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*Dimensions of Interest Group Evaluation of the U.S. Senate, 1969–1978**

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Each year many varied interest groups rate members of Congress. These ratings may be regarded as preferential choice data because they indicate the degree of approval of the members' voting records. Applying multidimensional unfolding to the ratings of U.S. senators for 1969–1978 produces one common evaluative dimension that accounts for approximately 80 percent of the variance.

The ten configurations were fitted together so that senators and interest groups could be tracked across time. The large majority of senators and interest groups are stable on the identified dimension over time with the exception that senators up for election tend to change position and become more ambiguous.

Dimensional thinking about politics is common. Political discussion is full of references to the "left," the "right," and the "center." Politicians are referred to as "liberal," "conservative," "leftist," "centrist," and so on, and during elections, are spoken of as "moving left," "moving right," or "capturing the center." This dimensional thinking is widespread in the press and academic worlds and evidence suggests it exists in the general population as well. The mass public appears to order political candidates along issue dimensions coherently (Aldrich and McKelvey, 1977) and to use a small number of broad dimensions to evaluate presidential candidates (Weisberg and Rusk, 1970; Rusk and Weisberg, 1972). Politicians also appear to think dimensionally. Based upon extensive interviews of congressmen, Kingdon (1973, p. 248) concludes that "congressmen are quite comfortable with thinking in terms of general evaluative dimensions and placing political objects (amendments, groups, congressmen) along those dimensions at points they perceive to be appropriate."

This paper examines the dimensionality of interest group ratings of U.S. senators. One main dimension is found to underlie these ratings, and senators tend to maintain stable positions on this dimension over time.

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Method

To rate congressmen, an interest group typically selects ten to 30 votes related to issues it deems important and then publishes a list of these votes showing how each member of Congress voted and indicating what the group thought was the correct way to vote. A congressman's rating is computed from this list by taking the ratio of "correct" to "correct" plus "incorrect" votes (some groups count absences as "incorrect" votes) and multiplying it by 100 to produce a percentage.¹ In order to enhance the comparability of the ratings of the interest groups, all ratings used in this paper were recomputed where necessary to remove absences from the "incorrect" category.

The issues of concern to the interest groups that form the basis of the ratings are, nearly without exception, what Stokes (1966, p. 179) called *position* issues. A position issue is an ordered set of policy alternatives. For example, the five most frequently used issues in the 1977 Senate ratings were food stamps (17 groups), minimum wage (14), social security financing (14), natural gas pricing (13), and the B1 bomber (10). All of them can be viewed as position issues. The positions that a group takes on a wide range of issues like those used in 1977 are very likely to be systematically related (or what Converse [1962] called *constrained*). A group that opposes food stamps for

¹Some groups are reluctant to be seen as rating congressmen so even though they publish lists of votes, they stop just short of computing actual percentages. In these cases, I computed the percentages and I shall regard these groups as engaging in the activity of rating congressmen. I was able to obtain ratings for the following groups for the years indicated: American Conservative Union (ACU), 1971, 1972, 1974–1978; Americans for Constitutional Action (ACA), 1969–1978; Americans for Democratic Action (ADA), 1969–1978; American Farm Bureau Federation (AFBF), 1978; American Federation of Government Employees (AFGE), 1973–1975, 1977; American Federation of State, County, and Municipal Employees (AFSCME), 1973, 1975–1978; American Federation of Teachers, 1975–1978; American Security Council (ASC), 1969–1978; Chamber of Commerce of the United States (CCUS), 1975–1978; Child Welfare League of America (CWLA), 1976–1977; Coalition for a New Foreign and Military Policy (CFNFMP), 1977–1978; AFL-CIO Committee of Political Education (COPE), 1969–1978; Common Cause (CCS), 1978; Congress Watch (CW), 1975–1978; Conservative Coalition (CC), 1969–1978; Consumer Federation of America (CFA), 1971–1978; Friends Committee on National Legislation (FCNL), 1977–1978; League of Women Voters (LWV), 1971–1975, 1977–1978; League of Conservation Voters (LCV), 1971–1975; Liberty Lobby (LIBERTY), 1969, 1973, 1975, 1977; National Alliance of Senior Citizens (NASC), 1977; National Council of Senior Citizens (NCSC), 1977–1978; National Education Association (NEA), 1969–1978; National Farmers Organization (NFO), 1973, 1975–1978; National Farmers Union (NFU), 1969–1978; National Federation of Independent Business (NFIB), 1977–1978; National Taxpayers Union (NTU), 1971, 1973–1978; Presidential Support, 1969–1978; Ripon Society (RIPON), 1969–1978; Citizens for a Sane World (SANE), 1973–1978; Taxation with Representation (TWR), 1977–1978; United Auto Workers (UAW), 1969–1978.

strikers is likely to favor a low minimum wage, oppose public service jobs, favor the construction of the B1 bomber, and so on. Thus, an interest group's positions on a range of issues can be determined by knowing the group's positions on a small number of evaluative dimensions. Interest groups select votes reflective of issue positions close to their own such that, on any particular vote, congressmen who vote "correctly" are closer to the group's position on the issue than congressmen who vote "incorrectly." The overall rating, then, is a measure of how close the member of Congress is to the interest group on the evaluative dimensions.

These ratings may be regarded as preferential choice data because they indicate the degree of approval by the interest groups of the members' voting records. The best available technique for determining the underlying structure of preferential choice data is unfolding analysis (Coombs, 1964). To perform an unfolding analysis, the ratings are treated as distances. The higher the rating, the closer the member is to the interest group; conversely, the lower the rating, the farther away the member is from the interest group. The aim of unfolding analysis (in this specific instance) is to place the interest groups and the members of Congress in a space of a given dimensionality such that the interpoint distances between the members and the groups reproduce the ratings as closely as possible. The ratings of the members of the Senate for the ten-year period 1969-1978 will be analyzed in this way to determine, first, how many evaluative dimensions are present each year, and second, what these dimensions are and if they persist over time. The unfolding method used is described in the appendix.

Dimensionality of the Interest Groups

Table 1 displays the unfolding results for the ten-year period. The measure of fit used was the squared Pearson correlation coefficient between the actual interest group ratings and the ratings predicted by the unfolding results. The unfolding results strongly indicate that considerable structure exists in the data. On average, one dimension "explains" approximately 80 percent of the variance for this period (mean $r^2 = .803$). For two and three dimensions, the approximate figures are 88 percent (mean $r^2 = .877$) and 90 percent (mean $r^2 = .895$), respectively. Unfolding the data in four dimensions improves the r^2 on average by only .008.

Figure 1 displays the recovery of the interest groups in one dimension for the ten years. The origin of the 1969 coordinate axis is placed at the joint centroid of the senators and interest groups of that year. The origin of the 1970 configuration was then placed such that it minimized the sum of squared differences between the positions of the interest groups and senators present in both years. This was done for each pair of adjacent years.

TABLE 1
Unfolding Results^a

Number of Dimensions	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978
1	.827	.862	.780	.854	.784	.769	.812	.824	.753	.767
2	.898	.910	.876	.901	.873	.874	.885	.887	.837	.832
3	.911	.920	.895	.909	.891	.898	.903	.905	.861	.859
Interest Groups	11	10	15	14	19	18	23	21	29	26
Senators	100	100	100	99 ^c	100	100	100	100	100	100
Total <i>N</i> ^b of Ratings	1100	983	1481	1380	1896	1798	2300	2100	2894	2595

^aAll entries are r^2 values between actual ratings and ratings predicted by the unfolding results.

^bNumber of interest groups times number of senators minus number of missing ratings.

^cKarl Mundt had no recorded votes in 1972.

The lowest r -square between years was .93, which indicates considerable year to year stability in the configurations.

It is apparent from an examination of Figure 1 that the one-dimensional solution produces a classic liberal/conservative configuration. The additional 8 percent of the variance accounted for by the two-dimensional solution is due to two effects. First, the second dimension tends to separate the liberal farmer and labor interest groups from the remaining liberal interest groups. The labor and farmer groups are, generally speaking, what Schattschneider (1960) called "private" interest groups, i.e., those with exclusive memberships which seek the exclusive interests of the members of the group. In contrast, the remaining liberal interest groups (e.g., ADA, Congress Watch, Consumer Federation of America) are, generally speaking, "public" interest groups. These groups have nonexclusive memberships and do not (officially, at least) seek the exclusive interests of the members of the group.

Second, groups that fitted poorly in one dimension (see Table 2) usually loaded highly onto the second dimension (e.g., Ripon 1973-1978). The second dimension produced practically no separation between the conservative interest groups because, based upon a reading of their literature, almost all of them are public interest groups.

The usefulness of the second dimension is severely limited by the fact that the locations of the interest groups on it were not stable over time. The separation of the public and private liberal interest groups varied widely

from year to year and there was no consistent ordering within the two groupings over time. Given the low percentage of variance accounted for by this dimension and the lack of coherent placement of interest groups along it, I feel the second dimension is not necessary for a good description of the dimensional structure.

The overall fit statistics reported in Table 1 disguise the extent to which the interest groups varied in their use of the liberal/conservative dimension to evaluate senators. Table 2 breaks down Table 1 by interest group for all ten years. Of the 187 entries in Table 2, 22 are below .5, 18 are between .5 and .7, and 147—or 75 percent—are above .7.

The far right column of Table 2 displays the mean r -square for each interest group. Although only six interest groups had mean r -squares below .7, with four of these six below .5, examining the mean fits for various categories of interest groups reveals considerable diversity. For example, of the four foreign-policy-oriented interest groups, the three liberal groups (CFNFMP, FCNL, SANE) had mean fits below .8 while the one conservative (ASC) group has a mean fit above .8. The two teachers' groups provide an interesting contrast. The American Federation of Teachers, a trade union, was considerably more ideological than the National Education Association, a professional organization. Four of the five labor union groups (UAW, AFSCME, AFT, COPE) had mean fits above .8. The one exception, the American Federation of Government Employees, had a mean fit of only .739. This lower fit is probably due to the group's practice of using only five to seven votes to calculate their ratings. The other labor groups typically used more than 10 votes. The three farmers groups were quite diverse. The conservative American Farm Bureau Federation had a very high fit (.859) with the liberal/conservative dimension for the one year (1978) that it rated. In contrast, the mean fits for the National Farmer's Union and the National Farmer's Organization disguise some interesting changes that have recently taken place in their ratings. Prior to 1977, the NFU and the NFO were moderately liberal groups with consistently high fits. Both groups, the NFO in 1977 and the NFU in 1978, appear to have abandoned liberal/conservative criteria entirely. This change is due apparently to a shift in policy by both groups from an emphasis on party line votes on a broad range of issues to a more narrow focus on farm issues that cut across party lines. In contrast to the diversity of the farmers, the two senior citizen organizations (the liberal NCSC and the conservative NASC) and the two consumer organizations (CW and CFA, both liberal) had nearly identical fits and all were above .8.

In sum, labor unions, conservative foreign policy and farm groups, and the Americans for Democratic Actions (ADA) and Americans for Con-

FIGURE 1
Interest Group Locations Over a Ten-Year Period

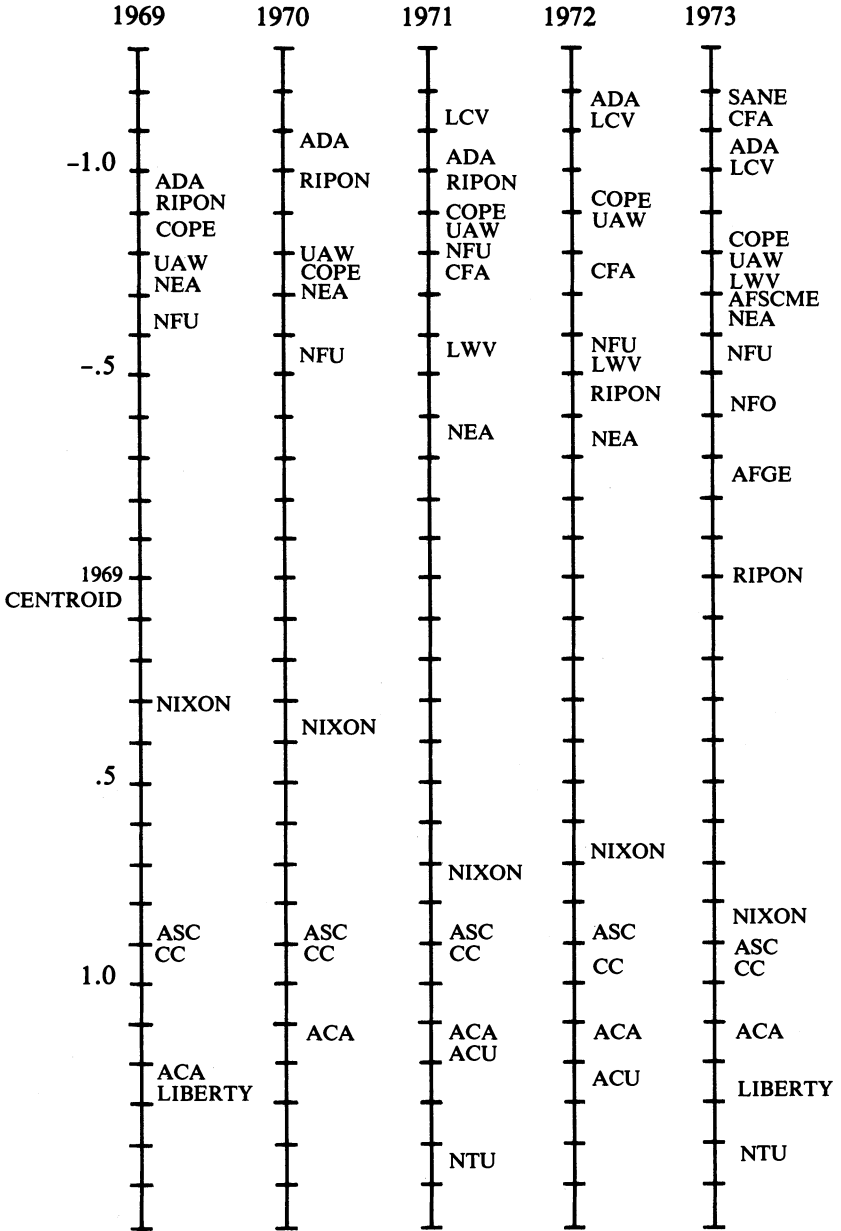
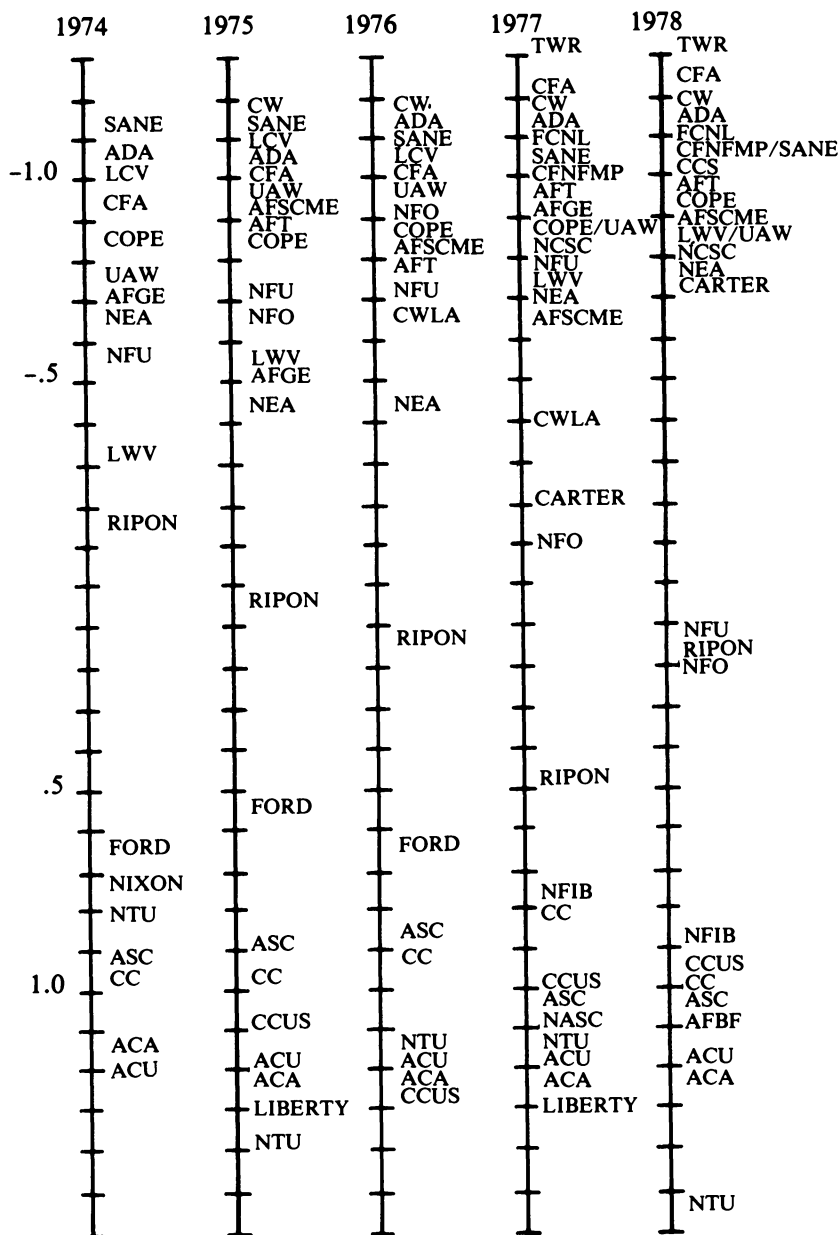


Figure 1, Continued



stitutional Action (ACA) are very ideological. The liberal foreign policy groups, environmentalists (LCV), nonunion teachers (NEA), and the League of Women Voters are somewhat less ideological. In between fall the consumer and senior citizen groups.

Two groups, the National Taxpayers Union and the Ripon Society, have especially low mean fits and account for 14 of the 22 entries in Table 2 below .5. From 1969 to 1972 the Ripon Society used the liberal/conservative evaluative dimension to a moderate degree. Beginning in 1973, however, the group sharply changed directions. From 1973 to 1978 the largest r -square was only .14, and in 1978 it fell to .00—indicating that consideration of liberalism/conservatism played no role in their ratings at all. Interestingly, the Ripon Society (*Ripon Forum*, 1979, p. 3) is quite aware of this fact:

In the new political climate a considerable degree of political statesmanship and courage is required to decide issues on their merits. The votes chosen for the 1978 Ripon ratings to an even greater degree than usual involve choices between the national interest and the more politically organized interest. The votes blur standard liberal/conservative lines with a number of self-avowed liberals and conservatives finishing on both the high and low ends of the scale.

The National Taxpayers Union bases its ratings primarily on votes concerning spending. Because liberals and conservatives favor spending money on social welfare and defense, respectively, this tends to make their ratings very

TABLE 2
Interest Group Fits for One Dimension^a

Group	Year										Mean
	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	
ACU			.953	.948		.919	.961	.896	.957	.920	.936
ACA	.876	.920	.940	.946	.955	.951	.951	.960	.960	.909	.937
ADA	.951	.922	.948	.902	.906	.907	.909	.884	.920	.879	.913
AFBF										.859	.859
AFGE					.722	.841	.610		.781		.739
AFSCME					.933		.763	.909	.675	.876	.831
AFT							.891	.911	.887	.807	.874
ASC	.828	.848	.846	.859	.840	.811	.799	.768	.807	.778	.818
CCUS							.897	.902	.943	.845	.897
CWLA								.710	.358		.534
CFNFMP									.789	.700	.745
COPE	.918	.885	.737	.880	.837	.849	.868	.935	.923	.889	.872

Table 2, Continued

Group	Year										
	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	Mean
CCS										.660	.660
CW						.872	.867	.776	.809		.831
CC ^b	.960	.967	.922	.980	.955	.963	.956	.935	.889	.930	.946
CFA			.808	.875	.815	.842	.840	.842	.789	.664	.809
FCNL									.809	.770	.790
LWV			.603	.797	.722	.689	.757		.810	.756	.733
LCV			.730	.750	.692	.747	.788	.780			.748
LIBERTY	.843				.624		.837		.778		.771
NASC									.831		.831
NCSC									.862	.859	.861
NEA	.804	.834	.694	.693	.858	.830	.767	.775	.700	.723	.768
NFO					.700		.762	.728	.016	.076	.456
NFU	.793	.914	.897	.737	.877	.925	.893	.838	.624	.031	.753
NFIB									.635	.799	.717
NTU			.119		.176	.045	.220	.532	.380	.423	.271
NIXON ^c	.279	.646	.791	.875	.886	.834					.719
FORD ^c						.463	.741	.826			.677
CARTER ^c									.586	.843	.715
RIPON	.593	.647	.352	.379	.034	.103	.044	.029	.141	.000	.232
SANE					.740	.709	.741	.656	.773	.700	.720
TWR									.451	.497	.474
UAW	.916	.889	.920	.920	.935	.908	.947	.918	.923	.934	.921

^aAll entries are *r*-square values between actual interest group ratings and ratings predicted by the unfolding results.

^bConservative coalition support scores (corrected to remove absences) from *CQ* were used as ratings.

^cPresidential support scores (corrected to remove absences) from *CQ* were used as ratings.

similar. However, in the last three years, the NTU does seem to be using the liberal/conservative dimension to a moderate degree.

Three Presidents—Nixon, Ford, and Carter—served during this period and fits for presidential support all followed the same pattern. The fit is always lowest the first year of a presidency and then—with the exception of Nixon in the Watergate year of 1974—rises continuously thereafter. Presumably, the low fit in the first year of a presidency is due to the “honey-

moon effect." That is, senators, especially those of the president's party, are voting with the president on many issues despite their own views to demonstrate their good will toward the new president and as a show of national unity. In addition, senators normally in the opposition to a president may refrain from raising their own proposals during the first year of a new administration. As a president's term wears on, this honeymoon melts away until finally members of the president's party begin to vote their own views and the resultant ratings thus reflect a more pure liberal/conservative alignment.

In sharp contrast to Ripon, NTU, NFO, and NFU, most interest groups are very stable in terms of their fits over time. Most notable in this regard are the ADA, ACA, and the Conservative Coalition.

Many investigators over the years have used the ADA and ACA ratings as measures of liberalism/conservatism in empirical studies of Congress. Table 2 shows that the confidence investigators have had in these ratings as measures of liberalism/conservatism was not misplaced. The mean r -squares for the ACA and the ADA over the ten years were .937 and .913, respectively, indicating that as measures of liberalism/conservatism the ACA and ADA ratings are good bets. However, I would recommend that in the future investigators use a modification of the *CQ* conservative coalition scores as the liberalism/conservatism measure. I modified the conservative coalition scores by adding the support and opposition scores, dividing the total into the support score, and then multiplying by 100. As noted earlier, this removes the absences from the "incorrect" category. The mean r -square for this modified conservative coalition for the ten years is .946—about as pure a measure as one could ask for.

The fact that most major interest groups use only one dimension to evaluate members of Congress appears to be somewhat anomalous in light of the evidence produced by Clausen (1973; Clausen and Van Horn, 1977a, 1977b; Clausen and Cheney, 1970), Weisberg (1968), and MacRae (1958, 1970) for the existence of multiple dimensions of congressional decision-making. On closer examination, however, this anomaly does not appear to be very important. The interest groups are free to select votes of importance to them from any number of policy areas. Some groups select votes from only one area; some from a wide variety of areas. Most of the policy dimensions found in the above studies are such that strong liberals and conservatives are likely to be at the opposite ends of them. Hence, in almost any policy area an interest group can find a vote or votes that tend to separate senators purely along liberal/conservative lines. This being the case, it is not surprising that these policy dimensions do not appear in an analysis of the interest group ratings if the interest groups are using a single liberal/conservative evaluative dimension.

Analysis of the Senators' Behavior

A total of 161 senators served during this ten-year period. They generated a total of 999 fits, of which approximately 16 percent (157) were below .5, 16 percent (161) were between .5 and .7, and 68 percent (681) were above .7. The fit is the r -square between the actual and predicted ratings. In effect, the fit or r -square is a measure of *ambiguity*. The greater the congruence of the perceptions of the senator's position on the dimension, the greater the likelihood that a senator emphasized liberal/conservative criteria in voting decisions. The degree of fit is also related to the position on the liberal/conservative continuum. The correlation between the fits and the distances the senators are from the centroid is $+ .777$. There are two reasons why this is the case. First of all, there are no centrist interest groups rating senators. A centrist senator will be distant from both liberal and conservative interest groups. Because interest groups select votes reflective of issue positions close to their own, this has the effect of making it easy for the groups to rate senators as being close to them or far away by using a relatively small number of votes. To rate senators a middling distance away with the same accuracy, however, requires more votes than are needed to rate the close/distant senators. Consequently, the ratings of centrist senators will likely contain more error than those of senators near the ends of the dimension. Furthermore, the range of variation in the ratings of senators at the ends of the dimension will be much greater than that for those near the center, which has the effect of depressing the correlations and hence the r -squares between the input and reproduced ratings of the centrist senators.² Secondly, a centrist senator's voting decision is more difficult than that of a senator near one of the ends of the dimension. Kingdon (1973, p. 249) makes this point well:

The congressman on the end is only required to treat ideological continua ordinarily: He simply needs to see objects as closer or farther away and to choose the closest one. But the congressman in the middle must additionally treat a dimension in an interval fashion: He must judge *how far* from his middle position in either direction a given proposal is. Such a task is much more difficult, and makes ideological dimensions much less useful than they are for ideologues of the Left or Right.

Consequently, a centrist senator is not only more likely to make perceptual errors, he or she is also more likely to use criteria other than the position on the dimension.

The above analysis can also be used to argue that a centrist senator over time will be less *consistent*, that is, his or her position on the dimension will vary more widely than a senator located near either end. The ratings of centrist senators contain more error. Hence the recovered position will likely vary more from year to year than that of a senator near either end.

²See Poole (1978, Ch. 4) for a more detailed discussion of this problem.

TABLE 3
Consistency and Ambiguity of Senators Present All Ten Years

Senator	State	Party	Mean Position	Standard Deviation	
				of Position (Consistency) ^a	Mean Fit (Ambiguity) ^b
Kennedy	MA	D	-.750	.051	.948
Nelson	WI	D	-.712	.071	.898
McGovern	SD	D	-.692	.064	.902
Williams	NJ	D	-.688	.049	.929
Muskie	ME	D	-.676	.075	.909
Cranston	CA	D	-.669	.055	.942
Pell	RI	D	-.664	.073	.925
Bayh	IN	D	-.644	.036	.903
Ribicoff	CT	D	-.637	.075	.900
Case	NJ	R	-.614	.062	.865
Eagleton	MO	D	-.595	.103	.864
Church	ID	D	-.548	.091	.846
Inouye	HI	D	-.532	.080	.861
Javits	NY	R	-.531	.073	.861
Brooke	MA	R	-.529	.092	.857
Gravel	AK	D	-.503	.120	.783
Proxmire	WI	D	-.501	.111	.586
Burdick	ND	D	-.484	.114	.788
Magnuson	WA	D	-.459	.048	.824
McIntyre	NH	D	-.431	.096	.798
Mathias	MD	R	-.418	.096	.762
Jackson	WA	D	-.393	.108	.697
Schweiker	PA	R	-.321	.325	.778
Hatfield	OR	R	-.295	.132	.590
Randolph	WV	D	-.269	.063	.627
Percy	IL	R	-.203	.080	.615
Byrd	WV	D	-.060	.214	.386
Cannon	NV	D	.011	.094	.344
Packwood	OR	R	.031	.168	.428
Hollings	SC	D	.042	.128	.305
Pearson	KS	R	.086	.197	.608
Stevens	AK	R	.183	.155	.577
Sparkman	AL	D	.323	.233	.564
Long	LA	D	.342	.140	.461
Talmadge	GA	D	.459	.182	.547
Baker	TN	R	.575	.150	.749

Table 3, Continued

Senator	State	Party	Mean Position	Standard Deviation of Position (Consistency) ^a	Mean Fit (Ambiguity) ^b
Griffin	MI	R	.576	.099	.681
Bellmon	OK	R	.601	.143	.750
Young	ND	R	.630	.121	.782
Dole	KS	R	.646	.106	.793
Stennis	MS	D	.733	.111	.778
Eastland	MS	D	.738	.150	.771
Byrd	VA	I	.803	.077	.817
Thurmond	SC	R	.892	.152	.906
Tower	TX	R	.898	.069	.900
Hansen	WY	R	.936	.076	.929
Goldwater	AZ	R	.962	.093	.891
Curtis	NE	R	.963	.065	.936

^aStandard deviation of the positions on the dimension over the 10 years.

^bMean of the *r*-square values between actual interest-group ratings and the ratings predicted by the unfolding results.

A total of 48 senators were present for the entire ten-year period. Table 3 lists them in order of their mean position over ten years, along with their consistency (as measured by the standard deviation of their positions on the continuum for the ten years)³ and their mean fit. Since the length of the dimension is approximately two units (see appendix), multiplying the consistency values by 100 gives an interval two standard deviations wide expressed as a percentage of the total length of the dimension. In this sense then, consistency ranged from 3.5 percent to 32.5 percent of the total length of the dimension, with 40 of the 48 senators at 15 percent or below.⁴ That the overall consistency of the senators is good is not surprising in light of the fact (though it need not follow from it) that the year to year stability of the configurations is very high.

³Because I am dealing with the universe of observations—viz., all available ratings—I am using the population formulas for variance and standard deviation rather than the sample formulas.

⁴These figures were checked by using another measure of consistency—the residual sum of squares of a simple linear regression where the dependent variable is the position on the dimension and the independent variable is time (the units used for time were the integers 1 through 10). The slopes calculated in the regression, except for the five most inconsistent senators, were all near zero. This method produced nearly the same rank order of consistency values as that shown in Table 3.

Political moderation, lower fit, and inconsistency tend to occur together. The correlation between the consistency and mean fit columns of Table 3 is .512 while the correlation between the consistency column and the distances the senators are from the centroid is $-.465$. It is possible, however, to be a consistent centrist or to be unambiguous and inconsistent. For example, over the ten-year period, the fit of Cannon of Nevada varied from a high of .692 to a low of .162 while his position on the dimension always was near the centroid. Senator Thurmond of South Carolina was one of the most conservative members of the Senate from 1969 to 1976. He was the most conservative in 1970 and was always among the ten most conservative members until 1976. In 1977 he appears to have considerably moderated his voting behavior and shifted from far right to right center slipping, in the process, from third most conservative senator in 1976 to nineteenth most conservative in 1977 to twenty-second most conservative in 1978. Significantly, his fit never fell below .75. It dropped from .95 in 1976 to .75 in 1977 but then went back up to .85 in 1978. The interest groups were clearly in substantial agreement that a change in his position had taken place.

Thurmond was up for reelection in 1978. Could he have deliberately moderated his positions on issues to enhance his reelection chances? Thurmond won the 1972 election with 63.3 percent of the vote and won the 1978 election with 56 percent of the vote. But is the 7 percent drop what he limited his losses to by moderating his issue stands or is the 7 percent drop due to the moderation itself? There is no sure way to answer this question with these data but the larger question of whether or not senators shift position (i.e., become less consistent) prior to an election can be answered. (By less consistent, I mean that, like Thurmond, some senators may moderate their positions, others may become more extreme, or still others may oscillate depending upon the circumstances in their respective states.)

To test this question, I subtracted the square root of the mean of the sum of the squared deviations of the last two years from the square root of the mean of the sum of the squared deviations of the first four years of the term (the mean in both cases was the six-year mean, so these are not technically standard deviations) for all senators up for election in 1972, 1974, 1976, and 1978.⁵ If a senator becomes less consistent, then the difference be-

⁵That is,

$$\sqrt{\frac{\sum_{i=1}^4 (x_i - \bar{x})^2}{4}} - \sqrt{\frac{\sum_{i=5}^6 (x_i - \bar{x})^2}{2}} \text{ where } \bar{x} = \frac{\sum_{i=1}^6 x_i}{6}$$

and the x_i are the positions on the dimension.

TABLE 4
The Election Effect

	Mean of the Standard Deviation Differences				Mean of the Average Fit Differences			
	1972 ^a	1974	1976	1978	1972 ^b	1974	1976	1978
Reelected	-.017 ^c (19)	-.028 (22)	.005 (16)	-.009 (15)	.030 ^d (19)	.093 (22)	.003 (16)	.053 (15)
Defeated	-.017 (5)	.012 (2)	-.022 (9)	.001 (6)	-.040 (5)	.035 (2)	.034 (9)	.053 (6)
Total	-.017 (24)	-.025 (24)	-.005 (25)	-.005 (21)	.015 (24)	.088 (24)	.014 (25)	.053 (21)
<i>t</i> values	1.435	2.110*	.430	.398	.402	2.358*	.382	1.339

^aThese values based upon comparing the standard deviations of the two-year period 1969-70 with 1971-72.

^bSame as above for the mean of the differences in average fit.

^cA positive value means consistency increases prior to an election.

^dA positive value means fit decreases prior to an election.

*Significant at the .05 level.

tween the two "standard deviations" will be less than zero. If a senator becomes more consistent or stays the same, then the difference between the two "standard deviations" will be greater than or equal to zero.

Table 4 displays the mean of these differences for the four elections. For comparative purposes, Table 4 also shows the mean of the differences for the reelected and defeated senators. There is no clear pattern between the two groups but combining both groups produces a clear election effect. Compared to the standard deviations in Table 3, these values are not large and only for 1974 is the value statistically significant. Nevertheless, there is a clear tendency for senators to become less consistent as an election approaches.

Table 4 also shows the mean of the differences between the average fit for the first four years of the term and the average fit for the last two years of the term for all senators up for election in the four election years of the

period.⁶ If a senator's fit drops in the last two years, then the difference between the two means will be greater than zero. Since consistency and fit are related, a reasonable conjecture is that those senators up for election become more ambiguous prior to it. That is, they could "fuzz" their positions on issues to broaden their appeal and hence enhance their electoral prospects. This does seem to be the case, even though the 1974 value is the only one that is statistically significant.

Although senators up for election appear to slightly shift position and become more ambiguous prior to the election, it is not clear from these data that this behavior affects their reelection chances. For example, of the five most inconsistent senators, Pearson of Kansas, Talmadge of Georgia, majority leader Byrd of West Virginia, Sparkman of Alabama, and Schweiker of Pennsylvania, only Byrd and Talmadge are presently in the Senate and running for reelection in 1980. Pearson and Sparkman retired in 1978, but their retirements appear not to be due to their inconsistency. Pearson received 71.4 percent and Sparkman 62.3 percent of the vote in their reelections in 1972, which suggests that both probably could have remained in the Senate if they had desired to. Majority leader Byrd, the closest to the centroid and the one with the lowest mean fit of the five, was reelected in 1970 with 77.6 percent of the vote and won reelection in 1976 unopposed. His inconsistency and location near the centroid make sense given the scheduling responsibilities of the majority leader and the diverse nature of the Democratic party. His popularity in West Virginia is obviously unaffected by his inconsistency. Talmadge won reelection in 1974 with 71.7 percent of the vote and is apparently in trouble in Georgia in his 1980 reelection effort. However, Talmadge's troubles are due to a well-publicized financial scandal rather than to his inconsistency. Only for Schweiker can a case be made that his inconsistency is related to his tenure in the Senate.

From 1969 to 1976 Schweiker was a moderate liberal and indeed appeared to be slowly drifting further left. However, in 1976 Schweiker was chosen by Ronald Reagan as his running mate. This evidently radically altered Schweiker's subsequent voting behavior. His shift in position from 1976 to 1977, from $-.609$ to $+.269$, was the largest of any senator serving

⁶That is,

$$\frac{\sum_{i=1}^4 r_i^2}{4} - \frac{\sum_{i=5}^6 r_i^2}{2}$$

where the r_i^2 are the r -squares between the actual and predicted ratings.

two or more years during the ten-year period. Evidently his conversion at the hands of Ronald Reagan is a lasting one. Schweiker's position in 1978 is just slightly more conservative (.311). Significantly, Schweiker has announced that he will not run for reelection in 1980. The Senator Schweiker that won reelection with 53 percent of the vote in 1974 was a moderate liberal while the Senator Schweiker that would stand for reelection in 1980 is a moderate conservative. Schweiker's decision not to run cannot be definitively linked to his radical shift in position because he may have never intended to run for reelection in 1980. On the other hand, Schweiker may have decided not to run in 1980 because, given his close victory in 1974, he may have judged that his shift in position would not sit well with the voters.

These exceptions serve only to emphasize the rule. *The overwhelming majority of senators are stable over time.* Even with the election effect, the typical senator remains within a narrow range on the liberal/conservative dimension.

Conclusion

I have shown that most interest groups emphasize the same evaluative dimension and are in close agreement on the placing of senators along this dimension over the past ten years. I have assumed that the interest groups select votes reflective of issue positions close to their own such that, on any particular vote, congressmen who vote "correctly" are closer to the group's position on the issue than congressmen who vote "incorrectly." By this argument, the overall rating is a measure of how close the member of Congress is to the interest group on the evaluative dimensions. I have also shown that the typical senator remains within a narrow range on the liberal/conservative dimension. This implies that the senators had to be reacting to the issues important to the interest groups *consistently over time*, which means that the typical senator was maintaining fixed position(s) on some general evaluative dimension(s). Technically, the evaluative dimension(s) used by a senator to react to these issues need not be the same as another senator nor need they be the ones that the interest groups use. However, given these data, there is no way to distinguish this much more complex state of affairs from the simpler one where the senators are all using the liberal/conservative dimension. Functionally, the two are equivalent.

This finding of overall stability meshes well with recent work. Fenno (1978, pp. 157-160) found that members of the House are very consistent in explaining their votes. Kingdon (1973, pp. 254-257) found that a consistent voting history simplified the voting decisions of House members. Asher and Weisberg (1978, p. 391) note that the "policy decisions of the United States Congress as reflected in voting outcomes exhibit substantial continuity over

time. When change does occur, it tends to be evolutionary and incremental as opposed to revolutionary and dramatic.” Given this stability in voting, it is logical to assume that if interest groups and senators over time use stable sets of evaluative dimensions to react to issues that the interest groups deem important, then the locations of the senators on the evaluative dimensions recovered from an unfolding analysis should show a similar stability over time. This is indeed the case.

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APPENDIX

The ratings were transformed into distances by subtracting them from 100 and dividing them by 50. This transforms the ratings from a range of zero to 100 to distances with a range of two to zero. The recovered configuration is then confined to a space with a diameter of approximately two units. The unfolding procedure consisted of two stages. In the first stage, Cahoon’s (1975) statistical procedure was used to obtain a first estimate of the configuration. In the second stage, this was used as the starting configuration for a standard gradient routine which was used to “focus” the configuration (it usually improved the fit by a factor of about .2).

Let z_{jk} be the j th ($j=1, \dots, q$) interest group’s estimated position on the k th ($k=1, \dots, s$) evaluative dimension, let x_{ik} be the i th ($i=1, \dots, p$) senator’s estimated position on the k th evaluative dimension, and let d_{ij} be the resultant distance between them. Denote the transformed ratings by d_{ij}^* . The sum of squared error at the start of the gradient routine, therefore, is

$$\mu = \sum_{i=1}^p \sum_{j=1}^q e_{ij}^2 = \sum_{i=1}^p \sum_{j=1}^q \{d_{ij}^* - [\sum_{k=1}^s (x_{ik} - z_{jk})^2]^{1/2}\}^2 \tag{1}$$

Taking the partial derivatives with respect to the x_{ik} and z_{jk} yields the $q \cdot s$ expressions:

$$\delta\mu/\delta z_{jk} = -2 \sum_{i=1}^p (x_{ik} - z_{jk}) (1 - \frac{d_{ij}^*}{d_{ij}}) \tag{2}$$

and the $p \cdot s$ expressions

$$\delta\mu/\delta x_{ik} = 2 \sum_{j=1}^q (x_{ik} - z_{jk}) (1 - \frac{d_{ij}^*}{d_{ij}}). \tag{3}$$

The coordinates at the h th iteration of the gradient procedure are given by

$$z_{jk}^{(h)} = \frac{z_{jk}^{(h-1)} \sum_{i=1}^p \frac{d_{ij}^*}{d_{ij}^{(h-1)}} + \sum_{i=1}^p (1 - \frac{d_{ij}^*}{d_{ij}^{(h-1)}}) x_{ik}^{(h-1)}}{p} \tag{4}$$

$$x_{ik}^{(h)} = \frac{x_{ik}^{(h-1)} \sum_{j=1}^q \frac{d_{ij}^*}{d_{ij}^{(h-1)}} + \sum_{j=1}^q (1 - \frac{d_{ij}^*}{d_{ij}^{(h-1)}}) z_{jk}^{(h-1)}}{q} \tag{5}$$

The procedure usually converged in less than ten iterations.

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