

Explorations of Heterogeneity in Models of Voter Choice

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Dissertation submitted in partial fulfillment of
the requirements for the degree of Doctor
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ABSTRACT

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Abstract

In this dissertation, I examine three sources of heterogeneity in voter choice that fit into two typologies. The first of these is *inter*-individual heterogeneity, or the idea that different types of individuals use unique models in evaluating candidates. I examine voters' levels of moral conviction and voters' partisanship as sources of this type of determinacy of decision criteria. My results indicate that the morally convicted differ in the shape of their utility function for candidate assessment. Instead of having a linear function representing the relationship between the candidate's distance from their ideal points and how much they like the candidate, the morally convicted have a convex curve. I also find that the criteria on which individuals rate candidates differs based on whether they are partisan or moderate voters. I use the method of eye tracking to find that moderates tend to weigh candidates' policy stances much less than partisans do.

The second type of heterogeneity explored is *intra*-individual heterogeneity, or the idea that the same individual uses different models depending on the context she is in. In an experiment, I find this type of heterogeneity is present: it is possible to prime people to use directional or proximity theory based on whether the issue is presented through a proximity-based framework or a directional-based structure.

This dissertation contributes to the literature on heterogeneity by providing a theoretical framework within which to think of different types of heterogeneity. It also

provides something new in each chapter: Chapters 2 and 4 offer the first examination of these sources of heterogeneity while Chapter 3 uses a new method in political science.

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1. Introduction

What citizens base their voting decisions on is one of the most important unanswered questions in political science. It is critical not just because we want to understand how voters come to a decision, but also because many of our institutional theories are – consciously or unconsciously – based on a model of individuals’ decision making process. Thus the answer to this foundational question has implications for topics like legislative bargaining, constitutional design, and even foreign policy as well as for public opinion research.

It would perhaps be more appropriate to describe the question as one of the most *over*-answered questions in political science rather than an unanswered one, because it is this uncertainty as to voters’ choice models that motivates scholars to try to find the answer. Those given by scholars include the policy stances of the candidate [e.g., the traditional spatial models of voting (Enelow & Hinich, 1984; Merrill & Grofman, 1999)], the candidate’s party (Page & Jones, 1979; Hinich & Munger, 2010), retrospective economic performance (Markus, 1988), what the candidate looks like (Rosenberg et al, 1984), feelings about coalitions that could form after an election (Blais, Aldrich, Indridason, & Levine, 2006), and any scandals the candidate has been involved in (Funk, 1996), to name just a few. But a commonality amongst most of this work is the assumption that all citizens use the same process in making their voting decision. We are accustomed to treating all of the independent variables as if they have a constant

strength of association with the dependent variable (in this case, vote choice) for all people, regardless of their gender, race, level of education, or political party. The agreement I am talking about is not an agreement on preferences, but instead an agreement about the overall form of the utility function that is being used. In other words, there is an assumption of *homogeneity* amongst voters.

Some work has found this assumption to be false, or that there is *heterogeneity* amongst the voting population. Perhaps the most frequently examined source of differences is education or political sophistication – for example, the idea that belief systems are differentially organized according to this variable (Stimson, 1975), or that the less educated voters judge candidates by focusing on a retrospective assessments of the incumbent’s performance while the more sophisticated judge both candidates’ competence (Sniderman et al., 1991), or that the candidates are judged on “easy” issues by those with a low level of sophistication while the more sophisticated evaluate them on “hard” issues (Carmines and Stimson, 1980). However, such work tends to limit its investigation of heterogeneity to political sophistication or some other variable of choice with no discussion of broader theory or what the results suggest about the assumption of heterogeneity.¹

In this dissertation, I provide a theoretical framework for thinking about heterogeneity. I suggest that two types of heterogeneity are possible: *inter*-individual

¹ Also, see Adams et al., 2012; Lewis-Beck et al., 2008; Rahn et al., 1990; and Bartle, 2005.

heterogeneity, meaning that people choose differently from one another based on some characteristic, and *intra*-individual heterogeneity, which involves differences in the same person's method of choice across contexts. The first captures differences in voting across individuals; the latter represents differences within individuals, across time or situation. I explore three sources of heterogeneity, which span both of the mentioned types.

The second chapter examines whether the model that respondents use to evaluate candidates changes based on whether the individual is morally convicted or not. The definition of moral conviction suggests that moral attitudes do not lend themselves to middle of the road evaluations of policies, such as the '*somewhat right thing*' or '*neither right nor wrong thing*'. But the standard utility functions used by political scientists in predicting voter choice involve just this type of gradual loss of utility. Consequently, I suggest that the morally convicted have a unique utility function, which is an area of high, constant utility (representing the morally right policies) followed by a steep, convex drop to an area of low, constant utility (representing the morally wrong policies). I provide evidence from a survey that morally convicted individuals do differ in their utility functions, and that their utility loss is of a convex form.²

² Note that in this chapter I only test issue-specific utility functions – that is, functions predicting a thermometer rating for a candidate on a single issue – not an overarching function that includes all issues.

The third chapter looks at whether moderates weigh candidates' policy positions to the same extent as partisans do. Partisan voters seem to care about specific candidate policy proposals in evaluating candidates. But "moderate" voters may not, at least not to the same extent or in the same way. I analyze this question using an eye tracking experiment finding that moderate respondents weigh candidates' policy positions far less than partisans. First, using self reported data, I show that moderates do not use policy at all in coming to their evaluations of candidates. This finding is corroborated by eye tracking data indicating that liberals and conservatives spend significantly more time than moderates examining candidates' policy positions as opposed to other information such as their job histories and personal characteristics. This finding demonstrates the value of eye tracking as a method in political science and also has important substantive implications for candidate strategy and the behavior of independent voters.

These chapters, then, are explorations of inter-individual heterogeneity, in that the sources examined differ between individuals rather than within voters, across context. The fourth chapter, on the other hand, offers an examination of the second type of heterogeneity by looking at an intra-individual source. This chapter examines not the bases of heterogeneity but whether heterogeneity is grounded in relatively fixed sources (e.g., political sophistication) or if it instead can be induced through priming. Specifically, I show in an experiment that framing respondents' conception of the

“space” of the policy in question affects the models they use to evaluate candidates. Specifically, if self-placement questions invoke a directional logic, respondents are more likely to respond as if their own preferences were directional. But if these questions are of a proximity logic, respondents appear to be proximity voters. Therefore, voters are susceptible to strategic manipulation by elites, who may frame issues in order to induce strategies that are maximally advantageous given their interests.

I use a number of methods to test these realizations of heterogeneity amongst the voting population. Chapter 2 utilizes a survey design that effectively captures the shape of respondents’ utility functions. Chapter 3 uses a new method in political science – eye tracking – that allows for the direct measurement of the information acquisition preceding a choice. And my conclusions in the fourth chapter are based on an experimental design, which allows for a more persuasive argument regarding the causality of the key variable.

2. The unique utility function of morally convicted voters

Cutting Social Security, a life and death issue for seniors and those with disabilities, isn't just bad economics – it's immoral.

-Bernie Sanders, *Twitter*, December 12, 2016

What difference in voter behavior was Sanders trying to achieve by casting social security in a moral light? His comment may have had substantial impacts on his readers' perception of social security and likelihood of political participation. Experimental research has shown that by using moral rhetoric, elites can increase public support for their side of a debate (Clifford & Jerit, 2013). And survey and experimental work tells us that those who view an issue through a moral lens are less likely to compromise (Skitka, Bauman, & Sargis, 2005; Toner, Leary, Asher, & Jongman-Sereno, 2013; Ryan, 2016), more likely to be prejudiced against the opposition, and more likely to vote (Skitka & Bauman, 2008). The literature thus would predict not only that Sanders increased his followers' support for maintaining social security benefits, but also that they would strongly resist the opposition and more likely to engage in political action over the issue.

Despite the importance of these findings, the effects associated with moral conviction are not incorporated into the standard formal models of public preferences and turnout. Voters' opinions of candidates tend to be measured according to the same model for all voters and for all issues, most commonly with linear or quadratic utility. Yet our formal and empirical models are less likely to accurately predict voter choice if they do not take moral conviction into account – the effects of moral conviction are

generalizable, applying to a large percentage of the population and spanning several issues, including those of the economic type. Additionally, the associated effects have been shown to be independent from those of religious conviction, issue importance and relevance, and attitude extremity – variables that might be added to a model predicting utility for a candidate as control variables but would fail to capture the full effects of moral conviction.

Consequently, in this chapter I offer a formalization of the moral conviction concept. I do not suggest that it merely be added to models as a covariate, because results suggest that morally convicted individuals have a patently distinct utility function from those whose attitudes are non-moral, termed here “pragmatic” individuals. Moral attitudes are different from pragmatic attitudes in that they involve viewing an issue in a two-sided manner. In his definition of a moral attitude, Haidt (2001) gives only two options for considering a given policy: “good vs. bad.” But typical models of utility assume that as a policy gets further away from one’s ideal point, one loses utility *gradually*. This idea of utility loss as a continuous, measured process does not coincide with the view of an issue position as either morally correct or not, with no intermediary level of utility.

My claim is that while the preferences of pragmatic individuals are consistent with the traditional quadratic or linear forms of utility, the preferences of individuals with a high level of moral conviction are better described by a different utility function.

This function is a step function, where utility drops suddenly when the policy transitions from a region of high, constant utility (for policies that are deemed morally 'right') to a region of low, constant utility (for policies deemed morally 'wrong'). As I will explain, in practice this function should take the form of a convex curve.

The empirical investigation that follows shows that the relationship between utility and policy distance on two issues – abortion and minimum wage – is significantly different for the morally convicted than it is for pragmatic individuals. Specifically, the morally convicted favor candidates who are very close to their preferred policy more highly than pragmatic individuals do, then lose utility more rapidly as the candidate moves away from their preference, and then have a low and relatively consistent regard for distant policies. This utility function is well represented by a convex curve. The preferences of pragmatic individuals, on the other hand, are consistent with a linear utility function.

This idea is important in the following sense. All of our formal and empirical work implicitly makes assumptions about a voter utility function, and numerous results depend upon the form assumed. For example, Kamada and Kojima (2010) show that if utility functions are convex, then candidates diverge instead of converging to the median, as they would do in equilibrium under concave utility. Or, as Shepsle (1972) shows, whether the form of utility is convex or concave determines whether candidates should choose clear, distinct points on issue scales at which to locate or if they should

instead equivocate on their policies, making voters uncertain as to where they are located. As he demonstrates, candidates facing a majority of voters with risk acceptant utility functions (or, convex functions) have an incentive to be ambiguous about their policy proposals, whereas those facing an electorate whose majority has quadratic utility functions have reason to be precise about their platforms. Since several of our key political issues likely involve strong moral conviction from large swaths of the electorate, if their utility functions are convex then their impact on these results are a demanding concern.

Thus, this chapter speaks to both formal theorists and political psychologists alike. For the former, it alters them to the possibility that the assumption that everyone chooses according to the same utility function is not reasonable. And the suggested form that the morally convicted's utility function takes has implications for candidate divergence and policy equivocation. For political psychologists, it offers a formalization of an increasingly studied concept, which should aid in its application to a number of problems that cannot be observed in experimental circumstances. The logic required by formal theory can be applied to the abundance of experiments and survey work on moral conviction to draw conclusions regarding candidate location, voting patterns, and voter turnout. This chapter is consequently in the tradition that Lupia (2002) described:

For scholars whose goal is the pursuit of clear and reliable explanation, logically organized and empirically grounded analyses are the only path to success. Together, the

logic of rational choice theory and the empirical foundations of political psychology provide the foundations for achieving such success.

2.1 Background: alternative utility functions

The idea that there might be different functional forms for utility builds on previous work. McKevley (1975) suggested three utility functions that might represent voters' preferences (shown in Figure 1). Work on voter utility has mostly assumed a linear or quadratic function since then (U1 or U2 in Figure 1).³ Under this assumption, utility is lost gradually as the policy moves away from a voter's ideal point. Under the quadratic function, the loss in utility between subsequent policies *increases* relatively as the policies get further away from an individual's ideal point. Under linear utility, the relative loss between two policies that are close and two policies that are far away is the same – the first derivative of the function is constant.

While one of these two utility functions is typically assumed, there has been intermittent deviation from them. For example, Poole and Rosenthal base their NOMINATE model on legislators' utility functions being of a normal distribution (represented by U3 in Figure 1), finding it to be a more realistic description of legislator behavior (Poole, 2005). Likewise, in a 2013 paper, Carroll, Lewis, Lo, Poole, & Rosenthal explore whether legislators have a quadratic or Gaussian utility function, and find that the normal function better describes behavior across many roll-call data sets. Another

³ For a useful review of the literatures' use of linear and quadratic functions see Singh, 2014.

important exception is Egan (2014), who proposes that a double-peaked utility function better describes the preferences of some Americans on “consensus” issues. This departs from traditional utility functions, which assume that preferences are single-peaked. This literature shows that the form of both legislators’ and citizens’ utility functions, typically assumed by scholars to be linear or quadratic, may be different or at least vary across “types” of citizens. Why does this matter? It is important because the form that utility takes has implications for choice behavior.

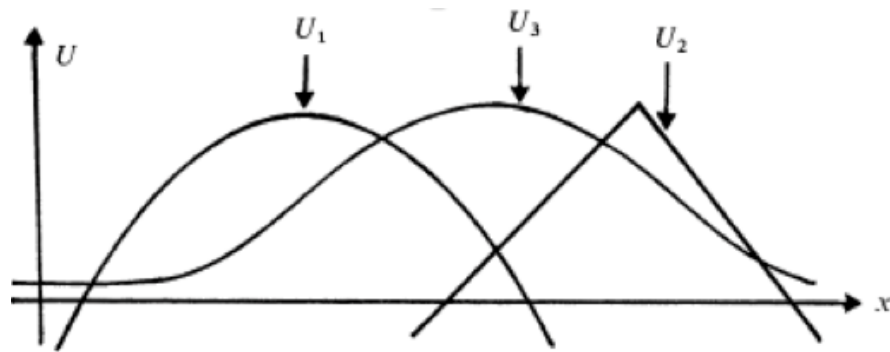


Figure 1: Three potential utility functions [Source: McKelvey (1975)]

2.2 Defining a utility function for morally convicted individuals

This chapter focuses on citizens’ utility functions. Previous research on moral conviction provides a psychological basis for the idea that voters who view an issue in moral terms are unique in terms of their utility loss. This idea begins with the definition of moral conviction, which is described as an opinion rooted in beliefs about “an *absolute* sense of right and wrong that transcends normative conventions and cultural context” (Skitka & Bauman, 2008, italics added). Moral judgments are “evaluations (*good vs. bad*)

of the actions or character of a person that are made with respect to a set of virtues held to be obligatory by a culture or subculture” (Haidt, 2001, italics added). Notice that there are only two evaluations that Haidt defines as applicable to a moral attitude: good and bad. This means that moral conviction does not lend itself to middle of the road, consistently scaled evaluations of an action or policy, such as the ‘really right (wrong) thing,’ ‘somewhat right (wrong) thing,’ or ‘neither right nor wrong thing’. To be “absolute,” there must be a clear demarcation between right and wrong. Morality is not a consistently continuous concept.

A linear or quadratic utility function assumes that people lose utility *gradually* as a policy moves away from their ideal point. But viewing an issue morally does not allow one to lose utility in the slow fashion suggested by the function. Instead, the binary view of utility that is suggested by the theory of moral conviction translates intuitively into a different form for the utility function: a step function, where the step (down) occurs at the point where the individual switches from viewing a policy as the right thing to do to the wrong thing to do. This form suggests that for the policies that an individual deems within the region of morally correct policy, she has a high and relatively flat level of utility; for those that she judges as wrong, she has a similarly flat but low level of utility.

This model of utility is consistent not only with the definition of moral conviction, but also with survey and experimental findings. Moral conviction has been associated with a propensity to view political issues in a one-sided manner and to show

increased animosity towards those who disagree with one's opinions (Skitka, Bauman, & Sargis, 2005; Tetlock, Orie, Kristel, Elson, Green, and Lerner, 2000). Increased animosity is simply another way to describe the results of increased utility loss. Moral respondents are also uniquely hostile towards a representative who will compromise with the opposition, and are less likely to accept a political compromise. If one has close to no area of moderate utility, then one would reject compromises – not because they are compromises per se, but because their utility for the policies in question is very low. Consequently, the suggested utility function is consistent with many of the principle findings regarding moral conviction.

It is important to note, though, that these findings regarding moral conviction do not exhaust all of the potential implications that would result from a change in the form of a utility function. Utility functions have consequences for a variety of broader topics, including voter participation, framing effects, and risk attitudes (Morgenstern and Zechmeister, 2001; Berinsky and Lewis, 2007; Kam and Simas, 2012). The formalization of the concept of moral conviction should aid in the concept's application to these alternative problems, beyond the findings that have motivated this investigation. I will review some of the potential further applications in the conclusion.

2.3 Testing the morally convicted utility function

Thus far, I have outlined my theory for morally convicted individuals assuming that a moral principle can be translated into policy directly, without uncertainty or

ambiguity. But there are several measurement errors that could affect the translation of the function, such that a convex curve better represents the utility function across individuals in practice.

For example, each individual might have a clean step function, but all, say, supporters of a policy might differ slightly in exactly what policy point is their non-differentiable break point for the step. Or, even if all voters were to have the same break points in theory, if Gilligan and Krehbiel (1990) were right about the uncertainty surrounding the relationship between policies (e.g., bills or legislation) and the outcomes or consequences resulting from these policies, then the placement of citizens' break points would likely differ in practice. In other words, if voters are unsure as to the outcome of a policy, then it is likely that people with the same preference would have different break points because of differences in their estimated consequences of the policies. In practice, then, we should see variation in the drop off point; rather than a single point, it is a distribution of points around a central position.⁴

I also expect a distribution of the drop-off point across individuals because of disagreement amongst survey respondents about what the interior positions of an issue space represent. Typically on surveys, only the end points of the scale are labeled with a policy, while the interior points are left unlabeled. Consequently, one may view

⁴ That is to say that there is a step function plus measurement error, which I assume to be standard, that is $\epsilon_i \sim N(0, \sigma^2)$.

movement on, say, an abortion scale to be a function of what is permitted according to stages in gestation, while someone else may view it as a function of what is permitted according to therapeutic need, including danger to the mother's life or her physical and mental health. Therefore, even if two respondents had the same drop off point in policy terms, their understanding of the scales may cause them to place this point at somewhat different positions.

I would expect the measurement issues to particularly affect a step function, since the step is set at a distinct point. Taking these ambiguities into account, the sudden drop off of a step function is 'rounded off', so that the function becomes a convex curve. When testing across individuals, the preferences of the morally convicted should depend on how quickly moral voters view policies as becoming morally wrong once they begin to depart from their ideal points. If moral voters do not stand for any movement away from their ideal points, then the curve will be convex all the way through. If, on the other hand, they see the closest points to their ideal point as morally right, then the curve will be briefly concave, and then will become convex.

An example of the precise form this utility function could take is:

$$Utility = \frac{1}{e^X}$$

where $X = \sum_{z=1}^n |P_{iz} - P_{jz}|$, and

where i indicates the individual, j denotes the candidate, z is the policy issue, and P represents policy preference or ideal points. X thus represents the sum of the absolute

value of the policy distances between the candidate and the voter across all issues. k is a positive number ($k > 0$), and its size specifies the steepness of the convex function. E.g., if $k < 1$, then the utility function will be very convex, falling away from the utility associated with the individual's ideal point very quickly. Figure 2 depicts a sample curve for this utility function across candidate proximities.

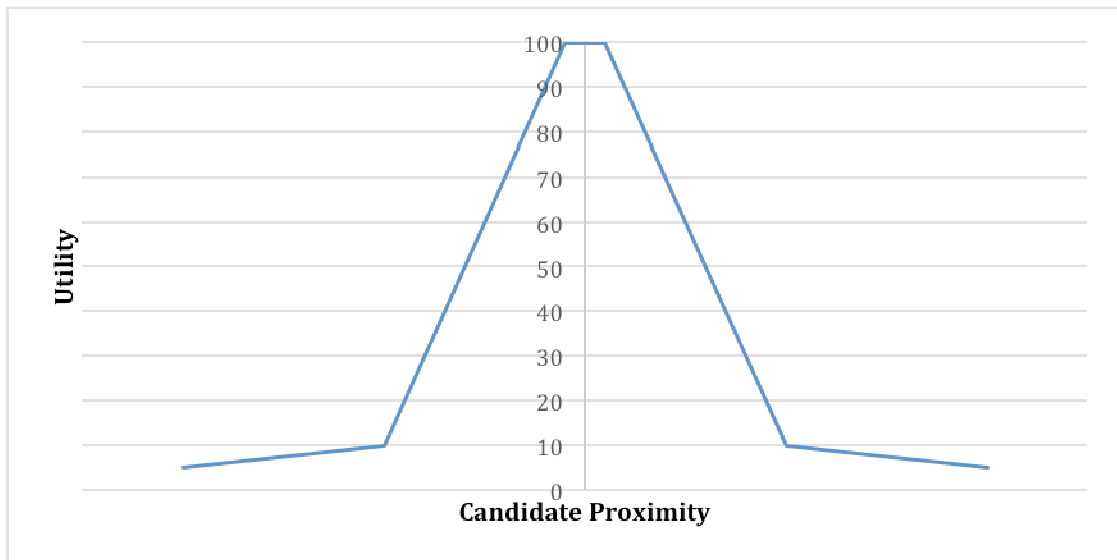


Figure 2: Utility function of the form $\frac{1}{k \cdot x}$

2.4 Materials and Methods

This leads to the hypothesis that the utility functions of morally convicted respondents are convex in shape, while those of pragmatic respondents are linear or quadratic. To test this hypothesis I use data gathered from Amazon.com's Mechanical

Turk (MTurk).⁵ Specially designed survey questions were required in order to thoroughly test the form of respondents' utility functions. Specifically, respondents needed to evaluate several policy proposals on the same issue to estimate the shape of the function, but standard opinion surveys do not ask this of participants. My approach was to directly measure respondents' utility functions. Subjects were shown a horizontal scale ranging from 0 to 10 for two issues: abortion and minimum wage. The end points of the scales were labeled with a very conservative policy on one side and a very liberal policy on the other side.⁶ Consistent with other studies attempting to directly measure utility functions (Bartels, 1986 and Thurner, 2000), as well as the standard ANES-style measurement of issues, I did not include labels on the interior points of the scale.

I chose to look at abortion and minimum wage in order to include one putative moral issue and one that is associated with economic concerns. Previous work has assumed that moral issues are definitionally separate from economic issues (Laver and Garry 2000), although more recent work has called this separation into question (Hillygus and Shields 2005). By testing my hypothesis on both, I will provide additional

⁵ MTurk has been found to be a viable alternative to phone surveys, laboratory experiments, and alternative internet polling (see Paolacci, Chandler, & Ipeirotis, 2010; Buhrmester, Kwang, & Gosling, 2011; and Berinsky, Huber, & Lenz, 2012). It has more specifically been found to be appropriate for research on political ideology (Clifford, Jewell, and Waggoner, 2015). That said, it is still not a nationally representative survey. This is unlikely to affect the results, since moral conviction has not been found to be associated with any standard demographic characteristics.

⁶ See Appendix A (6.1) for question wordings and sample scales, as well as details regarding the sample's demographic characteristics.

support for the idea that moral conviction is working in the same manner across an economic and a more recognized moral issue.

In the survey, respondents were first asked to indicate where their ideal policy point lies on the scale. Then, subjects were shown five policy points consecutively (on the same scale) and asked to indicate on a “thermometer scale” how happy they would be if they were to be implemented. The thermometer measurements [used frequently in the American National Elections Studies (ANES) surveys] are indicative of utility, yielding values for five policies of different proximities to the respondent’s ideal point.

Since subjects with an extreme ideal point could be asked about policies up to ten units away, while those with moderate ideal points could be asked about policies only up to five units away, it was necessary to alter the policies presented to respondents according to their ideal points. All subjects were shown policies at 1 unit away, 2 units away, the greatest possible number of units away, the second to greatest possible number of units away, and in the middle of the closest and farthest away point. For example, an individual with a preference of 3 was asked to rate policies 4, 5, 10, 9 and 7. Someone with a preference of 0 was asked to rate policies 1, 2, 10, 9, and 5.5. This design yields a voter’s utility across five issue proximities, ranging from the closest policy to the farthest policy.

To distinguish between moral and pragmatic respondents, I utilized the standard measure of moral conviction: “To what extent is your opinion on this issue deeply

connected to your fundamental beliefs about right and wrong?" Answer options: "Not at all, slightly, moderately, much, and very much."⁷ This question was asked in regards to each issue separately.

In regards to the model, one possibility would be to run a model of the convex form (such as the example function shown before, $utility = \frac{1}{xx}$) over the data of respondents of each level of moral conviction separately, and then compare the fit of that model to that of the linear equation on each set of data. However, the specification of the appropriate model would depend on the point at which utility drops for the morally convicted, and so there are a large number of curves that would be suitable. Instead of preemptively choosing among them, I run a polynomial regression, which allows the model to fit itself at two inflection points. The reason that I choose a third order polynomial function, rather than two, is that the third term allows for the function to take a backwards "S" shape. If moral respondents consider policies several units away to be moral, then the model results will indicate a flat beginning to the curve followed by a convex function. It is necessary to include three terms to capture these two potential changes in the function. On the other hand, if such respondents' utility decreases more quickly, then the model will be convex all the way through.

The polynomial regression is:

⁷ The survey included an alternative measure of moral conviction ("To what extent is your opinion on this issue a reflection of your core moral beliefs and convictions?"). The results were substantively the same run with this question. Results are available from the author upon request.

$$T_{ij} = \beta_1 + \beta_2 X_{ij} + \beta_3 X_{ij}^2 + \beta_4 X_{ij}^3 + u_{ij} + \varepsilon_{ij}, \quad (1)$$

where T is individual i 's thermometer rating for a given policy j , and X is the absolute value of the distance between the individual's ideal point and the given policy.⁸ This model is run on respondents with each level of moral conviction separately. I include respondent-level random effects to account for the fact that each respondent rates five policy points (such that person i has five observations j), such that u_{ij} indicates between-subject error and ε_{ij} represents within-subject error.⁹ Last, the model is run independently for abortion and minimum wage.¹⁰

The model has no control variables in it for two reasons. First, the frequently used controls of race, age, gender, etc. are not included because I would not expect them to impact the dependent variable, the thermometer rating for a distinct policy. There is no reason that people of a certain race or age should be higher than another on their ratings of their ideal policies, or a policy one, two, or more units away from their ideal point.

Second, there may be other variables that correlate with moral conviction and thus could be responsible for the results found, instead of moral conviction. Contenders

⁸ I choose to test linear utility rather than quadratic utility for pragmatic respondents because Singh (2014) found the linear function to better predict voter choice on a dataset spanning 20 countries.

⁹ Run as an alternative specification of the model with a fixed effect analysis, the results are very close to those of the random effects model. Results available upon request.

¹⁰ While I could simply run a model interacting the variables *moral conviction* and *distance* together, the choice to run a separate model on each level of moral conviction gives us a clearer idea of the level of moral conviction at which respondents' utility functions transition from linear to convex.

include religious conviction, issue importance, and extremity of preference. I do not include them in the model because to test whether they are responsible for the relationship, I would have to interact these with each of the distance variables (the base, squared, and cubed). Doing so would increase the number of variables in the model by 12 (four for each control variable). My sample size is not large enough to support such an extensive model. Instead, in the appendix (Supplementary Tables 2, 3, and 4), I include the model run over different levels of religious conviction, issue importance, and extremity of preference. The results are noted in the following section.

2.5 Results

Table 1 presents the results of the random effects models, run across the five levels of moral conviction. The shaded cells are those variables that are significant ($p < 0.05$) and of primary interest (the distance variables). The first thing to note is that morally convicted individuals differ from pragmatic respondents in the shape of their utility functions: the distance squared and cubed terms are significant only when moral conviction is high or very high. Those of moderate moral conviction for minimum wage show a marginal amount of convexity, the squared distance term being significant. But among all others in the moderate, low, and very low amounts of moral conviction categories, across both issues neither the squared nor the cubed term is significant (nor even close to it).

These findings are strengthened by the results of F-tests that examine whether the squared and cubed terms significantly increase the amount of variance explained by the model. Again, only in the case of high or very high moral conviction individuals do both variables significantly contribute to the model. For all others (except the squared term for those “moderately” morally convicted for minimum wage), neither of the variables adds to the models’ explanatory power. When respondents feel their opinion on the issue to be “much” a reflection of their core beliefs and values, their utility functions change from the linear form to a convex form.

Table 1: Differences in pragmatic and moral voters' utility functions

	“To what extent is your opinion on this issue deeply connected to your fundamental beliefs about right and wrong?”				
	Very much	Much	Moderately	Slightly	Not at all
ABORTION					
Intercept	103.5*** (0.000)	100.7*** (0.000)	91.07*** (0.000)	81.65*** (0.000)	91.24*** (0.000)
Distance	-27.23*** (0.000)	-25.60*** (0.000)	-16.56*** (0.000)	-13.02** (0.001)	-19.17** (0.001)
Distance ²	2.49*** (0.000)	2.50*** (0.000)	0.64 (0.270)	0.69 (0.434)	1.71 (0.188)
Distance ³	-0.08* (0.022)	-0.10* (0.013)	0.01 (0.875)	-0.02 (0.666)	-0.07 (0.370)
Overall R Squared	0.76	0.80	0.74	0.64	0.68
F test (distance ²)	118.29*** (0.000)	15.01*** (0.001)	1.22 (0.270)	0.61 (0.434)	1.75 (0.188)
F test (distance ³)	5.23* (0.022)	6.18* (0.013)	0.02 (0.875)	0.19 (0.666)	0.80 (0.370)
N	153	82	112	56	22
MINIMUM WAGE					
Intercept	100.20*** (0.000)	93.76*** (0.000)	85.41*** (0.000)	82.96*** (0.000)	79.10*** (0.000)
Distance	-29.33***	-24.98***	-19.41***	-15.16***	-13.23**

	(0.000)	(0.000)	(0.000)	(0.000)	(0.008)
Distance ²	3.14*** (0.000)	2.77*** (0.000)	1.63** (0.004)	0.44 (0.597)	0.53 (0.656)
Distance ³	-0.13*** (0.000)	-0.13*** (0.000)	-0.06 (0.134)	0.02 (0.674)	-0.01 (0.938)
Overall R-squared	0.73	0.64	0.61	0.58	0.46
F test (distance ²)	30.35*** (0.000)	23.33*** (0.000)	8.29** (0.004)	0.28 (0.597)	0.20 (0.656)
F test (distance ³)	13.28*** (0.000)	13.29*** (0.000)	2.24 (0.134)	0.18 (0.674)	0.01 (0.938)
N	110	104	118	72	37

p-values in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Morally convicted individuals have significantly different utility functions, but what shape are these functions? It appears that the region of morally right policy is very short for the moral individuals. If moral individuals had a long area of flat and high utility (for morally right policies), the coefficient for *distance* would not be significant or would at least be close to zero. The strong negative coefficient on this variable means that moral voters' region of morally right policy is extremely short in length; it appears to end at about 1 unit away from their preferred policy. For policies about two units away from their ideal point, moral voters are already losing utility on average.

And they do so at a *much* higher rate than pragmatic individuals. The coefficients on *distance* indicate that the downward slope of morally convicted individuals' utility functions is much steeper than that of pragmatic individuals. This is the case for both issues – for minimum wage, the coefficients for the morally convicted are around twice the size of the coefficients for the pragmatic respondents on average. And in the case of abortion, for the highest moral conviction group this coefficient is approximately 1.5

times the size of that for the lowest moral conviction group. This means that moral utility functions drop off much more quickly than pragmatic utility functions.

Between the most and least morally convicted respondents, the distance-squared term for the morally convicted is larger than that for pragmatic individuals – it is about 1.5 times larger (abortion) and approximately six times larger (minimum wage). This indicates a flattening out of the utility function after the sharp drop off in utility, which is just what we would expect. And then the cubed term for both issues are significant but extremely small in magnitude, meaning that there is a very slight decrease in the slope of the utility functions towards the tail end.¹¹ This represents the area of low, constant utility for policies that are deemed morally wrong. In sum, the utility function predicted by the model confirms the hypothesis for both abortion and minimum wage, fitting a convex curve in the case of those more highly morally convicted and a linear function in the case of those with low moral conviction.

For a visual idea of the difference between the utility functions of high and low moral conviction groups, see Figure 3. This figure shows the mean thermometer ratings of respondents at different distances from their ideal points, across the different levels of moral conviction. For the two highest levels of moral conviction, the graphs depict the function estimated in Table 1. For the three lowest levels of moral conviction, it shows a

¹¹ The next results – those regarding the tail end of the utility function – confirm just how slight this decrease is.

linear approximation of the utility function, the squared and cubed terms being non-significant in each case.¹² These graphs clearly show the previously described relationship between the distance between subjects' ideal points and proposed policies (the x-axis) and thermometer ratings (the y-axis) over levels of moral conviction. For those whose opinions are "very much" or "much" connected to their beliefs about right and wrong, this relationship takes on a convex form: when distance is zero, the thermometer rating is higher than that of pragmatic respondents and then drops more quickly and flattens out towards its end. The utility function of pragmatic individuals, on the other hand, is linear.

Also worth noting is the fact that the intercepts for the morally convicted are higher than those for pragmatic individuals. This is consistent with the findings of Clifford and Jerit (2013), that when moral rhetoric is used by elites it leads to an increase in public support for the targeted position. It is reasonable to assume that those who hear or read moral rhetoric are more likely to become morally convicted, and my data shows that such individuals are likely to rate a candidate who agrees with their preference more highly than pragmatic individuals.

¹² The one exception is the "moderately" morally convicted respondents on the issue of minimum wage. On that issue, the squared term was significant but extremely small in size, such that a linear function best approximates the relationship.

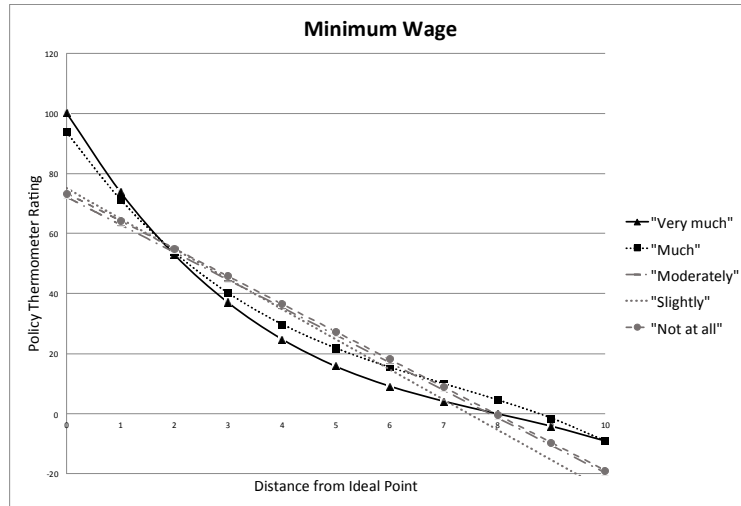
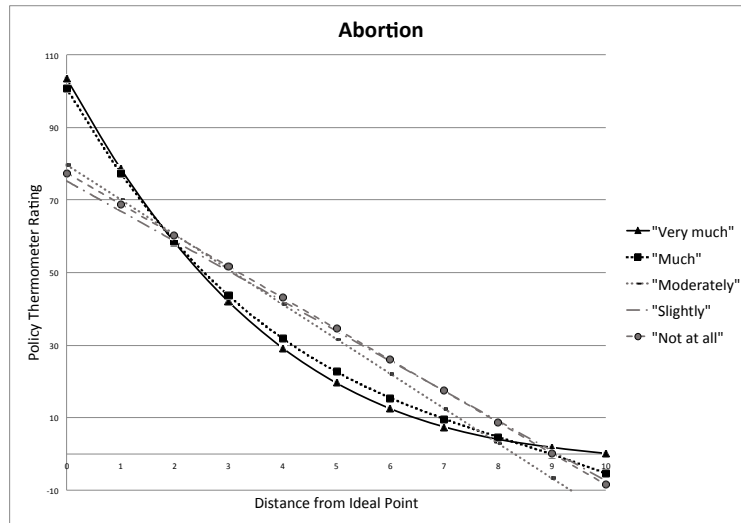


Figure 3: Predicted utility functions by level of moral conviction.

In these figures, the curves for those with a high level of moral conviction ("very much" and "much") are as described in Table 1. Those respondents with a low level of moral conviction are estimated with a linear function.

What about alternative explanations for this relationship? Religiosity, issue importance, preference extremity correlate with moral conviction and could be responsible for the observed relationship. Tables 2 through 4 in the appendix show the results of Model 1 run not across levels of moral conviction but instead across levels of

these variables. Regarding religiosity, we do not see much change at all in the utility function of those who consider religion to be an important part of their life and those who do not, so religious conviction cannot be responsible for the relationship. Across levels of issue importance, there is a general trend where the utility function of those to whom the issue is not important is more linear than those to whom it is very important. However, the relationship is not nearly as precise as it was for moral conviction. The group to whom abortion is most important has the same predicted function as the group to whom minimum wage is only “slightly” important.

Last, regarding the extremity of respondents’ preferences, the relationship between distance and thermometer ratings is different than that found in the case of moral conviction. In fact, for minimum wage the relationship is the opposite from what we would expect if preference extremity were responsible for the finding. For those who are extreme in their preferences, the linear function predicts thermometer ratings best, while for those of moderate preferences, the squared term is also significant. Consequently, the relationship associated with moral conviction – convex for those on one end of the spectrum and linear on the other – is unique to moral conviction. This relationship does not hold for any of the alternative explanations.

2.6 Testing the tail end of the utility function

As an alternative test of the hypothesis, I look closely at the tail end of the utility functions, since linear and convex functions have different predictions across distant

policies. A linear utility function decreases at a constant rate, even when the individual considers policies very distant from his preference. A convex function, on the other hand, has an area of flat utility when policies are distant. This leads to the expectation that the tail end of the utility function of morally convicted individuals should be significantly flatter than that of pragmatic individuals.

To examine the end portion of respondents' utility functions, I create a variable that is the absolute value of the difference in thermometer ratings between the two policy points furthest away from the respondent. For those with a preference of zero through five, those are points nine and ten. And for those with a preference greater than five, those are points zero and one. If respondents with a high level of moral conviction have a convex utility function, then the tail end of this function should show less difference in the thermometer ratings than that of those with low moral conviction.

The equation takes the form:

$$|T_{i_1} - T_{i_2}| = \beta_1 - \beta_2 M_i + \beta_3 R_i + \beta_4 I_i + \beta_5 E_i + \epsilon_i, \quad (2)$$

where T indicates the thermometer rating of respondent i on policy points 1 and 2, which represent the two farthest away points that he was asked to rate. M indicates the individual's level of moral conviction ($M=[1,2,\dots,5]$). For this model, we can add the control variables in with ease because there are no squared or cubed terms. R represents the religious conviction of the respondent and was measured by the question, "Do you consider religion to be an important part of your life, or not?" The variable ranges from 0

("no") to 1 ("yes"). *I*, issue importance, was measured by the question, "How important is this issue to you personally?" (1=Not at all; 2=slightly; 3=moderately; 4=somewhat; 5=very). And finally, *E* represents the extremity of the respondent on the issue. The variable takes a value of one for respondents with a preference of zero or ten, two for respondents with a preference of one or nine, and so forth until takes a value of six for respondents with a preference point of five.

Table 2 provides evidence that the tail end of the utility function is significantly flatter for morally convicted respondents than for pragmatic respondents. The estimated coefficients for the moral conviction variable are significant for both abortion and minimum wage ($p < 0.001$). To have an indicator besides the p -value, an F-test confirms that this variable significantly adds explanatory power to the model for both issues. The coefficients on the moral conviction variable are negative, indicating that as moral conviction increases, the difference in utility between the farthest away policy points decreases. This is precisely what we would expect the relationship to be if the morally convicted have convex utility functions and the pragmatic have linear utility functions.

How substantive a difference is this? The predicted difference in utility between the two farthest away policy points for respondents who are at the highest level of moral conviction (all other variables held at their averages) is 4.56. But the predicted difference in utility for someone at the lowest level of moral conviction is 9.33. Therefore, moving

from the lowest to the highest level of moral conviction makes about a 100% increase in size of the utility drop off at the end of the utility function.

Table 2: Moral and pragmatic voters' utility loss between distant policies

VARIABLES	Minimum Wage	Abortion
Intercept	6.78** (0.000)	14.49** (0.000)
Moral conviction	-0.82** (0.001)	-1.94** (0.000)
Religious conviction	-0.10 (0.860)	-1.64* (0.012)
Issue importance	-0.23 (0.382)	-0.96** (0.000)
Extremity	1.16** (0.000)	1.71** (0.00)
Adj. R-squared	0.04	0.22
F test (moral conviction) <i>Prob>F</i>	17.32** (0.000)	57.21** (0.000)

p-values in parentheses
 $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

These effects are robust to the influence of the three control variables. Religiosity has the same directionality as moral conviction but is only significant in the case of abortion. Given that the correlation of this variable and moral conviction is less than ten percent for both issues, it is highly unlikely that religiosity is responsible for the main effect in Model 1. The effect of moral conviction is also robust to an alternative indicator of attitude strength, issue importance, which is similarly significant only for abortion. Last, preference extremity exerts a *positive* influence on utility differences at the tail end of the utility function, the opposite effect of moral conviction. This result provides additional support for the idea that moral conviction, rather than preference extremity, is the cause of the convexity of respondents' utility functions. If preference extremity

were to cause this utility function, then the variable would be associated with a flattening out of the function at its end.

Thus, these results provide additional evidence that morally convicted individuals have a utility function of the convex form. The shape of the function is consistent with a sharp drop off in utility followed by a relatively flat region of utility.

2.7 Conclusion

This article furthers the contribution of moral conviction to political science scholarship through offering a formalization of the concept. I provide a theory and evidence that morally convicted respondents have a different utility function than pragmatic individuals. I suggest that the morally convicted do not have the same gradual utility loss as pragmatic individuals, which is represented by a linear (or quadratic) utility function. Instead, their utility drops suddenly, as the policy in question transitions from a morally acceptable answer to an unacceptable solution, and then remains low. This utility function is represented in practice as a convex curve.

I have empirically investigated utility functions on two issues – abortion and minimum wage – using a polynomial regression and found that those of the morally convicted are significantly different from those of pragmatic individuals. Specifically, the morally convicted like candidates who are very close to their preferred policy more than pragmatic individuals do, then lose utility more rapidly as the policy moves away from their preferred point, and finally have a flat area of utility. I also have examined the

end points of the two groups' utility functions to test whether those of morally convicted individuals is flatter in this area. I find that across the two issues the utility loss between the farthest away points is significantly less for morally convicted individuals than it is for pragmatic individuals. The shape of a morally convicted individual's utility function is consistent with agreeing very strongly with one's own policy preference, then quickly becoming very unhappy as soon as the policy moves from that preferred, and remaining similarly unhappy even as the suggested policy gets farther from one's preference.

This function is suggested by the definition of moral conviction, which describes the morally convicted as viewing policies in a binary sense, as either good or bad, rather than in a continuous sense, under which medium amounts of utility are appropriate. Previous results regarding moral conviction offer support for this idea: such individuals are less likely to compromise, less likely to accept politicians who are willing to compromise, and more likely to express prejudice against those on the opposing side of the issue. But this article is the first to formalize these ideas in a model. The formalization of the concept allows us to look beyond the dependent variable of vote choice, to see how the concept applies to problems such as voter participation and risk orientations.

For example, this finding applies to the relationship between moral conviction and framing effects. The convex shape of the moral utility function is the same as the

utility function of a risk acceptant individual.¹³ And risk orientations have implications for individuals' susceptibility to framing effects (Kam and Simas, 2010). Specifically, citizens who are risk acceptant are less likely to reverse their preferences in response to the framing of a topic [i.e., the Tversky and Kahneman (1974) anchoring and adjustment heuristic]. This finding, when placed alongside the results presented in this chapter, suggests that the morally convicted may be less susceptible to framing effects than more pragmatic citizens. Studies regarding individual differences in sensitivity to framing effects have been conducted in the decision sciences (e.g., Levin, Gaeth, Schreiber, & Lauriola, 2002), but have yet to make a significant dent in political science scholarship. This study suggests that moral conviction might represent one important group of voters who differ in their receptiveness to framing.

Also deserving of future attention is the question of what the shape of an individual's overall utility function for a candidate is, given that she may be morally convicted on some issues and not morally convicted on others. In other words, how does a moral conviction score on many issues interact to yield an overall shape of the utility function? Are the issues on which an individual is moral necessarily more salient than those on which she is not? Is it the case that if an individual is morally convicted on an issue, the importance of those issues on which she is not decline? In this analysis, this

¹³ Risk acceptance is represented in the decision making literature by a convex utility function; risk avoidance is represented by a concave (or quadratic) function, and a risk neutral individual's utility function is linear. See Shepsle (1972) for further discussion.

was not an issue on the MTurk data since the dependent variable was issue-specific, but it remains a critical unanswered question in applications of moral conviction to politics.

The formalization of moral conviction leads to questions that remain about moral conviction and its effects on the political system, and provides a starting point for future analyses examining the effect of moral conviction on candidate positioning. It is my hope that fruitful outcomes will result if political psychologists and formal modelers can communicate on this concept in the future.

3. Tracking moderates' use of policy information in candidate evaluation

3.1 Introduction

Citizens evaluate candidates on many dimensions. Partisan ties, job history, education, personal information such as hobbies, interests, family, physical characteristics, and personality are all of interest to voters. In traditional political science research, however, the central focus has been the candidate's stance on the important political issues of the day. The strength of the impact each of these aspects of the vote choice may well be idiosyncratic; some citizens care a lot about candidates' issue stances and will vote based on this facet alone. Others will consider how much they like the candidate based on personal characteristics, such as their sense of humor or leadership qualities.

Political scientists need not be concerned with this heterogeneity in citizens' choice architectures if the differences are randomly distributed throughout the population. But if these choices are correlated with identifiable groups, it is useful to know how they are so that our statistical models can take such dependencies into account.

Such a dependency would be particularly important if it were correlated with other variables included in the evaluation itself. This paper focuses on one such dependency: the intensity of party commitment by the voter. Specifically, the claim to be evaluated is whether the contingency of use of non-policy variables in evaluation rests on partisanship, where partisans use policy as a primary factor and independents use other factors to a much greater extent. I analyze the effect of being an independent on voter decision making using two data types. First I test the impact of being an independent on the effect of candidate proximity on candidate ratings using self reported data. My findings are that for partisans, candidate proximity plays a large role in determining candidate ratings. But for independent subjects, the candidates' policy preferences have no impact on candidate evaluations.

Then, I test whether experimental subjects' partisanship makes a difference in the amount that they use issue positions in candidate evaluations using a new method in political science – eye tracking – that allows one to explicitly measure the amount of attention subjects give to candidates' policy preferences, versus other candidate

information such as their jobs histories, prior to rating those candidates. Directly measuring what information subjects choose to look at offers an explicit measure of attention. And attention gives us an insight into how important different types of information are to them in forming their candidate evaluations. The results show that partisan subjects spend a greater proportion of their time than independents do looking at candidates' policy preferences. This finding corroborates the finding on the self-reported data, that independent citizens care less about policy in their candidate evaluations than partisans do.

This chapter proceeds as follows. The following section introduces the relevant literature. Then, I review the method of process tracing and cover some fundamental knowledge regarding eye tracking. Section 4 describes the experimental design and Section 5 presents models and results. And Section 6 concludes.

3.2 The literature

Research in psychology has revealed that important attitudes are typically more extreme or polarized than unimportant ones are (Suchman, 1950; Brent & Granberg, 1982). Follow-up studies in political science determined that this finding, replicated in many contexts, applies to political issues specifically, whereby there is a positive correlation between the extremity of policy positions and their importance. Kronsick and Schuman (1988) found a positive relationship between political attitude importance

and ideology: people whose attitudes are not intense are expected to select a middle-of-the-road alternative disproportionately often, while those whose attitudes are important tend to pick a more extreme policy position. Liu and Latane (1998) also found that ideological importance increases alongside ideological extremity.

What does this mean in terms of the models that citizens use to choose candidates? Boninger, Krosnick, Berent, and Fabrigar (1995) define attitude importance more specifically:

To attach personal importance to an attitude is to commit oneself to think about the object, to gather information about it, to use that information as well as one's attitude in making decisions, and to design one's actions in accord with that attitude.

Those with extreme attitudes are more likely to find those attitudes important. And by this definition, those who ascribe importance to an attitude are more likely to use that object in decision making. Applied to the vote decision, then, those with more extreme issue opinions are more likely to find those issues important, and so should be more likely to use those issues and the candidates' positions on them in evaluating the candidates. Those with moderate opinions, on the other hand, should find issues less important and should be more likely to use other information about candidates, such as their traits, in their evaluations.

Recent research supports this expectation. Adams, Engstrom, Joesten, & Stone (2017) found that moderate voters weighed candidates' policy positions far less than

partisan voters did in the 2010 Congressional elections. Basinger & Lavine (2005) also found that partisans in the 1990 – 2000 House elections relied more on the candidates' policy proximity in choosing for whom to vote than did moderates. Moderates, they concluded, relied more heavily on affect toward the candidates.

But these findings are muddled when compared to the theory behind them when considering the fact that ideological moderates are actually more cross-pressured than centrist. Those who identify as “moderate” on the typical seven-category ideology scale may be so because their preferences are actually at the center of the issue scales or because they prefer the liberal position on some issues and the conservative position on other issues. And in their examination of the 2000 American National Election Survey, Treier and Hillygus (2009) found that the “moderate” group consisted of almost three times as many cross-pressured individuals as centrist respondents. For cross-pressured moderates, the *average* of their positions is centrist. Yet their positions on individual issues are just as extreme as partisans' positions, meaning that they should care just as much about those policies as partisans do. Consequently, the findings by Adams et. al and Basinger & Lavine suggest that it is not one's individual policy preferences that determine the importance of that one policy in the voting decision. Instead, the centrality of one's *average* ideology across all issues appears to be the major determinant of policy's importance in voting judgments. This point will become important later in

the chapter, when I discuss my measurement of where candidates are on a partisan scale.

The hypothesis that moderates care less about policy than partisans do has not yet been tested in a laboratory setting. Why do so? For one, experiments allow for the use of hypothetical candidates rather than real candidates (e.g., Tomz and van Houweling, 2009). While the use of hypothetical candidates decreases the external validity of an experiment, it also decreases the impact of some issues of endogeneity. With survey data, there is the possibility that reported candidate positions are impacted by the respondents' general liking of that candidate. The possibility of this endogeneity is minimized when using hypothetical candidates because the researcher has control over the information that the subject sees and the order in which the questions are asked.¹⁴

And, most importantly, an experiment allows for the use of eye tracking, a new method in political science. Eye tracking measures respondents' information-gathering processes when they are viewing material about a candidate. Presenting subjects with a variety of types of candidate information – including personal information and job histories in addition to policy positions – allows me to measure which pieces of information respondents choose to view and the order in which they do so. Thus, I can

¹⁴ In particular, in this experiment the endogeneity of candidate ratings is minimized by not presenting the candidates' party identification.

test whether subjects differ in their interest in candidate issue positions by evaluating the amount of attention they pay to these positions.

3.3 Process tracing and eye tracking

The field of political behavior tends to use surveys or experiments to test its theories. Each of these methods has its advantages, but both share a limitation: only the *outcome* of a treatment is measured by a self-reported behavioral response. This form of measurement is not ideal for theories of decision making, which put forth certain cognitive processes that citizens go through in making a choice, because the decision process must be inferred based on subjects' final responses. "Process tracing" is a more direct way of observing the cognitive process that occurs before a decision is made. Process tracing has been defined within the judgment and decision making literature as "time-dependent, predecisional observations used to inform predictions regarding the psychological mechanisms assumed to operate concurrently with the choice-generating process" (Schulte-Mecklenbeck et al., 2017).¹⁵

Process tracing techniques include interactive measures such as (computer) mouse tracking and eye tracking, peripheral psychophysiology like pupilometry and galvanic skin response, as well as neural techniques such as EEG and fMRI. Through these methods, researchers gain insight into mental processes that provide immediate evidence of decision-making strategies. The interactive measures allow us to access the

¹⁵ This definition of the 'process tracing' differs from the term's use in causal inference (Collier, 2011).

information search paradigms that subjects use when making a choice. Because the researcher can analyze how long the subject looks at each informational category, she can infer which types of information the subject considered in making her choice. Also available to the researcher is the order in which the information was accessed, which can provide additional insight into the decision making process.

Process tracing has been used in political behavior, most notably by Richard Lau and David Redlawsk (see, for example, Lau & Redlawk, 2001), who utilize mouse tracking in their experiments. In a mouse tracking experiment, subjects are presented with information display boards, and each cell in the matrix of the display contains hidden information. When the subject moves her mouse over a cell, she sees the information, which becomes hidden again when she selects another cell. This method effectively measures subjects' sampling of information. Eye tracking is a method that allows the researcher to measure the same variables, but without necessitating a physical movement that requires effort and time or requiring information to be hidden and then revealed. Eye tracking has been used for decades as an effective proxy for measuring attention and inferring thought processes (Yarbus, 1967).

This study is an eye tracking study in use, in so far as I can judge, for the first time in political science on this problem. I track what subjects are looking at on a webpage-like "information board" to determine whether independents look at policy information the same amount as partisans do. Eye tracking directly measures the

fixation parameters of a subject's gaze. I used a Tobii T60 Eye Tracker (Tobii Technology, Stockholm, Sweden) that is a particularly flexible mechanism. This system, for example, is a remote system, meaning that it allows moderate head movements¹⁶ and does not require the subject to use a chin rest or any head affixation. The eye tracker also adjusts to various physiological factors including variable light conditions, the subject's eye color, and sight correction (i.e., glasses or contacts can be worn). The screen that the eye tracker is in is a 17-inch LCD monitor, which looks just like a normal computer screen.

Camera-based eye trackers locate a subject's gaze by shining an infrared light that reflects off of the cornea and off of the retina, through the pupil. The relationship between the corneal reflection (which is constant through eye rotations and thus acts as a point of reference) and the pupil is then used to compute the gaze direction of the eye. The eye tracker is sensitive to infrared light and records the relationship between the reflections, which is then superimposed onto the screen being shown to the subject. The Tobii T60 is a 60 hertz system, meaning that it records 60 gaze locations per second. This is considered within the acceptable range of Hz, likely to produce a fixation error of +/- 10 milliseconds or less (as compared to the typical fixation time of 100 and 500 ms). Subjects' eye properties are determined through a calibration processes that is completed before subjects began the experiment. Calibration consists of the subject

¹⁶ Within a 44x22x30 cm volume that is centered 70 cm from the camera.

fixating on several predetermined screen positions sequentially, which allows the system to solve for the location of the pupil. The system is quite accurate.¹⁷

3.4 Experimental Design

The experiment had two principle screens shown to subjects 81 times. The first of these consisted of information about a hypothetical candidate. Information was given in four rectangles, each rectangle containing a different type of information. The types of information included a candidate silhouette and name¹⁸ and information about the candidate's policy stances, personal life, and job history. All topics had two pieces of information associated with them that were a maximum of 45 characters long (with spaces) and a minimum of six characters long.¹⁹ Figure 4 shows an example screen depicted on a trial. Each candidate's information was the actual preferences, job history, and personal life of a real member of Congress, and subjects were aware of this.

¹⁷ The system's accuracy is within 0.5° with less than 1° error resulting from head motion and less than 0.3° drift over time (Tobii Technology Inc., 2007).

¹⁸ First and last names were taken from a 1974 list of most common names in the United States and randomly matched.

¹⁹ It is not necessary for every rectangle's text to be the exact same length because I am interested not in the relative time taken on different types of information but on the relative time taken by partisans and independents on different types of information. Thus, the fact that all respondents view the same screens is enough to control for any effect of text length.

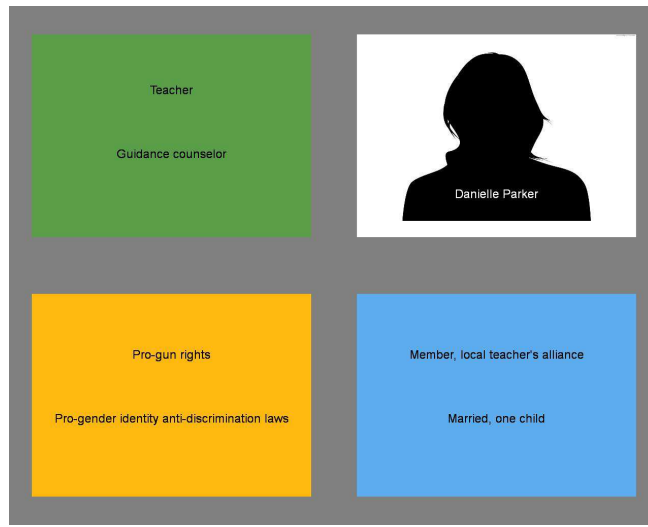


Figure 4: Candidate information screen

To create structure in the data, the information within each information type was coded on scales of 0 to 2. Issue positions were coded according to their ideology: the preferences listed were either both liberal or both conservative, or one of each (independent). An alternative approach would have been to use centrist positions to characterize independent candidates. But, as stated before, more moderates are cross-pressured than centrist. Centrism is also not an apt characterization of the more successful independent candidates in American political history. Instead, they tend to be like Ross Perot, who was conservative on issues such as the debt and the death penalty but liberal on issues such as abortion and military spending. Thus, these candidates are cross-pressured: independent in the average of their positions across issues, rather than taking a centrist position on all issues.

A wide range of political issues was used across all of the candidates shown in order to account for the fact that different issues were likely salient to different subjects. Over a single trial, I would expect those to whom the issues are more salient to look more at the issues. But given the variety of political issues as well as the number of trials (81 per subject), these differences in salience should wash out.²⁰

For job histories, the information was coded by how political the candidate's job history was. Candidates' jobs were either both political, one political and one apolitical, or both apolitical. For example, a political job history was "Whip, State House, two years," and an apolitical job history was "financial consultant". The third information category, personal information, was coded on a three-tiered scale of interpersonal warmth, measured by whether the information was about an activity that involved engagement with others or not. For example, candidates listed as single would not be categorized as "warm", nor would the hobby of running. But candidates involved in sports leagues or volunteer activities were counted as "warm". The last information type, silhouettes/names, was coded into only two categories by gender, female or male. Subjects saw an equal number of male and female candidates, and the gender of the candidates was switched for half of the subjects to prevent any bias in subjects' ratings of the candidates. The first names chosen for the female and male candidates were as similar as possible (e.g., Joe and Joanne) to prevent any change in how much subjects

²⁰ Appendix B (7.1) shows a list of the political issues covered in candidates' policy issue information.

liked the candidate based on their name. There were an equal number of candidates in each combination of scores across the four categories.

Finally, the order in which the candidates were shown to subjects was also randomized, to account for potential temporal differences in what subjects looked at across the length of the study, which could hypothetically interact with some specific candidate traits. The placement of the information on the screen also changed three times throughout the experiment (every 20 candidates), to account for the fact that people tend to look in the upper left hand corner first, regardless of which information is most salient to them (Josephsson, 1996; Abed 1991; Ishii et al. 2011). E.g., in the second placement of rectangles, compared to the first placement shown in Figure 4, the candidate's photo would have been in the upper left hand corner, her job information in the lower left hand corner, her policy proposals in the lower right hand corner, and her personal information in the upper right hand corner.

After viewing a the first screen showing a single candidate's information, subjects next saw a screen containing and asking them to fill out a standard feeling thermometer. These feeling thermometers are regularly used on the American National Elections Studies surveys to measure a respondent's feeling towards a candidate.²¹ Subjects had to evaluate the candidate before moving on to the next screen.

²¹ American National Elections Studies surveys are available at http://electionstudies.org/studypages/download/datacenter_all_NoData.php.

It is important to note that subjects evaluated 81 candidates in total over the course of the experiment in order to account for differences in looking times on individual trials other than the salience of the information type for the person. For example, a subject might connect with a certain job or hobby of a candidate due to shared experiences, or have a certain aversion towards a particular name of a candidate. These factors could impact how long a subject spends looking at each category. Therefore, the large number of trials mitigates the effects of any alternative reasons besides salience for spending time looking at a particular information type.

I collected two separate samples in order to test my results in an internal replication. Doing so is an important step to address the ‘replication crisis’ that has taken place in psychology and neuroscience (Barch & Yarkoni, 2013). It is also key in this chapter given that the first dataset was exploratory research. In both samples, subjects were recruited through a research center at a university, which recruits from the university and local community. The samples were taken about one month apart in the early fall of 2017. Consistent with the common recommendation in the JDM field (Barch & Yarkoni, 2013), I capped my samples a priori at 75 subjects each. After attrition, the first sample had 66 subjects and the latter had 61 subjects.

3.4 Model 1 and results

The first model relies entirely on self-reported data. The model is as follows:

$$R_{si} = C_{si} + I_{si} + (C_{si} * I_{si}) + H_i + W_i - u_{yi} + \epsilon_{si}, \quad (3)$$

where R indicates the subject s ' rating of candidate i ($i = [1,2,\dots,81]$). Since each subject rated 81 candidates, the model is run with subject-level random effects to account for within-subject variance between the multiple observations per subject. (Thus, u_{si} represents between-subject error and ϵ_{si} indicates within-subject error.) C represents the candidates' proximity to the individual on issue s . Recall that candidates' policies were either both Republican, both Democratic, or one of each. So, candidates were on a 0 to 2 partisan rating, with 0 representing a candidate with Democratic stances, 1 representing one with independent stances, and 2 representing one with Republican stances.

I identify subjects' issue preferences by using their party identification (rather than their ideological labels). While it was traditionally assumed that ideological labels were based on issue preferences, a large number of studies have shown that the measurement is not primarily determined by issue stances and instead has nonissue meanings (Klingemann, 1979a, 1979b; Levitin & Miller, 1979; Conover & Feldman, 2004). On the other hand, scholars have found a robust and pervasive effect of party identification on issue attitudes (Jacoby, 1988; Jacoby, 1991). While asking respondents to simply report their issue preferences would have been ideal, given the large number of issues in the experiment there was not sufficient time (or, in all likelihood, subjects' attention) to do so.

Subjects' party identification is measured on the standard seven-category scale. In order to calculate candidate proximity, it is necessary to align the measure with the three-category candidate partisanship measure. I count all who identify with a party (strongly or weakly) as partisan, and those who identify as independent (including independent leaners) as independents.²² Then, Democratic subjects were coded as a 0, independents were coded as 1, and Republicans were coded as 2. I took the absolute value of the distance between the two measures [I follow Singh (2014) in using the linear loss function]. Candidates' proximity to subjects thus ranged from zero to two. A Democratic (or Republican) candidate is two units away from a Republican (or Democratic) subject, the while farthest away that a candidate can be from an independent subject is one unit.

I indicates whether the subject is an independent ($I = 1$) or not ($I = 0$). Then, the third independent variable in the equation is an interaction between whether subjects are independent and candidate proximity. This term tests whether being an independent makes a difference in the effect of a candidate's proximity on the subjects' rating of that candidate. H represents the candidate's score on the job variable, and W indicates her personal warmth. Control variables, such as age, gender, and political sophistication, are

²² The results of Model 1 and Model 2 also hold without the leaners included. Likewise, they hold *only* with the leaner included. While leaners are like partisans in many respects, they are not so regarding the use of candidates' policy stances in evaluation of those candidates.

not necessary to include in the model given that the dependent variable is candidate ratings, which (to my knowledge) has not been shown to be affected by these variables.

To account for the fact that I have relatively few independents in my samples,²³ I run a bootstrap regression (with random effects). The bootstrap randomly draws new samples from the observations with replacement. This means that for each independent sample, some observations may be included multiple times and others excluded. Overall, the bootstrap generates 1000 samples and presents results that are averaged across these samples. Therefore, my results cannot be driven by only a few observations; the bootstrap would exclude these observations from many of its random samples, causing any results dependent on those observations not to hold in the average.

The results of the model run on the primary and replication samples are shown in Table 3. In the primary sample, as expected *candidate proximity* has a robust and negative effect on candidate ratings. As the distance between the individual and the candidate increases from its smallest to its largest, candidate ratings fall approximately 90 points on average. This decrease is about 50 percent of the range of candidate ratings. The next coefficient, *independent*, shows that independents have an interesting relationship with candidates: on average they rate candidates about 51 points lower than partisans do. This relationship suggests that while partisans rate candidates who they like higher than independents do (or alternatively simply liked the candidates more),

²³ The number of independents in the first sample is 18. The second sample has 14 independent subjects.

their ratings of candidates whom they dislike are similar to independents' ratings of disliked candidates. This result is consistent with recent research showing that independents/leaners, in addition to Republicans and Democrats, have a significant level of partisan affect (Iyengar & Westwood, 2015), which negatively impacts their ratings of candidates of a different party.

Table 3: Candidate proximity, moderates, and candidate ratings

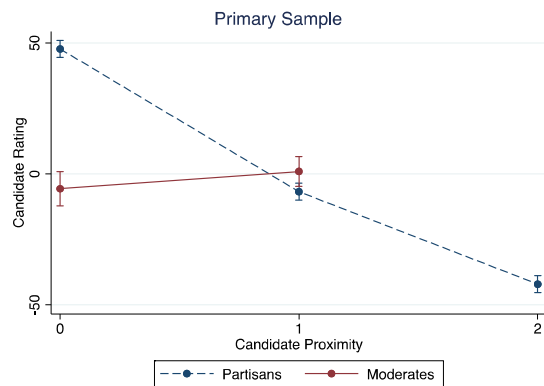
DV: Candidate ratings [-100, 100]		
VARIABLES	Primary sample	Replication sample
Candidate proximity	-44.91***	-37.88**
Independents	-50.18***	-40.80**
Independents * candidate proximity	51.51***	39.74**
Personal warmth	1.78*	0.48
Job history	-4.07***	-3.30**
Intercept	49.09***	44.30***
<i>N</i>	74 subjects 5,346 observations	61 subjects 4,941 observations
<i>R</i> ²	81 trials 0.34	81 trials 0.33

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$

Model 3 is run with subject-level random effects and a 1000 sample bootstrap

The most important result is the coefficient for the interaction between *independent* and *candidate proximity*, which is positive and larger than that of candidate proximity base term. The *candidate proximity* and interaction term essentially cancel out, then, leaving the relationship between distance from the candidate and candidate ratings effectively flat for independents. This relationship is graphically depicted in Figure 5, which shows the marginal effects of being an independent on predicted candidate ratings, across levels of candidate proximity. In other words, this figure

depicts the impact of candidate proximity on candidate ratings for independents and partisans separately. The solid line represents independents and the dashed line, partisans. Partisans show the relationship between proximity and candidate ratings that most spatial theories predict: as the candidate gets further away from the subject, the average rating of the candidate decreases from about 50 to about -40. Partisans care a lot about how close candidates' issue proposals are to their own policy preferences. But independents show a different relationship between candidate proximity and candidate ratings. The slope of the line is basically flat, indicating that as the candidate gets further away ideologically, this has close to no impact on how much she is liked by the subject.



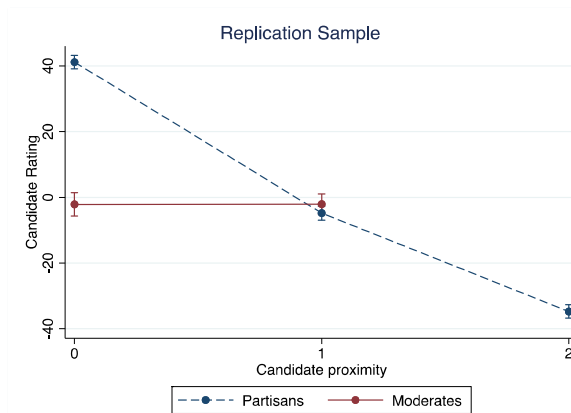


Figure 5: Marginal effects of being an independent on candidate ratings, across effects of candidate proximity

These results are all confirmed on the replication sample. *Candidate proximity* has a negative relationship with candidate ratings, as do independents. But the coefficient on the interaction is positive and about as large as that of candidate proximity. This leads to the second marginal effects figure shown in Figure 2, which again depicts the relationship between candidate proximity and candidate rating as flat for independents, while it is steeply negative for partisans. These results indicate that independents are not using information about candidates’ issue positions to inform their candidate evaluations. As the candidates get further away from them on policy, the subjects’ ratings of those candidates do not decrease.

3.5 Discussion of Model 1

The results of Model 1 indicate that independents de-emphasize policy in their voting decisions compared to partisans. But a confounding factor not considered in Model 1 is that the partisan and independent candidates may agree with independents’

policy preferences equally. As an example, consider a hypothetical independent subject who is conservative on issues A and B but liberal issues C and D. Let a conservative candidate list her stance on issues A and C as her policy issues and a liberal candidate list his stances on issues B and D. Last, let an independent candidate list a liberal position on issue A and conservative position on issue C. Then, all candidates have one issue on which they take the same position as the subject and one issue on which they are on the opposite side of the ideological spectrum, and the subject's rating for all of the candidates (based only on their issues positions) would be equal. As this example shows, since the proximity measure did not take into account the policy positions of the subject on each issue individually, it is possible that the proximity measure was inaccurate for some independents. If this occurred, independents could be just as interested in policy as partisans, and the first model would be misleading in making it look like they do not care about the proximity of candidates. In other words, if independents actually are equidistant from many of the candidates, they would appear not to have policy-based preferences, when actually they do – the proximity of the candidates would simply be the same.

To address this explanation, I use eye tracking data. The confounding explanation suggests that partisans and independents should use policy equally in forming their candidate evaluations, and thus should spend similar amounts of time gaining information about the candidates' platforms. Contrast this with what my

working hypothesis, that independents care less about policy than partisans, suggests: independents should spend less time gaining information about candidates' platforms. Eye tracking allows for a direct test of this given it measures the amount of time spent looking at candidates' policies relative to the amount of time spent gaining information about their job histories or personal lives. If independents do indeed care less about policy than partisans, a lesser percentage of their time should be spent studying candidates' positions.

To present the next model, it is first necessary to review a few details of the experiment's eye tracking stimuli and measurement. Eye movements were sampled at 60 Hz. The sampling rate of 60 Hz means that 60 individual gaze points per second were collected, so the data is very fine grained. Eye movement patterns were analyzed by "fixation analyses". A fixation is a period in which eyes are locked on an area of the screen rather than moving between areas on the screen. There were four areas of interest (AOIs) within each stimulus, defined by the area of the four rectangles containing each type of information about a candidate. Visual attention was measured by the total number of fixations on an AOI or the total "dwell time" associated with an area. I.e., the dwell time associated with policy was the total number of fixations on the policy box.

The average amount of time spent on a candidate information screen was 9.07 seconds. The time spent on each information type was measured as a percentage of the total decision time of the trial. Percentages are more effective measures than raw time

scores because some subjects might simply take longer than others to examine *all* types of information. This means that a longer time spent on one information type would not be an indication of increased interest in that information type relative to another type of information.

3.6 Model 2 and Results

Model 4 takes the form:

$$Y_{si} = C_{si} + I_{si} + (C_{si} * I_{si}) + E_{si} + U_{si} + I_{si} + \alpha_{si} + \epsilon_{si}, \quad (4)$$

where as before s indicates the subject and i indicates the trial number. Y represents the percentage of dwell time in a single trial spent looking at the candidate's policy preferences. C represents candidate proximity and M indicates whether subjects are independent ($I=1$) or partisan ($I=0$). E is education, which ranges from one to four and increases as the variable increases. U , political understanding, was measured by the question, "Indicate which is true about you in response to the statement, 'I feel like I have a pretty good understanding of policies'" and increases in strength as the variable increases. Political interest (I) is measured by the question, "Generally speaking, how interested are you in politics and public affairs?" and also increases alongside the variable. The model is run with random effects to account for within subject variance across the 81 trials and 1000 bootstrap replications.

How long subjects look at a candidate's policy stance might depend on whether they support the same policy proposals or not. After all, a person might realize that the

candidate agrees with them after a short glance at their policies and then move on to other information but spend more time on the issues that they disagree on. Or, as suggested by Taber and Lodge's (2006) theory of motivated political reasoning, subjects may choose to focus more on information that reinforces their pre-existing opinions and ignore that which disagrees with them. To test for these possibilities, I include a variable for candidate proximity in the model.

I also include an interaction between candidate proximity and the variable *independent*. The alternative account has different predictions for attention to policy depending on whether the individual is close to or far away from the candidate than the working hypothesis. These predictions are depicted in Table 4. I will go through the predictions of the alternative hypothesis first. Starting in the upper left hand corner of the table, the alternative hypothesis predicts that there is actually no difference in the distance of the candidates from independents (regardless of their coded distance), meaning that there should be no difference in the attention paid of policies between independents who are coded as far away from the candidate and those whose policy preferences are coded are the same as the candidate's. Moving to the middle column, independents who have the same policy preferences as the candidate should pay an equal amount of attention to policy as partisans who agree with the candidate, since the alternative hypothesis suggests that there is no difference in the amount of attention paid based on partisanship. The same logic leads to the prediction that independents

who disagree with the candidate on policy will pay the same amount of attention as partisans, regardless of their proximity to the candidate. According to the working hypothesis, however, independents will pay less attention to policy than partisans do. This is the case both when proximity to the candidate is zero and when it is one.

Table 4: The two theories' hypothesized eye tracking outcomes

A's time spent looking at candidate policies should be ____ the time spent by B.		B		
		Independents ₁	Partisans ₀	Partisans ₁
A	Independents ₀	=	= <	=
	Independents ₁		=	= <

[Group]₀ represents the group when their proximity to the candidate is zero and [group]₁ represents them when their proximity is one. The upper left hand corner of each cell signifies the expectations of the alternative hypothesis, while the lower right hand corner represents those of the working hypothesis.

Last, through the inclusion of the three political sophistication variables, I control for an important confounder in all eye tracking studies: that the time spent on a stimulus will indicate how complex and thus difficult it is to read rather than how engaging and salient it is to the subjects' decision making process. My task's stimulus could be difficult to understand because the subject is not familiar with the topic. This is most likely to apply to candidates' issue positions, hobbies and jobs being relatively easy to comprehend. The three variables control for the chance that those with poor political understanding or little education will spend longer on the issue positions simply because they are harder for them to read. This is particularly a concern for this test given

that independents tend to be less well informed than partisans (Abramson, Aldrich, & Rohde, 2012). Therefore, a finding that independents looked more at policy than partisans could be called into question if these controls were not included in the model.

The results of the model are shown in Table 5. My findings on the primary sample indicate that independents and partisans differ in the attention they pay to candidates' policy information. The variable *independent* has a robust negative effect. Independents who are at a proximity of zero from a candidate are likely to take about eight percent less time looking at candidates' policy stances than partisans of the same proximity from a candidate.

To see if this effect holds regardless of the proximity of the candidate, we must turn to the effect of candidate proximity and its interaction. The base term is not significant, meaning that the time partisan subjects spend focused on candidates' policy stances does not change as the candidate gets further away. However, the coefficient on the interaction term is significant and positive, meaning that as subjects get further away from a candidate, they spend more time looking at candidates' policy proposals. This refutes the expectation of the working hypothesis, which predicts that there should be no difference between the groups.

The joint effect of the base term, *independent*, and the interaction term remains negative, meaning that regardless of how far away from them the candidate is, independent subjects take less time than partisan subjects looking at information about

candidates' policy stances. This result again confirms a prediction of the working hypothesis for the eye tracking data and refutes that of the alternative hypothesis: when at a proximity of one, independents will pay less attention to candidates' policies than partisans do.

Table 5: Candidate proximity, moderates, and the eye tracking measure

DV: Percentage of time per trial spent focusing on candidates' policy stances [0, 100]		
VARIABLES	Primary sample	Replication sample
Candidate proximity	0.14	0.80**
Independents	-7.91**	4.43
Candidate proximity*independents	5.48***	-2.26*
Education	-1.93	-1.57
Political understanding	-3.45*	0.46
Political interest	1.62	0.64
Intercept	56.04***	53.20***
	66 subjects	61 subjects
<i>N</i>	5,346 observations	4,941 observations
	81 trials	81 trials
<i>R</i> ²	0.10	0.03

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$

Model 4 is run with subject-level random effects and a 1000 sample bootstrap

These results offers a clear explanation for the results of Model 1: subjects do not use candidates' policy stances in their evaluations as much as partisans do because they are less interested in them or pay less attention to them. Subjects give significantly less attention to the policies that the candidates support. They instead spend their time instead looking at the candidates' job histories and personal information.

Also of note is that the coefficient for political understanding is as predicted: those with more political understanding spend less time looking at the policy stances.

This is likely due to more politically sophisticated subjects being more familiar with the policies, and thus taking slightly less time to read them.

On the replication sample, the coefficient on *independents* is not significant. But this only holds for independents when the candidate is of the same partisanship. When the candidate gets further away, the negative coefficient on the interaction is significant, meaning that independents who are a proximity of one away from the candidate pay significantly less attention than partisans to candidates' policies. So, this result is in partial confirmation of the theory.

The result for candidate proximity matches neither of the theories. It shows that for partisans, as the candidate gets further away, the amount of attention spent on policies increases. Taber and Lodge's theory of motivated policy reasoning as well as much of the work done on partisan bias (e.g., Bartels, 2002) focuses on how individuals reason about their own beliefs in the face of confirming and disconfirming evidence. The gist of the theories from this literature is that citizens pay more attention to information that ratifies their prior beliefs and ignore confounding facts. My results suggest that this straightforward conclusion may only be applicable to information in certain circumstances. When individuals are reading information with the implicit goal of finding out whether their beliefs are correct, they learn as much as they can to defend their prior beliefs. But when they are viewing candidate information, the goal is different: individuals are finding out if the candidate agrees with them, not whether

their own beliefs are correct. And in this context, it appears that independents and partisans differ in their behavior. Independents are less interested in the policy beliefs of candidates who disagree with their issue preferences (consistent with the expectations of partisan bias) but partisans spend additional effort in reading the policies of candidates who disagree with them.

This result could be an effect of increasing affective polarization, whereby public officials and individuals from the other party are viewed with antipathy even if their stances on issues are not that far away from the individual's preferences (Iyengar & Westwood, 2015). While Iyengar and Westwood did find some affective polarization amongst independents, partisans opposed those of the other party to a much greater extent. This hostility and anger could manifest itself in an increased focus on the policies that one disagrees with, leading partisans to give extra attention to the policy proposals of those of the other party.

While the primary sample results clearly favors the explanation that independent voters care less about the policy positions of candidates, those of the replication sample only offer partial confirmation. Looking at the goodness of fit statistics from the two models, it is clear that the model fit the data on the primary sample much better than it did on the replication sample; the former has an R^2 statistic of 0.10, while the latter explains only three percent of the variance in the dependent variable. This means that the results found in the replication sample do not help very

much in explaining why subjects differed in the amount of time spent on policy stances. While I cannot dismiss the replication sample results, then, the quality of the data is certainly dubious.

Thus, an overall picture emerges from the results of Model 1 and Model 2 on the primary and replication samples. My computations support the hypothesis that independent voters disregard policy stances compared to partisan voters when evaluating candidates. The first model supports this conclusion on both of the samples. Furthermore, the second model supports the hypothesis' predictions on the primary sample, both when candidates are close to and far away from the subject. Showing that independents pay less attention to policy supports the notion that partisans care more about candidates' policy stances than do independents.

3.7 Conclusion

The behavior of voters in evaluating candidates is one of the core questions of political science. From a normative perspective, the capacity of citizens to understand politics and choose among different platforms and policy positions is at the center of democratic theory. From a strategic perspective, all our results on equilibrium policy positions, or tendencies of political parties in choosing platforms, rest on the assumptions made about how voters evaluate candidates.

A 'first pass' at an approach was that used by the Downsian model: voters have no intrinsic partisan commitments, but these partisan commitments emerge from the use

of labels as a heuristic means of economizing on the costs of gathering information. A 'second pass' was the "American Voter" conception of partisan identification as being an analytic primitive, resulting from a funnel of causation beginning with family and peer socialization (Campbell et al., 1960; Stokes, 1966). In this view, partisanship is destiny, or nearly so, and partisan identification explains the lion's share of the variation in voter evaluation of candidates.

In recent years, both the theoretical and empirical inadequacies of these approaches have become much clearer. My contributions in this paper are two-fold: first, I have shown that eye tracking is a methodology that can be usefully applied to questions of voter choice, and suggest that eye tracking become part of the tool-kit of the literature. And second, I have shown that the model that voters use in choosing candidates is dependent upon their partisanship. This result fits into the recent wave of papers suggesting that the Michigan school and Downsian approach relied on an overly simplified view of the electorate, and that instead there may be heterogeneity in voter decision criteria (Stubager, Seeberg, & So, 2018; Blumenstiel & Plischke, 2015).

Specifically, my findings in this paper are that partisan subjects focus more on policy than do independent subjects when evaluating candidates. This result holds across two different, separately collected, samples. Using self reported measures of candidate ratings, independents appear to use policy less in forming these ratings than do partisans. In particular, independents do not penalize a candidate when he moves

away from them in the policy space, while partisans penalize such candidates harshly. This finding is supported by the eye tracking data. Independents spend less of their time fixated on candidates' policy proposals than partisans do. The eye tracking measure of attention is an indication of the salience of policy to individuals in forming their evaluations of the candidates.

These findings are consistent with the theory that voters with a more extreme partisanship hold their issue opinions with greater intensity. But my findings in this regard are preliminary, because this experiment does not provide unambiguous causal evidence. The causal factor – whether one was independent or not – was not manipulated, and so it is possible that some other factor correlated with being an independent is in fact responsible for the results. It is not clear, however, how one's political identification could be manipulated, particularly in a manner that would be externally valid. That said, the internal replicability of the experiment is solid, as demonstrated by the results of my replication sample. Administering the same design in different places with more varied subject populations could provide additional evidence that the finding is true of independents and partisans more generally in the population.

Also omitted from the study is a noticeable partisan identification of the candidates. While one could categorize a candidate's party by his policy positions, the candidates were not overtly classified as Democratic, Republican, or independent. Experiments often do not overtly present hypothetical candidates' party identifications

[e.g., see McGraw, Hasecke, & Conger (2003)]. In many cases this approach prompts worries about external validity and the objection that a candidates' partisan affiliation may eliminate the impact of other variables. But having already seen the effect of ideology on the use of issue positions in candidate evaluations using survey data (Adams et al., 2017), in this case these worries are not applicable.

The bottom line for my results is that candidates' policy stances make less of a difference in independents' (including leaners') vote choices. In addition to contributing a finding using a new method to the literature on the topic, this paper also has implications for the literature on independents. The explanation most independents offer for their lack of party identification is that "I vote for candidates, not parties".²⁴ My data suggests that what respondents mean by "parties" is policy issues, and that by voting for candidates, what independents mean is making that decision based on candidates' job histories, personal information, and other valence information. As more and more Americans become independent (Pew Politics Survey put the number at 45.7 percent of participants in the summer of 2013), they may be shifting not towards a more compromising, above-party stance, but instead towards avoiding the topic of policy issues altogether.

²⁴ 2007 Washington Post Kaiser Foundation Harvard University Survey

4. Voter decision making models: Predetermined or primed?

"And [Clinton] wants virtually unlimited immigration and refugee admissions from the most dangerous regions of the world to come into our country and to come into Minnesota and you know it better than anybody. Her plan will import generations of terrorism, extremism, and radicalism into your schools and throughout your communities. You already have it. When I'm elected president, we will suspend the Syrian refugee program and we will keep radical Islamic terrorists the hell out of our country."

-Donald Trump, November 6, 2016, at a campaign stop in Minnesota

"It's time to begin a new phase and intensify and broaden our efforts of smash the would-be caliphate and deny ISIS control of territory in Iraq and Syria. This starts with a more effective coalition air campaign, with more allies' planes, more strikes, and a broader target set. . . . And we should be honest about the fact that to be successful, air strikes will have to be combined with ground forces actually taking back more territory from ISIS."

-Hillary Clinton, November 19, 2015, at the Council of Foreign Relations

4.1 Introduction

Framing and priming are related concepts, involving the manipulation of considerations that voters bring to bear on a choice. The net effect of framing can change the "sum" of considerations, resulting in attitudes that appear to be variable or perhaps

even contradictory. Chong and Druckman (2007) model the two processes²⁵ as $Attitude = \sum(v_i + w_i)$, where v_i is one's evaluation of the topic according to attribute i , and w_i is the salience weight associated with that consideration. The effect of the frame, according to this model, would be measured in terms of its effect on w_i ; different considerations are brought to mind, depending on the frame. An example is an individual's opinion about a Ku Klux Klan rally, which will likely favor it if the decision is framed as a free speech issue but oppose it if it is framed as a public safety issue (Nelson, Clawson, & Oxley, 1997).

But framing might have an additional consequence: reframing an issue may not only change the considerations brought to bear in making a judgment or decision (i.e., Is a Klan rally seen in terms of a free speech issue or a public safety issue?) but also the very spatial model used to represent those attributes and thus, the way that individuals come to make a decision based on those considerations. That is, the framing of an issue may affect an individual's construction of the issue "space" itself. Entman (1993) describes framing the following way:

Framing essentially involves selection and salience. To frame is to select some

²⁵ Chong and Druckman use this model in order to explain both framing and priming, under the reasoning that "the two terms can be used interchangeably" (Chong & Druckman, 2007, 115). To avoid confusion, in this chapter I talk about the *framing* of decision problems and the *priming* of decision models. That is, a decision problem may be *framed* in terms of directional or proximity considerations, and this frame *primes* the model in the individual's memory, thus making it more accessible and thus also more likely to be applied to that problem.

aspects of a perceived reality and make them more salient in a communicating text, in such as a way as to promote a particular problem definition. . . . Frames, then, define problems—determine what a causal agent is doing with what costs and benefits”
(Entman 1993).

When an ad or candidate says, “What this issue is really about is _____,” they may be offering an entirely different representation or structure of the problem. They may not only change the consideration through which the issue is viewed but also change the voter’s mental conception, which may be knocked from one track, or model, to another.

To take one recent and critical example, Donald Trump and Hillary Clinton appear to have suggested that we think of the Syria issue through very different issue spaces. Trump’s speech, quoted above, was filled with emotional rhetoric (“. . . the hell out of our country”), and he mentions two – and only two – opposing policies. Clinton’s quote, on the other hand, uses no emotional rhetoric, and her language called attention to a number of possible policy solutions. As I will go on to explain, these two issue spaces are very similar to those suggested by directional theory and proximity theory, respectively.

This may have been because the electoral contest was over more than issue positions: it was over the framing of those issues and over the very way in which individual voters should come to decide on the issues. In this chapter, I show that people do not necessarily adhere to a set way of thinking about the space that underlies

their political decisions but instead can be primed to think according to *one model or another*. While this idea is consistent with Shah et al.'s (2002) definition of a frame as promoting "particular definitions and *interpretations of political issues*" (italics added), thus far the framing literature has not explored this possibility.

Doing so takes us into the literature on formal theories of political choice. Studies of voter decision making have assumed that all voters use the same model when thinking about politics, regardless of the issue. But this assumption is not likely true (Payne, Bettman, & Johnson, 1993; Jones, 1994), and there are a few exceptions to the standard assumption of consistency (e.g., Carmines and Stimson, 1980; Rivers, 1988; Laver, 2005; Lodge et al., 2011; Egan, 2014). Yet, again, none of these authors have taken into account the framing of an issue as a potential cause of a change in choice model.

The goal of this chapter is to evaluate whether the models that voters use to consider candidates may be primed by the wording of questions asking them about where they stand on the issues (or, "self-placement" questions). Of course, there are several models of voter decision making, and I cannot evaluate whether framing affects the use of all of them. Instead, I will evaluate this hypothesis on two well-known models. Prominent candidates for consideration might include retrospective voting (Fiorina, 1981), the on-line tally model of Lodge, McGraw, and Stroh (1989), the John Q. Public model (Kim, Taber, and Lodge, 2010), or theories of partisan bias (Sniderman and

Stiglitz, 2012; Lavine, Johnston, and Steenbergen, 2012). However, I focus on proximity theory (Downs, 1957) and directional theory (Rabinowitz and Macdonald, 1989).

A longstanding literature [see Lewis and King's review (1999); for more recent work, see Lacy & Paolino (2010), Tomz and Van Houweling (2008), Claassen (2008), Adams, Bishin, and Dow (2004), and Cho and Endersby (2003)] has been dedicated to the question of which of these two theories better describes voter behavior. The two models represent different types of decision making processes. Proximity theory characterizes policy-based reasoning, with the idea that individuals have an ideal point for each issue and choose the candidate whose policy position is closest to their preference. Directional theory, on the other hand, conceives of issues in a diffuse manner, focused on the *direction* of the policy and the *intensity* with which the preference is held, rather than in terms of specific policy alternatives. I choose to focus on these theories because of the frequent usage of proximity theory in formal work and because there is already an established literature comparing the two. Scholars have still not found conclusive evidence in favor of one or the other, despite close to 30 years of research on the topic and, recently, the application of experimental methods to the problem. Different papers find different percentages of subjects using each. And while this is at least in part due to the methodological choices that favor one or the other

theory,²⁶ it may be also the case that the different ways in which self- and candidate placement questions have been asked in surveys and experiments have had framing effects, causing the rate of each theories' use to differ survey to survey.

The reason this is important is that the nature of the "space" being contested has fundamental implications for the way that politics plays out. The prediction from a proximity conception of politics is that respondents often prefer centrist outcomes. But, in a directional model, respondents always prefer more extreme outcomes. Thus the question of "direction versus proximity" has importance far beyond the technical political science literature. It has policy implications for elections laws, for regulation of primaries and campaign finance, and for our expectations of what a well-functioning democracy would look like. Lewis and King (1999) emphasize the importance of this issue:

Unfortunately, there exists essentially no evidence within this [body of literature] and these data to distinguish between the two models. Perhaps as a consequence, other scholars have probably paid insufficient attention to this controversy. However, the issue is clearly critical, as it potentially threatens to undermine a large fraction of the work on formal rational choice and empirical voting behavior. That there exists no

²⁶ Such as those detailed in Lewis and King (1999), e.g. using each respondent's perception of a candidate issue position or, alternatively, using the average issue position in the sample for each candidate.

evidence for one of the most elementary assumptions underlying work in these fields is worthy of much future attention.

My conjecture is that the reason for mixed results in past research is that each model is active in some contexts. Indeed, the same person might use the directional or the proximity conception of the same issue at different times, depending on which construction has been primed. It is a mistake to say “which?” model is more correct when the question should be “when” does the individual use each of them?

In this chapter I use experimental data to show that framing the issue space in a way that is consistent with directional or proximity theory affects subjects’ likelihood of using one or the other model to choose between candidates. My results imply that elite actors might act strategically by framing an issue in terms of one model or the other, thus eliciting responses that are most congenial to their interests. Additionally, they are an important addition to recent work on why voters at times do not appear to be proximity voters (Boatright, 2008; Lau, Andersen, and Redlawsk, 2008; Joesten & Stone, 2014).

4.2 Theory: the priming of subjects through the presentation of issue spaces

To review the two theories briefly, proximity theory holds that voters’ utility for candidates is linear or quadratic, causing them to vote for the candidate who is closest to their ideal point. Directional theory, on the other hand, suggests that a voter’s utility function is a scalar product of their ideal point and the candidate’s position. Counting

the middle point of the scale as zero, this means that an individual will have negative utility for a candidate on the other side of the issue space. Additionally, the further out on the scale the candidate is, the higher an individual's utility for her will be. So the two theories predict different outcomes in situations like the following: suppose the issue scale has a -5 to 5 range, and an individual's ideal point is at 1. Say that candidate A is located at -1, and candidate B is at 4. According to proximity theory (with linear utility), the individual will prefer candidate A to B: $-|1 - -1| = -2 > -|1 - 4| = -3$. But according to directional theory the individual will prefer candidate B to A: $(1 * 4) = 4 > (1 * -1) = -1$. This difference in predicted choice between a centrist and extreme candidate holds for all individuals with preferences at the middle points of the scale; the only preference points for which the predictions are the same are the endpoints of the scale.

It is important to note that the issue scales for each theory differ. Proximity theory proposes that voters view the "space" of an issue as a set of policy alternatives ordered according to ideology. Thus, the issue space ranges from the most liberal stance to the most conservative stance on an issue, with the middle of the space denoting a middle of the road policy position. In directional theory, on the other hand, "the impact of issues should be modeled in terms of direction and intensity . . . the basic issue is conceptualized in a diffuse fashion rather than in terms of a set of specific policy alternatives" (Rabinowitz and Macdonald, 1989). Voters are assumed to see the policy space as representing only two policy alternatives (such as more or less taxation), with

the middle issue stands representing the intensity with which either of the two sides is supported.²⁷

Having reviewed the two theories, it is now useful to note how surveys and experiments traditionally judge which of the models an individual uses. This is helpful because the question of whether people can be primed to use one model or the other goes to core of existing survey approaches to the measurement of self- and candidate placements. Studies of proximity versus directional theory typically use a single question to measure self-placement and another single question to measure candidate placement. The idea is that a generic scale permits either proximity or directional responses, allowing the researcher to adjudicate between the models. To achieve such a compatible scale, the approach typically has been to use placement questions in which the middle points of the scale are not labeled [Tomz and Van Houweling, 2008; most American National Election Study (ANES) datasets²⁸]. For example, the question about defense spending in the 1988 ANES, used by Pierce (1997), is as follows:

Some people believe that we should spend much less money for defense. Others feel that defense spending should be greatly increased. Where would you place yourself on this scale, or haven't you thought much about this? (Seven point scale shown, with 1

²⁷ While the joint proximity and directional model created by Merrill and Grofman (1997) does an excellent job in exploring how voters may use both of the models under different circumstances, the different issue spaces underlying the two theories presents a problem for this approach: the models are not arrayable on a single continuum. This makes combining the two models in a single model questionable because individuals may place themselves differently on the two scales.

²⁸ Available at http://www.electionstudies.org/studypages/download/datacenter_all_NoData.php.

labeled, “Greatly decrease defense spending” and 7 labeled, “Greatly increase defense spending.”)

Scholars have assumed that individuals innately think in either proximity terms or directional terms; consequently, those who think in proximity terms will view the middle points of the scale as representing issue positions, while those who think in terms of directional theory will view these points as representing intensities.

But it is often the case that one model is distinctly favored in the underlying issue space implied by the survey question. Framing effects may still apply even if the middle points of the scale are not labeled. For example, Todosijevic’s (2005) policy preference scale is labeled only at the ends but has 5 as its midpoint. This choice may push subjects towards answering in favor of proximity theory rather than directional theory, which generally is represented with a zero as its midpoint in order to stress that the negative values of the scale represent a different policy than the positive values. Subjects might also be primed by the previous question or the instructions, which might appear innocuous but have the potential to have substantial framing effects. Blais et al. (2001) and Lacy and Paolino (2010) ask their questions in a way that patently corresponds with the underlying issue space of directional theory, noting that the majority of scholars have favored an approach that supports proximity theory.

Consequently, it is possible that subjects have been primed to use one model or the other in surveys and experiments. This chapter provides a test of whether the way

we ask respondents to place themselves and the candidates on an issue affects subjects' usage of the models. I find that the proximity model tends to be used when the placement questions are asked with a proximity scale, with the intermediate positions on the scale presented as distinct policy proposals. On the other hand, the directional model is used more often when the questions are asked with a directional scale, with the intermediate points of the scale presented as degrees of intensity. This means that the idea that individuals instinctively and always use one theory is not likely true. Instead, the model citizens choose to use is affected by contextual cues.

To return to the beginning of the train of logic and put this hypothesis into the context of the priming literature, see Figure 7. This figure highlights the differences between traditional framing theory and my hypothesis, using the example of whether a Ku Klux Klan rally should be allowed. Each of the four principal lines represents an issue space, which ranges from the Klan not being allowed to rally to them being allowed to do so.²⁹ The upper box is a representation of what traditional framing theory means when applied to the framework of a spatial theory of candidate preference, proximity theory. The frame in this perspective represents the sub-issue (free speech or public safety) through which the individual views the main issue (whether or not the Klan should be allowed to rally). In 1(a), the frame is public safety while in 1(b) the issue is viewed in terms of its effects on free speech. The individual's preference, represented by

²⁹ A more centrist position could be, for instance, allowing a rally of a limited number of people.

the circle, switches sides of the issue depending on which sub-issue is brought to mind. Thus, the candidate she is closest to in the space changes from candidate C to candidate A. That is, framing in the traditional sense changes the sub-issue of the issue space, and thus alters the individual's preference, which then changes which candidate she chooses.

The bottom box represents the hypothesis presented in this chapter, "model framing". In 2(a) and 2(b), the traditional frame is the same, that of free speech. But in 2(a), a proximity representation of the space is primed. Thus the individual chooses according to proximity theory and prefers candidate A. In 2(b), on the other hand, a directional way of looking at the issue space is primed, and so the individual uses a directional model and prefers candidate B. Essentially, even if two individuals have received the same traditional frame, they may choose different candidates depending on which model frame they receive.

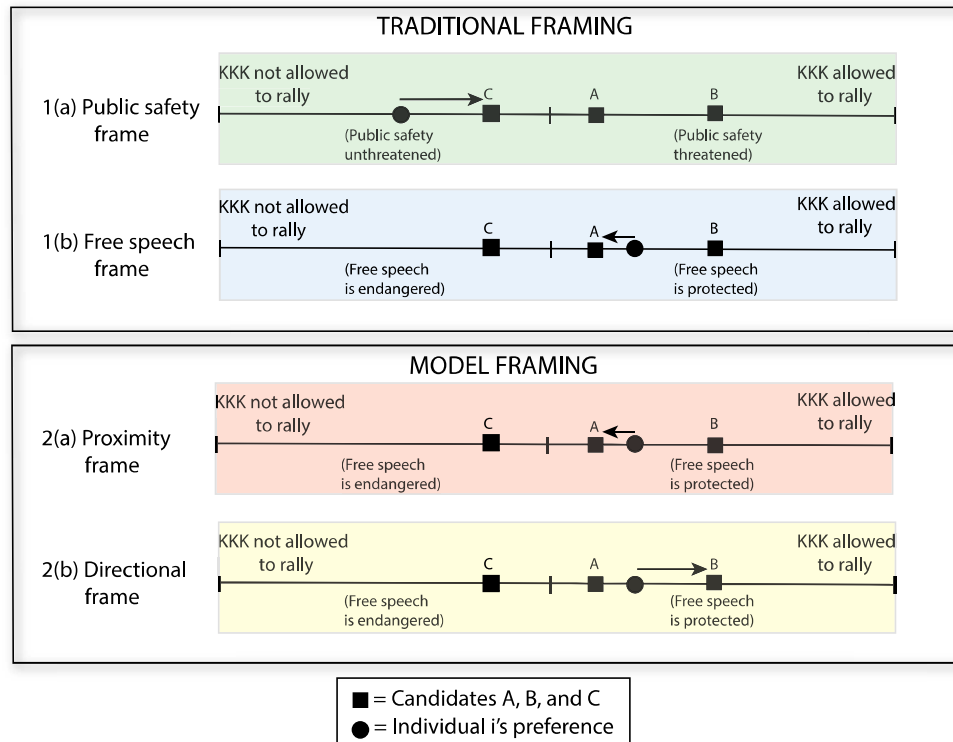


Figure 6: The difference between the traditional theory of framing and the proposed 'model framing'

4.3 Experimental Design

The data used to evaluate this hypothesis comes from a survey sponsored by a university research institute, run in October 2016, with 508 respondents. The online appendix (1) contains a description of the data and sample characteristics. Subjects were randomly assigned to one of two treatment conditions, the proximity treatment or the directional treatment condition. In the proximity treatment, participants received a self-placement question with nine choice options, each one labeled as a policy gradation on a continuum ranging from liberal to conservative. The issue asked about was minimum

wage, and the gradations ranged from \$16/hour minimum wage to no minimum wage at all, decreasing by \$2 between each policy stance.³⁰

In the directional treatment condition, subject preferences were measured using a branching format. Participants were asked to choose between two policy positions, no minimum wage or \$16/hour minimum wage (or, alternatively, to indicate that they had no preference on this issue).³¹ Note that the choice of the end points of the scale are important for directional theory; if they are too extreme, or outside of the “region of acceptability,” the theory says that they will be evaluated less favorably. Unfortunately, Rabinowitz and Macdonald were unspecific in defining this concept, and their explanation of it varies throughout the years (Westholm, 1997). But both of the proposed minimum wage policies were within the realm of national debate in the 2016 presidential election. Bernie Sanders’ platform included a \$16 per hour minimum wage, and several U.S. cities, including Seattle and Los Angeles, have voted to gradually increase their minimum wage to \$15 over the next few years. On the other end of the issue, Texas Governor Rick Perry and Senator Marco Rubio have both said they are comfortable with eliminating the federal minimum wage altogether. Additionally, a

³⁰ While Rabinowitz and Macdonald (1989) argued for labeling only the endpoints of the scale in order to allow for comparison of the two theories using the same question, here it is not necessary to do so given that I am asking different questions for each theory. And labeling each point of the scale increases clarity and reliability (Krosnick 1999).

³¹ If subjects chose the third option, they were assigned a 0 as their preference. As MacDonald, Rabinowitz, and Listhaug (1995) stated, “A response . . . at the middle position . . . means no preference on this issue” (456).

HuffPost/YouGov survey run on April 8-10, 2016 found that eight percent of Americans support getting rid of the minimum wage entirely (while, for comparison, ten percent would like to keep the federal minimum wage at \$7.25). This means that we can be fairly certain that most subjects would consider both of the policies within the range of reasonable issue positions.

Figure 8 shows the percentage of respondents who preferred each issue position under the proximity and directional treatment conditions. Note that all respondents who had preferences in the middle of the scale were dropped. There was unfortunately no way to avoid this, since directional theory does not specify which direction such a respondent will prefer (and, this position represents subjects who had no preference on the issue, so to ask them which candidate they prefer is nonsensical). To avoid differences between the two treatment conditions, I also dropped these respondents (with a preference of \$8/hour) in the proximity condition. Additionally, those whose preferences were at the ends of the scale were dropped, since the predictions of proximity and directional theory are the same under these circumstances. This left the sample at 508 respondents. See the appendix (3.1) for more detail

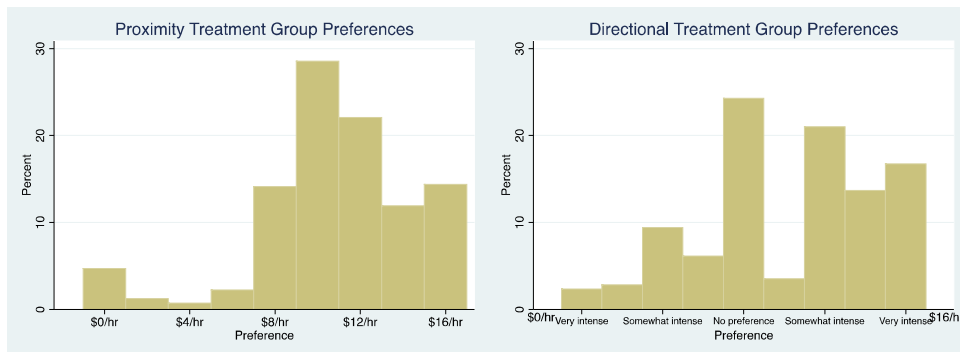


Figure 7: Preferences of proximity and directional treatment group respondents

After indicating which of the two policy directions they preferred, subjects in the directional treatment condition were asked to choose from four levels of intensity with which they hold their preference, from “not very intensely” to “very intensely”. This question, combined with the answers from the first question, generated information that can be captured on a scale of nine points ranging from no minimum wage to \$16/hour minimum wage, with the interior points representing intensities. Thus, the directional and proximity treatment conditions yielded an issue space with the same end points and number of policies but with different labeling of the interior points, as specified by the theory.

In both conditions, after indicating their preference, subjects were presented with the opinions of two candidates and asked which they prefer.³² The candidates’ preferred

³² Placing the candidates on the scale for the respondents, rather than allowing subjects to place them themselves after hearing, for example, campaign speeches, follows Tomz and Van Houweling’s (2008) approach to measuring candidate placements, and accounts for criticisms of previous tests including the potential endogeneity of candidate locations and the impact of nonissue considerations.

policies were chosen so that directional and proximity theory have different predictions about which candidate respondents should prefer. Such is the case when one candidate is closer to a subject and the other is farther away and more extreme *in the direction of the subject's preference*. Proximity voters will prefer the closer of the two candidates, while directional voters will prefer the more intense candidate on their side of the space. So, for all preferences, candidate A was placed one unit away from the individual, while candidate B was placed at the most extreme stance on the same side of the issue space.

The issue spaces on which the candidates' ideal points were presented were the same as those for the self-placement question under each treatment. In the proximity treatment condition, each candidate preferred one of the nine different policies outlined above. In the directional treatment condition, the two candidates had the same direction of preference (either for no minimum wage or for \$16/hour minimum wage) but held this preference with different intensities. For example, under the proximity treatment condition, someone with a preference of \$12/hour would view candidate A at \$14/hour and candidate B at \$16/hour. Under the directional treatment, someone who preferred \$16/hour "somewhat intensely" would view candidate A at \$16/hour (quite intensely) and candidate B at \$16/hour (very intensely). To get a visual idea of the question presentation, see the appendix (1), which depicts the self-placement and candidate preferences questions asked under the proximity treatment and the directional treatment.

Readers might question how the candidates were placed if the respondent's preference was only one unit away from the end of the scale (at \$2/hour or \$14/hour for the proximity treatment condition, and "quite intense" for the directional treatment condition), which under the experimental design presented thus far would place both candidate A and B on the same preference point. Instead, in this case candidate A was placed one unit away from the respondent *towards the interior* of the scale (for example, for someone with a preference of \$2/hour, candidate A would be placed at \$4/hour). Candidate B was placed at the end of the scale, consistent with the previously defined experiment setup. These respondents were given an extra answer option to the question of which candidate they preferred: "Neither – I like them equally." This answer was given because they would like both candidates equally only under proximity theory; under directional theory, they would prefer only candidate B. Thus, if they chose this third answer or candidate A, their preference was coded as the proximity preference. If they chose candidate B, their preference was coded as the directional preference.

Last, an explanation of the choice of minimum wage as the issue under examination is due. This issue was chosen because of the feasibility of creating issue spaces for both proximity theory and directional theory. For some other issues such as gay marriage, it is difficult to conceive of nine different policies to fill the proximity issue space; the issue is largely binary and thus difficult to envision according to proximity theory. The fact that such directional-favoring issues exist, and that other issues may

lend themselves to the proximity way of thinking, has implications for the interpretations of my results. It is possible that minimum wage tends to be viewed either as a proximity issue or a directional issue by the general population. This would be reflected in results showing that between the two treatment conditions, a majority of subjects use the same theory. However, if I find a significant difference in the percentage of subjects using the minority theory between treatment groups, this would mean that the prime has indeed worked. There are simply additionally other unknown contextual variables that affect the theories' usage.

4.4 Models

To test my hypothesis, I begin by running a chi square test. Specifically, Candidate A (the candidate preferred under proximity theory) is coded as 0 and candidate B (the candidate preferred under directional theory) is coded as 1, so the mean preference of the directional group should be greater than that of the proximity group.

I also test this hypothesis by running the following logistic regression:

Preference (A or B) = Treatment group + party ID + political interest + political knowledge

The dependent variable is whether the subject preferred candidate A or B. Treatment group takes a value of 0 for those in the proximity group and 1 in the directional group. Party identification is the standard seven category variable, with 1 = strong Democrat and 7 = strong Republican.

The model also includes two control variables – political interest and political knowledge – to account for the possibility that those with a higher level of political sophistication use proximity theory, while those with a lower level use directional theory [see Macdonald, Rabinowitz, and Listhaug (1995) for a discussion of the logic behind this theory, as well as evidence that this is not the case in their data]. Political interest is the subjects' response to the prompt, "Some people aren't that interested in political campaigns. How about you? Would you say that you have been very interested, somewhat interested, not very interested, or not interested at all in the political campaigns so far this year?" The variable takes a value of 0 for the response, "not at all interested," and a value of 4 for the response, "very interested." Political knowledge ranges from 0 to 2, with knowledge increasing as the variable increases.³³ This variable was created as the combination of two others: one asking, "Do you happen to know which party has a majority of seats in the U.S. Senate?" and the other asking the same of the House. The variable takes a value of 0 if the respondent got both questions wrong (or didn't know), a value of one if one answer was correct, and a value of two if both answers were correct. I run a second model, model 2, in which these two control variables are dropped as a robustness check on the effects associated with treatment group.

³³ The model was also run with education included instead of political knowledge. The effects were almost identical.

4.5 Results

Table 6 depicts the results of the chi-square test. The evidence is clear: the respondents in the directional treatment group prefer candidate B in a significantly greater proportion than those in the proximity treatment group [*Pearson* $\chi^2(1)=15.75$, $p=0.000$]. 23 percent of the proximity treatment group used a directional model in deciding which candidate they preferred. On the other hand, about 40 percent of the directional treatment group used the directional model. This amounts to a significant difference of about 17 percent in the theories' usage between the two treatment groups. So while usage of each model is not perfectly predicted by the prime, it significantly (and largely) affects the percentage of respondents using each model.

Table 6: Chi-squared test of proximity and directional treatment groups' candidate preference

Preference	Treatment group		Total
	Proximity	Directional	
Candidate A	206 76.58%	144 60.25%	350 69.90%
Candidate B	63 23.42%	95 39.75%	158 31.10%
Total	269 100%	239 100%	508 100%

The top number in each cell depicts the number of respondents in that category. The lower number in each cell depicts the percentage of the column that number represents. For example, about 77% of those respondents in the proximity treatment group chose Candidate A.

Table 7 shows the results of the two models, which likewise provide strong support for the hypothesis. The log of the odds of a subject using the directional model is positively related to being in the directional treatment group ($p < 0.01$). In other words, receiving the self-placement question in a format consistent with directional theory increases the likelihood that the person will use directional theory in evaluating the candidates. More precisely, the odds of someone who was in the directional treatment group using directional theory are 2.33 times greater than the odds for someone in the proximity treatment group. This result is robust, remaining consistent in model 2, unaffected by the presence of the control variables.³⁴

³⁴ The point of this chapter is to test whether the treatment condition has an effect on the likelihood that an individual uses one or the other model. However, one might also ask: how does the model do in terms of correctly predicting which subjects are using directional theory and which are using proximity theory? This question has to do with the predictive validity of the model, which may or may not do a great job of classifying respondents even when the main effect found is valid. See Appendix C (8.3) for a classification table and ROC curve.

Table 7: Logistic regression predicting the choice of candidate A or B

Model	(1)			(2)		
VARIABLES	β	e^β (odds ratio)	Wald's χ^2	β	e^β (odds ratio)	Wald's χ^2
Treatment group	0.847*** (0.200)	2.332***	17.97***	0.835*** (0.199)	2.306***	17.61***
Party identification	-0.144*** (0.0467)	0.866***	9.55***	-0.138 (0.046)	0.871***	9.03***
Political knowledge	0.0763 (0.114)	1.079	0.44			
Political interest	-0.0803 (0.0927)	0.923	0.75			
Constant	-0.585* (0.323)	0.557*		-0.727 (0.205)	0.483***	
Observations	508			508		
Test	χ^2	<i>df</i>	<i>p</i>	χ^2	<i>df</i>	<i>p</i>
Likelihood ratio test	26.09***	4	0.00	25.10***	2	0.00
Hosmer & Lemeshow	11.6	8	0.17	7.32	6	0.29

Standard errors shown in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Calculating the predicted probability of an individual using directional theory given her treatment group offers a different way to visualize these results. Holding all other variables at their means (which means that party identification is roughly at a true independent), the predicted probability that an individual in the proximity treatment uses a directional model is 0.22. But the predicted probability of an individual who was in the directional treatment using a directional model is 0.40.

Additionally, these results held consistently when run in a separate Amazon Mechanical Turk dataset, collected in August, 2016. This replication of the result means that these effects are highly unlikely to be produced random chance. See appendix (4) for results.

4.6 An additional test: the role of political sophistication

I have shown that the question wording affects the model that individuals use to think about candidates. But given that the cognitive limitations of the average voter is a main reason directional theory, and other models like the on-line tally model (Lodge et al., 1989) were created, this is a surprising result: it suggests that individuals have the ability to keep not one but *multiple* models in their heads, which they switch between depending on the context. One might say that surely this can't be true equally for all people, for all issues, and for all elites running for office. I cannot test all of these prospects but can account for the possibility that characteristics of the respondent may affect the extent to which she is affected by the frame.

Specifically, political sophistication may change the likelihood of an individual's model use being affected by a frame. Two logical theories come to mind: (1) the more politically sophisticated a voter is, the *less* susceptible the model through which she views candidates is to framing effects. Having thought longer and harder about political issues, the politically sophisticated are likely to develop a resolute way of thinking about candidates. Or, (2) the politically sophisticated are *more* likely to change the model they use according to how the problem is framed. Having thought more about politics, such individuals are more likely to have the ability to think in terms of multiple models.

To test these theories, I run the same logistic regression as above but add an interaction between treatment group and political knowledge. If H_1 holds, the coefficient

on the interaction should be negative, indicating that as political sophistication increases and when subjects are in the directional treatment group, the likelihood that they will use directional theory decreases. That is, as political sophistication increases, the likelihood that subjects will switch the model they are using to be in line with the frame of the question decreases. If H_2 holds, the coefficient on the interaction should be positive, indicating that as political sophistication increases, the likelihood of those who were primed with the directional treatment using the directional model increases.

In this model political sophistication is measured as political knowledge, described on page 18. But I also ran the model using political interest (also described on page 18) to represent sophistication, with similar results as those below.

Table 8 depicts the results, which show that the interaction is not significant and has very little effect on the coefficients and significance of the other variables.

Additionally, a likelihood ratio test between the main model and this model (with the interaction) has a chi-square statistic of 1.03, with a p-value of 0.31, meaning that the addition of the interaction variable into the model does not significantly increase the model's goodness of fit. Thus, we can conclude that political knowledge has no relationship with the likelihood that an individual can be primed to use the directional or proximity model. Other variables that should behave similarly to political knowledge, like education and political interest, also have no significant interaction effect with

treatment group (see appendix). Thus, the priming effect appears to affect everyone with equal likelihood, regardless of his or her political sophistication.

Table 8: Model 5, with an interaction between treatment group and political knowledge

VARIABLES	β	e^β (odds ratio)	Wald's χ^2
Treatment group	0.614** (0.558)	1.85**	4.14**
Party identification	-0.145*** (0.040)	0.865***	9.60***
Political knowledge	-0.049 (0.160)	0.952	0.66
Political interest	-0.075 (0.086)	0.927	0.09
Treatment group * political knowledge	0.227 (0.281)	1.255	1.03
Constant	-0.464 (0.215)	0.628	
Observations	508		
Test	χ^2	<i>df</i>	<i>p</i>
Likelihood ratio test	27.12***	5	0.00

Standard errors shown in parentheses

*** p<0.01, ** p<0.05, * p<0.1

4.7 Discussion and concluding suggestions

This study has shown that which model citizens use to evaluate candidates is in part dependent on which underlying issue space is primed. The wording of self- and candidate-placement questions changed which of the models – directional or proximity – about 20 percent of respondents used. Consequently, while framing is not perfectly predictive, by any means, it does matter more than it should, if people had pre-existing fixed conceptions of issues as either proximity or directional. These effects appear to be

common amongst all members of the population and are not dependent on political sophistication.

This result contributes to two literatures. The first is the proximity versus directional theory literature. In their 1999 paper, Lewis and King lamented the inability of available data to distinguish whether voters decide based on proximity or direction. The recent arrival of experiments has expanded the type of data available, but still has not brought the literature to a conclusion. My result means that asking which theory is correct is the wrong question; instead we should be questioning how the contextual variables surrounding decisions may have primed respondents to use one theory or the other. This is a different aspect of differentiation than that raised by the recent literature on proximity and directional theory, which does consider variance in use of the theories among different “types” of voters. For instance, Tomz and Van Houweling (2008) find that in their sample independents almost never use directional theory whereas about a fourth of partisans do. And Cho and Endersby find that the proximity model explains preferences for incumbents while the directional model fairs better for challengers in the case of British voters. These, however, are fixed aspects of most elections – there will be independents and an incumbent and challenger in most – while there can be considerable movement by parties and candidates regarding which of the models they choose to prime issues through. My analyses reinforce and extend these results.

This result also has implications for the literature on framing. I have introduced a new context in which framing occurs: in addition to priming the sub-issues through which a larger issue is viewed (and thus changing preferences), framing works by priming different ideas of the issue space, thus changing the model individuals are using and consequently changing the candidate they choose. Preferences that can be affected by the way questions are asked are susceptible to strategic manipulation by others. Parties and candidates would be very interested in the ability to push individuals to use directional or proximity theory, similarly to the way in which they attempt to make certain issues salient (Riker, 1990). Depending on whether they are located towards the extreme of the political spectrum or towards the middle of it, priming voters to use one or the other model would have the potential to make a real difference in which candidate voters prefer.³⁵

The fact that choice behavior may be highly contingent can be viewed as a problem that overcomplicates the modeling process or as an opportunity for researchers. I suggest we view it as the latter. There are several political science theories besides directional and proximity theory that potentially fit within this framework. An example is Egan's (2014) work on "do something" politics versus "non-consensus" issues. On

³⁵ Note that since the issue spaces differ, a candidate may be located at different places depending on which model an individual is using. For example, a candidate who is extreme in terms of both policy position and intensity would be placed the same on both issue scales. But a candidate who is extreme only in terms of policy position, but not in terms of intensity, would be placed more towards the center in the directional conception. This would need to be taken into account in order to calculate whether changing the model voters were using would positively or negatively affect a candidate.

issues on which Americans agree on goals – such as safety from national threats, cleanliness of air and water, or lowering crime rates – he finds that one out of four individuals holds double-peaked policy preferences (meaning that individuals are happy to change policy in either ideological direction). Issues on which there is no consensus regarding goals – for example, gun availability or abortion – do not engender a double peaked utility function, and the typical spatial utility function is used instead. This finding suggests that framing an issue in terms of consensus or non-consensus policies could prime one or the other models in voters' minds. For example, gun rights could be framed as an issue whose ultimate goal is the safety of Americans (a consensus issue), or it could be framed as an issue of gun *control*, with the focus placed on the availability of guns (which is not a consensus issue). Similar parallels might be drawn with other models, and I encourage future work to examine if they can be primed similarly to directional and proximity theory.

As is always the case with experimental studies, it is important to address questions of external validity. One limitation of experiments has to do with the subject pool, the question being whether they are comparable to citizens who vote. I was able to broaden the participant pool by using an online platform – Qualtrics – meaning that there were no geographic limitations to my sample (within the United States) and it is relatively diverse. Qualtrics' respondent pool mimics a nationally representative sample by using gender, education, age, and race quotas. Additionally, I implemented an

internal replication of my study on an Amazon Mechanical Turk subject pool (see appendix for details). The main results all held on this separate sample. This suggests that my findings do generalize to other populations at other times.

That said, this generalization is limited to the experiment context that the study is conducted within. Another issue is the realism of experimental settings. By utilizing survey questions, my treatment certainly applies to the survey results that we typically use to distinguish between proximity and directional theory; but can we say that it applies to the impact of candidate strategies on voter behavior? Unfortunately, issue voting in the real world is extraordinarily difficult to study using survey data. Asking respondents to report the position of real-world candidates risks those positions being endogenous to how much the candidates are liked by the citizen. Also, citizens' opinions of candidates are formed by much more than the candidates' issue positions. Candidates' competence, personality, trustworthiness, and even appearance are factors that are likely to come into play but difficult to measure.

Experiments face a similar number of different complications. While I avoid the problems of endogeneity and measurement that surveys face, real world behavior may diverge from that found here, due to the same factors that make the avoidance of these problems possible. A candidate's personality may make a larger difference in a citizen's vote than his issue stances, which may lead that person to deviate from my behavioral results. Thus, this chapter is properly viewed as providing a behavioral benchmark

under conditions in which citizens' candidate evaluations are entirely dependent on issue positions. Future work testing this same idea using survey data would be helpful, to see if the results hold in a different context.

A brief consideration of the recent Presidential election suggests that candidates may try to frame issues in a directional or proximity manner, providing fertile ground for such a study. Table 9 contains quotes from campaign speeches by Trump and Clinton over four issues – trade, policing, ISIS, and the economy. In all of these examples, Trump makes extensive use of emotionally volatile images (e.g., “In Chicago, they’ve had thousands of shooting, thousands since January 1st. Thousands of shootings. And I’m saying, where is this? Is this a war-torn country?”). He also systematically presents the possible policy options as dichotomized: “My campaign has the opposite message. . . . That’s the choice we face. We can either give in to Hillary Clinton’s campaign of fear, or we can choose to believe in America.”

Clinton, on the other hand, methodically takes a nuanced approach to discussing policy options. Her discussion of each of her proposals involves more than one tactic, highlighting the complexity of the issue as well as the fact that there are multiple policy options. “And we’ve got to do several things at the same time. . . . Well, I think that there are a number of issues that we should be addressing. . . . Trade agreements don’t happen in a vacuum . . .” And her quotes lack any emotional content. Just as survey questions can be framed to push voters to use directional or proximity theory, it is likely that

campaign speeches can also be framed to produce the same effect. This chapter has answered initial questions while suggesting that efforts to study how framing may impact citizens' model use should be pursued.

Table 9: Trump and Clinton campaign rhetoric

Trump	Clinton
Trade	
<p><i>Greensboro, NC, October 14, 2016</i> I mean, you take a look at this, it's one way. They get the jobs, they get the factories, they get the cash, and all we get – we get illegal immigration and we get drugs. And the drugs are poisoning our youth, the drugs are poisoning our youth and others. But we're getting the drugs and we're getting lots of problems.</p>	<p><i>PBS News Hour, October 5, 2015</i> Trade agreements don't happen in a vacuum, and in order for us to have a competitive economy in the global marketplace, there are things we need to do here at home that help raise wages On the one hand, trade is a part of it, but it's not the only answer, and on the other, if we don't get more investments in education and science and research and infrastructure and clean energy the kinds of things that will create jobs here at home, then I'm afraid on the net [the Trans-Pacific Partnership] won't meet the high bar that I've set.</p>
Policing	
<p><i>Hofstra University, NY, September 26, 2016</i> Well, first of all, Secretary Clinton doesn't want to use a couple of words, and that's law and order. And we need law and order. If we don't have it, we're not going to have a country. . . . In Chicago, they've had thousands of shooting, thousands since January 1st. Thousands of shootings. And I'm saying, where is this? Is this a war-torn country? What are we doing? And we have to stop the violence. We have to bring back law and order.</p>	<p><i>Hofstra University, NY, September 26, 2016</i> And we've got to do several things at the same time. . . . I've laid out a platform that I think would begin to remedy some of the problem we have in the criminal justice system. But we also have to recognize, in addition to the challenges that we face with policing, there are so many good, brave police officers who equally want reform. So we have to bring communities together in order to begin working on that as a mutual goal. And we've got to get guns out of the hands of people who should not have them.</p>

ISIS	
<p><i>Youngstown, OH, August 15, 2016</i> In short, the Obama-Clinton foreign policy has unleashed ISIS, destabilized the Middle East, and put the nation of Iran – which chants ‘Death to America’ – in a dominant position of regional power and, in fact, aspiring to be a dominant world power. . . . But it is time to put the mistakes of the past behind us, and chart a new course. If I become President, the era of nation-building will be ended. Our new approach, which must be shared by both parties in American, by our allies overseas, and by our friends in the Middle East, must be to halt the spread of Radical Islam.”</p>	<p><i>Hofstra University, NY, September 26, 2016</i> Well, I think there are a number of issues that we should be addressing. I have put forth a plan to defeat ISIS. It does involve going after them online. . . . But we also have to intensify our air strikes against ISIS and eventually support our Arab and Kurdish partners to be able to actually take out ISIS in Raqqa. . . . Our military is assisting in Iraq. . . . But we have to be cognizant of the fact that they’ve had foreign fighters coming to volunteer for them, foreign money, foreign weapons, so we have to make this the top priority. And I would also do everything possible to take out their leaders.”</p>
The economy	
<p><i>Monessen, PA, June 28, 2016</i> Globalization has made the financial elite who donate to politicians very wealthy. But it has left millions of our workers with nothing but poverty and heartache. . . . The people who rigged the system are supporting Hillary Clinton because they know as long as she is in charge nothing will ever change. . . . My campaign has the opposite message. . . . That’s the choice we face. We can either give in to Hillary Clinton’s campaign of fear, or we can choose to Believe In America.</p>	<p><i>New York, NY, January 31, 2016</i> In the coming weeks, I’ll propose specific policies to: Reward businesses who invest in long term value rather than the quick bucks. . . . I will rewrite the tax code. . . . I will give new incentives to companies that give their employees a fair share of the profits their hard work earns. . . . We will restore American to the cutting edge of innovation, science, and research by increase both public and private investments. And we will make America the clean energy superpower of the 21st century.”</p>

5. Conclusion

These three chapters demonstrate the two types of heterogeneity that are present in the voting population. There is *inter*-individual heterogeneity, or inconsistency in the models used across individuals in the population. I have shown that there is variance in the utility function used to evaluate candidates according to whether the individual's opinion is based in pragmatic reasoning or in their moral code. Whereas pragmatic respondents' liking of candidates decreased linearly as those candidates' preferences moved away from their ideal points, morally convicted respondents had a convex utility function. This function of decreasing utility is consistent with a view of an issue as either moral or non-moral, with little in between. I also demonstrated that the model used by individuals in rating candidates is contingent on partisanship. Using eye tracking data from an experiment, I have shown that moderates' assessment of candidates is much less dependent on those candidates' policy proposals than partisans' evaluation of candidates is.

There is also *intra*-individual heterogeneity, or differences in the models citizens use, depending on the context that a voter faces. In chapter 4, I presented results of an experiment demonstrating the effect of priming subjects with the underlying issue space of proximity versus directional theory: when primed to think in terms of the directional issue space, a significantly greater proportion of subjects used directional theory in deciding between candidates than was the case when subjects were primed to think in

terms of the proximity issue space. This result suggests that candidates may have the opportunity to prime citizens similarly through their rhetoric, changing the model they use and, thus, perhaps the outcome of a vote.

These three chapters add to the growing list of known heterogeneities in voting behavior. While other scholars before me have examined the effect of being a moderate on the use of policy in candidate evaluations, I am the first (to my knowledge) to look at the effect of moral conviction on utility functions and the effect of primes on model use. Other discovered sources of heterogeneity include political information, media attention, political interest, and education (Fournier, 2000). Scholars have also found variety in the models that individuals use depending on the type of emotion that a context elicits (Johnston, Lavine, and Woodson, 2015). Work on this topic continues; recently, Stoetzer (2017) found that the less consistent respondents' self-placements were on a liberal-conservative scale, the less policy distance affected their voting decisions. The abundance of sources raises the question of what we should do with this knowledge. After all, taking even two of these sources into account would greatly complicate our models. Yet on the other hand, the explanatory power of our models is significantly diminished if we do not take the diversity in decision rules seriously.

Since Rivers (1988) brought the issue of heterogeneity to consideration, there have been a relatively small number of studies examining the dependencies of the voting model across citizens. And of these studies, very few focus on the relative

importance of different sources of variety in decision rules or on the potential interaction between them. For example, many scholars have found that individuals are more likely to hold policy attitudes (Krosnick and Milburn, 1990), to have stable attitude structure (Feldman, 1989), and to reason ideologically (Sniderman, Brody, and Tetlock, 1991) when they are politically sophisticated. How might this result interact with my finding that moderates take policy into account to a lesser extent than partisans? The two results together suggest that the result regarding political sophistication should be dependent on the partisanship of the individual. Politically sophisticated moderates may not care as much as policy issues, and therefore even if they have stable and cohesive attitude structures should not apply these criteria to their votes. In addition to examining the overlapping effects of sources of heterogeneity, such studies may find that the strength of the effect of one source effectively cancels out the effects of another source. Consequently, such studies would have the opportunity to pare down the list of sources into one of a more manageable size.

Also needed are studies that look at the cross-country affect of heterogeneity sources. In a country like Denmark, which has a political system that is centered on parties rather than individual candidates, heterogeneities may take a different form. Valence characteristics such as a party leaders' appearance or perceived trustworthiness may be less important for everyone. In such a context, then, I would not expect to see much difference in the use of valence issues across levels of voter sophistication.

The (perhaps unfortunate) take away from this dissertation is that voting behavior is complex – not just because of the myriad of criteria that affect a voting decision but because these variables differ in their effects both between people *and* within people, across different contexts. However, it is important that scholars do not stick their heads in the sand over the complexity. After all, as Alan Perlis³⁶ said, “Fools ignore complexity. Pragmatists suffer it. Some can avoid it. Geniuses remove it. . . Simplicity does not precede complexity, but follows it.” I hope to have added to our understanding of this complexity so that, hopefully, a simplicity that comes closer to the truth may follow.

³⁶ A computer scientist known for his groundbreaking work in programming languages, Perlis received the ACM Turing Award.

6. Appendix A: The unique utility function of morally convicted voters

6.1 MTurk sample characteristics and question wordings

The survey was run on January 7, 2016 and had 590 respondents before dropping those who were not paying attention. The survey included five attention check questions, which 14 people answered incorrectly and were excluded. Additionally, those who answered the two moral conviction questions differently (“To what extent is our opinion on this issue a reflection of your core moral beliefs and convictions?” and “To what extent is your opinion on this issue deeply connected to your fundamental beliefs about right and wrong?”) by more than or equal to two were dropped ($N=39$ for minimum wage, $N=58$ for abortion). The questions were similar enough that there is no reason a respondent who was paying attention would answer “much” to one and “slightly” to the other. This left 537 respondents for the minimum wage regressions and 518 for the abortion regressions.

It was also necessary to account for respondents whose utility functions do not meet the very basic assumption of single-peakedness (or, the assumption that voters’ rankings over policy alternatives decline as the choice gets further away from their ideal points, held by most formal and empirical models of voter choice). While the purpose of the article is to develop an alternative account of spatial utility, it is an alternative account in a specific manner. I am not suggesting that anything goes for a utility function; declining utility across distance is a reasonable assumption to hold. Thus,

respondents who had *two or more* utility judgments increasing by more than five as the policy got further away from their ideal point (e.g., ratings of 75, 60, 65, 96, and 100 at distances from the ideal point of 1, 2, 5, 8, and 9), or were all within five units of each other (e.g., 51, 51, 50, 51, 49) were dropped. 96 respondents were dropped from the wage regressions, leaving 441 respondents, while 93 were dropped from the abortion regressions, leaving 425 respondents.

Under the same logic, if a rating of a policy was more than two units of utility greater than the respondent's rating of the closest policy, I dropped only that single rating (keeping the rest of the individual's ratings across the distances). This was applicable to respondents who had only one policy rating increasing (e.g., ratings of 100, 80, 40, 75, and 15 at distances of 1, 2, 5, 8, and 9). There were 46 individual thermometer ratings (across 46 individuals) that met this criterion for minimum wage and 29 for abortion. To see the models without any observations dropped, see Supplementary Table 5 and 6 in this appendix.

6.2 Self-placement questions

Self-placement question for the issue of abortion:

Below is a slider with options for government abortion policies. Some people think that by law, a woman should always be able to obtain an abortion. Suppose these people are at one end of a scale, at point 0. Other people think that by law, abortion should never be permitted. Suppose these people are at the other end, at point 10. And, of course, some other people have opinions somewhere in between, at points 1 through 9. Where would you please your opinion on this scale? Please move the slider below so that it lies on this point.

Self-placement question for the issue of minimum wage:

Below is a slider with options for minimum wage policies. Some people think that there should be no minimum wage at all. Suppose these people are at one end of a scale, at point 0. Other people think that we should have a minimum wage of at least \$20 per hour. Suppose these people are at the other end, at point 10. And, of course, some other people have opinions somewhere in between, at points 1 through 9. Where would you place your opinion on this scale? Please move the slider below so that it lies on this point.

6.3 Accounting for alternative explanations

Table 10: Model 1 run across levels of religious conviction

	<i>Religious conviction: Do you consider religion to be an important part of your life, or not?</i>	
	No	Yes
ABORTION		
Intercept	95.66 ^{***} (0.000)	95.40 ^{***} (0.000)
Distance	-24.10 ^{***} (0.000)	-19.79 ^{***} (0.000)
Distance ²	2.263 ^{***} (0.000)	1.274 ^{***} (0.001)
Distance ³	-0.0833 [*] (0.020)	-0.0270 (0.255)
Overall R Squared	0.73	0.75
<i>N</i>	122	303
MINIMUM WAGE		
Intercept	87.72 ^{***} (0.000)	91.03 ^{***} (0.000)
Distance	-24.40 ^{***} (0.000)	-21.15 ^{***} (0.000)
Distance ²	2.695 ^{***} (0.000)	1.835 ^{***} (0.000)
Distance ³	-0.125 ^{**} (0.002)	-0.0711 ^{***} (0.001)
Overall R-squared	0.60	0.65
<i>N</i>	121	320

p-values in parentheses
^{*} *p* < 0.05, ^{**} *p* < 0.01, ^{***} *p* < 0.001

Table 11: Model 1 run across levels of issue importance

	<i>Issue importance: "How important is this issue to you personally?"</i>				
	Very	Somewhat	Moderately	Slightly	Not at all
ABORTION					
Intercept	105.96 ^{***} (0.000)	98.00 ^{***} (0.000)	93.94 ^{***} (0.000)	87.46 ^{***} (0.000)	88.22 ^{***} (0.000)
Distance	-27.74 ^{***} (0.000)	-22.52 ^{***} (0.000)	-19.94 ^{***} (0.000)	-16.20 ^{**} (0.000)	-18.81 ^{**} (0.001)
Distance ²	2.41 ^{***} (0.000)	1.82 ^{***} (0.007)	1.64 (0.024)	0.701 (0.244)	1.73 (0.074)
Distance ³	-0.07 (0.092)	-0.06 (0.169)	-0.06 (0.1495)	-0.001 (0.982)	-0.07 (0.230)
Overall R Squared	0.78	0.76	0.69	0.74	0.70
N	111	92	93	92	37
MINIMUM WAGE					
Intercept	102.1 ^{***} (0.000)	95.02 ^{***} (0.000)	84.22 ^{***} (0.000)	78.07 ^{***} (0.000)	79.47 ^{***} (0.000)
Distance	-28.88 ^{***} (0.000)	-24.12 ^{***} (0.000)	-18.59 ^{***} (0.000)	-16.49 ^{***} (0.000)	-14.63 [*] (0.027)
Distance ²	3.050 ^{***} (0.000)	2.439 ^{***} (0.000)	1.193 [*] (0.050)	1.410 (0.051)	1.571 (0.297)
Distance ³	-0.127 ^{***} (0.000)	-0.105 ^{**} (0.004)	-0.0177 (0.669)	-0.0673 (0.178)	-0.110 (0.254)
Overall R-squared	0.74	0.64	0.61	0.54	0.46
N	117	106	118	83	17

p-values in parentheses
^{*} *p* < 0.05, ^{**} *p* < 0.01, ^{***} *p* < 0.001

Table 12: Model 1 run across levels of preference extremity

	<i>Extremity determined by respondents' placements of their preferences</i>	
	Moderate	Extreme
ABORTION		
Intercept	83.85 ^{***} (0.000)	102.1 ^{***} (0.000)
Distance	-17.92 ^{***} (0.000)	-22.09 ^{***} (0.000)
Distance ²	1.20 (0.083)	1.57 ^{***} (0.001)
Distance ³	-0.03 (0.566)	-0.04 (0.169)
Overall R Squared	0.70	0.78
<i>N</i>	166	259
MINIMUM WAGE		
Intercept	85.06 ^{***} (0.000)	100.80 ^{***} (0.000)
Distance	-20.28 ^{***} (0.000)	-18.18 ^{***} (0.000)
Distance ²	1.62 ^{**} (0.001)	0.84 (0.231)
Distance ³	-0.05 (0.215)	-0.002 (0.961)
Overall R-squared	0.60	0.82
<i>N</i>	351	90

p-values in parentheses
^{*} *p* < 0.05, ^{**} *p* < 0.01, ^{***} *p* < 0.001

Table 13: Utility functions by levels of moral conviction (Model 1), with only those who got the attention check questions wrong (N=14) dropped

	“To what extent is your opinion on this issue deeply connected to your fundamental beliefs about right and wrong?”				
	Very much	Much	Moderately	Slightly	Not at all
ABORTION					
Intercept	83.58*** (0.000)	93.21*** (0.000)	80.20*** (0.000)	70.78*** (0.000)	66.19*** (0.000)
Distance	-17.36*** (0.000)	-22.41*** (0.000)	-9.944** (0.002)	-7.548 (0.073)	-2.073 (0.778)
Distance ²	0.929 (0.258)	2.228** (0.010)	-0.392 (0.576)	0.0480 (0.959)	-1.187 (0.462)
Distance ³	0.00509 (0.919)	-0.0920 (0.084)	0.0629 (0.151)	-0.000362 (0.995)	0.0855 (0.391)
<i>N</i>	191	102	158	80	45
MINIMUM WAGE					
Intercept	92.79*** (0.000)	89.00*** (0.000)	78.13*** (0.000)	75.00*** (0.000)	71.90*** (0.000)
Distance	-23.89*** (0.000)	-22.54*** (0.000)	-14.67*** (0.000)	-13.20*** (0.000)	-9.122 (0.064)
Distance ²	2.397** (0.001)	2.641*** (0.001)	0.936 (0.187)	1.035 (0.214)	0.202 (0.865)
Distance ³	-0.0987* (0.031)	-0.126* (0.013)	-0.0140 (0.770)	-0.0507 (0.370)	0.000499 (0.995)
<i>N</i>	136	126	146	109	59

p-values in parentheses
 * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 14: Utility loss between distant policies (Model 2), with only those who got the attention check questions wrong (N=14) dropped

VARIABLES	Minimum Wage	Abortion
Moral conviction	-0.82** (0.002)	-1.59*** (0.000)
Preference extremity	0.60** (0.003)	2.22*** (0.000)
Issue importance	-0.18 (0.530)	-0.15 (0.636)
Religiosity	-1.22* (0.049)	0.85 (0.231)
Intercept	11.49*** (0.000)	4.91 (0.091)
Adj. R-squared	0.02	0.16
F-test (moral conviction) <i>Prob < F</i>	9.68*** (0.002)	27.13*** (0.000)

p-values in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

7. Appendix B: Tracking moderates' use of policy information in candidate evaluation

7.1 Issues covered in candidates' political preferences information

Abortion
Taxation
Healthcare
Minimum wage
Parental leave
Charter schools
Death penalty
Government spending
Immigration
Same-sex marriage
Gun access
Discrimination (gender, LGBT)
Marijuana legalization
Alternative energy
Fracking
Climate change
Environmental preservation
Biofuels
Welfare
Education
Affirmative action
Stem cell research

8. Appendix C: Voter decision making models: Predetermined or primed?

8.1 Data description

After dropping those who failed attention checks ($n = 150$), took less than three minutes to finish the survey in full ($n = 10$),³⁷ were less than 18 years old ($n = 18$), or didn't finish the survey ($n = 3$), 827 of the original 1,008 respondents who answered the survey were left. 135 respondents in the proximity treatment group, and 184 from the directional treatment group, had a preference at the ends or in the exact middle of the issue scale. Since the prediction of the theories is the same for those at the end of the scale, these respondents were dropped from the analysis. Additionally, those with a preference in the middle of the scale are not specified by directional theory to prefer one direction or the other – specifically, they are those with “no preference on this issue” (MacDonald, Rabinowitz, and Listhaug, 1995, 456), and as such it is theoretically nonsensical to ask them which of two candidates they prefer. This left the sample with 508 respondents. Across both of the treatment groups, 158 subjects (31 percent) used directional theory, preferring the farther away candidate, while 350 of them (69 percent) used proximity theory, preferring the closer candidate.

³⁷ The full survey, of which my questions were a part, took me nine minutes to complete. Dropping only those two took less than three minutes is thus a conservative approach to the data.

8.2 Self-placement and candidate placement questions

Proximity treatment

Q1. Recently there has been a debate about the minimum wage. Some people think that it should be raised, and others think that it should be lowered or gotten rid of entirely. Which of the following is closest to what you think the federal minimum wage should be?

- \$0 -- no minimum wage at all
- \$2/hour
- \$4/hour
- \$6/hour
- \$8/hour
- \$10/hour
- \$12/hour
- \$14/hour
- \$16/hour

Q2. Consider the positions of two politicians on minimum wage. One of them, Candidate A, feels that there should be a \$14/hour minimum wage. Another, Candidate B, feels that there should be a \$16/hour minimum wage. Which of the two candidates do you prefer?

- Candidate A (\$14/hour)
- Candidate B (\$16/hour)

Directional treatment

Q1. Recently there has been debate about the minimum wage. Some people think that it should be raised, while others think it should be lowered or gotten rid of entirely. Which of the following federal minimum wage policies do you prefer?

- No minimum wage
- \$16/hour minimum wage
- I have no preference on this issue

Q2. (Asked if Q1 = 1 or 2) How intensely do you feel that there should be no minimum wage (a \$16/hour minimum wage)?

- Not very intensely
- Somewhat intensely
- Quite intensely
- Very intensely

Q3. Consider the positions of two candidates on minimum wage. They both prefer that there be a \$16/hour minimum wage. However, they differ in how intensely they feel about the policy. Candidate A feels quite intensely about this policy, while Candidate B feels very intensely about this policy. Which of the two candidates do you prefer?

- Candidate A (quite intense)
- Candidate B (very intense)

Table 15: Sample characteristics

Age (mean)	44.7
Female	53.49%
Democratic	46.51%
Republican	38.31%
Education	
Less than or some high school	3.6%
Finished high school or GED	23.7%
Trade certificate	3.6%
Some college or associate's degree	34.82%
Bachelor's degree from a university or college	24.22%
Graduate or professional degree	10%

8.3 Predictive validity

I have shown that treatment condition has an effect on the likelihood that a person uses the directional or proximity model. This does not mean that the model does well in terms of classification, or in correctly predicting which subjects will use each theory. In particular, given the small number of predictors, I would not expect a precisely predictive model.

The area under the ROC curve (AOC) is 0.63 (for both Model 5 and 6), meaning that the model does better than chance in classifying which theory people use. While this

area under the curve may seem small, a 13 percent increase in the predictive power of the model from only two variables is quite good. When the regression is run with only treatment group as an independent variable, the AOC is 0.59. Thus, the variable of primary interest (rather than party identification) is doing the majority of the work in explaining the outcome, accounting for nine percent of the variance over chance.

Another way of looking at predictive validity is by using a classification table, shown in Table 16, which demonstrates the soundness of the predicted probabilities. I calculated the sensitivity and specificity of the model using a cutoff of 0.31, rather than the usual 0.5, to indicate a predicted probability of using directional theory of 0.31. The reason behind this choice was to account for the fact that only 31% of my respondents used directional theory, a conservative proportion given the findings on other datasets.³⁸ The rows represent the predicted number of proximity and directional users and the columns are their actual numbers. The overall percentage of subjects correctly classified by the model is about 59 percent. The model does better job correctly predicting which respondents use the proximity model than it does in predicting which use the directional model. The magnitude of sensitivity (50%) compared to that of specificity (62.86%) offers support for this assertion. Sensitivity reports the proportion of subjects

³⁸ For example, Tomz and Van Houweling found that only 14.7 percent of their sample used a directional logic, which is even further from 0.50 than the 0.31 cutoff that I use.

correctly identified as using the directional model, whereas specificity measures the proportion of subjects correctly classified as using the proximity model.

Table 16: Classification table

		<i>Observed</i>		
		Directional	Proximity	Total
<i>Predicted</i>	Directional	79	130	209
	Proximity	79	220	299
	Total	158	350	508

Thus, while the model does a decent job of classifying subjects overall given the small number of predictors, much of the variance remains unexplained. This means that the wording of the question asked pushes subjects towards answering using whichever model's issue space was primed, but there are also other variables (besides the controls variables included here: party identification, political knowledge, and political interest) playing a large role in determining which model people use. Possibilities suggested by scholars include that voters with a moderate ideology are directionalists while more extreme partisans are proximalists (Tomz and Van Houweling, 2008), or that the use of the models depends on the type of issue being considered (Claassen, 2008). Another possibility is that people use directional criteria when considering a challenger and proximity criteria when considering a candidate of the incumbent party (Cho and

Endersby, 2003). These hypotheses should be further examined. But this chapter has shown that in doing so, scholars must take into account that the way they ask the self and candidate placement questions effects people's likelihood of using the models.

8.4 Alternative interaction variables

Table 17: Political interest interacted with treatment group

VARIABLES	β	e^{β} (odds ratio)
Treatment group	1.072**	2.920**
Party identification	-0.143***	0.866***
Political knowledge	0.073	1.076
Political interest	-0.031	0.969
Treatment group * political interest	-0.088	0.916
Constant	-0.710*	0.492*
Observations	508	

*** p<0.01, ** p<0.05, * p<0.1

Table 18: Education interacted with treatment group

VARIABLES	β	e^{β} (odds ratio)
Treatment group	1.569**	4.801**
Party identification	-0.142***	0.868***
Education	0.106	1.112
Political interest	-0.074	0.929
Treatment group * education	-0.149	0.861
Constant	-1.048*	0.350*
Observations	508	

*** p<0.01, ** p<0.05, * p<0.1

8.5 MTurk experiment

The experiment was run on Amazon Mechanical Turk on August 31, 2016 and was exactly the same as that described in the main analysis. 149 respondents answered the survey. 44 people between the proximity and directional treatments had a preference at the ends or in the middle of the scale and thus were dropped from the analysis. One person who was not an American citizen was also dropped, as were two people who answered an attention check question incorrectly. This leaves my sample with 103 respondents. Across both treatments combined, 46 of the respondents used directional theory, preferring the farther away candidate, while 57 of them used proximity theory, preferring the closer candidate.

The results of the chi-square test (testing whether participants' preference of candidate A or B differed between the two treatment conditions) run on this alternative dataset align with those found in the main analysis and are shown in Table 9. (Also see Table 10 for the main model run on this dataset.) 27 percent of those in the proximity treatment group used directional theory; compare this to about 59 percent of the directional treatment group (a difference of 32 percent). The difference in theory usage between the two treatment groups is significant [*Pearson* $\chi^2(1)=10.11, p=0.001$]. Not only is the treatment group significant, but additionally on this dataset over half of the directional treatment group used directional theory. This result suggests that the pattern of results found is indeed replicable.

Table 19: MTurk sample characteristics

Age (mean)	30-39 years old
Democratic	57.72%
Republican	26.85%
Education	
Less than or some high school	0.67%
Finished high school or GED	14.09%
Some college or associate's degree	35.57%
Bachelor's degree from a university or college	38.93%
Graduate or professional degree	10.73%

Table 20: Chi-squared test of proximity and directional groups' candidate preference

Preference	Treatment group		Total
	Proximity	Directional	
Candidate A	34 72.34%	23 41.07%	57 55.34%
Candidate B	13 27.66%	33 58.93%	46 44.66%
Total	47 100%	56 100%	103 100%

Table 21: Logistic regression predicting the choice of Candidate A or B

VARIABLES	β	e^{β} (odds ratio)
Treatment group	1.312*** (0.431)	3.712***
Party identification	-0.035 (0.116)	0.966
Political knowledge	0.244 (0.206)	1.276
Constant	-1.483* (0.806)	0.227*
Observations	508	

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

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Biography

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