The Unidimensional Congress, 1919-84

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1. Introduction*

A simple unidimensional spatial model provides a highly accurate description of roll call voting in the United States Congress. Moreover, the dimension exhibits remarkable temporal stability. Today's liberal-conservative lineup basically prolongs the major political axis that existed both after World War I and after the Great Depression. These theses are argued on the basis of a statistical analysis of, essentially, every recorded roll call vote in the House and in the Senate in the years 1919-1984.

The stable, unidimensional alignment of members of Congress is all the more remarkable given the wide span of substantive issues faced by Congress. Indeed, over time, a given issue can completely flip-flop in terms of how it projects onto the basic liberalconservative dimension. Protectionism, for example, a conservative issue during the days of Smoot-Hawley is now primarily championed by liberals. This multiplicity of issues has led theorists to emphasize the fundamental instability of multidimensional politics (e.g. McKelvey, 1975). To model how Congress specifically has dealt with these problems of instability, Shepsle (1979) has emphasized the role of the committee system in partitioning the issue space into jurisdictions. Coupled with agenda control powers embodied in the rules of each house, the partitions can lead to "structure induced equilibria." Past and current developments in multidimensional theory, however, fail to address a strong empirical regularity documented in this paper. Members of Congress tend to line up relative to one another in a basically stable, unidimensional pattern even though issues and how they are interpreted in liberal-conservative terms are in constant, kaleidoscopic motion.

Another way of viewing our results is to place them in the context of the Hinich-Pollard (1981) model of a multidimensional issue space with poorly informed voters. In their model, although voter preferences are multidimensional, voter information about candidates is restricted to knowledge about candidate positions on a predictive (read liberal-conservative) dimension. As a result, voters project their multidimensional ideal points onto this dimension and vote as if they had unidimensional preferences. If, as we argue later, members of Congress are likely to make similar projections as a result of some mixture of coalitional and informational considerations, we can reconcile the multiplicity of issues with our unidimensional empirical results.

As we see it, the major theoretical problems raised by these results are to explain: (1) why the stable pattern occurs; (2) how specific issues become related to the stable dimension; and (3) what, for a given roll call, determines the division between yeas and nays along the dimension.¹

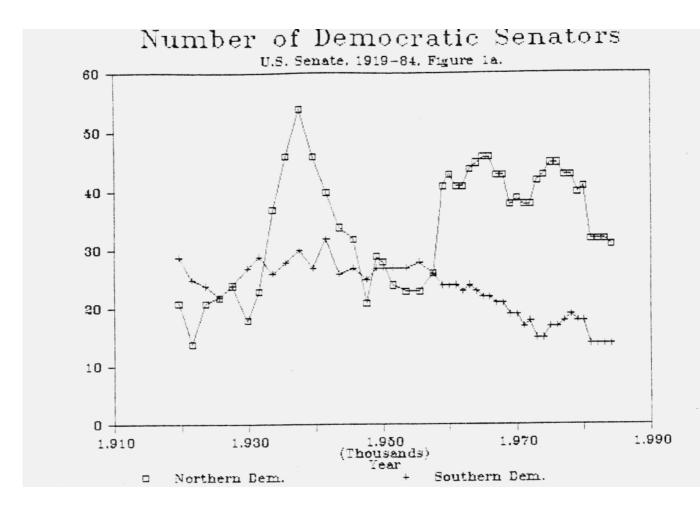
This paper's purpose, however, is not to undertake these theoretical developments but simply to document the regularity that needs to be accounted for. Similarly, although we would hazard that the dimension basically defined by questions of income redistribution,² we do not attempt to provide a definitive statement as to the historical or substantive meaning of the dimension and how issues project onto it. Nonetheless, as patterns of variation along the

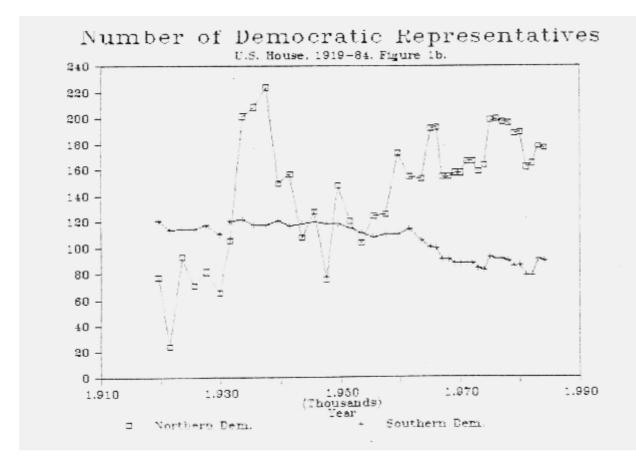
dimension may provide important clues to answering the theoretical questions we have stated, we will briefly discuss the important elements of change.

From the discussion of realignment by Sundquist (1973) to the formal model of Aldrich (1983), scholars have been concerned with issues that would cut across existing lines of party cleavage and reorganize voting along new spatial axes. A permanent shift of this type does not appear in our data.³ In particular, although the Depression shattered the political world of the 1920s, it did not create a new dimension of conflict. The massive replacement of Republicans by Democrats produced a sharp shift to the left on the dimension existing in the 1920s. In the four Congressional elections from 1930 through 1936, a 100 seat Republican majority gave way to a 242 seat Democratic majority in the House. The swing in the Senate was from a 17 seat Republican majority to a 60 seat Democratic advantage. Party replacement, which was the engine for the policy changes of the 1930s (Brady, 1979, 1982; Sinclair, 1977) moved the center of political opinion to the left. It did not reorganize roll call voting along a new spatial axis.

From Roosevelt's New Deal to Johnson's Great Society in the mid-sixties, both the Northern Democrats and the Republicans had a net liberal movement. Newly elected Republicans and Northern Democrats in the sixties tended to be more liberal than the old guard, which, rather than adapting like pure Downsian competitors, generally died with their ideological boots on. Whether this long-term change within the parties grew out of the Depression is an open question. Senate Republicans became more liberal prior to the Depression, swung conservative after Roosevelt's first reelection, and made a substantial liberal move only in the sixties. The same pattern was echoed, with far lesser amplitude, by House Republicans. Northern Democrats in the House made a sharp liberal swing only in 1943-44. A. similar, but smoother, pattern is shown by the Senate. (See Figures 3 and 4 below).

Prior to the Depression, the Democrats were primarily a sectional, Southern party. At the nadir following Harding's election in 1920, Southern Democrats outnumbered their Northern colleagues 5-to-1 in the House and nearly 2-to-1 in the Senate (see Figure 1). The Southern Democrats, prolonging Bryan's agrarian populism, were, particularly in the House, more liberal than their Northern colleagues. Southern liberalism continued through the Depression when, it will be remembered, FDR risked being outflanked on his left by Huey Long.





The alignment of the thirties, perhaps motivated by the redistributional conflict between a poor South and a rich North, could not be sustained given another, essentially, redistributional conflict between impoverished, subjugated blacks and richer whites. What happened is evident in the position of Southern Democrats. They became more conservative over time, although the patterns differ between the House and Senate. The thread common to both chambers, however, is a sharp movement of Southern Democrats in a conservative direction in 1943-44 when many roll call votes occurred on issues that arose from black participation in the armed forces. In response to the race issue, which was hardly on the agenda of Congress before World War II, the Southern Democrats realigned, but along the liberal-conservative dimension. They embarked on a conservative defense that reached a final paroxysm in the sixties.

These more conservative Southern Democrats offset liberal Northern Democrats. This change, paired with the more liberal Republican Party, meant that party differences along the dimension had decreased markedly. This was particularly true in the Senate in the early sixties when that chamber played the key role in the development of civil rights legislation. Through the height of the Vietnam conflict, in 1968 and 1969, party differences were far less, in both houses, than they had been in the twenties and thirties. Daniel Bell's The End of Ideology (1960) marked the transition.

From the mid-sixties until the present, the two parties have spread apart, polarizing in the fashion we described in "The Polarization of American Politics" (Poole and Rosenthal, 1984a). The Republicans, reversing a four decade trend, have become more conservative. The Democrats have become more liberal, largely because the remaining Southern Democrats have become more liberal. (See also Bullock, 1981). The Reagan period continues this trend but does not mark any fundamental change in the political system either in terms of spatial realignment or in terms of strong movement along the dimension.

The preceding descriptive assertions about the course of Congressional conflict have been developed from the results of applying a specific quantitative methodology to the entire record of roll call voting in both the House and the Senate from 1919 to 1984. Claims such as the one that there is a pervasive, stable ideological dimension are made within the limitations of this methodology. Consequently, we conclude this introduction by providing a brief methodological overview.

First, we have, for individual years or pairs of years of roll call voting, carried out

unidimensional nominal scaling using the NOMINATE procedure of Poole and Rosenthal (1985). Separate scalings are carried out for the House and Senate. Euclidean coordinates for the legislators and roll call alternatives are recovered simultaneously. This methodology is reviewed in Section 2. In that section, we also describe the ability of a one dimensional model to summarize roll call voting. In all, we carried out 90 separate scalings for the 66 year period of our analysis and found that, at any point in time, roll call voting tends to obey a strongly unidimensional pattern. The quality of the scalings was very uniform. (See Tables 1-4 below.)

But is, say, the dimension found in our first scaling, for 1919-20, at all comparable to that found in our last, for 1984? To address that question, we have made a strong assumption, namely, that the spatial (ideological) position of a legislator is constant, up to a random disturbance with mean zero, throughout his tenure in Congress. Thus, this assumption asserts that change in the ideological makeup of Congress is accomplished mainly through the election of new members. While this assumption is strong, it has support in the literature. (See Clausen, 1973; Fiorina, 1974; Stone, 1980; Bullock, 1981). Using this assumption, we bind the separate scalings together using a singular-value decomposition method for matrices with missing data developed by Poole (1983). This technique and the results are presented in Section 3. We find a pervasive liberal-conservative dimension present across the entire time period.

The dimension in the House is very consistent. The greatest perturbation, which is quite small, appears related to isolationist sentiment at the outbreak of World War II. There are more deviations for the Senate. Not only is the isolationist factor present, but there is a suggestion of less stable alignments in the Depression and, more importantly, a major perturbation due to civil rights in the sixties. These deviations, however, are always episodic. The major dimension always rebounds strongly. A summary of our empirical results and their theoretical implications is presented in Section 4.

2. Unidimensional Voting in Congress, 1919-84

We began our investigation by estimating a unidimensional spatial model for 43 separate data sets for the House and 47 data sets for the Senate. Our scalings correspond to calendar years, except for earlier years when there were relatively few roll calls. In those cases, we used data for a two-year period. Tables 1 and 2 indicate the years covered and the number of roll calls in each data set.⁴ The largest scaling, that of the individual votes of 434 representatives on 662 roll calls in 1978, covered 256,442 voting decisions. The roll calls included in each scaling represent all recorded roll call votes with more than 2.5% of the announced votes and pairs cast on the minority side. All legislators with at least 10 recorded votes were included.

The model we estimate, except for its stochastic aspect, was proposed by MacRae (1958) and termed a cumulative model by Weisberg (1972). In this model, each legislator is described by a spatial coordinate x_i where, *i* indexes the legislators. Similarly, each roll call, indexed by *j* is described by two spatial coordinates, one, *y*, for the "yea" outcome, and the other, *n*, for the "nay" outcome. These coordinates are given as z_{jy} and z_{jn} , respectively. Without any stochastic considerations, each legislator would simply vote for the alternative whose coordinate was closer to his own coordinate or ideal point. We model each legislator as having a utility function composed of a spatial component and a stochastic component. The legislator votes for the alternative with higher utility. The utility for the "yea" and

"nay" alternatives is given by:

$$U_{ijy} = u_{ijy} + \epsilon_{ijy}$$
$$U_{ijn} = u_{ijn} + \epsilon_{ijn},$$

Where u designates the non-stochastic component of the utility and the errors satisfy the standard assumptions that lead to logit estimation. In particular, the probability of a "Yea" vote is given by:

$$P_{ijy} = \frac{u_{ijy}}{u_{ijy} + u_{ijn}}$$

Our model for the non-stochastic, spatial part of the utility function the quasi-concave function:

$$u_{ijl} = \beta \exp\left[\frac{-w_i^2}{2} (x_i - z_{jl})^2\right]$$
$$\ell = y, n$$
$$\omega_i = \omega_0 + \omega_1 x_i + \omega_2 x_1^2$$

The parameters $x_{i, z_{jl}}$, β , ω_0 , ω_1 , and ω_2 are estimated via a modified maximum--likelihood method described in Poole and Rosenthal (1985). The parameterization of ω_i included to allow extremists to have tighter utility functions than moderates in line with the social-psychological literature reviewed in Poole and Rosenthal (1984b).⁵ As can be seen in Tables 1 and 2, a unidimensional model is quite successful in accounting for the data on a year-by-year basis. This assertion is supported in terms of three criteria: (a) geometric mean probabilities, (b) classification errors, (c) roll call coordinate scaling.

(a) <u>Geometric means.</u> The geometric mean probabilities are consistently high, (See Tables 1 and 2.) To compute the geometric mean, we take the total log-likelihood and divide it by the total number of votes cast. This normalizes the log-likelihood to give a figure that is comparable across scalings. We then exponentiate this normalized quantity. This produces a probability measure, but one that behaves like a squared error measure in that low probability choices (e.g., Jesse Helms voting against school prayer) are penalized. For example, the geometric mean for the model in which half the legislators vote "Yea" with probability 0.1 and half with probability 0.9 would be only 0.3, less than the average probability of 0.5. The average geometric mean for the Senate scalings is 0.681, The House, which fits a unidimensional model even better than does the Senate, has an average geometric mean of 0.705.

[Tables 1 and 2 about here]

(b) <u>Classification errors.</u> For each scaling in both houses, NOMINATE correctly classifies most of the individual votes, the percentages for the various scalings ranging from 77 per cent to 88 per cent. Again, the House fits better than the Senate. The House average is 84.0 percent as against 81.4 percent in the Senate. To put these figures in perspective, we report the percentages "explained" by the two party and three party (Northern Democrats, Southern [Confederacy plus Kentucky and Oklahoma] Democrats, Republicans) models proposed by Weisberg (1978). In these models, for each roll call, one finds how the majority of each "party" voted and then "predicts" that all party

members vote with the majority. With reference to the two-party model, note that this is not a party cleavage model where Democrats and Republicans would be predicted to vote on opposite sides of every roll call. Because the Weisberg model can readily predict that all legislators will vote identically on roll calls with strong majorities, it will always be substantially better at classification than a cleavage model. Even better classification is guaranteed for the three-party model.

Compared to the two--party model, NOMINATE always does better. In the House, the three-party model does better than NOMINATE in eight scalings, all of which precede 1961. In the Senate, NOMINATE outperforms the three-party model in all but three periods -- 1943-44, 1960, and 1964. These were all key years for civil rights votes. In 1964, voting on the Civil Rights Act produced over one-third of all the roll calls. Civil rights appears to be an issue that is often not fully captured in the main dimension we scale for a given data set. Obviously, civil rights is proxied by the three party split.

These comparisons with the party models are nonetheless misleading. Our sample of roll calls contains many "Hurrah["] votes which all three models will trivially- classify correctly. In addition, the party models are designed to minimize classification errors whereas in NOMINATE the estimates are chosen maximize a likelihood. To obtain a better comparison, we (a) restricted our comparison to votes in which the majority was 60 per cent or less and (b) minimized prediction errors -- holding our estimated legislator coordinates fixed-- by finding the midpoint of the yea and nay outcomes that minimizes prediction errors.

[Tables 3 and 4 about here]

As shown in Tables 3 and 4, comparisons with optimized classifications always favor our spatial model, both on close votes and on all roll calls, except for a minute edge to the threeparty model in the Senate in 1964 and in the House in 1941-42. (For discussion of these exceptions, v. infra.) This is especially impressive given that the three-party model can in fact contain more parameters than a one-dimensional spatial model.⁶ The results for close roll calls are particularly important. The marginals average about 55 per cent for the majority on these roll calls. A one-dimensional spatial model can correctly classify 81 percent of the votes on these same roll calls in the Senate and 82 percent in the House. Indeed, there is surprisingly little shrinkage in the percent correctly classified when one restricts the analysis to "close" roll calls. Classification is actually better on "close" roll calls than on "non-close" for 12 of the House and 6 of the Senate scalings. We suspect that this is because many of the non-close or Hurrah votes are based on decision rules that fail to fit our "Yea vs. Nay" two alternative comparison model. "Nay" vote on such roll calls may simply represent strong dissatisfaction over the final outcome of legislation. NOMINATE performs best when votes *count*, and its marked improvement over the two party and three party models for these votes demonstrates that a liberal-conservative spatial model contains substantial information not represented in simple classifications by party and region.

(c) <u>Roll call coordinate scaling</u>. The scaling of the roll call coordinates does not disclose strong indications of a multidimensional pattern. Some roll calls scaled poorly in that one coordinate was to the left of the most liberal legislator while the other was to the right of the most conservative legislator. These were essentially roll calls that fit the unidimensional pattern well but had less noise than called for by the estimate of β , Other roll calls, those that have both coordinates off the same end of the dimension are more

troublesome; they do not fit the dimension,⁷ Although such roll calls exist, they are always a minority, and many of them represent near unanimous votes. (Again, see Tables 1 and 2 for a complete summary).

An additional and more interesting check on our scaling would be to ask if the midpoints estimated by NOMINATE made sense on a series of roll calls where the midpoints could be ordered by a priori information. While this task has not been carried out systematically, Romer and Rosenthal (1985) have used our coordinates to analyze amendment voting on several regulatory policy issues that arose in the seventies. These include wage-price control exemptions for small business, exemption from OSHA inspections for small business, minimum wage, and strip-mining legislation. In all these cases, the estimated midpoints had the order expected. We thus conclude that a unidimensional model is not only able to "fit" the data in terms of statistical measures but also provide substantively valid placement of roll calls.

The degree to which a unidimensional model accounted for roll call voting was fairly uniform throughout our time series. NOMINATE did perform, mainly for the Senate, somewhat above average in the early twenties and somewhat below average in the thirties. Not too much should be made of these distinctions for the degree of fit may depend as much upon the distribution of roll calls in a given year--including the relative number of close vs. non-close votes--as upon the extent to which preferences are highly unidimensional. The three lowest classification percentages for close votes in the Senate and the two lowest in the House do, however, all fall in the first four Congresses elected after the stock market crash of 1929, suggesting that some temporary realignment may well have taken place in this period. To get a firmer handle on realignment, we now proceed to a temporal linkage of the separate scalings.

3.Intertemporal Analysis of the Liberal-Conservative Dimension

Roll call voting in Congress has, at any point in time, exhibited a strongly unidimensional pattern. But how stable is the dimension? To assess this, we link the separate scalings by the following model:

$$x_{it} = c_t + w_t x_i + v_{it}$$

where *x_{it}* represents the scaled coordinate in the *t*-th scaling,

 v_{it} an additive disturbance with mean zero,

 $x_{i.}$ the vector location of the legislator in the common space, and c_{t} , w_{t} coefficients of a linear transformation,

The parameters x_{i} , c_t and w_t are estimated by the alternating least squares algorithm of Poole (1983). The algorithm carries out singular value decompositions of matrices (47 scalings by 331 senators. and 43 scalings by 1,321 representatives) with missing entries.⁸ Except for the missing data problem, the procedure is equivalent to principal components factor analysis. Since the scale and origin of the spaces for individual scalings are arbitrary, the coefficients of the linear transformation may be chosen freely. Taking advantage of the fact that, between any two adjacent scalings we find substantial overlap in membership (at least two-thirds in the Senate), we can tie the separate spaces together within each house. Although we have assumed that, over time, the expected change in any individual's position is zero, in the common space described by the x_i , mean positions for party blocs can vary over time, due to the changing composition of Congress.

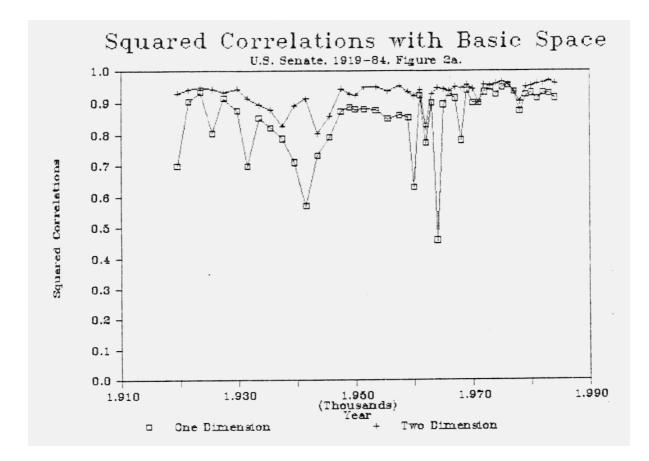
Because there was no overlap to permit a gain to joint estimation, separate singular value decompositions were carried out for the House and the Senate.⁹ We estimated one and two dimensional mappings of the scalings into a basic space.

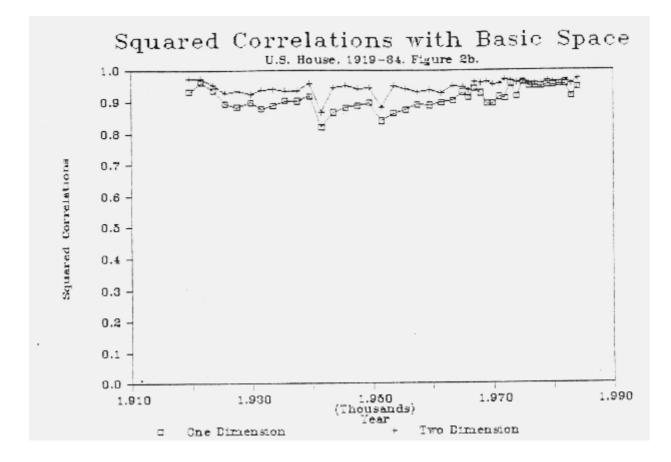
The fit of a one dimensional model in the Senate was excellent. With only one dimension we accounted for 86.5 per cent of the variance in the individual x_{it} values, Two dimensions raised this to 93.6 per cent. The fits for the House were even better, with a 92.1 percent figure for one dimension and a 95.5 figure for two dimensions. As two dimensions account for nearly all of the variation in the main yearly dimension, we will confine our attention to the one and two dimensional intertemporal estimations.

The fits of 86.5 per cent and 92.1 percent for the one dimensional projection are striking, considering that a time period of 66 years is spanned. There is a persistent character to the left-right or liberal-conservative conflict in American politics. Economic issues, emphasizing income redistribution, would appear to be the one common thread that could run through this long period of time.

The few deviations from this highly stable pattern can be examined by studying the squared correlations between the x_{it} values and the x_i values for each scaling. We begin with the Senate, which had the strongest exceptions to the unidimensional pattern. The squared correlations are plotted in Figure 2a.

[Figure 2 about here]





The basic dimension comes out quite strongly at the beginning of our time series. Three of the four Senates that sat in the twenties before the stock market crash have R^2 values in excess of 0.9.¹⁰ The Depression and events associated with the onset of World War II may in fact have begun a dimensional realignment, for the R^2 values fall to a low in 1941-42. But the long term liberal-conservative pattern quickly reasserted itself. From 1947 to 1959 the scalings have nearly identical R^2 values which are only slightly less than those found before 1929 and after 1968.

Indeed, the Senate data suggest that it was the civil rights movement, not the Depression that most perturbed the basic line of conflict. The lowest correlation over all 47 scalings occurs in 1964, previewed by less important dips in 1960 and 1962. These were years in which civil rights dominated the national agenda, particularly in the Senate. The results show that conflict in these years did not run along the usual liberal-conservative lines. Finally, there is a smaller deviation at the time of the Vietnam debate in 1968. After 1968, every year has a high fit to the basic space.

The fluctuations for earlier years are all but eliminated with a two-dimensional model, as shown in Figure 2a. We cannot, however, infer that the estimates reflect the addition of a single substantive dimension. The second dimension is essentially going to try to pick up what's left over from the first dimension. Consequently, the second dimension will attempt to fit the prewar and the sixties dips seen in the figure. Since there was virtually no overlap between these two widely separated periods (Carl Hayden notwithstanding), second dimension coordinates can be fitted independently for the two groups of senators present in the two eras. Prewar, the second dimension appears to correspond to non-economic issues such as isolationism. It is noteworthy that the lowest fit in two dimensions occurs in 1943-44, after entry into the war and when civil rights was beginning to appear as an issue. By the sixties, the second dimension should correspond to civil rights--an issue beyond the pale in the thirties.

In the House, a second dimension is largely irrelevant, as the House is even more highly structured along liberal-conservative lines than is the Senate. A comparison of Figures 2a and 2b shows that the one dimensional scaling fits for the House are nearly as good as those for the Senate in two dimensions. The more unidimensional character of the House appears to result from (1) the House's lesser involvement with foreign affairs, which dampened pre-war deviations and (2) the Senate's pivotal role, as a result of the filibuster, on the civil rights issue. The result worth stressing, however, is the highly unidimensional nature of both houses, disclosed by combining NOMINATE with singular value decomposition. Most important political events can be viewed as movement along the dimension. We now proceed to analyze these movements.

To track distributions of positions over time, we must first map the individual scalings onto the basic (one dimensional) space. We accomplish this by transforming each x_{it} by the inverse of the linear transformation for its scaling:

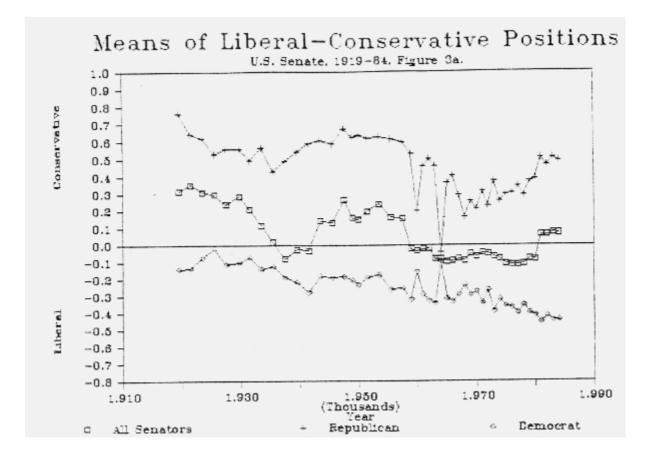
$$x_{it}^* = \frac{1}{W_t} \left[x_{it} - c_t \right]$$

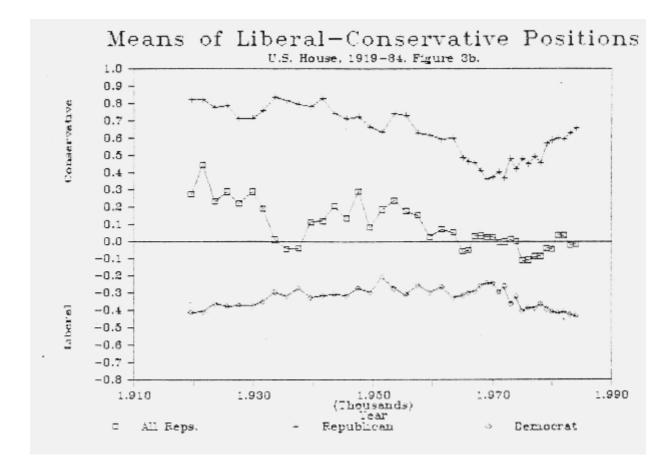
The x^{*} values for the Senate and the house are not comparable, since the c, w values are only defined up to a linear transformation. However, using interest group ratings of representatives and senators from 1959-80, Poole and Daniels (1985) also scaled Congress, this time using a least squares metric unfolding (Poole, 1984) of the ratings. For this shorter period, they also report unidimensionality. Their results, via the common ratings scales, are comparable across houses.

Like NOMINATE, the metric unfolding procedure is one whose estimation strategy is based on the spatial model of political choice behavior. But the input data to metric unfolding are distances, in the form of ratings, rather than binary choices. As such the mathematical mechanics of estimation are quite different in the two approaches. Consequently, it is important, quite independently of our desire to match up the Senate and House results, to check if the two approaches validate each other. For the comparable years, we regressed our x* values on theirs and obtained an R² value of 0.882 for the Senate and 0.914 for the House.

Having found highly consistent results from the two approaches, we used the regression coefficients to compute linear transformations of the x* values, assuming that the 59-80 regression was valid for earlier and later years. This is a strong assumption. Consequently, we do not make inter-house comparisons in changes in magnitude. We simply use the transformed values as a vehicle for placing our graphical results in a roughly comparable metric.

The remainder of our analysis is based on the transformed x^{*} values. In terms of overall mean positions, what has happened in the two houses is remarkably similar, as disclosed by Figure 3. First, the Depression, via the massive swing in seats to the Democrats outlined in the Introduction, produced a strong shift in the liberal direction. By the Mid-thirties, Congress was—given the assumptions of our model—as liberal as it has been in contemporary times. As the Republicans rebuilt strength, the pendulum swung back in a conservative direction, peaking in Harry Truman's whipping boy, the 80th Congress. Subsequently, there was a return to liberalism that stabilized in the mid sixties.





Of these changes in mean positions, by far the greatest, for both houses, was the liberal shift initiated with the elections of 1930 and continued through those of 1936. Other scholars have detailed how this dramatic shift produced a marked change in the type of policies enacted by Congress.¹¹ Ginsberg (1976), on the basis of a content analysis of party platforms and public laws, emphasizes how it produced "alterations in the economic system and redistributions of opportunities in favor of the urban working class elements" (p. 49), Sinclair (1977), using Clausen's (1973) five policy dimensions (government management, social welfare, civil liberties, international involvement, agriculture), found that only the government management dimension was present in roll call voting prior to the Depression. The most significant change was the emergence of social welfare issues in the 71st Congress (1929-30). The debate then was over direct relief. After the 73rd Congress

(1933-34), the debate was not over whether, but how much to spend (Sinclair, 1981, p. 225).

Although the work of Sinclair and other recent scholars has shown that the Depression initiated great changes in issue content, our results show that these changes were not accompanied by a change in spatial alignments. In particular, those members of Congress who served both in the twenties and in the thirties lined up very similarly in both periods. Thus, with reference to our introduction, the effect of the Depression can be summarized as largely one in which the distribution of Congress shifted along a previous existing liberalconservative dimension while, at the same time, a host of new issues were projected onto this dimension,

Simple models of party competition could be used to analyze how the distribution shifts. Research presented and literature reviewed in Poole and Rosenthal (1984) indicate that, even within a constituency, candidates for Congress are not likely to obey the simplest Downsian model in that they tend to take distinct, rather than convergent, liberalconservative positions. This polarization at the constituency level is echoed by differences in the liberal-conservative means for the two parties in Congress. However, an element of Downsian competition might remain in the sense that both parties would track changes in the distribution of voter opinion similarly. For example, if public opinion became more liberal, both parties would move in a liberal direction. A more conservative mood would drive both parties to the right,

If the parties did indeed move parallel to one another, we could not track changes in the overall (all legislators) liberal-conservative['] mean in terms of the seat shares held by the two parties. If, for example, there was a liberal movement while seat shares were unchanged, prediction in terms of seat shares would predict no change when change had indeed occurred. If, in contrast, party movements were either uncorrelated or always offsetting, prediction on the basis of seat shares would be relatively successful.

Our analysis clearly rejects viewing movement of the overall mean as the outcome of parallel movement of the two parties. Nearly all of the changes in the overall mean on the dimension can, for both the Depression and later periods, he attributed to changes in the seat shares held by the two parties. An illustration is provided by the evident, if small, swing in the conservative direction in the Senate from 1980 to 1981, occasioned by a 15 seat Republican swing in the 1980 election, and the absence of any significant change in the House, better protected by incumbency advantage from political gusts. To document this point systematically, we carried out two forecasting computations.

First, we asked what if we had predicted, knowing the results of Congressional elections but not knowing the future roll call voting record, that the mean liberal-conservative position in the future Congress could be found by taking the party means in the past Congress and weighting them by the new seat shares. That is:

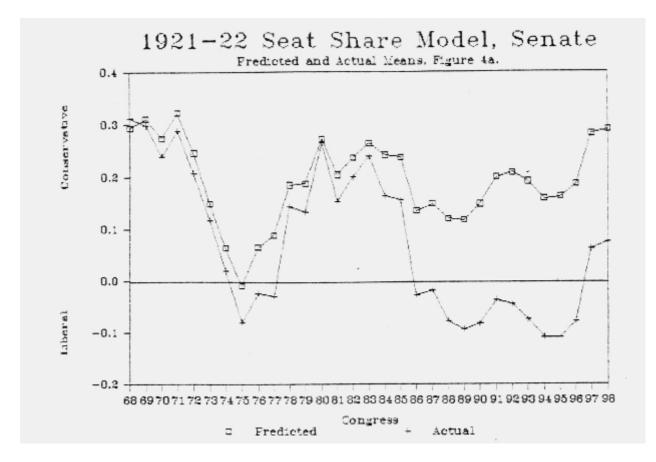
$$\overline{X}_{t,predicted} = \frac{N_{d,t}\overline{X}_{d,t-1} + N_{r,t}\overline{X}_{r,t-1}}{N_{d,t} + N_{r,t}}$$

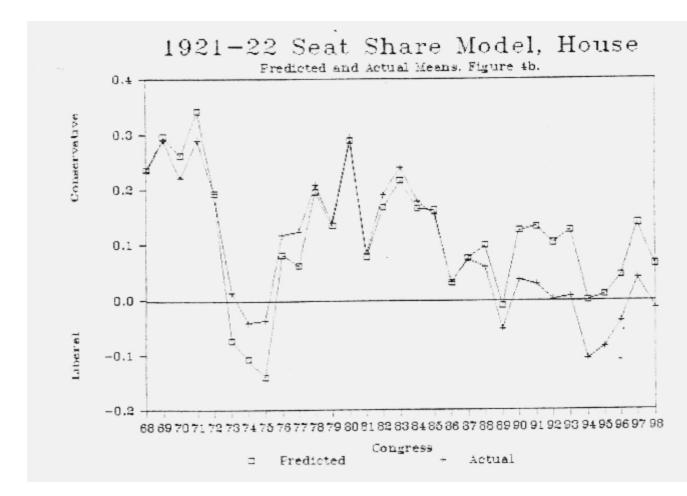
where \overline{X} denotes mean, *d*, Democrats, *r*, Republicans, and *t*-1, *t*, two successive Congresses.

The result of this exercise is that the mean liberal-conservative positions from

NOMINATE could be forecast very accurately one period ahead by this simple party share model. In the House, the root mean square prediction error is 0.026 while the standard deviation of mean liberal-conservative positions over the 32 Congresses from the 67th to the 98th is 0.130. The corresponding proportionate-reduction-in-error (R²) measure is 0.961.¹² Even in terms of forecasting the change (which obviously has less variance than the mean itself) in the mean, the R² is 0.933. For the Senate, the corresponding values of 0.952 and 0.831 are somewhat lower, but still very high.

Our second forecasting exercise involved always basing the forecasts on the 67th (1921-22) Congress party means.¹³ For the House, these forecasts led to a proportionate-reductionin-error figure of 0.706. The shrinkage from the one period forecasts (0.961) is largely explicable by a single shift. As can be seen by inspection of Figure 4b, the forecast accurately tracks the actual means until the 90th Congress. Thereafter, the House is uniformly more liberal than the forecast.¹⁴ The average forecast error from the 90th Congress through the 98th is -0.087. If the prediction is "corrected" by subtracting 0.087 from the previously forecast positions for this period, the R² jumps to 0.907.





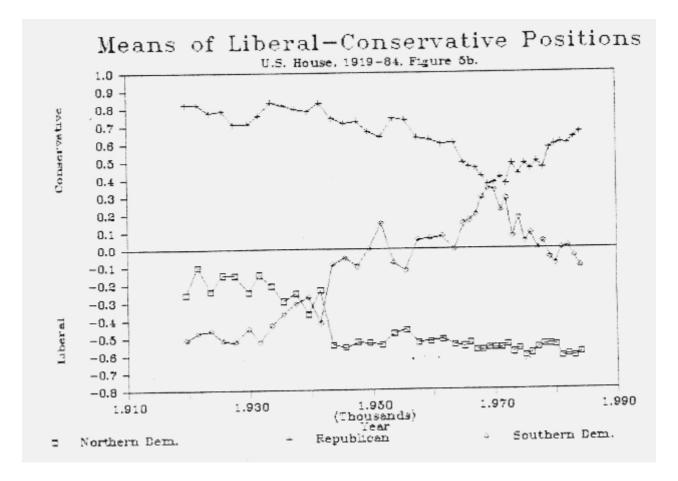
Uncorrected long-term forecasts for the Senate are very poor. Again, a single shift is the culprit. (See Figure 4a.) If we adjust by the average error of -0.229 from the 86th Congress onwards, the R² becomes 0.877, very comparable to the House results. We do not attach any significance to the fact that the Senate shift appears to predate that in the House, for the Senate scalings were highly influenced (see below) by civil rights issues during this period. On the whole, it appears that a seat share model tracks the data in both houses well until the sixties when there was, independent of seat share considerations, a permanent shift of the political center of gravity in the liberal direction. Afterwards, seat shares again account for changes in the mean liberal-conservative position.

Our results show that swings in party seat shares explain, even over very long periods

of time, almost all the variation in the mean positions of the two houses. The key role of party obviously must reflect, throughout the entire 66 year period, important distinctions in the positions of the two parties, as shown in Figure 3. The only exception is the Senate in 1964 when the civil rights debate overrode party allegiances. But party swings in seats are not the whole story because the differences between the parties changed in important ways during the period of our analysis.

In the House, the major change in position is represented by the Republican party which, up until 1966, moved in the liberal direction at a relatively constant pace. Since 1968 the Republican party has become substantially more conservative, but by 1984 the party had not retreated to its positions of the early fifties, let alone the halcyon days of Calvin Coolidge.

Changes in position of House Democrats are less dramatic. Prior to the sixties watershed, House Democrats actually move in a slightly conservative direction. Thereafter, they become slightly more liberal. This pattern masks two important trends shown in Figure 5b. The relative positions of Northern and Southern Democrats have changed. Before Roosevelt's presidency, the Southern Democrats were significantly more liberal than Northern Democrats. Consistent with our concept that the dimension largely concerns income redistribution, the relevant distinctions in this period were largely between a rich white North and a poor white South.



With the Roosevelt presidency, this distinction began to unravel, but the differences persisted. The party was moved slightly in the conservative direction by the strong increase in the number of the somewhat more conservative Northern Democrats in the early thirties. (See Figure lb.) The big switch occurred in 1943-44. Many roll call votes were taken on voting rights of members of the armed forces and other issues related to black service in the military, These signaled forthcoming black-white redistributional issues. The Northern Democrats, who had enrolled by their coalition, shifted strongly in the liberal direction, remaining in that position until the present. The Southern Democrats moved just as strongly in the conservative direction. Moreover, they continued to become more conservative in fairly steady fashion until they approached the Republican position in 1968.

By 1968, the inconsistencies of the Roosevelt coalition .had become evident. In the 1960's the South fought (often with violence) a second Civil War that shows up clearly in Figure 3b and even more so in Figure 3a for the Senate. The consequence of the outcome, as ably described by Bullock (1981), was that the Republicans inherited the mantle of Southern conservatism. Faced with competition from Republican conservatives and an enfranchised black population, Southern Democrats gravitated toward the position of their Northern counterparts. This movement and the gradual decline in the number of Southern Democrats (see Figure la) resulted in a liberalization of the Democratic party.

The process we have described in the House was largely repeated in the Senate, with important exceptions. (See Figures la, 3a, and 5a.) The liberal swing of the Republicans up until the mid sixties was less regular. As to the Senate Democrats, they have tended to become slightly, but steadily, more liberal over time. Although 1943-44 and 1967-68 were swing periods as in the House, distinctions before and after 1943-44 were somewhat different in the Senate. First, as seen in Figure 5a, there were no important distinctions between Northern Democrats and Southern Democrats pre-Roosevelt. Under Roosevelt, the Southern Democrats actually become more liberal--until the big switch. As a result, the party as a whole moved slightly in the liberal direction (Figure 3a). After the big switch, rather than continuing a conservative move as in the House, the Southern Democrats paused while the Northern Democrats became more liberal. The gradual liberal drift of the party was only temporarily offset by the big conservative swing the Southern Democrats in the early sixties. After the sixties, the Senate Northern Democrats, like their colleagues in the House, have maintained a constant liberal position. Despite pundits' claims of a more conservative mood in the country, our evidence suggests that Northern Democrats have not

moderated their positions in recent years.¹⁵

In our discussion of both fit and the underlying, long-run dimension and movement on a year-to-year basis, the race issue or civil rights has played a key role. It should be stressed that some episodic movements, particularly the strong conservative swing of Southern Democrats in 1964, are really a case of a given year not fitting the long-term dimension more than a movement along the dimension. The perturbation of the liberal-conservative dimension by the civil rights issue is shown even more dramatically by Figure 6, which shows the percentage of the total variance of each year's scaling explained by one way analyses of variance in terms of the two party and three party classifications.¹⁶ Although the three party classification cannot explain less variance than the two party classification, breaking down the Democrats into two factions added only minimally to the explained variance in the Senate through 1958. In fact, through 1935, as seen in Figure 6a, the addition is essentially zero. From 1959 through 1977, there were, with varying degrees of intensity, clear Northern and Southern factions in the Democratic party. Although these years, like the twenties, relate strongly to the basic dimension, a three party classification is needed to explain variance on the dimension, almost surely because the distributional claims of race cut across those of party. Once again, the split is highlighted by the 1964 results, where the two-party split explains virtually none (0.2%) of the variance.

[Figure 6 about here]

The variance explained by party classifications in the House shows an attenuation of the pattern observed in the Senate. Just as the House fits the long-term dimension better than the Senate, party generally explains more of the variance in the House and the fluctuations are

less dramatic. The three party model has more explanatory power than the two party model at an earlier date, but the gap between the two in the sixties is much less than in the Senate. In both the Senate and the House, party voting was extremely strong at the beginning of our time series. The decline of the role of party was reversed at the end of the sixties, but the resurgence has not yet reached the degree of liberal-conservative polarization along party lines found in the twenties.

4. Conclusion

We have argued that roll call voting in the Congress is largely unidimensional. A stable liberal-conservative pattern was only temporarily perturbed by the Depression and the civil rights issues of the sixties. Changes in the relative electoral success of Democrats and Republicans played a critical role in determining the location of the mean position in Congress. At the same time, Congress generally became more liberal and party differences attenuated up until the late sixties. Subsequently, the process has polarized.

It is too early to tell if the early eighties contain an important movement in the conservative direction. Our estimates suggest that the net conservative movement from 1980 to 1981 was fairly minor. We estimate the 1980 to 1981 movement to be less than the liberal movement induced by Democratic victories that followed the 1958 recession. The House has been particularly resistant, the conservative shift being actually slightly less than the liberal shift engendered by Watergate and no more than the midterm conservative shift resulting from the 1966 election. Moreover, the midterm elections of 1982 eliminated about half of the conservative shift of 1980 in the House and failed to further increase the shift in the Senate.

Not only do our estimates fail to disclose a truly major conservative trend but, even

more importantly, they suggest that there is no new dimensional realignment. Positions for recent years still correlate extremely highly with the basic space. The field of battle of the political system continues to be sharply defined in traditional liberal-conservative terms.

These conclusions require at least two important qualifications. First, our techniques cannot account for shifts in the overall mean of liberal-conservative preferences. If our assumption about the constancy of individual positions is incorrect and if there is, in contrast, some overall average movement of all returning members of either house, this movement will tot be captured. Second, a small change in average coordinates can be amplified into substantial changes in policy under majority rule. Thus, while the average conservative movement from 1980 to 1981 may well have been small by historical standards, the movement as accompanied by the Republicans taking control of the Senate and the Presidency. A conservative President and Senate leadership gained control of much of the agenda of roll call voting. As a result, the shift to conservative policies may have been far greater than the shift in average spatial positions.

These caveats suggest caution in making inferences about policy changes from our results. Our results, because of our inability to capture changes in the overall mean, are basically a lower bound on the extent of change from one scaling to the next. Moreover, majority rule may well lead to policy swings of greater amplitude than changes in average liberal-conservative positions. Nonetheless, we are left with the striking conclusion that the relative lineup in Congress has been remarkably stable since the end of World War I.

Why such strong unidimensionality? The results of Poole and Daniels (1985) make us

virtually certain that little systematic behavior will be revealed, even on an intra-year basis, by adding a second dimension to the NOMINATE scaling. Indeed, those roll calls that do not fit the one dimensional model tend not to involve broad policy issues but questions of geographic redistribution.¹⁷ When the debate shifts from a conflict between haves and have nots in general to issues that have differential effects on various parts of the nation, the unidimensional model will not work. That these geographic issues are not more prevalent in our data reflects, we suspect, that they are bargained out at the committee level. When a geographic issue cannot be bargained away, as with civil rights in the sixties, the issue will indeed strongly perturb the long-term dimension.

In more typical circumstances, as in strip-mining votes in the mid-seventies, for example, the details on differentials in cost imposed on western and eastern operators appear to have been largely already bargained out prior to roll call votes. As a result, such roll calls, which on the surface appear rich in geographic distributional consequences, in fact are voted on along the dimension, liberals favoring the environment and governmental regulation, conservatives being opposed.¹⁸

Unidimensionality, in addition to being partially a result of a prior bargaining process, may also, we suggest, be found as a consequence of optimizing behavior by political actors in models of incomplete information.¹⁹ Unidimensionality "solves" the following problems: (1) it allows horse-trading to occur among spatially adjacent actors in defining the midpoint on a given issue. Conditional on the midpoint, liberals and conservatives will look like they are voting in a consistent, non-strategic fashion that maintains their voting histories (Asher and Weisberg, 1978), thereby preserving their reputations (Bernhardt and Ingberman, 1985), with their electorates; (2) from the

viewpoint of voters and campaign contributors, a simple index greatly simplifies decision problems in an information poor environment; (3) similarly, the dimension greatly facilitates cue-taking by members of Congress, who, massive staffs notwithstanding, are clearly information overloaded when faced with hundreds of roll calls a year.²⁰

Time and again we see that substantive issues arise and are absorbed into the long-term dimension. Much of the discussion of the paper was devoted to showing that a racial dimension did not survive as a separate spatial axis. Another excellent example is women's rights where feminist organizations reached a position where they could not obtain bipartisan support for their objectives. In the long run, we argue, all the issues get defined in terms of the liberal-conservative dimension.

FOOTNOTES

- *This work was supported by National Science Foundation grant SES-831-390 and by an award from the NSF supercomputer program. We thank Dave Seaman and Bill Whitson of the Purdue University Computer Center for greatly facilitating our work on the Cyber 205.
- 1. In this latter task, Shepsle's framework will be highly relevant.
- 2. See Peltzman (1985) for a similar view.
- 3. Poole and Rosenthal (1985) contains the methodological argument as to why earlier analysts [e.g. MacRae (1958), Clausen (1973)] exaggerated the dimensionality of Congressional voting. See also Schneider (1979) who argues that Congressional voting in the 1970's was largely unidimensional.
- 4. Our initial work, for the Senate, was carried out on a DEC-VAX 11/780. As the larger of these scalings proved severely taxing of the virtual memory capacity of this machine, the work for the House and some Senate runs were performed on a Control Data Cyber 205.
- 5. The remainder of this paper focuses on the estimated coordinates for legislators, the x_i . As discussed in the text, Tables 1 and 2 provide a brief summary of how roll call coordinates are distributed relative to legislators. For more detailed discussion of typical sets of roll call coordinates, see Poole and Rosenthal (1985). As to the values of β and the ω parameters, they were quite stable. For 47 Senate scalings, the means (standard

deviations) of β , $\omega_{0,}$, $\omega_{1,}$ and ω_{2} , were, respectively, 18.94 (4.03), 0.51 (0.07), 0.03 (0.05), and 0.20 (0.09). The comparable results for the 43 House scalings are, respectively, 16.39 (2.05), 0.61 (0.18), 0.00 (0.06), 0.09 (0.14).

- 6. If there are p legislators and q roll calls, NOMINATE estimates p + 2q + 2 parameters (the "+ 2". represents the 4 parameters in the utility function less the 2 spatial coordinates that are arbitrary), the two party model would estimate 2q parameters, and the three party model 3q. In all our Senate scalings and 9 House scalings, p + 2q + 2 is less than 3q. A one dimensional spatial model that was only concerned with minimizing classification errors could be described in terms of only p + q 2 parameters.
- 7. Quantitative results on classification accuracy, geometric means, and bad roll calls similar to those reported here could arise were we applying our estimation procedure to data generated by roll call voting that was multidimensional over a low (two or three) dimensional space. However, the results could not arise were the space of a high dimensionality (say 20), with all dimensions equally salient. In this case, we would find classification percentages and geometric means only slightly greater than 0.5 and many "bad" roll call coordinates. Thus, it is clear that spatial models of roll call voting can be represented as models of low dimensionality. Our results indicate that a one dimensional model is an excellent approximation of the "true" space. For additional discussion of related issues, see Poole and Rosenthal (1985).
- 8. From 1919 to 1984, 662 individuals served in the Senate and 1,345 in the House. To insure some stability in the x_i estimates, we included only those legislators who had appeared in at least six scalings. For legislators in the early years where the scalings

were biennial, this criterion meant that a legislator had to have had 11 years of service to have been included.

- 9. There is a handful of individuals who had careers in both Houses. Quite independently of whether the stability assumption, justified in this case [Poole and Daniels (1985) suggest that, with a few notable exceptions, position does not change with a change in constituency], the N's are just too small to make a linkage on this basis. A direct linkage could be made for the entire period we cover by using newspaper editorial endorsements for roll calls. An endorsement is equivalent to a vote. Since newspapers endorse measures in both houses, newspapers, senators, and representatives could be plotted in a common space. Another linkage possibility is through the roll call coordinates on up-or-down conference report votes. We have not explored this as yet given the effort involved in coding roll calls.
- 10. We do not comment substantively on the low R² value for 1919-20. A senator serving in 1919-20 would have had to serve for at least 9 more years to have been included in the analysis. As a result the parameters c, w are estimated on the basis of only 35 observations in that year. In contrast, the parameters for 1927-28 are based on 65 observations. An even higher number applies to all later years. Estimates for the House, of course, are based on much larger numbers of observations,
- The more recent work includes Brady (1979, 1982); Ginsberg (1972, 1976); and Sinclair (1977,1981).
- Our measure is 1 (mean square error of forecast)/(variance of mean liberalconservative positions). This measure is less than the ordinary Pearson R² formed

by regressing the forecast means on the actual means.

- 13. Because the forecasts concern Congresses, we have averaged results for individual years, where available, in this figure.
- 14. We did not use the 66th Congress as our starting point, since the Senate data showed an important shift between the 66th and 67th Congresses. Since our singular value decomposition procedure is least accurate at the ends of a data series [see n.10], we do not comment on this shift.
- 15. See also Poole and Daniels (1985).
- 16. Since the x* values are just linear transformations of the x values, the results inFigure 6 apply to both sets of scaled values.
- Poole and Rosenthal (1985a, b) and Romer and Rosenthal (1985) provide more detail on NOMINATE results for issues that involve geographic redistribution.
- 18. Poole and Rosenthal (1985b) treats strip-mining in detail.
- 19. See Calvert (1985) for a survey of incomplete information models.
- 20. Compare the discussion of Kingdon (1973, p. 248).

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							Percent
	Geometric		Percent	Correct	Total	Off	Off
	Mean		2-Party	3-Party	Roll	Same	Same
Year	Prob.	NOMINATE	Model	Model	Calls	End	End
919-	0.721	85.1	83.2	83.8	399	82	20.6
921-	0.765	87.7	85.5	85.7	731	106	14.5
923-	0.680	81.6	79.0	<u>83.7</u> 79.9	192	42	21.6
925-	0.670	81.3	79.0	79.9	229	36	15.6
925-	0.659	79.3	76.0	76.8	185	24	13.0
927-	0.039	83.1	75.7	76.3	433	57	13.2
931-	0.645	77.9	73.0	73.9	255	32	12.5
933-	0.647	77.6	75.3	76.0	223	37	16.5
935-	0.637	77.7	74.0	74.7	189	24	12.7
937-	0.659	79.4	73.5	76.0	170	28	16.5
939-	0.646	77.7	75.0	76.3	259	51	19.7
941-	0.654	78.4	76.2	77.5	173	39	22.5
943-	0.643	78.4	75.7	78.7	210	35	16.7
945-	0.686	82.8	76.2	79.2	237	34	14.3
947-	0.710	84.2	81.4	83.1	237	40	16.9
949	0.694	82.9	79.1	80.6	230	15	6.5
950	0.664	79.4	77.1	79.2	217	23	10.6
951-	0.686	82.3	78.3	79.8	304	37	12.2
953-	0.696	82.5	78.9	81.1	242	37	15.3
955-	0.670	80.4	78.1	79.2	217	23	10.6
957-	0.666	80.4	76.7	79.5	255	63	24.7
959	0.686	82.3	77.8	80.2	185	45	24.3
960	0.672	80.2	75.5	80.6	175	24	13.7
961	0.698	82.9	76.9	81.0	191	18	9.4
962	0.711	84.9	79.1	81.1	209	28	13.4
963	0.691	82.6	78.5	81.1	214	26	12.1
964	0.704	82.0	73.7	82.5	291	59	20.3
965	0.681	82.0	76.1	79.5	235	43	18.3
966	0.690	83.0	75.8	79.6	206	39	18.9
967	0.667	81.0	77.3	79.8	268	75	28.0
968	0.661	80.0	73.5	77.6	250	40	16.0
969	0.665	80.3	74.5	78.0	211	230	14.2
970	0.698	83.3	74.5	78.7	345	46	13.3
971	0.679	81.7	74.7	78.2	353	32	9.1 17.0
<u>972</u> 973	0.690	82.6	74.8 78.7	79.0 80.5	4 <u>30</u> 499	73 98	17.0
<u>973</u> 974	0.664	84.5 81.0	73.3		499	<u>98</u> 110	19.6
<u>974</u> 975	0.664	83.3	76.6	76.4 78.7	<u>484</u> 548	52	9.5
975	0.098	84.4	76.3	78.7	<u>548</u> 596	101	9.5
970	0.683	82.3	74.9	78.7	568	90	16.9
977	0.685	83.0	75.9	77.6	469	<u>90</u> 107	22.8
979	0.667	80.4	76.3	78.0	409	41	9.2
980	0.666	80.5	77.1	78.6	480	83	17.3
981	0.698	83.1	80.9	82.5	397	64	16.1
982	0.677	81.8	79.8	80.5	421	97	23.0
983	0.670	81.1	78.4	79.1	348	74	21.3
984	0.684	82.2	80.0	81.2	230	71	30.9
Mean	0.681	81.632	76.934	79.177	311.511	51.723	16.598
Std.	0.023	2.155	2.567	2.286	133.904	26.710	5.153

Table 2. Overall Fit of Unidimensional Model, 1919-84, House							
	Geometric		Percent	Correct	Total	Off	Percent
	Mean		2-Party	3-Party	Roll	Same	Off Same
Year	Prob.	NOMINATE	Model	Model	Calls	End	End
1919-20	0.690	83.0	82.3	83.4	271	72	26.6
1921-22	0.748	87.5	86.2	86.8	325	54	16.6
1923-24	0.711	85.0	82.8	83.7	164	33	20.1
1925-26	0.696	83.3	81.1	82.2	104	21	19.8
1927-28	0.704	85.1	81.1	82.7	68	14	20.6
1929-30	0.734	86.1	84.1	84.8	98	14	14.3
1931-32	0.665	80.5	78.2	79.7	115	20	17.4
1933-34	0.721	85.3	84.3	84.9	137	17	12.4
1935-36	0.693	83.1	82.8	83.3	206	43	20.9
1937-38	0.664	80.4	79.6	81.1	153	19	12.4
1939-40	0.722	85.1	84.3	85.8	216	25	11.6
1941-42	0.676	81.2	80.4	83.5	126	21	16.7
1943-44	0.700	84.1	80.9	84.0	135	11	8.1
1945-46	0.724	85.9	81.3	85.1	206	22	10.7
1947-48	0.745	87.1	84.1	86.2	146	15	10.3
1949-50	0.690	82.6	80.1	84.8	243	43	17.7
1951-52	0.715	84.8	79.3	82.7	159	10	6.3
1953-54	0.679	82.0	79.8	83.2	120	28	23.3
1955-86	0.662	80.1	78.7	81.0	121	19	15.7
1957-58	0.654	79.0	76.6	80.0	172	19	11.0
1959-60	0.683	81.3	79.1	82.7	162	8	4.9
1961-62	0.724	85.4	81.7	83.5	202	11	5.4
1962-63	0.738	86.4	83.0	84.6	200	10	5.0
1963-64	0.737	86.3 87.2	80.0 81.1	83.5 83.8	161 143	13 14	8.1 9.8
1966 1967	0.742	86.5	81.0	83.8	145	27	13.8
1967	0.710	84.6	79.0	82.3	193	49	25.3
1968	0.723	85.5	79.0	81.6	194	15	10.7
1909	0.709	84.1	78.2	81.4	213	13	8.5
1970	0.709	83.5	76.9	80.3	267	29	10.9
1972	0.696	83.4	76.5	79.8	260	26	10.0
1973	0.684	82.5	77.9	80.0	473	70	14.8
1974	0.694	83.2	77.9	79.6	444	34	7.7
1975	0.695	83.4	78.1	80.5	536	41	7.6
1976	0.698	83.7	77.7	80.1	528	51	9.7
1977	0.694	83.5	78.5	80.5	555	60	10.8
1978	0.691	83.2	78.4	80.2	662	119	185.0
1979	0.705	84.2	79.0	80.7	572	53	9.3
1980	0.703	84.5	80.7	31.9	495	106	21.4
1981	0.706	84.5	79.8	81.9	281	64	22.8
1982	0.707	84.1	80.8	82.1	398	83	20.9
1983	0.725	85.7	82.0	83.4	432	60	13.9
1984	0.721	85.5	82.0	83.2	351	68	19.4
Mean	0.705	84.033	80.356	82.572	259.326	36.023	13.977
Std. Dev,	0.023	1.971	2.285	1.899	153.300	26.268	5.761

Table 3. Corre	ect Predictions fro	om Optimal Classif	ication Mo	dels, Senate	
All Ro	Percent Correctly Classified Roll Calls, < 60% Majority				
Year	NOMINATE	NOMINATE	2-Party	3-Party	
1919-20	87.0	89.2	86.0	86.3	
1921-22	90.0	89.3	82.9	83.1	
1923-24	84.0	83.5	77.8	78.7	
1925-26	84.3	81.3	75.2	75.9	
1927-28	82.6	80.9	75.3	76.3	
1929-30	85.4	86.5	74.4	74.8	
1931-32	81.0	75.9	67.2	68.2	
1933-34	80.5	75.0	69.4	70.8	
1935-36	80.4	76.3	67.4	68.9	
1937-38	81.7	78.9	66.2	69.0	
1939-10	80.6	78.2	69.4	71.6	
1941-42	<u>81.1</u> 81.3	<u> </u>	70.0	71.6	
<u> </u>		84.1	71.8	75.0 76.5	
1943-46	85.5 86.9	87.5	83.2	84.1	
1941-48	85.5	83.7	77.5	79.2	
1949	83.5	82.4	76.4	78.8	
1951-52	84.9	84.3	79.1	80.2	
1953-54	85.5	85.6	81.1	81.8	
1955-56	83.1	83.5	78.3	79.6	
1957-58	83.0	82.2	75.9	78.8	
1959	84.4	81.7	71.9	75.5	
1960	83.6	78.6	66.8	73.9	
1961	85.1	85.1	73.3	80.0	
1962	87.2	84.5	77.9	80.9	
1963	81.6	80.2	72.6	78.2	
1964	85.0	78.0	69.3	78.1	
1965	83.9	83.8	71.0	76.1	
1966	<u>85.3</u> 83.1	86.2	71.2	78.9	
<u> </u>	82.4	<u> </u>	69.1 65.8	72.3	
1968	82.6	77.1	67.9	73.0	
1909	84.8	82.9	58.4	75.0	
1971	83.7	81.0	71.5	76.2	
1972	85.0	83.7	68.9	75.3	
1973	86.4	82.1	73.0	76.7	
1974	83.1	79.3	57.0	72.4	
1975	85.4	82.7	70.1	76.8	
1976	86.3	82.5	70.2	75.7	
1977	84.1	80.1	69.4	74.0	
1978	84.9	79.3	60.9	71.9	
1979	82.5	78.1	71.3	74.2	
<u> </u>	82.8 85.8	78.2	/1.8 81.6	7 4.6	
1981	83.9	<u> </u>	81.6 77.3	78.4	
1982	83.7	80.6	76.1	76.7	
1985	84.4	82.5	70.1	78.6	
Mean	83.856	81,260	72.374	75.960	
Std. Demo.	1.757	3.054	4. 484	3.640	

Tabl	e 4.Correct Prediction	onsOptimal Classific	cation Models. H	House			
All Roll Calls		Percent Correctly Classified Roll Calls < 60% Majority					
Year	NOMINATE	NOMINATEE	2-Party	3-Party			
1919-20	84.3	85.2	83.9	84.2			
1921-22	88.8	81.6	76.3	76.7			
1923-24	86.7	87.2	82.8	83.2			
1925-26	85.3	81.0	76.1	76.5			
1927-28	86.3	84.1	78.7	79.1			
1929-30	87.4	88.7	85.4	85.6			
1931-32	82.5	83.4	78.7	80.2			
1933-34	86.8	78.1	73.5	75.0			
1935-36	84.2	71.5	68.3	69.7			
1937-38	81.5	74.7	71.0	73.5			
1939-40	86.5	88.1	86.7	87.3			
1941-42	82.5	81.1	79.7	83.0			
1943-44	85.6	86.1	84.2	85.0			
1945-46	87.3	87.1	83.4	85.2			
1947-48	88.6	89.4	88.1	89.0			
1949-50	84.4	84.3	77.8	83.4			
1951-	86.2	86.3	80.4	83.5			
1953-	83.9	84.0	81.1	83.3			
1955-	81.8	81.8	78.7	81.2			
1957-	80.8	79.0	75.4	78.8			
1959-	83.2	80.3	74.7	79.3			
1961-	86.7	86.3	81.4	83.9			
1963-	87.7	88.1	83.0	85.1			
1965	87.3	88.0	78.1	83.7			
1966	87.4	87.9	78.8	83.8			
1967	87.5	86.8	79.1	83.2			
1968	85.1	82.1	72.9	79.1			
1969	86.6	82.2	69.7	76.8			
1970	84.6	77.5	67.9	74.6			
1971	84.3	79.6	70.9	76.2			
1972	84.0	79.1	69.9	75.2			
1973	83.5	79.3	73.2	76.6			
1974	83.6	76.3	69.8	73.3			
1975	84.4	81.0	71.6	77.2			
1976	84.3	80.3	69.9	76.3			
1977	84.5	80.1	72.0	76.0			
1978	83.9	79.0	70.8	74.9			
1979	85.2	81.8	74.7	77.0			
1980	85.2	81.2	75.1	77.6			
1981	85.6	81.0	77.1	79.3			
1982	85.3	81.3	76.8	78.6			
1983	86.7	84.2	77.7	80.4			
1981	86.1	81.3	76.2	78.5			
Mean	85.212	82.498	76.779	79.767			
Std.	1.841	3.993	5.139	4.223			