9: Party Overlap in Congress

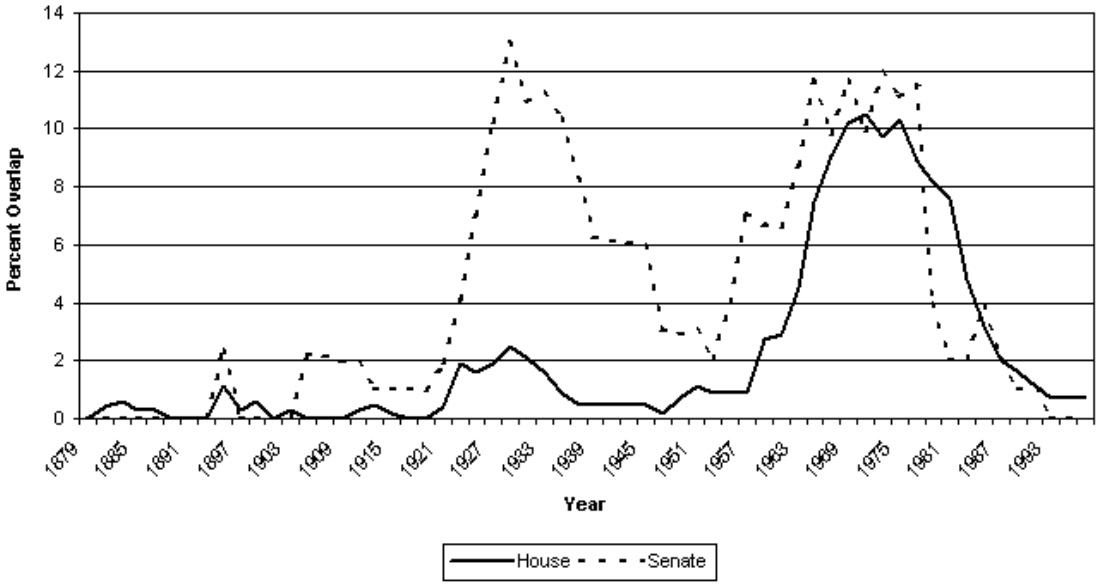


Figure 10: Distribution of Ideal Points in the 105th House

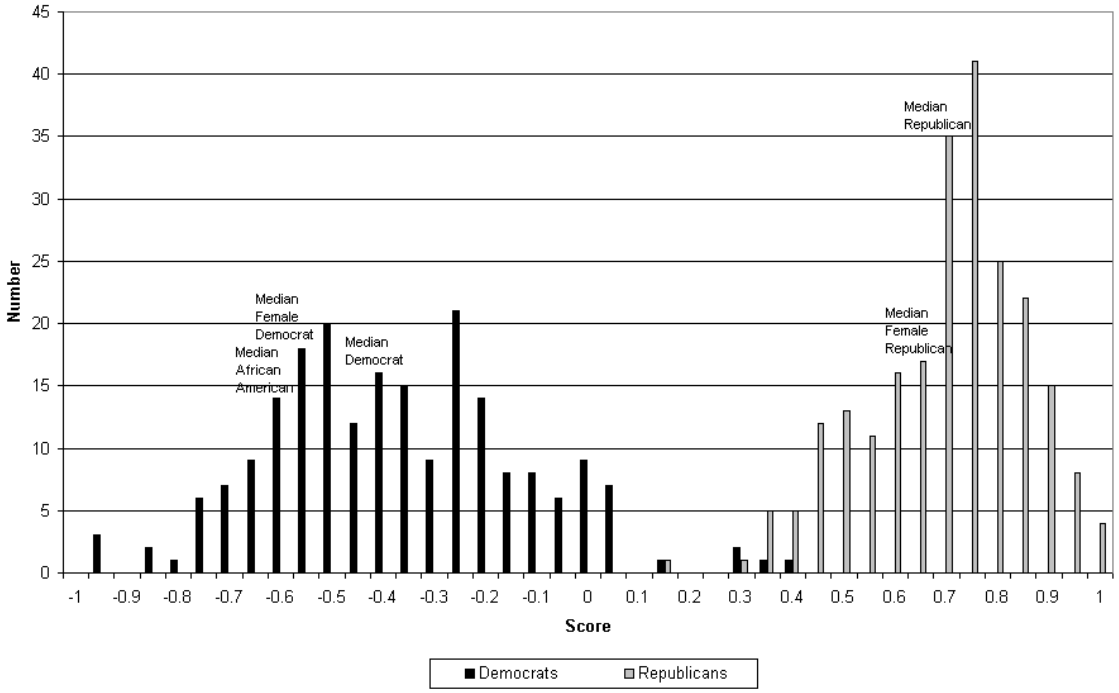


Figure 11

Presidential Voting by Region

needs to be update

Figure 12

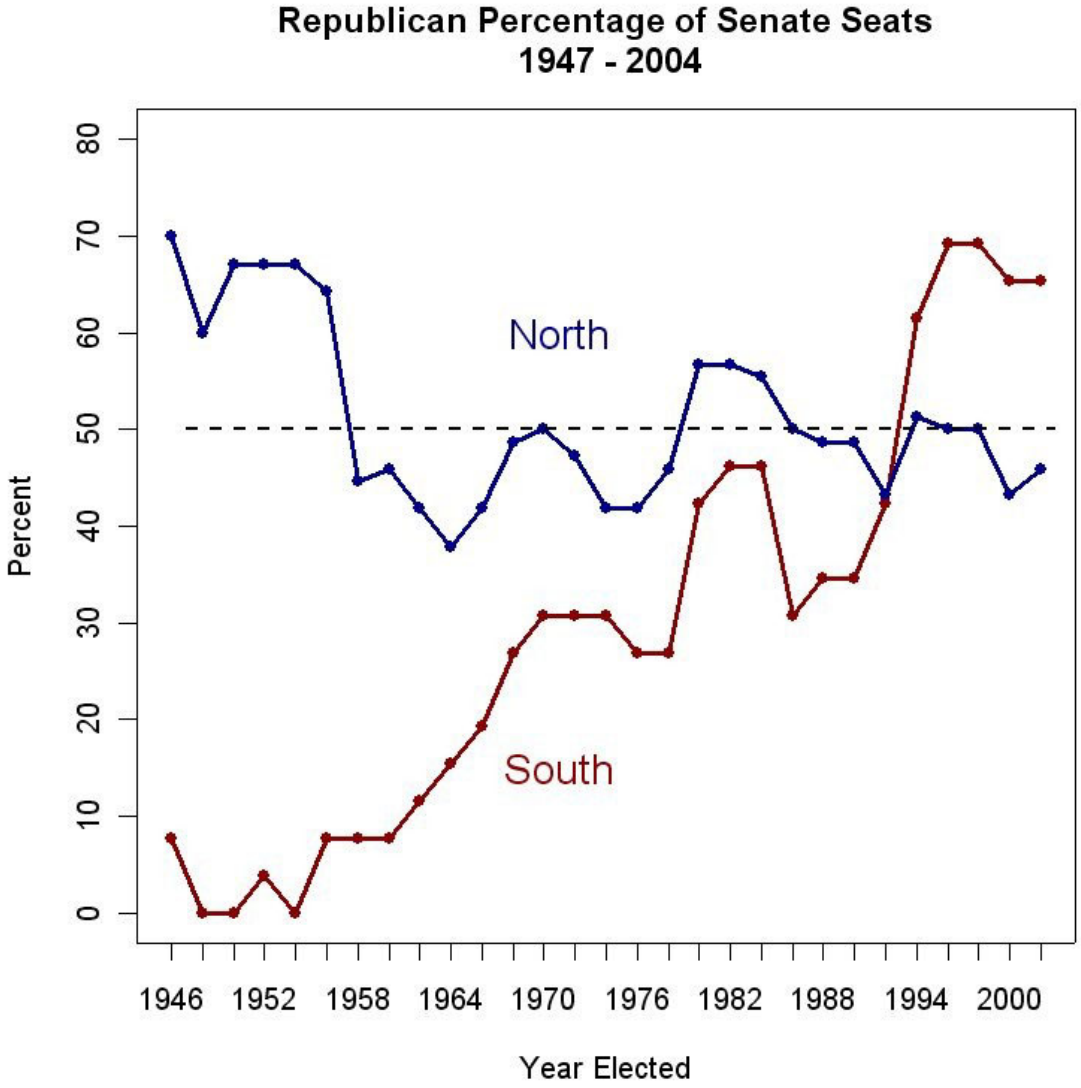


Figure 13

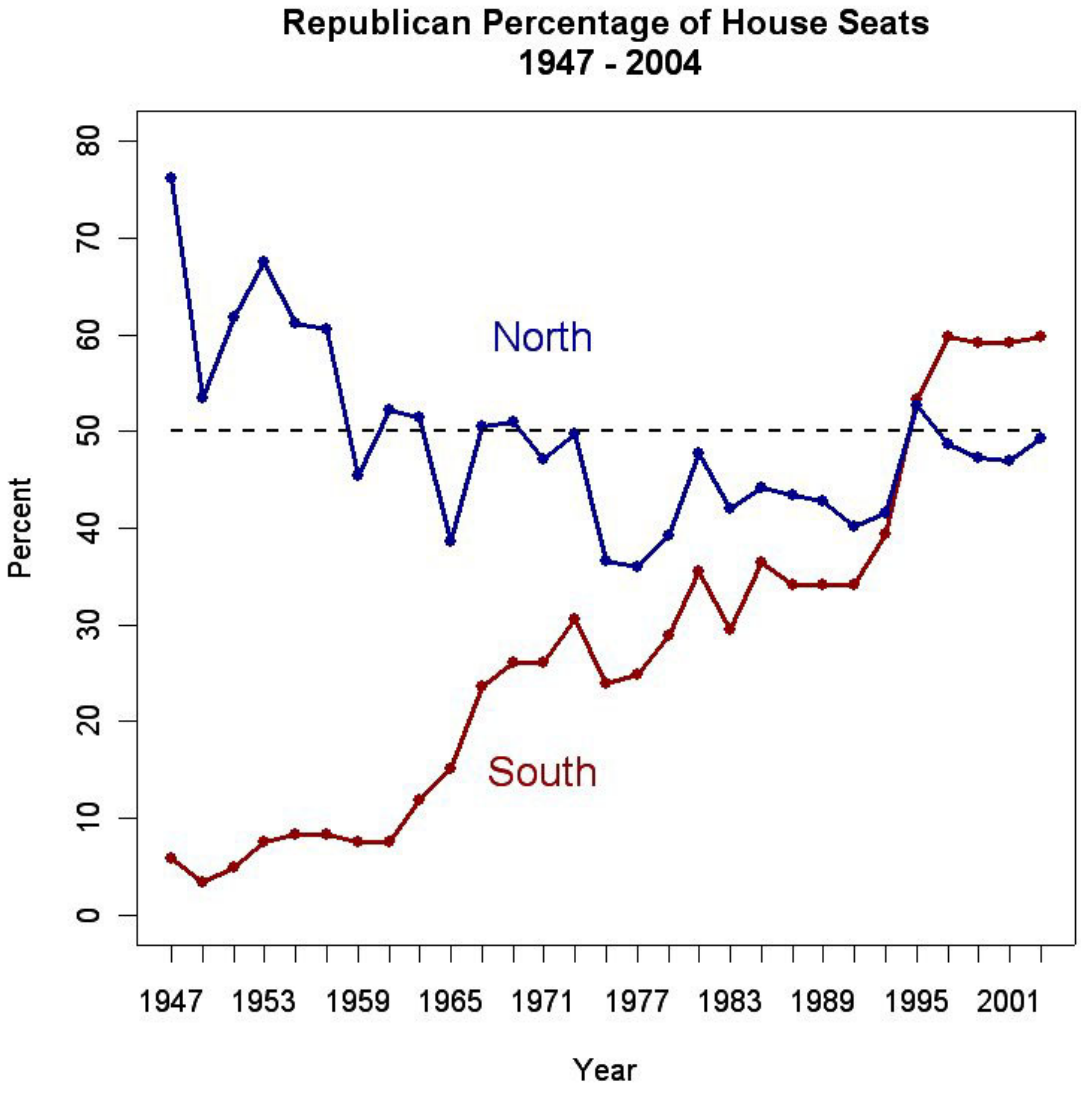

Republican Percentage of House Seats
1947 - 2004
Percent
0
10
20
30
40
50
60
70
80
North
South
1947
1953
1959
1965
1971
1977
1983
1989
1995
2001
Year

Figure 14

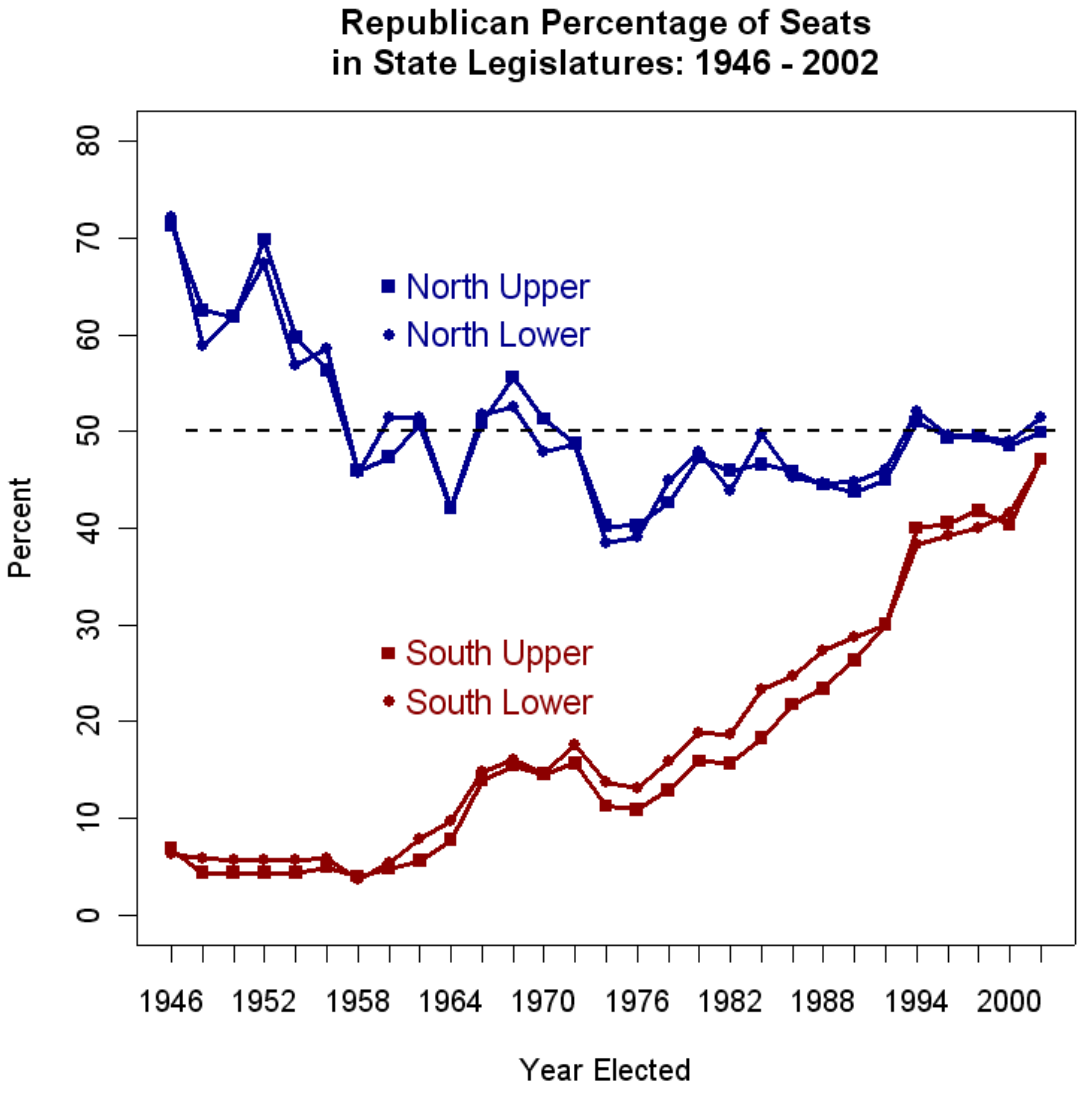

Republican Percentage of Seats
in State Legislatures: 1946 - 2002
Percent
0
10
20
30
40
50
60
70
80
North Upper
North Lower
South Upper
South Lower
1946
1952
1958
1964
1970
1976
1982
1988
1994
2000
Year Elected

Figure 15

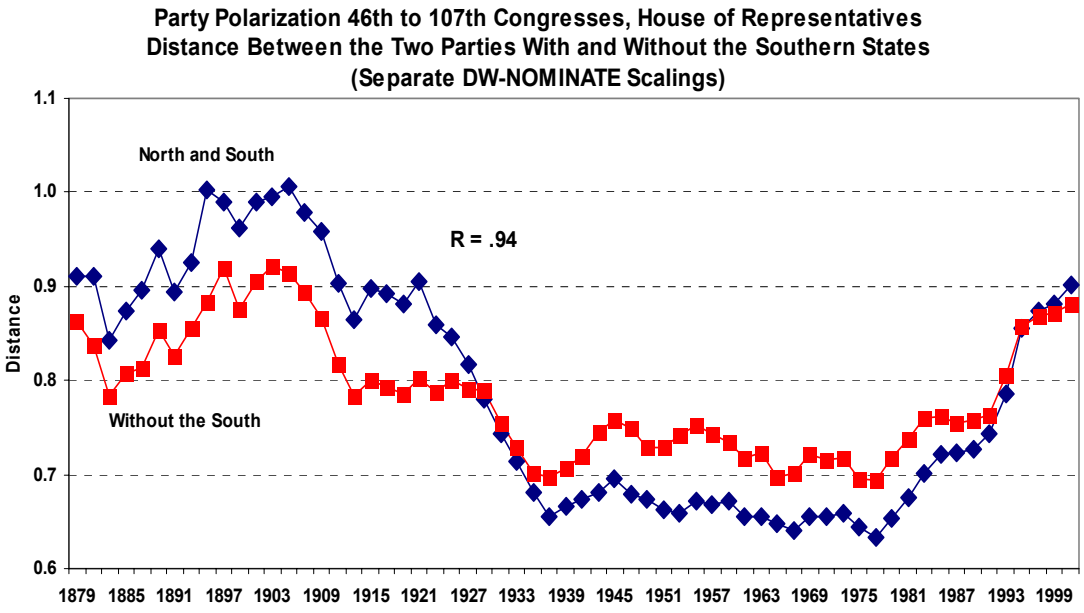

Party Polarization 46th to 107th Congresses, House of Representatives
Distance Between the Two Parties With and Without the Southern States
(Separate DW-NOMINATE Scalings)
Distance
1.1
1.0
0.9
0.8
0.7
0.6
North and South
R = .94
Without the South
1879 1885 1891 1897 1903 1909 1915 1921 1927 1933 1939 1945 1951 1957 1963 1969 1975 1981 1987 1993 1999

Figure 16 (needs to be extended backward to match text)

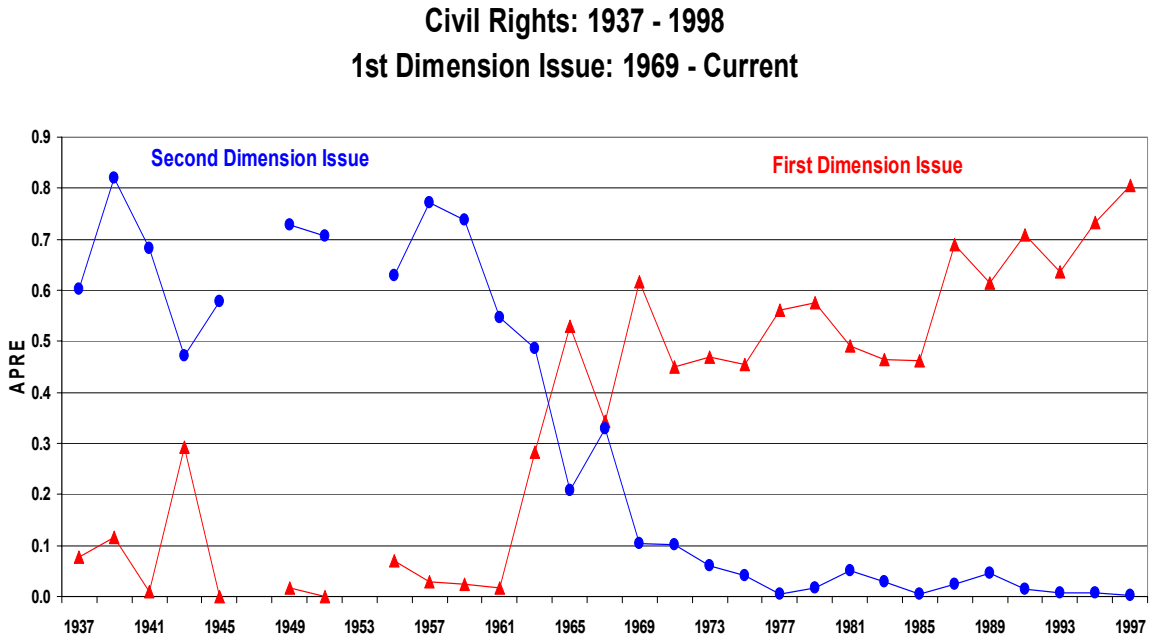


Figure 17. Cutpoint Models

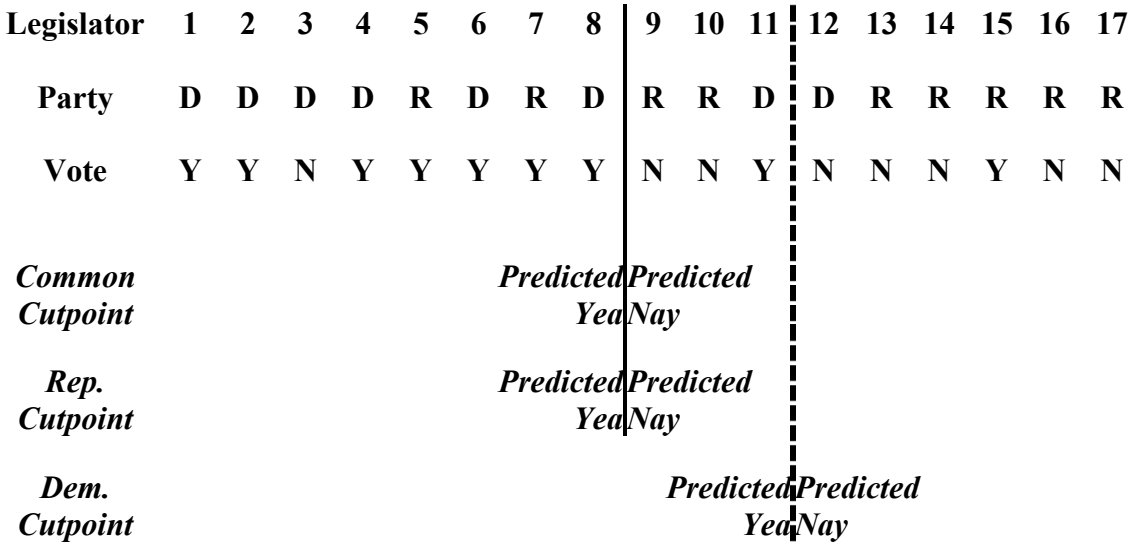
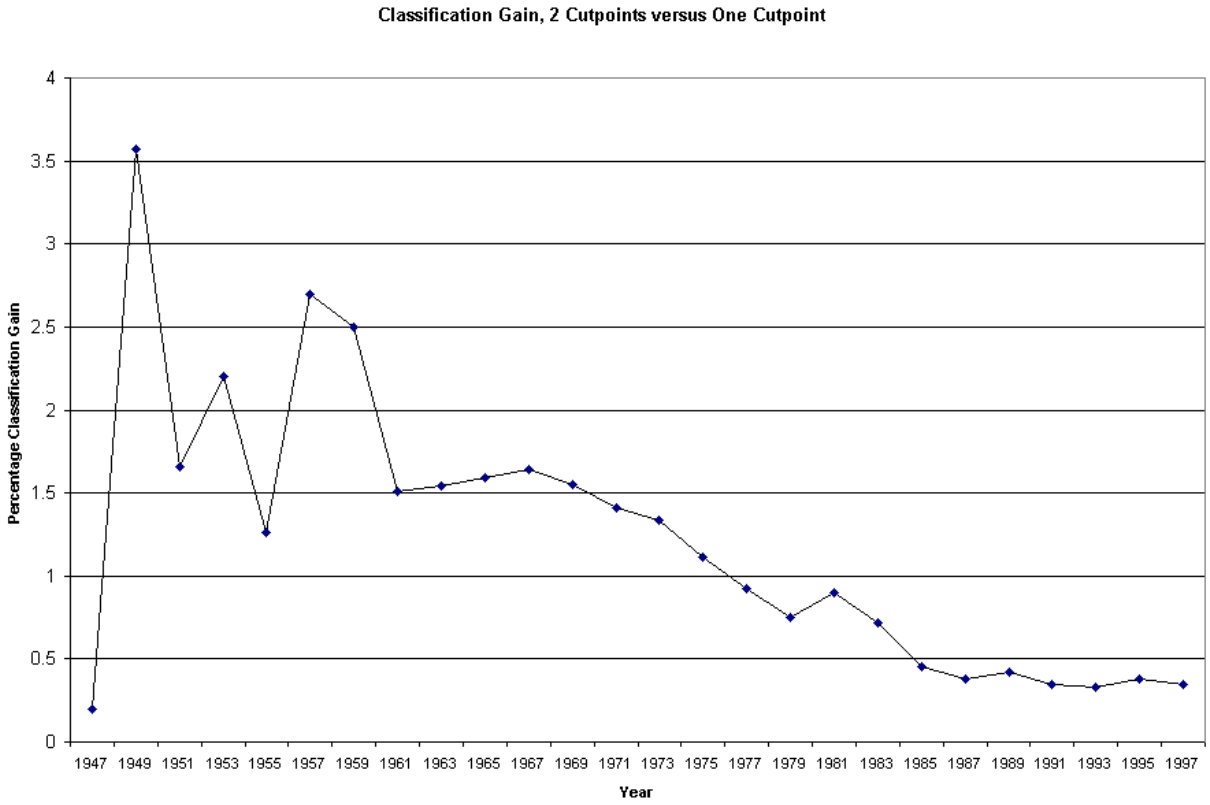


Figure 18



Note to figure 18. The classification gains are for a one-dimensional voting model. All representatives were scaled together and a separate cutpoint was then estimated for each party. The classification gains are similar to those scalings in which each party has an independent rank order of ideal points as well as a separate cutpoint.

Figure 19

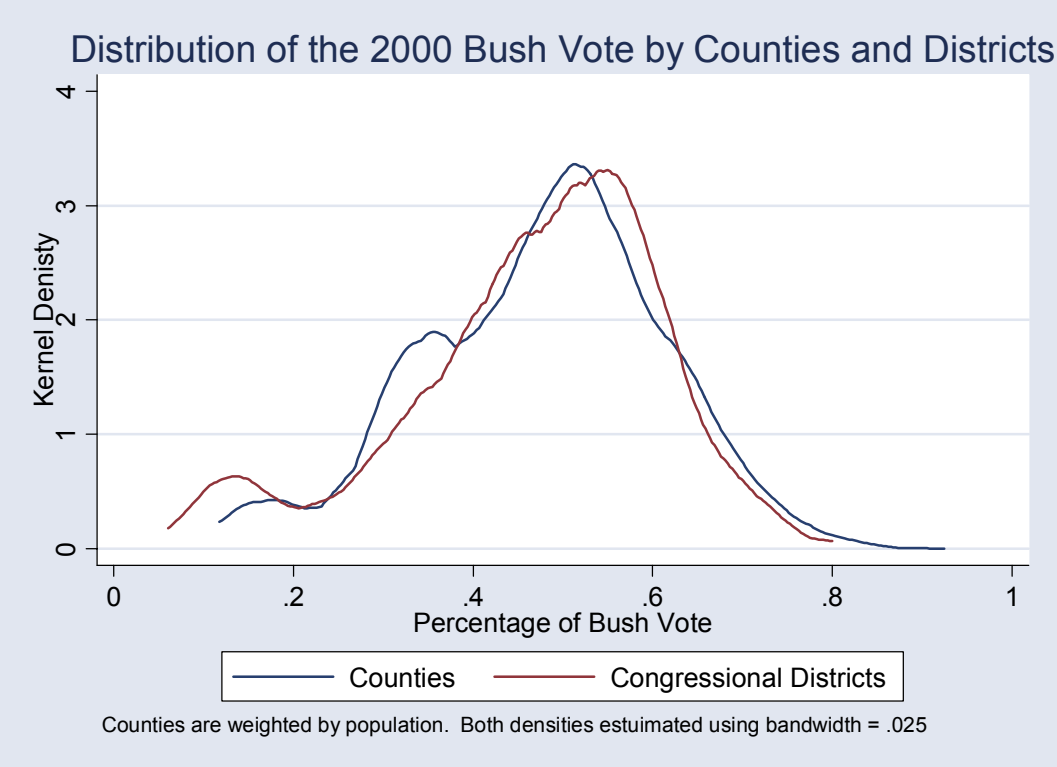

Distribution of the 2000 Bush Vote by Counties and Districts
Kernel Denisty
0
1
2
3
4
0
.2
.4
.6
.8
1
Percentage of Bush Vote
Counties
Congressional Districts
Counties are weighted by population. Both densities estuimated using bandwidth = .025

Table A1

Classification Percentages, Proportional Reduction in Errors, and Geometric Mean Probabilities for DW-NOMINATE: 1947-1997

House of Representatives

	One Dimension				Two Dimensions			
	Parameters	**Percent**	**APRE**	**GMP**	**Parameters**	**Percent**	**APRE**	**GMP**
Constant (v = 0)	**31,122**	**84.7**	**.506**	**.712**	**62,244**	**86.2**	**.554**	**.729**
Linear (v = 1)	**32,132**	**85.0**	**.513**	**.715**	**64,264**	**86.4**	**.561**	**.732**

Total Number of Choices	5,701,611	Number of Scaleable Roll Calls	14,402
Total Representatives all Houses	11,538	Number of Unique Representatives	2,317

Senate

	One Dimension				Two Dimensions			
	Parameters	**Percent**	**APRE**	**GMP**	**Parameters**	**Percent**	**APRE**	**GMP**
Constant (v = 0)	**29,765**	**82.2**	**.442**	**.680**	**59,530**	**83.6**	**.485**	**.693**
Linear (v = 1)	**30,000**	**82.5**	**.451**	**.685**	**60,000**	**83.9**	**.496**	**.698**

Total Number of Choices	1,337,713	Number of Scaleable Roll Calls	14,647
Total Senators all Senates	2,629	Number of Unique Senators	470

Note: Percent refers to percent correctly classified, APRE to aggregate proportionate-reduction-in-error (with respect to the marginals), GMP to geometric mean probability.

Table A2

Parameter Estimates

House of Representatives

	One Dimension		Two Dimensions	
	Estimate	**Stnd. Error**	**Estimate**	**Stnd. Error**
		Constant Model (v=0)		
β	**3.428**	**0.0024**	**3.708**	**0.0025**
w_2			**.305**	**0.00034**
		Linear Model (v=1)		
β	**3.430**	**0.0024**	**3.739**	**0.0025**
w_2			**.302**	**0.00034**

Senate

	One Dimension		Two Dimensions	
	Estimate	**Stnd. Error**	**Estimate**	**Stnd. Error**
		Constant Model (v=0)		
β	**3.551**	**0.0052**	**3.795**	**0.0054**
w_2			**.277**	**0.00077**
		Linear Model (v=1)		
β	**3.810**	**0.0057**	**3.846**	**0.0055**
w_2			**.280**	**0.00074**

Endnotes

[1] Political polarization has not prevented the political system from remaining competitive. Poole and Rosenthal noted the dramatic increase in the number of Senate delegations that were split between the two parties. This number grew from fewer than 10 in the 1950s to 26 in 1978. This number has fallen back to slightly less than 20 over the past decade -- well above its average in the 1950s and 1960s (see Brunell and Grofman, 1998).

[2] For more detailed discussion of the methodological problems of interest group ratings, see Londregan and Snyder (1994), Snyder (1992), and Groseclose, Levitt, and Snyder (1999).

[3] If we were to maximize classification as in Poole (2000), the second dimension will always improve classification. However, using maximum likelihood techniques as we do in this book, classification is not guaranteed to improve as dimensions are added.

[4] For each roll call, the "Yea" vote also has a position on the dimension as does the "Nay" vote. (If there were more than one dimension, the legislators and the votes would have positions on each dimension.) The scaling methods include our DW-NOMINATE method (McCarty et al, 1997), Poole's (2000) non-parametric method, and the factor analytic method of Heckman and Snyder (1997).

[5] For simplicity, we use classification in our discussion rather than, say, the geometric mean probability of the observed choices. Results are similar (see Poole and Rosenthal [1997]). Third and higher dimensional fits add little to the substantive story. Moreover, improvements to classification for third and higher dimensions are very small. Of course, with the large number of observations available to us, these dimensions would be viewed as statistically significant. But they are truly dimensions that only a chi-square can see.

[6] There is a conservative GOP uptick, more pronounced in the Senate than in the House, during the New Deal. This is because the few seats in Congress that the Republicans managed to maintain represented the most conservative parts of the country.

[7] In his speech (letter?) to the electors of Bristol, British statesman Edmund Burke distinguishes between representatives who act as "delegates" by acting only on the expressed wishes of constituents and those who act as trustees pursuing their own conception of the constituencies interests.

[8] In the economic literature on "shirking" politicians, ideology is often measured as the residual from a regression of legislative behavior on district economic interests (e.g. Kalt and Zupan 198x). Of course, such an interpretation could only be valid if all of the relevant economic interests are included in the model and they are measured correctly.

[9] This interpretation is valid when β is a consistent estimate of $E\left(DWN \mid R_i = 1, \mathbf{C}_i\right) - E\left(DWN \mid R_i = 0, \mathbf{C}_i\right)$. Some readers will observe that $E\left(DWN \mid R_i = 1, \mathbf{C}_i\right) - E\left(DWN \mid R_i = 0, \mathbf{C}_i\right)$ is the "treatment" effect of assigning a Republican (instead of a Democrat) to represent a district with characteristics $\mathbf{C}_i$. For $\hat{\beta}$ to be a consistent estimate of the treatment effect, we must assume that the treatment is ignorable (Wooldridge 2003). Let DWN_1 be the DW-NOMINATE score if the district is represented by a Republican and DWN_2 be the score if represented by a Democrat. The assumption of ignorabilty of treatment requires that $E\left(DWN_0 \mid \mathbf{C}, R\right) = E\left(DWN_0 \mid \mathbf{C}\right)$ and $E\left(DWN_1 \mid \mathbf{C}, R\right) = E\left(DWN_1 \mid \mathbf{C}\right)$. Wooldridge suggests estimating $\hat{\beta}$ using a "saturated" model including R, $\mathbf{C}$, and interactions of R and $\mathbf{C}$ (in sample mean deviations). The saturated models produced almost identical estimates with the $\gamma = 0$ restricted model so we do not report them.

[10] A different selection of congressional terms would not affect our results.

[11] The results are essentially unaffected by averaging the DW-NOMINATE scores for districts with more than one representative in a Congressional term.

[12] For the 2000 census, we compute the percentage of African-Americans by adding the number who identify solely as African-Americans and those who chose any multi-racial category which included African-American.

[13] Following the standard designations of the political South, the designated states are the eleven Confederate states, Oklahoma, and Kentucky.

[14] In the next chapter, we will see that this non-linear effect of education is apparent in voter choices and partisan identification.

[15] In his study of Senate voting, Leavitt (199x) finds that constituency plus national party can explain only 50% of the variance.

[16] Its plausible that this null finding is due to the linear specification of the African-American percentage. Perhaps there is a threshold effect beyond which the percentage of African-Americans moves the representative to the left. Given that majority African- American districts are all represented by African-Americans, it would be hard to identify such a threshold with the available data. However, it is worth noting that higher percentages of African-Americans do not effect the NOMINATE scores of Afircan-American representatives.

[17] A probit analysis predicting the party of the representative from the constituency characteristics supports this claim.

[18] The lack of significance for Hispanics may be do to their small numbers in the 93rd and 98th Houses.

[19] Of the 38 members of the Congressional Black Caucus in the 108th House, eight had DW-NOMINATE scores to the right of the median Democrat. Almost all are Southern, young, or have relatively small minority populations in their district.

[20] Of course, the absolute size of the income gap would increase because of average income growth across all districts even if there were no change in the distribution of income across Republican and Democratic differences. However, this effect accounts for only ¼ of the increased gap.

[21] The APRE is defined as sum of all roll call decision correctly classified by DW-NOMINATE minus the sum of votes cast for the minority position divided by the number of votes for the minority position. Thus, it measures the incremental explanatory power of DW-NOMINATE against the null model that every member votes in majority.

[22] The fact that these reforms also decentralized power by strengthening subcommittees is not stressed.

[23] Another of our finding is that for many of estimated cutpoint pairs, the Democratic cutting line is to the left of the Republican cutting line, seemingly inconsistent with party pressure. However, there is some debate, even among ourselves (see Cox and Poole), about how to interpret this result.

[24] We do not wish to take sides in the Texas dispute. While the Republicans took extraordinarily aggressive measures, the obstruction of the Democrats to protect their 1990 gerrymander and the decision of federal judges to make incumbency-protection the centerpiece of their Texas districting plan are unlikely to be featured as exemplars in future civics texts.

[25] However, contrary to conventional wisdom, the polarization increases in 1982 and 1992 are much larger than 2002.

[26] Indeed, the 1982 and 1992 (but not the 2002) still produce larger than average increases in polarization.

[27] With respect to this question, our results are somewhat at odds with Cameron, Epstein, and O'Halloran who argue that white representatives are sufficiently responsive to the size of their African-American constituency to make the creation of majority minority districts counterproductive from the perspective of black interests.

[28] In a recent paper, Carson et al. find that members representing newly created districts have NOMINATE scores that are more extreme than those from established districts. However, they did not distinguish between the effects of inter-regional seat reallocations and the effects of party gerrymandering.

[29] In these estimates, counties are weighted by population size.

[30] It is appropriate to look at changes in polarization rather than levels, because of the trends in both polarization series.