How Do Voters Simplify? Issue Preferences and Candidate Choice (Draft)

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August 2019

Abstract: While issue voting is a well-studied concept in political behavior, we lack a systematic understanding of how voters engage in the process. What (and how many) issues are voters considering and how are they combined to shape vote choice? Relying on the bounded rationality paradigm, I propose that voters use issues differently from standard models of issue voting that often serve as normative benchmarks. Voters use heuristic strategies that allow them to engage with issue information in meaningful, but also efficient, ways. I employ two experimental surveys that have respondents choose their preferred candidate in a series of conjoint choice tasks. The design of these surveys reveals the prevalence of a variety of issue-based decision rules. Results suggest that voters appear to have a variety of issue-based heuristic strategies at their disposal, allowing them to meaningfully engage with issue information in an efficient manner. Two heuristic strategies in particular, Equal Weights (an issue agreement tally model) and Take-the-Best (similar in concept to the ‘issue public’), are estimated to be used by a high proportion of citizens. Overall, the results of these studies imply that there need not be a conflict between issue-based and heuristic theories of vote choice.
Issue voting, in which citizens select candidates based primarily on their positions on key political issues, is a normatively appealing theory of voting. A public whose political behavior is driven by personal preferences on issues of the day can better hold politicians accountable to its interests than one distracted by non-issue considerations. There is substantial evidence in political science that voters engage in issue voting to some extent (e.g. Ansolabehere and Jones 2010; Ansolabehere, Rodden, and Snyder 2008; Canes-Wrone, Brady, and Cogan 2002; Jessee 2012; Nyhan et al. 2012). Despite this, we know little about how voters engage in issue voting. That is, how many, and which, issues are voters considering and how are these considerations combined to form a vote intention? Often, issue voting research has focused on whether it occurs or not (Achen and Bartels 2016; Ansolabehere and Jones 2010; Hillygus and Shields 2008), how prevalent it is (Ansolabehere, Rodden, and Snyder 2008), or, given that it occurs, how utility is calculated over single issue dimensions (Merrill and Grofman 1999; Tomz and van Houweling 2008). But with few exceptions, this work fails to consider how voters process issues available for consideration in any given election and how these issues are aggregated by the voter to reach a decision (but see Lau, Kleinberg, Ditonto 2018; Lau and Redlawsk 2006; Taber and Steenbergen 1995 for related work).

The most influential framework in the study of issue voting has been spatial theory, which assumes a public that utilizes issue information in a highly motivated and sophisticated manner (Enelow and Hinich 1984). From this, a number of critics have argued that, because of the limitations and biases of human psychology, issue voting is not prevalent (Achen and Bartels 2016; Mason 2018). In turn, several alternative models have been proposed that exclude the use of issue information, such as identity-based voting (Mason 2018) and heuristic
voting based on simple cues such as partisanship (Lau and Redlawsk 2001; 2006). In contrast, I argue that psychological constraints do not preclude issue voting. That is, voters may be using issue-based heuristic strategies when choosing candidates for public office.

While political behavior research has previously considered issue voting under psychological constraints, it has focused on the meta-choice of issue voting versus other decision rules, like partisan voting — that is, how citizens “decide how to decide” (Hillygus and Shields 2008; Lavine, Johnston, and Steenbergen 2012). This research departs from this work by instead looking at how the public can engage in different forms of issue voting. I adapt a series of heuristic decision rules from the judgement and decision-making literature, as well as one full-information normative benchmark, to the issue voting context and study the prevalence of these rules among the public.

Empirically distinguishing these rules is difficult, however, because the polarized political landscape typically leads voters to the same decisions regardless of how they consider issue information. Using two different nationally sampled surveys, I examine respondents’ tendencies to engage in different forms of heuristic issue voting through a variety of electoral environments where the different rules are able to reach divergent decisions.

Results across the two studies find evidence that voters use multiple heuristic decision rules, each of which simplifies the issue environment in some way. Importantly, use of these strategies is found even when party cues are readily available. Together, this suggests that heuristic issue voting is a plausible framework for modeling voting behavior. Voters appear to have a variety of heuristic strategies at their disposal that allow them to meaningfully engage with issue information despite cognitive and motivational constraints. Understanding how
voters engage with issue information is a fundamental area of political behavior that needs more exploration before we can conclude that voters cast aside issues in favor of social identities and non-issue shortcuts.

Background

Issue voting can be described as any process of determining candidate vote choice based on evaluation of the issue positions of candidates. However, there are many different forms that issue voting can take. It can vary in terms of what issue information is considered, how that information is evaluated, and how it is aggregated with other considered issue information. Traditionally conceptualized within spatial theory, issue voting has served as the standard normative voting model in political science. Under this conceptualization it is assumed that voters and candidates can be represented by positions in an $N$-dimensional space, with voters’ choices determined by comparing their own positions on issues to the positions taken by candidates on all issues with non-zero subjective importance (Downs 1957; Enelow and Hinich 1984; Merrill and Grofman 1999; Tomz and Van Houweling 2008).

The theory of issue voting has recently come under fire by political scientists who challenge the extent to which voters possess the motivation and skill to engage in it (Achen and Bartels 2016; Lenz 2012).¹ The central claim is that citizens’ psychological limitations violate the assumption that voters “have definite preferences to be elicited and aggregated through some well-specified process of collective choice” (Achen and Bartels 2016; Bartels 2003). These critics

¹ This is by no means the first time the theory of issue voting has been questioned (e.g. Campbell et al. 1960; Converse 1964).
argue that the appearance of issue voting in empirical studies is an artifact of observational equivalence — where the outcome of issue voting and some non-issue voting process are identical (Lenz 2012). Using a definition of issue voting where citizens rely on a multitude of issues and complex calculations as a point of comparison, many scholars have concluded that voters do not use issues to inform their vote choice, instead favoring heuristic decision rules that rely on simple cues such as social identity (Achen and Bartels 2016; Mason 2015), candidate traits (Fridkin and Kenney 2011), partisanship, or ideological labels (Lau and Redlawsk 2006; Lupia 1994; Popkin 1994; Sniderman, Brody, and Tetlock 1993).

These alternatives overlook another possibility: heuristic voting and issue voting are not mutually exclusive. This is not a new claim. For example, the well-known 'issue public' model (Converse 1964; Hillygus and Shields 2008; Krosnick 1990) is a heuristic form of issue voting. In this model, citizens use only a small number of issues to determine their vote choice, perhaps only one. Another example is an unweighted issue tally model (Kelley and Mirer 1974), where voters keep running tallies of how many issue positions they favor for each candidate and select the candidate with the highest tally. Each of these examples defines a voting strategy that engages with issue information, but the process for how issues are used differs from normative benchmarks associated with spatial theory. Indeed, each rule uses only a subset of the available information. Issue publics seek out information on a small set of issues and ignore the rest, while running tallies treat all issues as equally important. Despite these important examples, the possibility of a more general heuristic issue voter has not been systematically examined as an alternative theory of heuristic voting. I argue that a primary reason for this is lack of an
orienting theoretical framework. Fortunately, psychology offers one such framework that can be applied to issue voting – bounded rationality.

The bounded rationality literature in psychology (Simon 1957) has made a lot of progress in recent decades specifying formal rules that allow citizens to make reasonable decisions under cognitive and motivational constraints (Gigerenzer and Selten 2002; Kahneman 2011). These decision rules are known as heuristics and they simplify the information environment in some way, allowing an individual to reach a decision with a reduced amount of effort and expertise.² Heuristic decision rules, such as take-the-best and the imitation heuristic, have been found to be used by individuals when making decisions in a multitude of contexts (Gigerenzer and Goldstein 1999). Voters may be relying on similar rules to process issue information in an efficient manner when determining vote choice.

Importantly, this idea of heuristic issue voting differs from the as if informed heuristics that are often studied in political science (e.g. Lau and Redlawsk 2006; Sniderman, Brody, and Tetlock 1993). Examples of heuristic issue voting would be the issue public or the tally model described above — with vote choice based on a simplified version of the political issue space. Whereas, as if informed heuristics allow the voter to reach a decision absent of any actual issue information. For example, a party cue may allow the voter to act as if they were informed about political issues without requiring them to have any knowledge of issue information (Lau and Redlawsk 2001). A public made up of heuristic issue voters is neither the ideal citizen of spatial

² Political science and psychology/decision theory often use the term heuristic differently. In the former, heuristics are usually defined by the type of information that is utilized (e.g. Kuklinski and Quirk 2000; Lau and Redlawsk 2001). For example, the party cue heuristic describes a voter using partisanship to help reach a decision. In the latter, heuristics describe formal rules that specify how information is utilized to reach a decision (e.g. Gigerenzer and Gaissmeier 2011; Payne, Bettman, and Johnston 1993).
theory, nor the uninformed citizen of as if informed heuristics and identity politics. Instead, heuristic issue voters rely on issue information in a simplified manner, while still placing value on efficiency. By assuming voters are boundedly rational and considering issue voting as a potential heuristic process itself, we can determine whether voters use issue information in limited but methodical ways.

How Voters Could Use Issues

In order to study how voters engage with issue information, we first need to identify plausible decision rules that voters could use when navigating the issue environment. While there are a vast number of defined decision rules within the judgment and decision-making literature, we can narrow down the list substantially by only considering rules that are plausible given the political information environment and the task at hand — issue voting. In addition, the decision rules to be considered are well supported by past research in psychology and consumer behavior (see Gigerenzer and Selten 2002; Payne, Bettman, and Johnson 1993).

Each decision rule is defined by three criteria: a search rule which specifies how information will be processed, a stop rule which indicates when the information search ends, and a choice rule which specifies the translation of information into a final decision (Mousavi, Gigerenzer, and Kheirandish 2016). Table 1 breaks down each decision rule into the search, stop, and choice components. With the exception of the Weighted-Additive Rule (WADD), all rules are heuristics in the sense that they disregard some of the information in the environment in order to reduce expended effort (Gigerenzer and Gaissmeier 2011). Because of this, all rules
other than WADD will be collectively referred to as heuristic rules. A brief discussion of each rule follows.

**Weighted Additive Rule (WADD):**

The Weighted Additive Rule (WADD) describes a process of decision-making where the voter considers candidate issue positions in reference to their own defined preference intensities. A voter relying on WADD would evaluate all candidates across all relevant issues, and weight these evaluations based on the personal importance they attach to each issue. They then sum these weighted issue evaluations for each candidate and vote for whoever has the highest weighted evaluation. This rule falls closest to classic models of issue voting in political science, though it makes no assumptions about the nature of the issue space or the form of the relationship between issue agreement and voter utility.\(^3\) In practice, use of this rule would seem unlikely as it requires much of the voter — weighted preferences on a variety of issues as well as knowledge of candidate positions on these issues.

**Equal Weights Rule (EQW):**

The Equal Weights Rule (EQW) is an unweighted version of WADD. Voters still evaluate all candidates across all relevant issues, however each issue evaluation is treated equally. A voter using EQW has preferences on each issue, but either does not have, or does not consider, preference intensities on these issues. While the voter will still consider candidate positions on

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\(^3\) That is, WADD is a rule for translating voter utility on each issue dimension into a final vote choice and is thus more general than spatial models of voting.
all relevant issues, each issue influences their decision equally. This rule serves as a formal definition of the unweighted tally model discussed above, with voters giving equal tallies of approval or disapproval for candidates on issue positions regardless of the subjective importance placed on the issue. EQW has been used to understand issue voting in the past (Kelley and Mirer 1974; see also Leeper and Robinson 2018) as well as other decision-making tasks (Gigerenzer and Todd 1999), often to greater success than WADD.

**Take the Best (TTB):**

Take the Best (TTB) comes from a family of heuristic decision rules known as Lexicographic rules. TTB describe a process where an issue voter determines which issue is most important to them, then evaluates each candidate on that issue. The voter then selects the candidate that best matches their own position on that issue. If multiple candidates are assessed as 'best matches' the voter then considers each of these candidates on the next most important issue, and so on until only one remains (Gigerenzer and Goldstein 1999; Payne, Bettman, and Johnson 1993). Information acquisition stops once the voter is able to discriminate between the candidates, meaning the voter may only need to consider one or two issues before they are able to select a candidate. Voters relying on this rule when engaging with issue information would behave similar to the issue public, where they only consider candidate positions on a few issues that are personally important to them.

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4 There are a variety of decision rules in the lexicographic family that differ based on how one defines the order of attribute evaluation. See Elimination by Aspects (Tversky 1972) for an alternative process from TTB that includes more noise for how attributes are selected for evaluation.
Frequency of Good and Bad Features Rule:

Frequency of Good and Bad Features (FGBF) is a heuristic decision rule where voters take the ratio of issue positions a candidate takes that agrees with the voter over the total number of issue positions taken (Alba and Marmorstein 1987). If this ratio is above some threshold of acceptability, the voter selects the candidate, otherwise they move on to consider another candidate. Here, the order of candidate evaluation is important because as soon as one candidate meets the required ratio, no information is sought out for the yet-to-be-considered candidates, making it a type of satisficing heuristic (Simon 1955).

Composite Rules:

In addition to WADD and the other heuristic rules discussed above, voters could use issue information via a combination of decision rules. These ‘composite rules’ could include any feasible combination of decision rules. I focus on two composite rules that have been studied elsewhere — TTB with WADD (TW) and TTB with EQW (TE). Both composite rules propose that a voter first uses a lexicographic process to narrow down the number of candidates they are considering before switching to a more scrutinizing process to determine which of the remaining candidates best match their issue preferences, reflecting a dual-process framework (e.g. Lau and Redlawsk 2006; Steenbergen, Hangartner, and de Vries 2011).
Table 1: Decision Strategies Relevant to Issue Voting

<table>
<thead>
<tr>
<th>Strategies</th>
<th>Examples</th>
<th>Search Rule</th>
<th>Stop Rule</th>
<th>Choice Rule</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weighted-Additive (WADD)</td>
<td>Payne, Bettman, &amp; Johnson (1993)</td>
<td>For each candidate note (dis)agreements for all issues multiplied by preference intensity; Store this information</td>
<td>After each candidate has been evaluated</td>
<td>Choose candidate with highest evaluation</td>
</tr>
<tr>
<td>Equal Weight (EQW)</td>
<td>Kelley and Mirer (1974)</td>
<td>For each candidate note (dis)agreements for all issues; Store this information</td>
<td>After each candidate has been evaluated</td>
<td>Choose candidate with highest evaluation</td>
</tr>
<tr>
<td>Take-the-Best (TTB)</td>
<td>Gigerenzer &amp; Goldstein (1999)</td>
<td>Choose the most important issue; Evaluate each candidate on this issue</td>
<td>After each candidate has been evaluated on the issue</td>
<td>IF one candidate in agreement and rest in disagreement, select candidate; ELSE return to start rule with next most important issue and subset of agreeing candidates</td>
</tr>
<tr>
<td>Frequency of Good &amp; Bad Feature (FGBF)</td>
<td>Alba &amp; Marmorstein (1987)</td>
<td>Add up the number of issues the first candidate agrees with you on</td>
<td>After each issue has been evaluated</td>
<td>Choose candidate if ratio of agreement to total issues is above some threshold; otherwise proceed to next candidate</td>
</tr>
<tr>
<td>Composite Rule 1: TW</td>
<td>Steenbergen, Hangartner, &amp; de Vries (2011)</td>
<td>TTB until two candidates remain, then WADD</td>
<td>After TTB identifies one candidate or after two candidates are evaluated with WADD</td>
<td>TTB decision rule UNLESS two candidates remain, THEN WADD decision rule</td>
</tr>
<tr>
<td>Composite Rule 2: TE</td>
<td>Payne (1976)</td>
<td>TTB until two candidates remain, then EQW</td>
<td>After TTB identifies one candidate or after two candidates are evaluated with EQW</td>
<td>TTB decision rule UNLESS two candidates remain, THEN EQW decision rule</td>
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</tbody>
</table>

Together, these decision rules offer a plausible list of suspects for how voters could be using issue information to inform their political decisions. The list includes an intensive, non-heuristic issue-based decision rule (WADD), as well as a variety of heuristic decision rules that have found success in other political and apolitical decision contexts. Additionally, there is good variance in procedure for the heuristic decision rules even though they all share the characteristic of ignoring or simplifying the information environment in some way.

**Expectations**

The various decision rules explored here all propose different ways that voters could be using issue information to inform their political decisions. My expectations are that voters do
use issues in systematic ways to inform their political decisions, but their use of issues is heuristic in nature – simplifying with the intent of efficiency. Voters will be more likely to utilize heuristic rules than the WADD rule, as past work suggests voters behave in a boundedly rational manner (Lau and Redlawsk 2006; Marcus, Neuman, and MacKuen 2000). Voters are often found making political decisions after considering only simple cues or a subset of information (Krosnick 1990; Popkin 1994). This decision-making behavior is preferred by the voter because it allows for a substantial reduction of expended effort for, sometimes, only small loses in accuracy of their decision (Payne, Bettman, and Johnson 1993).

Hypothesis 1: Heuristic rules that simplify the issue environment in some way will be better predictors of vote choice than the WADD rule.

While I expect voters to rely on a variety of heuristic rules when engaging in issue voting, the EQW and TTB rules should be most prevalent. For one, these rules have found stronger support in other decision-making contexts (Payne, Bettman, and Johnson 1993). In addition, these rules are easily applied to the voting environment with evidence of their existence implicit in past work in the form of the tally model for EQW and the issue public for TTB. These two rules also substantially overlap with the decisions made by WADD under conditions of high (TTB) and low (EQW) dispersion of probability weights (Payne, Bettman, and Johnson 1993), meaning that a voter who only cares about a handful of issues (TTB), or a voter who cares about most issues equally (EQW), would almost always reach the same decision as the more informed and effortful WADD rule. This suggests that a large proportion of voters
would obtain little benefit from using the more effortful WADD rule (e.g., Converse 1964; Leeper and Robinson 2018).

Hypothesis 2: EQW and TTB will be the most commonly used heuristic rules for issue voting.

Next, I expect reliance on heuristic rules over the use of WADD increases in likelihood as electoral environments becomes more complex. Voter use of heuristic rules comes from a desire to reduce expended effort when deciding. Therefore, as the total amount of effort that would be required to implement WADD increases, the proclivity for heuristic rule reliance should also increase.

Hypothesis 3: As the electoral environment becomes more complex, use of heuristic rules will increase while use of WADD will decrease.

Finally, I expect that voters will rely on heuristic issue voting strategies to reach political decisions even when powerful non-issue alternative cues are present. Despite its critics, evidence of issue voting has been found in past work, even in the presence of non-issue cues like partisanship (Arceneaux 2008; Boudreau and MacKenzie 2014). A formal study of heuristic issue voting should strengthen these past results by showing that voters do use issues to inform

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5 Electoral complexity can be defined as a combination of many factors of the election context, such as the number of candidates, the number of salient issues, the electoral rules in place, or the amount of time until the election. For these studies, it is operationalized as the number of candidates and issues present in a given election.
their decisions in systematic ways, even when non-issue information shortcuts are available. This hypothesis is only examined in Study 2.

Hypothesis 4: Voters will rely on heuristic issue voting strategies even in the presence of powerful, non-issue-based cues.

The Problem of Studying How Voters Use Issues

Conceptually, we need to examine which decision rule, if any, a voter is using when processing issue information to cast a vote. In practice, however, it is difficult to identify what strategy a decision-maker utilized for any given decision. Unlike typical retrospective survey questions, like vote history, we cannot simply ask respondents to tell us what decision strategy they used to vote. These decision processes may not be known by the respondent, with previous work suggesting that selection of a decision process may come about from cognitive intuition, rather than a deliberate choice (Kruglanski & Gigerenzer 2011; Morton 2000).

Additionally, we cannot easily distinguish decision rules by looking at vote choice in the real world. There are several reasons for this. First, candidates strategically take positions on issues so they can win elections, and this typically involves converging toward broadly popular stances (Ahler and Broockman 2018; Downs 1957). From this, it may look as if citizens care little about issue distinctions among candidates because we cannot observe what would have happened if one candidate took a widely diverging stance on any given issue. This strategic positioning prevents us from being able to study the implicit rules that structure the incentives of elite position taking. Second, coordination within parties—and growing partisan polarization at the elite level—results in candidates of the same party taking similar stances on issues, thus
preventing the public from choosing candidates over a full range of issue combinations. This related point makes it appear as if partisanship is the dominant consideration in vote choice (Tomz and Van Houweling 2009). Finally, as noted above, different decision rules often make the same choice; for example, WADD and EQW are highly correlated when importance weights have low dispersion. This is a problem of observational equivalence—multiple alternative rules result in selection of the exact same candidate. Observational equivalence becomes even more of a nuisance when we include non-issue considerations like partisanship. Even voters who rely primarily on issues will make choices that coincide with decisions based on non-issue considerations, making it appear as though non-issue considerations drove their decision.

My research designs help to mitigate the problem of observational equivalence. Specifically, I generate fictitious candidates that either span the full range of potential issue combinations (Study 1) or are generated deliberately to allow for rule differentiation (Study 2). While the experimental context brings with it the problem of external validity, the difficulty associated with distinguishing these strategies of issue use makes it a valuable tool to complement other approaches (see Tomz and van Houweling 2008 for a similar discussion related to the need for experiments when studying how utility is derived in spatial voting).

Study 1

An experimental survey was conducted on Amazon Mechanical Turk (MTurk) from October 5th to 7th, 2017. Respondents were told they would be completing a survey about their opinions on issues facing the country. In order to be eligible for the survey, respondents needed to be adults living in the United States with an MTurk approval rating of eighty percent or
A total of 1222 surveys were completed. Respondents were paid $3 for completing the survey on October 5th and $2.80 if they completed the survey on the other two days. See the Appendix for additional information about the sample, including descriptive sample statistics and question wording.

Respondents participating in the survey first answered a series of questions on political interest, political knowledge, cognitive traits, partisan ambivalence (Lavine, Johnston and Steenbergen 2012), and issue positions. For the issue position questions, respondents selected from dichotomous stances in fifteen policy areas, then indicated how important each of the policy areas were to them personally on a seven-point scale (Howe and Krosnick 2017; Krosnick and Petty 1995). For example, respondents were asked if they preferred laws covering firearm sales to be more or less strict, then indicated how important firearm regulation was to them.

Following this, respondents participated in six choice tasks, where they were asked to choose their preferred candidate from a set of candidates. Finally, respondents answered demographic questions, as well as questions on partisanship and political ideology.

The six candidate choice tasks proceeded as follows. For each task, respondents were shown a static information grid with candidates displayed in the columns, issues displayed in the rows, and candidate positions for a given issue displayed in the cells. Respondents were told to select their most preferred candidate given this information, as if it were a real election. Each of the six choice tasks varied the number of issues and candidates present, such that each

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6 The first day of data collection did not prevent MTurk users outside the U.S. from partaking in the survey. In order to best account for this error, first day respondents with latitude and longitude coordinates (based on IP addresses) that fell outside of the forty-eight continental states were excluded from all analysis (n = 48). The following two days of data collection oversampled in order to correct for this mistake.
respondent selected a candidate in a three issue by two candidate (3x2) context, as well as a 3x3, 3x6, 6x2, 6x3, and 6x6 context. Across the six choice tasks the average amount of time a respondent spent selecting a candidate varied from a low of 14 seconds for the 3x2 condition to a high of 35 seconds for the 6x6 condition.

Table 2 - Example of a Three Issue X Three Candidate Choice Task

<table>
<thead>
<tr>
<th></th>
<th>Candidate A</th>
<th>Candidate B</th>
<th>Candidate C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Military Spending</td>
<td>Federal military spending should be <strong>decreased</strong> relative to other government programs</td>
<td>Federal military spending should be <strong>increased</strong> relative to other government programs</td>
<td>Federal military spending should be <strong>decreased</strong> relative to other government programs</td>
</tr>
<tr>
<td>Gay Marriage</td>
<td>Same-sex couples should <strong>not be</strong> allowed to marry</td>
<td>Same-sex couples should <strong>be</strong> allowed to marry</td>
<td>Same-sex couples should <strong>be</strong> allowed to marry</td>
</tr>
<tr>
<td>Firearm Regulation</td>
<td>Laws covering firearm sales should be <strong>more strict</strong></td>
<td>Laws covering firearm sales should be <strong>more strict</strong></td>
<td>Laws covering firearm sales should be <strong>less strict</strong></td>
</tr>
</tbody>
</table>

Respondents were asked to select which candidate they would choose if this were a real election. Issues are randomly selected from a set of fifteen issues. Candidate positions are randomly selected to be either a liberal or conservative position.

There were fifteen issue topic areas present in the choice tasks, one for each of the fifteen dichotomous issue position questions respondents were asked about earlier in the survey. For a given choice task, a subset of these fifteen issues was randomly selected to be present. The positions candidates took on each of these issues was either liberal or conservative, reflecting the two possible response options of the fifteen dichotomous issue position questions. Every candidate issue position was also randomly selected for each choice task. This format follows a general conjoint study framework (Ahler and Broockman 2017;
Haimueller, Hopkins, and Yamamoto (2013). Thus, candidate issue positions were independent both across issues and candidates. Table 2 shows an example of a three issue × three candidate (3x3) choice task that randomly sampled military spending, gay marriage, and firearm regulation from the fifteen potential issues.

Dependent variables in the survey were the candidate choices each respondent made in the six choice tasks. In line with work on conjoint experiments, the unit of analysis was the respondent-candidate pair (Hainmueller and Hopkins 2015). The dependent variable is coded one if the candidate was chosen by the respondent and coded as a zero if the candidate was not chosen. Thus, there are N (respondents) × K (candidates) observations for each choice context. To account for potential correlation of errors within respondents, standard errors were clustered at the respondent level using the Huber-White method.

The key independent variables of the study are predictions made by each of the decision rules described in Table 1. Using respondent issue preferences and importance weights on the fifteen dichotomous issue position questions allowed for each decision rule to be simulated for every respondent on all six choice tasks, thus determining which candidate the respondents would have selected had they followed a given rule. For example, WADD simulations took the respondent's stated issue positions and compared them to each candidate issue position in a given choice task. If the candidate position agreed/disagreed with the respondent's position, the candidate's evaluation was incremented/decremented by the level of issue importance the respondent held for that issue (one to seven points). The WADD simulation for that choice task then selected the candidate with the highest weighted-sum evaluation. See the Appendix for full descriptions of how each decision rule was simulated. Each decision rule variable takes on a
value of one if the candidate was chosen by the decision strategy or zero if the candidate was not chosen for each of the N x K observations. In order to simulate these decision strategies for each respondent, issue preference and importance measures had to be captured for each of the fifteen issues potentially present in each choice task. Because of this, item non-responders to issue position or issue importance questions were dropped from the analysis (n = 77), resulting in a final sample size of 1145.

After respondent data was collected, simulations of each decision rule were run for each respondent across all six choice tasks for a total of 61,830 predictions. Table 3 shows the correlational structure of the different rule predictions for the 3x3 choice task. As seen, there is a strong, positive correlation among decision rules. These correlations illustrate how pervasive the issue of observational equivalence is for studying how voters use issues, as whenever multiple rules select the same candidate we are unable to determine which rule a voter was using. It should be noted that these high correlations exist even when candidates’ positions were, by design, uncorrelated with one another. In the much more constrained issue space of real elections, where candidates take strategic positions (Tomz and Van Houweling 2009), this problem is likely more severe. The correlations decrease as the number of candidates increase across choice tasks because additional choices allow the decision rules to

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7 In some situations, simulated decision rules resulted in ties. For example, this occurs when summed unweighted evaluations of multiple candidates are equal under the EQW rule. In these cases, the predictions would take on proportional values. For example, in a three-candidate environment where a decision rule selected both Candidate A and B as potential options, A and B were given values of 0.5 and C was given a value of 0 for the three candidate-respondent pairs. Thus these independent variables are treated as pseudo-continuous, rather than dummy variables.

8 This corresponds to candidate-respondent paired sample sizes of 2290, 3435, and 6870 in the two, three, and six candidate choice tasks, respectively.

9 See the Appendix for correlational structures between the decision rules for the other five choice tasks.
better differentiate themselves. Study 2 uses an alternative experimental framework to further lower these correlations.

Table 3: Correlations of Decision Rule Simulations for the 3 Issues X 3 Candidates Choice Task

<table>
<thead>
<tr>
<th></th>
<th>WADD</th>
<th>EQW</th>
<th>TTB</th>
<th>FGBF</th>
<th>TW</th>
<th>TE</th>
</tr>
</thead>
<tbody>
<tr>
<td>WADD</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EQW</td>
<td>0.88</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TTB</td>
<td>0.78</td>
<td>0.67</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FGBF</td>
<td>0.57</td>
<td>0.66</td>
<td>0.37</td>
<td>1.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TW</td>
<td>0.51</td>
<td>0.42</td>
<td>0.60</td>
<td>0.34</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>TE</td>
<td>0.51</td>
<td>0.43</td>
<td>0.61</td>
<td>0.37</td>
<td>0.91</td>
<td>1.00</td>
</tr>
</tbody>
</table>

Each off-diagonal row represents the correlation coefficient between two decision rules for the 3 Issues X 3 Candidate choice task. Correlations are higher for rules that consistently select the same candidate as one another across the different respondent choice environments. Observations are at the respondent-candidate level. Correlation tables for the other five choice tasks can be found in the Appendix.

To test the three hypotheses, a series of binary logistic regressions are used to estimate the association of each decision rule with the actual decisions made by respondents (H1 & H2). Separate regression models were run for all six choice tasks to assess the extent to which task complexity impacts the use of decision rules (H3). Positive, significant values of decision rule coefficients indicate that the predictions made by a given rule are associated with actual decisions by respondents in a given context, after taking into consideration the variation explained by the other strategies in the model. More concretely, these coefficients are measures of how good each rule is as a classifier — with the coefficient value representing the difference in the log-odds that an individual selected a candidate when the rule predicts selection of that candidate compared with when the rule does not predict selection.

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10 I am also working on replicating these results with an alternative approach that relies on Bayesian cognitive modeling (see Lee and Wagenmakers 2014).
Figure 1 shows the association between each decision rule and respondent choice across the six choice tasks. First, notice that WADD does a poor job of classifying how respondents make decisions. Across the six choice tasks, WADD is only significantly associated with respondent choice (after controlling for other rules) in the 6x3 task (p = 0.00). As for the heuristic decision rules, we see some context-based variation in success, but most of the variation is across rules rather than across context. The EQW and TTB rules were significantly associated with respondent choice across five and six choice tasks respectively, and FGBF was significantly associated with choice across four of the tasks. The composite rules (TW and TE) were poor classifiers, with TE only significantly associated with respondent choice in the 3x6 choice task (p = 0.04) and TW never being significantly associated with respondent choice. A supplementary analysis (see Appendix) was run by dropping FGBF and the two composite rules from the analysis. After removing the two composite rules, which had extremely high correlations with WADD and EQW, conclusions about WADD remain the same, however EQW becomes an even better classifier and is significantly associated with candidate choice in all six choice tasks.
This figure shows the association of each simulated decision rule with respondent choice across the six different choice tasks. Coefficients are in logit space with 95% confidence bounds. Positive coefficients indicate a given decision rule is a strong classifier of how respondents made decisions after controlling for the variance from the other rules. Standard errors are clustered at the individual level for cluster sizes of two, three, and six for choice tasks with two, three, and six candidates. This gives total sample sizes of 2290, 3435, and 6870 for figures in rows one, two, and three, respectively.
These results provide strong evidence for Hypothesis 1, as the decision rules most associated with respondent choice across the tasks were heuristic in nature, either by omitting some combination of information related to weights (EQW), candidate stances on certain issues (TTB), or candidates altogether (FGBF). There is also good evidence for Hypothesis 2, with EQW and TTB being positively associated with respondent choice across every task. Context, however, appeared to not play much of a role – providing evidence against Hypothesis 3. WADD did not become less associated with respondent choice as processing costs in the tasks increased because even in the simplest choice task, where respondents viewed two candidates taking dichotomous positions on three issues, WADD was not predictive of the decisions actually made. In combination, these results suggest that voters use issues in imperfect, but still systematic ways that simplify the issue environment.

Questions remain from this study, however. First, the design of the choice tasks was meant to alleviate the problem of observational equivalence between different decision rules but in practice the correlations between rules are still very high. These high correlations reduce the power of the study and thus increase uncertainty in estimates. Second, this study excluded all non-issue considerations. In reality, there are a variety of non-issue considerations that voters might rely on to make decisions, such as partisanship. Do voters engage with issues using heuristic decision rules even when powerful non-issue considerations are available? To address these drawbacks, a second study was conducted with design features that further mitigate observational equivalence and also allow for a decision rule based on non-issue considerations.
Study 2

The second study was conducted through Lucid, a survey marketplace, from January 2\textsuperscript{nd} to January 3\textsuperscript{rd}, 2019. Eligibility requirements were similar to the first study; respondents had to be adults living in the United States. A total of 818 surveys were completed, with the final sample size being narrowed down to 723 individuals.\textsuperscript{11} All respondents were paid $1.00 for completing the survey. See the Appendix for additional information about the sample descriptive statistics and question wording.

The flow of the second survey worked similar to Study 1, but with slightly less content. Respondents first answered questions about their political interest, political knowledge, cognitive traits, political identity (Huddy, Mason, and Aaroe 2015), and issue positions.\textsuperscript{12} The issue position questions were structured in the same way – binary preference questions followed by seven-point issue importance questions. Study 2 only featured ten issue positions, whereas Study 1 included fifteen.\textsuperscript{13} Following all of this, respondents then engaged in ten choice tasks and concluded the survey by answering some demographic questions.

Presentation of the choice tasks in Study 2 was identical to Study 1, but with the addition of four choice tasks. These new tasks added an additional row for each candidate that included their partisanship, as shown in Table 4. This allows for each issue-based decision rule

\textsuperscript{11} 24 respondents were removed for failing a `bot check' where they were asked to select every image that included a stop sign from a set of six images. An additional 31 respondents were removed for failing or not answering a quality check, where they were asked a multiple-choice question on who the President of the United States is. Finally, 40 respondents were removed for lacking information about issue preferences – a requirement for decision rule simulation, similar to Study 1.

\textsuperscript{12} Study 1 asked questions related to Need for Cognition and Need for Affect, whereas Study 2 only asked questions related to Need for Cognition.

\textsuperscript{13} The issue positions dropped were religious belief in the workplace, the minimum wage, education, jobs, and affirmative action.
to be compared to a party cue rule (Party), where a voter selects whichever candidate identifies with the same party as themselves – ignoring candidate issue positions entirely.\textsuperscript{14} Overall, the ten choice tasks viewed by respondents were the same structure as the six tasks viewed in Study 1 (3x2, 3x3, 3x6, 6x2, 6x3, and 6x6) along with four party contexts (3x2 with party (3x2p), 3x3p, 6x2p, and 6x3p). To induce a level of realism, the two-candidate party contexts always had one candidate take the Democrat party label, while the other would take the Republican label. In the three-candidate party contexts, the third candidate would take an Independent label.\textsuperscript{15} The order of party labels in all instances was randomly assigned.

\textsuperscript{14} Note that Party makes no prediction whenever the respondent identifies as an Independent on the standard seven-point party identification question.

\textsuperscript{15} Six-candidate party conditions were not included due to lack of realism. In addition, the party cue rule only makes firm predictions when only one candidate agrees with the voter’s party, so this rule could not be distinguished in a Primary context.
Table 4 - Example of a 3x3 Choice Task that includes Partisanship

<table>
<thead>
<tr>
<th></th>
<th>Candidate A</th>
<th>Candidate B</th>
<th>Candidate C</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Party</strong></td>
<td>Democrat</td>
<td>Republican</td>
<td>Independent</td>
</tr>
<tr>
<td>Military Spending</td>
<td>Federal military spending should be <strong>decreased</strong> relative to other government programs</td>
<td>Federal military spending should be <strong>increased</strong> relative to other government programs</td>
<td>Federal military spending should be <strong>decreased</strong> relative to other government programs</td>
</tr>
<tr>
<td>Gay Marriage</td>
<td>Same-sex couples <strong>should not be</strong> allowed to marry</td>
<td>Same-sex couples <strong>should be</strong> allowed to marry</td>
<td>Same-sex couples <strong>should be</strong> allowed to marry</td>
</tr>
<tr>
<td>Firearm Regulation</td>
<td>Laws covering firearm sales should be <strong>more</strong> strict</td>
<td>Laws covering firearm sales should be <strong>more</strong> strict</td>
<td>Laws covering firearm sales should be <strong>less</strong> strict</td>
</tr>
</tbody>
</table>

Respondents were asked to select which candidate they would choose if this were a real election. Issues are randomly selected from a set of ten issues. Candidate issue positions are randomly selected to be either a liberal or conservative position. Candidate partisanship is dependent on other candidates, with always one Democrat and one Republican, and one Independent in three candidate choice tasks. Candidate partisanship is always the first row of the four party choice tasks, whereas the order of all issue rows is randomized.

Study 2 improves upon the choice task framework of Study 1 with respect to observational equivalence. In Study 1, each choice task was randomly generated, with a subset of the fifteen possible issues selected and candidates randomly taking binary positions on those issues. Following this, respondents made choices. After all the data was collected, simulations of each decision rule were run over the choice tasks that respondents saw, which allowed each decision rule to make a prediction. The drawback, as shown in Table 3, was that respondents were often shown choice tasks where, given their preferences, multiple decision rules would select the exact same candidate.
Study 2 helped to mitigate this problem by running simulations of decision rules across randomly generated choice tasks during the survey, to see if an observationally equivalent result would occur between decision rules; making adjustments when necessary. More specifically, respondents were randomly assigned to an ‘isolated rule’, such that, given their preferences, they saw a choice task that results in one of the simulated decision rules selecting a candidate that none of the other decision rules would choose. Therefore, respondents are given a choice task where one decision rule makes an isolated decision from all of the other decision rules. To accomplish this, random choice task environments are created until one is found such that simulations of the decision rules on the choice task result in the isolation condition being met.

To clarify, the following steps occur before the respondent views a choice task, with all steps being unknown to the respondent. First, the respondent is randomly assigned a decision rule to make an isolated decision. Second, a random choice task environment is generated. Third, using the respondent’s preferences, each decision rule is simulated over the choice task to see which candidate the respondent would choose if they were using each rule. Fourth, we check to see if the decision rule that was intended to be isolated chooses a candidate that none of the other decision rules chose. If this isolation condition is met, the respondent is shown the choice task. However, if the isolation condition is not met, steps two through four repeat until the isolation condition is met. For example, if a respondent was assigned to have WADD

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16 If more than 10,000 simulations were run for a given isolation condition with no success, the respondent would be randomly assigned to receive a new isolation condition. Under certain preferences, rules may be unable to be isolated from one another. For example, if a respondent indicates that every issue is ‘Extremely Important’ to them, then WADD can never be isolated from EQW because every issue is given the exact same weight.
isolated in the 3x2 choice task then, unaware to the respondent, potentially thousands of random choice tasks would be generated until one was created such that, given the respondent’s preferences, WADD selected one candidate and the other decision rules selected the other candidate.

The decision rules experimentally isolated in Study 2 were WADD, EQW, TTB and the Party rule (only in the four party choice tasks). There was also an ‘Other’ condition where all three (four in party choice tasks) of these rules would not select a certain candidate. This subset of the full rules discussed in Table 1 were selected for two reasons. First, the primary expectations for use of the heuristic rules are with respect to EQW and TTB (H2), as these two rules are made up of components that have been used to understand simplified issue voting in past work (the tally model and issue public respectively). Second, it becomes computationally more difficult, and sometimes impossible, to isolate a given decision rule as the number of rules it must be distinct from increases. For each additional rule considered, isolation requires more specific conditions of the environment to be met. While the other decision rules are plausible, and some evidence was found for their use in Study 1, their omission from being isolated in the experimental design was necessary. As will be shown below, only isolating a subset of the decision rules still allows for substantial decreases in collinearity among rule choices. In addition, the other rules are still considered for the first portion of the overall analysis. To avoid confusion, from here the rules with isolation conditions (WADD, EQW, TTB, and the Party rule) will collectively be referred to as the ‘isolated rules’.

In total, 723 respondents each participated in 10 choice tasks for 7230 total choices made. The 7230 choice tasks viewed represented 0.0001% of the 55,120,878 simulated choice
tasks that were created. Table 5 shows the correlational structure of decision rules for the 3x3 choice task. Comparing these numbers to Table 3, we see that correlations between the isolated rules (rules that were given explicit isolation conditions) are substantially lower compared to Study 1. Even some of the correlations between rules not explicitly isolated exhibit lower correlations, though this is not always the case. These decreased correlations allow us to reproduce the analysis from Study 1 with a higher level of certainty for how good of a classifier each decision rule is for respondent vote choice, as the isolated rules now make distinct predictions more often.

Table 5: Correlations of Decision Rule Simulations for the 3 Issues X 3 Candidates Choice Task

<table>
<thead>
<tr>
<th></th>
<th>WADD</th>
<th>EQW</th>
<th>TTB</th>
<th>FGBF</th>
<th>TW</th>
<th>TE</th>
</tr>
</thead>
<tbody>
<tr>
<td>WADD</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EQW</td>
<td>0.61</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TTB</td>
<td>0.26</td>
<td>0.12</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FGBF</td>
<td>0.49</td>
<td>0.88</td>
<td>0.00</td>
<td>1.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TW</td>
<td>0.20</td>
<td>0.05</td>
<td>0.95</td>
<td>-0.01</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>TE</td>
<td>0.20</td>
<td>0.05</td>
<td>0.95</td>
<td>-0.01</td>
<td>1.00</td>
<td>1.00</td>
</tr>
</tbody>
</table>

Each off-diagonal row represents the correlation coefficient between two decision rules for the 3 Issues X 3 Candidate choice task. Correlations are higher for rules that consistently select the same candidate as one another across the different respondent choice environments. Observations are at the respondent-candidate level. Correlation tables for the other five choice tasks can be found in the Appendix.

Figure 2 shows the association between each decision rule and respondent choice across the six choice tasks that do not include party cues, reflecting the analysis of Figure 1. Similar to Study 1, we see that the heuristic rules EQW and TTB are positive and significant classifiers of respondent choice for every choice task environment. In addition, we see the two

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17 See the Appendix for more details on the number of simulations by isolated rule conditions. Pre-survey simulations of the ‘isolation condition’ concept revealed that certain isolation conditions would be harder to attain than others. Because of this, isolation conditions were not randomly assigned with equal proportions. In the six choice tasks that did not include party cues WADD and EQW were each assigned with probability 1/3, while TTB and error were each assigned with probability 1/6. In the four choice tasks with party cues WADD and EQW were each assigned with probability 2/7, while TTB, the Party rule, and error were each assigned with probability 1/7.

18 See the Appendix for correlation tables for all 10 choice tasks.
composite rules, TW and TE, are again poor classifiers for respondent choice. In contrast to Study 1, FGBF sees much less success as a classifier; the rule is only positively associated with choice in the 3x6 choice task, whereas it was positively associated with vote choice in four of the six tasks of Study 1. In addition, WADD, which was a highly unsuccessful classifier in Study 1, is positively associated with vote choice in five of the six choice tasks, though often to a smaller magnitude than EQW. The unexpected differences between studies for FGBF and WADD may be due to the use of isolation conditions. FGBF was never intentionally isolated for and WADD was, creating more uncertainty around the former and less around the latter with respect to this type of analysis.
Figure 2: Association of Decision Rules with Respondent Candidate Choice Across No Party Cue Contexts

This figure shows the association of each simulated decision rule with respondent choice across the six choice tasks that did not include party cues. Coefficients are in logit space with 95% confidence bounds. Positive coefficients indicate a given decision rule is a strong classifier of how respondents made decisions after controlling for the variance from the other rules. Standard errors are clustered at the individual level for cluster sizes of two, three, and six for choice tasks with two, three, and six candidates. TE is dropped from all three issue choice tasks and TW is dropped from the 3x2 choice task because of perfect multicollinearity (see Appendix).
Figure 3 displays a similar analysis for the four choice tasks that included partisanship for each of the candidates. This analysis is limited to only include respondents who claimed non-independent partisanship, as the Party rule cannot make predictions for someone who is independent. To reiterate, the Party rule always selects the candidate whose party agrees with the respondent, while the issue-based decision rules do not consider partisanship whatsoever when making decisions. Unsurprisingly, the Party rule is always positively associated with respondent choice. We also see however, that EQW and TTB are positively associated with respondent choice in every choice task, even with the inclusion of non-issue information. This provides stronger evidence for the use of issue-based heuristic decision rules, as we see respondents appear to be using these rules even when non-issue cues are available to them (H4). Overall, we continue to see support for H2 and failure for H3 even with the presence of non-issue information. However, the second study makes it less clear that WADD is used outright less than the heuristic decision rules (H1), as there is some evidence that it is positively associated with respondent choice. Fortunately, the experimental design of Study 2 allows us to go beyond the analysis strategy of Study 1 to give us a better idea of the proportion of respondents relying on each of the isolated rules.
This figure shows the association of each simulated decision rule with respondent choice across the four choice tasks that did not include party cues. The analysis only includes partisans, allowing the Party rule to make distinct predictions. Coefficients are in logit space with 95% confidence bounds. Positive coefficients indicate a given decision rule is a strong classifier of how respondents made decisions after controlling for the variance from the other rules. Standard errors are clustered at the individual level for cluster sizes of two and three for choice tasks with two and three candidates. TE is dropped from the three issue choice tasks and TW is dropped from the 3x2p choice task because of perfect multicollinearity (see Appendix).

The unique introduction of the isolation condition to this experiment, where one (or none in the ‘Other’ condition) of the isolated rules always selects a candidate none of the other
isolated rules pick, allows us to calculate the proportion of respondents using a decision rule, given that rule makes an isolated decision.\(^\text{19}\) For example, we can estimate the proportion of respondents who use EQW in choice tasks where EQW selects a unique candidate from the other isolated rules (i.e. EQW is isolated) by taking the proportion of respondents who chose that unique candidate over all other candidates. We can also take advantage of the Other condition to get an estimate of how often the isolated rule set is not utilized by respondents. This would just be the proportion of respondents who selected a candidate that none of the isolated rules selected. Selecting a candidate that none of isolated rules selected would represent either the use of a rule other than the isolated rules, such as FGBF, or a failed attempt to use one of the isolated rules, such as by making a computational mistake.

Table 6 shows proportions of respondents selecting the candidate chosen by a given rule conditional on it being isolated, along with an overall estimate of error, for each choice task.\(^\text{20}\) We see that, for example, in the 6x2 choice task, when EQW selects one candidate and the other isolated rules select the other candidate, 52% of respondents selected the same candidate that EQW would predict them to select. This analysis shows similar patterns to the figures above – EQW appears to be the most used decision rule for navigating the issue environment, even with the presence of party cues. Moreover, TTB is also used by a substantial subset of respondents. Indeed, TTB is typically as, or more, influential than WADD and partisanship. The table also suggests that the successful use of at least one of these rules is

\(^{19}\) See the Appendix for descriptive statistics showing how often each of the isolated rules was experimentally isolated, as well as how often it was conditionally chosen given it was isolated.

\(^{20}\) See the Appendix for 95% uncertainty estimates calculated by performing a 10,000 sample non-parametric bootstrap.
quite high, with the Other column being below 30% in every choice task outside of the most complex and cognitively demanding six-issue, six-candidate task.

Table 6: Conditional Rule Use Proportions by Isolation Conditions

<table>
<thead>
<tr>
<th></th>
<th>WADD</th>
<th>EQW</th>
<th>TTB</th>
<th>Party</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>3x2</td>
<td>0.25</td>
<td>0.64</td>
<td>0.38</td>
<td>NA</td>
<td>0.18</td>
</tr>
<tr>
<td>3x3</td>
<td>0.35</td>
<td>0.55</td>
<td>0.37</td>
<td>NA</td>
<td>0.12</td>
</tr>
<tr>
<td>3x6</td>
<td>0.31</td>
<td>0.48</td>
<td>0.27</td>
<td>NA</td>
<td>0.29</td>
</tr>
<tr>
<td>6x2</td>
<td>0.46</td>
<td>0.52</td>
<td>0.37</td>
<td>NA</td>
<td>0.22</td>
</tr>
<tr>
<td>6x3</td>
<td>0.38</td>
<td>0.43</td>
<td>0.29</td>
<td>NA</td>
<td>0.18</td>
</tr>
<tr>
<td>6x6</td>
<td>0.21</td>
<td>0.32</td>
<td>0.20</td>
<td>NA</td>
<td>0.38</td>
</tr>
<tr>
<td>3x2p</td>
<td>0.23</td>
<td>0.46</td>
<td>0.29</td>
<td>0.16</td>
<td>0.16</td>
</tr>
<tr>
<td>3x3p</td>
<td>0.16</td>
<td>0.54</td>
<td>0.27</td>
<td>0.21</td>
<td>0.12</td>
</tr>
<tr>
<td>6x2p</td>
<td>0.35</td>
<td>0.37</td>
<td>0.28</td>
<td>0.21</td>
<td>0.17</td>
</tr>
<tr>
<td>6x3p</td>
<td>0.24</td>
<td>0.35</td>
<td>0.23</td>
<td>0.21</td>
<td>0.16</td>
</tr>
<tr>
<td>Average</td>
<td>0.29</td>
<td>0.47</td>
<td>0.30</td>
<td>0.20</td>
<td>0.20</td>
</tr>
</tbody>
</table>

This table shows estimated proportions of each decision rule usage for each choice task conditional on the given rule being isolated. The Other rate represents the proportion of respondents in each choice task who chose a candidate that none of the isolated rules selected, given there was at least one candidate for which this was true.

Overall, the analysis from Study 2 has bolstered much of the analysis from Study 1. There is substantial evidence that respondents use heuristic strategies for issue voting. EQW and TTB, two especially important heuristic rules in past work, stand out as strong classifiers for how voters use issues. Use of the more informed and effortful WADD rule is mixed between the two studies. While Study 1 finds no evidence that voters use this rule, Study 2 provides evidence that it may be as commonly employed as TTB; though both WADD and TTB typically fall short of EQW as a classifier in both studies. Finally, this study provided evidence that these issue-based decision rules are employed even when powerful non-issue information is available for decision-making. While the party cue rule was a significant classifier of respondent choice, it
did not overwhelm the impact of the issue-based rules, indicating that a substantial proportion of the electorate engages with issue information even when political identity cues are present.

**Discussion**

These two studies show, across a variety of electoral choice tasks, that issue-based heuristic decision rules are associated with voter choice. Study 2 showed that this conclusion holds even when non-issue information, partisanship, is available. In contrast, the more intensive WADD decision rule, which puts substantial cognitive and motivational expectations on voters, found mixed results across the studies and was not more prevalent than the two most common heuristic rules (EQW and TTB). These trends persisted across both studies regardless of the complexity of the task environment. Overall, these studies imply that the literature should not frame vote choice as issues *versus* heuristics. Rather, heuristic voters can be issue voters. The upshot is that a significant proportion of the electorate may engage in issue voting despite substantial cognitive and motivational constraints (Gigerenzer and Selten 2002; Payne, Bettman, and Johnson 1993).

In particular TTB and EQW, two heuristic decision rules well equipped to handle the political context, suggest promising avenues for future work on issue voting. These two rules have found considerable success predicting decision-making behavior in other contexts (e.g. Gigerenzer and Todd 1999) and can be nearly as accurate as the WADD rule in decision environments that contain low and high levels of importance weight dispersion, respectively (Payne, Bettman, and Johnson 1993). In addition, their existence has been explored to an extent in the past through the issue public (TTB) and tally (EQW) models of voting. This more
systematic study of issue voting, which considers use of a variety of heuristic strategies at once, has found that these two strategies account for a significant proportion of variation in voter decision-making, even when considering other possibilities.

One limitation to these studies' conclusions about how voters engage in issue voting is that the information within the choice tasks was restricted to either only issue information, or issue information with a single party cue. There are non-issue considerations outside of partisanship that individuals may consider when deciding on their vote, such as candidate traits (Fridkin and Kenney 2011) or viability (Lau and Redlawsk 2006). Future work should consider these alternatives as well. Nonetheless, partisanship is the dominant alternative to spatial models in the literature (Campbell et al. 1960), and the fact that heuristic issue voting survives this test is strong evidence for its importance.

Future work can also improve upon the external validity of these studies. The experiments selected candidate positions on issues in ways that are unrealistic in typical contexts. In reality, emphasized issues are chosen by campaigns, issue positions are positively correlated within candidates and within parties, and parties show little overlap in positions. This sacrifice of realism is important to the present design, as it reduces problems of observational equivalence by allowing the candidates full range over the issue space. Yet the external validity critique needs to be taken seriously and alternative designs should be used in future work to supplement the present studies. For example, methods such as process-tracing could be used to observe respondent use of different issue-based strategies in environments that are more representative of real-world elections (Lau, Kleinberg, Ditonto 2018).
Finally, it is important to emphasize that I am not proposing rules such as EQW and TTB are the exact ways in which voters navigate the issue environment to determine their vote choice. Just as various spatial models are useful simplifications of a more complex reality, these heuristic rules are models intended to capture important regularities in how voters decide. These studies provide good evidence that a substantial proportion of citizens use decision strategies that are well-approximated by EQW and TTB. And importantly, these studies suggest very few voters consider every bit of relevant issue information in casting their votes. Rather, voters use only a subset of the available information in terms of issues, importance weights, and/or candidate profiles. Moreover, while non-issue criteria, like partisanship, may also influence decisions, voters rarely ignore issues altogether.

Taken together, the results of these studies suggest that voters use shortcuts and other information saving strategies to glean issue information for their electoral decisions. One may conclude that this does not bode well for democratic accountability because it suggests that voters may skip over important issue information and ultimately decide on a candidate that is not best for them (Bartels 1996; Lau and Redlawsk 1997). However, these glum conclusions need not be drawn. Scholars exploring heuristic decision making in psychology, provide evidence that heuristics often perform comparably to normative benchmarks (Payne, Bettman and Johnson 1993) and, in some cases at least, the use of less information can actually generate better decisions overall (Mousavi, Gigerenzer, and Kheirandish 2016). Voting 'correctly' (Lau and Redlawsk 1997) does not necessarily require a voter to engage in the highly accurate but effortful WADD rule, as is evident by the high correlations between the rules. Indeed, even if
citizens use, say, TTB in all environments, they will ‘get it right’ a large percentage of the time, and with much less effort expended.
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Kruglanski, Arie W., and Gerd Gigerenzer. ""Intuitive and deliberate judgments are based on common principles": Correction to Kruglanski and Gigerenzer (2011)." (2011): 522.


