The More You Know: Voter Heuristics and the Information Search

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Abstract Informed voting is costly: research shows that voters use heuristics such as party identification and retrospection to make choices that approximate enlightened decision-making. Most of this work, however, focuses on high-information races and ignores elections in which these cues are often unavailable (e.g. primary, local). In these cases, citizens are on their own to search for quality information and evaluate it efficiently. To assess how voters navigate this situation, we field three survey experiments asking respondents what information they want before voting. We evaluate respondents on their ability to both acquire and utilize information in a way that improves their chances of voting for quality candidates, and how this varies by the sophistication of respondents and the offices sought by candidates. We find strong evidence that voters use "deal-breakers" to quickly eliminate undesirable candidates; however, the politically unsophisticated rely on unverifiable, vague, and irrelevant search considerations. Moreover, less sophisticated voters also rely on more personalistic considerations. The findings suggest that voters' search strategies may be ineffective at identifying the best candidates for office, especially at the local level.

Keywords information search, heuristics, local elections, nonpartisan elections, primaries

Scholars of public opinion broadly accept that when American citizens venture to the polls to vote for president, they bring to bear something far less than the full range of candidate information publicly available (Achen and Bartels 2017, 1-4). The average voter is often too preoccupied with the demands of daily life to pay attention to the intricacies of a campaign. Though this behavior appears to pose a challenge to obtaining good representation, scholars argue that heuristics allow voters to use a very limited amount of knowledge to cast an as-if-informed vote (Gigerenzer, Czerlinski, and Martignon 1999; Lau and Redlawsk 2001a). In high-profile presidential elections, voters likely carry key cues, such as the candidates' partisan affiliation or endorsements received, with them into the voting booth. What happens, however, in the case of local, non-partisan, or primary elections? How do voters search for information about candidates in these comparatively low-information environments, and how does this search process impact the quality of their decision-making?

If voters know little about even many presidential candidates, the information environment for races like county comptroller is likely magnitudes worse (cf. Oliver and Ha 2007). In these situations, a voter may know nothing other than the candidates' names, and then only because they are printed on the ballot. A sense of civic duty may compel voters to attempt to make an informed choice, but every voter has competing demands on their time (Downs 1957, 139). In this circumstance, many of us may conduct a brief Google search on our smartphone or leaf through a voter guide to determine our vote. Yet however commonplace this scenario is, little research examines this stage of the voting process (Lau, Kleinberg, and Ditonto 2018).

Deficiencies in voters' search strategies could diminish the quality of representation in several possible ways (Redlawsk 2004), yet scant research examines whether voters search for information that predicts actual job performance. For instance, the criteria they choose to base

their decision on may be irrelevant to the duties of the office, impossible to verify in a short amount of time, or too generalized to produce useful information. While more interested and more knowledgeable voters may be more likely to conduct thorough, "rational choice"-style searches (Lau, Kleinberg, and Ditonto 2018), not all voters will.

We conduct a simple set of experiments to explore how voters search for information. We pose a fictional candidate to survey respondents and randomize the offices candidates run for (including both high-profile positions like president and governor, as well as local offices like mayor, comptroller, clerk, and judge). We then ask respondents in open-ended questions what information they would want in order to cast an informed vote for that candidate, and how their likelihood of voting for him or her changes depending on whether they find the new information encouraging or disappointing. From the resulting data, we evaluate the content and quality of the information desired by respondents, as well as their ability to request information that efficiently winnows the list of acceptable candidates. We focus on how these things vary by both the sophistication of respondents and the office being considered. While our approach is not without drawbacks, we believe it largely mirrors the experience of the average voter searching for information about a long list of obscure candidates.

In these three survey experiments, which utilize the same design across different samples, we find evidence that respondents are informationally efficient. After requesting information, voters employ what we call a "deal-breaker" heuristic, in which they evaluate whether candidates from a list meet their most important criterion, and harshly penalize those who do not. In contrast, respondents only slowly warm to candidates who meet the criteria. However, this apparently good news for democracy comes with a caveat: the actual information that citizens seek out varies greatly depending on the voter's political knowledge and education.

Sophisticated respondents make "good" information requests that are relevant to the office, verifiable through a brief search, specific enough to reveal something useful, and focused on candidates' politics and/or experience; less sophisticated voters are more likely to ask questions that are irrelevant, unverifiable, and vague, especially regarding candidates for lesser known offices.

Moreover, citizens belonging to political demographics that typically lack political knowledge are almost as likely to search for characteristics of the candidates themselves, such as their age, religion, or perceived personality traits ("likeable," "speaks his mind") as they are to search for policy or political cues like endorsements. In other words, the informed look for programmatic representatives, while the uninformed look for personalistic representatives. Such findings pose new concerns about citizens' ability to obtain good representation. Some candidates may be able to win elections despite poor performance in (or qualification for) office by playing up likeable aspects of their personality and life.

Searching for Quality Representation

To obtain good political representation, citizens must possess information with which they are able to discriminate between desirable and undesirable candidates, and if they lack this information, they must ask good questions to acquire it.[1] While our project focuses primarily on information search *strategies* (how the information is acquired and used), the information *content* voters seek out will also vary based on what they believe to be "good" representation. Although many kinds of representation are possible (Pitkin 1967), we focus here on substantive representation, or congruence between the policies desired by constituents and those pursued by

[1] Voters must also know how to effectively process and utilize this information, a skill lacking even amongst the knowledgeable, as argued by Cramer and Toff (2017).

the representative.[2] Given the consensus among normative theorists that substantive representation lies at the heart of high-functioning democracy, when we evaluate whether citizens are able to search out information that allows them to secure "good" political representation, we assume that good representation means substantive representation. Throughout, we consider substantive representation to mean both programmatic or ideological representation on issues, but also—in the case of local offices that may not be "programmatic," but instead technocratic—competent execution of office responsibilities. What information, then, would voters need to assess whether a candidate represents their substantive interests?

Voters' Information Search: Strategies and Content

Scholars widely regard the high cost to voters of acquiring full information as an impediment to democratic accountability. The vast majority of the evidence, dating back to at least Berelson et al. (1954), suggests that most individuals fall short of fully informed, fully rational voting behavior. Instead, our behavior reveals that we are cognitive misers attempting to maximize the utility of the limited information we do have while avoiding the time-consuming search needed to enact a fully informed vote (e.g., Conover and Feldman 1984; Conover and Feldman 1989; Redlawsk 2004; Lau, Kleinberg, and Ditonto 2018).

[2] Perhaps the clearest consequence of our focus on substantive representation is obscuring voters' desire for descriptive representation –the congruence between the demographic characteristics of the representative and the represented (Pitkin 1967). Of course, given the underrepresentation of women and minorities, especially at higher offices, it would be reasonable for concerned voters to prioritize descriptive representation of such groups. Scholars typically argue that descriptive representation is valuable to the extent that someone like them is more likely to pursue their key substantive goals, or to the extent that having a fellow group member in office secures symbolic benefits for the group. A descriptively congruent representative, for instance, may be more likely to represent in the way Mansbridge (2003) refers to as gyroscopic — pursuing what constituents desire because it is what they themselves desire. In real life, however, voters may face tradeoffs between descriptive and substantive representation (Mansbridge 1999, Dovi 2002). Some evidence suggests in-group members choose substantive over descriptive representation, given a conflict between the two(Lerman and Sadin 2014).

Given this reality, the political science literature on heuristics examines the strategies by which voters attempt to approximate full information given limited information. While some research finds that heuristics work very well (Lupia 1994), and others show they work very poorly (Bartels 1996), most studies tend to fall somewhere in the middle. Certain types of strategies, such as "Take-the-Best" or "Minimalist" heuristics, seem to work well (Gigerenzer, Czerlinski, and Martignon 1999), especially when aggregated across individuals (Kuklinski and Quirk 2000; Gilens 2011), and in certain conditions, such as when there are few candidates with clear positions (Lau and Redlawsk 1997). Take-the-best, in particular, requires a decision between only two alternatives, and prior knowledge about those alternatives on a number of criteria considered important to the individual.

The literature on heuristics thus stands in contrast to much of the research on vote choice in that it focuses on voter efficiency, rather than information content; the latter attempts to identify the characteristics of candidates—their past performance, policy platforms, and personal qualities—that carry the greatest weight in voters' minds. Many studies find that candidates' personal traits predict both voters' assessments of the candidates and candidates' eventual electoral success (Miller, Wattenberg, and Malanchuk 1986; Funk 1997; Funk 1999). Others have found that demographic characteristics seem to influence voter attitudes towards candidates (Goggin NP), and some traits, such as gender, may moderate which other traits are considered important (Ditonto 2016; Ditonto, Hamilton, and Redlawsk 2014). Still others find little relationship between the traits respondents claim matter and the traits that predict votes, except for incumbent presidents (Kinder et al. 1980). Respondents frequently have trouble identifying where candidates stand on specific issues (Freeder, Lenz, and Turney 2018), especially in low-salience or local elections, ensuring little academic consensus on whether and how issues matter

to all but the most informed voters. Finally, voters do seem to care about past performance, termed "retrospective voting," though this literature is too voluminous to address in detail here (see Healy and Malhotra 2013 for review). Yet we know little about how retrospective voting operates at the local level, especially given the comparative difficulty of assessing the performance of more technocratic and nonpartisan offices.[3]

Unsurprisingly, many studies find that voters' political sophistication and education affects both the content sought (Pierce 1993 is one exception) and the process by which voters sort through the information available (Lau, Kleinberg, and Ditonto 2018). While early analyses of voting behavior argued that educated voters should be less concerned with candidates' personal attributes, Glass (1985) and Miller et al. (1986) find the opposite to be true. Funk (1997) finds that only sophisticated voters prefer candidate competence (a personal trait linked to job performance) to warmth. Similarly, Gomez and Wilson (2001) find that more sophisticated voters are more capable of retrospective voting. Sophistication not only affects the content of voters' opinions, but how they form those opinions. Lau and Redlawsk (2001a) find that more sophisticated voters better use heuristics; likewise, McGraw and Pinney (1990) and Krosnick and Milburn (1990) show that political sophistication (general and domain-specific, and objective and subjective, respectively) matters to information acquisition and opinion formation. More pointedly, Delli Carpini and Keeter (1993) state that "factual knowledge is the best single indicator of sophistication" (1180), and moderates a large number of attitudinal and behavioral outcomes of interest. In short, "all things being equal, the more informed people are, the better

[3] The key question for the current project is whether voters know enough about even the functions of such offices to make retrospective considerations. Although we do not report the results in the main body of the paper, we show in SI Section 1.4 that, for all the offices we pose to respondents, a majority of respondents successfully identify key responsibilities of the office in question, suggesting that many voters can indeed engage in local retrospective voting, should they so choose. Nonetheless, due to considerations of length, we do not examine here how frequently voters engage in retrospective voting at the local level.

able they are to perform as citizens" (Delli Carpini and Keeter 1996, 219). As with the vote choice literature, however, little work examines whether voter sophistication also affects decision-making about local candidates, and to our knowledge, there is no scholarship examining whether it affects information acquisition strategies.

Voting With a Blank Slate

Despite behaviorists' emphasis on the costs of acquiring full information, the topic of information search is curiously understudied (Lau and Redlawsk 2001b; Redlawsk 2004), especially at the very origins of the search process. This is an unfortunate omission given that the vast majority of elections are low-information, low-salience races in which many voters start with little more than names and office titles on a ballot (cf. Oliver and Ha 2007). Nor is it obvious that voters search only for political or programmatic information; the most frequent Google search terms associated with the names of the 2016 presidential candidates are "age" and "height" (Kaplan 2015).

Earlier scholarly work on the determinants of vote choice, such as partisanship, generally operates under the assumption that some usable information for each determinant is available to the voter.[4] Such work thus assumes that voters have been exposed to information, and attempts to understand the effects of this exposure on voters' decisions. We ask a different question: how will voters acquire and evaluate information if they know absolutely nothing about the

[4] This scholarship faces a unique challenge: any consideration that seems to play a minor role in vote choice—for instance, issue opinions—may appear to be unimportant either because citizens are uninterested in evaluating their candidates on that basis, or because they lack the necessary information to do so. Despite this problem, most experiments examine voting behavior by manipulating either specific types of information about candidates—partisanship, policy stances, demographic characteristics, and so on—to assess their relative importance, or altering the presentation of those cues (such as with a prose vignette, photo, or video) to examine whether voters are sensitive to the medium.

candidates, apart from their names and the offices they seek? We believe this is essential to ask when, more frequently than we may wish to admit, we open our ballots to find we must select a comptroller or city clerk, let alone a myriad of other offices that vary idiosyncratically based on one's location—transit director, county commissioner, dogcatcher, tree warden, fence viewer (all real elected positions in the U.S.), et cetera. Rather than focus on determinants of vote choice, we explore (1) what information voters search for before making a choice, (2) how relevant, specific, and verifiable the information sought is, and (3) how voters' searches change as they learn more.

To our knowledge, no studies examine how voters execute this first stage of the information search. What information do voters want to have, as might be discovered in a quick Internet search or provided by a voter guide, to make a reasonably informed choice about these candidates? Do voters execute careful and precise searches? Further, what purpose does that information serve? Is the search used to create a lushly detailed picture of the candidates, as required for fully informed voting (e.g., by funnel theories of voting behavior: Campbell et al. 1960; Miller, Shanks, and Shapiro 1996)? Or does it function as a heuristic to quickly sort candidates into "still acceptable" and "immediately unacceptable" bins? The evidence in favor of cognitive miserliness suggests the latter is a more likely use of each piece of information, especially in low-salience elections; we refer to this approach as the "deal-breaker" heuristic throughout.[5] We expect voters conducting quick searches in low-salience elections to form snap

[5] We consider this heuristic conceptually distinct from other heuristic strategies, such as "take-the-best" or "fast and frugal" (Gigerenzer, Czerlinski, and Martignon 1999; Gigerenzer et al. 2008), for two reasons. First, take-the-best is meant for quickly choosing between *two* alternatives, while the deal-breaker heuristic we describe is often or even typically used in situations involving more than two alternatives. Second, take-the-best assumes the individual possesses prior knowledge about each alternative, then recalls from memory the most important information and looks for discriminating characteristics among them; we propose that voters employ the deal-breaker heuristic when they possess *no* prior knowledge on desired topics, and must instead choose the *topics* that they believe are both important and will allow them to eliminate at least some options. Recent work on information search and voting refers to what we call deal-breaking as "heuristic-based decision-making," but we view this label as insufficiently

judgments by applying this heuristic to the information at hand, rather than online or memory-based processing, which presumes exposure to information over a non-trivial amount of time (Lodge, McGraw, and Stroh 1989; McGraw, Lodge, and Stroh 1990).[6]

Empirical Strategy

We assess here what types of information voters seek in order to select candidates and how efficiently they are able to seek it. To do so, we recruited respondents to participate in a brief survey in three separate instances between February and December 2016. Respondents in Studies 1 and 3 were drawn from Mechanical Turk, in Study 2 through Survey Sampling International, and tallied to 3,678 in total. Survey designs differed in small ways, but largely used the same format (for full details on individual studies, see SI Section 1.1). Respondents across all studies were asked about demographics, media usage, and given a political knowledge battery.[7]

In each survey, respondents were presented with a hypothetical candidate for office. We manipulated the office sought, as we had little sense for how tailored information requests might be for specific offices. Respondents were randomly told that the candidate was running for one of four local races—mayor, clerk, comptroller, judge—or governor or presidential primary.

precise, as distinct types of heuristics (minimalist, take-the-best, fast and frugal, etc.) would result in different types of search strategies--for instance, in shallow but comparable searches vs. non-comparable searches (see Lau, Kleinberg, and Ditonto 2018, 4). For succinct conceptual definitions of take-the-best and fast and frugal heuristics, see Gigerenzer and Gaissmeier (2011).

[6] We stress that this process applies only to candidates about whom the voters knows nothing before seeing their name on the ballot; the search process likely operates quite differently in high-profile races, where early information about candidates will not be self-sought but instead provided by the media.

[7] We provide detailed information on the political knowledge batteries in SI Section 1.4. In the main paper, we use a five-item political knowledge battery per Delli Carpini and Keeter (1993), which is broadly understood to correlate with both political interest (further mediated through media coverage), as well as education levels, which mediate uptake of the knowledge available (Jerit et al. 2006). While it was not possible to measure media coverage of a hypothetical candidate for office, we do also present evidence that using education levels rather than political knowledge (SI 3.1) or knowledge of local offices (SI 3.2) as the independent variable provide similar results.

Each respondent was then asked to request, using an open-ended text box, whatever information they felt they would need most to cast an informed vote for or against them.[8] For each candidate, each respondent repeated this procedure three times, to generate three information requests. A typical set of responses from a single person might thus look something like "stance on taxes," "where they're from," and "corrupt or honest." To turn these responses into quantitative data, we employed two student assistants to evaluate them using a coding scheme we created that categorized responses according to the type of content requested, and then by the quality of the search. The coding scheme is described in the next section.

After giving us their three information requests, each respondent in Studies 1 and 3 was randomly assigned to one of four conditions, in which they were presented with a hypothetical situation where they found information about one of the pieces of information they requested.[9] Half were told that the information they found was generally "disappointing," the other half "encouraging"; half were randomized to see the first piece of information they requested, while the other half saw the last piece of information. By doing this, we left it up to the respondents to determine what constituted a "disappointing" or "encouraging" response to a given request. All respondents were then asked how this disclosure would affect their willingness to vote for that candidate using a five-point scale ranging from "certain to vote for/against" (depending on the condition) to "no effect."[10]

[8] Our hope was that an open-ended text box most closely replicates the process of searching for information online, with the secondary advantage that we avoid putting ideas in the heads of our respondents. If asked to choose from a list of information about a candidate, the respondent might be confronted with many pieces of information (e.g., specific policy positions or candidate qualities) that they might otherwise never consider themselves.

[9] We emphasize that we did not provide respondents with actual information regarding their request. Doing so would require us not only to anticipate all possible types of information requests, but also make assumptions about whether individual respondents would respond to a given revelation positively or negatively.

[10] We assume that respondents would never react to disappointing information with increased likelihood of voting for the candidate, or vice versa.

This procedure allows us to assess three separate aspects of the voter information search: search content, search quality, and search efficiency. We take this "breadth" approach simply because the topic of information search is so understudied, and because we are the first to our knowledge to study it at the local level. Rather than proceed study-by-study, we present results grouped by each of the three aspects of the information search. As such, the paper provides individual hypotheses and methods together with the results for each section in turn. First, we describe the content of the information respondents requested. Second, we develop a new set of criteria for categorizing voters' searches as likely to improve their ability to make an informed choice between the candidates. Finally, we determine whether voters utilize the information discovered to quickly winnow a list of candidates. For each of these three concerns, we evaluate whether respondents' strategies vary depending on their level of political sophistication and the type of office sought by the candidates. By doing so, we allow for the possibility that politicians are less likely to be held accountable under certain conditions, some of which we anticipate to be prevalent at the local level.

Information Search Content

Given the lack of scholarship on this topic, we first explore what information people claim they want in order to make an informed vote choice. We expect the content of the information sought to depend on both the sophistication of the voters and the type of office sought by the candidates. This content should vary both because of what voters know (and often do not know) about these positions, and because of the nature of the jobs themselves. While higher offices are explicitly political and programmatic, many at the local level are narrowly technical, inviting a different set of considerations.

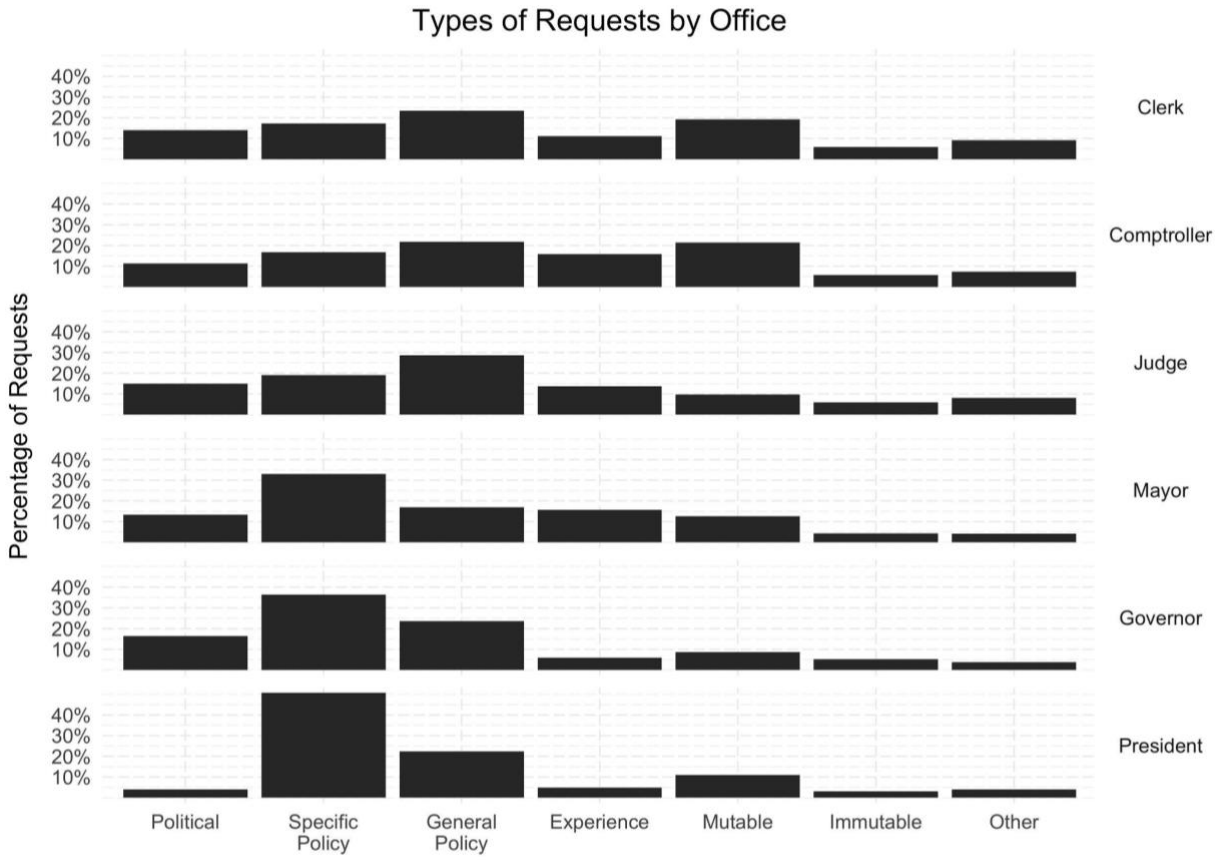
Table 1. Coding Scheme and Examples

Category	Examples of Content
Political	Ideology: "is she a liberal" Partisan affiliation: "Democrat," "political affiliation" Endorsements: "is he a union man"
Policy	General: "economic plans," "track record on social issues," "main objectives" Specific: "unemployment," "do they support LGBTQ," "city transit planning" Experience: "previously worked in government"
Mutable Characteristics	Personality/traits: "is she a liar," "how trustworthy," "bold," "sanity" Education: "college degree" Family: "is he married/kids" Background/general: "neighborhood," "personal life", "his or her story"
Immutable Characteristics	Age: "how old is she" Race: "where are her people from/is she ethnic" Gender: "gender" Religion: "believes in Jesus"
Other	Incoherent/nonsensical: "bdrtrfsg," "NA," "I would fix everything as mayor" Unable to categorize: "background," "who is it"

Figure 1.

Content Coding

As described in the "Empirical Strategy" section, each response was converted to a three-digit code for quantitative analysis. Each code is concatenated such that the first number corresponds to a major category, while the second and third numbers correspond to subcategories. The major categories include Political Information, Policy Information (either specific policies or general interest), Mutable Characteristics, Immutable Characteristics, and Other. The authors resolved all differences in coding categories manually. Basic descriptions are outlined in Table 1; for an exhaustive list of coding categories, please see SI Section 1.2. All analyses in this section report p-values from two-tailed t-tests of the difference of means.



Note: Each row shows the share of information requests for a given office. All rows sum to 100. The number of requests made by each office, top to bottom: 1,308, 1,294, 1,299, 7,830, 348, 326 (total=12,045). Randomization details can be found in SI 1.1.

Results

What do voters claim they want to know about candidates? Figure 1 shows the relative frequency of different types of information requests by office. Policy Information ("specific" and "general") is by far the most commonly requested type. Searches for "specific" information reference individual issues (e.g. "how he'll deal with rising crime"); "general" policy searches are performance-related queries that do not reference particular issues (e.g. "what she'll do to help us"). Requests about the candidate's political affiliations and about their personal life and individual characteristics also were quite common. The least used category was Immutable Characteristics, indicating that explicit attention to (or willingness to express interest in) gender,

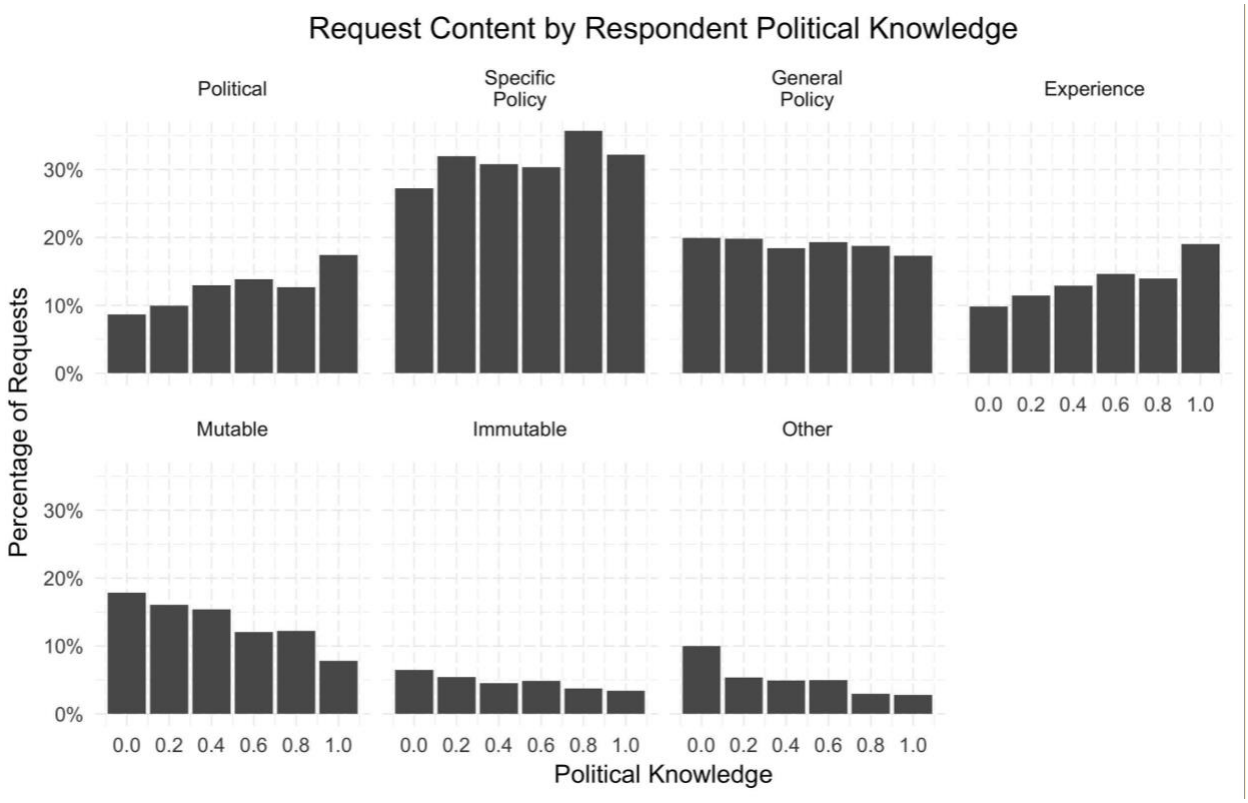
age, race and other such categories was quite low. Few requests fell into Other; these consisted primarily of unintelligible or non-unserious responses, and the remainder typically involved one-word references to "background," which might mean either the politician's record, personal characteristics, or their preparation for office, and thus could not be classified.

There are clear differences in information requests by office. Political information requests (party, ideology, and endorsements) are consistent across offices.[11] Requests for both specific and general policy information increase as the level of the office increases, suggesting that voters may either care more about or be more familiar with national and party-driven policy topics (e.g., immigration) than local policy topics (e.g., police hiring). Experience-related information requests decrease as the level of office increases, perhaps because voters assume that someone running for governor or president must have relevant prior experience. Requests centered on immutable characteristics stay about the same, though mutable requests are more common in local than national races (two-tailed t-test, $p<0.001$). "Other" requests are higher for the lowest-level offices, either because individuals were likelier to simply ask about candidates' "background" or because voters did not know enough about relevant policy to ask policy-related questions.

These results paint an arguably optimistic picture of the electorate. Respondents report prioritizing political and policy information over factors like race and gender, and domain experience over policy where appropriate (i.e. for local administrative positions). On the other hand, as offices became more obscure, voters were more likely to ask general policy questions and questions about the candidates' personalities. This may indicate that respondents are less capable of quickly assessing candidates' qualifications in lower-profile races. We assume these

[11] Requests for political information are low for president because respondents were told this was a presidential primary candidate of their own party.

Figure 2.



Note: Percentages are calculated by knowledge level (i.e., the bars for those who answered zero political knowledge questions correctly sum to 100 across all seven plots). 1,260 requests were made by respondents answered zero questions correctly, 2,156 requests by those with one correct, 1,741 requests by those with two correct, 1,852 requests by those with three correct, 2,087 requests by those with four correct, and 2,589 requests were made by those who answered all five political knowledge questions correctly.

results reflect at least some social desirability bias by respondents. If true, our findings likely overestimate the use of policy considerations, and underestimate reliance on partisan cues and immutable characteristics of the candidates.

Per Figure 2, we see clear changes in the content respondents ask for as respondents become more politically knowledgeable.[12] Respondents become much more likely to request information like endorsements, experience, and specific programmatic stances (both prospective, in the sense of the candidate's agenda, and retrospective, in the sense of the candidate's record

[12] In SI Section 2.1, we also provide a breakdown of the content requests by both office and respondent political knowledge.

on a given issue) as they became more politically knowledgeable. However, the less knowledgeable respondents were, the more likely they were to make personalistic requests (about both mutable and immutable characteristics of the candidates), as well as to make requests filed as "Other" (which includes both responses like "background," which could not be classified, or responses that misunderstand or blow off the assignment). We see the same patterns when we use voter education (see SI Section 2.2) or local office-specific knowledge (see SI Section 2.3). Knowledgeable voters report looking for good representatives, while less knowledgeable voters report looking for good people.

Information Search Quality

In addition to searching for different content, less sophisticated citizens should be more likely to conduct searches that are misleading or unhelpful. We define searches to be misleading in the sense that they do not allow the voter to unequivocally ascertain whether the candidate offers them good substantive representation, not in the sense that the information obtained is factually untrue. We consider information searches to be suboptimal if they rely on unverifiable, vague, or irrelevant questions. If a large percentage of the public relies upon misleading information when deciding between low-profile candidates, this may be worse than choosing officials at random. For instance, if voters search for candidates' age and height, per Kaplan (2015), they may inadvertently select less ideologically congruent candidates who look appealing on those characteristics.

Search Quality Coding

In order to evaluate the quality of the searches, we build on the previous coding scheme by assessing how likely each search is to help voters identify good representatives. We posit three qualities we associate with suboptimal information search strategies:

- *Irrelevant*: Information should be predictive of representative performance or policy. Some information, such as height, we argue is politically irrelevant. Other information is contextually irrelevant, as in the example of selecting a comptroller on the basis of her position on abortion.[13]
- *Unverifiable*: Some information might be useful, but impossible to fairly ascertain without extensive over-time observation. For instance, though honesty is surely a valuable candidate trait, it is difficult to imagine that trustworthiness can be assessed from a voter guide blurb or campaign materials, short of a guilty verdict in a trial.
- *Vague:* Knowing "[the candidate's] background" or "how they'll improve the city" is ideal in theory, but as search terms these questions are unlikely to reveal detailed information. Vague or broad questions may thus limit voters' ability to identify the candidate that best matches their ideological preferences, and reinforce candidate preferences for delivering platitudes over taking stands.

We then code each of the content categories for whether they appear consistent with each of the above criteria. Searches were coded as 1 if they appeared to match the criterion (e.g.,

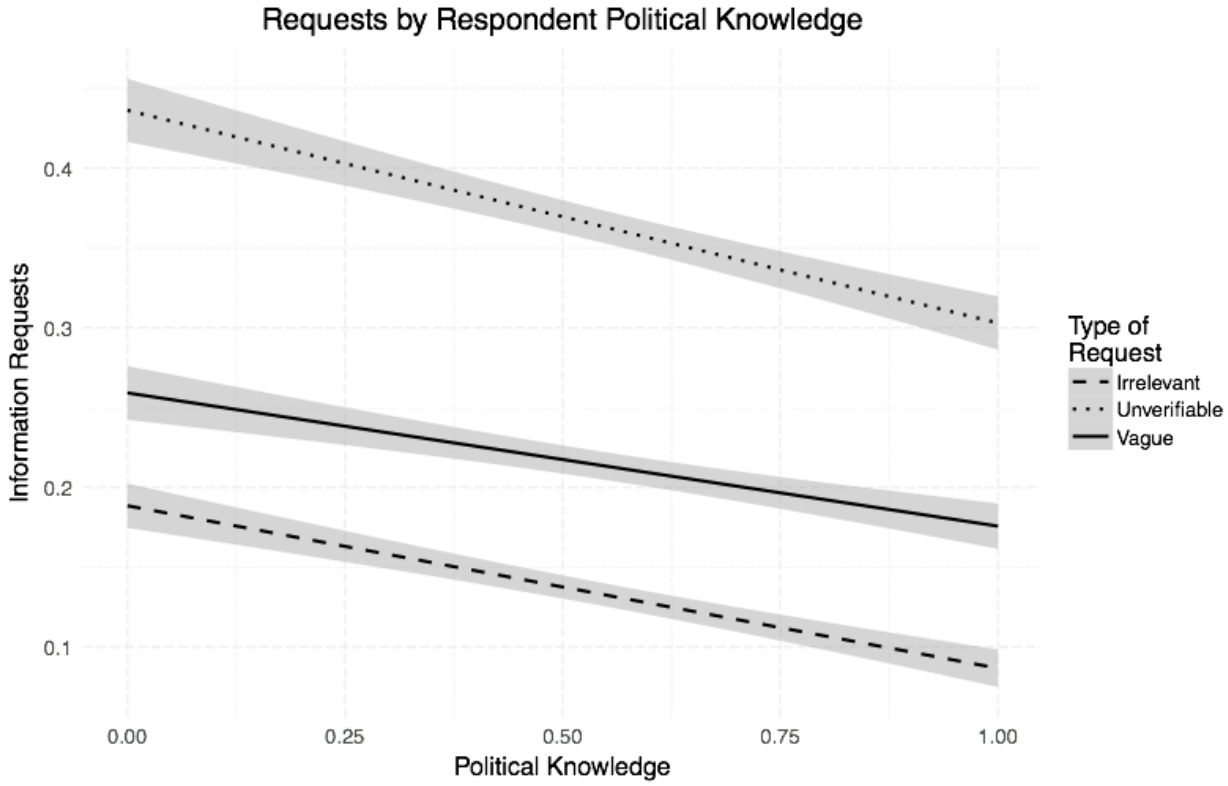
[13] We acknowledge that citizens could potentially be justified in seeking ideological information about candidates for non-ideological offices. For instance, if voters see such offices as a springboard to higher office, some may want to eliminate ideologically divergent candidates early in their political careers. Other voters may be aware that some offices do touch on the ideological; Kentucky clerk Kim Davis' refusal to provide marriage licenses to gay couples is one such example. Thus, we include all political requests as relevant for all offices. But we restrict the policy requests considered relevant based on each office (e.g., finance and economic policies would be considered relevant for a comptroller). See SI Section 1.3 for details.

relevant) and 0 if not; a full account of the coding scheme can be found in SI Section 1.3. We attempted to be as generous as possible in our coding so as not to discredit unduly valid searches. Each information request is coded independently, and thus can appear as any combination of values (e.g., a search may be relevant and specific, but unverifiable). We analyze the relationship between these search quality variables and political knowledge using simple bivariate OLS regressions, and differences across offices using t-tests for difference of means (e.g., between local offices and higher offices).

Results

Which voters are able to ask "good" questions? The quality of the information search is not universal across respondents. Rather, as we previously argued, the ability to ask "good" (verifiable, specific, and relevant) questions varies depending on the respondent's sophistication. In Figure 3, the x-axis depicts performance on a five-question political knowledge battery, where zero means that the respondent got none of the questions right, and one that they got every question right. The y-axis shows how likely a given request was to fall into a particular category, where (for example) zero means that no respondents asked vague questions, and one means that every question asked by someone at that level of political knowledge was vague. As political knowledge increases, one's propensity to ask irrelevant (B=-.101, two-tailed t-test $p<.001$), unverifiable (B=-.139, $p<.001$), and vague (B=-.056, $p=.017$) questions decreases. On average, for each additional political knowledge question answered correctly, respondents are about ten percentage points (10.26%) less likely to request information that falls into one of these categories. The results are similar but slightly weaker if one uses educational attainment instead of political knowledge (see SI Section 3.1). The results are much stronger when we use our

Figure 3.



Note: Each line represents the relationship between requests and knowledge using a simple bivariate OLS regression. Specifically, the lines indicate the frequency with which a search request (total number of requests=8,472) meets the given criteria as the political knowledge of the requester increases. This figure reflects data pooled across Studies 1 and 3 only, as we used a different measure of political knowledge in Study 2. A version of this figure for Study 2 is available in SI Section 3.2.

measure of knowledge of local offices (asked in Study 2 only) instead of the general political knowledge battery (see SI Section 3.2).[14] Finally, given our hypothesis that voters will prioritize the information most important to their decision-making, we also check that the results hold when we only examine the first search request, and find that they do (see SI Section 3.3).

[14] We asked a battery of local political knowledge questions (e.g., does the mayor have the ability to hire city employees?) on Study 2 due to two concerns. First, we worried that typical political knowledge batteries, which focus on national offices and events, might overstate voters' knowledge about local offices. Second, Ahler and Goggin (NP) report concerns that typical political knowledge batteries are too easy and too familiar (e.g., "who is president?), reducing variation in the variable of interest. As predicted, we find our results are even stronger with the local knowledge battery. We provide and interpret our results in SI Section 3.2.

Respondents are not equally adept at asking good questions about the lesser known local offices (comptroller, clerk, judge); relative to requests for mayor, governor, or president, the base rate of *unverifiable* requests jumps by 15% across all knowledge groups, 20% for *irrelevant* requests, and 10% for *vague* requests (see SI Section 3.5 for a version of Figure 3 separated out by offices). Furthermore, high and low knowledge respondents are equally likely to ask vague questions about local candidates, suggesting that even the very politically attentive have trouble understanding what they should know about obscure offices.[15]

Information Search Efficiency

Finally, we evaluate whether people can use heuristics efficiently when they must acquire information. A heuristic's value is determined not by its substantive relevance to the voter, but rather its ability to assist the voter in maximizing the certainty of selecting the candidate they would "truly" prefer given full information (to "vote correctly," per Lau and Redlawsk 1997). Given a long list of unknown candidates, we hypothesize that it is more efficient to eliminate candidates from consideration based on the discovery of a single undesirable quality than it is to commit to candidates after confirming their desirability on a large range of items.

Throughout, we call this the "deal-breaker" heuristic. An efficient information search using this heuristic looks something like a game of "Guess Who": the voter attempts to reveal

[15] Moreover, when aggregating across all requests made by an individual, we find that the base rates of each "unhelpful" type of search increase by 20-25%, with 80% of low knowledge and 65% of high knowledge respondents asking at least one unhelpful question (see SI Section 3.4). In SI Section 2.4, we show that less politically knowledgeable respondents are also less likely to report needing additional information to make a vote decision than high-knowledge respondents, and discuss the potential explanations for this finding.

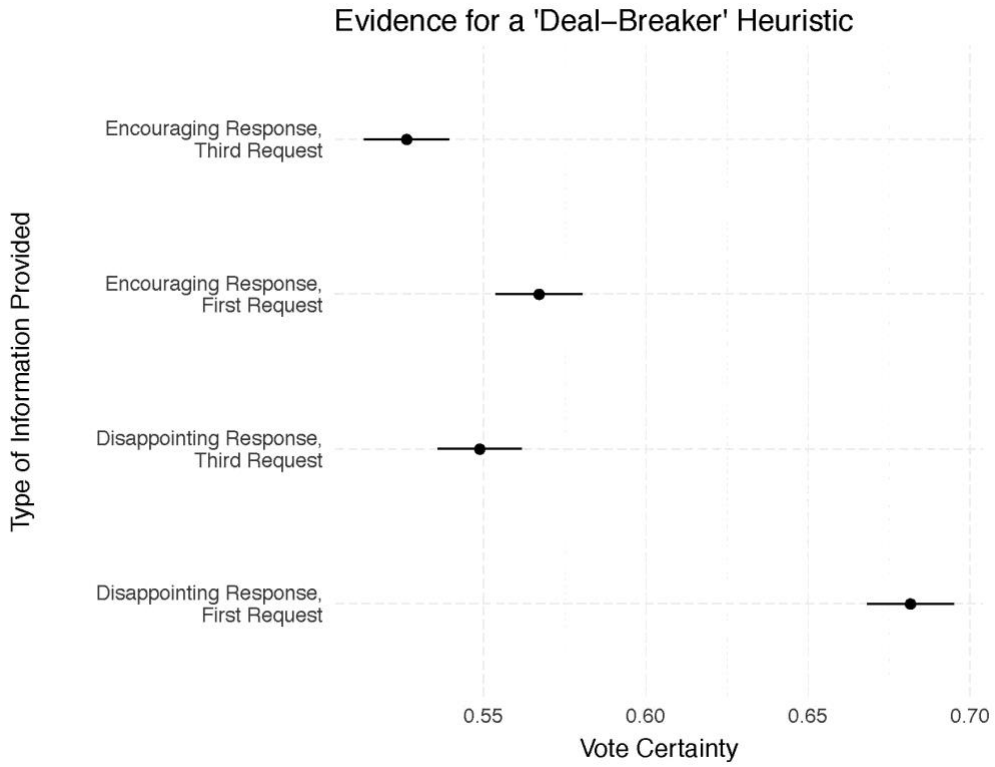
highly undesirable qualities about the candidates, eliminates those who possess them, and repeats this process until one viable candidate remains.[16]

In high-profile elections, partisan affiliation may be the only cue most voters need, but this is less true in low-profile races, for several reasons: a party label is useless in party primary elections; local elections are often non-partisan; and the responsibilities of local elected officials are often orthogonal to partisanship, as these roles emphasize administrative and technical ability above ideological vision. As such, a discerning voter facing these conditions must determine and search for additional criteria before feeling certain that a candidate deserves her support.

If voters use the deal-breaker heuristic as described, we should observe several behaviors. When a voter learns about a candidate, he or she should react more strongly to negative information than to positive information (Kahneman and Tversky 1979). In other words, we expect they will be more certain they won't vote for a candidate who disappoints them than they will feel certain to vote for a candidate who pleases them. Second, efficient voters should search for higher-priority information first. The combination means that discouraging results yielded from information sought initially should produce greater certainty that the candidate should be rejected than the discouraging results yielded from information sought later, but encouraging information about candidates discovered early should produce only a little more certainty about voting for a candidate than information sought later. We assess this hypothesis using a t-test of difference of means between experimental conditions.

[16] This would create an information search asymmetry in most races: voters will know much less about candidates they quickly eliminate than candidates who meet that criteria. In other words, voters will learn much more about a candidate who exhausts their search preferences–the candidate they select–than their opponent(s). This prediction, though outside the scope of the present study, runs directly counter to most accounts of voting behavior, which presume that voters know the stances of all candidates on the criteria used to make a vote decision.

Figure 4.



Note: Each point above reports the mean vote certainty of the respondents for each experimental condition with 95% confidence intervals. The number of observations in each row, from top to bottom, is 929, 937, 892, and 918, for a total of 3,675 observations. The deal-breaker experiment was conducted only in Studies 1 and 3. Findings broken out by study are available in SI Section 4.2.

Results

Do voters prioritize information that lets them eliminate unsuitable candidates quickly? We find evidence that citizens make use of a "deal-breaker" heuristic when searching for political information about candidates. Recall that we earlier predicted that citizens should react with more certainty about their vote when they learn something bad about a candidate than something good, and that they should prioritize finding deal-breakers at the beginning of their information search. This is precisely what we find, shown in Figure 4. The x-axis shows respondents' certainty about their vote, with one signaling they "definitely would" (when shown encouraging information) or "definitely would not" (when shown discouraging information) vote

for the candidate after receiving this information, and zero signaling no change in likelihood of voting for or against the candidate. Of the four conditions in which respondents were asked about their vote certainty, certainty is by far the highest when the information revealed is disappointing and in response to the first request (two-tailed t-test of difference of means, $p<.001$).[17] This suggests that voters efficiently eliminate unacceptable candidates from the pool. We find a smaller but still significant increase in certainty when the first information requested is encouraging compared to the third information requested ($p<.01$). These findings hold regardless of the respondent's sophistication or education (see SI Section 4.1). However, they appear to be weaker for lower-level offices, such as clerk, comptroller, and judge, than they are for higher-level offices such as mayor, governor, and president (see SI Section 4.3); this may either be due to the smaller sample size for the lower-level offices, or because voters hold fewer deal-breaker stances about low-salience offices. In sum, voters prioritize searches that help them winnow the field most efficiently, especially when they perceive the race to be important.

Discussion

Our findings provide both good and bad news about the American electorate's capacity to identify the most qualified candidates. On one hand, people seek out information in an order that helps them eliminate less preferable candidates as quickly as possible, and thus appear to search for information in a rational and cost-effective manner. Moreover, the information voters report seeking is heavily programmatic, and therefore hopefully conducive to the pursuit of quality substantive representation. The visible changes in search content across types of political offices suggest that people do take into account contextual relevance when searching for information.

[17] We show that the findings hold within each individual study in SI Section 4.2.

On the other hand, the quality of search content voters use depends greatly on their level of education and/or political knowledge. Many citizens appear comfortable basing their decisions on information gleaned from unverifiable, irrelevant, and vague searches, especially for less-known local offices; less-knowledgeable citizens are also less likely to report needing more information to make a decision in the first place. The content of the searches, while encouraging, surely reflects social desirability bias, and the sample itself over-represents the well-educated; both suggest that we may be overestimating the proportion of high-quality information searches in the full population. These results may thus paint a more optimistic view of sophisticated voters than is warranted if these respondents are also those most likely to know which answers will be viewed as socially desirable. However, less knowledgeable voters were also much more likely to rely on personalistic considerations in their searches. This raises new concerns about the personalization of American politics, not just at the highest levels of office, but throughout the system, perhaps as a function of voters' "overwhelm" with the variety of potentially obscure offices on which they are asked to adjudicate.

We recognize the limitations of this study. One important difference between this project and much of the literature on voter behavior is that information search, rather than vote choice between two candidates, is the dependent variable of interest. Thus, the study cannot speak to questions about which candidate voters would select. The design also faces external validity issues, as respondents are asked to self-report, rather than actually conduct real searches. Still, we feel the exercise is closer to reality than one might think. For most people, the first time they encounter the candidates of a local race will be when they see them listed on the ballot. Respondents could easily offer careless or inappropriate answers, and some did, biasing our study against finding any effects. That we still see large differences in response to information

requested earlier versus later suggests many respondents took the assignment seriously. If people are willing to engage in a rational information search for a matter of little consequence, we think it is likely that they would apply similar or greater effort under more meaningful voting conditions. Finally, while we recognize the limitations of convenience samples, we also note that respondents on Mechanical Turk tend to be regarded as unrepresentative in part because they are young, tech-savvy, and politically knowledgeable; to the extent that voters in real life are *less* knowledgeable than Turkers, our results would lead us to expect lower-quality (less relevant, less verifiable, and less specific) searches to be more prevalent, rather than less.

Given the dearth of scholarship (either theoretical or empirical) on both the information search and voting behavior in subnational races, this study is also necessarily exploratory. As such, we attempt to describe variation and provide a rich context for future scholarship to adapt and explore in more detail, building our understanding of these phenomena going forward. It is possible, for instance, that there are more criteria of "good" searches than the three we propose here. Likewise, future research may find other factors, such as voters' propensity to "roll-off" ballots in local elections, are related to office type or voter knowledge in important ways. Still other research might find that observational search data looks more or less concerning than the experimental data we present here. As an exploratory study, future scholarship will almost certainly prove some of these estimates wrong and some of our concerns misguided.

Still, based on these findings, we worry that ineffective search strategies are prevalent, and diminish citizens' ability to obtain good representation. When voters base their decisions on unverifiable, vague, or irrelevant information, they open themselves to potential manipulation, particularly when that information may be provided by the candidate themselves or a fake news source. Furthermore, as many citizens had a tendency to ask about irrelevant policies for offices

like clerk and comptroller, there is a danger that voters will eliminate highly qualified candidates simply because of candidates' stances on issues that have little relevance for the office they hope to hold. Research does suggest that voters' search behavior predicts election outcomes: a study using real Google search trends data, for instance, shows that Obama received fewer votes in 2012 in states where searches using racist language increased, even after controlling for his performance in 2008 (Stephens-Davidowitz 2014).

Given our findings, we think developers of popular search engines like Google and Bing would do well to consider the impact of their algorithms on voter decision-making. Confused by some obscure local race, many voters' first impulse will be to reach for their smartphone rather than their voting guide, should they be lucky enough to receive one. Searching the candidates' names, along with any number of criteria, is far from guaranteed to result in the receipt of any actual useful information. This scenario could be improved if search engine developers used a list of public candidates for office to prioritize information from websites that stress accuracy and emphasize relevant considerations, like Ballotpedia. Ideally, Google could make use of its profile feature that provides a quick set of summary information on the search results screen itself. Such a service would be consistent with current efforts by companies in Silicon Valley to become more civically engaged, and help voters in the twenty-first century to navigate a busy and confusing political landscape.

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