

An Assessment of Citizens' Capacity for Prospective Issue Voting using Incentivized Forecasting

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Abstract

How well do voters know candidates' issue positions, and to what extent does this knowledge depend on partisan cues? The ability of voters to predict the future policy-related behavior of candidates is essential to a well-functioning representative democracy. But existing studies have difficulty capturing whether citizens can discriminate between co-partisan candidates, who have similar yet meaningfully distinct positions on issues. This article uses incentivized forecasting of candidates' interest group ratings, which yields a continuous measure of candidate placements, to examine the extent to which citizens can not only identify the typical voting patterns of partisans but also to distinguish legislators within parties on a continuous ideological space. Overall, our results are cause for optimism: we find (1) a strong relationship between citizen's prospective beliefs and candidates' actual positions once elected to office, even when comparing co-partisan legislators and (2) a strong correlation between political interest and accuracy of prospective beliefs. However, we also find a result that is worrying: a negative relationship between the strength of political identity and voters' accuracy.

Keywords: Ideology, voter knowledge, voter behavior, campaigns, voter learning

Word Count: 7741

1 Introduction

In a well-functioning representative democracy, elected officials pursue the policy direction preferred by their constituents. To achieve this goal efficiently, citizens must form reasonably accurate beliefs about the future policy actions of candidates for office, were they to be elected, and then choose the candidate with the most desirable portfolio of issue stances. Yet studies have found that roughly half of U.S. citizens cannot identify their congresspersons' positions across diverse issues (Ansolabehere and Jones, 2010; Dancey and Sheagley, 2013, 2016). Moreover, their ability to do so appears to depend critically on politicians' congruence with party platforms (Dancey and Sheagley, 2016). This suggests that citizens use party heuristics to infer the broad orientation of politicians' stances (e.g., liberal or conservative) but have little direct knowledge of the issue positions of any individual politician, and are unable to make more nuanced distinctions *within* the left or right (Liñeira, Muñoz and Rico, 2020; Bernhard and Freeder, 2020; Bakker, Lelkes and Malka, 2020). Taken together, these results suggest pessimism about citizens' capacity for efficient prospective issue voting and thus significant slippage between public preferences and policy outcomes (Achen et al., 2017).

Yet prior work is limited in an important way. Past research primarily relies on roll call votes as measures of congresspersons' issue positions. Because these votes have only two outcomes – yea or nay – they provide within-party variance *only* when candidates vote against their own party. The measure does not distinguish among co-partisans with qualitatively similar, yet meaningfully distinct, positions on issues. Can citizens not only identify the typical voting patterns of partisans but also place individual politicians accurately within a continuous ideological space? Can they do so on specific issues? The focus on binary outcomes may understate the importance of political engagement and sophistication, which are likely to be more important when making fine-grained distinctions among politicians that share a party label.

The reliance on roll call votes is also problematic because it fails to capture much of the policy work that representatives do while in office. Much of the action of policy making occurs prior to the final vote on an amendment or bill and is the outcome of a long process of intra- and inter-party bargaining, conflict, and compromise. These actions have major policy implications that are often visible to constituents but not captured in roll call votes. For example, Joe Manchin was influential in shaping the content of the Democrats' Inflation Reduction Act of 2022 by forcing

changes to secure his (necessary) support in the final vote. The bill is ultimately more fiscally conservative than previous iterations. Yet, his important role in shaping the policy content of this bill would not be captured by measures based on final roll call votes, where he would be treated identically to his fellow Democrats. However, constituents have had ample opportunity to become aware of his role given extensive coverage in the news. In this way, much policy-relevant information that constituents have about candidates is not present in roll call votes.

For these reasons, roll call votes are a weak proxy for the information needed to engage in prospective issue voting. What citizens want is an accurate sense of candidates' ideal points within a continuous policy space, which provides information about what they will seek to achieve, not only when casting final votes, but when engaged in the long process of constructing legislation. Moreover, from a purely practical perspective, roll call votes are only available for candidates who have actually served in Congress, and are thus unable to serve as measures of positions for most challengers to incumbent politicians.

This paper examines citizens' capacity for prospective issue voting using a new approach. We measure citizens' beliefs about both incumbent and challenging candidates' *future* policy behavior on scales that differentiate among politicians within the ideological left and right. Specifically, we asked survey respondents to forecast the interest group ratings each of their 2018 Senate candidates *would* receive during the 2019-2020 sessions of Congress, *if* they were elected to office. Since these forecasts can be objectively scored for accuracy in the years that followed the respondent forecasts, we provided monetary incentives to encourage our respondents to report their beliefs truthfully and accurately.

Our results show a strong relationship between citizens' prospective beliefs and the actual ratings candidates receive from interest groups as a result of their time in office. This is true of candidates' broad ideological orientation as well as their specific issue positions. We find that a substantial portion of forecasting accuracy is likely due to the use of partisan heuristics. Importantly, however, we also find a substantial degree of citizen responsiveness to within-party differences in extremity of policy positions. This suggests many citizens possess reasonably fine-grained knowledge of the policy orientations of individual politicians. Examining individual differences, we find that political engagement – interest in and knowledge about U.S. politics and Senate campaigns – is strongly associated with forecasting accuracy. We also find that respondents with more extreme

issue positions are more accurate on average. However, strength of partisan identity is associated with *lower* accuracy.

Our study provides an innovative empirical examination of a question of perennial interest to political scientists: to what extent do citizens approximate the ideal of the prospective issue voter? While tentative, our conclusion is an optimistic one: there is a strong relationship between prospective beliefs and what candidates actually do when elected to office, and citizens are somewhat responsive to intra-party differences in their representatives' policy orientation. Tempering these conclusions somewhat is the observation that politically engaged citizens are substantially more accurate in their beliefs than the unengaged. Further, intense partisanship, which is on the rise (Iyengar et al., 2019; Druckman et al., 2021), inhibits accuracy.

2 The American Public's Record of Voter Accuracy

Studies of voter accuracy find that a little more than half of citizens can accurately identify their congresspersons' issue positions. Using American National Election Studies (ANES) data, Wilson and Gronke (2000) examined citizens' accuracy in recalling their senators' positions on the 1994 Omnibus Crime Bill, which was a high-salience issue that generated considerable media coverage.¹ Only 23.3% of respondents knew their senators' correct positions. 28.1% more were unsure but were able, upon further questioning, to guess correctly, for a total of 51.4% either knowing or guessing the position of their senators correctly. This means that approximately half of citizens would not have been able to correctly utilize the proximity of the candidate to their own position to make an inference about for whom they should vote based on this highly salient issue.

Ansola-behere and Jones (2010) also found that about half of citizens have accurate knowledge of their representatives' positions. The issues they examined were also highly salient and covered both the economic and social components of ideology; they included a ban on "partial-birth" abortion, a constitutional amendment to ban gay marriage, federal funding for stem cell research, extending capital gains tax cuts, immigration reform, and tax breaks for energy, among others.² The authors found that the average proportion of issue items on which respondents guessed their

¹The parties were both split on the bill due to its inclusion of traditionally liberal and conservative solutions and thus it was an excellent issue to test citizens' knowledge of their particular senators' positions rather than simple knowledge of party issue positions.

²The surveys took place in 2005-2006.

representatives' position correctly was 0.75. However, this impressive proportion excluded respondents who answered none of the questions regarding how the candidates voted (17% of the sample). If the excluded participants were instead included, the average percentage of questions answered correctly was 62.23%. And, given that there were two answer options to every question, asking whether the vote was for or against the bill, a respondent guessing randomly would have an expected outcome of getting 50% of the questions correct. Thus, the percentage of questions gotten right by respondents represents only a 12.23% improvement over pure guesswork.

To the extent that voter perceptions of politicians' positions are correct, they appear to be so largely because of party heuristics. Party-conforming behavior is much better known by citizens than party-deviating behavior, suggesting that citizens make inferences about individual politicians' positions from their knowledge of the parties' positions rather than learning directly about the policy preferences of a specific candidate. For example, for seven issues between 2003 and 2006, the average percentage of citizens guessing the position of senators voting with their party correctly was 73%. The percentage of citizens guessing correctly for senators voting against their party was 23% (Donnelly, 2019). On six prominent issues voted on in the Senate between 2005 and 2006,³ respondents placed a senator who had the lowest level of party loyalty in their votes correctly on about 39% of the issues; this percentage was about 50% for the senators with the highest level of party loyalty in their votes (Dancey and Sheagley, 2016).

How do we know that this pattern is due to party heuristics? Political knowledge positively correlates with incorrect guesses of the positions of candidates who are inconsistent with their parties (Dancey and Sheagley, 2013). Among the candidates whose positions are consistent with those of their parties, citizens with higher levels of political knowledge have higher levels of correct knowledge of their positions. However, for senators who deviate from the party line, citizens with more political knowledge have more difficulty correctly placing the senators' positions than citizens with less political knowledge. The politically knowledgeable are more able to identify party positions on issues, and they use this knowledge to infer politicians' positions. This leaves them more likely to guess a party-inconsistent politician's position incorrectly.

Overall, these findings suggest a mixed picture regarding citizens' knowledge. On the one

³The topics of the votes included withdrawing troops from Iraq, increasing the federal minimum wage, extending the capital gains tax cut, increasing funding for stem cell research, amnesty provisions for undocumented immigrants, and the Central American Free Trade Agreement (CAFTA). The majority of these issues were on the *Washington Post's* list of key votes in the 109th Congress and so were relatively salient.

hand, the public is performing somewhat better than random guessing in their knowledge of representatives' roll call votes. On the other hand, the evidence suggests that this is due largely to the use of partisan cues, leading to incorrect beliefs whenever representatives deviate from the party line. Moreover, the evidence suggests that politically sophisticated citizens are most reliant on partisan heuristics in predicting roll call votes, leading them to be *less* accurate in cases of deviation. The key question, then, is to what extent these results extend beyond citizen knowledge of roll call votes to the more complex, but more important, context of prospective beliefs about continuous issue orientations.⁴

We consider the following questions. First, are citizens reasonably accurate at predicting the future policy-related behavior of candidates for office? Second, to what extent is forecasting accuracy due to the use of partisan cues? Can citizens go beyond partisan cues to make intra-party distinctions among candidates for office? Finally, to what extent does political engagement promote forecasting accuracy?

3 Measuring Candidates' Positions and Voter Perceptions of Candidates' Positions

To effectively analyze voters' accuracy in judgements of candidates' issue positions, two measures are needed: (1) voters' perceptions of the candidates' positions on the issues and (2) candidates' actual positions on the issues. Ideally, these measures would be possible to estimate for both incumbents and challengers. Additionally, they will be most useful for examining voter accuracy when they are measured on individual issues, rather than by a summary measure of the candidate's ideological position, and when they allow for judgments of relative extremity.

We measured candidates' positions using interest group ratings of candidates. Interest groups are likely to rate candidates accurately as they have a strong incentive to know how candidates voted on, whether candidates introduced any bills on, and whether candidates served on committees related to the issue about which their group is concerned (Fouirnaies and Hall, 2018). There

⁴For example, taking into account the broader context of a continuous ideological scale may yield a more nuanced picture regarding party heuristics' role in the relationship between voter sophistication and accuracy than focusing on the small percentage of party-inconsistent votes [about 16% (Donnelly, 2019)]. We may find that citizens with increased political knowledge have a better understanding not merely of party cues but also of politicians' ideological extremity.

is a long history of using interest group ratings to measure the policy preferences of legislators (Bishin, 2000; Dion and Huber, 1997; Fourinaies and Hall, 2022; Krehbiel, 1992). While interest group ratings are in part based on legislators’ roll call votes, they use a zero to one-hundred scale, which gives us variance in legislator position that roll call votes do not offer.

Perceptions of candidates’ issue positions were measured in reference to interest group ratings. Respondents to our survey were provided descriptions of eleven interest groups, each of which was chosen to represent a salient issue area. The descriptions were written to clarify the organization’s issue focus and ideological bent. For example, abortion was represented by the National Right to Life Committee (anti-abortion), whose description reads, “NRLC is a pro-life organization that works through legislation and education to oppose abortion, infanticide, euthanasia, and assisted suicide.” Gun control was represented by the National Rifle Association (pro-guns), whose description reads, “The NRA advocates for the right to keep and bear arms and champions gun safety, education, and training.” Table 1 contains a complete list of issues, organizations, and descriptions. Participants were informed that the interest groups provide ratings of Senators on a scale from 0 to 100, where ratings between 50 and 100 indicate support for the group’s policy goals, with higher values indicating greater support and ratings between 0 and 50 indicating lesser support. Respondents were asked to indicate the probability that the candidate would receive each rating from each organization during the first two years of his/her term, if elected. The ratings from 0 to 100 were grouped in fifths, such that 0 - 19 was represented by the first row, 20-39 was represented by the second row, and so on. Figure 1 shows the scale that respondents used, representing the answer of someone who was 80% sure that the group would rate the candidate between 60-79 and 20% sure that it would rate her between 40 and 59.

In addition to measuring candidates’ positions on specific issues, we included a measure of predicted overall candidate ideology. Respondents were informed about the DW-NOMINATE ranking of Senators and asked to guess what the candidate’s ranking would be two years into their tenure.

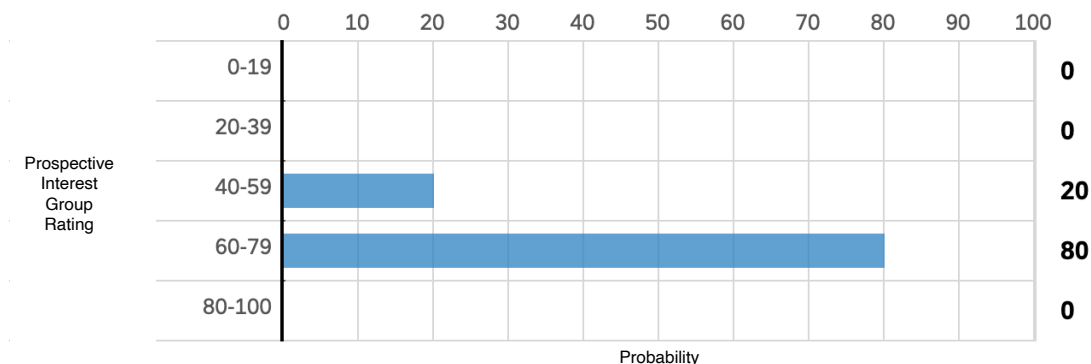
We use a modified Brier score (Jose, Nau and Winkler, 2009) to measure the accuracy of respondents’ beliefs about candidates’ future interest group ratings. A standard Brier score is calculated for beliefs about the likelihood of binary events occurring as the squared distance of the belief (on the probability scale) from the outcome (0 or 1). Since the interest group rating

Table 1: Interest Group Descriptions

Interest Group	Description
National Right to Life Committee (NRLC)	NRLC is a pro-life organization that works through legislation and education to oppose abortion, infanticide, euthanasia, and assisted suicide.
The Club for Growth (CFG)	CFG believes that prosperity and opportunity come from economic freedom, and supports reducing income taxes and the size and scope of the federal government.
Human Rights Campaign (HRC)	HRC serves as America’s largest civil rights organization working to achieve LGBTQ equality.
National Association for the Advancement of Colored People (NAACP)	The NAACP seeks to eliminate racial hatred and discrimination and protect and enhance the civil rights of African Americans and other minorities.
League of Conservation Voters (LCV)	LCV advocates for sound environmental policies and works to elect pro-environment candidates who will adopt and implement such policies.
American Federation of Labor and Congress of Industrial Organizations (AFL-CIO)	AFL-CIO is a federation of 55 national and international labor unions which give working people a collective voice to address workplace conditions.
National Organization for the Reform of Marijuana Laws (NORML)	NORML’s mission is to move public opinion sufficiently to achieve the repeal of marijuana prohibition so that the responsible use of cannabis by adults is no longer subject to penalty.
NumbersUSA (NUSA)	NUSA favors reductions in immigration numbers toward levels that would allow for a stable U.S. population.
RESULTS	RESULTS works to strengthen government health and assistance programs like food stamps and Medicaid and advances policies to reduce inequality.
NOMINATE	Political scientists use a measure called DW-NOMINATE to rank members of the Senate from 1 to 100 in terms of their level of conservatism or liberalism. The ranks are based on their voting behavior on roll call votes in the Senate. The Senator ranked 1 is the most conservative Senator, while the Senator ranked 100 is the most liberal Senator. The closer a Senator is to 1 the more conservative they are, and the closer a Senator is to 100 the more liberal they are.

categories are multi-category (0 - 100) and ordinal, however, it is meaningful to classify certain incorrect judgments as closer to the correct answer than others. The modified rule calculates the average of the Brier scores for each possible set of binary pairs of categories that preserve their order. In our case, there are five categories for each item, and thus four possible binary pairs: 0-19 vs 20-100, 0-39 vs 40-100, 0-59 vs 60-100, and 0-79 vs 80-100.⁵

Figure 1: Example Answer Scheme for Interest Group Ratings Questions



4 Data Collection

We conducted a non-probability online survey in two waves on September 13, 2018 and between October 31, 2018 and November 5, 2018, in which all respondents in the second wave had previously completed the first wave. This panel design allows us to examine changes in respondents' levels of knowledge about the candidates' positions throughout the 2018 Midterm campaigns and whether accuracy increases over this period. The dates of collection were chosen to obtain measures prior to campaigns picking up and then right before Election Day, where voters should be most informed about the candidates.

In the first wave, 1,004 unique workers entered the survey. We removed the 135 of these for whom the self-reported state of residence did not match the geocoded state provided by Qualtrics. This was done in order to confirm that respondents resided in the state, since the subsequent questions they were asked were based on a given state's Senate race. Of the remaining workers, 797 had non-missing data. Of these workers, 564 completed both the first and second wave of the survey.

⁵For an example of how to calculate the modified Brier score, see the Appendix, Section D.

Respondents answered questions about the two candidates running for the U.S. Senate in their state of residence and, thus, the sample included only citizens of states that had a Senate election in 2018.⁶ In the Appendix, Table A.1 provides descriptive statistics on the political and demographic composition of the sample. Respondents received \$2.50 for completing each survey.

We provided monetary incentives to respondents to improve attention and accuracy in reporting of beliefs. This method provides survey respondents with accuracy motivation to avoid common problems, such as inattentiveness and satisficing (Simon, 1955; Krosnick, 1991), biased placements due to projection (Conover and Feldman, 1982), and expressive responding (Bullock et al., 2013). Respondents were told at the beginning of the survey that 25 of them would be randomly selected at the end of the study. For each of those respondents, one of the questions would be selected and then it would be determined whether the individual won or not.⁷ All winners of the game would receive a \$10.00 Amazon.com gift card. Respondents were told that they could maximize their chances of winning this prize by reporting their true beliefs accurately.

Respondents were provided with all details of the payment scheme as well as an example. They also received two sample questions with well-defined answers to test their understanding. If they got either of these questions incorrect, the correct answer was given and explained.

This incentivization scheme encouraged respondents to accurately report their pre-existing beliefs regarding the information about the candidates. That said, it is possible that by offering respondents a monetary payoff for answering correctly, we inadvertently caused them to do research on the candidates during the survey. A respondent who did so would not be reporting their pre-existing beliefs but instead changing their pre-existing beliefs through taking the survey. However,

⁶These states included Arizona, California, Connecticut, Florida, Hawaii, Indiana, Massachusetts, Maryland, Michigan, Minnesota, Mississippi, Missouri, Montana, Nebraska, Nevada, New Jersey, New Mexico, New York, North Dakota, Ohio, Pennsylvania, Tennessee, Texas, Utah, Virginia, Vermont, Washington, West Virginia, Wisconsin, and Wyoming. The primary elections for Delaware and Rhode Island occurred too late to be included in our study. Maine was also excluded because it had a three-way election, with the favored candidate an incumbent Independent.

⁷Winners were determined using the binarized scoring rule. After randomly choosing one of the questions, we divided the beliefs for each answer provided by the participant by 100, so that all values were on a zero to one scale. We then subtracted the respondents' belief value for the correct answer (ranging from zero to one) from one and squared this difference. Next, we subtracted the belief placed on answers that were not correct from zero and squared those differences. We summed all of the squared differences from the correct and incorrect answers. Next, we drew a random number from 0 to 1. If the randomly drawn value was greater than or equal to the total calculated, the participant won the prize. If it was less than this value, the participant did not win the prize. For an example of the method of determining whether an answer to an interest group placement question was correct, see the Appendix, Section C.

this is unlikely. Because these questions involved forecasting what the ratings of candidates would be in two years, rather than what they were at the time, the correct answers were unknown and could not be looked up. Additionally, prior ratings are not easy to find on the internet. The quickest way to find a summary of ratings is through Project Vote Smart; however, respondents would have needed to know about this source and then be willing to spend the time to sort through more than a hundred interest groups' ratings to find that of the group they were looking for.

Yet, it is possible that respondents reasoned that interest group ratings provided by Project Vote Smart at the time were indicative of what ratings would be in the future and were willing to spend the time looking up the specific interest group ratings. Therefore, we instructed respondents not to use outside sources. Specifically, before beginning that part of the surveys, respondents were asked: "We are interested in your true beliefs about each of these questions, and it is important to us that you do NOT use outside sources like the Internet to search for the correct answer. Will you answer the following questions without help from outside sources?" Large percentages of respondents answered affirmatively in both Wave 1 and Wave 2 of the survey. In the first wave of the survey, 87.87% of respondents answered affirmatively. In the second wave of the survey, 88.62% of respondents answered affirmatively.

Additionally, at the end of the survey, we included a question about adherence to this instruction. Specifically, we asked: "We have just a few more questions for you. We would like to know a bit more about your experience taking our survey. Your answers to the following questions will NOT affect your compensation, your eligibility for winning the Amazon.com gift card, or your eligibility for future studies – we just want to know the truth. This is important for our research, so we appreciate your honesty. On how many of the factual questions did you use outside sources – such as the internet – to help you answer? Answer options included "none, only a few, some, most, and all." In both waves of the survey, the vast majority of respondents indicated that they did not use the Internet at all. In Wave 1, 98.69% of respondents indicated that they used outside sources in answering none of the questions in the survey. Thus, even some respondents who would not agree to answer without use of the Internet pre-hoc did not end up using the Internet when completing the survey. 1.12% of respondents used the internet only a few times. No respondents used it on "some" questions, one respondent used it on "most" questions, and no respondents used it on "all" questions. In Wave 2, 97.57% of respondents did not use the Internet at all. 1.96% of

respondents used it on “only a few” questions, 0.56% of respondents used it on “some” questions, one respondent used it on “most” questions, and no respondents used it on “all” questions.

5 Results

5.1 Between Party Results

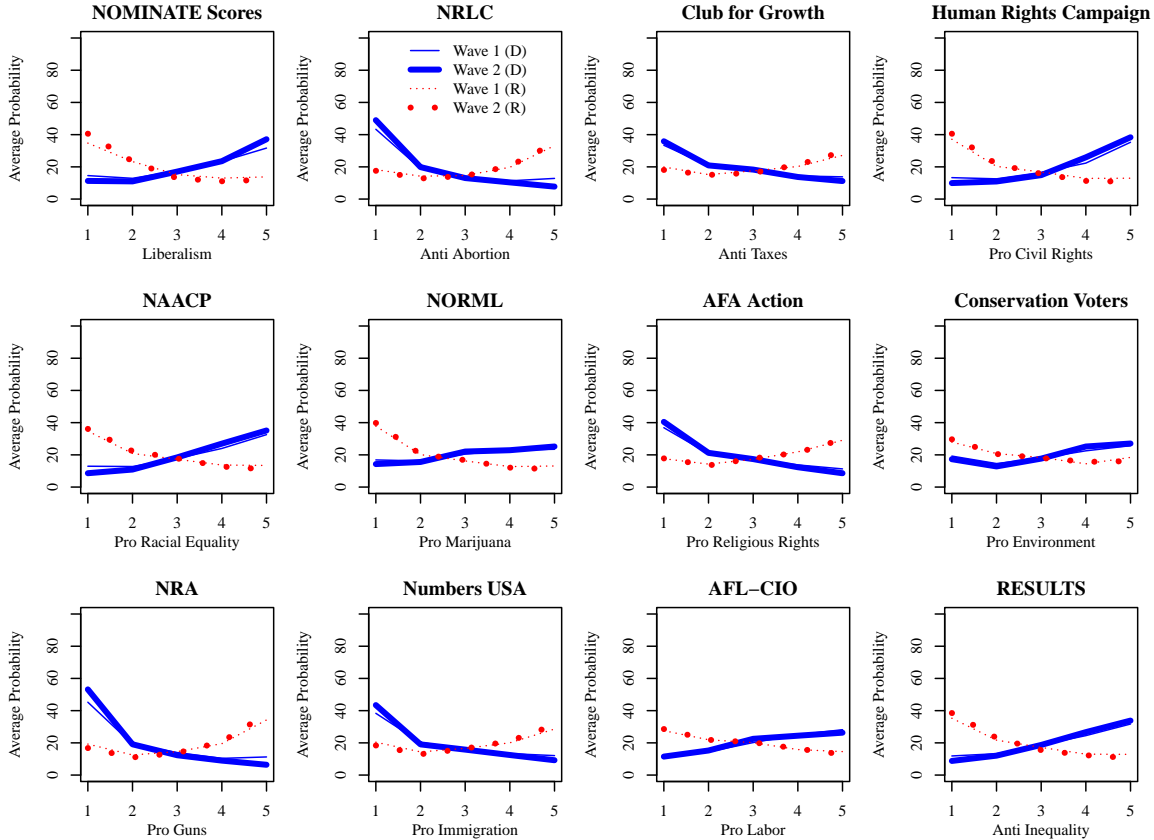
We begin with descriptive statistics of respondents’ beliefs about candidates’ future interest group ratings and NOMINATE scores. Figure 2 plots the average reported probability for each interest group rating category separately for Democrat and Republican candidates in each wave. For example, the first panel indicates that the average reported probability that a Republican candidate will fall in the most conservative NOMINATE category is about 40%. This declines to less than 20% for the most liberal NOMINATE category. Similarly, the second panel shows that the average reported probability that a Democrat candidate will fall in the lowest rating category for the National Right to Life Council (anti-abortion) is about 45% and declines to under 20% for the highest rating category.

The gaps in reported probabilities across partisanship for the first and last rating categories are typically substantial, though there is some variability across issues. In particular, the perceived difference between parties (Democrats minus Republicans in the first wave) is smallest for Club for Growth (economic conservatism) (0-19: 13.49; 80-100: -13.30), the League of Conservation Voters (pro-environment) (0-19: -8.73; 80-100: 7.27), and AFL-CIO (pro-unions) (0-19: -15.36; 80-100: 13.60). It is largest for the National Right to Life Council (anti-abortion) (0-19: 25.07; 80-100: -20.32), Human Rights Campaign (LGBTQ equality) (0-19: -23.83; 80-100: 22.32), RESULTS (pro-government assistance) (0-19: -23.43; 80-100: 18.84), and National Rifle Association (pro-guns) (0-19: 26.00; 80-100: -22.96).

In most cases, the relationship between partisanship and probability judgments is larger in the second wave relative to the first, but the difference is very slight. For example, in Wave 1, respondents placed an average of 45% probability on the NRA (pro-guns) giving Democratic candidates the lowest rating and a 19% probability on the NRA (pro-guns) giving Republican candidates the lowest rating. In Wave 2, these values were 53% and 17%, respectively.

Overall, these initial descriptive results suggest that respondents prospectively and strongly

Figure 2: Average Probability Judgments for Democrat and Republican Candidates across Issues



differentiate Democrat and Republican candidates on important ideological and issue dimensions. They expect Democratic and Republican Senators to behave differently in office with respect to policy activity and voting behavior.

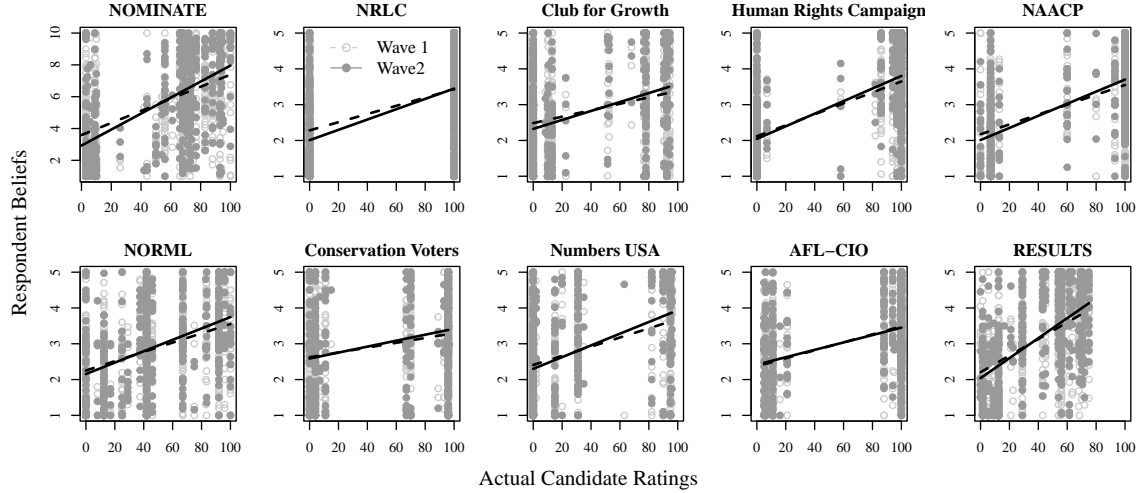
But how accurate are respondents’ forecasts of candidate behavior? For each winning candidate, we collected NOMINATE ranks and all available interest group ratings for the relevant period (2019-2020) from Project Vote Smart’s API.⁸ At the time of analysis, ratings were available in at least one year for the following groups: NRLC, Cfg, HRC, NAACP, NORML, LCV, NUSA, RESULTS, and AFL-CIO.⁹ For groups with multiple ratings for a given candidate (both 2019 and 2020), we averaged the two ratings.

For NOMINATE and all available interest groups, Figure 3 plots respondents’ prospective

⁸NOMINATE ranks were downloaded from <https://voteview.com/congress/senate/116/text> on 6/9/2021 – a screenshot of the rankings is provided in the reproduction materials. Vote Smart’s API was last accessed on 5/5/2022 for purposes of this analysis. Reproduction materials for this paper include code for accessing the API.

⁹The interest groups for which ratings were not available include the NRA (pro-guns) and AFA Action (pro-religious rights).

Figure 3: Relationship of Forecasts to Actual Ratings



NOMINATE is an indicator of ideology. The NRLC is an anti-abortion group. The Club for Growth is anti-taxes. The Human Rights Campaign is pro-civil rights. The NAACP is pro-racial equality. NORML is a pro-marijuana interest group. Conservation Voters is pro-environment. The NRA is pro-guns. Numbers USA is pro-immigration. The AFL-CIO is pro-labor. And RESULTS is anti-inequality.

interest group ratings of individual candidates on the y-axis and the actual interest group ratings on the x-axis, with linear fits superimposed on the data. A 45° line represents perfect accuracy, while a horizontal line suggests forecasts that are no better than random guessing. The dashed lines represent Wave 1 forecasts and the solid lines represent Wave 2 forecasts.

Respondents did substantially better than chance in forecasting the placement of each winning candidate over the subsequent two years. For example, every 10-unit increase in a winning candidate’s NOMINATE ranking (from 1-100) during the 2019-2020 sessions was associated with a 0.38 point increase in respondents’ predicted NOMINATE ranking (from 1-10, with each category representing 10 ranks). Similarly, a 10-point change in a candidate’s rating from HRC (LGBTQ equality) (from 0-100) is associated with a 0.15 point change in forecasted ratings (from 1-5, with each category representing 20 rating points).

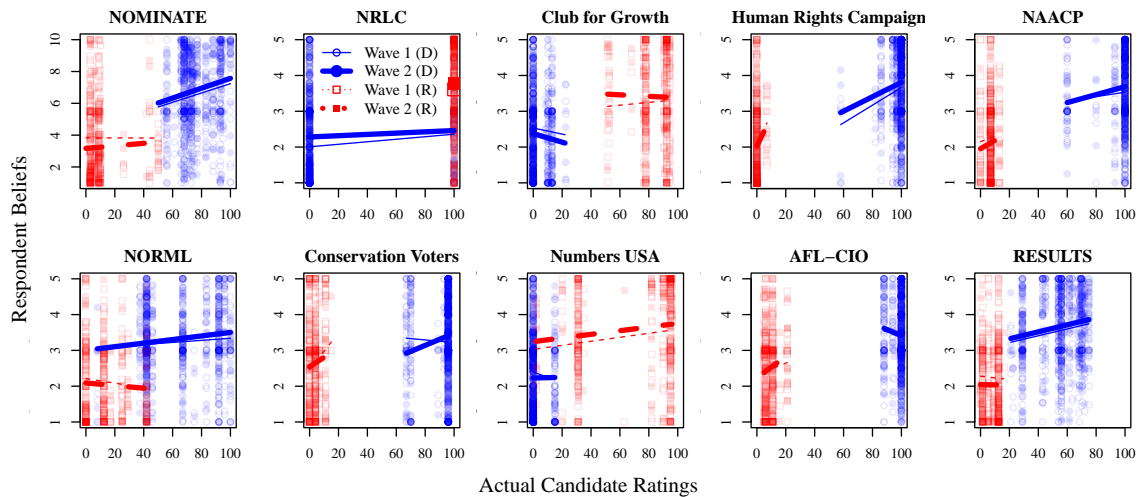
We wish to neither over- nor under-state the strength of these patterns. On the one hand, respondents are clearly responsive to actual behavioral differences among the winning candidates – candidates predicted to be liberal are generally rated as liberal by these interest groups. The correlations between actual and predicted scores range from 0.24 (0.28) for LCV (pro-environment) to 0.55 (0.61) for HRC (LGBTQ equality) in Wave 1 (Wave 2). Predicted NOMINATE scores also

track actual scores, with an association of 0.48 in Wave 1 and 0.57 in Wave 2. Respondents thus have the basic ingredients necessary to engage in prospective issue voting. On the other hand, the relationships between forecasts and actual ratings are far from perfect. While respondents can generally distinguish candidates who will be relatively liberal from those who will be relatively conservative, judgments of extremity within those categories appear quite noisy.

5.2 Within Party Results

To explore intra-party variation further, we estimate the association between actual and predicted values for winning candidates of each party separately. This allows us to explore the extent to which respondents are going beyond partisan heuristics and incorporating more fine-grained information about candidates within each party. These estimates are shown in Figure 4. As one would expect, there is far less variation in actual interest-group ratings *within* parties than there was between parties – which is precisely why partisan cues can be valuable for predicting future behavior.

Figure 4: Relationship of Forecasts to Actual Ratings, by Candidate Party



NOMINATE is an indicator of ideology. The NRLC is an anti-abortion group. The Club for Growth is anti-taxes. The Human Rights Campaign is pro-civil rights. The NAACP is pro-racial equality. NORML is a pro-marijuana interest group. Conservation Voters is pro-environment. The NRA is pro-guns. Numbers USA is pro-immigration. The AFL-CIO is pro-labor. And RESULTS is anti-inequality.

Nonetheless, there is enough variation in actual ratings – for at least one party on most issues – to explore the extent to which respondents track within-party differences in policy-related behavior.

We find mixed evidence for voter responsiveness, with stronger evidence for responsiveness to within-party differences among Democratic candidates than Republican candidates. Looking first at Democratic candidates, the relationship between actual and predicted ratings is statistically significant for NOMINATE, HRC (LGBTQ equality), and RESULTS (pro-government assistance) in both waves, and effect sizes are substantial and comparable to those in Figure 3. For example, a 10-point change in actual HRC (LGBTQ equality) rating (0-100 scale) is associated with a 0.25 point change in predicted ranking (1-5 scale). The relationships for NAACP (pro-racial equality), NORML (pro-marijuana), and LCV (pro-environment) are significant in Wave 2 and substantively meaningful. Their comparative lack of significance in Wave 1 suggests that respondents learned about the candidates' positions throughout the campaign.

Looking at Republican candidates, in Wave 1, the relationship is significant for LCV (pro-environment) and NUSA (pro-immigration). For LCV (pro-environment), a 10-point change in actual ratings (0-100 scale) is associated with a 0.52 point change in predicted ratings (1-5 scale). For NUSA (pro-immigration), the corresponding estimate is 0.16. These effect sizes are similar in Wave 2 but neither attains statistical significance.

Overall, we find evidence that respondents made meaningful, substantive distinctions among candidates within parties on issue-related dimensions. The relationships are far from perfect and low variation in actual candidate behavior within parties creates substantial uncertainty in some of our estimates. Nonetheless, our results suggest that many citizens are capable of engaging in prospective issue voting that goes beyond partisan cues. We emphasize that our evidence is especially compelling because respondents made incentivized predictions about the future on well-defined dimensions closely tied to actual policymaking behavior in Congress.

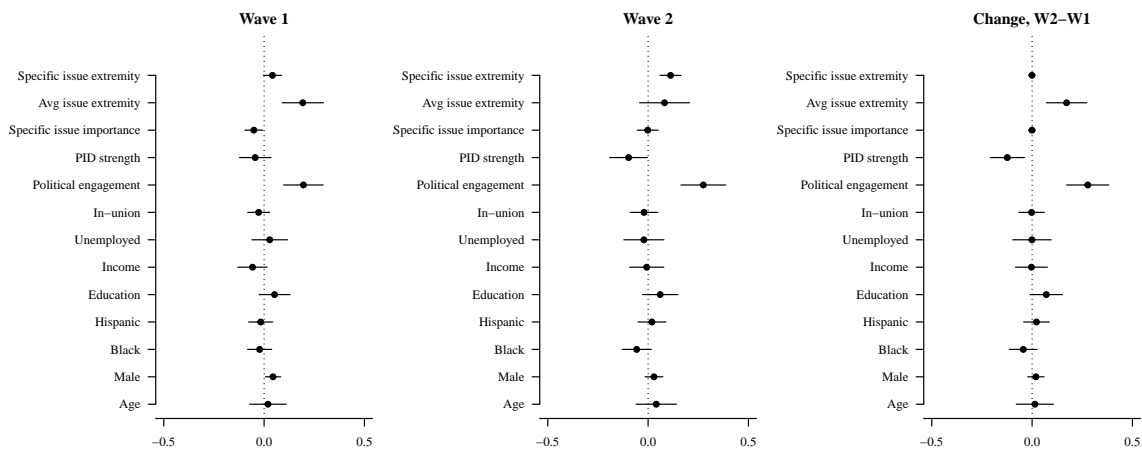
In contrast, we find little to no evidence of improvements in accuracy from Wave 1 to Wave 2 and, thus, inconsistent support for the importance of campaign learning for prospective issue voting. Previous work has found that voters learn about candidate's positions through the campaign (Alvarez, 1998; Brians and Wattenberg, 1996; Guntermann and Lenz, 2021; Lenz, 2013; Sears and Valentino, 1997), but this work tends to focus on presidential campaigns. These receive significantly more attention, both from the media and from citizens, than midterm elections do. As reporting increases, knowledge about political debates, candidates, and policy issues increases (Carpini and Keeter, 1996; De Vreese and Boomgaarden, 2006; Jerit, Barabas and Bolsen, 2006).

Additionally, presidential campaigns involve incumbent candidates who have been in office for a much shorter time period than incumbent Senators, meaning that there is more for citizens to learn about the candidates. Whereas presidents are limited to two terms in office, Senators have no limit on terms served, and in the 117th Congress, the average previous years of a Senator in the Chamber was 11. In the 2018 election, an incumbent was elected in 73.33% of the races, meaning that citizens may have already known about the candidates prior to the campaign. In a supplemental analysis, however, we find no differences in accuracy changes from Wave 1 to Wave 2 across incumbency status. That is, respondents did not learn more about eventual non-incumbent victors than incumbent victors over the course of the campaign.

5.3 Predictors of Forecasting Accuracy

We turn now to an analysis of the individual-level predictors of forecasting accuracy. Figure 5 presents the coefficients from a random effects model predicting respondents' Brier scores. For this analysis, we stacked respondents' Brier scores, regressed these on our set of independent variables, allowed the intercept to vary across respondents, and included fixed effects for issues. The dependent variable ranges from zero to two and is coded such that higher values indicate greater accuracy (full distributions are shown in the Appendix). The left and middle plots represent accuracy in the first and second waves of the survey. The rightmost plot represents the change in accuracy between Waves 1 and Wave 2, calculated as the Wave 2 score minus the Wave 1 score.

Figure 5: Predictors of Accuracy, Wave 1, Wave 2, and Change Between Waves



First, political engagement¹⁰ is strongly and consistently related to accuracy in both waves. A change in engagement from its minimum to maximum value is associated with an increase in prediction accuracy of 0.20 (Wave 1) and 0.28 (Wave 2), which represent about 40% and 60% of a standard deviation, respectively, and more than half the median value of the Brier scores. The absolute effect size is similar for the *change* in accuracy between waves (0.28), which is about 45% of a standard deviation. This means that for more engaged respondents, accuracy increases throughout the campaign. These results strongly suggest that political engagement facilitates greater awareness of candidates' positions.

While intuitive, it is important to emphasize that this need not be true. Indeed, influential work has argued that heuristics – such as partisan or interest group cues – allow relatively unsophisticated voters to act as if they had more detailed knowledge (Lupia et al., 1998). Instead, we find that engagement matters. This could be due to at least two processes. First, politically engaged citizens may be better at using heuristics like partisanship (Lau and Redlawsk, 2001), perhaps because they are more sophisticated with respect to their knowledge of the relationship between party, ideology, and issues. Second, even if all citizens are equally adept at applying partisan cues in judgments about candidates, we find evidence that at least some citizens are able to go beyond such cues to differentiate candidates within parties.

The extremity of respondents' issue positions is also associated with prediction accuracy in two ways. First, respondents who take more extreme positions on issues in general¹¹ tend to be more accurate in their predictions about candidates' future interest group ratings on any given issue. The coefficient for general extremity is positive and significant in Wave 1 and for the change in accuracy from Wave 1 to Wave 2. The extremity of the respondent's position on the particular

¹⁰Political engagement was measured by the following questions: “How much attention do you typically pay to news about national politics?” Answer options included a great deal, a lot, a moderate amount, a little, and none at all. “During a typical week, how many days, if any, do you watch, read, or listen to news about politics?” Answer options included zero days to seven days in one day increments. “How closely have you been following this year's Senate election in your state?” Answer options included not closely at all, not very closely, somewhat closely, very closely, and extremely closely.” And respondents answered three political knowledge questions, including the name of the Speaker of the House, the length of term for Senators, and the job held by John Roberts. Political knowledge consists of the number of correct answers.

All variables were placed on 0-1 scales, with zero indicating less engagement and 1 indicating more engagement. The final political engagement variable was formed by the average of the four variables.

¹¹In both Waves 1 and 2, respondents were asked to place themselves on the 0-100 rating scales for each of the interest groups in our study, where higher values mean that “you generally support the group's policy goals.” General issue extremity was measured as the absolute value of the average self-rating (rescaled from zero to one) minus 0.50.

issue in question¹² is also positively related to accuracy in both Waves 1 and 2, though not for the change in accuracy. Overall, this evidence suggests that citizens with more extreme issue positions are better at predicting the future policy-related behavior of candidates on the relevant issue. Why should this be? One possibility is that people with extreme issue stances are more likely to care deeply about the issues (Lavine, Borgida and Sullivan, 2000; Howe and Krosnick, 2017), and this could lead them to seek out information about candidates’ policy stances. Another possibility is that politically active citizens tend to hold more extreme views, and so extremity may be operating as an additional indicator of political engagement. Extremity may be simply picking up variance in political engagement that is not captured by our (imperfect) measure of the latter construct.

Interestingly, we find that strength of party identification¹³ is *negatively* associated with accuracy in Wave 2 and for the change in accuracy from Wave 1 to 2. Stronger partisans know candidates’ positions less well, and their accuracy diminishes over the course of a campaign. It is important to note that this is the partial association of identity strength with accuracy, after controlling for engagement and issue extremity. Thus, aspects of psychological commitment to one’s party that are independent of extremity, political interest, and knowledge tend to inhibit successful prospective voting. This is consistent with the tendency of strong partisans to overstate differences between the in- and out-party (Greene, 1999) and to feel stronger emotions that promote activity but inhibit critical thought and learning of new information (Groenendyk and Banks, 2014; Huddy, Mason and Aarøe, 2015). It is also congruent with Lavine, Johnston and Steenbergen (2012)’s theory that stronger partisans ignore some information about their parties’ candidates in order to conserve mental resources and to maintain cognitive consistency with their own beliefs. They expect that “so long as party images are relatively static over time, [partisan] citizens should see little reason to carefully monitor the political environment, thus inhibiting political learning and belief updating” (Lavine, Johnston and Steenbergen, 2012, p. 14), and our results are consistent with that expectation.

¹²Issue-specific extremity was measured in Waves 1 and 2 as the absolute value of respondent’s self-rating for the relevant interest group for the issue in question (on a zero to one scale) minus 0.50.

¹³Strength of party identification was measured with four items based on Huddy, Mason and Aarøe (2015): 1. How important is being a [party] to you? 2. How well does the term [party] describe you? 3. When talking about [party], how often do you use “we” instead of “they”? 4. To what extent do you think of yourself as being a [party]?

6 Conclusion

The extent to which citizens approximate the ideal of the prospective issue voter is one of the perennial questions in political behavior research. Our study provides an innovative empirical examination of this question. We use incentivized forecasting of interest group candidate ratings as a measure of citizens' perceptions of candidate positions. Unlike previous work, this measure is not based on dichotomous roll call votes and thus allows us to examine whether citizens can identify within-party variance in candidate positions, in addition to placing candidates on the correct side of the ideological scale.

We have answered a few questions. First, are citizens reasonably accurate at predicting the future policy-related behavior of candidates for office? We find that there is a strong relationship between citizens' prospective candidate placements and actual interest group candidate ratings. Second, to what extent is forecasting accuracy due to the use of partisan cues, and can citizens go beyond partisan cues to make intra-party distinctions among candidates for office? Our evidence indicates that, in at least some cases, citizens make meaningful distinctions among candidates within parties, suggesting that citizens have knowledge of candidates beyond partisan cues. Finally, to what extent does political engagement promote forecasting accuracy? We find that accuracy is substantially increased among politically engaged citizens and those with more extreme issue attitudes. Additionally, there is *decreased* accuracy among strongly identified partisans.

Our findings show that sophisticated voters do not necessarily depend primarily on partisan heuristics when thinking about candidates. Previous work suggests that political sophistication is a double-edged sword (Kuklinski et al., 2000). Sophisticated voters are more likely to know a candidate's position if that position is consistent with that of the candidate's party. But they are also more likely to misplace a candidate's position when that position is inconsistent with the position of the candidate's party (Dancey and Sheagley, 2013, 2016; Lau and Redlawsk, 2001). These findings suggest that sophisticated voters depend in large part on partisan heuristics when thinking about candidates' positions. Our data show instead that sophisticated voters have greater knowledge of candidates' distinct positions – as measured on a continuous scale – which involves knowledge that goes beyond binary partisan classification. From a normative perspective, then, scholars have reason to be reassured. While partisan cues surely matter, voters – particularly sophisticated voters – do more than take part in a simple guessing game when it comes to candidates'

issue positions according to their partisan affiliation, instead knowing the location of candidates across a wide range of issues as well as overall ideology.

Our finding that the strength of political identity decreases voters’ accuracy, on the other hand, is worrying. The finding is consistent with previous research, which shows that those high in partisan identification simplify the voting process by using partisanship as a heuristic to know how “people like them” should decide (Fiorina, 2002). A stronger knowledge of and dependence on partisan heuristics should lead to a decrease in accuracy when placing candidates of the same party. We know additionally that as the strength of partisan identification increases, people become more politically active (Abramson and Aldrich, 1982; McAllister, 2020). They also experience heightened emotions such as anger (Rydell et al., 2008; Huddy, Mason and Aarøe, 2015). Together, these findings suggest that strong party identifiers are less likely to accurately place candidates, more likely to participate in the political process, and more likely to anger – a combination that is the opposite of the ideal rational prospective issue voter.

How applicable are these results to other situations and contexts? Given that our data was from a non-probability sample, concerns about external validity are warranted. Several studies comparing online non-probability samples with probability samples (such as the ANES and CPS) have found that online respondents differ from probability samples in terms of gender (approximately 5% more females on average), age (about 14 years younger on average), income (about \$12,000 less on average), and race (about 3% more whites, 7% fewer African Americans, and 5% fewer Hispanics) (Berinsky, Huber and Lenz, 2012). These covariates were included in our models and were not significant. Thus, because the differences were not associated with our dependent variable, we have more confidence that our results would hold on a probability sample.

We also compared our sample to the 2020 ANES Time Series dataset, a probability sample, in terms of its party identification, ideology, and political attention (see the Appendix Table A.1). In particular, the comparisons of the two samples on the latter variable is important given that political engagement was a significant predictor of forecasting accuracy. The two surveys asked the same political attention question, allowing for a clean comparison between the samples. The proportion of respondents answering that their level of political interest was “none at all,” “a little,” and “a great deal” were almost exactly the same between the two surveys. The only difference was the proportion of respondents who indicated “a moderate amount” and “a lot” of

interest; in the ANES, a greater proportion of respondents indicated more interest while in our sample, a greater proportion indicate a moderate amount of interest. This provides some evidence that our sample should be no more accurate in their predictions than a representative sample of the population.¹⁴

¹⁴The political knowledge questions differed between the two surveys, both in terms of the questions asked and the answer format (closed vs. open-ended). This prevents us from making a clean comparison between the samples on this variable.

6.1 Funding and Conflicts of Interests/Competing Interests

The authors received support from [redacted] University for the submitted work. The authors have no relevant financial or non-financial interests to disclose. The questionnaire and methodology for this study was approved by the Human Research Ethics committee of [redacted] (Ethics approval number: [redacted]). Informed consent was obtained from all participants in the study.

Appendix

A Sample Characteristics

Table A.1: Sample Comparison to Current Population Survey

	Category	CPS	Our Sample
Gender	Male	48.30%	54.71%
	Female	51.70%	44.92%
	TOTAL	100.00%	99.63%
Age	18 to 24 years old	11.50%	8.66%
	25 to 34 years old	17.90%	44.67%
	35 to 44 years old	16.40%	25.60%
	45 to 54 years old	15.90%	10.29%
	55 to 64 years old	16.80%	7.78%
	65 years old or older	21.50%	3.01%
	TOTAL	100.00%	100.00%
Race	White only	77.50%	69.51%
	African American only	12.70%	9.66%
	Asian only	6.30%	7.90%
	Other (including two or more races)	3.41%	5.15%
	TOTAL	100.00%	92.22%
Hispanic	Hispanic	16.70%	10.29%
	Not Hispanic	83.30%	89.71%
	TOTAL	100.00%	100.00%
Education	Less than high school graduate	9.80%	0.25%
	High school graduate	27.70%	11.92%
	Some college, no Bachelor's degree (assoc. degree incl.)	27.80%	34.25%
	Bachelor's degree or more	34.60%	53.58%
	TOTAL	100.00%	100.00%
		2020 ANES Time Series	Our Sample
Party identification	Democrat	34.54%	35.54%
	Independent	34.08%	30.23%
	Republican	31.38%	24.21%
	TOTAL	100.00%	100.00%
Ideology	Liberal	30.43%	53.46%
	Moderate	21.96%	20.08%
	Conservative	47.61%	26.46%
	TOTAL	100.00%	100.00%
Political attention	None at all	0.93%	1.25%
	A little	16.43%	14.93%
	A moderate amount	19.17%	31.74%
	A lot	40.02%	28.73%
	A great deal	23.46%	23.34%

Categories for gender do not sum to 100% because we allowed our survey allowed respondents to identify as “other” for gender. Categories for race do not sum to 100% because we did not force a distinction between race and ethnicity and respondents could identify as Hispanic-only without choosing a separate racial category.

B Survey Questions

Candidate Issue Positions

1. Political scientists use a measure called DW-NOMINATE to rank members of the Senate from 1 to 100 in terms of their level of conservatism or liberalism. The ranks are based on their voting behavior on roll call votes in the Senate. The Senator ranked 1 is the most conservative Senator, while the Senator ranked 100 is the most liberal Senator. The closer a Senator is to 1 the more conservative they are, and the closer a Senator is to 100 the more liberal they are.

If [candidate] wins the election, what will their DW-NOMINATE rank be for votes cast during the period January 2019 through December 2020? (Answer options are in terms of 10 points of rank, a.k.a. between 1 and 10, 11 and 20, etc.)

2. Abortion: National Right to Life Committee (NRLC)

NRLC is a pro-life organization that works through legislation and education to oppose abortion, infanticide, euthanasia, and assisted suicide.

If elected, what rating will [candidate] receive from the NRLC over the next two years?

3. Taxation: Club for Growth (CFG)

CFG believes that prosperity and opportunity come from economic freedom, and supports reducing income taxes and the size and scope of the federal government.

If elected, what rating will [candidate] receive from the CFG over the next two years?

4. LGBTQ rights: Human Rights Campaign (HRC)

HRC is America's largest civil rights organization working to achieve LGBTQ equality.

If elected, what rating will [candidate] receive from the HRC over the next two years?

5. Civil rights: National Association for the Advancement of Colored People (NAACP)

The NAACP seeks to eliminate racial hatred and discrimination and protect and enhance the civil rights of African Americans and other minorities.

If elected, what rating will [candidate] receive from the NAACP over the next two years?

6. Marijuana legalization: National Organization for the Reform of Marijuana Laws (NORML)

NORML's mission is to move public opinion sufficiently to achieve the repeal of marijuana prohibition so that the responsible use of cannabis by adults is no longer subject to penalty.

If elected, what rating will [candidate] receive from the NORML over the next two years?

7. Moral issues: American Family Association Action (AFA Action)

AFA Action is dedicated to advancing biblical, family values in society and government. If elected, what rating will [candidate] receive from AFA ACTION over the next two years?

8. The environment: League of Conservation Voters (LCV)

The LCV advocates for sound environmental policies and works to elect pro-environment candidates who will adopt and implement such policies.

If elected, what rating will [candidate] receive from the LCV over the next two years?

9. Gun policies: National Rifle Association (NRA)

The NRA advocates for the right to keep and bear arms, and champions gun safety, education and training.

If elected, what rating will [candidate] receive from the NRA over the next two years?

10. Immigration: NumbersUSA (NUSA)

NUSA favors reductions in immigration numbers toward levels that would allow for a stable U.S. population

If elected, what rating will [candidate] receive from NUSA over the next two years?

11. Labor unions: American Federation of Labor and Congress of Industrial Organizations (AFL-CIO)

AFL-CIO is a federation of 55 national and international labor unions which give working people a collective voice to address workplace conditions.

If elected, what rating will [candidate] receive from the AFL-CIO over the next two years?

12. Poverty: RESULTS

RESULTS works to strengthen government health and assistance programs like food stamps and Medicaid and advances policies to reduce inequality.

If elected, what rating will [candidate] receive from RESULTS over the next two years?

Respondent Issue Positions

Respondents read the following instructions:

In this part of the study, we are interested in your opinions about important issues. We are going to show you descriptions of prominent issue interest groups in American politics. We would like you to tell us how much you support or oppose the policy goals of these interest groups on a

scale from 0 to 100.

Ratings between 50 and 100 mean that you generally support the group's policy goals with higher values indicating greater support. Ratings between 0 and 50 mean that you generally oppose the group's policy goals with lower values indicating greater opposition.

Then, they saw the following descriptions of interest groups alongside a sliding scale from 0 to 100.

NRLC: NRLC is a pro-life organization that works through legislation and education to oppose abortion, infanticide, euthanasia, and assisted suicide.

CFG: CFG believes that prosperity and opportunity come from economic freedom, and supports reducing income taxes and the size and scope of the federal government

HRC: HRC serves as America's largest civil rights organization working to achieve LGBTQ equality

NAACP: The NAACP seeks to eliminate racial hatred and discrimination and protect and enhance the civil rights of African Americans and other minorities

AFA Action: AFA Action is dedicated to advancing biblical, family values in society and government

LCV: LCV advocates for sound environmental policies and works to elect pro-environment candidates who will adopt and implement such policies

AFL-CIO: AFL-CIO is a federation of 55 national and international labor unions which give working people a collective voice to address workplace conditions

NORML: NORML's mission is to move public opinion sufficiently to achieve the repeal of marijuana prohibition so that the responsible use of cannabis by adults is no longer subject to penalty

NRA: The NRA advocates for the right to keep and bear arms, and champions gun safety, education and training

NUSA: NUSA favors reductions in immigration numbers toward levels that would allow for a stable U.S. population

RESULTS: RESULTS works to strengthen government health and assistance programs like food stamps and Medicaid and advances policies to reduce inequality

Other Questions

We focus on respondents' forward-looking beliefs about candidates' issue positions and ideological orientations. But we also measured beliefs about several other topics, including recent economic changes, the campaign horse race, whether or not the candidate had been endorsed by President Trump, candidates' party identification, age, gender, race/ethnicity, religious identification, political experience, and their likelihood of engaging in an ethics violation if elected. There were 21 questions in all that were asked for both the Democratic and Republican candidate in the respondent's state.

C Determining Correct Answers to Candidate Placement Questions

We incentivized respondents to give their best approximation of accurate answers to the interest group rating question. Because we allowed probabilistic guesses (with say, 0.2 in one category and 0.8 percent in another), we needed to translate these guesses into chances of winning for respondents. We did so by taking the following steps, which respondents were informed of before beginning the placement of candidates' interest group ratings:

1. Divide all beliefs (or probabilities) provided by the participant by 100, so that all these values are on a 0 to 1 scale.
2. Determine which answer is correct, subtract the participant's provided value for that answer from 1, and square this difference.
3. Subtract the respondent's values for all incorrect answers from zero and square these differences.
4. Add up all of the squared differences from steps 2 and 3.
5. Draw a random number from 0 to 1, where all values are equally likely to be drawn.
6. If the randomly drawn value is greater than or equal to the total calculated in 4, the participant wins the prize. If it is less than this value, the participant does not win the prize.

For example, take a respondent (Respondent A) who put down 0-19 with 0.2 probability and 20-40 with 0.8 probability. Say that the candidate is rated (2 years in the future) at 30. We would take the following steps:

1. 0-19: 0.2; 20-40: 0.8
2. $1 - 0.8 = 0.2$
 $0.2^2 = 0.04$
3. $0 - 0.2 = 0.2$
 $0.2^2 = 0.04$
4. $0.04 + 0.04 = 0.08$

5. Draw a random number from 0 to 1 ; if this is ≥ 0.08 , Respondent A would win.

Compare this to someone (Respondent B) who put down 0-19 with 0.2 probability, 20-39 with 0.6 probability, and 40-59 with 0.2 probability. Say that the candidate is rated at 30. The following steps give:

1. 0-19: 0.2 ; 20-39: 0.6; 40-59 = 0.2

2. $1 - 0.6 = 0.4$.

$0.4^2 = 0.16$

3. $0 - 0.2 = -0.2$.

$-0.2^2 = 0.04$.

$0 - 0.2 = -0.2$.

$-0.2^2 = 0.04$.

$0.04 + 0.04 = 0.08$.

4. $0.08 + 0.16 = 0.24$

5. Draw a random number from 0 to 1 ; if this is ≥ 0.24 , Respondent B wins.

Respondent A has a better chance of winning than Respondent B (A's chance = 0.92; B's chance = 0.76). This explains why it was not in respondents' interest to put down 0.20 for all possible answers.

D An Example of the Modified Brier Score: Interest Group Ratings

This example is for the respondent shown in Figure 1, who guessed the interest group rating to be between 40 and 59 with probability 0.2 and to be between 60 and 79 with probability 0.8. Imagine that the correct placement of the candidate was between 60 and 79.

We divided the five answer categories (0-19, 20-39, 40-59, 60-79, and 80-100) into four binary pairs: 0-19 versus all other categories, 0-39 versus all other categories, 0-59 versus all other categories, and 0-79 versus all other categories.

0-19 versus all other categories: The sum of the forecasts for 0-19 is 0 and the sum of the forecasts for all other categories is 100. Because answer option 60-79 occurred, the outcome for "all other categories" is 1 and the outcome for 0-19 is 0. We get the following score for this binary

pair: $(0 - 0)^2 + (1 - 1)^2 = 0$.

0-39 versus all other categories: The sum of forecasts for 0-39 is 0 and the sum of forecasts for all other categories is 100. The score for this category is the same as above: 0.

0-59 versus all other categories: The sum of the forecasts for 0-59 is 0.2 and the sum of the forecasts for all other categories is 0.8. Because answer option 60-79 occurred, the outcome for “all other categories” is 1 and the outcome for 0-59 is 0. We get the following score for this binary pair: $(0.2 - 0)^2 + (0.8 - 1)^2 = 0.08$.

0-79 versus all other categories: The sum of the forecasts for 0-79 is 1 and the sum of the forecasts for all other categories is 0. Because answer option 60-79 occurred, the outcome for “all other categories” is 0 and the outcome for 0-79 is 1. We get the following score for this binary pair: $(1 - 0)^2 + (0 - 1)^2 = 2$.

This forecaster would receive an ordered categorical score of 0.7, which is the average of 0, 0, 0.8, and 2.

A respondent who put a probability of 1 on the category 60-70, on the other hand, would receive an ordered categorical score of 0.5, which is the average of 0, 0, 0, and 2. The score of 0.7 is worse than the score of 0.5.

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