Coordination, Moderation and Institutional Balancing in American House Elections at Midterm

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Abstract

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Individuals' turnout decisions and vote choices for the House of Representatives have been coordinated in recent midterm election years, with each eligible voter (each elector) using a strategy that features policy moderation. Coordination is defined as a noncooperative rational expectations equilibrium among electors, in which each elector has both common knowledge and private information about the election outcome. Stochastic choice models estimated using individual-level data from the American National Election Study Post-Election Surveys of years 1978–1998 support coordination, but a model in which electors act non-strategically to moderate policy has very similar behavioral implications and also works well. The empirical coordinating model satisfies the fixed point condition that defines the common knowledge expectation electors have about the election outcome in the equilibrium of the theoretical model. Both the coordinating and non-strategic models are capable of generating a midterm cycle in which the President's party usually loses vote share at midterm. Both models correctly flag 1998 as an exception to that pattern: the Republican party had policy positions that were too conservative for most electors. Moderation at midterm has usually been based on electors' expectations that the House will dominate the President in determining post-election policy.

Do Americans coordinate their electoral choices in midterm congressional elections? Consider the population of everyone who is eligible to vote—henceforth, the population of *electors*. Suppose an elector knows that policy outcomes are compromises between the positions taken by the President and the Congress, and believes the two political parties push for distinct policy alternatives. Then the elector believes that different combinations of party control of the presidency and the Congress will produce different policy outcomes. If the elector cares about the policy outcomes, then the elector should take the President's party—and hence the President's policy position—into account when deciding what to do in the election. Alesina and Rosenthal (1989; 1995; 1996) argue that midterm voters are choosing between House candidates with the intention to bring about a "moderate" policy outcome, meaning a policy outcome that is between the parties' positions. But some electors may find the effect they expect their vote to have on the post-election policy outcome to be too small to motivate them to vote at all. To make the most effective electoral choice, each elector should consider how likely it is that the election will produce each possible combination of party control: will it create or increase the size of a majority in Congress for the President's party, increase the size of an opposition majority, or what. Coordination occurs when each elector makes the best possible assessment of what the election outcome will be, and then uses that assessment to act in the way that is most likely to produce the best possible result for the elector.

Moderation does not necessarily imply coordination. Moderation refers to the relationship between the policy outcome intended by the elector and the parties' policy positions. There is moderation if the intended policy outcome is an intermediate combination of the parties' positions. Coordination refers to a relationship among different electors' choices among candidates. There is coordination if each elector's choice is in a strategic sense in equilibrium with every other elector's choice. We interpret this to mean three things: each elector's strategy for choosing among candidates or perhaps deciding not to vote is in equilibrium with every other elector's strategy for choosing among candidates or perhaps deciding not to vote; each elector's beliefs about every other elector's preferences and strategy are compatible with the elector's own strategy; each elector's beliefs are compatible with every other elector's beliefs.

Coordination among electors is not the same thing as cooperation among them. In the theoretical model we develop in this paper, electors do not cooperate with one another—they do not act based on binding prior agreements—but each elector is able to make an equilibrium strategic choice, in accurate anticipation of the aggregate result of the choices all other electors intend to make, by using information that all electors know. Alesina and Rosenthal's (1989; 1995; 1996) theory of moderation features coordination in the choices voters make between candidates—each voter's choice between candidates depends on an expected election result that everyone knows and that is an equilibrium. Their model does not feature an equilibrium level of voting turnout, however. In the current model there is an equilibrium that includes the level of turnout along with the two-party split of votes for House candidates. Our model allows for exogenous factors that may motivate an elector to vote, so that our equilibrium does not necessarily represent a new solution to the problem of obtaining substantial positive turnout in equilibrium based purely on post-election policy considerations (cf. Hinich, Ledyard and Ordeshook 1972; Enelow and Hinich 1984; Ledyard 1984; Palfrey and Rosenthal 1985). Voters in Alesina and Rosenthal's treatment do not have private information about the election outcome. In the model developed here, different electors have beliefs about the upcoming election results that are very similar but not exactly the same in equilibrium. The similarity among their beliefs is a result of the common knowledge they have, while the differences that remain are due to private information each elector has about concerns that affect the elector's preferences among electoral actions.

We use American National Election Studies [ANES] survey data from midterm election years 1978 through 1998 to estimate a stochastic choice model that closely matches the theoretical model.

The empirical results support the idea that in recent years Americans' electoral choices for the House of Representatives have been coordinated, with each elector using a strategy that features policy moderation. In both the theoretical model and the empirical model, each elector forms preferences about the candidates based on a personally distinct idea about what the parties' policy positions are. The coordination takes the form of a rational expectations equilibrium among electors. In form our notion of an equilibrium among electors is quite similar to the concept of a coordinating equilibrium among voters during presidential election years developed theoretically and tested empirically by Mebane (forthcoming). Mebane's (forthcoming) analysis considers only voters and their choices among candidates for President and for the House of Representatives. He ignores electors' decisions whether to vote (and if so, whether to vote for both offices).

We also introduce an empirical model that applies to midterm elections the core idea in the non-strategic theory that Fiorina (1988; 1992, 73–81) introduced to describe institutional balancing by voters in elections during presidential years. Mebane (forthcoming) found the non-strategic theory to be significantly inferior to his coordinating theory in analysis of ANES data from the presidential-year elections of years 1976–1996. The outcome could well be different at midterm, however, if only because at midterm there are fewer choices: there is no vote for President at midterm. We find the non-strategic model to have implications for midterm elector behavior that are very similar to the implications of the coordinating model. We compare the models closely to try to measure the difference coordination may mean for what different kinds of electors do.

The theory of moderation-with-coordination developed by Alesina and Rosenthal (1989; 1995; 1996) implies that the party that wins a presidential election will usually lose support in Congress at midterm. The theory explains the midterm loss as a consequence of a kind of equilibrium overshooting in the presidential election. Each voter chose a congressional candidate during the presidential-year election to match the voter's expectation regarding the presidential outcome, which was uncertain. For some voters, the equilibrium vote in the congressional election when the presidential outcome was uncertain is not the same as the vote they would cast if they knew for sure which presidential candidate would win. At midterm, such voters change their votes, so that the midterm election results differ from the congressional voting results in the preceding presidential-election year. Usually the changed votes produce a reduction of support for candidates of the President's party. Alesina and Rosenthal (1989; 1995, 137–160; Alesina, Londregan and Rosenthal 1993) show patterns in aggregate data that match the kind of midterm cycle that their theory implies. But neither they nor anyone else has provided evidence to show that individual voters act the way the equilibrium of their theory says they should. A question we examine is whether a non-strategic model of individual electors' choices can explain a midterm cycle pattern as well as a coordinating equilibrium model can. The 1998 election helpfully reminds us that a midterm loss by the President's party is not inevitable. A successful model ought to be able to explain such an outcome, too.

Alesina and Rosenthal's theory is far from the only one on offer to explain the frequently observed midterm cycle (Erikson 1988). Some have emphasized the connection between evaluations of the President and midterm election outcomes. Put most simply, as the President's popularity goes, so goes the midterm election (Kernell 1977; Piereson 1975; Born 1990; Cover 1986; Abramowitz 1985).[1]. Such explanations are not strictly speaking alternatives to a policy-moderating theory, because evaluations of policy performance may be a large reason for a President to be more or less popular. Another line of argument emphasizes differences in voter turnout between the presidential election and midterm, with a surge of support for the President's party in the presidential election ebbing at midterm (Campbell 1966; Campbell 1985, 1987, 1991; Born 1990; Cover 1986). The relationship between partisan preferences and turnout at midterm is well known to be strong, as we reconfirm in our empirical analysis. In the current paper we are not able to assess how surge-and-decline dynamics may affect midterm cycles in the context of a coordinating equilibrium, because we do not have a comparable analysis of elector's choices in presidential years.

The heart of the formal model of coordination that we develop and test empirically in this paper is a fixed point theorem that defines the common knowledge belief that all electors have about the upcoming election results. The election results are summarized in the values of two aggregate statistics, corresponding to (i) the proportion of the two-party vote to be cast nationally for Republican candidates for the House and (ii) the proportion of electors who will vote. Each elector cares about those values because they affect the loss each elector expects to experience from policies the government will adopt after the election. Each elector chooses what to do so as to minimize the loss the elector expects to incur. Therefore each elector's belief about the aggregate values affects the elector's choice. The fixed point theorem shows that aggregate values exist that have a basic self-consistency property: if every elector chooses based on the belief that the aggregate statistics have those values, then the aggregate result to be expected from all the electors' choices is the very same pair of aggregate values. In that case, beliefs match expected actions. Common knowledge of the fixed point values is not quite enough to establish an equilibrium, because the common knowledge does not include private information each elector has about the elector's actual choice. If each elector's belief equals the common knowledge values adjusted by amounts that correspond to the elector's choice, then the belief each elector has about the aggregate result is consistent with the choice the elector knows it will make. Despite knowing that every other elector is also acting on the basis of beliefs that differ slightly from the common knowledge values, no elector knows any other elector's private information and so no elector can do any better than to use the common knowledge values as its aggregate expectation for what everyone else is going to do. Because all electors are situated similarly, it is common knowledge that every elector is forming beliefs in that way. So there is an equilibrium in which every elector has a slightly different expectation regarding the upcoming election results.

The fixed point result that determines what electors' beliefs are in equilibrium in the theoretical model imposes a constraint on the statistical model to be used to estimate the parameters of the model with survey data. The empirical model is defined to correspond as closely as possible to the theoretical model. The empirical and theoretical models use the same functional forms for each elector's loss function, as well as the same specifications for the statistical distribution of the random disturbances that affect the choice each elector makes. Hence both models specify the same stochastic choice model for each elector. The special constraint is that the estimates of the parameters of the empirical model must be such that the aggregate election summary statistics estimated from the survey data satisfy the fixed point condition. Mebane (forthcoming) first imposed such a constraint on a stochastic choice model of electoral behavior. The empirically determined fixed point values are the estimates for the aggregate values that are common knowledge in equilibrium in the theoretical model. A distinction between the empirical and theoretical models is that, because of limitations on what we can observe with survey data, the empirical model treats the fixed point values as the belief that every elector has regarding the upcoming election outcome. The empirical model does not refine each elector's belief to take the elector's private information into account.

A Model of Coordinating Turnout and Vote Choice at Midterm

In the model the election is a game among everyone who is eligible to vote—among all the electors, assumed to be a large number. Electors all act non-cooperatively. The model focuses on the choice each elector makes whether to vote for one of two candidates for a House seat, or not to vote. There are many House districts, but each elector has the option of voting in only one of them. There are two parties, Democratic and Republican, and each race has one candidate running for each party (in the next section we extend the model to include districts in which one candidate is running unopposed). Whether the incumbent is running and the incumbent's party each varies over districts. Some electors' preferences regarding the candidates and the possibility of not voting depend on the expected outcome of the election and therefore on the choice strategy every other elector is using. Equilibrium occurs when, given everything each elector knows—including the elector's own intended choice and accurate expectations regarding other electors' strategies—no elector expects to gain by using a different strategy.

Some electors have preferences regarding the three choices that depend on spatial comparisons between the elector's ideal point and the policies the elector believes will result from various election outcomes. Those policies are functions of the policy position the elector expects each party will act on after the election. The expected post-election policy position for the party of the President is a combination of two positions that may differ: the position the elector associates with the party on the basis of previous turns in office and previous campaigns; and the position the elector thinks the President has adopted. For each election, the expected position of the President's party is a weighted average of the President's position and the prior party position. Presidents do not all have the same ability to move their parties to the position the President supports. The more influential the President, the greater the weight on the President's position. For the opposing party there is no presidential figure so there is only one position for the elector to consider.

We use a variable ν_i to indicate whether the preferences of elector i, $i = 1, \ldots, N$, depend on expected policy outcomes: $\nu_i = 1$ if so, $\nu_i = 0$ if not. If $\nu_i = 1$, we use ϑ_{Di}, ϑ_{Ri}, ϑ_{PDi} and ϑ_{PRi} to denote values in the interval $[0, 1]$ that elector i has in mind at election time for the prior position of the Democratic party (ϑ_{Di}) and Republican party (ϑ_{Ri}), and the position of the Democratic President (ϑ_{PDi}) and the Republican President (ϑ_{PRi}), as relevant. The Democratic positions need not be to the "left" of (i.e., numerically less than) the Republican positions. The policy positions elector i expects the Democratic party (θ_{Di}) and the Republican party (θ_{Ri}) to act on after the election are, respectively,

$$\theta_{Di} = \begin{cases} \rho\vartheta_{PDi} + (1-\rho)\vartheta_{Di}, & \text{if Democrat is President} \\ \vartheta_{Di}, & \text{if Republican is President} \end{cases} \tag{1}$$

$$\theta_{Ri} = \begin{cases} \vartheta_{Ri}, & \text{if Democrat is President} \\ \rho\vartheta_{PRi} + (1-\rho)\vartheta_{Ri}, & \text{if Republican is President} \end{cases} \tag{2}$$

with $0 \leq \rho \leq 1$. If the President is a Democrat and the Democratic party's position is expected to be very close to the President's position, the weight ρ is near one, but if the party's position is expected to remain close to its previous value, ρ is near zero. The elector's expectation for the position of the Republican party with a Republican President is determined analogously.

The policy expected to result from each possible election outcome depends on four factors: the parties' expected policy positions (as just defined); the policy position expected to be supported in Congress; the President's strength in comparison to the House; and which party controls the presidency. To represent the expected position of Congress, we simplify by ignoring both the existence of the Senate and all internal structure in the House. Ignoring such structures of the House as seats, committees, bills and rules, the expected position of the House is simply a weighted average of the expected positions of the two parties. Each party's weight is equal to the proportion of the vote that i expects to be cast nationally for the party's House candidates. The proportion that i expects to be cast for Republicans, denoted $\bar{H}_i$, depends on the proportion of electors i expects to vote nationally for Republicans ($\bar{R}_i$) and for Democrats ($\bar{D}_i$): $\bar{H}_i = \bar{R}_i/(\bar{R}_i + \bar{D}_i)$; equivalently, $\bar{H}_i = \bar{R}_i/\bar{V}_i$, where $\bar{V}_i = \bar{R}_i + \bar{D}_i$ is the proportion of electors i expects will vote nationally. The expected position of the House is $\bar{H}_i\theta_{Ri} + (1 - \bar{H}_i)\theta_{Di}$.

Given $\bar{H}_i$, the post-election policy that elector i expects is then a weighted average of the expected position of the House and the expected position of the President's party. The weight of the President represents the President's strength in comparison to the House. For each value of $\bar{H}_i$ the expectation for post-election policy depends on the President's party:

$$\tilde{\theta}_i = \begin{cases} \alpha\theta_{Di} + (1-\alpha)[\bar{H}_i\theta_{Ri} + (1-\bar{H}_i)\theta_{Di}], & \text{if Democrat is President} \\ \alpha\theta_{Ri} + (1-\alpha)[\bar{H}_i\theta_{Ri} + (1-\bar{H}_i)\theta_{Di}], & \text{if Republican is President} \end{cases} \tag{3}$$

with $0 \leq \alpha \leq 1$. The weight, α, represents the strength the President is expected to have. The value $\alpha = 1$ means that the President is expected to dictate policy so that the legislature would play no role, while $\alpha = 0$ means that the legislature is expected to determine policy with the President being irrelevant.

The functional form of $\tilde{\theta}_i$ is essentially the same as the simplest policymaking formalism considered by Alesina and Rosenthal (1995, 47–48), but there is an important difference in what the current model says about the information that electors have. Following the approach of Mebane (forthcoming), the specification of (3) differs from Alesina and Rosenthal's (1995) theory in allowing the expected policy $\tilde{\theta}_i$ and the expected election outcome $\bar{H}_i$ to vary over voters. In the theory of Alesina and Rosenthal (1995; 1996), the expected policies and expected election outcomes have the same values for all voters. The variations in the values over voters in the current model mean that the current model endows voters with private information in a way that the theory of Alesina and Rosenthal (1995; 1996) essentially does not do.

The policy-related loss each elector with $\nu_i = 1$ expects from the election outcome depends on the absolute discrepancy between the elector's ideal point, denoted $\theta_i \in [0, 1]$, and the policy expected given the election outcome. The absolute discrepancy is $|\theta_i - \tilde{\theta}_i|$. The loss always increases as the absolute discrepancy between the elector's ideal point and the expected policy gets larger. We use an exponent $q > 0$ to allow the loss to be a concave ($0 < q < 1$), linear ($q = 1$) or convex ($q > 1$) function of the absolute discrepancy between θ_i and the expected policy. The loss is

$$\lambda_i = \begin{cases} |\theta_i - \tilde{\theta}_i|^q\,, & \text{if } \nu_i = 1 \\ 0\,, & \text{if } \nu_i = 0\,. \end{cases} \tag{4}$$

Every elector i's choice affects the expected election outcome, $\bar{H}_i$, and hence for electors with $\nu_i = 1$ affects $\tilde{\theta}_i$ and therefore the expected loss λ_i. For electors with $\nu_i = 1$ the expected loss therefore has three different values, depending on whether i chooses the Republican $(\lambda_{i,R})$, i chooses the Democrat $(\lambda_{i,D})$ or i does not vote $(\lambda_{i,A})$. For electors with $\nu_i = 0$, $\lambda_{i,R} = \lambda_{i,D} = \lambda_{i,A} = 0$.

Considerations other than the expected policy-related losses also affect the value elector i associates with each choice. For instance, the act of voting itself subjects i to rewards or costs that do not occur if i does not vote. Let the continuous random variables $\xi_{i,A}$, $\xi_{i,D}$ and $\xi_{i,R}$ represent gains or losses elector i experiences in addition to the expected policy-related losses if i, respectively, does not vote, votes for the Democrat and votes for the Republican. The total loss for elector i from the election, taking into account elector i's choice whether to participate, is then

$$\tilde{\lambda}_i = \begin{cases} \lambda_{i,D} + \xi_{i,D}, & \text{if } i \text{ votes for the Democrat} \\ \lambda_{i,R} + \xi_{i,R}, & \text{if } i \text{ votes for the Republican} \\ \lambda_{i,A} + \xi_{i,A}, & \text{if } i \text{ does not vote .} \end{cases} \tag{5}$$

An elector's preference between voting for the Democrat and voting for the Republican depends on which choice produces the least total loss, $\tilde{\lambda}_i$. Using $\bar{V}_{i,V}$ to denote the proportion of electors i expects to vote, including i, let $\bar{H}_{i,R} = \bar{R}_{i,R}/\bar{V}_{i,V}$ denote the proportion of the national vote received by Republican House candidates if the elector chooses the Republican running in the elector's district, and let $\bar{H}_{i,D} = \bar{R}_{i,D}/\bar{V}_{i,V}$ denote the proportion received by Republican House candidates if the elector chooses the Democrat. Because $N\bar{V}_{i,V}$ is large and each elector has one vote that is cast (or not) independently of other votes, the effect of a single elector's choice on the expected election outcome is small: $\bar{R}_{i,R} = \bar{R}_{i,D} + 1/N$, so that $\bar{H}_{i,R} - \bar{H}_{i,D} = 1/(N\bar{V}_{i,V})$. The small size of $\bar{H}_{i,R} - \bar{H}_{i,D}$ means that the effect on λ_i of the elector's choosing the Republican candidate rather than the Democrat, $\lambda_{i,R} - \lambda_{i,D}$, is well approximated by $(N\bar{V}_{i,V})^{-1} d\lambda_i/d\bar{H}_i$.[2] If $(N\bar{V}_{i,V})^{-1} d\lambda_i/d\bar{H}_i$ is positive, voting for the Republican rather than the Democrat increases the elector's expected policy-related loss. Elector i therefore prefers the Republican to the Democrat if $(N\bar{V}_{i,V})^{-1} d\lambda_i/d\bar{H}_i + \xi_{i,R} - \xi_{i,D} <$

0, and the Democrat to the Republican if $(N\bar{V}_{i,V})^{-1}d\lambda_i/d\bar{H}_i + \xi_{i,R} - \xi_{i,D} > 0$.

An elector's preferences between voting for one of the candidates and not voting likewise depend on which alternative produces the least total loss. Using $\bar{V}_{i,A} = \bar{V}_{i,V} - 1/N$ to denote the proportion of electors i expects to vote, excluding i, let $\bar{H}_{i,A} = \bar{R}_{i,A}/\bar{V}_{i,A}$ denote the proportion of the national vote received by Republican House candidates if i does not vote, $\bar{R}_{i,A} = \bar{R}_{i,R} - 1/N$. Then $(N\bar{V}_{i,A})^{-1}(1 - \bar{H}_{i,R})d\lambda_i/d\bar{H}_i$ and $-(N\bar{V}_{i,A})^{-1}\bar{H}_{i,D}d\lambda_i/d\bar{H}_i$ approximately measure the effect on λ_i of elector i's choosing, respectively, the Republican or the Democrat rather than not voting.[3] So elector i prefers to vote for the Republican, rather than not to vote, if $(N\bar{V}_{i,A})^{-1}(1 - \bar{H}_{i,R})d\lambda_i/d\bar{H}_i + \xi_{i,R} - \xi_{i,A} < 0$, and elector i prefers to vote for the Democrat, rather than not to vote, if $-(N\bar{V}_{i,A})^{-1}\bar{H}_{i,D}d\lambda_i/d\bar{H}_i + \xi_{i,D} - \xi_{i,A} < 0$.

We can summarize elector i's preferences among all three choices—voting for the Republican (R), voting for the Democrat (D) and not voting (A)—in the form of a choice rule for i, expressed as a random variable Y_i that takes values on the choice set $K = \{D, R, A\}$:

$$Y_i = \begin{cases} D, & \text{if} \quad -(N\bar{V}_{i,A})^{-1}\bar{H}_{i,D}\dfrac{d\lambda_i}{d\bar{H}_i} < \xi_{i,A} - \xi_{i,D} \quad \text{and} \quad (N\bar{V}_{i,V})^{-1}\dfrac{d\lambda_i}{d\bar{H}_i} > \xi_{i,D} - \xi_{i,R} \\ R, & \text{if} \quad (N\bar{V}_{i,A})^{-1}(1 - \bar{H}_{i,R})\dfrac{d\lambda_i}{d\bar{H}_i} < \xi_{i,A} - \xi_{i,R} \quad \text{and} \quad (N\bar{V}_{i,V})^{-1}\dfrac{d\lambda_i}{d\bar{H}_i} < \xi_{i,D} - \xi_{i,R} \\ A, & \text{if} \quad (N\bar{V}_{i,A})^{-1}(1 - \bar{H}_{i,R})\dfrac{d\lambda_i}{d\bar{H}_i} > \xi_{i,A} - \xi_{i,R} \quad \text{and} \quad -(N\bar{V}_{i,A})^{-1}\bar{H}_{i,D}\dfrac{d\lambda_i}{d\bar{H}_i} > \xi_{i,A} - \xi_{i,D} . \end{cases}$$

Observe that $d\lambda_i/d\bar{H}_i = w_{Ci}$, where

$$w_{Ci} = \begin{cases} q(\theta_{Di} - \theta_{Ri})(1 - \alpha)|\theta_i - \tilde{\theta}_i|^{q-1}\operatorname{sgn}(\theta_i - \tilde{\theta}_i) , & \text{if } \nu_i = 1 \\ 0 , & \text{if } \nu_i = 0 , \end{cases}$$

with $\operatorname{sgn}(x) = -1$ if $x < 0$, $\operatorname{sgn}(x) = 0$ if $x = 0$, and $\operatorname{sgn}(x) = 1$ if $x > 0$. Defining

$$\kappa_{i,D} = -(N\bar{V}_{i,A})^{-1}\bar{H}_{i,D}w_{Ci} + \xi_{i,D} \tag{6a}$$

$$\kappa_{i,R} = (N\bar{V}_{i,A})^{-1}\left(1 - \bar{H}_{i,R}\right)w_{Ci} + \xi_{i,R} \tag{6b}$$

$$\kappa_{i,A} = \xi_{i,A} , \tag{6c}$$

we may write elector i's choice rule as

$$Y_i = \operatorname*{argmin}_{h \in K} \kappa_{i,h} \ . \tag{7}$$

Equation (7) defines a strategy for each elector, in a large-scale game in which all electors are participating. The moves available to each elector are the three choices the elector may make. We assume that all electors move simultaneously, that each elector plays the game non-cooperatively, and that each elector knows that every other elector is playing the game the same way. Because $\kappa_{i,D}$ and $\kappa_{i,R}$ depend directly on both the proportion of electors who vote ($\bar{V}_i$) and the parties' shares of the vote ($\bar{H}_i$), if $\nu_i = 1$ the best choice for each elector whose preferences depend on the expected post-election policy depends on what every other elector is going to do. The strategy defined by (7) is an equilibrium if it is the rule that minimizes each elector's expected loss when each elector assumes that everyone else is using the same rule.

For an equilibrium to exist, each elector must assign values to $\bar{H}_i \in \{\bar{H}_{i,D}, \bar{H}_{i,R}, \bar{H}_{i,A}\}$ and $\bar{V}_i \in \{\bar{V}_{i,V}, \bar{V}_{i,A}\}$ in a way that accurately corresponds to the choices every other elector is likely to make. To be able to do that, each elector must know something about the losses other electors expect to incur from the possible election outcomes. With sufficient information about those losses, each elector can anticipate what other electors will do in response to each electoral circumstance that may arise. Knowledge of that response pattern allows each elector i to determine the mutually consistent values of $\bar{H}_i$ and $\bar{V}_i$. The pair $(\bar{H}_i, \bar{V}_i)$ is mutually consistent if, given everything i knows, i chooses in such a way that—taking i's own choice into account—the proportion Republican that i expects among votes for the House is $\bar{H}_i$ and the number of electors i expects will vote is $\bar{V}_i$. In equilibrium, all pairs $(\bar{H}_i, \bar{V}_i)$, $i = 1, \ldots, N$, are mutually consistent.

We assume it is common knowledge (Fudenberg and Tirole 1991, 541–546) that every elector i has an expected loss $\tilde{\lambda}_i$ as defined by (5), and further that every i is choosing candidates so as to minimize $\tilde{\lambda}_i$. We assume that the common knowledge includes the values of all parameters, including ρ, α, q and any parameters in $\xi_{i,D}$, $\xi_{i,R}$ or $\xi_{i,A}$. It is then common knowledge that, for some values of the policy position and other variables, (7) is every elector's choice rule.

No elector knows the exact values of the ideal point, the party and presidential candidate policy positions, or the other variables on the basis of which any other elector is choosing via (7). Each elector does know the probability distribution of those values. Let Z_i be an ordered set that includes all the observable variables in $\tilde{\lambda}_i$. That includes ν_i, the position variables θ_i, ϑ_{Di}, ϑ_{Ri} and ϑ_{PDi} or ϑ_{PRi}, and the component $z_{i,h}$ of each $\xi_{i,h}$, $h \in K$, that may be observed using some generally known technology (e.g., an opinion survey). There are $M \ll N$ mutually exclusive and exhaustive groups of electors, denoted E_k, $k = 1, \dots, M$. For every elector $i \in E_k$, the election-time value of Z_i is generated, independently across individuals, by a process that takes values in a set $\tilde{Z}$ and has unimodal probability measure f_k, $\int_{\tilde{Z}} df_k(Z_i) = 1$. Let $\epsilon_{i,h}$ denote the component of $\xi_{i,h}$ not covered by Z_i, $h \in K$. These variables—collectively, the disturbance $\epsilon_i = (\epsilon_{i,D}, \epsilon_{i,R}, \epsilon_{i,A})$—have a joint distribution that is the same for every elector:

$$\Pr(\epsilon_{i,D} < x_D, \epsilon_{i,R} < x_R, \epsilon_{i,A} < x_A) = F_H(x_D, x_R, x_A) ,$$

where F_H is a generalized extreme value (GEV) distribution, independent of each f_k. We assume that M, $\tilde{Z}$, f_k, $k = 1, \dots, M$, the number of electors in each group (M_k), and the fact that ϵ_i is identically and independently distributed as F_H are all common knowledge.

A GEV distribution arises in a natural way as a model for the disturbance vector ϵ_i.[4] Suppose that, as time goes by, elector i randomly encounters a large number of pieces of information about the candidates and about the cost of voting, but remembers only the best piece of information about each choice. That is, the elector remembers the information about each choice that makes the loss from that choice seem the smallest. For a wide range of random processes that may generate the information each elector encounters, the distribution of the information the elector remembers about each choice is a generalized extreme value distribution (Galambos 1987, 286–314; Resnick

1987, 263–290).

Because many of the costs (or benefits) of voting are the same regardless of which candidate an elector prefers, we assume that some of the information each elector encounters that pertains to the prospect of voting for one candidate is correlated with such information regarding the other candidate. In that case, $\epsilon_{i,R}$ and $\epsilon_{i,D}$ vary together. To specify the GEV distribution that such a pattern of dependence produces, we start by defining

$$x_{i,D} = -(N\bar{V}_{i,A})^{-1}\bar{H}_{i,D}w_{Ci} + z_{i,D} \tag{8a}$$

$$x_{i,R} = (N\bar{V}_{i,A})^{-1}\left(1 - \bar{H}_{i,R}\right)w_{Ci} + z_{i,R} \tag{8b}$$

$$x_{i,A} = z_{i,A} \; . \tag{8c}$$

Using $v_{i,h} = \exp\{-x_{i,h}\}$, $h \in K$, we define

$$G_i = \left(v_{i,D}^{1/1-\tau} + v_{i,R}^{1/1-\tau}\right)^{1-\tau} + v_{i,A} \; , \qquad 0 \leq \tau < 1 \; . \tag{9}$$

Parameter τ measures the dependence between $\epsilon_{i,R}$ and $\epsilon_{i,D}$. If $\epsilon_{i,R}$ and $\epsilon_{i,D}$ are independent, $\tau = 0$. The GEV distribution function is $F_H(-x_{i,D},-x_{i,R},-x_{i,A}) = \exp\{-G_i\}$.

Given Z_i but ϵ_i known only to have the distribution F_H, choice rule (7) implies that the probabilities for elector i to choose each candidate pair are

$$\Pr(Y_i = h \mid Z_i) = \frac{v_{i,h}}{G_i}\frac{\partial G_i}{\partial v_{i,h}} \; , \quad h \in K \tag{10}$$

(McFadden 1978; Börsch-Supan 1990; Resnick and Roy 1990). Define $\mu_{i,h} = \Pr(Y_i = h \mid Z_i)$, $h \in K$.

To characterize the conditions under which mutually consistent pairs $(\bar{H}_i, \bar{V}_i)$ exist when each elector i knows all its own attributes—i.e., knows Z_i and ϵ_i—it is useful first to consider what happens when each elector knows only which group it belongs to. Because M, M_k, $\tilde{Z}$, f_k and F_H are common knowledge, no elector then has any information that would produce an expectation about the election outcome different from what the common knowledge would imply. No elector has any relevant private information. Therefore, if a set of mutually consistent pairs exists, the expectations $(\bar{H}_i, \bar{V}_i)$ will be the same for all electors (Aumann 1976; Nielsen, Brandenburger, Geanakoplos, McKelvey and Page 1990). Let $(\bar{H}, \bar{V})$ denote the common value that all the pairs have in this case.

Knowing only the group E_k to which an elector i belongs, and therefore knowing only the range $\tilde{Z}$ and probability measure f_k of the variables in Z_i, every elector determines the same probability for i to choose each alternative, by using f_k to integrate over the unknown data:

$$\Pr(Y_i = h \mid i \in E_k) = \int_{\tilde{Z}} \Pr(Y_i = h \mid Z_i) df_k(Z_i) \ , \quad h \in K \ . \tag{11}$$

Define $\bar{\mu}_{k,h} = \Pr(Y_i = h \mid i \in E_k)$, $h \in K$. Using f_{k_i} to denote the measure for the group to which i belongs, the proportion of electors expected to vote for Republican candidates is

$$\begin{aligned} \bar{R} &= N^{-1} \underbrace{\int_{\tilde{Z}} \cdots \int_{\tilde{Z}}}_{N \text{ times}} \left(\sum_{i=1}^{N} \mu_{i,R} \right) \prod_{i=1}^{N} df_{k_i}(Z_i), && \text{by common knowledge} \\ &= N^{-1} \sum_{k=1}^{M} \sum_{i \in E_k} \int_{\tilde{Z}} \mu_{i,R} df_k(Z_i), && \text{by independence} \\ &= N^{-1} \sum_{k=1}^{M} M_k \bar{\mu}_{k,R} \ . && \end{aligned} \tag{12}$$

Similarly, the proportion of electors expected to vote for Democratic candidates is

$$\bar{D} = N^{-1} \sum_{k=1}^{M} M_k \bar{\mu}_{k,D} \tag{13}$$

and the proportion of electors expected to vote nationally is

$$\bar{V} = \bar{R} + \bar{D} \ , \tag{14}$$

so that the expected House outcome is

$$\bar{H} = \bar{R} / \bar{V} \ . \tag{15}$$

We assume that the functional forms of (12), (13), (14) and (15) are common knowledge. It then follows that the set of possible values of $\bar{H}$ and $\bar{V}$ is common knowledge. If only the group membership of each elector is known, the mutual consistency condition requires that the $\bar{H}$ and $\bar{V}$ values must reproduce themselves when they are used to compute the functions $\bar{\mu}_{k,h}$, $h \in K$, and hence (12), (13), (14) and (15). In technical terms, the pair of computed values $(\bar{H}, \bar{V})$ must be a fixed point of the mapping $[0,1] \times [0,1] \rightarrow [0,1] \times [0,1]$ that (12), (13), (14) and (15) define. In the Appendix we show that such a pair $(\bar{H}, \bar{V})$ always exists (except on a set of measure zero). Necessary or sufficient conditions for $\bar{H}$ and $\bar{V}$ to be uniquely determined by the parameters of the model and the measures f_k are not clear.

The result when each elector i knows Z_i and ϵ_i may be expressed as a collection of small deviations from a fixed point $(\bar{H}, \bar{V})$. Let $\bar{\mu}_{k_i,h}$, $h \in K$, denote the group-specific probabilities for the group E_k to which i belongs. Let $\tilde{\mu}_{i,h}$ indicate the value of Y_i of (7) when elector i knows Z_i and ϵ_i but for other electors has only the common knowledge: $\tilde{\mu}_{i,h} = 1$ if $Y_i = h$, $\tilde{\mu}_{i,h} = 0$ if $Y_i \neq h$, $h \in K$. The values of $\tilde{\mu}_{i,h}$, $h \in K$, depend on $\bar{H}_i = \bar{H}_{i\tilde{\mu}_{i,R}\tilde{\mu}_{i,D}}$ and $\bar{V}_i = \bar{V}_{i\tilde{\mu}_{i,R}\tilde{\mu}_{i,D}}$, where $\bar{H}_{i\tilde{\mu}_{i,R}\tilde{\mu}_{i,D}}$ and $\bar{V}_{i\tilde{\mu}_{i,R}\tilde{\mu}_{i,D}}$ are obtained by replacing one instance of $\bar{\mu}_{k_i,R}$ in (12) with $\tilde{\mu}_{i,R}$ and one instance of $\bar{\mu}_{k_i,D}$ in (13) with $\tilde{\mu}_{i,D}$ and then using (14) and (15):

$$\bar{R}_{i\tilde{\mu}_{i,R}} = \bar{R} + (\tilde{\mu}_{i,R} - \bar{\mu}_{k_i,R})/N \tag{16a}$$

$$\bar{D}_{i\tilde{\mu}_{i,D}} = \bar{D} + (\tilde{\mu}_{i,D} - \bar{\mu}_{k_i,D})/N \tag{16b}$$

$$\bar{V}_{i\tilde{\mu}_{i,R}\tilde{\mu}_{i,D}} = \bar{R}_{i\tilde{\mu}_{i,R}} + \bar{D}_{i\tilde{\mu}_{i,D}} \tag{16c}$$

$$\bar{H}_{i\tilde{\mu}_{i,R}\tilde{\mu}_{i,D}} = \bar{R}_{i\tilde{\mu}_{i,R}} / \bar{V}_{i\tilde{\mu}_{i,R}\tilde{\mu}_{i,D}} \ . \tag{16d}$$

Notice that, because i knows Z_i and ϵ_i, the choice i makes is not random as far as i is concerned: given $\bar{H}_i$ and $\bar{V}_i$, if $\nu_i = 1$, and regardless of $\bar{H}_i$ or $\bar{V}_i$ if $\nu_i = 0$, one of the three alternatives in K will certainly be best according to (7).[5] An equilibrium set of choices Y_i and expectations

$(\bar{H}_i, \bar{V}_i)$, $i = 1, \ldots, N$, is therefore given by the following. THEOREM: There is a coordinating elector equilibrium if, with all electors using the same fixed point $(\bar{H}, \bar{V})$ computed from common knowledge, each elector i has $(\bar{H}_i, \bar{V}_i) = (\bar{H}_{i\tilde{\mu}_{i,R}\tilde{\mu}_{i,D}}, \bar{V}_{i\tilde{\mu}_{i,R}\tilde{\mu}_{i,D}})$ and $Y_i = h$ for whichever of the three possible pairs of values $(\bar{H}_{i\tilde{\mu}_{i,R}\tilde{\mu}_{i,D}}, \bar{V}_{i\tilde{\mu}_{i,R}\tilde{\mu}_{i,D}})$ produces the smallest value of $\tilde{\lambda}_i$, where $(\bar{H}_{i01}, \bar{V}_{i01})$ sets $\lambda_{i,D}$, $(\bar{H}_{i10}, \bar{V}_{i10})$ sets $\lambda_{i,R}$ and $(\bar{H}_{i00}, \bar{V}_{i00})$ sets $\lambda_{i,A}$. PROOF: Plainly the expectations $(\bar{H}_i, \bar{V}_i) = (\bar{H}_{i\tilde{\mu}_{i,R}\tilde{\mu}_{i,D}}, \bar{V}_{i\tilde{\mu}_{i,R}\tilde{\mu}_{i,D}})$ that minimize $\tilde{\lambda}_i$ match the choices elector i makes according to (7). And while each elector i knows that every other elector i' also has expectations $\bar{H}_{i'}$ and $\bar{V}_{i'}$ as defined by (16a–d), $\bar{H}$ and $\bar{V}$ are the best estimates of the election outcome—*not* taking into account the choices i will make—available to i in the absence of knowledge of the particular values of $Z_{i'}$ and $\epsilon_{i'}$: based on the common knowledge, the expectations of $N^{-1}\sum_{i=1}^{N}(\tilde{\mu}_{i,R} - \bar{\mu}_{k_i,R})/N$ and $N^{-1}\sum_{i=1}^{N}(\tilde{\mu}_{i,D} - \bar{\mu}_{k_i,D})/N$ are zero;[6] there is no information beyond the common knowledge with which to produce estimates that have smaller variance. Since it is common knowledge that all electors are similarly situated (i.e., exchangeable), it is common knowledge that $(\bar{H}, \bar{V})$ is every elector's best estimate of the election outcome, not counting the elector's own choices. END OF PROOF.

Unopposed Candidates

The model of the preceding section ignores the fact that some candidates run unopposed. To extend the model to cover such cases, we assume that when a candidate is unopposed each elector forms preferences as indicated by the choice rule (7), except conditioning on the pair of choices that are available. If a Democratic candidate is running unopposed, the elector conditions on the choice set $\{D, A\}$. If a Republican candidate is running unopposed, the elector conditions on the choice set $\{R, A\}$. If Z_i is known but ϵ_i is known only to have the distribution F_H, the conditional probabilities for elector i to choose each alternative when the Democratic candidate is unopposed are

$$\Pr(Y_i = h \mid Z_i,\ \text{Democrat unopposed}) = \begin{cases} \dfrac{\mu_{i,A}}{\mu_{i,A}+\mu_{i,D}}, & h = A \\ \dfrac{\mu_{i,D}}{\mu_{i,A}+\mu_{i,D}}, & h = D \\ 0, & h = R\ , \end{cases}$$

where $\mu_{i,h}$, $h \in K$, is defined by (10). When the Republican candidate is unopposed the conditional probabilities are

$$\Pr(Y_i = h \mid Z_i,\ \text{Republican unopposed}) = \begin{cases} \dfrac{\mu_{i,A}}{\mu_{i,A}+\mu_{i,R}}, & h = A \\ \dfrac{\mu_{i,R}}{\mu_{i,A}+\mu_{i,R}}, & h = R \\ 0, & h = D\ . \end{cases}$$

To denote the conditional probabilities, define $\mu_{i,h|\{D,A\}} = \Pr(Y_i = h \mid Z_i,\ \text{Democrat unopposed})$ and $\mu_{i,h|\{R,A\}} = \Pr(Y_i = h \mid Z_i,\ \text{Republican unopposed})$, $h \in K$.

When all that is known is the group E_k to which an elector i belongs, the conditional probabilities are

$$\Pr(Y_i = h \mid i \in E_k,\ \text{Democrat unopposed}) = \int_{\tilde{Z}} \mu_{i,h|\{D,A\}} df_k(Z_i)\ , \quad h \in K$$

$$\Pr(Y_i = h \mid i \in E_k,\ \text{Republican unopposed}) = \int_{\tilde{Z}} \mu_{i,h|\{R,A\}} df_k(Z_i)\ , \quad h \in K\ .$$

Define $\bar{\mu}_{k,h|\{D,A\}} = \Pr(Y_i = h \mid i \in E_k,\ \text{Democrat unopposed})$ and $\bar{\mu}_{k,h|\{R,A\}} = \Pr(Y_i = h \mid i \in E_k,\ \text{Republican unopposed})$, $h \in K$. If the numbers of electors in each group who are in a district with a fully contested race ($M_{k|\{D,R,A\}}$), with an unopposed Democrat ($M_{k|\{D,A\}}$) and with an unopposed Republican ($M_{k|\{R,A\}}$) are common knowledge, with $M_k = M_{k|\{D,R,A\}} + M_{k|\{D,A\}} + M_{k|\{R,A\}}$, then the proportion of electors expected to vote for Republican candidates is

$$\bar{R} = N^{-1} \sum_{k=1}^{M} \left(M_{k|\{D,R,A\}} \bar{\mu}_{k,R} + M_{k|\{R,A\}} \bar{\mu}_{k,R|\{R,A\}} \right)\ , \tag{17}$$

and the proportion of electors expected to vote for Democratic candidates is

$$\bar{D} = N^{-1} \sum_{k=1}^{M} \left(M_{k|\{D,R,A\}} \bar{\mu}_{k,D} + M_{k|\{D,A\}} \bar{\mu}_{k,D|\{D,A\}} \right)\ . \tag{18}$$

Definitions (14) and (15) are unchanged and the characterization of equilibrium goes through as before, with only minor changes.

A Model for Estimation with Survey Data

For the coordinating model to be empirically estimable, the fixed point $(\bar{H}, \bar{V})$ that is the basis for the elector equilibrium must satisfy a condition of local stability. To understand what is needed, imagine that every elector's belief about $(\bar{H}, \bar{V})$ undergoes a small perturbation from the fixed point values, say to $(\bar{H}^{(1)}, \bar{V}^{(1)})$. If each elector uses the perturbed values in (11) and hence evaluates (12), (13), (14) and (15), the result will in general be values $(\bar{H}^{(2)}, \bar{V}^{(2)}) \neq (\bar{H}^{(1)}, \bar{V}^{(1)})$. The fixed point $(\bar{H}, \bar{V})$ is locally stable if a sequence $(\bar{H}^{(1)}, \bar{V}^{(1)}), (\bar{H}^{(2)}, \bar{V}^{(2)}), \ldots$ thus produced by repeated cycling through (11), (12), (13), (14) and (15) converges to $(\bar{H}, \bar{V})$. Perturbations being inevitable, it is easy to see that any equilibrium that occurs in reality must have such a property: even the smallest change would set electors on a path leading rapidly away from any unstable pair $(\bar{H}, \bar{V})$.

Assuming that the equilibrium does exist, that the likelihood function that defines the empirical model specification is correct and that the variables that affect electors' choices in that specification are measured sufficiently well, the stability condition allows an iterative estimation algorithm such as the one described in the Appendix to converge to the parameter estimates that characterize the choices electors make in equilibrium. The need for the computed pair $(\hat{\bar{H}}, \hat{\bar{V}})$ to be a fixed point imposes an additional condition for the estimation algorithm to be judged to have converged: in addition to the usual conditions for having found parameter estimates that maximize the likelihood function, the estimated values $(\hat{\bar{H}}, \hat{\bar{V}})$ must be constant over successive iterations of the estimation algorithm. The requirement from the formal model that $(\bar{H}, \bar{V})$ be a fixed point imposes a fixed point constraint on the maximum likelihood solution.

With survey data we can observe the choices reported by each sampled elector i and a number of other variables that affect electoral choices—a set of variables Z_i. We can use the observed Z_i values and a set of parameter estimates (not necessarily the maximum likelihood estimates [MLEs]) in (10) to compute estimated choice probabilities $\hat{\mu}_{i,h}$, $h \in K$, for each sampled elector. We use such estimated probabilities to compute $(\hat{\bar{H}}, \hat{\bar{V}})$ for each set of parameter estimates without having to specify any particular set of groups E_k. The method is to use the sampling weight associated with each elector in each survey to estimate the totals in the formulas for $\bar{H}$ and $\bar{V}$. The sampling weight for elector i is $1/\omega_i$, where ω_i is proportional to the probability, determined by the sampling design, that i is included in the sample. Ratio estimates based on such weighted totals implicitly average over groups, without requiring explicit definition of the groups. To compute $\hat{\bar{H}}$ and $\hat{\bar{V}}$ for a sample S of n electors, $i = 1, \ldots, n$, we proceed as follows. Let $S_{\{D,R,A\}}$ denote the subsample of electors in districts with a fully contested race, $S_{\{D,A\}}$ the subsample with an unopposed Democrat and $S_{\{R,A\}}$ the subsample with an unopposed Republican. Given estimates $\hat{\mu}_{i,h}$ and using the fact that $\mu_{i,R,|\{D,A\}} = \mu_{i,D,|\{R,A\}} = 0$, we compute

$$\hat{\bar{R}} = \left(\sum_{i \in S_{\{D,R,A\}}} \frac{\hat{\mu}_{i,R}}{\omega_i} + \sum_{i \in S_{\{R,A\}}} \frac{\hat{\mu}_{i,R|\{R,A\}}}{\omega_i} \right) \Big/ \left(\sum_{i=1}^{n} 1/\omega_i \right) \tag{19}$$

and

$$\hat{\bar{D}} = \left(\sum_{i \in S_{\{D,R,A\}}} \frac{\hat{\mu}_{i,D}}{\omega_i} + \sum_{i \in S_{\{D,A\}}} \frac{\hat{\mu}_{i,D|\{D,A\}}}{\omega_i} \right) \Big/ \left(\sum_{i=1}^{n} 1/\omega_i \right) . \tag{20}$$

$\hat{\bar{R}}$, $\hat{\bar{D}}$, $\hat{\bar{V}} = \hat{\bar{R}} + \hat{\bar{D}}$ and $\hat{\bar{H}} = \hat{\bar{R}}/\hat{\bar{V}}$ are design-consistent.[7]

For two reasons, $(\hat{\bar{H}}, \hat{\bar{V}})$ is the best we can do to estimate $(\bar{H}_i, \bar{V}_i)$ with survey data. Using $\hat{\mu}_{i,h}$ to estimate $\bar{\mu}_{k_i.h}$ in (16a,b) would underestimate the magnitudes of $(\tilde{\mu}_{i,h} - \bar{\mu}_{k_i,h})/N$, $h \in K$. And with $N \approx 10^8$, survey samples are too small to detect the effects of the deviations from $(\bar{H}, \bar{V})$. For every sampled voter we therefore set $(\hat{\bar{H}}_i, \hat{\bar{V}}_i) = (\hat{\bar{H}}, \hat{\bar{V}})$.

To define the empirical model, in (8a–c) we set $\bar{H}_i = \bar{H}$ and $\bar{V}_i = \bar{V}$, $i = 1, \ldots, n$, and substitute

$b_{\mathrm{C}}\bar{V}^{-1}$ for $(N\bar{V})^{-1}$, where $b_{\mathrm{C}} > 0$ is a constant parameter:

$$x_{i,D} = -b_{\mathrm{C}}\bar{V}^{-1}\bar{H}w_{Ci} + z_{i,D} \tag{21a}$$

$$x_{i,R} = b_{\mathrm{C}}\bar{V}^{-1}\left(1 - \bar{H}\right)w_{Ci} + z_{i,R} \tag{21b}$$

$$x_{i,A} = z_{i,A} \; . \tag{21c}$$

Because the definition $F_H(-x_{i,D},-x_{i,R},-x_{i,A}) = \exp\{-G_i\}$ implicitly standardizes the GEV distribution, b_{C} equals N^{-1} divided by the standard deviation of the elements of the unstandardized disturbance.[8] We also use a technical reparameterization of (9) in order to decrease the correlation between the estimate of τ and the estimates of the parameters of $x_{i,D}$ and $x_{i,R}$.[9] Instead of (9), we use G_i in the form

$$G_i = \left(v_{i,D} + v_{i,R}\right)^{1-\tau} + v_{i,A} \; , \qquad 0 \leq \tau < 1 \; . \tag{22}$$

Given $T \geq 1$ samples S_t each containing n_t observations of the choices Y_i and variables Z_i, with each observation being chosen with probability proportional to ω_i from a large population ($\omega_i > 0$, $i = 1, \ldots, N_t$), the parameters of the model may be estimated by maximum likelihood. Let $y_{i,h} = 1$ if $Y_i = h$ and $y_{i,h} = 0$ if $Y_i \neq h$, $h \in K$. Including observations from districts that have unopposed candidates, the log-likelihood function is

$$L = \sum_{t=1}^{T}\left(\sum_{i \in S_{\{D,R,A\}t}} \sum_{h \in K} y_{i,h} \log \mu_{i,h} + \sum_{i \in S_{\{D,A\}t}} \sum_{h \in \{D,A\}} y_{i,h} \log \mu_{i,h|\{D,A\}} \right.$$
$$\left. + \sum_{i \in S_{\{R,A\}t}} \sum_{h \in \{R,A\}} y_{i,h} \log \mu_{i,h|\{R,A\}} \right) \; . \tag{23}$$

Iterations to determine the parameter values include recomputation of $(\hat{\bar{H}}, \hat{\bar{V}})$ at each iteration, as described in the Appendix.

A Non-coordinating Moderating Model

We define a model that applies to midterm elections the core idea in Fiorina's (1988; 1992, 73–81) non-coordinating (indeed, non-strategic) theory of institutional balancing by voters in presidential year elections. Fiorina's theory considers a situation in which there are two parties. Each voter has a choice between two candidates for President and two candidates for the legislature, one from each party. All of each party's candidates represent the same policy position. The core idea of the theory is that each voter chooses candidates based on the mix of party control of the presidency and the legislature—either unified or divided government—that would produce a policy outcome nearest the elector's ideal point. If the policy that would result from having a Democratic President and a Democratic majority in the legislature—i.e., unified Democratic government—is closer to a voter's ideal point than is the policy that would result from divided government or unified Republican government, then the voter chooses both of the Democratic candidates. In so choosing, it does not matter to the voter how likely it is that the Democratic presidential candidate will win, nor does the voter care what the Democratic party's share of the legislature is likely to be. It is the fact that the voter ignores the expected election outcome that makes the theory not a theory of coordinating behavior: no voter's choice depends on the choice or likely choice of any other voter.

We apply the core idea of Fiorina's non-coordinating theory to midterm elections by assuming that at midterm each elector treats the party of the President as fixed in forming a preference between unified or divided government, but otherwise ignores the expected election outcome. Using the party policy positions θ_{Di} and θ_{Ri} defined in (1) and (2), the post-election policies elector i, $\nu_i = 1$, expects if there is a Democratic majority in the House are

$$\tilde{\theta}_{Di} = \begin{cases} \theta_{Di}, & \text{if Democrat is President} \\ \alpha\theta_{Ri} + (1-\alpha)\theta_{Di}, & \text{if Republican is President ,} \end{cases} \tag{24}$$

and the post-election policies elector i expects if there is a Republican majority in the House are

$$\tilde{\theta}_{Ri} = \begin{cases} \alpha\theta_{Di} + (1-\alpha)\theta_{Ri}, & \text{if Democrat is President} \\ \theta_{Ri}, & \text{if Republican is President ,} \end{cases} \tag{25}$$

with $0 \leq \alpha \leq 1$. The non-coordinating theory says that, other things equal, the elector votes for the Democratic House candidate rather than the Republican if the elector's ideal point is closer to the policy expected with a Democratic majority than to the policy expected with a Republican majority, i.e., if $|\theta_i - \tilde{\theta}_{Di}| < |\theta_i - \tilde{\theta}_{Ri}|$. If $|\theta_i - \tilde{\theta}_{Di}| > |\theta_i - \tilde{\theta}_{Ri}|$, then the elector votes for the Republican House candidate rather than the Democrat.

Notice that in the formulation of the non-coordinating model there can be institutional balancing to produce moderation in policy only if $0 < \alpha < 1$. If $\alpha = 1$, control of the House is irrelevant so that divided government has no effect on post-election policy. Indeed, because the policy always equals the position of the President's party, the equality $|\theta_i - \tilde{\theta}_{Di}| = |\theta_i - \tilde{\theta}_{Ri}|$ always holds so that policy comparisons have no effect on midterm vote choices. If $\alpha = 0$, then the President is irrelevant to post-election policy and divided government again becomes meaningless; $\tilde{\theta}_{Di} = \theta_{Di}$ and $\tilde{\theta}_{Ri} = \theta_{Ri}$ regardless of who is President. The comparison between $|\theta_i - \tilde{\theta}_{Di}|$ and $|\theta_i - \tilde{\theta}_{Ri}|$ reduces to a comparison between $|\theta_i - \theta_{Di}|$ and $|\theta_i - \theta_{Ri}|$. There is no institutional balancing—no moderation—but rather a direct choice between the parties' alternative policies.

Fiorina's theory says nothing about how the institutional balancing calculus may affect turnout decisions. The theory addresses only how voters are supposed to choose among candidates. To let the non-coordinating model include the possibility of not voting, in a manner as similar as possible to that used in the coordinating model, we use the log-likelihood function of (23), with G_i in the form of (22), based on modified definitions of the observed attributes of each alternative. By formulating the non-coordinating vote choice model to closely resemble the coordinating model, we focus the comparison between the models as powerfully as possible on the existence or non-existence of coordination. Defining

$$w_{NCi} = \begin{cases} |\theta_i - \tilde{\theta}_{Ri}|^q - |\theta_i - \tilde{\theta}_{Di}|^q \,, & \text{if } \nu_i = 1 \\ 0 \,, & \text{if } \nu_i = 0 \,, \end{cases}$$

we specify the observed attributes as

$$x_{i,D} = -b_{\mathrm{NC}} w_{NCi} + z_{i,D} \tag{26a}$$

$$x_{i,R} = b_{\mathrm{NC}} w_{NCi} + z_{i,R} \tag{26b}$$

$$x_{i,A} = z_{i,A} \,, \tag{26c}$$

with $b_{\mathrm{NC}} \geq 0$ and $q > 0$.[10] Increasing $|\theta_i - \tilde{\theta}_{Di}|$ while $|\theta_i - \tilde{\theta}_{Ri}|$ remains constant causes the probability of voting for a Democrat to decrease.

Tests of Coordination

We use two kinds of tests of whether electors coordinate. We check whether the estimated values of particular model parameters satisfy certain conditions necessary for coordination to exist. And we compare the coordinating model to the non-coordinating model.

If the President solely determines policy ($\alpha = 1$), then there is no coordination among electors because $w_{Ci} = 0$, so that electors' strategies do not depend on $\bar{H}_i$. A necessary condition for coordination is therefore that $\alpha < 1$. We use confidence interval estimates and likelihood-ratio [LR] tests to check whether estimates for α differ significantly from the value that annihilates the possibility of coordination. The LR tests have a non-regularity because the coordinating model does not depend on ρ when $\alpha = 1$. We use equation (3.4) of Davies (1987, 36) to adjust the significance probabilities of the test statistics.

Other conditions necessary for the choice models to describe coordination are that $q > 0$ and that $b_{\mathrm{C}} > 0$. If $q = 0$ then we have the degenerate value $w_{Ci} = 0$. If $b_{\mathrm{C}} = 0$, then whatever the discrepancies $|\theta_i - \tilde{\theta}_i|^q$ may be, they have no effect on electors' choices.

We use formal hypothesis tests to compare the coordinating and non-coordinating models.[11] The similarity between the models is such that we should not expect to be able to distinguish them very powerfully given the survey data sample sizes we have to work with. *Power to distinguish the two models empirically comes mostly from a subset of the electors whose ideal points are intermediate between the alternative expected policies of the non-coordinating model.*

Using $\tilde{\theta}_{i,R}$ to denote the value of $\tilde{\theta}_i$ when i votes for the Republican and $\tilde{\theta}_{i,D}$ to denote the value of $\tilde{\theta}_i$ when i votes for the Democrat, we have in the coordinating model

$$\begin{aligned}\lambda_{i,R} - \lambda_{i,D} &= |\theta_i - \tilde{\theta}_{i,R}|^q - |\theta_i - \tilde{\theta}_{i,D}|^q \\ &= |\theta_i - \tilde{\theta}_{i,D} - (1-\alpha) b_{\mathrm{C}} \bar{V}^{-1}(\theta_{Ri} - \theta_{Di})|^q - |\theta_i - \tilde{\theta}_{i,D}|^q \ ,\end{aligned}$$

where we have substituted $b_{\mathrm{C}}\bar{V}^{-1}$ for $(N\bar{V}_{i,V})^{-1}$. In the non-coordinating model the difference between policy-related losses that is comparable to $\lambda_{i,R} - \lambda_{i,D}$ in the coordinating model is[12]

$$\begin{aligned}&2b_{\mathrm{NC}}(|\theta_i - \tilde{\theta}_{Ri}|^q - |\theta_i - \tilde{\theta}_{Di}|^q) \\ &\quad = \begin{cases} 2b_{\mathrm{NC}}(|\theta_i - \theta_{Ri} - \alpha(\theta_{Di} - \theta_{Ri})|^q - |\theta_i - \theta_{Di}|^q) \ , & \text{if Democrat is President} \\ 2b_{\mathrm{NC}}(|\theta_i - \theta_{Ri}|^q - |\theta_i - \theta_{Di} - \alpha(\theta_{Ri} - \theta_{Di})|^q) \ , & \text{if Republican is President .} \end{cases}\end{aligned}$$

The similarity between the two models is greatest when $q = 1$, for electors who have ideal points that are relatively extreme:

$$\lambda_{i,R} - \lambda_{i,D} = \begin{cases} -b_{\mathrm{C}}\bar{V}^{-1}(1-\alpha)(\theta_{Ri} - \theta_{Di}) \ , & \text{if } \theta_i > \tilde{\theta}_{i,D}, \tilde{\theta}_{i,R} \\ b_{\mathrm{C}}\bar{V}^{-1}(1-\alpha)(\theta_{Ri} - \theta_{Di}) \ , & \text{if } \theta_i < \tilde{\theta}_{i,D}, \tilde{\theta}_{i,R} \end{cases}$$

and

$$2b_{\mathrm{NC}}(|\theta_i - \tilde{\theta}_{Ri}| - |\theta_i - \tilde{\theta}_{Di}|) = \begin{cases} -2b_{\mathrm{NC}}(1-\alpha)(\theta_{Ri} - \theta_{Di}) \ , & \text{if } \theta_i > \tilde{\theta}_{Di}, \tilde{\theta}_{Ri} \\ 2b_{\mathrm{NC}}(1-\alpha)(\theta_{Ri} - \theta_{Di}) \ , & \text{if } \theta_i < \tilde{\theta}_{Di}, \tilde{\theta}_{Ri} \ . \end{cases}$$

If the values of α and ρ are the same across the two models, then for an elector who has either $\theta_i > \tilde{\theta}_{i,D}, \tilde{\theta}_{i,R}, \tilde{\theta}_{Di}, \tilde{\theta}_{Ri}$ or $\theta_i < \tilde{\theta}_{i,D}, \tilde{\theta}_{i,R}, \tilde{\theta}_{Di}, \tilde{\theta}_{Ri}$ the models differ only to the extent that $b_{\mathrm{C}}\bar{V}^{-1} - 2b_{\mathrm{NC}} \neq 0$.[13] Depending on the values of b_{C}, b_{NC} and $\bar{V}$, that may be no difference at all.

The models differ in a more systematic way for an elector whose ideal point is intermediate between the non-coordinating model's alternative expected policies $\tilde{\theta}_{Di}$ and $\tilde{\theta}_{Ri}$. If $\tilde{\theta}_{Di} < \theta_i < \tilde{\theta}_{Ri}$, then with $q = 1$ we have

$$2b_{\mathrm{NC}}(|\theta_i - \tilde{\theta}_{Ri}| - |\theta_i - \tilde{\theta}_{Di}|)$$
$$= \begin{cases} 2b_{\mathrm{NC}}(1-\alpha)(\theta_{Ri} - \theta_{Di}) - 4b_{\mathrm{NC}}(\theta_i - \theta_{Di}) \ , & \text{if Democrat is President} \\ -2b_{\mathrm{NC}}(1-\alpha)(\theta_{Ri} - \theta_{Di}) - 4b_{\mathrm{NC}}(\theta_i - \theta_{Ri}) \ , & \text{if Republican is President .} \end{cases}$$

Notice that the difference between the coordinating model's alternative expected policies, $\tilde{\theta}_{i,D}$ and $\tilde{\theta}_{i,R}$, is so small that $\tilde{\theta}_{i,D} \le \theta_i \le \tilde{\theta}_{i,R}$ or $\tilde{\theta}_{i,D} \ge \theta_i \ge \tilde{\theta}_{i,R}$ virtually never occur. So for an elector with $\tilde{\theta}_{Di} < \theta_i < \tilde{\theta}_{Ri}$ it makes sense to consider two cases: $\tilde{\theta}_{Di} < \theta_i < \tilde{\theta}_i \le \tilde{\theta}_{Ri}$ and $\tilde{\theta}_{Di} \le \tilde{\theta}_i < \theta_i < \tilde{\theta}_{Ri}$. For simplicity in this illustrative exercise, we assume that α and ρ have the same values across the two models. If the President is a Democrat,

$$\lambda_{i,R} - \lambda_{i,D} - 2b_{\mathrm{NC}}(|\theta_i - \tilde{\theta}_{Ri}| - |\theta_i - \tilde{\theta}_{Di}|)$$
$$= \begin{cases} (b_{\mathrm{C}}\bar{V}^{-1} - 2b_{\mathrm{NC}})(1-\alpha)(\theta_{Ri} - \theta_{Di}) + 4b_{\mathrm{NC}}(\theta_i - \theta_{Di}) \ , & \tilde{\theta}_{Di} < \theta_i < \tilde{\theta}_i \le \tilde{\theta}_{Ri} \\ -(b_{\mathrm{C}}\bar{V}^{-1} + 2b_{\mathrm{NC}})(1-\alpha)(\theta_{Ri} - \theta_{Di}) + 4b_{\mathrm{NC}}(\theta_i - \theta_{Di}) \ , & \tilde{\theta}_{Di} \le \tilde{\theta}_i < \theta_i < \tilde{\theta}_{Ri} \ . \end{cases}$$

If $b_{\mathrm{C}}\bar{V}^{-1} \approx 2b_{\mathrm{NC}}$ then, since $4b_{\mathrm{NC}}(\theta_i - \theta_{Di}) > 0$, an elector with ideal point in the range $\tilde{\theta}_{Di} < \theta_i < \tilde{\theta}_i$ expects a vote for the Republican to cause a greater policy-related loss according to the coordinating model's calculus than according to the non-coordinating model. For an elector with ideal point in the range $\tilde{\theta}_i < \theta_i < \tilde{\theta}_{Ri}$ the difference between the models is much less positive and indeed negative if α is sufficiently small. Analogous results occur if the President is a Republican:

$$\lambda_{i,R} - \lambda_{i,D} - 2b_{\mathrm{NC}}(|\theta_i - \tilde{\theta}_{Ri}| - |\theta_i - \tilde{\theta}_{Di}|)$$
$$= \begin{cases} (2b_{\mathrm{NC}} + b_{\mathrm{C}}\bar{V}^{-1})(1-\alpha)(\theta_{Ri} - \theta_{Di}) + 4b_{\mathrm{NC}}(\theta_i - \theta_{Ri}) \ , & \tilde{\theta}_{Di} < \theta_i < \tilde{\theta}_i \le \tilde{\theta}_{Ri} \\ (2b_{\mathrm{NC}} - b_{\mathrm{C}}\bar{V}^{-1})(1-\alpha)(\theta_{Ri} - \theta_{Di}) + 4b_{\mathrm{NC}}(\theta_i - \theta_{Ri}) \ , & \tilde{\theta}_{Di} \le \tilde{\theta}_i < \theta_i < \tilde{\theta}_{Ri} \ . \end{cases}$$

Now if $b_{\mathrm{C}}\bar{V}^{-1} \approx 2b_{\mathrm{NC}}$, the fact that $4b_{\mathrm{NC}}(\theta_i - \theta_{Ri}) < 0$ means that an elector with ideal point in the range $\tilde{\theta}_i < \theta_i < \tilde{\theta}_{Ri}$ expects a vote for the Republican to cause a smaller policy-related loss according to the coordinating model's calculus than according to the non-coordinating model. For an elector with ideal point in the range $\tilde{\theta}_{Di} < \theta_i < \tilde{\theta}_i$ the difference between the models is much less negative and indeed positive if α is sufficiently small.

The models are not as similar if $q \neq 1$, due to the nonlinearities introduced by the exponentiation of the absolute discrepancies in the loss functions. Nonetheless the practical implication stands that power to distinguish the two models empirically comes mostly from a subset of the electors whose ideal points are intermediate between the alternative expected policies of the non-coordinating model. For purposes of interpretation it is the differences between the choice probabilities the models estimate for such electors that measure how strongly coordination affects what electors do.

Detailed Choice Model Specifications

To estimate both the coordinating and the non-coordinating models we use data from the ANES Post-Election Surveys of years 1978, 1982, 1986, 1990, 1994 and 1998 (Miller and the National Election Studies 1979; 1983; 1987; Miller, Kinder, Rosenstone and the National Election Studies 1992; Rosenstone, Miller, Kinder and the National Election Studies 1995; Sapiro, Rosenstone and the National Election Studies 1999). We pool the data over all years. Some parameters are constant over all years while others vary over years.

We use the observed responses to several seven-point ANES survey scales to measure θ_i, ϑ_{Di}, ϑ_{Ri}, and ϑ_{PDi} or ϑ_{PRi}. We use the variables' empirical cumulative distributions to code the responses in the $[0,1]$ interval. The idea is to make the responses comparable across the substantively different scales, by using relative units of measurement. In formulating their theory in terms of a uniform distribution of voters' ideal points, Alesina and Rosenthal (1989; 1995, 22, 86) are using relative units of measurement: the value of each ideal point and policy position corresponds to the cumulative proportion of support for that position among voters. McKelvey and Ordeshook

(1985a) similarly use relative measurement of positions. The codes we use for the ANES scales are to be interpreted as measuring the proportion of all survey respondents that support a position as liberal as or more liberal than the indicated position. Each scale either refers to liberal-conservative ideological labels or pertains to a policy issue. Each of the values θ_i, ϑ_{Di}, ϑ_{Ri}, and ϑ_{PDi} or ϑ_{PRi} averages the values for the named referent—self, Democratic or Republican party, Democratic or Republican President—over only the scales for which elector i placed all four referents on the scale. The values for different electors may therefore be computed using different subsets of the substantive scales in each survey. There is no assumption that every elector is using the same substantive policy dimension. The Appendix lists the scales used from each of the surveys and describes in detail the method used to compute codes for each scale.

If an elector does not provide values for the policy position variables (θ_i, ϑ_{Di}, ϑ_{Ri}, and ϑ_{PDi} or ϑ_{PRi}), we assume that the elector does not experience policy-related losses, so that such losses do not affect the choices the elector makes. We set $\nu_i = 0$ if there is not a complete set of policy position variable values for i and $\nu_i = 1$ if a complete set exists. We include ν_i in $z_{i,A}$. To allow for the possibility of ideologically based mobilization to vote, we also include each elector's ideal point in $z_{i,A}$, using the form $\nu_i\theta_i$ to switch the effect off when i lacks a complete set of policy position values.

Many have examined the effects that retrospective economic evaluations may have on vote choices. According to Alesina and Rosenthal, a voter's retrospective evaluation of the economy may be relevant to the voter's choice as an expression of two considerations: the voter's taste for macroeconomic outcomes (1995, 167–171); and the voter's judgment of the competence of the incumbent administration (1995, 191–195).[14] Evidence that retrospective judgments matter in presidential elections is strong, but it has been controversial whether retrospective economic evaluations matter for candidate choices in House elections at midterm. The best empirical evidence suggests that there are no systematic direct effects.[15] Arcelus and Meltzer (1975) test the idea that economic evaluations affect turnout decisions, finding at best weak evidence for the idea in an analysis of aggregate time series data. Fiorina (1978) also finds little evidence to support the idea in analysis of cross-sectional survey data. To measure retrospective evaluations we use a variable (EC_i) that is based on responses to a question asking whether the national economy has gotten worse or better over the past year (see Data Note 1 in the Appendix). We include EC_i in all three sets of observed attributes ($z_{i,h}$, $h \in K$), multiplied by a variable (PP_i) that changes sign depending on the incumbent President's party: $\text{PP}_i = 1$ if Republican; $= -1$ if Democrat.

Party identification has long been known to affect vote choices (e.g. Campbell and Miller 1957). Party identification has also been observed to be associated with varying rates of voter turnout (Campbell 1966; Converse 1966; Miller 1979). Party identification is in part an index of tastes for policy outcomes and of judgments accumulated over time about the competence of the parties' successive administrations (Fiorina 1981; Franklin and Jackson 1983; Franklin 1984; Jackson 1975). People who support different parties also tend to have different policy preferences and perceptions (Brady and Sniderman 1985). We measure party identification with six dummy variables that correspond to the levels of the ANES seven-point scale measure of partisanship, using "Strong Democrat" as the reference category: $\text{PID}_{\text{D}i}$, $\text{PID}_{\text{ID}i}$, $\text{PID}_{\text{I}i}$, $\text{PID}_{\text{IR}i}$, $\text{PID}_{\text{R}i}$ and $\text{PID}_{\text{SR}i}$ (see Data Note 2. We include the dummy variables in all three sets of observed attributes.

To take incumbent-related effects into account, we use a pair of dummy variables that indicate whether a Democratic or Republican incumbent is running for reelection or whether there is an open seat: $\text{DEM}_i = 1$ if a Democratic incumbent is running for reelection in individual i's congressional district, otherwise $\text{DEM}_i = 0$; $\text{REP}_i = 1$ if a Republican incumbent is running for reelection, otherwise $\text{REP}_i = 0$ (see Data Note 3). If $\text{DEM}_i = \text{REP}_i = 0$, the district has an open seat. We include the dummy variables in all three sets of observed attributes.[16] In the choice between candidates we expect to see an incumbency advantage.[17] And because the presence of an incumbent usually means the absence of vigorous opposing campaigns that might mobilize voters, we expect the effects of DEM_i and REP_i to indicate that the probability of not voting is higher when an incumbent is running than when there is an open seat.

Subjective political efficacy has long been known to affect voter turnout (Abramson and Aldrich 1982). We include among the attributes of not voting a measure of external efficacy (EFF_i), defined as the average of responses to two survey items: "people like me don't have any say about what the government does" and "I don't think public officials care much what people like me think" (Balch 1974).[18] The responses to each item are coded -1 for "agree" and 1 for "disagree." In 1990, 1994 and 1998 the latter item is worded "public officials don't care much what people like me think" and the five responses ranging from "agree strongly" to "disagree strongly" are coded, in order, -1, $-.5$, 0, .5 and 1. In 1986 only the "don't care" item is available, and that only for half the sample; we used a proxy variable in place of the missing responses in that year (see Data Note 4).

Among the attributes of not voting we also include four demographic variables that are frequently observed to have strong effects on voter turnout (Born 1990): education, age, marital status, and time at current residence. We use three dummy variables to measure education: high school diploma, 12+ years of school, no higher degree (ED1_i); AA or BA level degrees, or 17+ years school and no higher degree (ED2_i); advanced degree, including LLB (ED3_i). The reference category for the dummy variables is 11 grades or less, no diploma or equivalency. Age we measure as time in years, minus 40 (AGE_i). Marital status is a dummy variable (MAR_i) coded one for "married and living with spouse (or spouse in service)" and zero otherwise. Time at current residence (RES_i) is measured in whole years for durations between three and nine years, otherwise it is coded using the same values used by Born (1990): less than 6 months, .25; 6–12 months, or 1 year, .75; 13–24 months, or 2 years, 1.5; ten years or more, 10 (see Data Note 5).

To understand the functional form we use for $z_{i,h}$, $h \in K$, recall that in (8a–c) an increase in $x_{i,h}$ represents an increase in the loss elector i expects from choosing $h \in K$. G_i is specified to decrease as $x_{i,h}$ increases, via $v_{i,h} = \exp\{-x_{i,h}\}$, $h \in K$, so that, by (10), the probability that elector i chooses an alternative decreases if the loss expected from that choice increases. In (8a–c), an increase in $z_{i,h}$ implies an increase in $x_{i,h}$, $h \in K$. So any variable that should increase the probability of choosing $h \in K$ and that is included with an additive effect in $z_{i,h}$ should have a negative coefficient. The functional forms for $z_{i,h}$, $h \in K$, are

$$\begin{aligned} z_{i,D} = {} & c_0 - c_{DEM}\mathrm{DEM}_i + c_{EC}\mathrm{PP}_i\mathrm{EC}_i \\ & + c_D\mathrm{PID}_{\mathrm{D}i} + c_{ID}\mathrm{PID}_{\mathrm{ID}i} + c_I\mathrm{PID}_{\mathrm{I}i} + c_{IR}\mathrm{PID}_{\mathrm{IR}i} + c_R\mathrm{PID}_{\mathrm{R}i} + c_{SR}\mathrm{PID}_{\mathrm{SR}i} \end{aligned} \tag{27a}$$

$$\begin{aligned} z_{i,R} = {} & -c_0 - c_{REP}\mathrm{REP}_i - c_{EC}\mathrm{PP}_i\mathrm{EC}_i \\ & - c_D\mathrm{PID}_{\mathrm{D}i} - c_{ID}\mathrm{PID}_{\mathrm{ID}i} - c_I\mathrm{PID}_{\mathrm{I}i} - c_{IR}\mathrm{PID}_{\mathrm{IR}i} - c_R\mathrm{PID}_{\mathrm{R}i} - c_{SR}\mathrm{PID}_{\mathrm{SR}i} \end{aligned} \tag{27b}$$

$$\begin{aligned} z_{i,A} = {} & d_0 + d_1\mathrm{EFF}_i + d_2\mathrm{ED1}_i + d_3\mathrm{ED2}_i + d_4\mathrm{ED3}_i + d_5\mathrm{AGE}_i + d_6\mathrm{MAR}_i + d_7\mathrm{RES}_i \\ & + d_8(1-\nu_i) + d_9\nu_i\theta_i + d_{REP}\mathrm{REP}_i + d_{DEM}\mathrm{DEM}_i + d_{EC}\mathrm{PP}_i\mathrm{EC}_i \\ & + d_D\mathrm{PID}_{\mathrm{D}i} + d_{ID}\mathrm{PID}_{\mathrm{ID}i} + d_I\mathrm{PID}_{\mathrm{I}i} + d_{IR}\mathrm{PID}_{\mathrm{IR}i} + d_R\mathrm{PID}_{\mathrm{R}i} + d_{SR}\mathrm{PID}_{\mathrm{SR}i}\ , \end{aligned} \tag{27c}$$

where c_0, c_{EC}, d_0, d_{EC} and d_9 are coefficients constant in each year, and the remaining coefficients are constant over all years. The effects measured by the c coefficients primarily contrast the candidate alternatives to one another, while the d coefficients measure effects that contrast the choice not to vote to the choice to vote. For the attributes of the candidates, coefficient signs should be $c_0 < 0$ and c_{EC}, c_{DEM}, c_{REP}, c_D, c_{ID}, c_I, c_{IR}, c_R, $c_{SR} > 0$. For the attributes of the not voting alternative, coefficient signs should be d_8, d_{REP}, d_{DEM}, d_D, d_{ID}, d_I, d_{IR}, $d_R < 0$, and d_1, d_2, d_3, d_4, d_5, d_6, $d_7 > 0$. The signs of d_0, d_9 and d_{EC} are indeterminate.

To measure choices $y_{i,h}$, $h \in K$, we use individuals' self reports (see Data Note 6). The sample size of electors used, pooled over the six ANES surveys, is 9639 (by year, 1978–98, the sizes are 1814, 1226, 1972, 1833, 1648, 1146). Only those who did not vote or who voted for either a Democrat or a Republican are included. On the whole, of the 10954 respondents in all the ANES data, 1315 were omitted due to missing or invalid data (see Data Note 7).

Model Estimates and Results of Tests of Coordination

The coordinating and non-coordinating models produce similar results. MLEs and standard errors [SEs] for the parameters of the models—using observed attribute specifications (21a–c) and (26a–c)—appear in Table 1.[19] All of the parameters that have the same interpretation in both models have statistically indistinguishable estimates. The MLEs for c_{EC} are near zero for every year except 1990, suggesting that for the most part retrospective economic evaluations do not affect choices between candidates.[20] Except for 1994, the MLEs for d_{EC} are statistically insignificant, so that retrospective economic evaluations appear also to have no systematic effect on the choice not to vote. The MLEs for c_0, c_D, c_{ID}, c_I, c_{IR}, c_R and c_{SR} are appropriate for the usual effects of party identification on candidate choices. The MLEs for d_0, d_D, d_{ID}, d_I, d_{IR}, d_R and d_{SR} show that, other things equal, strong partisans suffer greater losses from not voting than do weak partisans or independents, while weak partisans and independent leaners suffer greater losses than do pure independents. The MLEs for c_{DEM} and c_{REP} point to a substantial incumbent advantage, while the MLEs for d_{DEM} and d_{REP} show losses from not voting to be smaller when the incumbent is running for reelection. Greater subjective political efficacy, higher education, greater age, being married and having lived longer at one's current residence all increase the loss from not voting and so increase the probability of voting. An elector who does not report a complete set of policy position values ($\nu_i = 0$) has a substantially smaller loss from not voting than does an elector who does report policy positions; so the elector who lacks policy positions is much more likely not to vote. For 1994 and 1998 there is a significant tendency for electors who have $\nu_i = 1$ and higher values of θ_i—more conservative electors—to be more likely to vote than electors who have $\nu_i = 1$ and lower values. The suggestion is that conservative electors were especially mobilized in those two elections.

*** Table 1 about here ***

The log-likelihood of the coordinating model (−6824.7) is not much greater than that of the non-coordinating model (−6825.4). A formal hypothesis test does not reject the non-coordinating model as an alternative to the coordinating model.

In every year, the coordinating voting model passes the parameter-based tests of the conditions necessary for it to describe coordinating behavior. Table 2 reports the LR test statistics for the constraint $\alpha = 1$, imposed separately for each year. The constraint is rejected in every year. The 95% confidence intervals shown in Table 3 support the same conclusions.[21] Regarding the other necessary conditions, 95% confidence intervals computed as in Table 3 show q (1.28, 1.81) and b_{C} (1.10, 1.90) to be positive and bounded well away from zero.

*** Tables 2 and 3 about here ***

Moderation, Institutional Balancing and the Midterm Cycle

With expected post-election policy $\tilde{\theta}_i$ defined as in (3), moderation is almost always a feature of every elector's choices in the coordinating model. Unless $\alpha = 1$, every elector who has $\nu_i = 1$ intends to produce a policy outcome that is an intermediate combination of the parties' positions. The estimates for $\bar{H}$, in Table 4, show the expected position of the House, $\bar{H}\theta_{Ri} + (1 - \bar{H})\theta_{Di}$, usually to have been close to the midpoint between the parties' positions. The House position was expected to be closer to the Democratic position in 1978, 1982, 1986 and 1990, closer to the Republican position in 1994 and 1998. The MLEs for α in the coordinating model are less than .5 in every year except one (see Table 1), suggesting that electors expected the President to be weaker than the House in determining post-midterm policy.

*** Table 4 about here ***

The substantive effects of the moderating portion of the coordinating model are often significant. One way of quantifying these effects is to calculate the average change in the vote probabilities of electors as $\bar{H}$ is moved from its lowest estimated value (0.373 in 1990) to its highest estimated value (0.544 in 1994). While, $\bar{H}$ is so moved, all of the other variables in the model are held at their sample means. Because key parameters of the model vary by year, we calculate the changes in vote probabilities separately for each year. Table 5 presents the results for 1998 with the electors broken down into the seven partisan categories. Table 6 presents the same results but is restricted to those electors whose ideal points are intermediate between the alternative expected policies of the non-coordinating model. As expected, the effects of changing $\bar{H}$ are generally greater for the restricted population of electors than the whole population.

*** Table 5 about here ***

*** Table 6 about here ***

The effect of $\bar{H}$ for the entire sample of electors ranges from a low of 1% to a high of 45.3%. The effect for the restricted set of electors ranges from 0.62% to 103%. Indeed, these effects are often substantively significant. It is important to note, however, that these calculated effects are not equilibrium results. For example, the fixed point constraints do not hold in these calculations.

For most years the MLEs for the non-coordinating model do not support the theory of non-coordinating institutional balancing to produce moderation in policy. Only two of the six MLEs for α ($\hat{\alpha}_{78}$, $\hat{\alpha}_{86}$) are statistically distinguishable from zero; $\hat{\alpha}_{82} = \hat{\alpha}_{90} = \hat{\alpha}_{94} = \hat{\alpha}_{98} = 0$. Rather than moderating, the estimates suggest that in most years electors were making direct choices between the parties' alternative policies.

The distribution of the ordering of each elector's ideal point with respect to the post-election policies the elector expects according to the models shows that the moderating mechanism of the coordinating model is capable of generating a midterm cycle of the kind emphasized by Alesina and Rosenthal (1989; 1995), though it need not do so. Table 7 shows that in four of the six years more electors had ideal points located relative to the expected policy $\tilde{\theta}_i$ in a way that gave them an incentive to vote *against* candidates of the same party as the President than had ideal points located relative to $\tilde{\theta}_i$ in a way that gave them an incentive to vote *for* candidates of the same party as the President. In 1978 and 1994, years when the President was a Democrat, respectively 53.6% and 56.2% of electors had $\theta_i > \tilde{\theta}_i$ while 30.1% and 36.0% of electors had $\theta_i < \tilde{\theta}_i$. In 1982 and 1986, when the President was a Republican, respectively 39.4% and 17.7% had $\theta_i > \tilde{\theta}_i$ while 45.8% and 69.7% had $\theta_i < \tilde{\theta}_i$. In 1990, with a Republican President, 42.0% of electors had $\theta_i > \tilde{\theta}_i$ while 41.9% had $\theta_i < \tilde{\theta}_i$, a virtual tie. In 1998, with the President a Democrat, 36.4% of electors had $\theta_i > \tilde{\theta}_i$ while 56.0% had $\theta_i < \tilde{\theta}_i$, suggesting what did occur, namely a midterm gain for the President's party rather than a midterm loss.

*** Table 7 about here ***

The percentages in Table 7 are not decisive for the occurrence—or not—of a midterm cycle, because the location of θ_i relative to $\tilde{\theta}_i$ measures only part of what motivates elector i's choice. Manifestly from the specification of (27a–c) and the parameter MLEs, considerations unrelated to policy preferences affect each elector's decision whether to vote, and factors such as partisanship and incumbency frequently (and economic evaluations occasionally) outweigh policy-related balancing considerations in the overall determination of which party an elector may choose to vote for. From Table 8 we can see that in several years such factors have shifted many electors' choices away from the choices they would make solely on the basis of policy-related motivations measured by the moderating mechanism of the coordinating model. For the electors that have each of the orderings shown in Table 7, Table 8 shows the mean of the difference between the probability of voting for the Republican and the probability of voting for the Democrat, given that one voted (i.e., $(\mu_{i,R} - \mu_{i,D})/(1 - \mu_{i,A})$). Electors in a district in which the incumbent was unopposed for reelection are omitted. The mean is always consistent with the preferences indicated by the policy moderating mechanism for electors who have relatively extreme ideal points: the mean is always substantially negative for those who have $\theta_i < \tilde{\theta}_{Di}, \tilde{\theta}_{Ri}, \tilde{\theta}_i$ and is always positive, though not always very substantially, for those who have $\tilde{\theta}_{Di}, \tilde{\theta}_{Ri}, \tilde{\theta}_i < \theta_i$. In 1978, electors with less extreme ideal points who had a policy-related incentive to vote for a Republican ($\tilde{\theta}_i < \theta_i < \tilde{\theta}_{Ri}$) on average instead preferred a Democrat. In 1986, electors with less extreme ideal points who had a policy-related incentive to vote for a Democrat ($\tilde{\theta}_{Di} < \theta_i < \tilde{\theta}_i$) instead on average preferred a Republican. These deviations from the preferences that the policy moderating mechanism alone would imply do not, however, overturn the midterm cycle pattern. In 1978 the percentage of electors with relatively extreme $\theta_i > \tilde{\theta}_i$ (45.1%) is greater than the percentage having one of the other three non-empty orderings (38.6%). In 1986 a majority of electors (54.0%) have relatively extreme $\theta_i < \tilde{\theta}_i$. Moreover, in 1990 the tilt toward a Democratic vote is on average much greater for electors with $\theta_i < \tilde{\theta}_i$ than is the tilt toward a Republican vote among those with $\theta_i > \tilde{\theta}_i$. Taking that difference into account implies a midterm loss for the President's party in that year, in line with the idea of a midterm cycle, but it is not possible to attribute the result solely or even primarily to the policy moderating mechanism.

*** Table 8 about here ***

The small differences in Table 9 show that the mean differences between the conditional voting probabilities for electors that have each of the orderings of ideal point and expected policies are pretty much the same in the non-coordinating model as they are in the coordinating model. At least in terms of aggregate outcomes, it appears one can explain the midterm cycle—and the occasional non-cycle—just about as well in terms of individual electors who neither coordinate nor behave strategically as in terms of individual electors who do both.

*** Table 9 about here ***

Discussion

There is strong evidence to support coordination, but no clear evidence to reject non-coordinating, non-strategic behavior. The two theories are extremely difficult to distinguish statistically given available survey sample sizes. There are nuanced differences that may upon closer examination favor the policy-related preference mechanism of one of the theories as the more likely generator of midterm cycle phenomena. Because the estimates of α are so often near zero in the non-coordinating model, the coordinating and non-coordinating models are telling very different stories about what electors are doing. In the coordinating model each elector is acting to moderate policy by balancing the President with the House. In the non-coordinating model each elector is (usually) voting either to give the President's party complete control of policy or to give the other party complete control. In the aggregate the two stories are impossible to distinguish. In individual-level data there are clear distinctions between the stories but they are subtle.

Appendix

Existence of Fixed Point Pairs $(\bar{H}, \bar{V})$**:** Let Ψ denote the compact open set of real vectors that is the parameter space for $\tilde{\lambda}_i$.[22] Let $\bar{\mu}_{k,h\ell\jmath}$ denote the values of $\bar{\mu}_{k,h}$, $h \in K$, when evaluated using $\bar{H} = \ell$ and $\bar{V} = \jmath$ for some $\ell \in [0,1]$ and some $\jmath \in [0,1]$. Let $\bar{H}_{\ell\jmath}$ denote the value of $\bar{H}$ as defined by (15) and let $\bar{V}_{\ell\jmath}$ denote the value of $\bar{V}$ as defined by (14) when $\bar{\mu}_{k,h} = \bar{\mu}_{k,h\ell\jmath}$, $h \in K$. THEOREM: For almost every $\psi \in \Psi$, there exist values $\ell, \jmath \in (0,1)$ such that, simultaneously, $\bar{H}_{\ell\jmath} = \ell$ and $\bar{V}_{\ell\jmath} = \jmath$. PROOF: For $q > 1$, the values $\bar{\mu}_{k,h\ell\jmath}$, $h \in K$, vary continuously as a function of ℓ for each k and $\bar{H}_{\ell\jmath}$ is a continuous function of the $\bar{\mu}_{k,h\ell\jmath}$ values. Hence there is at least one fixed point of $\bar{H}_{\ell\jmath}$ as a function of ℓ for each fixed value of $\jmath$, i.e., there is at least one value ℓ such that $\bar{H}_{\ell\jmath} = \ell$. Because $\bar{H}_{0\jmath} > 0$ and $\bar{H}_{1\jmath} < 1$, the number of fixed points is odd, except on a subset of Ψ of Lebesgue measure zero. For $q > 1$ there is similarly for each ℓ an odd number of fixed points $\bar{V}_{\ell\jmath} = \jmath$. If $q = 1$, the step functions in w_i imply that $\bar{H}_{\ell\jmath}$ and $\bar{V}_{\ell\jmath}$ do not vary continuously as functions of, respectively, ℓ and $\jmath$, so if $q = 1$ there are not necessarily fixed points $\bar{H}_{\ell\jmath} = \ell$ or $\bar{V}_{\ell\jmath} = \jmath$. If $0 < q < 1$, there is a discontinuity at infinity in w_i whenever $\theta_i = \tilde{\theta}_i$. But for a finite number N of electors, the number of points of discontinuity is finite.[23] So the values of $\jmath$ for which there is no fixed point $\bar{H}_{\ell\jmath} = \ell$ and the values of ℓ for which there is no fixed point $\bar{V}_{\ell\jmath} = \jmath$ are isolated: there is an $\epsilon > 0$ such that for every $\jmath'$ satisfying $0 < \jmath' < 1$ and $0 < |\jmath - \jmath'| < \epsilon$, every $\jmath''$ satisfying $|\jmath' - \jmath''| < \epsilon/2$ has a corresponding value $\ell'' \in [0,1]$ such that $\bar{H}_{\ell''\jmath''} = \ell''$.[24] Similarly, if for a value ℓ there is no fixed point $\bar{V}_{\ell\jmath} = \jmath$, then there is an $\epsilon > 0$ such that for every ℓ' satisfying $0 < \ell' < 1$ and $0 < |\ell - \ell'| < \epsilon$, every ℓ'' satisfying $|\ell' - \ell''| < \epsilon/2$ has a corresponding value $\jmath'' \in [0,1]$ such that $\bar{V}_{\ell''\jmath''} = \jmath''$. Now consider the graph of the set of fixed points $\bar{H}_{\ell\jmath} = \ell$ as $\jmath$ varies over $[0,1]$ and the graph of the set of fixed points $\bar{V}_{\ell\jmath} = \jmath$ as ℓ varies over $[0,1]$. When $q > 1$ both graphs are continuous and so necessarily intersect. That is, there is necessarily at least one pair of values $(\ell, \jmath)$ such that simultaneously $\bar{H}_{\ell\jmath} = \ell$ and $\bar{V}_{\ell\jmath} = \jmath$. If $0 < q \leq 1$, each graph is in general not continuous, because of the discontinuities in w_i, but each graph does have a finite number of continuous components. In this case, the graphs need not intersect. But because the number of points of discontinuity is finite, each set of parameter values for which there is no intersection is isolated. Let $\psi_0 \in \Psi$ be a vector for which there is no intersection. In every neighborhood of ψ_0 there is a vector $\psi_0' \in \Psi$ for which an intersection exists; an intersection exists for almost every set of parameter values. For finite $N > 0$, the argument holds for arbitrary finite sets of probability measures f_k. END OF PROOF.

Iterative Computation of MLEs and Expectations $(\hat{\hat{H}}, \hat{\hat{V}})$**:** Given estimates for the parameters and estimates $\hat{\hat{H}}^{(\imath)}$ and $\hat{\hat{V}}^{(\imath)}$ from iteration step $\imath$, use (10) to compute probability values $\hat{\mu}_{i,h}^{(\imath)}$, $h \in K$ for each elector. Use the $\hat{\mu}_{i,h}^{(\imath)}$ values in (19) and (20) to estimate $\hat{\hat{R}}$ and $\hat{\hat{D}}$, and hence $\hat{\hat{H}}^{(\imath+1)}$ and $\hat{\hat{V}}^{(\imath+1)}$, for each year. Use $\hat{\hat{H}}^{(\imath+1)}$ and $\hat{\hat{V}}^{(\imath+1)}$ and the parameter values of step $\imath$ to apply one step of Gauss-Newton maximization to the log-likelihood, to get new parameter values for use in iteration $\imath + 1$. Iterate until, for successive iterations $\imath$ and $\imath + 1$, $(\hat{\hat{H}}^{(\imath)}, \hat{\hat{V}}^{(\imath)}) = (\hat{\hat{H}}^{(\imath+1)}, \hat{\hat{V}}^{(\imath+1)})$ and the parameter estimates satisfy the first- and second-order conditions for a local maximum of the log-likelihood. In each Gauss-Newton step, each row of the Jacobian matrix of the parameters is weighted by ω_i. In `PROC NLIN` we used `_WEIGHT_` to weight the Jacobian matrix (SAS Institute 1990, 1148).

Measuring Ideal Points and Policy Positions: To measure θ_i, ϑ_{Di}, ϑ_{PDi} and ϑ_{Ri} or ϑ_{PRi} in each year, we use a collection of sets of four seven-point placement scales. Each set includes one scale for self, one for each party and one for the President, all referring to the same substantive policy description (see Data Note 9). All scale items are oriented so that the "liberal" position during the given time period has the lower number. We use the method described by Mebane (forthcoming) to assign a code in the $[0, 1]$ interval to the response levels of each scale. To determine values for θ_i, ϑ_{Di}, ϑ_{Ri} and ϑ_{PDi} or ϑ_{PRi} for each elector, we average the scores over all (and only) the substantive descriptions for which the person responded to all four scales for that substantive description.

Data Notes:

1. Economic Evaluations (EC_i): For 1978 the question refers to "business conditions," with wording, "Would you say that at the present time business conditions are better or worse than they were a year ago?" For 1982 the question wording is "What about the economy? Would you say that over the past year the nation's economy has gotten better, stayed about the same, or

gotten worse?" For 1986 and 1990 the initial part of the question changed to read, "How about the economy in the country as a whole." For 1998 the initial part was "Now thinking about the economy in the country as a whole." For all years except 1976, the responses are coded "much worse" (-1), "somewhat worse" ($-.5$), "same" (0), "somewhat better" (.5) and "better" (1). For 1978 only three levels of response were recorded, coded here "worse now" ($-.5$), "about the same" (0) and "better now" (.5). The ANES variable numbers for each year are 338 (1978), 328 (1982), 373 (1986), 423 (1990), 909 (1994), 980419 (1998).

2. Party Identification ($\mathrm{PID}_{\mathrm{D}i}$, $\mathrm{PID}_{\mathrm{ID}i}$, $\mathrm{PID}_{\mathrm{I}i}$, $\mathrm{PID}_{\mathrm{IR}i}$, $\mathrm{PID}_{\mathrm{R}i}$, $\mathrm{PID}_{\mathrm{SR}i}$): The levels of the party identification scale are Strong Democrat, Democrat, Independent Democratic, Independent, Independent Republican, Republican and Strong Republican. The variable numbers are 433 (1978), 291 (1982), 300 (1986), 320 (1990), 655 (1994), 980339 (1998).

3. Incumbency Status (DEM_i, REP_i): Variable numbers are 4 (1978), 6 (1982), 43 (1986), 58 (1990), 17 (1994), 980065 (1998).

4. Political Efficacy (EFF_i): Variable numbers are 351 and 354 (1978), 531 and 532 (1982), 549 ("don't care," 1986), 509 and 508 (1990), 1038 and 1037 (1994), 980525 and 980524 (1998). In 1986, half the sample was not asked the "don't care" question. We used a proxy variable for those survey respondents (indeed, for all respondents missing a value for var. 549). We constructed an index by summing for each respondent the values of four variables: "did you read about the campaign in any newspapers?" (var. 62), "did you watch any programs about the campaign on television?" (var. 64) and "do you ever discuss politics with your family or friends?" (var. 66), each being coded 1 if yes and 0 otherwise; and interest in the political campaigns (var. 59), coded 1 if "very interested" or "somewhat interested," otherwise coded 0. Respondents with $\mathrm{INDEX} = 4$ were assigned the value 1, those with $\mathrm{INDEX} < 4$ were assigned the value -1. Motivation for the proxy comes from the fact that using the MLEs from a logistic regression model for the binary responses

to variable 549 in the half-sample that was asked that question, with INDEX as the regressor, gives simulated probabilities Pr(var. 549 = disagree) = 1/(1 + exp(1.2445 − 0.3587 INDEX)), so that Pr(var. 549 = disagree) > .5 only if INDEX = 4.

5. Education, Marital Status, Residency (ED1_i, ED2_i, ED3_i, MAR_i, RES_i): Variable numbers for education, age, marital status and residency are 513, 504, 505, 628 (1978), 542, 535, 536, 760 (1982), 602, 595, 598, 753 (1986), 557, 552, 553, 684 (1990), 1209, 1203, 1204, 1426 (1994), 980577, 980572, 980573, 980662 (1998).

6. Electoral Choices ($y_{i,h}$): The variable numbers are 470, 473 and 474 (1978), 501, 505 and 506 (1982), 261, 265 and 267 (1986), 279, 287 and 289 (1990), 601, 612 and 614 (1994), and 980303, 980311 and 980313 (1998).

7. Missing Data: Data were missing for the following reasons (some observations had more than one of these problems): 15 cases missing district type information; 399 cases with nonexistent general elections or missing voting behavior data; 141 cases with votes for a candidate other than a Democrat or Republican; 89 cases missing age, marital status or residency; 332 missing efficacy data; 492 missing economic evaluations; 4 cases with vote recorded for challenger in district with incumbent running unopposed; 97 cases missing party identification.

8. Sampling Weights ($1/\omega_i$): In the ANES data, ω_i is the number of eligible adults in each household, multiplied by a time-series weight in the year (1994) when part of the Post-Election Study sample was part of a multiyear panel cohort. We rescaled the number of adults and time-series weight variables to give each a mean of 1.0 over the whole of each survey sample. The variable numbers are 38 (1978), 53 (1982), 14 (1986), 29 (1990), 6 and 58 (1994), 980035 (1998).

9. Placement Scales (θ_i, ϑ_{Di}, ϑ_{PDi}, ϑ_{Ri}, ϑ_{PRi}): Here are the brief substantive description and variable numbers for each set of scales for each year. The label "reversed" indicates an item that had its categories reordered to reverse the original 1-to-7 ordering. In years 1982–98 respondents

who initially declined to place themselves on the Liberal/Conservative scale, or who initially described themselves as "moderate" on the scale, were asked a follow-up question; we used those responses to categorize them as either "slightly liberal," "moderate" or "slightly conservative." **1978**: Government Guaranteed Job and Living Standard, 357–360; Rights of the Accused, 365–368; Government Aid to Minorities, 373–376; Government Medical Insurance Plan, 381–384; Equal Rights for Women, 389–392; Liberal/Conservative Views, 399–402. **1982**: Liberal/Conservative, 393, 394, 404-406; Defense Spending, 407–410; Government Aid to Minorities, 415–418; Guaranteed Job and Living Standard, 425–428; Equal Rights for Women Scale, 435–438; Government Services/Spending (reversed), 443–446. **1986**: Liberal/Conservative, 385–387, 393, 394; Defense Spending, 405, 406, 412, 413; Involvement in Central America, 428, 429, 435, 436; Government Services/Spending (reversed), 448, 449, 455, 456. **1990**: Liberal/Conservative, 406–408, 413, 414; Defense Spending, 439, 440, 443, 444; Social/Economic Status of Blacks, 447–450; Government Services/Spending (reversed), 452, 453, 456, 457. **1994**: Liberal/Conservative, 839–841, 847, 848; Government Guaranteed Job and Living Standard, 930, 931, 934, 935; Aid to Blacks, 936–939; Government Services/Spending (reversed), 940, 941, 944, 945; Federal Health Insurance, 950, 951, 954, 955. **1998** (omitting the variable number prefix '980'): Liberal/Conservative, 399, 401, 403, 411, 412; Equal Role for Women, 448, 449, 453, 454; Guaranteed Job and Living Standard, 457, 458, 460, 461; Government Services/Spending (reversed), 463, 464, 468, 469.

Notes

[1]Fiorina and Shepsle (1989) take issue with a version of negative voting that focuses on a supposed asymmetry between consequences of things a President does that voters like and consequences of things that voters dislike. The theory we develop involves no claims that evaluations work asymmetrically.

[2]Obviously, $\lambda_{i,R} - \lambda_{i,D} = (\bar{H}_{i,R} - \bar{H}_{i,D})(\lambda_{i,R} - \lambda_{i,D})/(\bar{H}_{i,R} - \bar{H}_{i,D})$, if $\bar{H}_{i,R} - \bar{H}_{i,D} > 0$. But if $\bar{H}_{i,R} - \bar{H}_{i,D}$ is very small, $(\lambda_{i,R} - \lambda_{i,D})/(\bar{H}_{i,R} - \bar{H}_{i,D}) \approx d\lambda_i/d\bar{H}_i$.

[3]$\lambda_{i,R} - \lambda_{i,A} = (\bar{H}_{i,R} - \bar{H}_{i,A})(\lambda_{i,R} - \lambda_{i,A})/(\bar{H}_{i,R} - \bar{H}_{i,A})$, $(\lambda_{i,R} - \lambda_{i,A})/(\bar{H}_{i,R} - \bar{H}_{i,A}) \approx d\lambda_i/d\bar{H}_i$ and $(\bar{H}_{i,R} - \bar{H}_{i,A}) = (1 - \bar{H}_{i,R})/(N\bar{V}_{i,A})$ give $\lambda_{i,R} - \lambda_{i,A} \approx (N\bar{V}_{i,A})^{-1}(1 - \bar{H}_{i,R})d\lambda_i/d\bar{H}_i$. Similarly, $(\bar{H}_{i,A} - \bar{H}_{i,D}) = \bar{H}_{i,D}/(N\bar{V}_{i,A})$ gives $(\bar{H}_{i,D} - \bar{H}_{i,A})(\lambda_{i,D} - \lambda_{i,A})/(\bar{H}_{i,D} - \bar{H}_{i,A}) = (\bar{H}_{i,D} - \bar{H}_{i,A})(\lambda_{i,A} - \lambda_{i,D})/(\bar{H}_{i,A} - \bar{H}_{i,D}) \approx -(N\bar{V}_{i,A})^{-1}\bar{H}_{i,D}d\lambda_i/d\bar{H}_i$.

[4]See Maddala 1983 for an introductory discussion of GEV choice models.

[5]An exact tie between two $\kappa_{i,h}$ values, $h \in K$, is a measure zero event that may be ignored.

[6]Let f_ϵ denote the density of ϵ_i on $\mathbb{R}^3$ (the real line three times). The basic result is

$$\begin{aligned}
&\int_{\tilde{Z}}\int_{\mathbb{R}^3} (\tilde{\mu}_{i,h} - \bar{\mu}_{k_i,h}) df_\epsilon(\epsilon_i) df_{k_i}(Z_i) \\
&= \int_{\tilde{Z}}\int_{\mathbb{R}^3} \tilde{\mu}_{i,h} df_\epsilon(\epsilon_i) df_{k_i}(Z_i) - \bar{\mu}_{k_i,h} \int_{\tilde{Z}}\int_{\mathbb{R}^3} df_\epsilon(\epsilon_i) df_{k_i}(Z_i) \\
&= \int_{\tilde{Z}} \mu_{i,h} df_{k_i}(Z_i) - \bar{\mu}_{k_i,h} = 0\ , \quad h \in K\ .
\end{aligned}$$

We have immediately $N^{-1}\sum_{i=1}^{N}\int_{\tilde{Z}}\int_{\mathbb{R}^3}(\tilde{\mu}_{i,R} - \bar{\mu}_{k_i,R})/N df_\epsilon(\epsilon_i) df_k(Z_i) = 0$ and $N^{-1}\sum_{i=1}^{N}\int_{\tilde{Z}}\int_{\mathbb{R}^3}(\tilde{\mu}_{i,D} - \bar{\mu}_{k_i,D})/N df_\epsilon(\epsilon_i) df_k(Z_i) = 0$.

[7]Isaki and Fuller (1982) rigorously develop the relevant concept of consistency.

[8]If in the unstandardized distribution $\text{var}(\epsilon_{i,h}) = \frac{1}{6}\pi^2\sigma^2$, $h \in K$ (cf. Johnson, Kotz and Balakrishnan 1995, 12), then $b_{\text{C}} = N^{-1}\sigma^{-1}$.

[9]Using (9), the correlation between estimates $\hat{\tau}$ and $\hat{b}_{\text{C}}$ approaches -1 as $\tau \to 1$; correlations between $\hat{\tau}$ and estimates of parameters in $z_{i,D}$ and $z_{i,R}$ approach -1 for parameters that have positive values and 1 for parameters that are negative.

[10]An alternative specification using $x_{i,D} = b_{\text{NC}}|\theta_i - \tilde{\theta}_{Di}|^q + z_{i,D}$, $x_{i,R} = b_{\text{NC}}|\theta_i - \tilde{\theta}_{Ri}|^q + z_{i,R}$, $x_{i,A} = z_{i,A}$ produces inferior results: the log-likelihood is -6832.8 and MLE $\hat{\tau} = .98$. The latter value suggests that the specification of the candidate attributes is much worse than in (26).

[11]With $z_{i,D}$, $z_{i,R}$ and $z_{i,A}$ specified the same way in both models, the coordinating and non-coordinating models have the same number of free parameters. Neither model nests the other. We use non-nested hypotheses tests

(Dastoor 1985) to determine which model is superior. Mebane (forthcoming) details the form of the tests.

[12]In (26a,b) set $z_{i,D} = z_{i,R}$ and compute $x_{i,R} - x_{i,D}$.

[13]Notice that if $q = 1$ and either $\theta_i > \tilde{\theta}_{i,D}, \tilde{\theta}_{i,R}$ or $\theta_i < \tilde{\theta}_{i,D}, \tilde{\theta}_{i,R}$, then $\lambda_{i,R} - \lambda_{i,D} = b_C \bar{V}^{-1} w_i$.

[14]Alesina, Roubini and Cohen (1997) further review "rational retrospective voting" models.

[15]Erikson (1990) reviews the literature and data through the late 1980s. Relevant work appearing since that time includes Jacobson (1989) and Born (1991).

[16]Instead of using a pair of incumbent status dummy variables, Born (1990) uses a single variable that contrasts districts in which there is an incumbent of the same party as the President to districts in which there is an incumbent of the other party.

[17]Eubank and Gow (1983) and Gow and Eubank (1984) document pro-incumbent biases in 1978 and 1982 ANES data. The incumbency effects we estimates may be somewhat exaggerated (cf. Eubank 1985).

[18]We use efficacy instead of Born's (1990, 622) variable CONCRN (concern about the national congressional election outcome) because we think that any relationship CONCRN may have to turnout, beyond the effect efficacy has on both, substantially reflects the effect of factors to which both CONCRN and turnout are endogenous in the current campaign.

[19]Estimates were computed using SAS, `PROC NLIN` (SAS Institute 1989–95), with numerical derivatives. Over all years for the coordinating model, the percent correctly classified by "predicting" for each observation the pair of vote choices that has the highest probability using the parameter MLEs is 67.3% (by year, 64.2%, 66.4%, 68.2%, 68.7%, 66.7%, 70.1%). Over all years the average probability of the pair of choices actually made is .57 (by year, .54, .56, .58, .59, .56, .59).

[20]The 95% confidence interval for $c_{EC,90}$, computed as in Table 3, is $(-.001, .558)$.

[21]Table 1 shows α_{90}, α_{94}, ρ_{78}, ρ_{86}, ρ_{90} and ρ_{98} to have MLEs equal to either 0.0 or 1.0, on the conceptual boundary of the parameter space. The on-boundary values do not imply problems with the consistency of the MLEs, but the asymptotic distributions of both the MLEs' and the LR test statistics are complicated (Moran 1971; Self and Liang 1987). None of the statistics in Table 2 are close to the critical value for a test based on χ^2_1 (including the adjustment based on Davies 1987), so slight variations from χ^2_1 in the statistics' distributions would not change any conclusions. The asymptotic distribution of the MLEs when parameters fall on a boundary of the parameter space is a mixture of censored multivariate normal distributions (Moran 1971; Self and Liang 1987). For the coordinating voting model, the hypothesis that $\alpha_{90} = \alpha_{94} = \rho_{78} = 0$ and $\rho_{86} = \rho_{90} = \rho_{98} = 1$ implies a distribution that is a mixture of 64 censored distributions. We use a bootstrap (20,000 resamples) of the score vectors associated with the MLEs of Table

1 to tabulate that mixture distribution and estimate the confidence intervals of Table 3.

[22]Confine $\alpha \in (0,1)$. As discussed in the text, $\alpha = 1$ is incompatible with coordination. Having $\rho \in \{0,1\}$ is innocuous in that the existence of a mutually consistent $(\bar{H}, \bar{V})$ pair is unaffected. For simplicity we ignore those possible values.

[23]When, as we assume, the ideal point and policy position variables are continuous, the set of discontinuities has measure zero.

[24]Proof sketch: Suppose that the values $\bar{H} = \ell_i$ and $\bar{V} = \jmath_i$ induce $\theta_i = \tilde{\theta}_i$ for some i, $0 < \theta_i < 1$, but either $\limsup_{\ell \to \ell_i} \bar{H}_{\ell \jmath_i} = \ell_i$ or $\liminf_{\ell \to \ell_i} \bar{H}_{\ell \jmath_i} = \ell_i$. We call such a pair $(\ell_i, \jmath_i)$ a *jump point* for i. Let $\jmath_i^+$ be the least value greater than $\jmath_i$ such that there is a jump point $(\ell_{i'}^+, \jmath_i^+)$ for some $i' \neq i$, $\ell_{i'}^+ \in [0,1]$; if there is no such value, set $\jmath_i^+ = 1$. Let $\jmath_i^-$ be the greatest value less than $\jmath_i$ such that there is a jump point $(\ell_{i'}^-, \jmath_i^-)$ for some $i' \neq i$, $\ell_{i'}^- \in [0,1]$; if there is no such value, set $\jmath_i^- = 0$. Almost surely, $\jmath_i \neq \jmath_i^-$ and $\jmath_i \neq \jmath_i^+$. Define $\epsilon^- = |\jmath_i - \jmath_i^-|$, $\epsilon^+ = |\jmath_i - \jmath_i^+|$ and $\epsilon_{\min} = \min(\epsilon^-, \epsilon^+)$. Almost surely, $\epsilon_{\min} > 0$. For every $\jmath'$, $|\jmath - \jmath'| < (2/3)\epsilon_{\min}$, there is for every $\jmath''$ satisfying $|\jmath' - \jmath''| < \epsilon_{\min}/3$ a value $\ell'' \in [0,1]$ such that $\bar{H}_{\ell'' \jmath''} = \ell''$.

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Table 1: Parameter Estimates for the Coordinating and Non-Coordinating Models

	Coordinating		Non-Coordinating			Coordinating		Non-Coordinating	
parm	MLE	SE	MLE	SE	parm	MLE	SE	MLE	SE
q	1.557	.137	1.433	.208	τ	.769	.068	.732	.068
b_C	1.491	.217	—	—	$d_{0,78}$	−1.184	.185	−1.249	.187
b_{NC}	—	—	1.390	.387	$d_{0,82}$	−1.256	.215	−1.318	.218
α_{78}	.463	.167	.359	.176	$d_{0,86}$	−1.518	.187	−1.594	.190
α_{82}	.143	.141	0*	.192	$d_{0,90}$	−1.630	.200	−1.706	.203
α_{86}	.570	.111	.408	.125	$d_{0,94}$	−1.790	.212	−1.827	.211
α_{90}	0*	.118	0*	.189	$d_{0,98}$	−2.048	.227	−2.095	.229
α_{94}	0*	.072	0*	.154	d_1	.292	.033	.292	.033
α_{98}	.272	.140	0*	.177	d_2	1.099	.071	1.098	.071
ρ_{78}	0*	.353	0*	.373	d_3	1.773	.087	1.770	.087
ρ_{82}	.780	.434	.086	.515	d_4	2.029	.119	2.026	.119
ρ_{86}	1*	.424	1*	.393	d_5	.031	.002	.031	.002
ρ_{90}	1*	.386	1*	.402	d_6	.423	.051	.425	.051
ρ_{94}	.752	.430	.641	.423	d_7	.117	.007	.117	.007
ρ_{98}	1*	.467	1*	.523	d_8	−.605	.115	−.585	.115
$c_{0,78}$	−1.018	.093	−.990	.093	$d_{9,78}$	−.057	.222	−.024	.223
$c_{0,82}$	−.898	.114	−.923	.119	$d_{9,82}$	.245	.312	.282	.313
$c_{0,86}$	−.772	.097	−.744	.097	$d_{9,86}$	.381	.295	.427	.295
$c_{0,90}$	−.864	.124	−.775	.124	$d_{9,90}$	−.169	.260	−.107	.262
$c_{0,94}$	−.871	.091	−.871	.092	$d_{9,94}$	.961	.280	.934	.280
$c_{0,98}$	−1.063	.110	−.992	.118	$d_{9,98}$	.881	.347	.881	.349
$c_{EC,78}$	.078	.112	.080	.111	$d_{EC,78}$	−.023	.117	−.023	.117
$c_{EC,82}$	.096	.109	.107	.109	$d_{EC,82}$	.015	.132	.015	.133
$c_{EC,86}$	.066	.094	.048	.094	$d_{EC,86}$	−.146	.110	−.146	.110
$c_{EC,90}$	.284	.143	.285	.143	$d_{EC,90}$	−.156	.131	−.149	.131
$c_{EC,94}$	.023	.101	.031	.101	$d_{EC,94}$	−.404	.121	−.408	.121
$c_{EC,98}$	−.061	.144	−.067	.141	$d_{EC,98}$	.152	.156	.153	.156
c_D	.493	.074	.485	.074	d_D	−.833	.081	−.816	.081
c_{ID}	.603	.083	.604	.083	d_{ID}	−.880	.094	−.860	.094
c_I	.946	.093	.931	.093	d_I	−1.265	.104	−1.242	.105
c_{IR}	1.408	.087	1.386	.086	d_{IR}	−.712	.099	−.691	.100
c_R	1.433	.082	1.418	.082	d_R	−.780	.091	−.760	.091
c_{SR}	1.892	.094	1.862	.094	d_{SR}	−.114	.103	−.103	.103
c_{DEM}	.683	.066	.685	.066	d_{DEM}	−.260	.085	−.269	.085
c_{REP}	.636	.067	.631	.067	d_{REP}	−.343	.087	−.348	.087

Note: Maximum likelihood estimates. * indicates a boundary-constrained parameter. Pooled ANES Post-Election Survey data, 1978–98, $n = 9639$ cases. Log-likelihood values: coordinating model, −6824.7; non-coordinating model, −6825.4.

Table 2: Likelihood-ratio Test Statistics for the Constraint $\alpha = 1$, by Year

year	$-2(L_{\text{constrained}} - L)$	sig. prob.
1978	13.2	7.7e-04
1982	35.2	4.3e-09
1986	12.0	1.4e-03
1990	28.6	4.7e-07
1994	53.3	6.4e-13
1998	26.7	6.5e-07

Note: The constraint is imposed separately for each year's α parameter. The significance probability is the upper-tail probability for the χ_1^2 distribution under the null hypothesis $\alpha = 1$, using the method of Davies (1987, eqn. 3.4) to adjust for the nuisance parameter ρ.

Table 3: 95% Confidence Intervals for α

parameter	lower bound	upper bound
α_{78}	.157	.787
α_{82}	0*	.423
α_{86}	.348	.775
α_{90}	0*	.196
α_{94}	0*	.127
α_{98}	.007	.541

Note: Estimates are based on tabulation of an asymptotic mixture distribution of the kind derived in Moran (1971) and Self and Liang (1987), under the hypothesis that $\alpha_{90} = \alpha_{94} = \rho_{78} = 0$ and $\rho_{86} = \rho_{90} = \rho_{98} = 1$. * indicates a boundary-constrained value.

Table 4: Expected Proportion Republican in National House Vote ($\bar{H}$) and Expected Proportion of Electors Voting ($\bar{V}$), by Year

year	$\hat{\bar{H}}$	$\hat{\bar{V}}$
1978	.393	.477
1982	.437	.550
1986	.418	.481
1990	.373	.439
1994	.544	.558
1998	.524	.455

Note: Computed using the parameter MLEs in Table 1 and 1978–98 ANES data.

Table 5: The Effects of Moderation for All Electors

	Democratic Vote Probabilities			
PID	min	max	difference	% change
Strong Democrats	0.578	0.609	0.031	5.379
Democrats	0.325	0.353	0.028	8.568
Democrat-Independents	0.302	0.337	0.035	11.657
Independents	0.179	0.188	0.009	5.258
Republican-Independents	0.127	0.168	0.041	32.767
Republicans	0.114	0.166	0.052	45.286
Strong Republicans	0.054	0.077	0.023	43.112
	Republican Vote Probabilities			
PID	min	max	difference	% change
Strong Democrats	0.051	0.060	0.009	17.369
Democrats	0.088	0.098	0.010	11.938
Democrat-Independents	0.094	0.107	0.013	14.218
Independents	0.136	0.138	0.001	1.001
Republican-Independents	0.314	0.361	0.047	14.927
Republicans	0.304	0.362	0.058	19.097
Strong Republicans	0.582	0.636	0.053	9.109
	Non-Voting Probabilities			
PID	min	max	difference	% change
Strong Democrats	0.340	0.362	0.022	6.553
Democrats	0.559	0.576	0.017	3.116
Democrat-Independents	0.569	0.591	0.022	3.830
Independents	0.676	0.684	0.008	1.190
Republican-Independents	0.513	0.521	0.009	1.700
Republicans	0.524	0.535	0.011	2.107
Strong Republicans	0.311	0.341	0.030	9.631

Note: This table calculates the average change in the vote probabilities of all electors in each partisan category as $\bar{H}$ is moved from its lowest estimated value (0.373 in 1990) to its highest estimated value (0.544 in 1994).

Table 6: The Effects of Moderation for Restricted Electors

	Democratic Vote Probabilities			
PID	min	max	difference	% change
Strong Democrats	0.573	0.618	0.045	7.931
Democrats	0.315	0.358	0.043	13.532
Democrat-Independents	0.285	0.340	0.055	19.218
Independents	0.177	0.192	0.015	8.226
Republican-Independents	0.128	0.170	0.043	33.287
Republicans	0.117	0.170	0.053	45.337
Strong Republicans	0.061	0.124	0.063	102.954

	Republican Vote Probabilities			
PID	min	max	difference	% change
Strong Democrats	0.062	0.094	0.032	52.579
Democrats	0.100	0.134	0.034	33.688
Democrat-Independents	0.107	0.150	0.043	39.758
Independents	0.149	0.161	0.011	7.595
Republican-Independents	0.308	0.354	0.046	15.000
Republicans	0.294	0.349	0.056	19.036
Strong Republicans	0.515	0.595	0.081	15.697

	Non-Voting Probabilities			
PID	min	max	difference	% change
Strong Democrats	0.320	0.335	0.014	4.505
Democrats	0.542	0.553	0.011	2.004
Democrat-Independents	0.553	0.567	0.014	2.578
Independents	0.659	0.663	0.004	0.623
Republican-Independents	0.518	0.526	0.008	1.524
Republicans	0.534	0.543	0.010	1.786
Strong Republicans	0.343	0.365	0.021	6.195

Note: This table calculates the average change in the vote probabilities of a subgroup of electors in each partisan category as $\bar{H}$ is moved from its lowest estimated value (0.373 in 1990) to its highest estimated value (0.544 in 1994). These results are restricted to those electors whose ideal points are intermediate between the alternative expected policies of the non-coordinating model.

Table 7: Orderings of Ideal Points and Expected Party Policy Positions, by Year

	Ordering				
year	$\theta_i < \tilde{\theta}_{Di}, \tilde{\theta}_{Ri}, \tilde{\theta}_i$	$\tilde{\theta}_{Di} < \theta_i < \tilde{\theta}_i$	$\tilde{\theta}_i < \theta_i < \tilde{\theta}_{Ri}$	$\tilde{\theta}_{Di}, \tilde{\theta}_{Ri}, \tilde{\theta}_i < \theta_i$	$\nu_i = 0$
1978	25.8	4.3	8.5	45.1	14.2
1982	26.7	19.1	14.4	25.0	10.9
1986	54.0	15.7	6.8	10.9	10.9
1990	30.9	11.0	17.7	24.3	12.2
1994	19.6	16.4	20.1	36.1	4.8
1998	42.5	13.5	18.0	18.4	5.0

Note: Entries show the percentage of electors in each year who have the indicated ordering of ideal point and expected policy positions, or who lack policy position values ($\nu_i = 0$). Computed using the parameter MLEs in Table 1 and 1978–98 ANES data. Percentages for other orderings are, by year: $\tilde{\theta}_{Di} > \theta_i > \tilde{\theta}_i$ (.6, 1.3, 1.1, 1.4, 1.7, 1.1); $\tilde{\theta}_i > \theta_i > \tilde{\theta}_{Ri}$ (1.4, 1.5, .7, 2.4, 1.4, 1.5). Each observation is weighted by the sampling weight $1/\omega_i$.

Table 8: Mean of Conditional Probability of Voting Republican Minus Conditional Probability of Voting Democrat within Orderings of Ideal Points and Expected Party Policy Positions, by Year

	Ordering				
year	$\theta_i < \tilde{\theta}_{Di}, \tilde{\theta}_{Ri}, \tilde{\theta}_i$	$\tilde{\theta}_{Di} < \theta_i < \tilde{\theta}_i$	$\tilde{\theta}_i < \theta_i < \tilde{\theta}_{Ri}$	$\tilde{\theta}_{Di}, \tilde{\theta}_{Ri}, \tilde{\theta}_i < \theta_i$	$\nu_i = 0$
1978	−.369	−.603	−.232	.015	−.247
1982	−.409	−.411	.349	.294	−.118
1986	−.235	.320	.540	.190	.053
1990	−.532	−.492	.151	.059	−.324
1994	−.363	−.464	.342	.291	−.233
1998	−.321	−.140	.402	.236	−.280

Note: Entries show the mean differences $(\mu_{i,R} - \mu_{i,D})/(1 - \mu_{i,A})$ in the coordinating model for the set of electors in each year who have the indicated ordering of ideal point and expected policy positions, or who lack policy position values ($\nu_i = 0$). Observations from districts with unopposed incumbents are omitted. Computed using the parameter MLEs in Table 1 and 1978–98 ANES data. Each observation is weighted by the sampling weight $1/\omega_i$.

Table 9: Mean Difference between Coordinating and Non-coordinating Models in the Differences between the Conditional Voting Probabilities within Orderings of Ideal Points and Expected Party Policy Positions, by Year

	Ordering				
year	$\theta_i < \tilde{\theta}_{Di}, \tilde{\theta}_{Ri}, \tilde{\theta}_i$	$\tilde{\theta}_{Di} < \theta_i < \tilde{\theta}_i$	$\tilde{\theta}_i < \theta_i < \tilde{\theta}_{Ri}$	$\tilde{\theta}_{Di}, \tilde{\theta}_{Ri}, \tilde{\theta}_i < \theta_i$	$\nu_i = 0$
1978	.0004	.0139	.0199	−.0086	−.0077
1982	.0189	−.0143	.0116	.0125	.0306
1986	.0158	−.0147	−.0180	−.0207	−.0103
1990	−.0323	−.0357	.0560	−.0123	−.0412
1994	.0090	−.0277	.0136	.0003	.0089
1998	−.0045	.0097	.0199	−.0343	−.0348

Note: Entries show the mean difference between the coordinating and non-coordinating models in the differences $(\mu_{i,R} - \mu_{i,D})/(1 - \mu_{i,A})$ for the set of electors in each year who have the indicated ordering of ideal point and expected policy positions, or who lack policy position values ($\nu_i = 0$). Observations from districts with unopposed incumbents are omitted. Computed using the parameter MLEs in Table 1 and 1978–98 ANES data. Each observation is weighted by the sampling weight $1/\omega_i$.