

# WEIGHING THE ALTERNATIVES: \*

PREFERENCES, PARTIES, AND CONSTITUENCY IN ROLL CALL VOTING

Adam Ramey<sup>†</sup>

September 1, 2009

## Abstract

Theories of parties and lawmaking typically require measures of legislators' preferences for empirical analysis (Aldrich & Rohde 2000, Cox & McCubbins 2005, Krehbiel 1996). However, existing methods for generating estimates of these preferences presume that legislators care only about their own policy preferences and not about their constituency or party position (Poole & Rosenthal 1997, Clinton, Jackman & Rivers 2004), though substantive scholars have for decades hypothesized otherwise (Fenno 1973, Clausen 1967, Smith 2007, Sinclair 1995). Focusing on the U.S. Senate, we develop a new statistical estimator to determine the weights legislators place on their preferences, party, and constituency in roll call voting. Estimation is within a Bayesian IRT framework. The results help to explain the gap between estimated ideal points and legislators' true preferences and, thereby, have important implications for lawmaking theories, as well as theories of representation.

**Keywords:** Congress, Ideal Point Estimation, Parties, IRT

---

\*I would like to thank Michael Peress, David Primo, Nolan McCarty, Larry Rothenberg, Tom Carsey, Hans Noel, Walter Mebane, Dan Butler, Burt Monroe, Jeremy Kedziora, Shawn Ramirez, Ian Sulam, Jonathan Olmsted, Gary Hollibaugh, and Jonathan Klingler for comments. All remaining errors are my own.

<sup>†</sup>Department of Political Science, University of Rochester, Rochester, NY 14620. E-mail: adam.ramey@rochester.edu

# 1 Introduction

April 28, 2009, was a day that shook the world of American politics. The 2008 Presidential Election, just a few months earlier, witnessed the Democratic Party boost its majorities in the House and the Senate for the second election in a row. With the victory of Barack Obama, the Democrats had unified control of the U.S. Government for first time since the first two years of Clinton's first term. In the Senate, the Democrats had won 58 seats and eventually a 59th, once Norm Coleman's appeals exhausted and Al Franken was seated in the Capitol. Though this outcome was surely positive, the Democrats were one vote short of filibuster-proof control of the Senate. Indeed, it was this last pivotal actor that could stand in the way of Obama's legislative agenda being successful.

Then, on April 28, 2009, Arlen Specter, a liberal Republican Senator from Pennsylvania announced he was switching parties. Specter's decision, a surprise to both Democrats and Republicans, was accompanied by a press conference wherein Specter explained his decision further:

As the Republican Party has moved farther and farther to the right, I have found myself increasingly at odds with the Republican philosophy and more in line with the philosophy of the Democratic Party... In the course of the last several months ... I have traveled the state and surveyed the sentiments of the Republican Party in Pennsylvania and public opinion polls, observed other public opinion polls and have found that the prospects for winning a Republican primary are bleak.

Indeed, Specter also cited that, "more than 200,000 Republicans in Pennsylvania changed their registration to become Democrats," thereby making the general election constituency more liberal and the Democratic primary constituency more conservative.<sup>1</sup>

---

<sup>1</sup>To see this, assume that the distribution of Democratic primary voters was skewed to the right

What was especially puzzling about Specter's decision is that it was not part of a *quid pro quo* arrangement with the Democratic Party. He was not promised any chairmanships in advance and, indeed, his switch cost him his seniority on his existing committee assignments. Specter's decision, using this fact and his own words as a guide, seems to have been the result of balancing his own views and those of his constituents and determining that his Republican affiliation of several decades had become a liability.

To be sure, Specter was legitimately worried about his fate in the Republican primary. The departure of 200,000 (moderate) Republicans from the primary electorate meant that Specter had to worry even more about his conservative primary challenger in 2010, Pat Toomey, than he did in 2004. However, this primary story is, at best, incomplete. Specter's ideological quarrels with the Republican Party began long before his challenges from Pat Toomey. Moreover, switching parties would not necessarily mean a smooth path to the Democratic nomination. Indeed, nothing was negotiated in advance and, while the establishment ultimately decided to back him, a quality challenger (Representative Joe Sestak) emerged anyway.

This scenario, by no means unique in Congressional history, highlights the inherent tension between legislators' multiple goals and influences, something noted by many scholars (e.g. Kingdon 1989, Smith 2007, Sinclair 1995, Sinclair 2002, Fenno 1973, Smith 2007, Aldrich & Rohde 2000, Clausen & Cheney 1970). While there has been a large body of research attempting to demonstrate the presence of partisan (e.g., Cox & McCubbins 1993, 2005, Aldrich 1995, Aldrich & Rohde 1998, 2000, Krehbiel 2000, 2006) and electoral (e.g., Mayhew 1974) influences on lawmaking, this vast literature has failed to consider how the multiple goals of legislators and parties shape the legislative environment (Smith 2007). Indeed,

---

before the influx of 200,000 Republicans. If we assume further than these Republicans, even if they were moderates, were generally more to the right than previous Democratic primary voters, then they will shift the median of the primary distribution to the right.

how these factors play out has a direct relevance to researchers who proceed from these theories to the analysis of Congressional voting. That is to say, the interaction between the multiple goals of legislators and parties has a direct impact on results from the ever-burgeoning literature on ideal-point estimation (e.g. Poole & Rosenthal 1997, Clinton, Jackman & Rivers 2004).

This paper seeks to fill this gap. Herein, we present a new statistical method that builds on the insights of Levitt (1996) and, to some extent, Ansolabehere, Snyder & Stewart (2001). This method allows scholars to estimate the weights that legislators place on various competing sources of influence (e.g., their own preferences, party, and constituency). This in turn can help scholars to address a variety of key questions in the study of legislatures.

As was noted above, much of the vast literature in the so-called parties vs. preferences debate has failed to consider how multiple goals of legislators' shape legislative decision-making. This point is made clear by Smith (2007, pp. 42):

The interdependence of parties' collective goals implies that even if party members are single-minded seekers of policy or reelection, as the single-goal theories assume, then fellow partisans share an interest in both collective goals. It appears that the assumption of multiple party goals is unavoidable, involves tradeoffs between the goals at times, and serves as a realistic basis for developing expectations about the influence of parties in floor voting.

Sinclair (2002) expands on this observation by offering a more explicit characterization of how the multiple sources of influence affect Members of Congress' (MCs) choices. Specifically, she argues that

members' legislatively relevant behavior is a weighted function of (1) the member's own views of what constitutes, (2) the preferences of

his or her electorally relevant constituents, and (3) the preferences of other career- and influence-relevant political actors (Fenno 1973).

While few examples exist in the literature that take the multiple goals (à-la-Smith or Sinclair) into account when assessing the various influences on legislators' decisionmaking, there are at least two precursors in the literature. The first (Levitt 1996) attempts to estimate the weights that Senators place on their state-wide constituency, their re-election constituency, their party position, and their personal ideology. However, to do this, Levitt makes a number of fairly restrictive assumptions. First, Levitt assumes that these weights are constant across legislators, not allowing them to vary by party or other grouping. Second, he assumes that the weights are constant over time. Third, he assumes that Senators' ideologies are simply what is leftover after accounting for the other sources of influence. Last, he uses ADA scores of U.S. House members to proxy the measures of constituency preferences, which is problematic since ADA scores are based on roll calls and, hence, may be contaminated by majority party agenda setting (Cox & McCubbins 2005). These assumptions, while needed for the linear model Levitt runs, significantly restrict the inferences and dynamics one can explore with the estimated weights.

In Ansolabehere, Snyder & Stewart (2001), National Political Awareness Test (NPAT) responses are used to estimate legislators' ideologies. In turn, they regress roll-call-based ideal points on these scores and a party dummy to get rough estimates of the weights that legislators are employing. Their approach also requires some restrictive assumptions. First, it assumes that all legislators have a common weight. Second, given the use of a dummy for party, it also assumes that party effects are symmetric, even though features such as majority party status suggest otherwise.

In this paper, we build off of this previous work by incorporating a weighted utility framework into the standard item response model. To avoid potential bi-

ases associated with U.S. House agenda-control (Cox & McCubbins 2005), we apply the method to the study of the Senate from 1995-2009. The Senate is an ideal choice for two additional reasons. First, since the Senate is understudied and poorly understood (Smith 2007), this approach can illuminate some of mechanisms behind legislative behavior in that institution. Second, the Senate has several features (e.g., split-delegations) that allow scholars to explain diverging behavior of legislators representing the same constituency at the same time.

## 2 Statistical Model

### 2.1 Foundations

Assume there are  $N$  legislators,  $i = 1, 2, \dots, N$ , and a series of votes,  $j = 1, 2, \dots, J$ . Each of these votes has a spatial position in a unidimensional policy space.<sup>2</sup> As in previous scholarship (e.g. Krehbiel 1996, Cox & McCubbins 2005, Clinton, Jackman & Rivers 2004), all players have preexisting preferences in this space. These preferences are quadratic, centered at the actors' ideal points,  $\hat{x}_i$ . Besides personal policy preferences, actors in the legislative arena make decisions that also depend on electoral and partisan stimuli. We model this by using a weighted utility function.

Consider a generic legislator  $i$ . While he possesses his own most-preferred policy,  $\hat{x}_i$ , he must also balance the preferences of his district and the desires of his party. More concretely, legislator  $i$  must not only consider his personal policy preferences, but also those of his constituency and his party (i.e., the party position) in decisionmaking. To capture this balancing act, let  $\hat{x}_{D(i)}$  denote the preferences of the median voter in  $i$ 's district and let  $\hat{x}_{P(i)}$  denote his party's preferences. For convenience, let  $\Omega_i = \{\hat{x}_i, \hat{x}_{D(i)}, \hat{x}_{P(i)}\}$  denote the set of of these ideal points.

---

<sup>2</sup>The model can be extended to two or more dimensions easily.

Now, let  $\omega_i^{\hat{x}_i}$  denote  $i$ 's weight on his preferences,  $\omega_i^{\hat{x}_i^D}$  denote the weight of  $i$  on his district's preferences, and  $\omega_i^{\hat{x}_i^P}$  denote the weight of  $i$  on his party's position. We assume the weights are exhaustive, i.e.,  $\sum_{k \in \Omega_i} \omega_i^k = 1$ . Legislator  $i$ 's utility for policy  $x_j$  is given by the following equation:

$$u_i(x_j) = - \sum_{k \in \Omega_i} \omega_i^k (x_j - \hat{x}_i^k)^2 + \varepsilon_{ij}, \quad (1)$$

where  $\varepsilon_{ij}$  is an idiosyncratic error term for each legislator-policy combination.<sup>3</sup>

This equation is simply a sum of quadratic utility functions, each centered at the ideal point of the legislator's particular source of influence. The weights that premultiply the quadratic utilities attenuate how much the desirability of a policy alternative for a particular source of influence matters to the legislator. For example, his party may really like a policy that neither he nor his constituency do. So long as his weight on party is low, his overall utility for that policy will be low. However, if his weight on party is high, his overall utility for that policy will be high.

Modeling preferences in this fashion allows us to capture more complex interactions that purely policy, partisan, or electoral preference-based approaches cannot address. Indeed, our approach is a generalization that reduces to each of these as their associated weight approaches unity.

## 2.2 Relation to Existing Methods

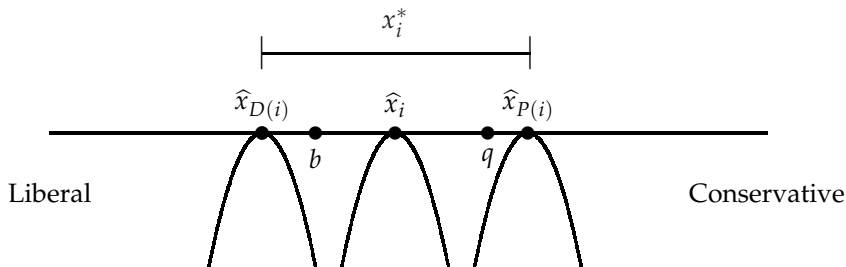
In traditional ideal point models, legislators are assumed to have an ideal point  $\hat{x}_i$  which is, by definition, their most-preferred policy. Ideal points are estimated using observed roll call votes by assuming various functional forms for the utility and error terms.

Our approach is a different enterprise. That is to say, preference measures

---

<sup>3</sup>Assumptions regarding these are discussed below.

Figure 1: Hypothetical Setup of Ideal Points



*Note:* The brackets above the line denote the set in which the net ideal point of legislator  $i$ ,  $x_i^*$ , is located.

are not objects of inference themselves. What this approach seeks to uncover is the weights that legislators are placing on the various competing influences in determining their vote choices.

To see this, consider what the ideal point in existing methodologies translates to in this model. For simplicity, assume the systematic component of the Clinton, Jackman, and Rivers (2004) utility function:

$$u_i(x|\theta_i) = -(x - \theta_i)^2,$$

where  $x$  is policy and  $\theta_i$  is the legislator's ideal point. Clearly, the optimal policy choice is  $x_i^* = \theta_i$ . In this model, differentiating the utility function in Equation 1 with respect to policy yields an optimal policy choice of  $x_i^* = \sum_{k \in \Omega_i} \omega_i^k \hat{x}_i^k$ . In other words, legislators' net ideal points are the weighted average of the sources of influence.

Thus, our method disentangles the various influences in the  $\theta_i$  that have previously been measured jointly. To see how this process plays out, consider a legislator  $i$  whose preferences are seen in Figure 1. This setup could roughly approximate the case of Arlen Specter as a Republican. As the figure shows, the party position is further to the right and the legislator's constituency is actually slightly to the left of his personal policy position.

There is also a hypothetical bill,  $b$ , that is closer to his preferences and those of



his constituency than is the status quo,  $q$ . His party, however, is closer to  $q$ .

How the legislator reacts depends of how he weights his preferences, party, or constituency in the utility function. If constituency or personal preferences receive a disproportionate weight, then the net ideal point of the legislator,  $x_i^* = \sum_{k \in \Omega_i} \omega_i^k \hat{x}_i^k$ , will be closer to  $b$  and, hence, a “yea” vote will be observed. However, if the weights on party are higher, then the legislator is unlikely to support the bill. Thus, in order to know what the legislator will do, it is necessary to understand his weights.

## 2.3 Estimator

As noted above, the objects of inference in this approach are the  $\omega_i^k$  that legislators place on various sources of influence, not the ideal points of legislators. We assume that preference measures of each source of influence are known and exogenous.<sup>4</sup> Like previous approaches, we look to the Congressional roll-call record to estimate our model. The setup of the model is as follows.

For a generic roll call  $j$ , assume that a “yea” vote and a “nay” vote each have a spatial location in the unidimensional issue space. Specifically, let  $v_j$  denote the location of “yea” and  $\zeta_j$  denote the location of “nay.” As in the standard spatial model, legislators vote “yea” if they get more utility from it than “nay.” However, since this is a stochastic model, the utilities are perturbed by random error. To that end, rather than speak about a deterministic vote choice, we henceforth discuss voting probabilistically.

A legislator chooses the “yea” alternative with probability  $Pr(y_{ij} = 1)$ . This probability can be found by applying the spatial logic described above to the

---

<sup>4</sup>See the section on the NPAT below.

utility function in Equation 1. Specifically,

$$Pr(y_{ij} = 1) = Pr(u_i(v_j) \geq u_i(\zeta_j)) \quad (2)$$

$$= Pr\left(-\sum_{k \in \Omega_i} \omega_i^k (v_j - \hat{x}_i^k)^2 + \varepsilon_{ij} \geq -\sum_{k \in \Omega_i} \omega_i^k (\zeta_j - \hat{x}_i^k)^2 + \varepsilon'_{ij}\right) \quad (3)$$

$$= Pr\left(\varepsilon'_{ij} - \varepsilon_{ij} \leq -\sum_{k \in \Omega_i} \omega_i^k (v_j - \hat{x}_i^k)^2 + \sum_{k \in \Omega_i} \omega_i^k (\zeta_j - \hat{x}_i^k)^2\right) \quad (4)$$

$$= Pr\left(\varepsilon'_{ij} - \varepsilon_{ij} \leq \sum_{k \in \Omega_i} \omega_i^k (\zeta_j^2 - v_j^2 - 2\hat{x}_i^k (\zeta_j - v_j))\right). \quad (5)$$

Since the quadratic terms in Equation 5,  $\zeta_j^2$  and  $v_j^2$  are free of the index of summation and, further, that the weights sum to one, we can remove the sum from these two terms. That is,

$$Pr(y_{ij} = 1) = Pr\left(\varepsilon'_{ij} - \varepsilon_{ij} \leq \zeta_j^2 - v_j^2 - 2(\zeta_j - v_j) \sum_{k \in \Omega_i} \omega_i^k \hat{x}_i^k\right). \quad (6)$$

If we assume that the error terms are jointly-Normal distributed,  $E(\varepsilon_{ij}) = E(\varepsilon'_{ij}) = 0$ , and  $Var(\varepsilon'_{ij} - \varepsilon_{ij}) = 1/\tau_j^2$ , then Equation 6 becomes

$$Pr(y_{ij} = 1) = \Phi\left(\tau_j^2(\zeta_j^2 - v_j^2 - 2(\zeta_j - v_j) \sum_{k \in \Omega_i} \omega_i^k \hat{x}_i^k)\right), \quad (7)$$

where  $\Phi(\cdot)$  is the standard Normal distribution function. As a final simplification, let  $\alpha_j = -\tau_j^2(\zeta_j^2 - v_j^2)$  and  $\beta_j = 2\tau_j^2(v_j - \zeta_j)$ . Plugging these into Equation 7 yields

$$Pr(y_{ij} = 1) = \Phi\left(-\alpha_j + \beta_j \sum_{k \in \Omega_i} \omega_i^k \hat{x}_i^k\right). \quad (8)$$

We know that the probability associated with voting “nay” is the complement of the probability associated with voting “yea.” That is,

$$Pr(y_{ij} = 0) = 1 - \Phi \left( -\alpha_j + \beta_j \sum_{k \in \Omega_i} \omega_i^k \hat{x}_i^k \right). \quad (9)$$

Equations 8 and 9 are, for the most part, familiar results. The probabilities of voting “yea” or “nay” are probit links applied to linear equations. The resulting equations bear much similarity to the corpus of literature on item-response theory (IRT), as well as applications in Bayesian ideal point estimation (Clinton, Jackman & Rivers 2004, Bock & Aitkin 1981). The  $\alpha_j$  is the difficulty of the roll call and the  $\beta_j$  is the measure of how well the roll call discriminates between legislators.

However, this result is different from past research in two important ways. First, rather than premultiplying a single ideal point,  $\beta_j$  pre-multiplies the weighted-average of a legislator’s three sources of influence. Second, and perhaps more important, the objects of inference are the weights on the abilities, not the abilities themselves. This turns out to ease some of the identification problems associated with ideal point estimation (see also Rivers 2003, Londregan 1999).<sup>5</sup>

We know the probabilities of a legislator voting “yea” or “nay” on a generic roll call and, thus, can write the Likelihood for the model easily. Since the outcome on a roll call is just a Bernoulli trial, the Likelihood is

$$\mathcal{L}(\omega, \beta, \alpha | \mathbf{y}, \mathbf{x}) = \prod_{j=1}^J \prod_{i=1}^N \Phi \left( -\alpha_j + \beta_j \sum_{k \in \Omega_i} \omega_i^k \hat{x}_i^k \right)^{y_{ij}} \times \left( 1 - \Phi \left( -\alpha_j + \beta_j \sum_{k \in \Omega_i} \omega_i^k \hat{x}_i^k \right) \right)^{1-y_{ij}}, \quad (10)$$

the log of which is

---

<sup>5</sup>In particular, the weights have natural bounds, unlike the ideal points. That is, they must sum to one and individually cannot be less than zero or greater than one. Furthermore, since the ideal points are on a common scale, the weighted-average of the the ideal points is also bounded. This point will be discussed further below. Technically, the model is exactly identified for the case where  $|\Omega_i| \leq 2$ . For other cases, further restrictions are needed for identification.

$$\ln \mathcal{L} = \sum_{j=1}^J \sum_{i=1}^N y_{ij} \ln \Phi \left( -\alpha_j + \beta_j \sum_{k \in \Omega_i} \omega_i^k \hat{x}_i^k \right) + (1 - y_{ij}) \ln \left( 1 - \Phi \left( -\alpha_j + \beta_j \sum_{k \in \Omega_i} \omega_i^k \hat{x}_i^k \right) \right). \quad (11)$$

### 3 Estimation Strategy

The Likelihood above (equation 11), like that analyzed by Poole and Rosenthal (1997) and those within the broader IRT literature (e.g. Bock & Aitkin 1981), cannot be maximized directly using standard techniques. The literature provides a number of alternative techniques including Conditional Maximum Likelihood, Marginal Maximum Likelihood (Bock and Aitkin 1981), Bayesian MCMC (Clinton, Jackman & Rivers 2004), and the so-called “zig-zag” estimator (Heckman & MaCurdy 1980, Poole & Rosenthal 1997). For this model, we opt to use a MCMC method that involves the use of Gibbs steps for the item parameters and Metropolis-within-Gibbs for the weights.

As mentioned above, identification issues arise when the number of weights is greater than two. For the case when the number of items a legislator weighs is equal to two (e.g., the legislator only cares about his party and his preferences), the model can be run directly and unique weights for every legislator may be estimated. When the number of items that a legislator is weighing exceeds two, the model as it stands is unidentified. Specifically, the number of unknowns (e.g., weights) exceeds the amount of data that is available to estimate them. To solve this problem, we must make some stronger assumptions, chiefly that legislators within groups share a common weight.

Thus, identification and estimation involves a two-step process. The first is to partition the  $N$  legislators into  $L$  batches, where  $|L| \ll N$ , and assume that legislators within a common group have a common weight. A simple approach is

to group legislators by party, though one can easily extend the number of groups. Thus, rather than speak about individual weights,  $\omega_i^k$ , we henceforth speak of group weights,  $\omega_{l(i)}^k$ , where  $l(i) \in L$  denotes the group  $l$  that legislator  $i$  belongs to. As long as the size of each group is larger than  $|\Omega_i|$ , identification is guaranteed.<sup>6</sup>

Now that the model is identified, the second step is estimation. The Bayesian MCMC setup requires, in addition to the Likelihood in Equation 10, priors on the item parameters and the weights. Following Clinton, Jackman & Rivers (2004), we assign Normally-distributed priors to the item parameters. That is,

$$\alpha_j \sim \mathcal{N}(0, 10)$$

and

$$\beta_j \sim \mathcal{N}(0, 10).$$

The priors on the weights are as follows:

$$\omega_i^1 \sim U[0, 1] \tag{12}$$

$$\omega_i^m \sim U[0, \bar{u}], \forall m > 1, \tag{13}$$

where  $\bar{u} = \max(0, 1 - \sum_{p < m} \omega_i^p)$ . This seemingly complex expression means that the first weight is drawn from the Uniform distribution on the unit interval and that all subsequent weights are drawn Uniform from 0 to the residual amount of weight left to draw from. As a practical matter, if draws of the first few weights are so large that the residual weight is effectively zero, the upper bound on the prior distribution must be shifted to avoid computational problems. This means that, in practice,  $\bar{u} = \max(0.000001, 1 - \sum_{p < m} \omega_i^p)$ , whereby 0 has been replaced

---

<sup>6</sup>The estimates of each batch of weights are from a Bayesian linear regression. To estimate the coefficients in this regression, we must have more than  $|\Omega_i|$  in order to have the requisite degrees of freedom.

by 0.000001.<sup>7</sup> Our model can be run in WinBUGS, though it is a rather simple model to code by hand.<sup>8</sup>

## 4 Data

To estimate our model, we need ideal policies on a common scale of legislators, constituencies, and parties, *a priori*. Unfortunately, while we can have good proxies for these three, it is nearly impossible to generate common-scale measures. The ideal data for this purpose would consist of candidate questionnaires whereby legislators truthfully place themselves, their party leadership, and their constituencies along a unidimensional policy space.

Here we propose an alternative using Project VoteSmart data to produce estimates of all three ideal points. Project VoteSmart has, since 1992, surveyed legislators at the congressional and state levels for all legislative, gubernatorial, and presidential races in their National Political Awareness Test (NPAT). NPAT data consists of a huge battery of questions designed to tap legislators' views on a plethora of issues raising from abortion to gun rights to the budget and so on. This data is available for scholarly purposes.<sup>9</sup>

### 4.1 NPAT: Legislators and Parties

The first step to generate common-space ideology measures is to pool the data across years. Since the Senate has a staggered election structure, only about one-third of that body is up for election at any time and, hence, the number of possible

---

<sup>7</sup>Extensive Monte Carlo analysis has been performed on this model. Therein, we have found that the upper bound constraint is generally not a problem unless that actual weight is 0 in the true data generating process. Indeed, the use of 0.000001 is not even necessary, save in these razor-edge cases.

<sup>8</sup>Using data augmentation techniques, all steps except the weights are Gibbs; weights can be drawn using a Metropolis step and a Normal jumping distribution.

<sup>9</sup>Thanks to Project VoteSmart, we have obtained this data going back to 1992. We are currently working with U.S. Senate data but will be moving to the state legislatures in the future.

NPAT respondents is lower than for the House. Furthermore, though the NPAT does ask a core battery of questions from year to year, many questions do change with the popular topics of the day. For example, detailed abortion questions are always asked, but questions on the balanced-budget or line-item veto were only asked during the mid-to-late 1990s.

Thus, we went through all NPAT questionnaires from 1992-2006 and identified a core of 33 questions that were the same across years (see the Appendix). We placed all members of the Senate serving from 1992-2006 and filling out a NPAT questionnaire at least once during that time period were included. Questions that are not asked in every survey were discarded.<sup>10</sup> Also, since the 33 questions we selected are prominent issues that are debated regularly in the American political arena, a scholar can essentially fill out the NPAT for someone who did not respond.<sup>11</sup> For example, while John McCain has responded to the NPAT many times, Barack Obama has not. However, Obama's position on almost all of the issues investigated are public knowledge through speeches and his websites over the years. Thus, an Obama position can be assessed.

Three further issues regarding use of the NPAT require comment: the assumption of constant preferences, respondent selection effects, and the reliability of NPAT-based ideal points as a measure of respondent preferences. As for the first, since the time span we are pooling is relatively short, this assumption seems quite reasonable. Specifically, it is unlikely that Ted Kennedy or Sam Brownback are going to change their minds on abortion or gun rights over such a short span. Indeed, for legislators who respond every time they are up for re-election (e.g.,

---

<sup>10</sup>Though we could in principle add all possible questions to the matrix and use the common questions as the linkages between the legislators across years, this turns out to produce less precise estimates. To see why, consider that a given Senator who responded to the NPAT in 1996 will have missing values for every question that was asked every other years besides 1996. This means he will have several hundred missing values. Since the Gibbs sampler in the IRT model will simply draw his latent utility differential from a diffuse Normal distribution, essentially no "good" information is added.

<sup>11</sup>We choose to use an imputation technique instead following Ansolabehere, Snyder & Stewart (2001). Details are found below.

McCain and Specter), their positions rarely change. Second, it is possible that NPAT respondents select themselves into the sample. This is problematic because it may induce a selection bias in the estimates of legislator weights if respondents are categorically different than non-respondents. Fortunately, it turns out that the legislators who respond come from all ideological groups, roughly evenly split between the two parties, and the characteristics of their voting behavior (e.g., NOMINATE scores, presidential support scores) are not substantially different. In an effort to be more confident in this regard, we use an imputation technique akin to Ansolabehere, Snyder & Stewart (2001) for the members not responding to the NPAT.<sup>12</sup> Results from the model including imputed NPAT preferences are qualitatively unchanged.

The third issue is that NPAT may not reflect actual legislator ideology. Since the survey is completely voluntary and results are made public, responses are merely cheap talk. One way to assess this is to look at the distances between legislator NPAT-based ideal points and voter positions (see below for method of construction). If legislators were merely telling voters what they want to hear, then legislator NPAT scores should correlate very highly with voter positions. Figure 2 shows the legislator-to-voter distances by Congress in the form of a box-and-whisker plot. As we see, on average, most legislators are not very close to their constituents. This either means that legislators are making lots of misjudgments about voters' positions or that NPAT is tapping something different. Given this finding, we are fairly confident that NPAT is indeed tapping the legislator's ideology and not simply capturing a mimicking of what voters desire.

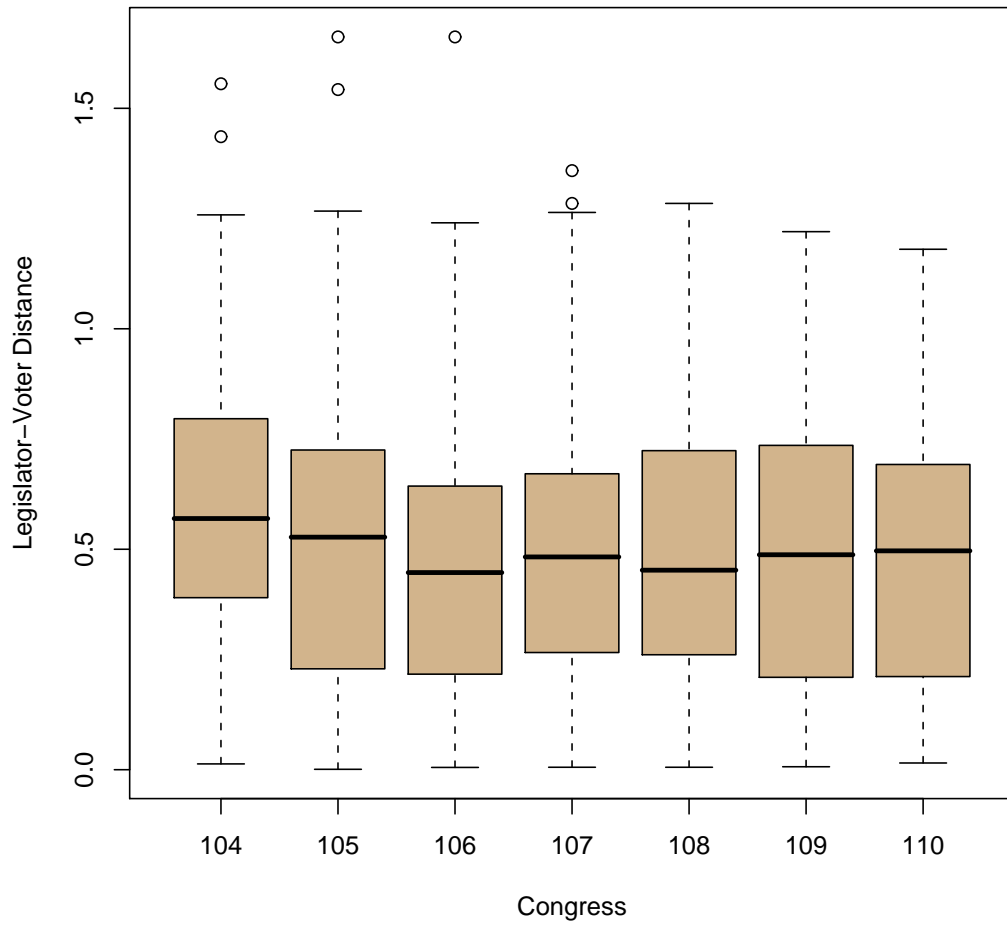
The next step in getting legislator and party estimates on a common scale is to translate the responses to these questions into measures of member ideol-

---

<sup>12</sup>This approach follows an observation by Snyder and Groseclose (2001), that estimated ideal points from lopsided roll calls correlate highly with NPAT-based ideal points. Thus, if we regress the NPAT-based ideal point (which we have for many Senators) on the roll call-based ideal point from lopsided votes (which we have for all), we can then use the slope and intercept to generate imputed NPAT scores for the rest.



Figure 2: NPAT-Legislator Distances



ogy. To do so, we mimic the methodology of Ansolabehere, Snyder & Stewart (2001). However, rather than using the Heckman & Jr. (1997) methodology, we run Bayesian IRT (Clinton, Jackman & Rivers 2004) on the matrix of responses, saving the first dimension score. We henceforth refer to legislator preference estimates generated in this way as NPoints.

We can then transform NPoints to measure party position using one of several approaches. The easiest one is to find the median of the NPoints within parties. Other alternatives would be to use the NPoints of the party majority/minority leaders, or to average the leadership team (majority/minority leader, majority/minority whip). We have done all of these and, since the results are essentially the same, we opted for the first solution.<sup>13</sup>

## 4.2 Putting Constituency in a Common Space

Finally, we need to put the electorate on a common scale with legislators and parties. Attempting this has drawn the interest of a few scholars as of late (e.g. Bafumi & Herron 2007, Shor 2009, Burden 2004). Bafumi & Herron (2007) and Shor (2009) each conducts extensive surveys, asking respondents to answer roll call and NPAT questions, respectively. This approach is highly desirable, as it can directly link the respondents with their respective legislators. Unfortunately, it is bound to 2006 and beyond. Scholars wishing to study earlier periods must resort to other techniques.

To this end, Burden (2004) introduces a technique that puts voters and legislators in a common space using the Democratic share of the two-party vote (DSTPV). As Burden (2004) notes, the DSTPV has long been regarded as a reliable measure of state-level preferences and correlates very highly with factor analytic solutions employing issue scales. Burden's technique involves rescaling the DSTPV by pinning down the the Democratic and Republican presidential can-

---

<sup>13</sup>One could also fill out a NPAT questionnaire with the responses as found in party platforms.

didates at 0 and 1, respectively. By doing this, the DSTPV (also bound by 0 and 1) is transformed to a policy position. He then uses NOMINATE and presidential support scores to generate estimates of legislator positions and district ideologies in this space.

We take a similar approach here, but diverge from the restrictive assumption that the Democratic and Republican candidates for president are at 0 and 1, respectively. This is made possible by identifying the Democratic and Republican candidates' issue positions on the 33 common-space NPAT questions, running the Bayesian IRT model on the matrix of Senators and presidential candidates, and then using the estimated ideal points of the candidates as the glue for this space.

Formally, let  $\delta$  and  $\rho$  denote the ideal points of the Democratic and Republican candidates, respectively. Voters vote for the candidate closer to their ideal point. To move from the DSTPV to NPAT-space, we must make two assumptions regarding the configuration of presidential candidates and voters:

**Assumption 1.** *The Democratic presidential candidate is never to the right of the Republican candidate.*

**Assumption 2.** *No state's median voter is more liberal than the Democratic presidential candidate or more conservative than the Republican candidate.*

Assumption 1 is uncontroversial and is certainly true during the period we are studying. Assumption 2 is a bit more controversial. To be sure, we are not assuming that all voters' ideal points are bounded by the two parties' candidates, only the median. This assumption is only problematic if at least one of the major party candidates is a moderate and not from the heart of the party. Over the time period we are analyzing (mid-1990s on), this seems to be a non-issue.

This means that a state,  $s$ , with a 0% vote for the Democratic candidate has a median ideal point equal to the Republican candidate, i.e.,  $\hat{x}_s = \rho$ . Similarly, a state,  $s'$  with a 100% vote for the Democratic candidate has a median ideal point

equal to the Democratic candidate, i.e.,  $\hat{x}_{s'} = \delta$ . Consequently, if  $d_s$  is the DSTPV of a state  $s$ , the ideal point of the median voter in that state is given by

$$\hat{x}_s = \rho + (\delta - \rho)d_s. \quad (14)$$

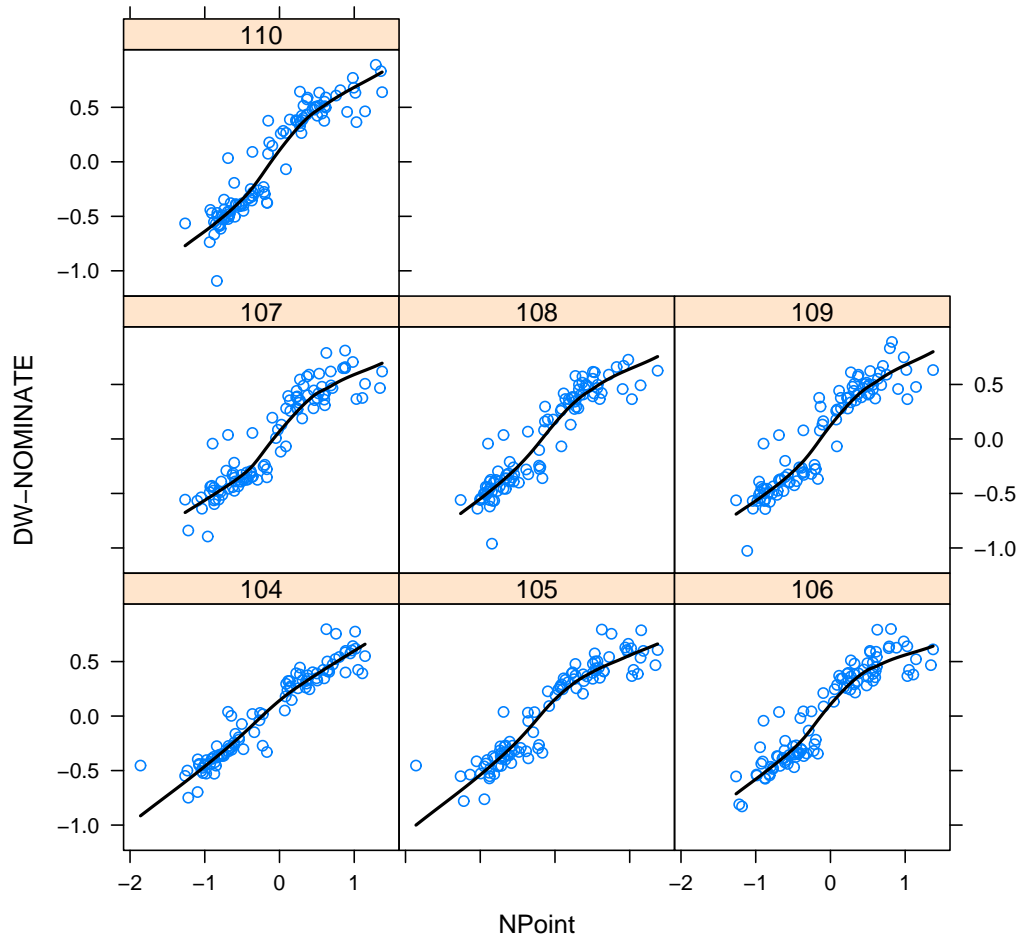
## 5 Results

We generated personal ideology measures for all Senators from the 104th to the 110th Congresses and used these to obtain estimates of party positions (i.e., the party median). We also matched known positions of presidential candidates in the 1992, 1996, 2000, and 2004 presidential elections to generate NPoints for these actors. With these in hand, we applied the transformation technique described above on the DSTPV to get a common-space measure of voter ideology. Having produced preferences of legislators, parties, and constituencies on the same scale, we can now discuss the implementation of the statistical model.

For the purpose of this paper, we grouped legislators into four bins, drawing weights from a common distribution for each bin. These bins were Republican moderates, Republican extremists, Democratic moderates, and Democratic extremists. Moderates are those Senators whose NPAT scores are to the right (left) of the party median if they are Democrats (Republicans); extremists are the rest of the chamber.

For each Congress in our sample, we ran our statistical model using WinBUGS (for code, see the Appendix). In each Congress, we generated starting values of item parameters running a set of independent probits. Starting values of the weights were chosen arbitrarily, but the results do not change over a widely dispersed set of initial parameter values. For each Congress, the three chains of the model were instantiated and run 100,000 times. However, this was unnecessary, since the model converged very quickly (i.e., around the 2,000th iteration). In-

Figure 3: NPAT vs. DW-NOMINATE (by Congress)  
**NPoints and DW-NOMINATE**

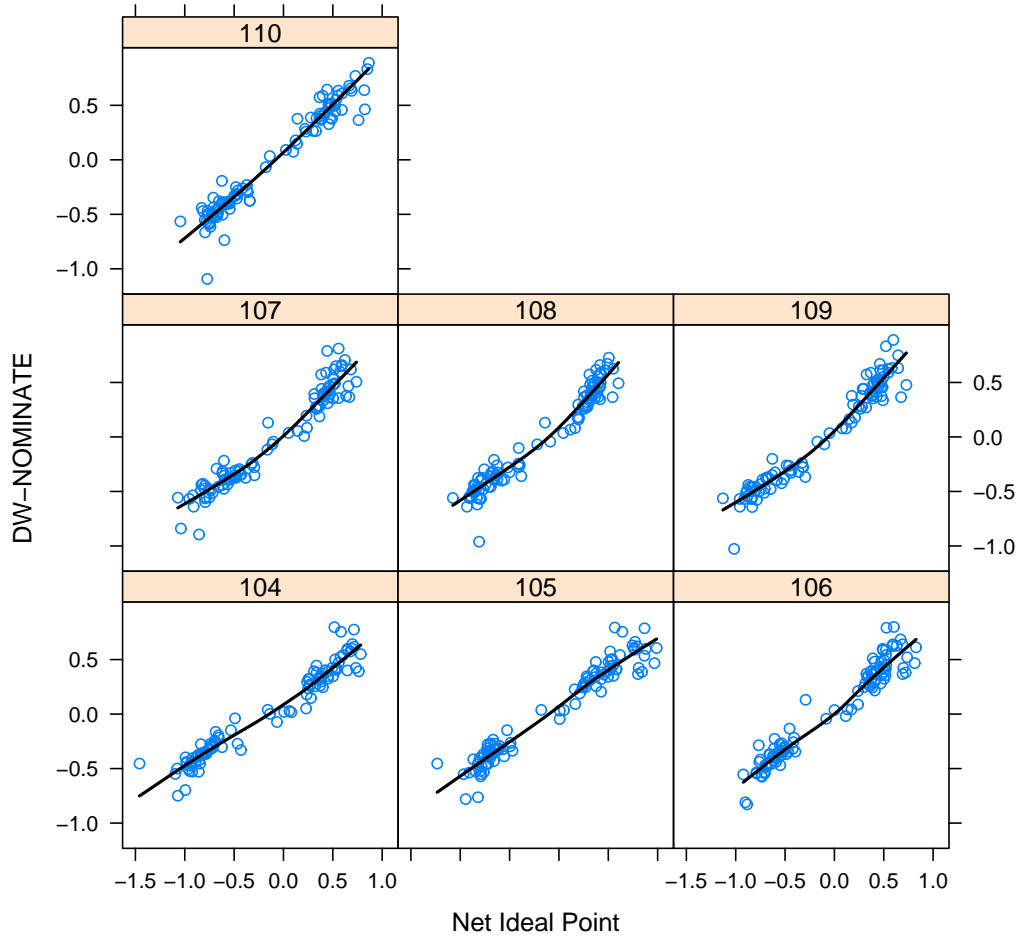


deed, standard approaches were applied to assess convergence (e.g., the Gelman & Rubin (1992) and Geweke, Berger & Dawid (1992) diagnostics) and all of these suggested the model had converged.

With the results of the model in hand, one of the first things to assess is the relationship between the NPAT-based legislator preferences and the most common proxy for legislator preferences, DW-NOMINATE. Figure 3 plots the NPoint against the DW-NOMINATE score for every Senator by Congress with a smoothed Loess curve and finds the same relationship found in Groseclose & Snyder (2000). While the NPoints and DW-NOMINATE scores correlate highly, it

Figure 4: Net Ideal Point vs. DW-NOMINATE (by Congress)

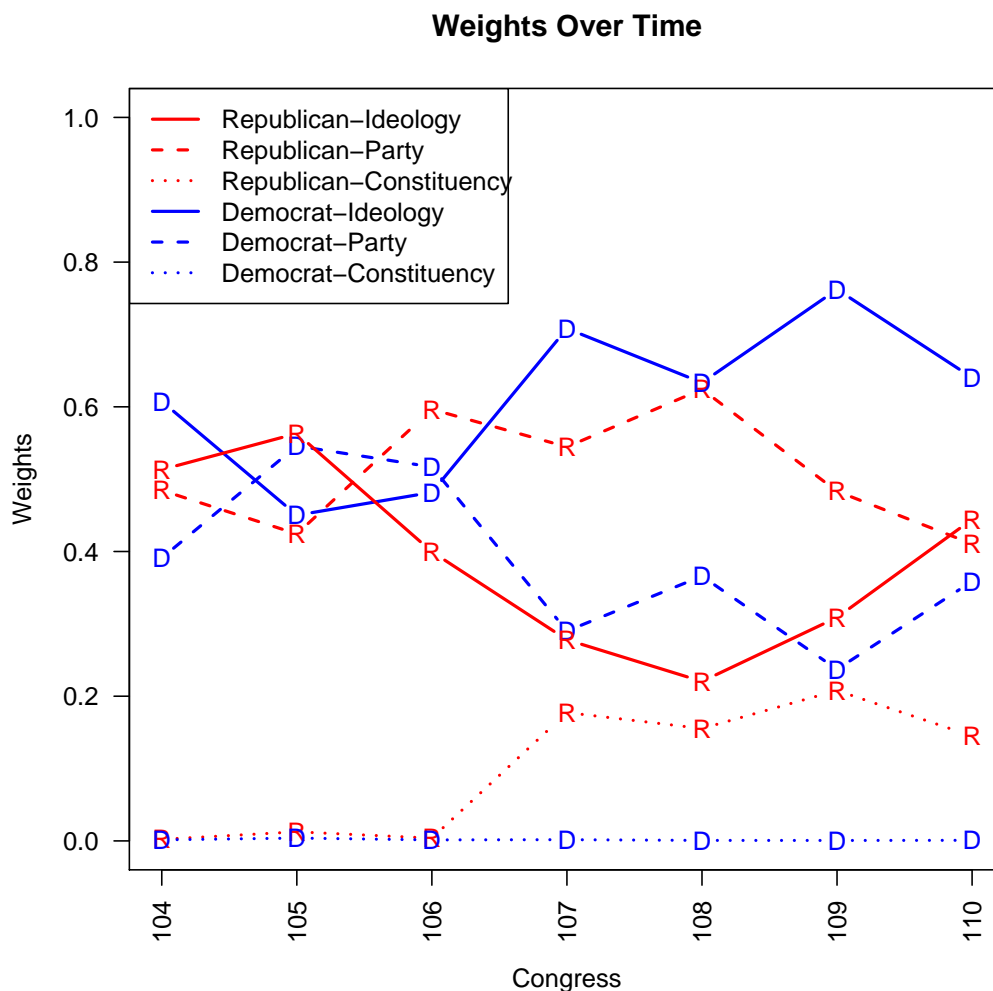
**Net Ideal Point and DW-NOMINATE**



is evident that moderates in NPAT-space appear to be pulled toward the extremists in their parties. This suggests that, especially for moderates, something other than the legislators' preferences is effecting their behavior.

Prior to looking at the weights, it is useful to see if the legislator's net ideal point, that is, the weighted average of the sources of influence, correlates with the DW-NOMINATE score. To measure the estimated net ideal point, we simply calculate:  $\hat{x}_i^* = \sum_{k \in \Omega_i} \omega_i^k \hat{x}_i^k$ . Figure 4 plots the resulting net ideal point against the DW-NOMINATE score, along with the Loess curve superimposed. As expected, the two measures match up nearly linearly, thereby providing some face valid-

Figure 5: Weights Over Time



ity for the model and replicating the IRT-NOMINATE relationship identified in Clinton, Jackman & Rivers (2004).

Finally, the main parameters of interest in the model, the weights, are plotted in Figure 5. While the pattern discovered is consistent with past research (e.g. Ansolabehere, Snyder & Stewart 2001, Levitt 1996), it also highlights patterns not previously known. The weights on legislators' constituencies are almost all very low, though Republicans are noticeably more constituency-minded, especially after the 107th Congress. This has consequences for representation and is discussed below. The weights on party reflect the ideological pull of Senators' party posi-

tions. In the aftermath of the Republican Revolution, party weights were high for both parties. However, after the 105th Congress, the Republicans had a noticeably higher weight on party than the Democrats. This peaked during the Bush presidency, almost invariably because Republicans were more pressured to push through their president's legislative agenda. To be sure, the Democrats' weight on party was noticeably higher during the Clinton presidency. This suggests a presidential effect regardless of which party controls the White House.

## 5.1 Representation

To more closely assess the inferences about representation present in the data, it is useful to consider the degree to which legislators' manifest voting records (i.e., net ideal points) correspond to voter preferences. Figure 6 presents this in the form of a box-and-whisker plot. The tan boxes, whiskers, and stems represent the distribution of preferences across states and years. Since presidential elections are *quadrennial*, the same DSTPV is used for each four-year block and, hence, the distributions for the 105-106th, 107-108th, and 109-110th Congresses are identical. The gray superimposed line represents the Senate median net ideal point.

From this figure, we see that the Senate appears, as a whole, to be fairly unrepresentative of public opinion. During the Clinton presidency (104-106th Congress), it was generally more conservative than the national median voter. In the Bush era, especially in the first term (107-108th Congress), the Senate was much more liberal than national opinion. This pattern exacerbates during the final two years of President Bush's presidency, where the median Senator's ideal point plummets to nearly the end of one of the stems in the last box-and-whisker plot.

One might be tempted to suggest that this pattern may be an idiosyncratic feature of my voter ideal point rescaling technique. However, we are not the first to find such a pattern. While Jacobson (2004) discovers a general congruency



Figure 6: Median Voters Across States and Years

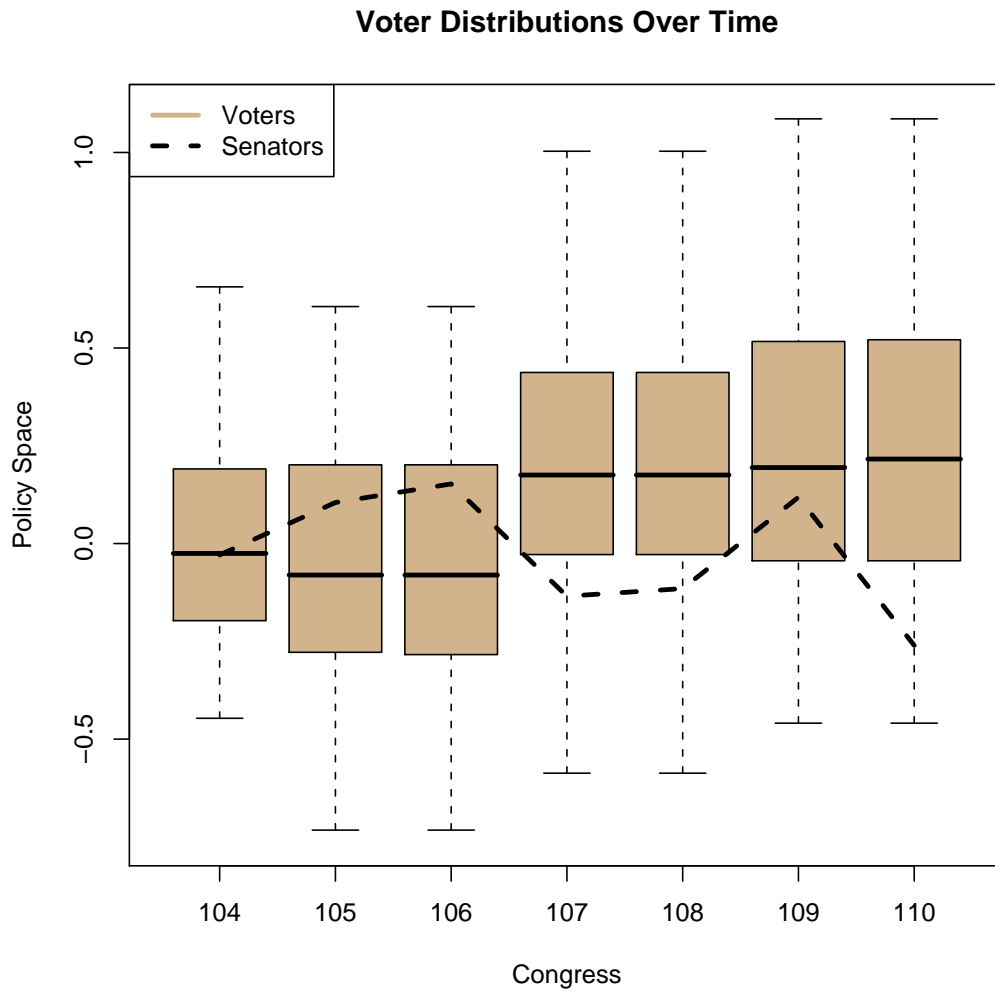
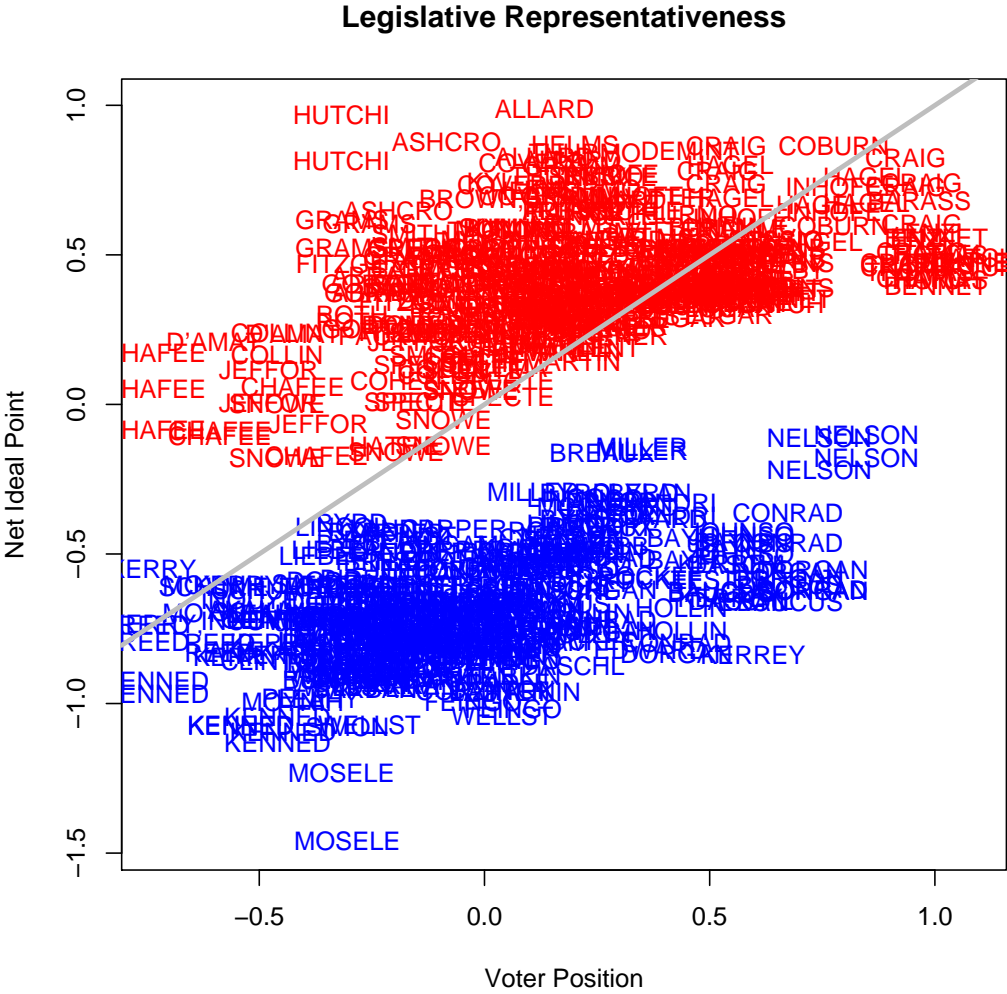


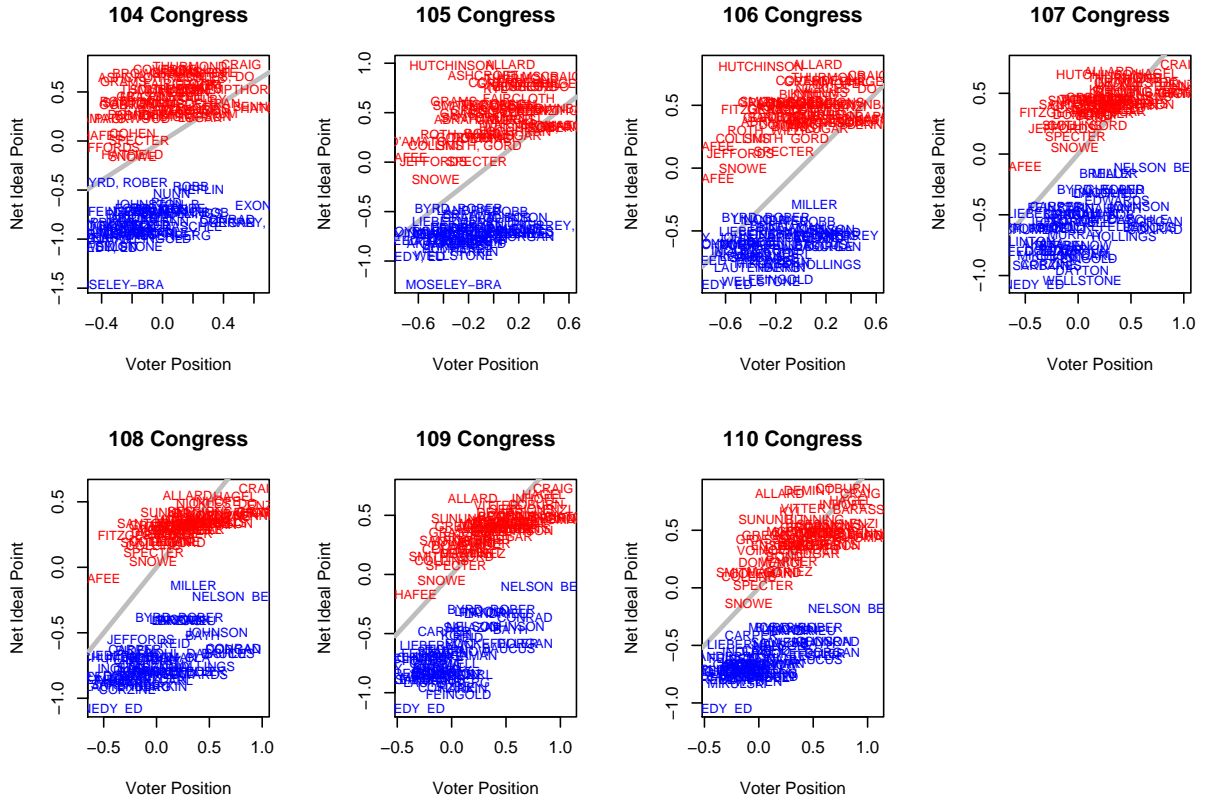
Figure 7: Senators' Representativeness (pooled)



between the preferences of legislators and voters, Shor (2009) has corroborated the essential finding above. Using the Cooperative Campaign Analysis Project (CCAP) survey, Shor was able to generate estimates of constituent opinion by asking respondents NPAT questions. From this, Shor finds that there is a generally liberal tilt (with respect to state opinion) of state legislatures and Congress. This finding is certainly in line with our results.

Figures 7 and 8 plot the net ideal point of Senators against the median voters in their respective states. Republicans are colored red and Democrats are colored blue, where legislators' names serve as plot character labels. In Figure 7, all years

Figure 8: Senators' Representativeness (disaggregated)



are pooled. Legislators whose ideal points are above the gray dashed line are too conservative for their states, whereas those below the line are too liberal. We see that conservative Republicans and liberal Democrats appear to cluster close to the gray line. Moderates, however, are far from the line, with Democrat moderates especially far from state opinion. This too appears to be in line with Shor (2009).

Figure 8 disaggregates the pattern by Congress. While the pattern is basically the same across years, we see Republicans increasingly clustering close to the 45-degree line. Democrats appear to be doing the same, but to a much lesser extent.

The outstanding question is, what factors lead legislators to converge to, or diverge from, their state's preferences? To understand this, there are a number of possibilities that seem intuitive to investigate.<sup>14</sup> One is *Chamber Seniority*, which measures how long Senators have been in the chamber. It seems natural to think that Senators with less seniority would be more likely to pander to public opinion, in contrast to older statesmen like Byrd or Kennedy.

The effect of subsequent elections may also have a pressuring effect on legislators. To analyze this, we use a variable called *Status in Next Election*, a dummy variable that is equal to 1 if a legislator is re-elected in the next election and 0 if he is not. This variable captures the "forward thinking," backward inducing nature of rational legislators. If a legislator anticipates a defeat in the next election, he should be more likely to move toward the median voter (Downs 1957).

Since ideological extremism is likely to pull centrists differently than extremists, we employ a dummy variable called *Moderate*. This is equal to 1 if the Senator is to the left (right) of the party median if he is a Republican (Democrat). Moderates, typically being in tough re-election races, seem to have more need to moderate their behavior in the direction of voter preferences.

Finally, whether the state has a split delegation, where two Senators from the same state belong to different parties, may impact how legislators behave. To

---

<sup>14</sup>Some of these variables were obtained from Stewart & Woon (2009). These include Seniority, Class of Senator, and Re-election Status

capture this effect, *Split Delegation* is a dummy equal to 1 if the Senator is of the opposite party of the other Senator representing his state. While it is *a priori* uncertain what effect this has on the distance between Senator behavior and voter preferences, it seems natural to think that split delegation Senators might behave differently than same-party ones.

Since the net ideal point of Senators and voter preferences are in a common space, we can calculate the Euclidean distance between them and regress this on the variables above, with appropriate Congress-specific fixed-effects. The resulting dependent variable is skewed and, thus, requires a square-root transformation in order to estimate this model via OLS. Further, since party differences could mitigate all of these effects, any regression must be run separately for each political party. In what follows, Model 1 refers to the OLS estimates for Republicans only and Model 2 refers to the OLS estimates for Democrats (and those who caucus with them). The results are found in Table 1.

The results are somewhat similar across the two parties (see Table 1). Seniority does not seem to matter for either party. Moderates in both parties are much more likely to be closer to their voters than extremists. The effect for Republicans is twice as much as that for Democrats.

Whether or not a legislator is reelected does not have an effect on Republicans, but it does in fact have a negative effect for Democrats. This difference is perhaps a majority-minority effect, but it does appear that Democrats are generally more sensitive to tight elections.

Perhaps most interestingly, split delegations also have a negative effect on the distance between voter preferences and legislator behavior; being in a split delegation increases the distance between voters and Senators. Thus, contrary to the logic of split-ticket voting, voters wishing to balance policy by choosing Senators of opposite parties actually create incentives for legislators to diverge.

Euclidean distances are one way to look further into the results, but they can

Table 1: Predicting the Distance between Senator Behavior and Voter Preferences

	Model 1	Model 2
Intercept	0.57 ** (0.04)	0.90 ** (0.04)
Chamber Seniority	0.00 (0.00)	-0.00 (0.00)
Status in Next Election	-0.01 (0.03)	-0.06 * (0.03)
Moderate	-0.11 ** (0.02)	-0.05 * (0.03)
Split Delegation	0.10 ** (0.02)	0.06 ** (0.02)
$N$	354	329
$R^2$	0.31	0.21
adj. $R^2$	0.29	0.19

*Note:* Coefficients are estimates from an OLS model and the associated standard errors are in parentheses. The dependent variable is the square-root of the Euclidean distance between the legislator’s net ideal point and the state median voter. Congress-specific fixed effects are suppressed. \* =  $p < 0.1$ , \*\* =  $p < 0.05$  (two-tailed).

be misleading. For example, a Senator like Susan Collins has to balance a liberal constituency with her own moderate preferences and a very conservative Republican party. Even if Collins’s largest weight is on her constituency, the gap between her net ideal point and her constituency’s ideal point is still be large. On the other hand, Senators like John Kerry, whose own preferences are very close to their constituency, don’t have to balance much and may appear closer to voters as a result. To get around this, we replace the Euclidean distance dependent variable with a binary variable that equals one if the Senator’s net ideal point is closer to his constituency than either his party or his own preferences and 0 otherwise.

Table 2 displays the results of the Logit model using the same regressors as in

Table 2: Proximity of Senators to Constituency and Party

	Model 3	Model 4	Model 5	Model 6
Intercept	-1.28 ** (0.57)	-6.21 ** (1.81)	-1.20 ** (0.57)	-5.66 ** (1.63)
Chamber Seniority	-0.03 (0.02)	0.09 ** (0.03)	-0.04 ** (0.02)	0.06 ** (0.03)
Status in Next Election	-0.79* (0.41)	0.17 (1.18)	-0.82 ** (0.41)	0.33 (1.15)
Moderate	2.33 ** (0.33)	2.11 ** (0.88)	2.42 ** (0.36)	1.73 ** (0.76)
Split Delegation	-1.02 ** (0.34)	-0.29 (0.80)	-0.85 ** (0.32)	0.09 (0.71)
<i>N</i>	354	329	354	329
AIC	342.01	74.88	365.95	89.37
BIC	512.26	241.90	536.20	256.40
log <i>L</i>	-127.01	6.56	-138.98	-0.69

*Note:* Coefficients are estimates from a Logit model and the associated standard errors are in parentheses. In Model 3, the dependent variable is equal to 1 if the legislator's net ideal point is closer to the state median voter than either the legislator's personal preferences or his party, Republicans only. Model 4 replicates Model 3 for Democrats and (when applicable) independents who caucus with Democrats. In Model 5, the dependent variable is equal to 1 if the legislator's net ideal point is closer to his party than either the legislator's personal preferences or the state median voter, Republicans only. Model 6 replicates Model 5 for Democrats and (when applicable) independents who caucus with Democrats. Congress-specific fixed effects are suppressed. \* =  $p < 0.1$ , \*\* =  $p < 0.05$  (two-tailed).

the OLS model. Models 3 and 4 are for Republicans and Democrats only, respectively. The results are somewhat similar to our OLS findings, in that moderates are still more likely to be closer to their constituency and split delegations are less so.<sup>15</sup> However, seniority appears to have a positive effect for Democrats (and not for Republicans). As expected, more senior Senators are much less likely to weigh their constituency as most important.

<sup>15</sup>In this instance, the effect of split delegations is only borne out for Republicans.

In terms of electoral factors, the sign and significance for Republicans has changed in this model. This means that being re-elected in the subsequent election cycle decreases the probability that the Senator's net ideal point is closest to his voters.

## 5.2 What about Party?

We now use the same approach as the above Logit to see what leads legislators to have net ideal points closest to their political parties. Specifically, a dummy dependent variable is constructed that equals 1 if the Senator's net ideal point is closer to his party's position than either his personal preferences or his constituency. All other variables are the same. Results are found in Table 2. Model 5 is the model run on Republicans only and Model 6 is for Democrats. The results are almost always different across parties.

Seniority appears to have a reverse effect for Democrats and Republicans. Whereas senior Republicans are less likely to be closest to their party position, senior Democrats are more so. Like in the previous Logit model, Republicans are more sensitive to electoral concerns than Democrats. Specifically, Republicans who are reelected are less likely to have a net ideal point closest to their party.

Not surprisingly, moderates of both parties are more likely than extremists to be tugged toward the party position. In terms of substantive effects, this is indeed the largest. To see this clearly, consult Table 3. This table shows the change in the predicted probability that a Senator is closest to his party by moving him from the extremist to the moderate category. We have disaggregated this by party and by delegation type to see how these may mitigate effect of ideology. We see that the predicted probability increases by over 50%, regardless of delegation type for Republicans. The effect is more modest for Democrats, but positive nonetheless.

Last, split delegations lessen the probability that Senators are closest to their party for Republicans. Taking this result in stride with the similar finding in



Table 3: Predicting Party Proximity

	Split Delegation	Same-party Delegation
Republican	0.54	0.50
Democrat	0.03	0.03

*Note:* cell entries are the difference in the predicted probability that the Senator's net ideal point is closest to his party between moderates and extremists. These are varied by delegation type and party, fixing Seniority at 10 year (the median), the Congress at the 110th, and assuming the Senator is subsequently re-elected.

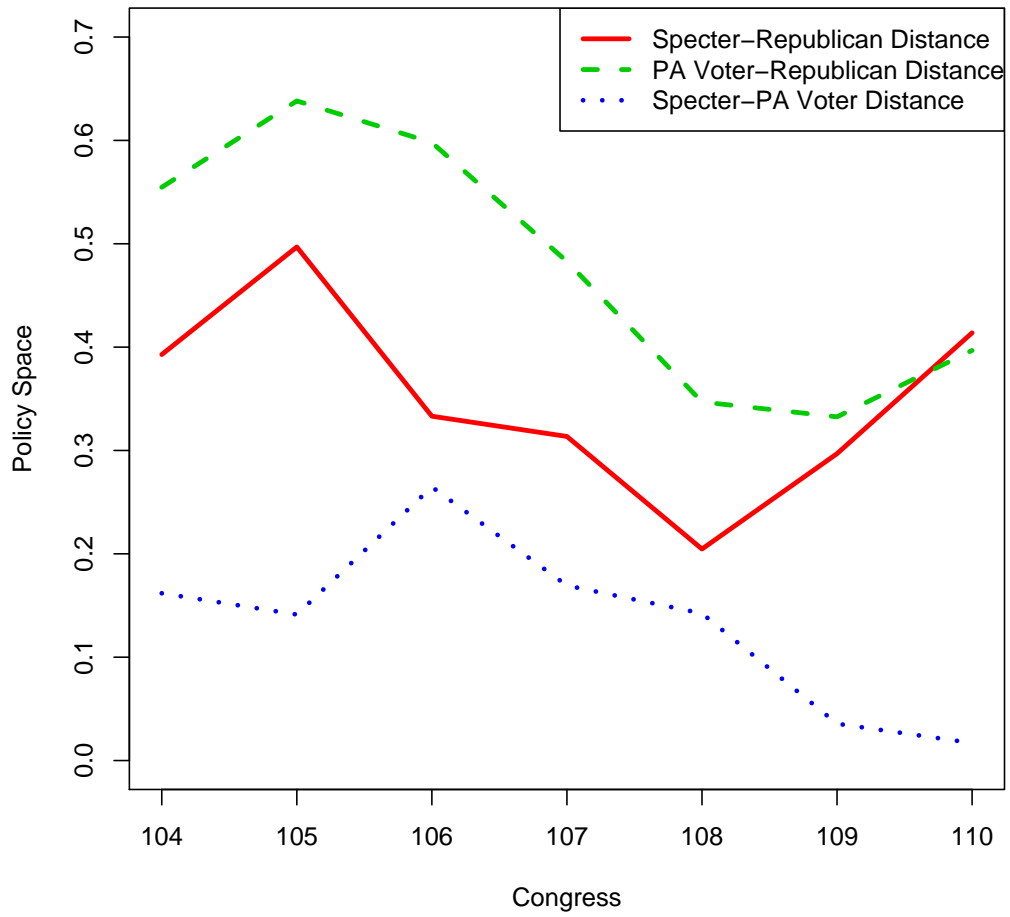
Model 3, it appears that Republican members of split delegations are simply more likely to vote according to their own personal ideologies than those of their party or constituency.

### 5.3 The Case of Arlen Specter

It is fitting to reconsider the case of Arlen Specter in light of the model's results. Figure 9 traces the distance between Specter's net ideal point and median voter in Pennsylvania over time, as well as his distance from the Republican Party and Pennsylvania's distance from the Republican Party as well. We see that, since the 108th Congress, the distance between Specter and the median Pennsylvanian continued to shrink, almost to the point of being non-existent. At the same time, his distance from the Republican Party, as well as the distance of his voters from that party, increased.

Specter, mindful of his re-election prospects, made the rational choice to switch parties. Indeed, when he spoke of distances between the Republicans and his voters, he was right on target. As a Republican moderate, the tension between the sets of competing interests that he sought to balance became too much to handle. While he was not sweet-talked into the party switch, with gifts of prominent chairmanships, he was nonetheless rational. Specter implicitly used the weighted utility framework employed in this paper and decided that having to weigh a Republican position so far from himself and his constituency was simply not going

Figure 9: Specter Over Time



to cut it.

## 6 Discussion

Until recently, it has been almost impossible to talk meaningfully about distances between legislators and other actors due to the lack of a common space. As a result, conclusions about responsiveness, in a spatial sense, have been limited at best. Though work by recent scholars (Bafumi & Herron 2007, Shor 2009) has made inroads in this respect, this line of research is designed to help scholars address issues of representation and partisan effects in the future and requires more data. As for looking to the past, rescaling techniques like the one used in this paper, are the next best alternative.

This paper has presented a new method that allows scholars to disentangle the effects of competing sources of influence on the voting behavior of legislators. The results from estimating the model on data from the last decade and a half suggest both a waning weight that legislators place on their parties and an increasing role of constituency in determining legislative behavior. Moreover, subsequent analysis revealed that ideological moderates and members of split delegations are more sensitive to partisan and constituency than ideological extremists. On the one hand, the results of this paper are not too surprising. After all, Sinclair (1995) theorized that legislators make decisions in a weighted framework. Other scholars (e.g. Smith 2007, Kingdon 1989) have also suggested that a lot of factors go into legislators' decisions. Thus, finding that neither preference nor party nor constituency alone sufficiently explains legislators' voting is not unexpected. Our method delineates precisely how legislators are affected by the sources of influence.

Though these results are interesting and important in and of themselves, there is still much to do. First, refining our measures of constituency ideology can help

to ensure the robustness of this paper's findings. While the rescaling technique presented is empirically sound, it is much more preferable to estimate the median voter's ideal point directly. To this end, projects like the CCAP will help to revolutionize scholars' abilities to assess the ideological congruence between legislators and voters.

Second, the analysis should be extended beyond the Senate to both the House and state legislatures, whenever possible. This will allow scholars to examine the degree to which patterns uncovered here are broad-reaching and cross-institutional. Even more interesting, this will allow scholars to see how variations in institutions and rules effect the weights legislators are placing on their various sources of influence.

Third, the set of influence that legislators weigh should be expanded. Fenno (1978) long ago observed that legislators' constituencies are much more complex than the general election electorate. The most important of these, in the context of our model, is the primary constituency. While we omitted this aspect from the applications in this paper, this was only because we lacked appropriate data. As surveys like the CCAP continue to grow, assessing preferences of the primary electorate in a common space will be possible. In turn, this will allow researchers to examine whether or not legislators' weights are higher for primary or re-election constituency.

While the tasks ahead are many, there is an important lesson that has been learned with these initial results at hand: ignoring the multiple influences on legislators is not merely a casual mistake. To the contrary, it masks a series of underlying dynamics that are reshaping American legislative institutions.

## Appendix A: NPAT Questions

*Note:* All questions below are taken verbatim from the NPAT. When an ordered question was used (e.g. lower, maintain, or raise), a dummy variable for was created. The coding of this new variable is described in parentheses, when appropriate.

1. Abortions should always be legally available.
2. Abortions should always be illegal.
3. Remove all legislative limits on campaign financing.
4. Do you support amending the United States Constitution to allow voluntary prayer and/or moment of silence in public schools?
5. Should the US have diplomatic relations with the government of Cuba?
6. Implement a universal health care program to guarantee coverage to all Americans regardless of income.
7. Decriminalize the possession and private use of marijuana.
8. Increase the minimum wage.
9. Do you support replacing the US income tax structure with a flat income tax?
10. Do you support the North American Free Trade Agreement (NAFTA)?
11. Do you support lifting the trade embargo imposed against Cuba?
12. Do you support replacing the US income tax structure with a broad-based consumption tax?
13. (Raise taxes on) Family income over \$150,000.

14. The US should withdraw from the UN completely.
15. Allow law-abiding citizens to carry concealed firearms that are legally owned and registered.
16. (Raise spending on) Welfare (AFDC).
17. (Raise spending on) Education (K-12).
18. Abortions should be legal in all circumstances as long as the procedure is completed within the first trimester of pregnancy.
19. Strengthen emission controls on all gasoline or diesel powered engines, including cars and trucks.
20. Establish English as the official and recognized language of the United States.
21. Further limit the number of immigrants allowed into the country.
22. (Raise spending on) Farm subsidies.
23. (Raise spending on) Medicaid.
24. Broaden use of the death penalty for federal crimes.
25. (Raise) Estate taxes.
26. (Support) National Missile Defense Program.
27. The federal government should not provide any affirmative action programs.
28. (Raise spending on) AIDS Programs.
29. (Raise spending on) Environmental Programs.
30. (Raise spending on) Law Enforcement.
31. (Raise spending on) Military hardware.

32. (Raise spending on) Provide parents with vouchers to send their children to any participating school: public, private or religious.
33. (Raise spending on) Abortions should be legal only when the pregnancy resulted from incest or rape or when the life of the woman is endangered.

## Appendix B: WinBUGS Code

```

model{
  for (i in 1:N){
    for (j in 1:J){
      y[i,j] ~ dbern(p[i,j])
      logit(p[i,j]) <- -a[j] + b[j]*x[i]
    }
  }

  for (k in 1:K){
    w[k,1] ~ dunif(0.0,1.0)
    upper1[k] <- 1.0-w[k,1]
    w[k,2] ~ dunif(0.0,upper1[k])
  }

  for (j in 1:J){
    a[j] ~ dnorm(0,0.2)
    b[j] ~ dnorm(0,0.2)
    cutpoint[j] <- a[j]/b[j]
  }
}

```

}

}



## References

- Aldrich, John H., & David W. Rohde. 2000. The Consequences of Party Organization in the House: The Role of the Majority and Minority Parties in Conditional Party Government. In *Polarized Politics: Congress and the President in a Partisan Era*. pp. 31–72.
- Ansolabehere, Steven, James Snyder, & Charles Stewart. 2001. “The effects of party and preferences on congressional roll-call voting.” *Legislative Studies Quarterly* pp. 533–572.
- Bafumi, Joseph, & Michael Herron. 2007. Preference Aggregation, Representation, and Elected American Political Institutions.
- Bock, R.D., & M. Aitkin. 1981. “Marginal maximum likelihood estimation of item parameters: Application of an EM algorithm.” *Psychometrika* 46:443–459.
- Burden, Barry C. 2004. “A technique for estimating candidate and voter locations.” *Electoral Studies* 23:623–639.
- Clausen, Aage R. 1967. “The Measurement of Legislative Group Behavior.” *Midwest Journal of Political Science* 11:212–224.
- Clausen, Aage R., & Richard B. Cheney. 1970. “A Comparative Analysis of Senate House Voting on Economic and Welfare Policy: 1953-1964.” *The American Political Science Review* 64:138–152.
- Clinton, Joshua, Simon Jackman, & Douglas Rivers. 2004. “The Statistical Analysis of Roll Call Data.” *The American Political Science Review* 98:355–370.
- Cox, Gary W., & Mathew D. McCubbins. 2005. *Setting the agenda: Responsible party government in the US House of Representatives*. Cambridge Press.
- Downs, Anthony. 1957. *An Economic Theory of Democracy*. New York: Harper.

- Fenno, Richard F. 1973. *Congressmen in Committees*. Little, Brown.
- Fenno, Richard F. 1978. *Home Style: House members in Their Districts*. Little, Brown.
- Gelman, A., & D.B. Rubin. 1992. "Inference from iterative simulation using multiple sequences." *Statistical Science* pp. 457–472.
- Geweke, J., JO Berger, & AP Dawid. 1992. "Evaluating the accuracy of sampling-based approaches to the calculation of posterior moments." *In Bayesian Statistics 4* .
- Groseclose, Tim, & Jr. Snyder, James M. 2000. "Vote Buying, Supermajorities, and Flooded Coalitions." *The American Political Science Review* 94:683–684.
- Heckman, James J., & James M. Snyder Jr. 1997. "Linear Probability Models of the Demand for Attributes with an Empirical Application to Estimating the Preferences of Legislators." *The RAND Journal of Economics* 28:S142–S189.
- Heckman, J.J., & T.E. MaCurdy. 1980. "A life cycle model of female labour supply." *The Review of Economic Studies* pp. 47–74.
- Jacobson, Gary C. 2004. *The Politics of Congressional Elections*. Pearson.
- Kingdon, John W. 1989. *Congressmen's Voting Decisions*. University of Michigan Press.
- Krehbiel, Keith. 1996. "Committee Power, Leadership, and the Median Voter: Evidence from the Smoking Ban." *Journal of Law, Economics, & Organization* 12:234–256.
- Levitt, Steven D. 1996. "How Do Senators Vote? Disentangling the Role of Voter Preferences, Party Affiliation, and Senator Ideology." *The American Economic Review* 86:425–441.

- Londregan, John. 1999. "Estimating legislators' preferred points." *Political Analysis* 8:35.
- Poole, Keith T., & Howard Rosenthal. 1997. *Congress: A political-economic history of roll call voting*. Oxford University Press.
- Rivers, Douglas. 2003. "Identification of Multidimensional Item-Response Models." *Typescript. Department of Political Science, Stanford University* .
- Shor, Boris. 2009. "All Together Now: Putting Congress, State Legislatures, and Individuals in a Common Ideological Space."
- Sinclair, Barbara. 1995. *Legislators, Leaders, and Lawmaking: The US House of Representatives in the Postreform Era*. Johns Hopkins University Press.
- Sinclair, Barbara. 2002. Do Parties Matter? In *Party, Process, and Political Change in Congress*. Stanford University Press.
- Smith, Steven S. 2007. *Party Influence in Congress*. Cambridge Univ Press.
- Stewart, Charles E. III, & Jonathan Woon. 2009. "Congressional Committee Assignments, 103rd to 110th Congresses, 1993–2007: Senate, updated 01/03/09."