

# Issue Scales, Information Cues, and the Proximity and Directional Models of Voter Choice

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## Abstract

One of the most important questions in the study of democratic politics centers on how citizens consider issues and candidate positions when choosing a candidate to support in an election. The proximity and directional theories make fundamentally different predictions about voter behavior and imply different optimal strategies for candidates, but a longstanding literature to empirically adjudicate between the theories has yielded mixed results. We use a survey experiment to show that the information to which people are exposed before being asked to choose between candidates contains unacknowledged cuing effects that can encourage citizens to choose a candidate that is preferred under the expectations of either the proximity or the directional theory. Proximity voting is more likely when an issue scale is understood to be a range of policies in which intermediate positions represent centrist policies. Directional voting is more likely when the issue scale represents degrees of intensity with which either the liberal or the conservative side of the issue is expressed.

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# 1 Introduction

Understanding why citizens choose one candidate over another is key to our more general understanding of how representative democracies function. We cannot deduce the meaning of election outcomes if we do not understand the reasons underlying citizens' choices. What drives citizens' decision making processes when they make their vote choices, and what role do candidates' spatial positions on issues play in citizens' decisions?

According to the *proximity theory* of voting (e.g. Downs 1957), a citizen prefers a candidate whose positions exactly match her own. Given a choice between two candidates, she should prefer the closer of the two, even if the closer candidate is on the opposite side of the positional midpoint. A slightly left-of-center voter should thus choose to vote for a slightly right-of-center candidate over a more more distant far-left candidate. Under the *directional theory* of voting (e.g. Rabinowitz and Macdonald 1989), the citizen is not primarily concerned with the candidates' positions, but rather with the sides that they occupy in issue space. The citizen should prefer any reasonable candidate on her side relative to any candidate on the other side, even if the candidate on the other side is closer to her own position.<sup>1</sup> In this case, a slightly left-of-center voter should choose the far-left candidate over the closer slightly right-of-center candidate.

These two models represent fundamentally different ways to conceive of voter behavior, and they have important implications for candidate strategy. According to the proximity model, a voter at the ideological midpoint is principled and prefers candidates who are as close as possible to the midpoint. Candidates should maximize their support by locating themselves at the median issue position in order to compete for the support of the median voter. Under the directional model, however, voters at the midpoint are indifferent or am-

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<sup>1</sup>The word "reasonable" refers to the penalty in Rabinowitz and Macdonald's (1989, 108) mathematical formulation of the directional model for candidates whose positions are so extreme that they are considered unreasonable.

bivalent towards candidates at any position and candidates maximize support by taking more extreme positions on issues in order to better distinguish themselves from one another when competing for votes. We should observe moderate candidates in a proximity world and polarized candidates in a directional world.<sup>2</sup>

This work joins a longstanding literature that adjudicates between the proximity and directional models. Like other studies, we consider citizens' views on a political issue, assuming that the issue's positions can be graphed on a continuum from liberal to conservative. But we ask a new question: *what does the middle mean?* Do intermediate positions on this left-right scale represent clear policy proposals, or are they understood to be degrees of intensity with which the liberal or conservative positions are stated? Is a candidate who places herself squarely in the middle taking a stand or refusing to take a position? For many issues, citizens can be cued to think about the issue in either way — depending on the way that the candidates' positions are communicated.

Using an experiment embedded in a nationally representative survey, we demonstrate that when an issue is presented such that centrist positions represent policies, a majority of participants employ the proximity model to choose between candidates. But when the issue is presented such that intermediate positions are degrees of intensity for the liberal or conservative position, most participants use the directional model to make decisions. In other words, the way in which information is communicated matters. These findings advance our knowledge of spatial choice by demonstrating that political discourse that emphasizes binary positions — the liberal side or the conservative side — and the strength or purity of candidates' positions encourages directional thinking, which in turn benefits extreme candidates. Discourse that emphasizes the policy content of intermediate positions on an issue, on the other hand, encourages proximity thinking.

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<sup>2</sup>That said, many factors, including the presence of primary elections in the U.S., confound the abilities of candidates to locate themselves at the exact position of the general election median voter.

## 2 The Proximity and Directional Models of Voting

There are many versions of the formal proximity model, but every version shares the property of assuming the voter's utility for selecting a candidate decreases monotonically with the distance between the voter and candidate. One common proximity model is

$$U_{ij} = \alpha - \sum_{k=1}^K \beta_k (v_{ik} - c_{jk})^2 \quad (1)$$

where  $U_{ij}$  is the utility that voter  $i$  has for selecting candidate  $j$ ,  $v_{ik}$  is the position of voter  $i$  on issue  $k$ ,  $c_{jk}$  is the position of candidate  $j$  on issue  $k$ ,  $\alpha$  is analogous to a regression constant and represents the expected value of  $U_{ij}$  for a voter that perfectly agrees with the candidate on every issue, and the  $\beta_k$  parameters are analogous to regression coefficients and allow the issues to be weighted differently in a voter's calculus. Control variables and a residual term can be added to Equation 1 to embed the model in a linear regression.

Rabinowitz and Macdonald's directional model of issue voting explicitly defines voter utility to be a function of direction and intensity rather than of distance (Rabinowitz and Macdonald 1989). Supposing that a value of 0 for  $v_{ik}$  and  $c_{jk}$  – as defined in Equation 1 – represents the ideological midpoint, the directional model can be written as

$$U_{ij} = \alpha + \sum_{k=1}^K \beta_k (v_{ik} c_{jk}). \quad (2)$$

If the voter and the candidate both take conservative positions on the same issue, then both  $v_{ik}$  and  $c_{jk}$  are positive, and their product yields positive utility. Likewise, if the voter and candidate both take liberal positions, then  $v_{ik}$  and  $c_{jk}$  are both negative and the product is again positive. If however the voter and candidate take different sides on the issue, then the product of  $v_{ik}$  and  $c_{jk}$  is negative. As a result, even a moderately partisan voter prefers any candidate on her side of the issue to every candidate on the other side, and prefers the

most extreme candidate of the candidates on her side.<sup>3</sup>

Figure 1: Voter evaluations of candidates under the proximity and directional models. Lighter shading indicates higher voter evaluation for a candidate.

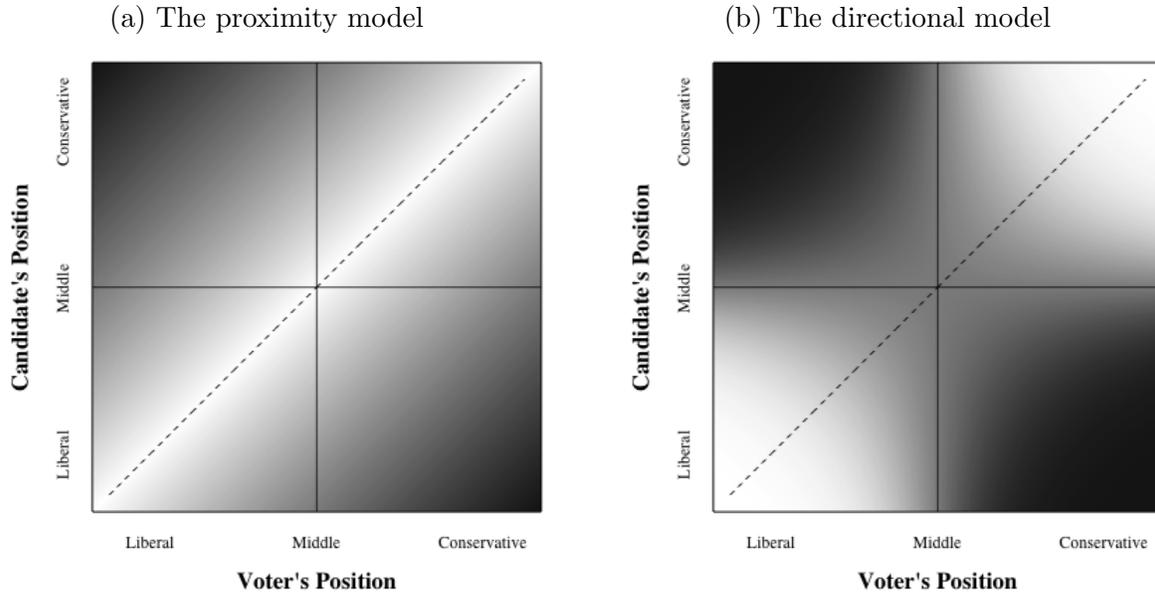


Figure 1 contains two heat maps illustrating a voter’s utility for a candidate under the proximity and directional models. In each graph, the  $x$ -axis represents the voter’s position on an issue, arranged left to right from extremely liberal positions to extremely conservative positions. The  $y$ -axis represents the position of a candidate, where the smallest values are extremely liberal positions and the largest values are extremely conservative positions. Each point in the Cartesian coordinate plane is shaded according to how much utility a voter at that position on the  $x$ -axis has for the election of a candidate at that position on the  $y$ -axis. The lighter the shade, the greater the utility. The dashed 45 degree line indicates the positions for which the voter and the candidate share the same position.

In many instances the proximity and directional model make similar predictions for a voter’s preference over candidates. According to both models, utilities in the bottom-left

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<sup>3</sup>We regard the wording of the issue we present in our experiment — modeled on the wording of the ANES health insurance question — as excluding unacceptably extreme positions, so we do not include a penalty in this model.

and top-right corners in Figure 1 are very high, and utilities in the top-left and bottom-right corners are very low – meaning that more extreme voters have a high utility for more extreme candidates on their side and have a very low utility for more extreme candidates on the other side. The important distinction between the models is best seen in the middle of these two graphs. According to the proximity model, a voter has highest utility for a candidate that shares her position, regardless of what that position is. Thus the lightest shades in Figure 1a exist on the 45 degree line and no point on that line is lighter than any other. In contrast the points in the middle of Figure 1b are much dimmer than the points towards the bottom-left and upper-right corners.

These differences imply contrasting behaviors under the two models for voters close to the ideological midpoint, and correspondingly, the models imply different incentives for candidates. The proximity model conceives of moderate voters as principled with strong preferences for moderate candidates, while the directional model conceives of these voters as either ambivalent or apathetic with utilities of equal and medium strength for candidates along all points of the ideological spectrum. Likewise, while a moderate candidate has a base of support among moderate voters under the proximity model, the same candidate has virtually no support (nor any strong opposition) under the directional model.<sup>4</sup>

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<sup>4</sup>We do not claim that the proximity and directional models are the *only* feasible models of voter choice. Another alternative is the discounting model proposed by Grofman (1985), considered as a competing model by Tomz and Van Houweling (2008), which posits that voters consider the status quo in making a spatial decision. If an elected official will only be able to move policy partway between the status quo and the elected official’s ideal point, then it is rational for a voter to prefer a candidate who is more extreme than her own position so that the resultant policy is closer to the voter’s position. In order to implement the discounting model, we need to measure both the status quo and a performance weight parameter that represents the efficacy of the candidate in moving policy away from the status quo. We choose not to adjudicate between the discounting model as well as the proximity and directional models for three reasons. First, we have no reason to expect that the presence of a discounting logic in voters’ calculus should interact with our experimental treatment. Second, since the publication of Tomz and Van Houweling’s (2008) study, health insurance has been the subject of campaigns aimed to create variation in voters’ perceptions of the status quo on this issue. Third, it is difficult to estimate performance weights in our survey since no information is provided about the candidates other than their positions on health insurance. While discounting and many nuanced models of voter choice are also worth experimental analysis, we restrict ourselves to a comparison of the proximity and directional models for clarity and parsimony.

Given the importance of these implications, it is understandable that the question of the relative validity of the two models has inspired a large and longstanding literature. Tomz and Van Houweling identify more than 50 independent studies that attempt to adjudicate between the models (Tomz and Van Houweling 2008). The theories have been directly compared in their ability to model observational data from American Presidential elections, American congressional elections, Canadian and European elections, and even in how voters are influenced by their spouses (see for example Adams, Bishkin, and Dow 2004; Blais et al 2001; Cho and Endersby 2001; Dow 1998; Iversen 1994; Johnston, Fournier, and Jenkins 2000; Kenny and Jenner 2007; Krämer and Rattinger 1997; Lewis and King 1999; Macdonald, Listhaug, and Rabinowitz 1991; Macdonald, Rabinowitz, and Listhaug 1995, 1998, 2001; Merrill 1994, 1995; Merrill and Grofman 1997; Montgomery and Nyhan 2010; Platt, Poole, and Rosenthal 1992; Rabinowitz and Macdonald 1989; Rabinowitz, Macdonald, and Listhaug 1991; Westholm 1997).

Although the proximity and directional models are empirically testable and comparable, the studies that compare the models have not yielded a consensus. There are four difficulties inherent in observational research that obscure a valid and general comparison. First, a large branch of this literature shows that the divergent results are conditioned on different data coding decisions (see Cho and Endersby 2003; Gilljam 1997a, 1997b; Merrill and Grofman 1997; Macdonald, Rabinowitz, and Listhaug 1997, 1998; Pierce 1997). Given these concerns, Lewis and King (1999, 32) conclude that “there exists essentially no evidence... to distinguish between the two models” using observational data. Second, none of these studies allow for the possibility that directional and proximity voters coexist in the electorate (Morris and Rabinowitz 1997). If some voters follow the directional model, and some voters follow the proximity model, then in the population we expect to see a mixed model emerge as the best overall fit. Third, few of the observational studies have attempted to isolate the positions in ideological space for which the proximity and directional models make different predictions.

A voter who reports the most extreme ideological self-placement, for example, will prefer the most proximate candidate under both the proximity and directional models. As a result, a large proportion of the samples used in these studies contains observations that offer no guidance on the relative fit of the models. Last, none of these studies have considered how the method through which voters learn about candidate positions cues voters to consider candidates in ways that are congruent with one model or the other. We address these last two points in more detail below.

An experimental comparison of the proximity and directional models can circumvent the four problems inherent in observational data described above. In general, an experiment requires far fewer data coding assumptions. In addition, experiments allow researchers to observe the frequency with which participants behave in accordance with each model, and to measure the extent to which the sample contains both proximity and directional voters. Experiments allow researchers sufficient control over the decision-making context to look specifically at situations where the proximity and directional models make different predictions. We can also alter as an experimental treatment the method through which candidate positions are communicated to participants.

Three recent studies use experimental designs to determine the relative validity of the proximity and directional models. These studies tasked participants with choosing between two competing candidates whose positions were either described numerically on an ideological scale (Claassen 2007), were shown visually on a number line describing the candidates' positions on a single issue (Tomz and Van Houweling 2008), or were presented via mock television advertisements and newspaper articles (Lacy and Paolino 2010). All three studies report evidence in favor of proximity theory. All of these experiments, however, hold the information context under which participants are exposed to candidate information constant. Their results therefore are contingent on how these presentations cue participants to think about the meaning of moderate issue positions. Our analysis is the first experiment to

consider the information context as a determinant of proximity and directional behavior in candidate evaluation.

## 3 Information Cues and Models of Voter Choice

### 3.1 What Does the Middle Mean?

Consider an issue with positions arrayed across a unidimensional number line. What exactly do the intermediate values on the number line represent? There are two ways to think about the meaning of an issue scale — as a continuum of policies or as degrees of intensity in either a liberal or conservative direction — and these two cognitive models are best distinguished by how they describe moderate positions. If the issue scale represents a range of policies, then positions at or near the midpoint represent clear preferences for moderate policy. But if the issue scale represents direction and intensity, then positions at or near the midpoint have low to no intensity and represent indifference or ambivalence.

The proximity and directional models offer fundamentally different conceptualizations about what an issue scale represents. The proximity model's implication that a citizen at an issue's ideological midpoint has the highest utility for a candidate that is also at that midpoint only makes sense in a context in which the candidate's centrism represents a policy proposal. In contrast, under the directional model, citizens — other than those at the midpoint — always prefer any reasonable candidate on their own side to any candidate at the midpoint or on the other side. If a citizen places herself somewhere in the middle of an issue scale, and she does so to support a moderate policy, then she will employ proximity thinking to favor candidates who signal support for the same moderate policy. But if she takes an intermediate position because she is to some extent undecided or ambivalent, she will use directional thinking to support candidates who signal clear preferences over candidates who

are similarly undecided or ambivalent.

The question of whether the proximity or directional model is correct, therefore, depends on a second question: do citizens think of intermediate issue positions as representing policy or intensity? In this work, we show that if citizens are cued to think about the policy content of intermediate positions, they will be more likely to use the proximity model, but if citizens are cued to think about the direction and intensity for individual issues, they will be more likely to use the directional model.

This result has important implications for other research literatures in political science. Many substantive results are predicated on proximity voting, and might not hold if the directional model is instead correct. The median voter theorem (e.g., Black 1958; Downs 1957; Hotelling 1929), for example, only holds under proximity voting. If voters are directional, then the positions that guarantee electoral victory are the most extreme acceptable positions for each issue on the same side as the median voter, instead of the positions of the median voter herself. It follows that the elected representative in a single-member district, such as in elections for the U.S. House of Representatives, may be much more ideologically extreme than the median voter in the district. This result may therefore provide an explanation for polarization in Congress beyond the effects of redistricting and primary elections. In addition, while proximity voting implies that centrist parties in multiparty democracies — where centrist is defined as adopting a platform that takes moderate positions on most issues — can have stable constituencies of moderate voters, directional theory predicts that centrist parties are likely limited to unstable support (Macdonald, Listhaug, and Rabinowitz 1991).

In this research, we focus on a single issue rather than on candidate ideology more generally. Overall ideology, or a party platform, consists of a set of issue positions. A candidate, party, or voter may be classified as moderate without taking even one moderate position on any issue by taking an equal number of extreme liberal and extreme conservative posi-

tions across the set of issues (but see Converse 1964). Jessee (2009), for example, measures the ideology of citizens by asking them to vote yes or no on a series of hypothetical bills; there is no opportunity to express a position in between yes and no for any issue. In a item response theory model, participants' prior distributions on their ideology scores are centered on the midpoint, and their posterior distributions move to the left or to the right as liberal or conservative responses are observed. As a result, a moderate citizen is someone who provides equal amounts of evidence of liberal and conservative preferences. By this definition, we cannot distinguish between actors whose preferences do not align neatly on a single ideological dimension, such as the libertarian party in the United States who adopt conservative economic and liberal social positions, and true centrists who adopt moderate positions on individual issues. Most work that employs spatial modeling in political science focuses on overall ideology, and does not consider how individual issue positions comprise this aggregated metric.

### 3.2 Cueing Cognitive Models

Under what conditions do citizens think about policy when considering an issue scale, and under what conditions do they think about direction and intensity?

Some issues are more amenable to moderate policy positions than others. Rabinowitz and Macdonald (1989, 94) cite as an example a psychological study in which subjects are asked to choose the “perfect shade of gray.” In politics, the level of the federal minimum wage or the amount of money that should be spent on a government program are examples of issues in which intermediate positions represent clear policies.

However, for many issues, it's unclear whether intermediate positions can be understood by citizens as policies. Even if an issue does have true intermediate positions, researchers' abilities to ask about these intermediate positions in a meaningful way on a survey is often

limited. For example, in the 2012 American National Election Study (ANES) pre-election questionnaire respondents are asked to state their position on health insurance as follows:

Some people feel there should be a government insurance plan which would cover all medical and hospital expenses for everyone. . . . Others feel that all medical expenses should be paid by individuals through private insurance plans like Blue Cross or other company paid plans. . . . And, of course, some other people *have opinions somewhere in between* (ANES 2012, 71, emphasis added).

The question wording leaves ambiguous the meaning of opinions somewhere in between. The 2012 ANES also uses “opinions somewhere in between” to describe intermediate positions for the services-spending, defense spending, jobs-standard of living, aid to blacks, and environment-jobs tradeoff issues.<sup>5</sup> These responses might express support for a policy that actually is intermediate and can be plotted in the middle region of a number line. On the other hand, these responses might represent ambivalence between the two explicitly described positions or might serve to signal the intensity of the respondent’s choice between the two positions. It is likely that different people conceive of these intermediate responses in different ways.

There are many reasons why a citizen might think of an issue’s intermediate positions in terms of intensity rather than policy if the issue under consideration allows for it. Most citizens are not very knowledgeable about politics (Delli Carpini and Keeter 1996), likely in part due to their general inattentiveness towards and disinterest in politics (Campbell et al. 1960). Citizens may find it less cognitively taxing to be aware of only two opposing positions relative to a spectrum of policies. Thus thinking about policies in binary terms may be an efficient cognitive shortcut. Citizens who follow elite cues are likely to be exposed to more

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<sup>5</sup>All of the other issues, save one, are presented with only three options representing the liberal position, the conservative position, and neither. The only issue in the ANES for which intermediate positions are clearly described as policy proposals is immigration.

binary position-taking by the two party system, which already encourages people to think about the parties as being the opposites of one another (Heit and Nicholson 2010).

The way a citizen thinks about an issue should also depend on how the issue is communicated to the citizen. If the candidates' positions are described to the citizen in a way that emphasizes the policy content of moderate positions, then the citizen should be inclined to think about a range of policies and to employ proximity thinking. But if these positions are discussed in a way that relates how strongly each candidate espouses their positions, then the citizen should be inclined to think about intensity and to utilize the directional model. This phenomenon is similar to framing effects on a survey (Druckman 2001). Survey respondents may be pliable in this way not because they lack information or competence, but rather because the way that information about an issue is presented is part of the larger discourse that surrounds the issue, and this discourse provides the essential context that the citizen uses to make a decision.

This theoretical expectation leads to the following hypothesis:

*People are more likely to employ directional thinking when choosing between candidates instead of proximity thinking when the candidates' positions are described as liberal or conservative intensities rather than as policy proposals.*

## **4 Data and Experimental Design**

We test our hypothesis using data drawn from a survey experiment conducted using Qualtrics, an internet-based survey research company. Our sample includes 1,005 participants selected from the U.S. adult population. Qualtrics compensates for the fact that people with higher levels of education and greater interest in politics tend to be overrepresented in internet samples by employing quotas on age, gender, and education so that these

distributions match the ones reported by the U.S. Census Bureau in the 2013 Annual Social and Economic Supplement to the Current Population Survey (CPS 2013). These data are superior to a convenience sample because data collected by Qualtrics allows researchers to experiment on a much larger, more representative, and more diverse sample of the electorate than samples made up primarily of undergraduate students or members of a single community.

Participants were first tasked with completing a battery of pretest questions, the first set of which asked them to answer several standard demographics questions about their own characteristics such as their gender, age, and racial identities. Afterwards, they were asked a series of questions about their political attitudes and identities. Following Tomz and Van Houweling, we asked participants about their views on health insurance policy near the end of the pretest (Tomz and Van Houweling 2008). We present this question as viewed by participants in Figure 2. The issue scale here ranges from -4 — people who favor a government insurance plan — to 4 — people who favor private insurance plans.<sup>6</sup>

Next, participants were exposed to a treatment containing information about the positions of two candidates — identified as Candidate A and Candidate B — on health insurance policy. All participants were randomly assigned to one of two treatments.

The first treatment — the *intensity treatment* — presents narrative descriptions of the candidates' issue positions in a way that emphasizes the direction and intensity of these positions. We described the positions of 1, 2, 3, and 4 in either direction as being respectively “undecided, but leans towards”, “slightly in favor of”, “mostly in favor of”, and “strongly in favor of” the liberal position (a government insurance plan) or the conservative position

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<sup>6</sup>Note that our issue scale is slightly more condensed than the one used by Tomz and Van Houweling (2008). Our scale runs from -4 to 4 while their scale ranges from -5 to 5. We made this change because we are able to place two candidates that distinguish the predictions of the proximity and directional models for every position other than the extreme points regardless of whether the scale ranges to 4 or to 5 on either side, and to avoid the challenge of creating a realistic narrative statement — described below — for more issue positions than necessary.

Figure 2: Self-placement on Health Insurance Policy

There is much concern about the rapid rise in medical and hospital costs.

Some people feel there should be a government insurance plan which would cover all medical and hospital expenses for everyone. Suppose these people are at one end of a scale, at point -4.

Others feel that all medical expenses should be paid by individuals through private insurance plans like Blue Cross or other company paid plans. Suppose these people are at the other end, at point +4.

And, of course, other people have opinions somewhere in between, at points -3, -2, -1, 0, +1, +2, or +3.

Where would you place yourself on this scale?



(private insurance plans). Table 1 shows each possible description of the candidates' positions on the health insurance issue scale. Note that there is no description for candidates positioned at 0 on the scale. We omit this description because, as we explain below, no candidate with this position appears in our experiment.

Our second treatment — which we refer to as the *policy treatment* — largely mirrors the approach used by Tomz and Van Houweling (Tomz and Van Houweling 2008). This treatment exposed participants to visual and numeric information about the candidates' issue positions. We showed the participants a number line to represent the range of policies on the health insurance issue, with arrows drawn to the relevant placements of the two candidates. This treatment encourages participants to think about how close the candidates' positions are to their own. Suppose, for example, that a person who places herself at 1 is asked to choose

Table 1: Intensity Treatment Descriptions of the Candidate’s Positions on Health Insurance

| Issue Scale Position | Narrative Description   |
|----------------------|---|
| -4                   | “strongly in favor of a government insurance plan”                  |
| -3                   | “mostly in favor of a government insurance plan”                    |
| -2                   | “slightly in favor of a government insurance plan”                  |
| -1                   | “undecided, but leans towards favoring a government insurance plan” |
| 0                    | —   |
| 1                    | “undecided, but leans towards favoring private insurance plans”     |
| 2                    | “slightly in favor of private insurance plans”                      |
| 3                    | “mostly in favor of private insurance plans”                        |
| 4                    | “strongly in favor of private insurance plans”                      |

between candidates positioned at -1 and 4; she will likely quickly calculate distances of 2 and 3. Given that she was shown a number line with arrows showing her the candidates’ positions, she can also estimate these distances without performing any explicit arithmetic. If this person chooses to vote for the candidate at -1, who is slightly closer but on the other side of the issue, she tacitly understands the position of -1 to be a *policy* that is closer to her own preference. Therefore, by emphasizing distance, this treatment cues participants to think about the policies endorsed by the candidates at each position.

There are alternative approaches to representing a range of policies. A more direct approach would attach written descriptions of distinct policy proposals to each position on the 9-point Likert scale. However, to present a fair test of the proximity and directional models, these policies must be written a way that is understandable to participants, can be clearly ordered from most liberal to most conservative, and are about evenly spaced on the ideological spectrum. This approach would allow for a great deal of potential confounding from the wording of each policy and the assumptions regarding the participants’ information levels and their perceptions of how these policies are arranged in ideological space. Our approach avoids these problems and has the additional advantage of allowing participants to decide for themselves what sorts of policies correspond to intermediate positions.

The primary independent variable of interest in our analyses is a simple dummy variable coded 1 if the respondent was exposed to the intensity treatment and 0 if they were exposed to the policy treatment.

In order to observe the degree to which participants make decisions that are congruent with the expectations laid out by either the proximity or the directional theory, our design requires that citizens be presented with one candidate favored by each of the theories. We use the participants' self placements on this issue scale to determine the positions of the hypothetical candidates they are asked to choose between: we place the candidates so that the one that is closer to the participant is not the most extreme candidate on the participant's side of the issue. The candidate placements, conditional on a participant's self-placement, are listed in Table 2.

Table 2: Candidate Placements

| Participant's self-placement | Candidate placement   |
|------------------------------|-----------------------|
| -3                           | -4 and -3             |
| -2                           | -4 and -1             |
| -1                           | -4 and -2 or -4 and 1 |
| 0                            | 1 and 3 or -2 and 3   |
| 1                            | 2 and 4 or -1 and 4   |
| 2                            | 1 and 4               |
| 3                            | 3 and 4               |

If participants placed themselves at -1, 0, or 1, it is possible to place the candidates on the same ideological side or different sides in a way that distinguishes the models. These respondents were randomly assigned to either view the issue positions of candidates on the same or on different sides of the issue. If candidates are on the same side, this model represents the types of situations we might see in primary elections, and if the candidates are on different sides, this model represents the types of situations we might see in general elections. Participants who placed themselves anywhere else on the issue scale would only

view the positions of candidates on the same side of an issue as they placed themselves.

We present four example treatments in Figure 3, all of which could only be viewed by participants who placed themselves at -1 on the health insurance issue scale. Panels (a) and (b) represent intensity treatments while panels (c) and (d) are examples of policy treatments. Panels (a) and (c) place the candidates on the same side of the health care issue scale — in this case on the side favoring a government insurance plan — while panels (b) and (d) place one candidate on each side of the issue. Note that the substantive descriptions of the candidates match up with their numerical positions as outlined in Table 1.

The proximity and directional theories predict that participants should prefer different candidates in the examples presented in Figure 3. Regardless of whether the candidates are placed on the same side or on different sides, the proximity model predicts that participants should prefer Candidate B over Candidate A because B is located closer to participants than is A. The directional model, on the other hand, predicts that participants will prefer Candidate A because they are sending a stronger signal about their position to participants than is Candidate B.

After viewing a treatment, participants were asked which of the two hypothetical candidates they preferred. We recoded these choices such that a value of 1 indicated that the participant chose the candidate predicted by the directional theory and 0 if they chose the candidate predicted by the proximity theory. This binary variable functions as our dependent variable while our primary independent variable of interest is the treatment to which participants were exposed.

Figure 3: Example Treatments for Participants Who Placed Themselves at -1 on the Health Insurance Issue Scale

(a) Same Side, Intensity Treatment

Many political candidates have opinions about this same issue. Some candidates feel there should be a government insurance plan which would cover all medical and hospital expenses for everyone. Others candidates feel that all medical expenses should be paid by individuals through private insurance plans like Blue Cross or other company paid plans. And, of course, other candidates have opinions somewhere in between.

Here are the opinions of two candidates, whose names will remain confidential.

- Candidate A is strongly in favor of a government insurance plan
- Candidate B is slightly in favor of a government insurance plan

On this particular issue, do you prefer Candidate A or Candidate B?

- Candidate A
- Candidate B

(c) Same Side, Policy Treatment

Many political candidates have opinions about this same issue. Some candidates feel there should be a government insurance plan which would cover all medical and hospital expenses for everyone. Others candidates feel that all medical expenses should be paid by individuals through private insurance plans like Blue Cross or other company paid plans. And, of course, other candidates have opinions somewhere in between.

Here are the opinions of two candidates, whose names will remain confidential.



On this particular issue, do you prefer Candidate A or Candidate B?

- Candidate A
- Candidate B

(b) Different Sides, Intensity Treatment

Many political candidates have opinions about this same issue. Some candidates feel there should be a government insurance plan which would cover all medical and hospital expenses for everyone. Others candidates feel that all medical expenses should be paid by individuals through private insurance plans like Blue Cross or other company paid plans. And, of course, other candidates have opinions somewhere in between.

Here are the opinions of two candidates, whose names will remain confidential.

- Candidate A is strongly in favor of a government insurance plan
- Candidate B is undecided, but leans towards favoring private insurance plans

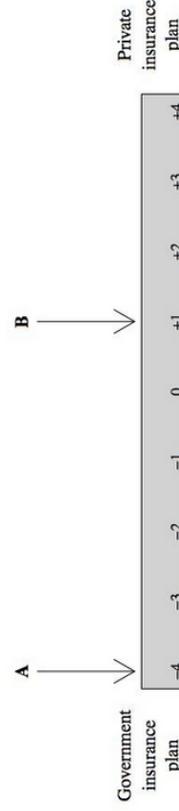
On this particular issue, do you prefer Candidate A or Candidate B?

- Candidate A
- Candidate B

(d) Different Sides, Policy Treatment

Many political candidates have opinions about this same issue. Some candidates feel there should be a government insurance plan which would cover all medical and hospital expenses for everyone. Others candidates feel that all medical expenses should be paid by individuals through private insurance plans like Blue Cross or other company paid plans. And, of course, other candidates have opinions somewhere in between.

Here are the opinions of two candidates, whose names will remain confidential.



On this particular issue, do you prefer Candidate A or Candidate B?

- Candidate A
- Candidate B

## 4.1 Participants who place themselves at extreme points or at zero

We excluded from our analysis 362 of 1,005 participants because these participants placed themselves at either the most extreme conservative position, 4, or the most extreme liberal position, -4. Under both the proximity and directional theories, the participant is predicted to choose the closer of the two candidates because the closer candidate must also be the more extreme of the two on the participant's side of the issue. Therefore, for these participants, it is impossible to place the two candidates such that the proximity and directional theories make different predictions.

Instead, we use these participants to learn about the nature of the experimental treatment. These participants were still randomly assigned to either the intensity or policy treatments, and were asked to choose between a candidate who is slightly in favor of their position (-2 or 2) and a candidate who is undecided, but leans towards favoring their position (-1 or 1). Both the directional and proximity theories predict that participants will choose the candidate slightly in favor of the position (-2 and 2), so we identified that candidate as the *theoretical choice* and the other candidate as the *atheoretical choice*. We are able to observe whether these participants selected the theoretical candidate. Table 3 is a cross-tabulation of these choices and the treatment.

About 74.3% of the participants who occupy extreme positions selected the theoretical candidate, but 25.7% of these participants selected the atheoretical candidate.<sup>7</sup> A significantly higher percentage of participants who were given the intensity treatment chose the atheoretical candidate.

This result is not surprising given that the method through which information is trans-

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<sup>7</sup>There is no significant difference however in the rates of selecting the theoretical candidate between extreme liberals (-4) and extreme conservatives (4).

Table 3: Candidate Choice Among Participants with Extreme Preferences

| Treatment | Theoretical choice | Atheoretical choice | Total |
|-----------|--------------------|---------------------|-------|
| Policy    | 153<br>(85.5%)     | 26<br>(14.5%)       | 179   |
| Intensity | 116<br>(63.4%)     | 67<br>(36.6%)       | 183   |
| Total     | 269<br>(74.3%)     | 93<br>(25.7%)       | 362   |

Test of association:  $\chi_1^2 = 23.1$ ,  $p < .01$ .

Note: row percents are included in parentheses

mitted under the intensity treatment is less precise than the policy treatment; participants have more freedom to interpret the meaning of the intensity descriptions in ways other than a placement on a left-right continuum. We cannot characterize these alternative interpretations, but whatever they may be, this result indicates that more participants in the intensity treatment group behave in ways that cannot be predicted by either the directional or proximity theories. In other words, *the intensity treatment generates more atheoretical behavior*. Within our sample, our theoretical expectation for participants in the intensity group is that they will select the candidate predicted by directional theory; if they choose the other candidate, we cannot tell if they are employing the proximity model, or if they are also interpreting the intensity descriptions in a way that does not align neatly on an ideological dimension. Thus we expect our test to be conservative. Despite this pattern, as we discuss in section 5, we still see a large and statistically significant difference in the experimental results between the intensity and policy treatment groups.

Participants who placed themselves at 0 are predicted by the directional model to be indifferent between all candidates. These participants are still predicted to prefer the closer candidate under the proximity model, however. It's ambiguous whether we should include participants who place themselves at 0 in the study because our theoretical expectations of

candidate choice only apply under proximity theory. We therefore run our analyses twice: once including all participants other than the ones who placed themselves at extreme positions, and once also excluding participants who placed themselves at 0. For the participants who place themselves at 0, we code the closer candidate as the proximity choice and the farther candidate as the directional choice despite the fact that the directional model predicts indifference.

## 5 Results

We present our results in Table 4 using a simple cross-tabulation of candidate choice, represented by the rows, and the treatment, represented by the columns. We report two versions of the result: Table 4(a) reports the candidate choices of all participants who placed themselves at values other than the two extreme positions, and Table 4(b) does the same but also excludes participants who placed themselves at zero.

We evaluate our hypothesis using  $\chi^2$  tests of association. These tests assess the degree to which the relative proportion of votes for the proximity and directional candidates depend on whether participants were exposed to the policy or intensity treatments. When we do not include participants who placed themselves at 0 on the issue scale (Table 4(b)), we observe a test statistic of 5.59 along with an associated p-value of 0.018. This allows us to reject the null hypothesis that the treatments do not affect candidate choice. As noted above, the directional model predicts that participants who place themselves at zero should be indifferent between the two candidates. Therefore when we include these participants (Table 4(a)), the test statistic is smaller (3.44) and the p-value is 0.064.

In order to describe a substantive effect size in addition to these hypothesis tests, we also use a logistic regression to calculate the predicted probabilities of choosing the directional

Table 4: Experimental Results

(a) Participants Who Place Themselves at 0 Are Included

|                                | Policy Treatment | Intensity Treatment | Total          |
|--------------------------------|------------------|---------------------|----------------|
| Vote for proximity candidate   | 171<br>(52.9%)   | 146<br>(45.6%)      | 317<br>(49.3%) |
| Vote for directional candidate | 152<br>(47.1%)   | 174<br>(54.4%)      | 326<br>(50.7%) |
| Total                          | 323              | 320                 | 643            |

$$\chi^2(1) = 3.44, \quad p = 0.064.$$

(b) Participants Who Place Themselves at 0 Are Excluded

|                                | Policy Treatment | Intensity Treatment | Total          |
|--------------------------------|------------------|---------------------|----------------|
| Vote for proximity candidate   | 127<br>(52.3%)   | 101<br>(41.6%)      | 228<br>(46.9%) |
| Vote for directional candidate | 116<br>(47.7%)   | 142<br>(58.4%)      | 258<br>(53.1%) |
| Total                          | 243              | 243                 | 486            |

$$\chi^2(1) = 5.59, \quad p = 0.018.$$

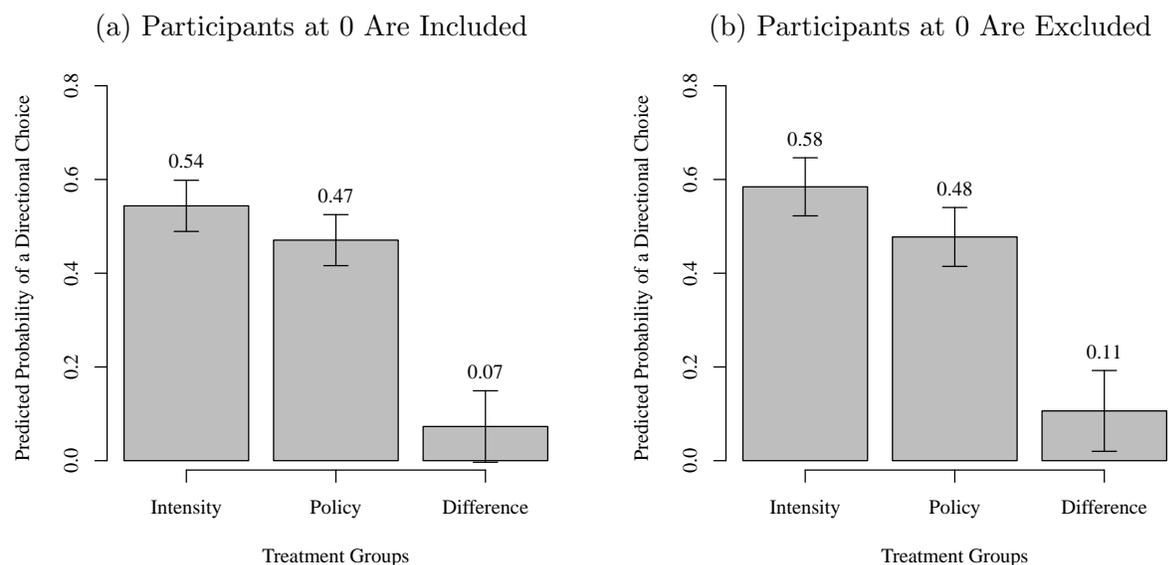
Note: column percents are included in parentheses

candidate within each treatment group, and we graph these probabilities in Figure 4.<sup>8</sup> These predicted probabilities are identical to the proportions reported in Table 4. However, we also report the difference in probability between the treatment groups and 95% confidence intervals for all of these quantities.<sup>9</sup>

<sup>8</sup>These logit models each include one binary independent variable for the treatment, in which the intensity treatment is 1 and the policy treatment is 0. Including participants who place themselves at 0, the treatment coefficient is 0.29 with a standard error of 0.16, and the intercept is -0.12 with a standard error of 0.11. Excluding participants who place themselves at 0, the treatment coefficient is 0.43 with a standard error of 0.18, and the intercept is -0.09 with a standard error of 0.13. The maximum log-likelihoods for each model are -441.91 and -333.15, respectively.

<sup>9</sup>When participants at 0 are included, the 95% confidence interval on the predicted probability of selecting the directional candidate is [0.49, 0.60] for the intensity treatment group, [0.42, 0.53] for the policy treatment group, and [-0.003, 0.15] for the difference between these probabilities. When participants at 0 are excluded, the 95% confidence interval on the predicted probability of selecting the directional candidate is [0.52, 0.67] for the intensity treatment group, [0.42, 0.54] for the policy treatment group, and [0.02, 0.19] for the difference between these probabilities. These intervals are derived from delta-method standard errors, calculated using

Figure 4: The Predicted Probability of Selecting the Directional Candidate By Treatment



Relative to the policy treatment, the intensity treatment is associated with a 7.3 percentage point increase in the prevalence of directional voting when participants who place themselves at 0 are included in the analysis, and with a 10.7 percentage point increase in the prevalence of directional voting when participants who place themselves at 0 are not included in the analysis. These increases shift the majority of votes from the candidate predicted by the proximity model to the candidate predicted by the directional model, which could change the result of a hypothetical election. Both models thus suggest that the treatments have substantively large effects.

Under the policy treatment, which replicates Tomz and Van Houweling (2008), 52.9% of participants select the proximity candidate when participants who place themselves at 0 are included, and 52.3% of participants select the proximity candidate when participants who place themselves at 0 are excluded. These proportions are similar but somewhat smaller than those reported by Tomz and Van Houweling (2008, 313), who found that 57.7% of their

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the margins command in Stata 14.

participants select the proximity candidate.

## 6 Discussion

Researchers have attempted to adjudicate between the proximity and directional models of voting for nearly 30 years, yet there remains no consensus regarding the relative validity of the models. One reason for this impasse is that the way in which information is communicated to a citizen can cue the citizen to think about a vote-choice in a way that corresponds to either the directional or proximity theory.

Citizens learn about an issue and about candidates' positions from the political discourse that surrounds the issue stemming from campaigns, the news media, and social networks. When this real-world discourse emphasizes the policy content of positions, citizens are more likely to employ the proximity model to choose between candidates. When this discourse portrays the issue as having two sides and describes the direction and intensity of candidates' positions, citizens are more likely to use the directional model. These two styles of communication most clearly differ in the latent argument each one makes about moderate positions. When intermediate positions are described as policies, then a moderate candidate can easily be portrayed as principled, even-tempered, and able to reach across the aisle. When intermediate positions are described as intensities, then a moderate candidate is unprincipled, self-interested, or weak. Both styles of communication are common, and the relative use of each style depends on the nature of the issue, on the characteristics of the candidates and the citizens receiving the information, and on the larger political context surrounding the issue. Future work can empirically describe the real-world conditions under which issues and positions are likely to be communicated as policies or as intensities.

Like the other experimental studies of proximity and directional voting (Claassen 2007; Lacy and Paolino 2010; Tomz and Van Houweling 2008), we find that our sample consists

of large groups of proximity and directional voters. Regardless of the treatment, a large proportion of the sample chose the candidate predicted by proximity theory, and a large proportion of the sample chose the candidate predicted by directional theory. If we take this behavior to indicate the cognitive model employed by the participants, then the electorate is likely heterogeneous as theorized by Morris and Rabinowitz (1997). If policy signals and intensity signals are both prevalent in political discourse, then we would have even more reason to expect both proximity and directional voters to exist in the electorate as different people are exposed to different messages.

Parties and candidates, therefore, may benefit electorally from carving out positions that diverge clearly from their opposition. Candidates who can clearly distinguish themselves are more likely to gain the support of directional voters, even when those voters are moderates who are also given the option to choose a candidate with a more moderate — but wrong sided — position. As a result, the optimal strategic position of a candidate is *more extreme than the median voter*. This implication holds even when only part of the electorate employs directional thinking. Therefore, attaining high degrees of policy congruence between citizens and their representatives in government may be difficult outside of districts that are both ideologically homogeneous and ideologically extreme. In such districts, citizens are likely to be represented by a similarly ideologically extreme politician, but in a district with a more ideologically diverse electorate many voters with less extreme preferences are also likely to support extreme candidates. This ideologically diverse district, then, is also likely to be represented by someone who will seek to create policies that are more liberal or more conservative than the positions of a large portion of their constituents. In other words, voter choices driven by directional thinking could lead to ideologically polarized candidates who attempt to produce government activity that moves policy further in the direction preferred by the plurality of their constituents than would be the case if voter choices were driven by proximity thinking. We argue, therefore, that scholars need to pay greater attention to the

directional model in analyzing voter behavior and its implications.

These results also imply a clear campaign strategy for candidates beyond changing their positions. Suppose that an election is contested by two candidates, one of whom is moderate and one of whom is more extreme on the same side as the median voter. The moderate candidate will win if all voters employ proximity calculations, and the extreme candidate will win if voters employ directional thinking. But, since citizens can be cued to think about their choices using either model, the moderate candidate has an incentive to campaign by communicating the policy substance of moderate positions, and the extreme candidate has an incentive to campaign by emphasizing ideological directions and intensities. The moderate candidate can, for example, list bullet points on a mailer with specific policy proposals while the extreme candidate can use language and images to convey strong identification with an ideological side. Conversely, it would be a losing strategy for the moderate candidate to compete by identifying with an ideological side, or for the extreme candidate to delve into policy specifics.

## 7 Conclusion

The longstanding research literature comparing the directional and proximity models by and large asks: which model is right? We draw a connection between this question and another one: what does the middle of an issue scale mean? If an issue is described as a range of policies in which intermediate positions represent centrist policy, then citizens are inclined to think about an election using the proximity model and will prefer candidates who share their positions. If an issue is described as having two sides such that intermediate positions are portrayed as low-intensity signals of being on one side or the other, then citizens will use directional thinking and will support the most extreme reasonable candidate on their side.

In other words, citizens think about their votes in different ways at different times. Like

other experiments, we find that both directional and proximity voters exist in the electorate. But we delve further into this heterogeneity and demonstrate that individual citizens can be encouraged to think about their choices in ways that correspond to the directional or the proximity model, based on the information to which they are exposed. Our results suggest that researchers must consider the presence of a large amount of directional voting in elections and the types of information cues that make this behavior more prevalent than proximity voting.

While this study points to an important relationship between the information context of elections, citizen preferences, and candidate behavior, more work is needed to overcome the limitations of our experiment. Our analysis, like any experiment, required assumptions to simplify the setting in which participants choose between candidates. The conclusions should be examined under different assumptions, varying the issue the participants are asked to consider, the number of issues, the number of candidates, the voting rules, and other features of the simulated election. Future work must also vary the mechanism through which candidate positions are presented, both as policies and as directions with intensities. Experimental work should be augmented with empirical and qualitative observational research to assess these effects in the most realistic possible settings.

Ethical approval: All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed consent: Informed consent was obtained from all individual participants included in the study.

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