

# Electoralates versus Voters

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## ABSTRACT

Voters are allegedly uninformed, fickle, and sensitive to irrelevant events, or they are stubborn, tribal, and hyper-partisan. As a result of evidence along these lines, many scholars argue that democracy does not function as it should, and some have gone so far as to argue that we should abandon democracy altogether. At the same time, studies on elections and policy outcomes tend to find that electoral selection and incentives work reasonably well. In this paper, we offer a reconciliation of these two literatures. Even if individual voters leave something to be desired, electoralates can still select the best candidates and incentivize elected officials to do a good job. We theoretically compare electoral accountability in a world with a single, rational, representative voter to one with many voters who exhibit the limitations documented in the literature, and we ask when the aggregation of imperfect voters can still produce desirable outcomes. We also empirically assess the extent to which voters change their votes or change their turnout decisions in response to the qualities of candidates, and we use the results to explore how different partitionings of voters into electoralates affect incentives for incumbent effort.

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Is democracy broken? Recent scholarship on American political behavior might leave that impression. The typical voter seems unsophisticated and

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incompetent. Voter behavior thus appears inconsistent with a well-functioning democratic government. In their influential book, *Democracy for Realists*, Achen and Bartels (2016, p. 306) conclude that “All the conventional defenses of democratic government are at odds with demonstrable, centrally important facts of political life”.

Among the defenses of democracy that Achen and Bartels argue against is electoral selection and accountability. On this view, voters learn about political candidates from past performance. They then vote for the one they believe will produce the best outcomes in the future. Democratic elections produce good outcomes for two reasons. One is that voters will tend to select candidates who are better (e.g., they are more competent, less corrupt, and more aligned with public preferences). The other is that incumbents’ desire to get re-elected gives them an incentive to try to impress the voters. This leads them to do a better job in office (e.g., work harder, engage in less corruption, and choose policy closer to public preferences). For simplicity, we will refer to these mechanisms as *selection* and *incentives*. (See Ashworth, 2012 for a more thorough treatment of this view.)

Scholars of political behavior cast doubt on such a favorable view of democracy. They claim that voters are generally uninformed (e.g., Campbell *et al.*, 1960), unsophisticated (e.g., Converse, 1964), myopic (e.g., Bartels, 2008), sensitive to irrelevant events (Achen and Bartels, 2016, cf. Fowler and Hall, 2018; Healy *et al.*, 2010, cf. Fowler and Montagnes, 2015), or hyper-partisan (e.g., Campbell *et al.*, 1960, cf. Fowler, 2020). How can voters select better candidates if the typical voter can not reliably make good choices at the ballot box? Democracy cannot function well, the argument goes, if voters are not up to the task. In its extreme form, this argument points to abandoning democracy altogether (e.g., Brennan, 2016; Caplan, 2007).

But evidence at the level of overall electorates paints a more optimistic picture. In the aggregate, election results appear to respond reasonably to government performance (Ferraz and Finan, 2008; Kramer, 1971; Lenz, 2012), candidate ideology (Ansolabehere *et al.*, 2001; Canes-Wrone *et al.*, 2002; Hall, 2015; Hirano *et al.*, 2014), and candidate quality (Fowler, 2016; Hirano and Snyder, 2009, 2019). And elected officials appear to produce better outcomes when they have stronger reelection incentives (Alt *et al.*, 2011; Eggers, 2014; Ferraz and Finan, 2011). If voter behavior is pathological, why do selection and incentives appear to work in the aggregate?

In this paper, we propose a resolution of this apparent contradiction. There is no inconsistency — the literatures are talking past one another. Variation in electoral outcomes is not driven by the typical voters. As such, elections can produce good outcomes even if typical voters behave poorly. If we want to know about the quality of democratic accountability, we need to understand electorates, not voters.

The behaviors of the electorate and the typical voters come apart for two reasons. First, strong partisans on opposite sides can offset one another. To see the point, imagine an election between a Democrat and Republican in which 49 percent of voters vote for the Democrat no matter what, 49 percent vote for the Republican no matter what, and the remaining 2 percent will vote for whichever candidate they believe is better. In this hypothetical scenario, the typical voter is an unthinking partisan, but the electorate is balanced in such a way that the responsive voters determine which candidate wins. As a result, incumbents have a strong incentive to do a good job.

Second, not everyone votes, and abstention can introduce a degree of responsiveness. Imagine another hypothetical electorate, this time evenly split between Democrats and Republicans. Suppose no one will ever cast a vote for the other party. But each voter might abstain if their party's candidate is particularly unappealing, or if the other party's candidate is unusually compelling. This could be enough for the better candidate to win every election. There is empirical support for this mechanism. Hill (2017) shows that changes in turnout explain more electoral change than swing voting does. Hall and Thompson (2018) show that turnout may also explain most of the effect of candidate ideology on general election outcomes. These results suggest that changes in the composition of the voting population are a particularly important reason that electoralates behave differently than the typical voter.<sup>1</sup>

The "Motivating Examples" section formalizes and fleshes out these examples, and the "Model of Electoral Accountability with Heterogeneous Partisanship" section presents a more general model. That more general model builds on a standard political agency model. We allow for heterogeneity in the strength of partisan attachment and a form of cognitive bias in interpreting outcomes. We also allow voters' turnout decisions to be sensitive to their evaluations of the candidates. We prove that, for any mixture of different voter types, election results and incumbent effort are as if there was a single representative voter. This representative voter is often quite different from the typical or the modal voter. Outcomes are often better than would be the case if the typical voter were the only voter.

We want to go beyond simply making a negative point, and offer a way forward for a more productive dialogue. To this end, we offer an example of how individual-level data on voter behavior can be combined with theoretical models of political agency to shed light on electorate-level responsiveness and political accountability. The second half of this paper takes up this challenge.

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<sup>1</sup>Another answer, less relevant to this paper, points out that large electoralates can aggregate noisy information at the individual level into accurate information at the level of the electorate (e.g., Condorcet, 1785). Martinelli (2006) and Aytimur and Bruns (2018) are recent models based on this idea.

The section entitled “Empirical Evidence on Well-Behaved Moderates and Turnout-Sensitive Partisans” presents empirical evidence on the responsiveness of different partisan groups to the candidate attributes that are the target of electoral selection. Even if we grant that many American voters behave poorly, the empirical evidence in conjunction with our model suggests that electoral selection and incentives might work reasonably well in many American elections.

The section entitled “Calibrations of Incumbent Effort with Realistic Combinations of Voters” further explores this hypothesis. There, we combine our empirical estimates with the logic of our theoretical model. We first calibrate responsiveness of the seven standard partisan groups in the CCES. We then compute the equilibrium level of effort with several distributions of partisanship. Both the nationwide electorate and many state electorates generate effort almost as great as the theoretical maximum. But for many states and districts with a strong partisan leaning, effort will be much weaker.

This last point should make clear that our paper does not show that democracy is not broken. In fact, there are instances of our model in which democracy performs poorly. Furthermore, many concerns about democracy are outside the scope of this paper. Our primary point is that the argument that flawed voters lead to flawed accountability is itself flawed, or at least incomplete. Democracy can perform well even with flawed voters because electorates are different from voters.

## Motivating Examples

To fix ideas, we start with two examples of the how a diverse electorate relates to a representative voter. Both examples build on the same political agency model.

There is an incumbent in office who might be high ability ( $\theta = H$ ) or low ability ( $\theta = L$ ). She can choose high effort ( $e = h$ ) or low effort ( $e = l$ ). Together, these lead to a governance outcome that is either good ( $g = G$ ) or bad ( $g = B$ ). These outcomes have conditional probabilities:

$$\begin{aligned}\Pr(g = G \mid H) &= 1 \\ \Pr(g = G \mid L, h) &= \frac{2}{3} \\ \Pr(g = G \mid L, l) &= \frac{1}{3}.\end{aligned}$$

Candidates do not know their own abilities. The prior belief is that abilities are independent, and that each candidate is equally likely to be of high or low ability.

There are  $n$  voters. They observe the governance outcome and then choose one of three options: vote for the incumbent, vote for the challenger, or abstain. The incumbent is re-elected if she receives more than half the votes cast.

The incumbent gets a benefit of 1 if she is re-elected, and bears a cost of  $\frac{1}{10}$  if she chooses high effort. Otherwise, her payoff is 0. Thus the incumbent will choose high effort if:

$$\Pr(\text{re-elect} \mid e = h) - \Pr(\text{re-elect} \mid e = l) \geq \frac{1}{10}. \quad (1)$$

We call the left-hand side of this inequality the *incremental return to high effort*.

We do not make any direct assumptions about voter preferences, beliefs, or cognition.<sup>2</sup> Instead, we specify five behavioral types of voters:

**Pure retrospective voters** vote for the incumbent if the governance outcome is good, and vote for the challenger if the governance outcome is bad.

**Rigid incumbent partisans** vote for the incumbent no matter what.

**Rigid challenger partisans** vote for the challenger no matter what.

**Turnout-sensitive incumbent partisans** vote for the incumbent if the governance outcome is good, and abstain if the governance outcome is bad.

**Turnout-sensitive challenger partisans** abstain if the governance outcome is good, and vote for the challenger if the governance outcome is bad.

We will refer to the  $n$  voters along with specified shares of these types as the *electorate*.

The following subsections discuss three salient cases, involving different assumptions about the electorate.

### ***Effort with a Representative Voter***

A standard assumption in the political agency literature would be that there is a single voter, so  $n = 1$ . This is the *representative voter model*. Whether the incumbent chooses high effort depends on the type of this representative voter.

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<sup>2</sup>It would be straightforward to ground these types in utility maximization. (In particular, Bayes' rule here would lead a voter who wanted to vote for the candidate more likely to be of high ability to vote like a pure retrospective voter.) But other interpretations are also possible.

Suppose first that the representative voter is purely retrospective. Then the incumbent wins re-election if and only if the governance outcome is good. If she chooses high effort, then she wins with probability  $\bar{p} \equiv \frac{1}{2} + \frac{1}{2} \cdot \frac{2}{3}$ . If she chooses low effort, then she wins with probability  $\underline{p} \equiv \frac{1}{2} + \frac{1}{2} \cdot \frac{1}{3}$ . The incremental return to high effort is thus  $\bar{p} - \underline{p} = \frac{1}{6}$ . Since this is greater than the cost,  $\frac{1}{10}$ , the incumbent will choose high effort.

Suppose next that the representative voter is a rigid partisan. Then the incumbent's probability of re-election does not depend on the governance outcome. Thus the incremental return to high effort is 0. This is less than the cost, so the incumbent will choose low effort.

The next two examples show how such a representative voter model can capture the incentives in a model with a heterogeneous electorate. Given some electorate  $E$  with  $n > 1$  voters, we will say that a representative voter of type  $\tau$  *represents* that electorate if electorate  $E$  and the representative voter of type  $\tau$  lead to the same incumbent effort and re-election probabilities.

### ***Example 1: Balanced Partisans***

Suppose that fraction  $\pi_R$  of voters are purely retrospective, fraction  $\pi_I$  are rigid incumbent partisans, and fraction  $\pi_C$  are rigid challenger partisans. There are no turnout-sensitive partisans, so  $\pi_R + \pi_I + \pi_C = 1$ .<sup>3</sup>

If the governance outcome is good, then the incumbent gets the votes of both the rigid incumbent partisans and the pure retrospective voters. In that case, the incumbent's vote share is  $\pi_I + \pi_R$ . If the governance outcome is bad, then the incumbent gets the votes only of the rigid incumbent partisans. In that case, the incumbent's vote share is  $\pi_I$ .

Suppose  $\pi_I < \frac{1}{2} < \pi_I + \pi_R$ . The incumbent wins if and only if the governance outcome is good. Notice that this is exactly the same relationship between the governance outcome and re-election as in the case of a single purely retrospective voter. Thus the purely retrospective voter represents the entire electorate.

If, on the other hand,  $\pi_I > \frac{1}{2}$  or  $\pi_C > \frac{1}{2}$ , then the incumbent's chance of being re-elected does not depend on the governance outcome. Again we can capture the relationship between the governance outcome and re-election with a representative voter. If  $\pi_I > \frac{1}{2}$ , then the representative voter is a rigid incumbent partisan. If  $\pi_C > \frac{1}{2}$ , then the representative voter is a rigid challenger partisan.

A weak measure of partisan balance is the key determinant of which type of voter is representative in this example. If a majority of voters are rigid incumbent partisans, so is the representative voter. If a majority of voters are rigid challenger partisans, so is the representative voter. But if the partisans

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<sup>3</sup>To rule out a degenerate case, we also assume that  $\pi_I + \pi_R \neq \frac{1}{2}$ .

are balanced in the weak sense that neither of these rigid partisan types make up a majority of the electorate, then the representative voter is purely retrospective.

### *Example 2: Turnout*

Suppose that fraction  $\pi_{RI}$  of voters are rigid incumbent partisans, fraction  $\pi_{RC}$  are rigid challenger partisans, fraction  $\pi_{TI}$  are turnout-sensitive incumbent partisans, and fraction  $\pi_{TC}$  are turnout-sensitive challenger partisans. There are no purely retrospective voters, so  $\pi_{RI} + \pi_{RC} + \pi_{TI} + \pi_{TC} = 1$ .

If the governance outcome is good, then the incumbent gets the votes of both the rigid and turnout-sensitive incumbent partisans, while the challenger gets the votes of the rigid challenger partisans. The turnout-sensitive challenger partisans abstain, so overall turnout is  $\pi_{RI} + \pi_{TI} + \pi_{RC}$ . The incumbent's vote share is  $(\pi_{RI} + \pi_{TI})/(\pi_{RI} + \pi_{TI} + \pi_{RC})$ . If the outcome is bad, then the incumbent gets the votes only of the rigid incumbent partisans, while the challenger gets the votes of both the rigid and the turnout-sensitive challenger partisans. The turnout-sensitive incumbent partisans abstain, so overall turnout is  $\pi_{RI} + \pi_{RC} + \pi_{TC}$ . In that case, the incumbent's vote share is  $(\pi_{RI})/(\pi_{RI} + \pi_{RC} + \pi_{TC})$ .

Suppose  $\pi_{RC} < \pi_{RI} + \pi_{TI}$  and  $\pi_{RI} < \pi_{RC} + \pi_{TC}$ . Substantively, this means that each turnout-sensitive group is large relative to the extent of balance between the two rigid groups (measured as the absolute value of  $\pi_{RI} - \pi_{RC}$ ). In this case, the incumbent wins if and only if the governance outcome is good. Again, this is exactly the same relationship between the governance outcome and re-election as in the case of a single purely retrospective voter, and a purely retrospective voter represents the entire electorate.

### *Looking Ahead*

The two examples show how a representative voter can capture the behavior of a heterogeneous electorate. A key observation is that these representative voters need not be typical voters. This is clear in the second example — the representative voter was purely retrospective even though no voter in the entire electorate was. In the first example, we do need some purely retrospective voters, but not many. For example, consider  $\pi_I = \pi_C = .49$  and  $\pi_R = .02$ . The typical voter is a rigid partisan — indeed, 98 percent of voters are. But the representative voter is a pure retrospective voter.

These examples elucidate the difference between the typical voter and the representative voter. That helps us see the way that the two literatures have been talking past each other. But to bring the theoretical idea to data, and to suggest a more fruitful dialogue, we need a more elaborate model. Specifically, we need to allow for more flexibility in which voter behaviors are possible, as

well as a less stark measure of the strength of incentives. The next section develops such a model.

## Model of Electoral Accountability with Heterogeneous Partisanship

In this section, we do two things. First, we present a model of electoral accountability with a representative voter. The model is a version of Holmström's (1999) career-concerns model, adapted for an electoral context. The version we use includes a policy-preference-based asymmetry between the incumbent and the challenger (as in Ashworth and Bueno de Mesquita, 2006). Second, we show how that model's representative voter can be derived from a richer model with a large electorate.

### A Representative Voter Model

There are two politicians and a representative voter. We refer to each politician as “she” and the Voter as “he.” In each of two periods, the voter receives a level of public goods. This level is a function of the effort taken by the Politician in office, the type of the politician in office, and a random shock.

The politicians are differentiated in two ways. First, one is the incumbent while the other is a challenger. Second, they belong to different political parties, denoted  $p \in \{d, r\}$ .

The politician in office in period  $t$  chooses a level of effort  $a^t \in \mathbb{R}_+$ . The level of public goods produced in period  $t$  is:

$$g^t = \theta^t + a^t + \epsilon^t,$$

where  $\theta^t$  is the type of the Politician in office in period  $t$  and  $\epsilon^t$  is the random shock in period  $t$ . (We will often neglect the time superscripts when no confusion will result.)

Prior to the game being played, nature determines the realizations of each politician's type and of the random shocks (one for each period). These realizations are not observed by any of the players.

Figure 1 depicts the timeline: In the initial governance period, the incumbent chooses a level of effort  $a^1$ . The choice is not observed by the voter. Instead, the voter observes the level of public goods produced,  $g^1$ . This leads

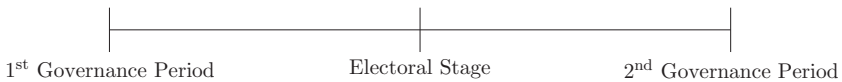


Figure 1: Timeline.



to the electoral stage, in which the voter chooses to elect either the incumbent or the challenger. The winner of the election is the politician in office in the second governance period. She chooses a level of effort  $a^2$ . Again, the Voter observes the level of public goods produced,  $g^2$ .

Types  $\theta_p$  are realizations of random variables that are normally distributed with mean 0 and variance  $\sigma_\theta^2$ . Random shocks are realizations of a random variable that is normally distributed with mean 0 and variance  $\sigma_\epsilon^2$ . All of these random variables are mutually independent.

Politicians' payoffs depend on both a benefit from holding office and the level of effort chosen while in office. The benefit from holding office is given by  $B$ , with  $0 < B < 2(\sigma_\theta^2 + \sigma_\epsilon^2)$ .<sup>4</sup> Taking effort  $a$  has cost  $c(a) = \frac{1}{2}a^2$ . A politician's payoff in governance period  $t$  is 0 if she is not in office and  $B - c(a^t)$  if she is in office and chooses effort  $a^t$ . A politician's payoffs are given by the sum of her payoffs in each governance period.

The parties are associated with different locations in a one-dimensional policy space.<sup>5</sup> Party  $p$ 's location is denoted  $x_p$ . We normalize by setting  $-x_d = \frac{\Delta}{4} = x_r$ .

The representative voter has preferences based on two factors. The first is the level of public goods provided. The second is the distance between the voter's ideal point,  $x$ , and the politician in office's location in the one-dimensional policy space. The voter's payoff in governance period  $t$  is  $g^t - (x - x^t)^2$ , where  $x^t$  is the fixed location of the party of the politician in office in period  $t$ . The voter's payoff is given by the sum of his payoffs in each governance period.

### *Equilibrium with a Representative Voter*

We solve the game from the end. Since the second governance period ends the game, the second-period office holder will choose  $a^2 = 0$ . Given this, all that matters for the representative voter's election decision are his posterior mean belief about the candidate's types and the difference in policy payoffs. (We will sometimes refer to the mean belief about a politician's type as her *reputation*.) Specifically, the voter votes for the candidate from party  $d$  if and only if

$$\mathbb{E}(\theta_d | g) - (x^* - x_d)^2 \geq \mathbb{E}(\theta_r | g) - (x^* - x_r)^2.$$

<sup>4</sup>Lemma 1 in Ashworth (2005) implies that this upper bound is sufficient for the incumbent's equilibrium action to be characterized by the first-order condition studied below.

<sup>5</sup>We think of these locations as being programmatic policy commitments of the parties, rather than as platforms the candidates can credibly commit to as individuals. The voter uses the party label as an informative cue about these programmatic stances, as in Snyder and Ting (2002).

(Equality is a zero-probability event, so this tie breaking rule is innocuous.) This implies that the voter chooses the party  $d$  politician if and only if:

$$E(\theta_d | g) - \mathbb{E}(\theta_r | g) \geq x\Delta. \quad (2)$$

Next we calculate the voter's posterior mean assessment of the incumbent's type, as a function of the actual level of public goods and the expected effort, denoted  $a^*$ . The voter observes the level of public goods,  $g = \theta + a + \epsilon$ . The voter believes that subtracting their belief about effort from the level of public goods gives an unbiased signal of type:

$$g - a^* = \theta + \epsilon.$$

Standard results on Bayesian updating with normal priors and likelihoods (Gelman *et al.*, 2013) then imply that the voter's posterior belief about the incumbent's type has mean  $\lambda(g - a^*)$ , where  $\lambda = \frac{\sigma_\theta^2}{\sigma_\theta^2 + \sigma_\epsilon^2}$ .

Next we derive the incumbent's optimal choice of effort. The details differ a bit depending on whether the incumbent is from party  $d$  or party  $r$ , though the resulting characterization is the same in either case. In the main text, we assume the incumbent is from party  $d$ , and discuss the other case in a note.

If the incumbent is from party  $d$ , then  $\mathbb{E}(\theta_r | g) = 0$ , since the governance outcome is not informative about the challenger's type. Thus  $E(\theta_d | g) - \mathbb{E}(\theta_r | g)$  is just the posterior mean belief about the incumbent's type. That posterior mean is itself a random variable, with realization:

$$\lambda(g - a^*) = \lambda(a - a^* + \theta + \epsilon).$$

Since  $\theta$  and  $\epsilon$  are realizations of independent, mean zero, normally distributed random variables, the posterior mean is distributed normally with mean  $\lambda(a - a^*)$  and variance

$$\lambda^2(\sigma_\theta^2 + \sigma_\epsilon^2) = \lambda\sigma_\theta^2.$$

Thus the incumbent chooses effort to solve:

$$\max_a B \left( 1 - \Phi \left( \frac{x\Delta - \lambda(a - a^*)}{\sqrt{\lambda\sigma_\theta^2}} \right) \right) - \frac{1}{2}a^2.$$

The first-order condition for this problem is:

$$\frac{\lambda}{\sqrt{\lambda\sigma_\theta^2}} B\phi \left( \frac{x\Delta - \lambda(a - a^*)}{\sqrt{\lambda\sigma_\theta^2}} \right) = a.$$

A similar calculation shows that an incumbent from party  $r$  has the same first-order condition.<sup>6</sup>

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<sup>6</sup>If the incumbent is from party  $r$ , then  $\mathbb{E}(\theta_d | g) = 0$ , since the governance outcome is not informative about the challenger's type. Thus  $E(\theta_d | g) - \mathbb{E}(\theta_r | g)$  is just minus the

Imposing the equilibrium condition that the voter's belief about effort is correct,  $a = a^*$ , yields an explicit formula for equilibrium effort:

$$a^* = \frac{\sqrt{\lambda}}{\sigma_\theta} B\phi\left(\frac{x\Delta}{\sqrt{\lambda\sigma_\theta^2}}\right). \quad (3)$$

Equation (3) reflects an incentive mechanism. The incumbent exerts effort to the extent she believes extra effort can swing the election in her favor.

Two comparative statics follow immediately from this characterization. First, equilibrium effort is decreasing in the polarization of party policy stances,  $\Delta$ . Second, equilibrium effort is maximized when the representative voter is perfectly moderate ( $x = 0$ ), and decreases monotonically as the absolute value of his ideal point increases.

Though it is not the main point of this paper, we also note that this model can be used to talk about electoral selection. The incumbent wins only if her reputation exceeds a threshold; otherwise the challenger wins. As a result, the average type of a winning politician exceeds the prior mean of 0. In a model with the same technology of public good provision used here, Ashworth and Bueno de Mesquita (2008) show that the selection effect, averaged across parties, is maximized when the representative voter is perfectly moderate.

### Whom Does the Representative Voter Represent?

Now we show how to use the previous model with a single, representative voter to think about a richer model with many voters, heterogeneous partisan affinities, and variable turnout. Even when the electorate is comprised of different kinds of voters, we can think of its electoral decisions as if they were made by a single, representative voter of a certain type.

There is a continuum of voters. They are divided into  $G$  groups, indexed by  $g = 1, \dots, G$ . The population share of group  $g$  is  $\pi_g > 0$ , with  $\sum_{g=1}^G \pi_g = 1$ .

We assume a voter evaluates a candidate based on three factors. The first is the policy utility:  $-(x_i - x_p)^2$ .

The second is his affinity for the party of the candidate,  $\eta_{ip}$ . These affinities represent non-policy dimensions of partisanship, perhaps driven by group identity (Achen and Bartels, 2016).

The third is his belief about the candidate's ability,  $\hat{\mathbb{E}}(\theta \mid g)$ . For the challenger, this is just the prior of 0. For the incumbent, this is:

$$\hat{\mathbb{E}}(\theta \mid g) = \mathbb{E}(\theta \mid g) + \delta\sigma_\theta^2 b_{ip}.$$

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posterior mean belief about the incumbent's type. The incumbent from the  $r$  party wins if the difference in posterior means is less than  $x\Delta$ . Given  $a$  and  $a^*$ , this has probability

$\Phi\left(\frac{x\Delta + \lambda(a - a^*)}{\sqrt{\lambda\sigma_\theta^2}}\right)$ . As a result, the  $r$  incumbent has the same first-order condition as the  $d$  incumbent.

Here, the first term is the rational expectation from above. The second term captures motivated reasoning. If  $b_{ip} > 0$  ( $b_{ip} < 0$ ), then voter  $i$  is motivated to believe that the politician from party  $p$  is of high (low) ability. As such, her posterior belief deviates from the Bayesian belief in a direction consistent with this motivation. (This is a special case of the updating model in Little *et al.*, 2020, who provide foundations for the specification and apply it to incentives in elections.) To simplify some of the derivations below, we assume that, for each  $i$ ,  $b_{id} = -b_{ir}$ .

We assume that each voter supports the candidate he evaluates more highly, if the difference in evaluations is large enough. If the evaluations are close together, he abstains.

Formally, voter  $i$  votes for the party  $d$  politician if

$$\widehat{E}(\theta_d | g) - (x_i - x_d)^2 + \eta_{id} \geq \widehat{E}(\theta_r | g) - (x_i - x_r)^2 + \eta_{ir} + \kappa_i,$$

votes for the party  $r$  politician if

$$\widehat{E}(\theta_r | g) - (x_i - x_r)^2 + \eta_{ir} \geq \widehat{E}(\theta_d | g) - (x_i - x_d)^2 + \eta_{id} + \kappa_i,$$

and abstains if neither inequality holds.<sup>7</sup> We can rewrite these inequalities as follows. Voter  $i$  votes for the party  $d$  politician if

$$\mathbb{E}(\theta_d | g) - \mathbb{E}(\theta_r | g) \geq x_i \Delta + (\eta_{ir} - \eta_{id}) - \delta \sigma_\theta^2 b_{id} + \kappa_i \quad (4)$$

and votes for the party  $r$  politician if

$$\mathbb{E}(\theta_d | g) - \mathbb{E}(\theta_r | g) \leq x_i \Delta + (\eta_{ir} - \eta_{id}) - \delta \sigma_\theta^2 b_{id} - \kappa_i. \quad (5)$$

Each group  $g$  is characterized by a common value of  $\kappa_g$  and a function  $F_g$ . The interpretation of this function is that, for any  $z$ , the fraction of group  $g$  voters with  $x_i \Delta + (\eta_{ir} - \eta_{id}) - \delta \sigma_\theta^2 b_{id} \leq z$  is  $F_g(z)$ . If the rational belief about the mean difference between the candidates' types is  $\mu = \mathbb{E}(\theta_d | g) - \mathbb{E}(\theta_r | g)$ , then fraction  $F_g(\mu - \kappa)$  of group  $g$  members vote for the  $d$  party, fraction  $1 - F_g(\mu + \kappa)$  of group  $g$  members vote for the  $r$  party, and fraction  $F_g(\mu + \kappa) - F_g(\mu - \kappa)$  of group  $g$  members abstain.

Call the collection  $\langle (\pi_1, F_1, \kappa_1), \dots, (\pi_G, F_G, \kappa_G) \rangle$  the *group structure* of the electorate.

**Example 1.** Suppose  $\kappa_g = 0$  and

$$F_g(z) = \begin{cases} 1 & \text{if } z \geq 0 \\ 0 & \text{if } z < 0. \end{cases}$$

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<sup>7</sup>The tie-breaking assumption implicit in the pattern of weak and strict inequalities makes some of the subsequent notation simpler, but it does not affect any results.

This says that every voter in group  $g$  bases his or her decisions only on the candidates' reputations, and he or she assesses those in a fully rational way. They are similar to the purely retrospective voters in "Motivating Examples" section.

**Example 2.** Let  $\Phi$  be the cdf of a standard normal random variable, and let  $F_g(z) = \Phi\left(\frac{z - m_g}{s_g}\right)$ . Then, in group  $g$ , the quantity  $x_i\Delta + (\eta_{ir} - \eta_{id}) - \delta\sigma_\theta^2 b_i$  has mean  $m_g$ , and standard deviation  $s_g$ .

Example 2 allows for quite extreme behavior. If the mean  $m_g$  is very large, then  $g$  is a group of close to being rigid partisans for the  $r$  party — only extremely unlikely combinations of the reputations could lead to more than a handful of votes for the  $d$  party. If the variance  $s_g$  is very large, then  $g$  is a group of nearly unresponsive voters, whose votes are barely affected by reputations.

We allow these possibilities to go all the way to the limit. That is, we assume that each  $F_g$  is non-decreasing and left continuous. This is just like saying that each  $x_i\Delta + (\eta_{ir} - \eta_{id}) - \delta\sigma_\theta^2 b_i$  is the realization of a random variable with cdf  $F_g$ , except we do not require that  $F_g$  range all the way from 0 to 1.<sup>8</sup>

**Remark 1.** *Since the model has only a single election, we treat the partisan affinities as fixed. But in a context with repeated elections, it would be natural to assume that the affinities are random draws, independent across elections. In that case, the model here is just the standard random utility model used to microfound discrete choice statistical models.*

The repeated election context also allows for purely random voters. For example, rather than interpreting a group with  $F_g(z) = p$  as consisting of fraction  $p$  with  $x_i\Delta + (\eta_{ir} - \eta_{id}) - \delta\sigma_\theta^2 b_i = -\infty$  and fraction  $1 - p$  with  $x_i\Delta + (\eta_{ir} - \eta_{id}) - \delta\sigma_\theta^2 b_i = \infty$ , we can interpret that group as consisting of voters each of whom votes for the incumbent's party with probability  $p$  completely independently of the incumbent's reputation.

To determine who wins the election, we calculate the  $d$  party's margin as:

$$\mathcal{M}(\mu) = \sum_g \pi_g (F_g(\mu - \kappa_p) + F_g(\mu + \kappa_p) - 1). \quad (6)$$

The term  $F_g(\mu - \kappa_g) + F_g(\mu + \kappa_g) - 1$  is the fraction of group  $g$  voting for the  $d$  party minus the fraction voting for the  $r$  party. These are weighted by the population share in each group,  $\pi_g$ , and summed to get the overall vote of the  $d$  party minus the overall vote of  $r$  party. The  $d$  party candidate wins if  $\mathcal{M}(\mu) \geq 0$ .<sup>9</sup>

We assume  $\mathcal{M}$  is strictly increasing, continuous, and takes both positive and negative values. (Example 1 shows that this need not hold group-by-group.)

<sup>8</sup>Each  $F_g$  can be interpreted as the cdf an extended-real-valued random variable.

<sup>9</sup>We break ties in favor of party  $d$ . Since ties will have probability zero, nothing hinges on this choice.

These assumptions ensure that there is a unique  $\tilde{\mu}$  with the property that  $\mathcal{M}(\mu) \geq 0$  if and only if  $\mu \geq \tilde{\mu}$ .

This result is the key to replacing the large electorate from this subsection with a representative voter. The  $d$  party candidate wins if and only if the difference in reputations exceeds a critical threshold,  $\tilde{\mu}$ . Otherwise, the  $r$  party candidate wins. Compare this with the decision rule from the representative voter model, in Equation (2). If we set  $\tilde{x} = \frac{\tilde{\mu}}{\Delta}$ , the resulting representative voter model will replicate exactly the relationship between reputation and reelection that obtains in the large electorate model. And that means that both incentives and selection will be the same as well. It makes sense, then, to refer to a representative voter with ideal point  $\tilde{x}$  as the *representative voter implied by the group structure*.

With this definition of the representative voter implied by the group structure, we can quickly derive the equilibrium incumbent effort in the model with a large, heterogeneous electorate. The incumbent's re-election probabilities are the same in the two models. Thus the incumbent's equilibrium effort continues to be given by Equation (3), with  $x = \tilde{x}$ .

### Looking ahead to Data

The equilibrium effort depends on the policy preference of the representative voter implied by the group structure of the electorate. This suggests a path forward if we want to learn about electoral accountability by studying the voting behavior of individuals or groups. We can first use individual-level data to estimate the group structure, and then use the model to transform that group structure into a measure of incentives.

The rest of this paper will take up that task, using the parameterization from Example 2. With this parameterization, we can calculate a variety of quantities that can be matched with empirical moments.

Fix a difference in candidate reputations,  $\mu$ . The probability of a randomly selected member of group  $g$  votes for party  $d$  is

$$\Phi\left(\frac{\mu - m_g - \kappa_g}{s_g}\right)$$

and the probability of a randomly selected member votes for the  $r$  party is

$$1 - \Phi\left(\frac{\mu - m_g + \kappa_g}{s_g}\right).$$

Finally, let  $\xi_i$  describe the ballot of voter  $i$  as follows:

$$\xi_i = \begin{cases} 1 & \text{if } i \text{ votes for party } d \\ 0 & \text{if } i \text{ abstains} \\ -1 & \text{if } i \text{ votes for party } r \end{cases}.$$

Then the expectation of  $\xi$  for a randomly selected member of group  $g$  is

$$\Phi\left(\frac{\mu - m_g - \kappa_g}{s_g}\right) + \Phi\left(\frac{\mu - m_g + \kappa_g}{s_g}\right) - 1.$$

Note that this is proportional to group  $g$ 's contribution to the margin defined in Equation (6).

The next section will present estimates relevant to these three quantities.

### **Empirical Evidence on Well-Behaved Moderates and Turnout-Sensitive Partisans**

To assess the extent of American voters who switch their partisan vote choices or turnout decisions in response to candidates' ideologies and qualities, we present some new empirical tests using individual-level data on voting behavior in recent U.S. House elections.

Before delving into individual voting behavior, we first confirm that — consistent with the literature — aggregate vote shares are responsive to candidate ideology and experience. In our model, electoral selection works well when the aggregate electorate is more likely to select high-quality candidates, and this also creates electoral incentives to the extent that candidates can appear to be higher quality by exerting effort. The model does not explicitly allow candidates to exert effort to please voters on an ideological dimension, although it could easily be modified to encompass this feature of elections. When we turn to empirical data, one sign that selection and incentives are working would be that higher-quality candidates who are better aligned with the ideology of their constituents perform better in elections. To assess this possibility, we use data from all U.S. House elections contested by a Democrat and Republican from 2006 through 2016. Our dependent variable is the Democratic share of the two-party vote in each race.

To quantify ideology, we use measures of candidate ideology from Bonica (2014), who infers the ideological location of each candidate from campaign contributions. Following the approach of Ansolabehere *et al.* (2001), we compute the midpoint of the ideological scores of the Democratic and Republican candidate in each race. Higher ideological scores correspond to more conservative policy positions, so a higher midpoint means that the Democrat is more moderate than normal, the Republican is more extreme than normal, or some combination of the two. If moderation is electorally beneficial for a party or candidate, we should see that Democratic vote shares increase as the midpoint increases. Furthermore, if we assume that the median voter's ideology is typically between the Democratic and Republican candidates, then the relative proximity of the Democratic candidate to the median voter increases as the

midpoint increases. We rescale these midpoints so that the 5th percentile is 0 and the 95th percentile is 1, so that the subsequent coefficients can be interpreted as the effect of shifting from a situation in which the candidate ideologies strongly favor the Republican to a situation in which the ideologies strongly favor the Democrat.

For measures of candidate quality and experience, we use an extended version of the data used in Jacobson (1989) on the incumbency status and political experience of each candidate. We code an incumbency variable that takes a value of 1 if the Democrat is an incumbent, 0 if the Republican is incumbent, and 0.5 if neither or both are incumbents. In our model, incumbents are, in expectation, no better than challengers, but in a repeated game with positive electoral selection, incumbents should be of, on average, higher quality, so we use incumbency as one proxy for quality in real-world elections. We also code an experience variable which takes a value of 1 if only the Democrat has previously held any elective office, 0 if only the Republican has previously held any elective office, and 0.5 if neither or both candidates have previously held elective office. Although coarse and surely imperfect, this measure of prior experience is the most commonly used measure of candidate quality in the literature.

We regress the Democratic vote share in each House election on each of the three independent variables described above — midpoint, incumbency, and experience — along with district fixed effects and year fixed effects. We generate new district identifiers for 2012 through 2016 because of redistricting. Because of the fixed effects, this is effectively a differences-in-differences design that implicitly controls for the partisan leanings of each district and the general popularity of the parties in each year. Identification comes from within-district variation in candidate ideology and experience across different elections.

The results of this analysis are shown in Table 1. All three coefficients of interest have the theoretically expected sign, and they are all statistically significant and substantively meaningful. Holding all else equal, candidates receive higher aggregate vote shares when they are more moderate, when they are incumbents, and when they have previously held elective office.

Although we see that aggregate vote shares do respond in reasonable ways to the characteristics of candidates, this evidence does not tell us which eligible voters are driving this aggregate response or whether they are doing so by changing their vote choices or their turnout decisions. To better relate these aggregate results to the claims in the political behavior literature and to the different types of voters in our model, we turn to individual-level survey data. Specifically, we use data from the Cooperative Congressional Election Study (CCES) from every even year from 2006 to 2016. Thirty thousand or more respondents took an online survey shortly before and after each of these November elections, and they reported, among other things, their partisan leanings and their voting behavior in the congressional race. Although the



Table 1: Effects of candidate ideology and experience on aggregate vote shares. District-clustered standard errors in parentheses.

DV = Dem Two-Party Vote Share	
Midpoint	.017 (.006)
Incumbency	.044 (.009)
Experience	.036 (.009)
District FEs	X
Year FEs	X
Observations	1,281

respondents were not randomly sampled from the population, the study is designed such that after re-weighting, the sample is representative of voting-age Americans. Furthermore, the large sample sizes mean that we typically have many respondents within each congressional race.

We use the same independent variables described above to study how different individuals respond to candidate ideology and experience. We also combine all three of these measures into a single index which summarizes how favorable the election should be for the Democratic candidate versus the Republican, given the candidates’ ideologies and backgrounds. To construct this index, we take the coefficients from Table 1, multiply each coefficient with the value of the relevant variable in each congressional race, and then rescale this variable so that the 5th percentile is 0 and the 95th percentile is 1. By combining these variables in this way, we can more efficiently test how individual voting behavior systematically responds to the ideologies and backgrounds of the candidates.

Do individuals vary their vote choices or turnout behavior in response to candidates’ ideologies and experiences? Our strategy is to mimic the approach of Table 1 to test how individual voting behavior responds to candidate characteristics and to further test how this varies across different types of individuals. To understand how different behaviors contribute to aggregate accountability, we separately examine whether each respondent casts a vote in the House race and who he or she supported if he or she did cast a vote. Furthermore, because we are interested in comparing different types of voters in the same election, we can use a more stringent design than in Table 1. Specifically, we include fixed effects for each House election. When we do this, the main effect of ideology or experience would not be identified because there is no variation in those variables within an election, but we can test whether different kinds of voters respond differently to these factors.

We focus on the extent to which respondents with different partisan leanings respond to candidate characteristics. One advantage of this approach is that we have theoretical predictions about the differences between groups with different partisan leanings. Another advantage is that it allows us to meet critics of democracy where they are. Even if we assume that strong partisans will never switch parties, we can test whether their turnout decisions are responsive to candidate characteristics, and we can test whether non-strong partisans will change their votes.

To measure the partisan leanings of each respondent, we use the standard seven-point measure of party identification which uses a two-part question to divide people into strong Republicans, weak Republicans, lean Republicans, independents, lean Democrats, weak Democrats, and strong Democrats. We assume that the specific features of a respondent's U.S. House race will not change their reported party identification, and we test whether each of these seven groups varies their behavior in response to candidates' ideologies and backgrounds.

Table 2 assesses the extent to which the turnout of partisans responds to candidate qualities. Specifically, we regress an indicator for whether each respondent reported casting a vote in the U.S. House race on indicators for party identification, interactions between one of our independent variables of interest and these indicators of party identification, and House election fixed effects. Independents are the omitted category, so that each interactive coefficient can be interpreted as the extent to which that partisan group responds to the contextual factor relative to independents. The main effect of each contextual factor is subsumed by the election fixed effects. Since we have little theoretical reason to expect that independents vary in their turnout decisions as our midpoint, incumbency, experience, or index variables increase, we could think about this as a differences-in-differences design where the independents serve as our effective control group. The election fixed effects capture the possibility that voter turnout is generally higher or lower in a particular race for unmeasured reasons, the party indicators capture the possibility that different partisan groups turn out at different rates independent of the specifics of each race, and the interactive coefficients estimate the extent to which a partisan group's turnout responds to ideology or experience relative to that of independents.

The results in Table 2 suggest that Republicans do not meaningfully vary their turnout in House elections in response to candidate ideology and experience, but Democrats do. For example, when we switch from a Republican incumbent to a Democratic incumbent, voter turnout increases 5 percentage points more for strong Democrats than for independents. If we average the coefficients in the last column and weight by group size, we conclude that in an average House election, about 1.6 percent of the eligible voters are partisans whose turnout decision will depend on the strength of their party's candidate.

Table 2: Turnout switching in response to candidate ideology and experience. District-clustered standard errors in parentheses. Independents are the omitted category.

<i>X</i> =	DV = Voted in House Race			
	Midpoint	Incumbency	Experience	Index
Strong Republican	.312 (.011)	.311 (.007)	.317 (.007)	.317 (.010)
Weak Republican	.220 (.011)	.219 (.008)	.221 (.008)	.218 (.011)
Lean Republican	.255 (.011)	.252 (.008)	.262 (.008)	.259 (.011)
Lean Democrat	.147 (.012)	.154 (.008)	.153 (.008)	.152 (.011)
Weak Democrat	.110 (.012)	.112 (.008)	.112 (.008)	.106 (.011)
Strong Democrat	.228 (.011)	.215 (.007)	.220 (.008)	.217 (.010)
<i>X</i> *Strong Republican	<b>.010</b> (.019)	<b>−.007</b> (.011)	<b>−.018</b> (.012)	<b>−.003</b> (.016)
<i>X</i> *Weak Republican	<b>−.009</b> (.018)	<b>−.007</b> (.012)	<b>−.009</b> (.013)	<b>−.005</b> (.017)
<i>X</i> *Lean Republican	<b>.030</b> (.020)	<b>.016</b> (.013)	<b>−.008</b> (.014)	<b>.022</b> (.019)
<i>X</i> *Lean Democrat	<b>.016</b> (.022)	<b>.005</b> (.012)	<b>.007</b> (.013)	<b>.005</b> (.018)
<i>X</i> *Weak Democrat	<b>.011</b> (.021)	<b>.024</b> (.012)	<b>.023</b> (.013)	<b>.019</b> (.018)
<i>X</i> *Strong Democrat	<b>.029</b> (.020)	<b>.049</b> (.011)	<b>.040</b> (.012)	<b>.051</b> (.016)
Election FEs	X	X	X	X
Observations	163,027	252,823	252,823	163,027

To assess vote switching, Table 3 presents a similar analysis. Here, we only include individuals who report voting in the House race, and the dependent variable is an indicator for whether each respondent supported the Democrat versus the Republican. The only other difference is that the omitted category is now strong Republicans instead of independents. Theoretically, we would expect that the vote choices of strong partisans are less responsive to candidate characteristics. And if we assume that strong Republicans do not change their vote choices, conditional on turning out, then we can think of this as a differences-in-differences design where strong Republicans are the control group.

As expected, strong Democrats are no more likely to switch their vote choices than strong Republicans, but every other group is notably more likely

Table 3: Vote switching in response to candidate ideology and experience. District-clustered standard errors in parentheses. Only individuals who voted for either the Democratic or Republican candidate are included. Strong Republicans are the omitted category.

	DV = Voted for Democrat   Voted			
<i>X</i> =	Midpoint	Incumbency	Experience	Index
Weak Republican	.070 (.008)	.066 (.004)	.061 (.004)	.064 (.006)
Lean Republican	.032 (.007)	.032 (.003)	.029 (.004)	.027 (.005)
Independent	.344 (.013)	.327 (.009)	.321 (.009)	.326 (.012)
Lean Democrat	.802 (.010)	.796 (.008)	.795 (.008)	.785 (.010)
Weak Democrat	.705 (.012)	.693 (.008)	.682 (.009)	.677 (.011)
Strong Democrat	.899 (.005)	.896 (.004)	.896 (.005)	.901 (.005)
<i>X</i> *Weak Republican	<b>.077</b> (.018)	<b>.081</b> (.010)	<b>.091</b> (.009)	<b>.100</b> (.014)
<i>X</i> *Lean Republican	<b>.036</b> (.015)	<b>.042</b> (.008)	<b>.048</b> (.008)	<b>.054</b> (.011)
<i>X</i> *Independent	<b>.102</b> (.023)	<b>.134</b> (.014)	<b>.142</b> (.014)	<b>.151</b> (.019)
<i>X</i> *Lean Democrat	<b>.045</b> (.018)	<b>.058</b> (.010)	<b>.058</b> (.011)	<b>.089</b> (.014)
<i>X</i> *Weak Democrat	<b>.102</b> (.019)	<b>.122</b> (.011)	<b>.141</b> (.012)	<b>.166</b> (.016)
<i>X</i> *Strong Democrat	<b>-.001</b> (.010)	<b>-.002</b> (.007)	<b>-.001</b> (.007)	<b>.010</b> (.009)
Election FEs	X	X	X	X
Observations	109,281	168,591	168,591	109,281

to change its vote choices than the strong partisans. About 10 percent of independents are willing to switch parties depending on which candidate is more ideologically moderate, and about 14 percent are willing to switch their votes depending on the experience of the candidates. To be clear, these are not necessarily disjoint groups. We find that 15 percent of independents are willing to switch in response to our index, so many of the voters who are responsive to ideology may also be responsive to experience, and vice versa. Interestingly, the numbers are nearly identical for weak Democrats, and smaller but still substantively meaningful for weak Republicans and leaners. If we again average the coefficients in the last column and weight by group size and

turnout, we conclude that in an average House election, 3.9 percent of eligible voters are non-strong partisans who will vote and will vary the party they support depending on the ideologies and experience levels of the candidates.

The preceding analysis suggests that both vote switching and turnout switching can contribute to aggregate accountability. Since we find more vote switchers than turnout switchers, and since each vote switcher has twice the effect on aggregate vote shares compared with a turnout switcher, vote switching appears to contribute more to selection on ideology and experience than does turnout switching. But if we just studied individual vote choice alone and ignored turnout, we would understate the extent of aggregate selection and accountability.

To assess the extent to which each partisan group contributes to aggregate selection and accountability, we return to the simpler differences-in-differences design from Table 1 with district and year fixed effects, but we examine each partisan group separately. The dependent variable is coded so that 1 corresponds with voting for the Democratic candidate, -1 corresponds with voting for the Republican, and 0 corresponds with abstaining. The key independent variable is our index that combines information on ideology and experience.

Table 4 shows the results of these analyses. Interestingly, partisans contribute to aggregate selection and accountability as much as — if not more than — independents. The group that contributes the most per capita is the weak Democrats, followed by Republican leaners, and then strong Democrats. Consistent with the previous results, strong Republicans contribute the least. But the estimated coefficients are in the expected direction for every group, and they are statistically and substantively significant for most groups.

Table 4: How much does each partisan group contribute to the democratic margin? District-clustered standard errors in parentheses.

	DV: Dem vote = 1, Rep vote = -1, neither = 0						
	Strong Dem	Weak Dem	Lean Dem	Ind	Lean Rep	Weak Rep	Strong Rep
Index	.111 (.029)	.192 (.053)	.089 (.048)	.087 (.046)	.135 (.050)	.104 (.055)	.044 (.030)
District FEs	X	X	X	X	X	X	X
Year FEs	X	X	X	X	X	X	X
Observations	38,314	19,234	16,910	20,719	19,658	16,510	31,667
Share of Respondents	.227	.128	.115	.142	.104	.111	.173
Pr(Dem Vote)	.671	.475	.559	.202	.066	.096	.030
Pr(Rep Vote)	.034	.111	.075	.264	.659	.591	.749

In the next section, we will combine these estimates with the insights from our model to say something about the representative voter and the extent of accountability in the American electorate. Table 4 also shows some summary statistics that we will use in this subsequent exercise. Specifically, the table reports the weighted share of respondents in each of the seven partisan groups. The table also reports the weighted proportions of each group that, averaging across all elections, cast a vote for the Democratic candidate and the Republican candidate. These numbers are not conditional on turnout, and because of abstention, they do not add up to 1.

The estimates in this section surely understate the true proportions of individuals who are willing to change their turnout or their partisan support depending on the details of a race. We used just three coarse measures of ideology and experience, while eligible voters in House elections could respond to many more factors that we have not measured or investigated. Furthermore, we can only study the range of ideologies seen in recent House races, but presumably, many more individuals would be willing to switch their voting behavior off the equilibrium path if, for example, a candidate advocated for a 90 percent tax rate, abolishing Medicare, or a military invasion of Canada. So we think of this exercise as estimating lower bounds on the shares of Americans who are turnout-sensitive partisans and persuadable moderates.

### **Calibrations of Incumbent Effort with Realistic Combinations of Voters**

Our theoretical model provides a way to predict incumbent effort for any hypothetical mix of different types of voters, and our empirical results tell us about the mix of voters in U.S. congressional elections. Here, we ask how incumbent effort in a realistic U.S. electorate likely deviates from what effort would be if U.S. elections were decided by a single moderate voter with no partisan leaning.

The goal of this exercise is not to take the model or the resulting numbers literally. Rather, we hope to explore whether the observed patterns of political behavior are inconsistent with good democratic accountability. We also hope to show that individual-level survey data can be used to study accountability so long as they are combined with a model of accountability that incorporates the aggregation of individual votes and the equilibrium behavior of elected officials.

We conduct calibrations with seven different types of voters — strong Democrats and Republicans, weak Democrats and Republicans, lean Democrats and Republicans, and independents. These calibrations are based on the parameterization discussed in the section “Looking ahead to Data”. We choose the parameters for group  $g$  to match the estimates from Table 4: the average

ratio of Democratic votes to group size ( $\beta_{gD}$ ), the average ratio of Republican votes to group size ( $\beta_{gR}$ ), and the regression coefficient on the index ( $\gamma_g$ ).

To implement this, we assume that the difference in reputations is captured by the index used in the regressions, and we assume that it is distributed normally with mean 0 and a variance we normalize to 1. In terms of the model in the section “Model of Electoral Accountability with Heterogeneous Partisanship”, this parameterization assumes that  $\lambda\sigma_\theta^2 = 1$ . This normalization does not affect the results, since we will measure effort as a fraction of the theoretical maximum.

We proceed in three steps. First, we solve the following system of equations to obtain estimates of the three parameters that characterize the voting behavior of each group:

$$\begin{aligned}\beta_{gD} &= \Phi\left(\frac{-m_g - \kappa_g}{s_g}\right) \\ \beta_{gR} &= 1 - \Phi\left(\frac{-m_g + \kappa_g}{s_g}\right) \\ \gamma_g &= \Phi\left(\frac{u - m_g - \kappa_g}{s_g}\right) + \Phi\left(\frac{u - m_g + \kappa_g}{s_g}\right) \\ &\quad - \left(\Phi\left(\frac{-u - m_g - \kappa_g}{s_g}\right) + \Phi\left(\frac{-u - m_g + \kappa_g}{s_g}\right)\right),\end{aligned}$$

where  $u$  is the 95th percentile of the standard normal distribution.<sup>10</sup> Second, we use estimates of the share of each partisan group in the electorate to solve the analog of Equation (6) to get a value of  $\tilde{\mu}$ . Finally, we use Equation (3) to calculate the incumbent’s effort.

The absolute level of effort is on an arbitrary scale, but we can compare our result with the expected level of incumbent effort in the same model but with a representative voter with no partisan leaning, allowing us to see how much electoral accountability deviates from the standard model when we add in a more realistic mix of voters.

We begin our analysis by examining the mix of party identification observed in the CCES (using survey weights). When we do this, we find that incumbent effort is 99.7 percent of what we would expect if elections were decided by a voter with no partisan bias. This suggests that in a nationwide election, Americans respond enough to perceived candidate quality and there is an even

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<sup>10</sup>The first two lines equate the relevant  $\beta$  to the model’s predicted fraction of the group’s votes for that party at the median of the index. A better fit to the model would have  $\beta_{gD} = \int \Phi\left(\frac{\mu - m_g - \kappa_g}{s_g}\right) \phi(\mu) d\mu$  and similarly for  $\beta_{gR}$ . Given our estimates, though, there is only a small approximation error from neglecting the integral and simply plugging in the median value of the difference in reputations.

enough mix of partisans on both sides that an incumbent who wants to be re-elected would have a strong incentive to exert effort — almost as much effort as they would exert if all voters behaved in an unbiased way. So although there may be strong partisans who respond to government performance in biased ways, aggregate elections still respond to government performance and incentive politicians to do a good job.

Of course, most (arguably all) U.S. elections are not conducted nationwide. If a state or district has a strong partisan leaning, that makes it more likely that the electorate gets the party it wants, but it should reduce equilibrium effort since the election result is more likely to be a forgone conclusion. To assess this possibility, we re-calculate incumbent effort using the mixes of partisan groups observed in the CCES from each state. Figure 2 shows incumbent effort for each state across the observed partisan balance of each state (proportion of Republicans of any type minus proportion of Democrats of any type).

We see that in states with an even mix of partisans like Pennsylvania, New Mexico, North Carolina, Nevada, Virginia, and Florida, incumbent effort is essentially the same as what we would expect with an unbiased electorate. In these six states, effort is more than 95 percent of what we would expect under a representative voter with no partisan leaning. But in states with a

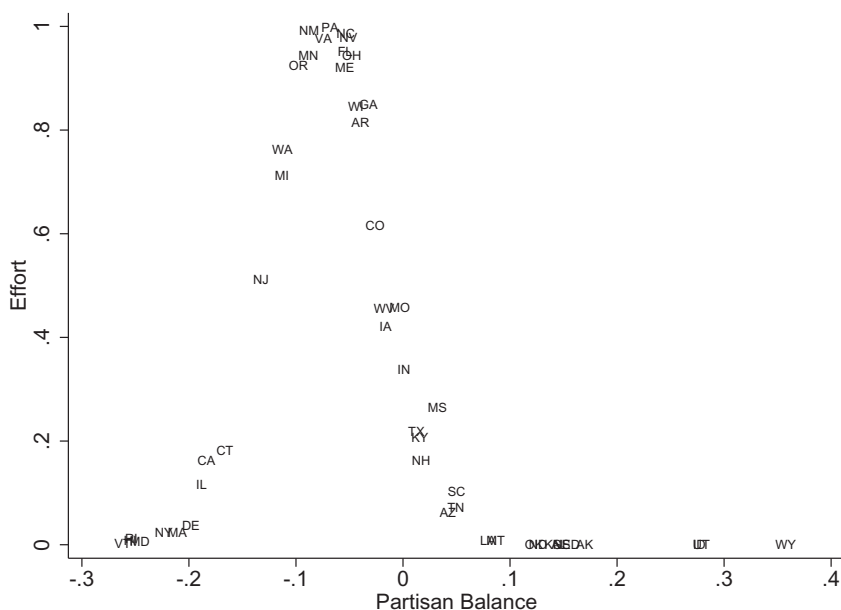


Figure 2: Predicted effort by state. Effort is measured as a fraction of the theoretical maximum obtained by assuming a completely unbiased electorate.



partisan imbalance like Wyoming, Idaho, Utah, and Alaska, effort is very low. In these states plus 11 others, effort is less than 1 percent of our nonpartisan benchmark.

Interestingly, we also see greater effort in states that lean slightly Democratic as opposed to those that lean Republican. This is because we found in the previous section that Democrats are, on average, more responsive to candidate quality and less partisan in their voting behavior than Republicans. Some, but not all, of this is attributable to southern voters — some of whom identify as Democrats but typically support Republicans in federal elections. When we repeat the entire calibration excluding southern states, this skew is still present but less pronounced.

Averaging across states, effort in statewide elections is only 36 percent of our nonpartisan benchmark. Although partisan states may be more likely to elect the party (and policy program) they prefer, our model shows that their incumbents are less likely to work hard (or avoid corruption, or deviate from their preferred policies) because they have less electoral incentive to do so. And since most states are more partisan than the nation as a whole, we should, on average, see less effort from politicians who are trying to appeal to their states rather than the nation as a whole.

We have conducted the same exercise at the congressional district level, again using the observed mixes of partisans in each district of the CCES (we only use 2012, 2014, and 2016 since the district boundaries changed between 2010 and 2012). As with the statewide calibrations, there are district-level electorates that are expected to produce essentially the same effort as our nonpartisan benchmark. But average effort in district-level elections is only 24 percent of the benchmark because so many districts are skewed toward one party or the other.

Our goal with these calibrations is not to provide reliable, numerical predictions of incumbent behavior in real electoral settings. Rather, our goal is to calibrate our theoretical model using realistic combinations of voters to see when and where we should expect electoral accountability to be similar to or different from what we would predict from a canonical model with an unbiased, representative voter. Many realistic electorates can produce good outcomes, even if most of the voters individually are flawed. But if an electorate is biased enough toward one party or another, then electoral incentives will not function as well as predicted in the standard model.

## **Discussion and Conclusion**

We have done two things. We first showed how the representative voter used as a modeling device in political agency models relates to the heterogeneous collection of voters that make up a realistic electorate. This step clarified

that the representative voter often differs from the typical voter. Second, we calibrated a version of the model to data on partisan groupings in the CCES, and we used the results to explore how different partitions of CCES respondents into electorates affect incentives for incumbent effort. The overall CCES electorate elicits a high level of effort, as do some states and house districts. But many states and house districts elicit quite low levels of effort.

Our results contribute to a broader agenda arguing that the voter behavior literature has moved too quickly from evidence on flawed voters to grand worries about democracy. First, the evidence is often unconvincing, and the flaws of voters may be overstated (e.g., Fowler, 2020; Fowler and Hall, 2018; Fowler and Montagnes, 2015; McGrath, 2017; Sances, 2018). Second, even if voters are flawed, the electorate need not be. This is the main point of this paper. Third, even if the electorate behaves in seemingly flawed ways, outcomes need not be worse because of equilibrium effort of the incumbent (Ashworth and Bueno de Mesquita, 2014; Lockwood, 2017; Prato and Wolton, 2016). And lastly, even if democratic outcomes diverge from some ideal world, they are not necessarily worse than outcomes in a counterfactual world in which we abandon democracy.

This last point relates to an important, recent discussion in political theory (Valentini, 2012). Finding that voters do not live up to some normative ideal matters for the comparison of our actual democracies to ideal democracies. But their usefulness for comparisons of actual democracies to live alternatives is much more obscure. And, as Sen (2006) has emphasized, the latter, comparative question is of much more practical interest. Comparing the actual version of a system of governance with the ideal version of that system is neither here nor there for comparing the actual system with alternatives.<sup>11</sup> Voters are surely imperfect relative to some hypothetical ideal, but so are bureaucrats, autocrats, and well-meaning epistocracy designers.

Where should scholars go from here if they want to learn more about the health of democracy? One response is that we should study aggregate electoral rather than individual voter behavior, and we should try to connect that aggregate behavior with outcomes of interest and importance. But such a drastic change of course is not the only possibility. The analyses here illustrate an alternative in which evidence on individual-level behavior is combined with a theoretical model of aggregate electoral accountability. This could be a particularly useful approach as richer, individual-level data become available, potentially allowing the indirect approach to be more accurate than directly estimating electorate-level responsiveness. But our simplest and most straightforward recommendation is that scholars and pundits stop making broad claims about the health of democracy based only on studies of individual voter behavior.

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<sup>11</sup>Brennan (2014) makes a related point in a different context.

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