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# On Measuring Partisanship in Roll-Call Voting: The U.S. House of Representatives, 1877–1999

**Gary W. Cox** University of California, San Diego
**Keith T. Poole** University of Houston

We propose a method of assessing party influence, based on a spatial model. Our method provides the first test of whether observed values of the widely-used Rice index of party dissimilarity are consistent with a "partyless" null model. It also avoids problems that beset previous estimators.

Substantively, we find evidence of party influence in all but one Congress since 1877. Moreover, our indicator of party pressure is systematically higher for the sorts of roll calls that party theorists believe are more pressured—procedural, organizational, and label-defining votes. Our results refute the widespread notion that parties in the House have typically had negligible influence on roll-call voting behavior. They also document important changes in party influence associated with the packing of the Rules Committee in 1961 and the procedural reforms of 1973.

In this article, we devise a general estimator of (variation in) party influence in roll-call voting. Our approach entails comparing the actually observed Rice index for each roll call to the expected index under a null model in which party pressures are constant. Rejecting the null thus entails rejecting the hypothesis that party pressures are nil. We propose our method because we believe the path-breaking Snyder-Groseclose (2000) estimator is biased toward finding party effects, while the McCarty, Poole, and Rosenthal (2001) article misinterprets the statistical tests they provide.[1]

When applied, our method uncovers evidence of party influence in all but one U.S. House since 1877. Our results thus refute the notion, articulated by Mayhew (1974) among many others, that parties in the House have generally had negligible influence on roll-call voting behavior. We also find important changes in party influence associated with the packing of the Rules Committee in 1961 and the subcommittee bill of rights in 1973.

The rest of the article proceeds as follows. We first describe a standard unidimensional spatial model of legislative voting. Poole (2001) provides a method of estimating the parameters of our model—in particular, each member's ideal point and standard error and each roll call's cutpoint and gap parameters. Given these parameter estimates, we show how to derive a theoretical distribution for the Rice index of party difference, under the null hypothesis of constant party influence (which includes nil influence as a special case). We then contrast our method to previous techniques (Snyder and Groseclose 2000; McCarty, Poole, and Rosenthal 2001). Empirically, we implement our tests for all roll calls (with cutpoints between the party medians) in all congresses from the 45th (1877–79) to the 105th (1997–99). We also present tests based on a two-dimensional model, to

Gary W. Cox is Professor of Political Science, University of California, San Diego, La Jolla, CA 92093-0521 (Gcox@weber.ucsd.edu). Keith T. Poole is Professor of Political Science, University of Houston, Houston, TX 77204-3011 (Kpoole@uh.edu).

We thank participants in seminars at the University of Houston and Washington University in St Louis for helpful comments on an earlier draft.

[1]These new approaches were motivated by the fact that traditional roll-call-based measures of party voting suffer a significant and well-known problem: they increase in size not only when parties devote more resources to influencing their members' votes but also when preferences within parties simply become more similar (see, e.g., Kingdon 1973; Cox 1987, 29; Krehbiel 2000).

*American Journal of Political Science*, Vol. 46, No. 3, July 2002, Pp. 477–489

 ISSN 0092-5853

yes. In terms of the model above, Rice's index is just $Rice(c_j,d_j;s,x) = |D_L(c_j,d_j;s,x) - R_L(c_j,d_j;s,x)|$. Ignoring the probability that more Republicans vote "left" than Democrats, the absolute value signs can be dropped. Thus, the Rice index for the jth roll call is normally distributed, as it is a linear combination of normal variates. Its mean and variance are as follows:

$$\mu_j = E[Rice(c_j,d_j;s,x)] = E[D_L(c_j,d_j;s,x)] - E[R_L(c_j,d_j;s,x)]$$

and

$$\sigma_j^2 = Var[Rice(c_j,d_j;s,x)] \\ = Var[D_L(c_j,d_j;s,x)] + Var[R_L(c_j,d_j;s,x)].$$

## A Statistical Test for Party-Separating Forces

Suppose that we have estimated the parameters of the model—s, x, $d=(d_1,\ldots,d_n)$, and $c=(c_1,\ldots,c_n)$—using roll calls from a given Congress. To begin with, ignore the error in these estimates—assume they are all the true parameters. In this case, for each roll-call j, we can look at the empirically observed value of the Rice index and test the null hypothesis that it could have been generated by the model (with the stipulated parameters)—that is, by a normal distribution with mean $\mu_j$ and standard deviation $\sigma_j$. We reject the null hypothesis for any roll call on which the empirically computed Rice index is surprisingly large, exceeding $\mu_j + 1.96\sigma_j$, or surprisingly small, falling short of $\mu_j - 1.96\sigma_j$.

One interpretation of our test is in terms of party-separating pressures. Let $\pi_{DDj}$ denote the total amount of pressure applied by Democrats on Democrats to vote left; $\pi_{DRj}$ denote the total amount of pressure applied by Democrats on Republicans to vote left; with $\pi_{RRj}$ and $\pi_{RDj}$ denoting Republican pressures to vote right. Focusing on roll calls with cutpoints between the party medians, as we do in our empirical analysis below, the pressures $\pi_{DDj}$ and $\pi_{RRj}$ act to *separate* the parties: the larger are such pressures, the more differently the two parties will vote. In contrast, the pressures $\pi_{DRj}$ and $\pi_{RDj}$ *unite* the parties: the larger are such pressures, the more similarly the two parties will vote. Thus, $Q_j = (\pi_{DDj} + \pi_{RRj}) - (\pi_{DRj} + \pi_{RDj})$ is the net party-separating force exerted by the parties on roll-call j. Positive values of $Q_j$ indicate a preponderance of party-separating forces, while negative values indicate a preponderance of party-uniting forces.

To explain the relationship between our test and party-separating pressure, denote the average pressure across all roll calls by Q and suppose that $Q_j = Q$ for all j: the parties exert a constant pressure on all roll calls. Without loss of generality, consider the case in which $Q > 0$. In this case, Democrats' *estimated* ideal points will be farther left than their partyless ideal points would be, while Republicans' estimated ideal points will be farther right. The location of legislators' ideal points, in other words, will already reflect their parties' "average" pressures.[3]

If one seeks to detect party pressure while controlling for the estimated ideal points, one will only detect variation (from roll call to roll call) around the mean level of party pressure. When party pressure is well above-average, the parties will vote more *differently* than would be expected on the basis of the estimated ideal points, yielding a higher-than-expected Rice index. When party pressure is well below average, in contrast, the parties will vote more *similarly* than would be expected on the basis of the estimated ideal points, yielding a lower-than-expected Rice index. However, when party pressure is near average, then the Rice index will be close to what one expects on the basis of the array of ideal points.

All told, then, our test detects party pressures that differ significantly from the average pressure, Q, reflected in the estimated ideal points. For a single roll call, *the null hypothesis is that party pressures on that roll call are average:* $Q_j = Q$. For a set of roll calls, *the null hypothesis is that party pressures are constant:* $Q_j = Q$ for all j.

Note two things about these null hypotheses. First, rejecting the null entails rejecting the narrower hypothesis that the parties exert nil separating pressure ($Q_j = 0$). Second, rejecting the null does not entail rejecting the hypothesis, propounded by Krehbiel, that party pressures on each roll-call balance, in the sense that the outcome of the roll call is the same as it would have been absent any pressure.[4]

[3]We put "average" in quote marks because the estimated ideal points cannot be shown to be a closed-form function of the simple average of party pressures. However, as the average party pressure increases, each Democrat's ideal point shifts left, each Republican's shifts right. This notion is recognized in McCarty, Poole, and Rosenthal, who note that their model does "not rule out polarization due to party pressures . . ." (680).

[4]For the record, we believe there is substantial evidence that the majority party has more resources with which to affect votes (see Aldrich and Rohde 2000). Moreover, political action committees say that majority status matters (Grenzke 1988), and they put large amounts of their money where their mouths are (Cox and Magar 1999; Ansolabehere and Snyder 2000). Also, the political parties themselves fight hard for majority status. All this suggests strongly that the majority party is better able to influence outcomes than the minority—which entails rejecting Krehbiel's balancing hypothesis.

These results support the general notion of parties as procedural cartels (Cox and McCubbins 1993). Moreover, they shed light on the partisan consequences of two watershed organizational episodes in House history. Finally, they help refute the widely-held "minimal party effects" thesis about roll-call voting in the U.S. House. As articulated by Mayhew: "Party 'pressure' to vote one way or another is minimal. Party 'whipping' hardly deserves the name" (1974, 100). This view of party strength is common—indeed, arguably dominant—in the literature of the 50s, 60s, 70s, and 80s. Our results argue against it strongly. It is not just that there are statistically significant party effects. They are substantively significant, too. McCarty, Poole, and Rosenthal (2001), Hager and Talbert (2000), and Nokken (2000) have shown that members who switch parties (and thus change the nature of party pressures by which they are influenced) exhibit big changes in voting behavior. In this article, we have shown that hypothetically changing a roll call from a "low" pressure (e.g., a substantive vote) to a "high" pressure one (e.g., an organizational vote) would switch from twenty to forty votes in the period 1973–99, in a one-dimensional model, and four to twelve, in a two-dimensional model. Thus, party pressure does affect a noticeable number of votes, even controlling for ideal points that themselves impound party pressures. Moreover, the pressured votes count because procedural and organizational decisions strongly influence substantive outcomes.

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