Issue Publics in American Politics

Thesis by

Garrett Glasgow

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Dedication

To my family and Akiko.

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Abstract

This work examines the existence of heterogeneity in the impact of issues on vote choice in the American electorate. I begin by explaining the reasons for studying heterogeneity in issue weights from both a methodological and substantive perspective. In Chapter 2 I examine the aggregate effect of heterogeneity in costs of information on the measures of issue salience derived from spatial models of voting. I find some evidence that individuals who are uncertain about candidate issue positions do bias these estimates, but the resulting bias is slight in the aggregate. However, the results of this chapter are suggestive, indicating that different voters may use issues differently or not at all, depending on their costs of information. In order to examine this possibility further, individual measures of issue salience must be developed. Chapter 3 explores the utility of using survey questions about issue salience as the solution to this problem. Unfortunately, most of the survey questions currently employed do not prove to be useful in determining issue salience in spatial models of voting. Thus, Chapter 4 attempts to determine individual level issue salience indirectly, using a method that employs rank-ordered data to estimate separate issue weights for each individual on each issue. I find a clear relationship between issue salience and costs of information, with those individuals who face higher costs of information being less likely to place weight on any given issue or consider multiple issues when deciding who to vote for. Although I am able to employ this technique to learn a great deal about the relationship between issue salience and the costs of information, this technique is not suited for most datasets. Therefore, in Chapter 5 I develop a model that allows for heterogeneity in issue weights, but is more widely applicable to the kind of data generally available for studying American elections. I again find evidence of heterogeneity in the impact of issues on vote choice in the American electorate and the role that costs of information play in determining issue salience. Finally, I conclude, discussing my findings and the implications they have for the political process in the United States.

Advisor: R Michael Alvarez

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Chapter 1 Introduction

The impact of candidate issue positions on the behavior of voters in the United States has been a topic of debate in political science for decades. Much of the early empirical work in political science has focused on this topic, although the link between the public and government was examined long before this (Lippman 1922; Mills 1956). These early studies were overwhelmingly negative, concluding that the average American voter does not base his or her voting decision on the issue positions of the candidates in the election.

In *The American Voter* Campbell et al. (1960) discuss three conditions that must hold if the issue positions of candidates are to have an impact on an individuals vote choice. They are: (1) the issue must be cognized in some form, (2) the issue must arouse some minimal intensity of feeling, and (3) there must be a perception that one party or candidate better represents the voter's position on the issue that does the other. Their general conclusion is that most voters are unable to meet these three criteria, and thus issues carry little weight in the decision rules of voters. Other empirical work from this era supported this conclusion (Lazarsfeld, Berelson, and Gaudet 1944; Berelson, Lazarsfeld, and McPhee 1954).

Many scholars have questioned the conclusions drawn from this research (Key 1966; Pomper 1972). However, the most striking contrast to the conclusions of *The American Voter* has been the success of the spatial model of voting (Davis, Hinich, and Ordeshook 1970; Downs 1957; Enelow and Hinich 1984). The spatial model of voting posits that an individual casts his or her vote for the candidate that holds positions on the issues that are closest to his or her own positions. Thus most empirical models that test the impact of issues in elections do so by determining the relationship between the proximity of candidates to voters on issues and vote behavior, with issue proximity and vote choice measured with survey data. Most studies that employ the spatial model of voting have found strong statistical relationships between issue proximity and vote choice, indicating that candidate issue positions are taken under consideration by voters.

How then do we account for these markedly different findings? Are voters unable to use the issue positions of candidates in their vote decisions as the low levels of information discovered in *The American Voter* would suggest, or do candidate issue positions have an impact on vote behavior, as numerous studies that have employed the spatial model of voting have found?

Some researchers have expressed concern that the strong relationship between issue proximity as measured by surveys and vote choice might not indicate a causal relationship. For example, Conover and Feldman (1989) posit that survey respondents infer where to place candidates on issue placement scales based on other information and thus placement on these scales does not indicate knowledge of candidate issue positions. Similarly, the possibility of projection effects reduces confidence in the strong relationship uncovered between issue proximity and vote choice (Brody and Page 1972; Page and Brody 1972). This line of reasoning postulates that voters first form preferences for candidates based on non-policy concerns and then place themselves and their preferred candidates close together on the issue placement scales. Again, this would create the illusion of a relationship between issue proximity and vote choice when none exists. Without further evidence the spatial model of voting alone cannot resolve the debate.

Merely demonstrating a correlation between issue proximity as measured on surveys and vote choice is not enough to prove that candidate issue positions have an impact on vote choice. In addition, we must demonstrate that there exist *differences across individuals in the use of issues that are related to variables associated with possible issue voting.* If the strong relationship between issue proximity and candidate choice is just the result of individuals projecting preferred issue positions onto candidates, then this effects should be relatively constant across individuals and across issues. However, if individuals really do place weight on issues when voting, then we should observe differences in the impact of issues on vote choice both across individuals (some people use issues and others do not) and across issues (different people care about different issues). An early indication of this possibility was the examination of "issue publics" by Converse (1964), who found that while many individuals were disinterested in the issues at stake in an election, on any given issue there was a subset of individuals who were aware of the issue and considered it when thinking about politics. Therefore, if we can uncover *heterogeneity in the impact of issues on vote choice* then this lends additional weight to the arguments advanced by the spatial model of voting — the issue positions of candidates do have an impact on individual vote behavior.

Thus the study of heterogeneity in the impact of issues on vote choice is necessary if we are to completely understand the role of issues in elections. The implications of heterogeneity in issue salience for the study of elections are both methodological and substantive. Methodologically, a failure to account for heterogeneity in issue salience can have serious implications in our models, such as coefficient bias. Substantively, a failure to understand heterogeneity in issue salience can lead to incorrect inferences about electoral outcomes and voter behavior. I discuss each of these possibilities below.

Most studies of the impact of issues on vote choice ignore the possibility of heterogeneity in issue weights. These studies instead attempt to determine the "average" impact of issues on vote choice. However, if one of the coefficients in the model is heterogeneous and correlated with one of the regressors, then *all* coefficients in the model will be biased. This means that even estimates of the impact of partisan identification and demographic characteristics are subject to bias. This pattern of heterogeneity is very plausible in models of vote choice. For example, if the weight an individual places on an issue is related to his or her position on an issue (such as an extremist on an issue placing more weight on that issue when voting), then there will be bias in all coefficient estimates unless the heterogeneity in issue weights is accounted for. As most models that relate issue proximity to vote choice are non-linear, the impact of heterogeneity in issue salience on coefficient estimates will be unpredictable. Thus, accounting for heterogeneity in the impact of issues on vote choice is vital to estimating the impact of *any* factor on vote choice.

Failure to understand heterogeneity in the impact of issues on vote choice also obscures our substantive understanding of electoral outcomes and voter behavior. Figure 1.1 represents a simple two-dimensional issue space of the type hypothesized by the spatial model of voting. There are two issues that comprise this space — Issue 1 and Issue 2. A voter's or a candidate's point in the space can be projected to either axis to determine what position he or she holds on either issue. For instance, the voter depicted in figure 1.1 has an identical position to Candidate 1 on Issue 1, and an identical position to Candidate 2 on Issue 2.

Figure 1.1 Here

In the spatial model of voting, the voter considers the distance between him or herself and the candidates in the election, and casts a vote for that candidate closest to his or her ideal point (the black dot labeled "Voter"). Let us assume that the voter is only concerned with these two issues. Under the homogeneity assumption usually imposed on the estimation of spatial models of voting, each issue is equally important to the voter. Thus, the most preferred candidate is the one who is the closest overall to the voter's ideal point. The circle in figure 1.1 represents one of the voter's indifference curves — all points along the circle are equally distant from the voter, and thus all equally preferred. Candidate 1 falls within this indifference contour, while Candidate 2 is outside it. Thus, if both issues are equally important to this voter, he or she will prefer Candidate 1 over Candidate 2.

However, what if all issues are not equally important to this voter? For example, let us assume that for this voter, Issue 2 is more important than Issue 1. The flattened ellipse in figure 1 represents one possible shape of this voter's indifference curves if this is true. All points on this ellipse are equally attractive to the voter. Notice that the axis of the ellipse is greater along Issue 1 than along Issue 2. This indicates that Issue 2 is more important to the voter than Issue 1, as a position a particular distance on Issue 2 from the voter's ideal point is less attractive than the same distance on Issue 1. This has implications for voter behavior — with this new decision rule the voter now prefers Candidate 2 over Candidate 1. Thus heterogeneity in issue weights has implications for voter behavior and electoral outcomes.

Obviously, studying this heterogeneity is important for our understanding of these issues. Below I develop an "ideal" model of vote choice that would give us all of the information necessary to fully understant heterogeneity in the impact of issues on vote choice. I will also briefly discuss strategies for empirically estimating this model.

I will first construct a theoretical model of vote choice without regard to empirical tractability. I utilize a spatial model of voting, where the utility that a voter would receive from a candidate is determined by a weighted sum of the distances between that candidate's positions on the issues and the voter's ideal points on the issues. Determining what these weights are will tell us what impact each issue had on the voter's decision.

Let the utility that voter i would get from voting for candidate c be given by:

$$U_{ic} = X_{ic}\beta_i + \varepsilon_{ic} \tag{1.1}$$

where U_{ic} is the utility yielded by candidate c to voter i, X_{ic} is a vector of the distances between candidate c and voter i on the issues, and ε_{ic} represents unobserved factors that affect U_{ic}. β_i is a vector of the weights that voter i assigns to each issue. The elements of β_i tell us how important each issue was to voter i when voting. Our goal is to estimate the elements of β_i and thus the impact of each issue on the vote decision of voter i.

Voter i will vote for the candidate that yields him or her the greatest utility. To determine this voter i must compare the utility that he or she would receive from each of the candidates. Such a comparison is given in equation 1.2.

$$U_{ic} \geq U_{id} \Rightarrow X_{ic}\beta_i + \varepsilon_{ic} \geq X_{id}\beta_i + \varepsilon_{id} \tag{1.2}$$

The utility yielded by candidate c is at least as great as the utility yielded by candidate d, which implies that the weighted issue positions of candidate c (plus unobserved factors) give voter i at least as much utility as the weighted issue positions of candidate d (plus unobserved factors). We can rearrange the right-hand side of equation 1.2 to obtain:

$$\varepsilon_{ic} \geq X_{id}\beta_i - X_{ic}\beta_i + \varepsilon_{id} \tag{1.3}$$

A number of discrete choice models can be set up with this formulation, depending on the distributional assumption we make about the unobserved portions of utility ε_{ic} and ε_{id}. For instance, assuming that the unobserved portions of utility are distributed IID Type I Extreme Value across voters leads to a conditional logit model. Thus the probability that voter i would vote for candidate c out of a choice set of k candidates is given by:

$$Pr(vote_i = c) = \frac{\mathrm{e}^{X_{ic}\beta_i}}{\sum_k \mathrm{e}^{X_{ik}\beta_i}} \tag{1.4}$$

Note that this equation differs from the usual conditional logit specification in that the parameter β is allowed to be unique for each voter i. Estimating β_i involves the estimation of a conditional logit, with voter *i's* vote choice as the dependent variable and the distances between voter i and the k candidates on the issues as the independent variables. If we could obtain β_i for voter i it would tell us the impact each issue had on the vote choice of voter i.

Unfortunately, such an empirical model is not identified. Voter i makes one vote choice, which gives us one observation. With this observation we are attempting to estimate β_i, which is a vector with a number of elements equal to the number of issues we have included in our model. Quite simply, when we attempt to estimate this model we are attempting to estimate more parameters than there are observations in our dataset.[1] Adding more voters to our dataset does not improve the situation, as each voter has their own unique vector of weights that must be estimated.

In order to successfully estimate the impact of issues on vote choice, some restrictions must be placed on β_i. The remainder of this thesis addresses four possible solutions to this estimation problem. The first solution is to assume that β_i is homo-

[1]Restricting ourselves to a single issue in our model would not help; estimates in that case would either tend towards positive infinity if voter i votes for the candidate closest to his or her ideal point on the issue, and towards negative infinity if voter i prefers some other candidate.

geneous across all voters ($\beta_i = \beta$). The model in Chapter 2 makes this assumption. In Chapter 2 I examine the aggregate effect of heterogeneity in costs of information on the measures of issue salience derived from spatial models of voting. The hypothesis is that individuals who are uncertain about candidate issue positions will tend to place candidates at the midpoint of survey issue placement scales, thus biasing our measures of issue proximity and thus of the effect of issue distance on vote choice. Although I do find some evidence of this, the resulting bias is slight in the aggregate. However, the results of this chapter are suggestive, indicating that different voters may use issues differently or not at all, depending on their costs of information. Unfortunately, this model cannot examine individual level heterogeneity due to the homogeneity assumption employed for tractability purposes.

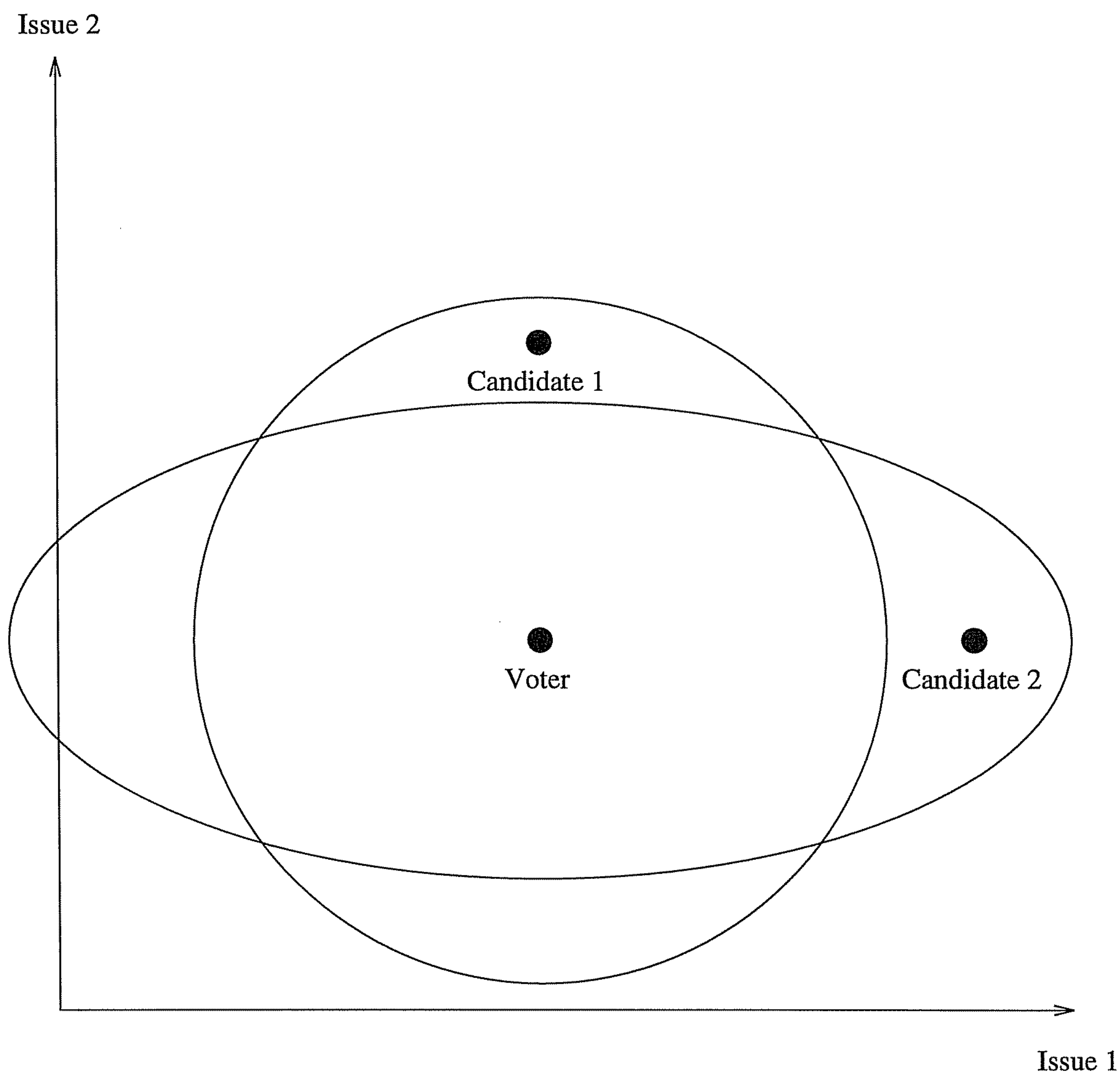
Another possibility is not to estimate β_i, but to gather this information through survey data. Chapter 3 explores the utility of using survey questions about issue salience as the solution to this problem. Unfortunately, most of the survey questions currently employed do not prove to be useful in determining issue salience in spatial models of voting.

Yet another possibility is to gather more choice data for each individual in the sample. With enough observations on each individual it is possible to estimate β_i. Chapter 4 employs this principle to determine individual level issue salience. The method in Chapter 4 first observes multiple preference choices from among sets of candidates by a single voter and then estimates which issue positions the preferred candidates have in common. I find a clear relationship between issue salience and costs of information, with those individuals who face higher costs of information being less likely to place weight on any given issue or consider multiple issues when deciding who to vote for. Although I am able to employ this technique to learn a great deal about the relationship between issue salience and the costs of information, this technique is not suited for most datasets available to political scientists.

Therefore, in Chapter 5 I develop a model that allows for heterogeneity in issue weights, but is more widely applicable to the kind of data generally available for studying American elections. This model is random parameters logit, which assumes that β_i is distributed according to some known probability distribution, and estimates the mean and variance of that distribution. The mean gives us information about the average impact of an issue on vote choice, while the variance is a measure of heterogeneity in the impact of that issue on vote choice. I find evidence of heterogeneity in the impact of issues on vote choice in the American electorate. Further, there is evidence to suggest that this heterogeneity is also influenced by the costs of information imposed by political campaigns. Finally, I conclude, discussing my findings and the implications they have for the political process in the United States.

Figure 1.1: Indifference Contours in a Spatial Model of Voting with Heterogeneity in Issue Salience

Indifference Contours in a Spatial Model of Voting with Heterogeneity in Issue Salience



Chapter 2 An Aggregate Look at Heterogeneity in Issue Salience and Uncertainty

Determining the impact of candidate issue positions on vote choice has long been a popular research topic in political science. The question is fundamental to our understanding of the functioning of democracy: to what extent are election outcomes determined by the issues? The dominant research approach to this question has been the spatial model of voting (Davis, Hinich, and Ordeshook 1970; Downs 1957; Enelow and Hinich 1984). The spatial model of voting posits that an individual casts his or her vote for the candidate that holds positions on the issues that are closest to his or her own positions. Thus most empirical models that test the impact of issues in elections do so by determining the relationship between the proximity of candidates to voters on issues and vote behavior.

However, this method necessarily assumes that individuals know the issue positions of candidates with certainty. Some work has been done on the effects of uncertainty about candidate issue positions on vote choice (Alvarez 1997), but very little is known about the effects of uncertainty about candidate issue positions on the salience of issues to voters and on our estimates of the impact of issues on vote choice.

This chapter addresses the possibility that respondent uncertainty about candidate issue positions leads to heterogeneity in issue weights and biases our estimates of the impact of issues on vote choice. Most empirical estimates of spatial models of voting measure the effect of distance between voters and candidates on vote choice. This distance is usually measured as the difference between the voter's self-placement on an issue placement scale and the position of the candidate on this scale. The "true" position of the candidate for these models is generally calculated as the mean placement of the candidate by all respondents on the scale. The tendency of uncertain individuals to place candidates at the midpoint of issue placement scales biases our estimates of the "true" positions of candidates, thus affecting our estimates of distances on issues between voters and candidates and our estimates of the impact of this distance on vote choice. This potential bias is especially troubling since those individuals who are guessing and affecting estimates of issue salience are among those least likely to use issues to determine candidate preference.

The tendency of uncertain individuals to place candidates at the midpoint of these issue placement scales indicates that many are guessing, and share more in common with those individuals who answer "don't know" to the issue placement question and are treated as missing data. In this chapter I determine the difference between a spatial voting model that is estimated in the usual way, and a model where uncertain individuals are treated as missing data for purposes of calculating the "true" position of candidates and the impact of issues on vote choice. The omission of uncertain individuals has little effect on the empirical estimates of the spatial voting model. This indicates that while the models that are currently used to determine the impact of issues on vote choice are robust, they are not useful for determining heterogeneity in the impact of issues on vote choice due to uncertainty. The homogeneity assumption common to nearly every model of vote choice, including the models in this chapter, do not allow us to study heterogeneity in the impact of issues on vote choice.

The next section discusses the possibility that uncertain individuals could introduce bias into our estimates of the "true" positions of candidates, and thus our estimates of the effect of these positions on vote behavior. Section 2 finds evidence of this bias empirically, but discovers that this bias is very slight. Section 3 concludes, discussing the robustness of the spatial voting model and its inability to uncover heterogeneity in issue salience due to uncertainty.

2.1 Uncertainty in the Measurement of Candidate Issue Positions

The spatial model of voting hypothesizes that the utility voter i would get from voting for candidate j is given by:

$$U_{ij} = k_{ij} - a_i(v_i - c_j)^2 \tag{2.1}$$

where U_{ij} is the utility yielded by candidate j to voter i, v_i is a vector of voter i's positions on various issues, c_j is a vector of candidate j's positions on various issues, a is a vector of the weight (or salience) that voter i assigns to each issue, and k_{ij} are non-issue factors that affect utility. Each voter evaluates this function for every candidate in the election and votes for that candidate who yields the highest utility.

In order to estimate the impact of issues in such a model empirically we require three pieces of information.[1] We need a measure of the voter's vote decision, the voter's positions on the issues, and the candidate's positions on the issues. In empirical studies this information is usually derived from survey data. Vote choice or vote intention is usually posed to respondents as a direct question; the answer to this question is used as the dependent variable in a discrete choice model. To determine the positions of voters and candidates on issues most academic surveys employ issue placement scales. Issue placement scales present the survey respondent with an ordinal scale, with one endpoint representing one policy extreme and the other endpoint representing the other policy extreme. Respondents are then asked to place themselves and candidates on this ordinal scale according to their beliefs about which position they and the candidates hold on the issue.

[1]Actually, there is a fourth piece of information necessary — the correct metric to measure distance between the candidate and the voter. Here, as in most studies of the impact of issues on vote choice I square the difference between the candidate and the voter on the issue scale when calculating distance. Although this metric performs well empirically, there are several assumptions built into this distance measure, such as risk aversion. However, to my knowledge there has not been any attempt to systematically examine the merits of various distance measures in spatial models of voting. Thus I will follow convention and use the squared difference between the voter's position and the candidate's position as the measure of distance between the voter and the candidate.

The resulting empirical model is a discrete choice model, with vote choice as the dependent variable and the distance between each vote and each candidate as independent variables. Estimation of this model yields an estimate of a for each issue, which is interpreted as the weight or salience attached to each issue by voters. The greater the weight attached to an issue by voters, the greater the impact of this issue on vote choice. At issue here is how respondent uncertainty about the placement of candidates on the issue placement scales can affect estimates of issue salience; that is, how much does measurement error in c_j affect our estimates of a?

The question of how to determine each voter's actual position on the issue dimension has been largely ignored in the empirical literature. Most studies treat the respondent's self-placement on issue scales as an accurate representation of the individual's true ideal point on the issue. However, the literature on attitude instability brings this assumption into question (e.g., Converse 1964). I will not address that question here, and will treat the respondent's self-placement on each issue placement scale as an unbiased estimate of his or her ideal point on each issue in this dissertation.

Also required are the positions of the candidates on each issue. The most obvious way to determine this is to use each survey respondent's placement of the candidate on the issue placement scale as their perception of the position of the candidate on the issue and calculate issue distances by squaring the difference between the respondent's self-placement and his or her placement of the candidate. This measurement strategy is appealing, since it is the voter's perception of the candidate's positions on the issues relative to his or her own that determines the impact of issues on vote choice. However, calculating issue distances using each voter's perception of where candidates are located in the issue space is likely to bias estimates of the impact of issues on vote choice upwards, due to an effect termed "projection." While in the spatial model of voting, individuals are aware of each candidate's position on all issues; in reality voters often have imperfect information about the true issue positions of the candidates they are considering. Individuals who are ignorant of the issue positions of the candidate they prefer for non-policy reasons may infer that their preferred candidate is the closest to them on the issues. Essentially, these individuals first form a preference for a candidate and then "project" their ideal issue positions onto that candidate due to a lack of information about that candidate's true issue positions. For these individuals the impact of issues on vote choice is zero, yet observationally we see a high correlation between minimal issue distances and vote choice. Any estimates of the impact of issues on vote choice will thus be biased upwards. This phenomenon is well documented in the voter behavior literature (Berelson, Lazarsfeld, and McPhee 1954; Brody and Page 1972; Markus and Converse 1979; Page and Brody 1972; Page and Jones 1979). Thus, a voter may observe that a candidate is close to him or her on many issues and thus prefer that candidate, or he or she may prefer that candidate for unrelated reasons and thus believe that this candidate must also agree with him or her on issues about which the voter has little or no information. Unfortunately, with issue placement scales both of these possibilities are observationally equivalent.

One method commonly employed to minimize projection effects is to calculate the "true" position of the candidate on the issue scale by the mean placement of the candidate on the issue scale by all respondents. It is hoped that projection effects and other errors in the perception of the candidate's issue position are distributed symmetrically and will thus cancel each other out in the aggregate, leaving the mean of all placements as a relatively unbiased estimate of the actual position of the candidate. Issue distances are then calculated as the squared difference between the respondent's self-placement on the issue placement scale and the mean placement of the candidate on the issue placement scale by all respondents. Since issue distances are no longer calculated using the respondent's placement of the candidate, but the fixed "true" position of the candidate, projection effects are minimized.

However, even this method of calculating issue distances is subject to bias due to respondent uncertainty. Although most issue placement scales include a filter question to screen out respondents who have no knowledge of the candidate's issue position, undoubtedly some uncertain respondents slip through and merely guess as to the location of the candidate on the scale. As long as this guessing is random, this will have no effect on the calculation of the mean placement of the candidate on the scale. However, studies of respondent placements of candidates on issue placement scales has revealed that uncertain individuals (measured through education or survey questions) tend to place candidates at the midpoint of issue placement scales (Alvarez and Franklin 1994, 1999; Brady and Sniderman 1991; Sniderman, Glaser, and Griffin 1991). If we believe that these uncertain individuals have less information about the candidate's "true" position on the issue placement scale, or are guessing, then clearly this violates the assumption that errors in perceptions of candidate positions are symmetrical. The presence of uncertain individuals will bias our estimates of the "true" position of the candidate towards the midpoint of the scale. This in turn will bias estimates of issue salience upwards in a moderate electorate by erroneously minimizing the distance between a candidate and his or her moderate supporters.

Explanations for the tendency of uncertain respondents to place candidates at the midpoint of the issue placement scales include uncertain respondents making a "safe" guess (Brady and Sniderman 1991) and uncertain respondents reporting the mean of a distribution of possible positions of the candidate that includes the entire issue placement scale (Alvarez and Franklin 1994, 1999). Whatever the case, the tendency for uncertain respondents to favor the midpoint of the issue placement scales indicates that many of these respondents are guessing at the actual position of the candidate, despite the presence of a "don't know" filter question before the issue placement scale in many cases. If these respondents had been screened out by the "don't know" filter, their guesses would not enter into the calculation of the mean position of the candidate. Thus, since these respondents who guess at the placement of the candidate have no more knowledge of the candidate's issue position than those respondents who answer "don't know," an appropriate strategy might be to treat them as missing data when calculating the mean placement of the candidate on the issue placement scale. This would eliminate the bias towards the midpoint induced by uncertainty, giving a more accurate placement of the candidate on the issue scale.

2.2 An Empirical Test of the Effect of Uncertainty on Estimates of Salience

To test the possibility that respondent uncertainty introduces bias into our estimates of issue salience, I use the 1996 National Election Study. The original sample consisted of 1714 adults interviewed in the nine weeks prior to the election on November 5. Like all National Election Studies since 1968, the 1996 study included a number of issue placement scales that are commonly utilized to estimate spatial models of voting. A typical example of these scales is the following:

Some people think the government should provide fewer services even in areas such as health and education in order to reduce spending. Suppose these people are at one end of a scale, at point 1. Other people feel it is important for the government to provide many more services even if it means an increase in spending. Suppose these people are at the other end, at point 7. And of course, some other people have opinions somewhere in between, at points 2, 3, 4, 5 or 6.

Respondents were asked to place themselves and various political entities on these scales, including Clinton, Dole, and Perot. With these scales a spatial model of voting can be estimated in the manner described in the previous section.

However, for the first time the National Election Study also included questions designed to measure a respondent's level of uncertainty in their placement of candidates on these 7-point scales. All of the respondents who placed a candidate on the 7-point scale were then asked about their certainty of this placement with the following question: "How certain are you about this [placement]? Very certain, pretty certain, or not very certain?" Past research has confirmed that questions such as these seem to be well-understood to survey respondents, and correlate highly with variables that are typically used to measure the costs of information about political candidates to voters (Alvarez and Franklin 1994, 1999). Thus we may be reasonably certain that the uncertainty questions that follow each issue placement are actually capturing each respondent's uncertainty about the issue position of the candidate.

I first test the hypothesis that uncertain respondents will tend to use the midpoint of the 7-point scale more frequently than certain respondents. To do this I split the respondents who placed a candidate on an issue scale into two groups — the certain (those who stated that they were "very certain" or "pretty certain" about their placement of the candidate on the 7-point scale) and the uncertain (those who stated that they were "uncertain" about their placement of the candidate). Figure 2.1 presents the percentage of each group of respondents at each point of the 7-point scale which asked respondents to place Clinton on the "level of government services" issue.

Figure 2.1 Here

The differences in placement on this scale between the two groups are striking. The distribution of uncertain respondents is clearly centered closer to the midpoint of the scale (mean = 4.325), relative to the distribution of certain respondents (mean = 5.073) — these distributions are statistically distinct ($\chi^2 = 133.130$, significant at $p =$ 0.01.). Higher numbers on this scale represent increased levels of government services, so the placement of Clinton on this side of the midpoint by the certain respondents seems logical. However, notice that nearly one-third of uncertain respondents place Clinton at the midpoint of the 7-point scale. In light of the discussion of the previous section, it seems possible that many of these uncertain individuals have no more knowledge of Clinton's issue positions that those who answered "don't know" to the placement question, yet attempted a placement anyway — quite often at the midpoint of the scale.

Table 2.1 reveals that the differences between certain and uncertain respondents in the placement of candidates on the 7-point scales is not unique to the case illustrated in figure 2.1. The χ^2 statistics presented in table 2.1 reveal that the distributions of placements for certain and uncertain respondents are statistically distinct for every candidate and every issue for which the certainty questions are available.

Table 2.1 Here

In every case, the distribution of the uncertain respondent placements has a mean closer to the midpoint of the 7-point scale than does the distribution of the certain respondents. This means that for each one of these scales, the mean placement of the candidate by all respondents will be closer to the midpoint than the mean placement of the candidate by only the certain respondents. The mean candidate placement by all respondents and by only the certain respondents is presented in table 2.2, along with t-tests for means.

Table 2.2 Here

In every instance the mean placement of the candidate is closer to the midpoint of the scale when uncertain individuals are included in the calculation and further from the midpoint when we only consider the placements of the certain individuals. This difference is statistically significant in four out of five issues for Clinton, all five issues for Dole, and three of five issues for Perot. When calculating spatial voting models, researchers commonly employ the mean placement of the candidate to avoid the bias introduced by projection effects, which are a result of imperfect voter information about the candidate. However, it is clear from table 2.2 that simply using the mean placement of the candidate does not remove all measurement error from our calculation of the "true" position of the candidate. Uncertain individuals gravitating towards the midpoint of the scale in their placement of the candidate due to a lack of information about the candidate's true issue position significantly biases the mean of the placements towards the midpoint, which may bias estimates of issue salience upwards for the reasons described in section 2.1. In fact, with the exception of Perot on two issues ("defense spending" and "jobs vs. environment"), the mean placements of the candidates for certain respondents were always further from the mean self-placements of respondents than were the placements of the candidates by all respondents.[2] This suggests that uncertainty in candidate placements biases estimates of issue salience upwards by reducing the estimated distance between voters and candidates on issues. How large a bias this introduces remains to be seen.

In order to determine the extent of the bias introduced into estimates of issue salience by uncertain respondent placements of candidates on the 7-point issue scales, I first estimated two multinomial probit models. Multinomial probit models were necessary because the presidential race in 1996 had three strong candidates (Clinton, Dole, and Perot). In each of these models I included measures of issue distance on the five issues for which the uncertainty questions were available. The first model specified issue distances in the usual way for a spatial model of voting — the distance between each voter and each candidate on a given issue is measured as the squared difference between the voter's self-placement on the 7-point scale and the mean placement of the candidate on the 7-point scale by all respondents. The second model replaced the mean placement of the candidate by all respondents with the mean placement of the candidate by only the uncertain respondents. Since this latter mean is always more extreme (further from the midpoint, and almost always further from the mean position of voters), I expect issues to have less of an effect on vote choice in this second model relative to the first. A number of control variables were also included.[3] The dependent variable was the respondent's stated vote choice. The results of both of these multinomial probit models are presented in tables 2.3 and 2.4.

[2]The mean self-placements of the respondents were: "ideology" – 4.327, "government services" – 3.892, "defense spending" – 4.022, "aid to blacks" – 4.822, and "jobs vs. the environment" – 3.533.

[3]The gender and age variables are dummy variables. The partisanship variables are also dummy variables, coded 1 if the individual claimed to identify with the party in question or felt he or she leaned towards identifying with that party (in other words, both of the partisanship variables were zero in the individual identified themselves as a true independent). Education is a 17-point scale, normalized to the 0-1 interval.

Tables 2.3 and 2.4 Here

A comparison of tables 2.3 and 2.4 reveals that both models produce very similar results. Each model fits the data well; among the 779 respondents in the dataset, 46.5% of respondents stated that they voted for Clinton, 45.4% said they voted for Dole, and 8.1% said they voted for Perot. The model with all respondents predicted vote shares of 46.5% for Clinton, 45.4% for Dole, and 8.1% for Perot, while the model that excluded uncertain respondents from the calculation of candidate issue positions predicted vote shares of 46.5% for Clinton, 45.3% for Dole, and 8.1% for Perot.

However, the coefficient estimates in table 2.4 (the model using the mean candidate placement of the certain respondents) are consistently smaller in magnitude than the coefficient estimates in table 2.3 (the model using the mean candidate placement of all respondents). This is exactly what we would expect to see as candidate positions on the issues move away from a majority of voters, but individual vote choice is held constant; issues appear to matter less.

The difference in the impact of issues on vote choice is not obvious from examination of the coefficients in tables 2.3 and 2.4. In order to determine the difference in the salience of issues, I calculated "first difference" estimates for both models. I first created a hypothetical voter by setting all of the independent variables to their mean or modal values.[4] Then by changing the value of a single independent variable I can calculate the effect this variable has on the probability of voting for each candidate (the dependent variable). Figure 2.2 graphically presents the results of the first difference calculations as I vary the position of Clinton across the "level of government services" scale. The ideal point of the hypothetical voter was set to 5 on this scale for this simulation. If including uncertain respondents in the calculation of the mean positions of candidates does bias our estimates of the impact of issues on

[4]Issue distances and education level were set to their mean values. This hypothetical voter was male, between 30 and 44, and a Democrat.

vote choice upwards, this should be apparent by comparing the probabilities graphed out in Figure 2. In particular, the impact of the issue on the probability of the hypothetical voter's support of Clinton should be less for the model that utilizes the mean placement of only the certain respondents, resulting in a flatter line than that for the model utilizing the mean placement of all respondents (the hypothetical voter should penalize Clinton less for deviations from his ideal point in the former case).

Figure 2.2 Here

It is apparent from examination of figure 2.2 that the differences in the estimated impact of issues on vote choice between the two models are minimal. Although the estimated impact of issues on vote choice is less for the model that only uses certain respondents to determine the position of Clinton on the "level of government services" issue, the estimated probabilities only diverge to a noticeable degree at the far left points of the scale, the furthest points from the hypothetical voter's ideal point of 5.

Another way to examine the differences in the impact of issues on vote choice is to calculate changes in predicted vote shares as a candidate moves across an issue space, holding all else fixed. In this simulation I calculated the probability of each respondent voting for each of the three candidates as I move one of the candidates across the issue space from 1 to 7 in increments of 0.02. The larger the impact of issues on vote choice, the more dramatic the effect of candidate issue position on predicted vote share. Figure 2.3 graphically presents the predicted vote share from both models for Clinton as he moves across the "level of government services" scale.

Figure 2.3 Here

Just as in the case of the "first difference" calculations in figure 2.2, there is very little difference evident in the estimated impact of issues on vote choice between the two models. Although the change in predicted vote share is less for the model that only uses certain respondents to place Clinton on this issue (indicated by a flatter line), the curves graphed out by the two models are nearly indistinguishable. Again, the bias introduced into estimates of the impact of issues on vote choice by uncertain respondent's placements of candidates appears to be minimal.

There is one inconsistency in the calculations presented in figure 2.3. By removing uncertain respondents from the calculation of the "true" position of the candidate, we are saying that these individuals are too uncertain to know where the candidate truly stands. Yet when we calculate vote shares as in figure 2.3, we assume that uncertain voters penalize candidates in the same way as certain voters, even though we assume that these individuals do not know where the candidate is positioned in the issue space. A more accurate depiction of the changes in vote share as the candidate moves across the issue space would specify that individuals with no knowledge of the candidate's position will not modify their voting behavior in response to a change in the candidate's position. This is exactly the kind of heterogeneity we would expect to see if costs of information play a role in determining issue salience.

Vote shares were recalculated for Clinton as he moved across the "level of government services" issue, holding the votes of the 114 uncertain voters constant. Thus, the effect of changing issue positions of Clinton were only calculated for the remaining 665 certain voters, using the mean placement of Clinton provided by the certain respondents.[5] The results of this calculation are presented in figure 2.4.

Figure 2.4 Here

The change in predicted vote share when uncertain respondents are assumed not to change their votes is slightly flatter than either of the curves graphed out in figure

[5]Note that the predicted vote shares for this model were very accurate, just as they were for the first two models: 46.3% for Clinton, 45.0% for Dole, and 8.7% for Perot.

2.3, but the differences are slight. Thus it appears that the bias introduced by uncertain respondent's placements of candidates on estimates of the impact of issues on vote choice is slight and poses no substantial problems for estimates of average issue salience using spatial voting models.

2.3 Discussion

The results of the previous section should be heartening for those researchers who utilize spatial models of voting to analyze elections in the aggregate. Both multinomial probit models were able to predict vote shares to a very high degree of accuracy. These models proved to be very robust to changes in the positions of the candidates (figure 2.3) and the removal of some respondents from the dataset (figure 2.4).

However, this robustness should be of concern to researchers who wish to use these types of models to analyze the effect of candidate issue positions on individual behavior. Changes in candidate issue positions had almost no effect on vote behavior, although it is possible that the changes in position may have been too small to induce a large effect. Another possibility is that the changes in position are roughly equal for all candidates, meaning that the relative utility yielded by the candidates remains similar. Of greater concern is the remarkable consistency of calculated vote shares when uncertain individuals were held constant. Again, the relatively small number of uncertain people may have kept changes from becoming obvious, but the steady influence of issues on vote choice regardless of how we treat uncertain individuals is strange. Multinomial probit models that included interactive terms between uncertainty and issue distance either did not converge or estimated statistically insignificant interactions. Estimating two separate models greatly reduced the sample size for each model and created convergence problems.

The robustness of the empirical estimation of the spatial model of voting presented here in the face of respondent uncertainty suggests one of three things. Either (1) issue voting is unrelated to voter certainty about candidate issue positions, (2) our estimates of issue weights are not what we think they are, or (3) a better specification of the empirical model is needed. This last point is always a possibility — future research will perform this same analysis on different datasets and using different specifications of the empirical model. The first possibility does not seem plausible given the high level of information necessary to perform the calculations required in the spatial model of voting. The second point is possible – perhaps treating the mean placement of the candidate as the "true" position of the candidate does not remove projection effects and other confounding factors. However, one conclusion is certain: models of the type presented in this chapter are unable to reveal heterogeneity in issue weights.

If we are to understand the effects of heterogeneity in issue weights on election outcomes, new models need to be developed. The results of this chapter indicate that there *are* differences across voters in their understanding and use of information about the issue positions of candidates. However, attempting to adjust for these differences at the aggregate level did not reveal any new insights into issue voting in the American electorate. To understand heterogeneity in issue salience, we must examine the use of issues at the individual level. The next 3 chapters adopt just such an individual-level approach by explicitly examining heterogeneity in the impact of issues on vote choice.

Figure 2.1: Placements of Clinton on Government Services by Certainty

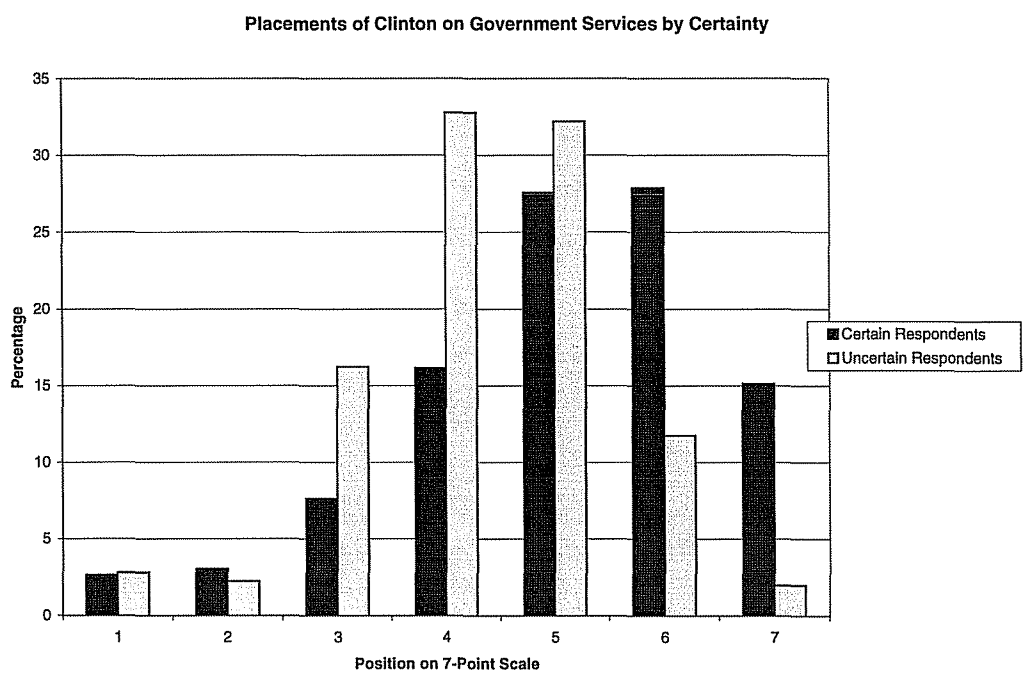


Table 2.1: Seven-Point Scale Placements and Respondent Uncertainty

Issue	Clinton	Dole	Perot
Ideology	98.42	124.75	70.62
Government Services	133.13	127.51	100.48
Defense Spending	73.67	97.29	31.39
Aid to Blacks	115.61	96.36	89.27
Jobs vs. Environment	105.68	88.64	23.13

Note: Entries are χ^2 statistics with 6 degrees of freedom. All entries are statistically significant at the 0.01 level.

Table 2.2: Mean Placement of Candidates by Certainty

Seven Point Scale	All Respondents	Certain Respondents	T-test for Difference in Means
Clinton			
Ideology	3.152	3.043	1.933**
Government Services	4.911	5.073	3.073**
Defense Spending	3.946	3.891	0.941
Aid Minorities	3.316	3.188	2.212**
Jobs vs. Environment	3.471	3.351	2.043**
Dole			
Ideology	5.148	5.368	4.126**
Government Services	3.146	2.951	3.781**
Defense Spending	4.654	4.838	3.427**
Aid Minorities	4.996	5.192	3.565**
Jobs vs. Environment	4.546	4.712	2.967**
Perot			
Ideology	4.486	4.595	1.387*
Government Services	2.936	2.730	3.269**
Defense Spending	3.827	3.903	0.569
Aid Minorities	5.165	5.404	3.531**
Jobs vs. Environment	4.605	4.601	0.033

Note: ** indicates significance at the 0.05 level, * indicates significance at the 0.10 level.

Table 2.3: Multinomial Probit, All Respondents

Independent Variables	Coefficients for Clinton	Coefficients for Dole
Ideology	**-0.075****	
	(0.029)	
Government Services	**-0.052****	
	(0.015)	
Defense Spending	**-0.056**	
	(0.038)	
Aid to Blacks	**-0.013**	
	(0.013)	
Jobs vs. Environment	**-0.047****	
	(0.023)	
Female	0.047	0.150
	(0.199)	(0.200)
Age: 18-29	-0.929*	-0.864
	(0.562)	(0.562)
Age: 30-44	-0.895**	-0.841**
	(0.408)	(0.379)
Age: 45-59	-0.375	-0.301
	(0.474)	(0.460)
Education	1.235	2.392**
	(0.870)	(1.055)
Democrat	1.355*	-0.071
	(0.757)	(0.565)
Republican	1.305**	1.396**
	(0.590)	(0.683)
Constant	-0.055	-0.725
	(0.717)	(0.761)
δ_{CD}	0.674**	
	(0.230)	
δ_{DP}	-0.227	
	(0.972)	
Number of Observations	779	
Log Likelihood	-392.362	

Note: Perot coefficients normalized to zero. Standard errors in parentheses. ** indicates significance at the 0.05 level, * indicates significance at the 0.10 level.

Table 2.4: Multinomial Probit Without Uncertain Respondents in Candidate Placement

Independent Variables	Coefficients for Clinton	Coefficients for Dole
Ideology	**-0.064****	
	(0.029)	
Government Services	**-0.043****	
	(0.014)	
Defense Spending	**-0.044**	
	(0.029)	
Aid to Blacks	**-0.011**	
	(0.010)	
Jobs vs. Environment	**-0.038**	
	(0.025)	
Female	0.044	0.149
	(0.196)	(0.192)
Age: 18-29	-0.938**	-0.875*
	(0.410)	(0.476)
Age: 30-44	-0.899**	-0.849**
	(0.315)	(0.409)
Age: 45-59	-0.373	-0.300
	(0.321)	(0.322)
Education	1.268	2.443**
	(1.107)	(1.205)
Democrat	1.345**	-0.084
	(0.613)	(0.636)
Republican	1.315*	1.416
	(0.678)	(0.895)
Constant	-0.058	-0.721
	(0.784)	(0.885)
δ_{CD}	0.669**	
	(0.258)	
δ_{DP}	-0.267	
	(1.099)	
Number of Observations	779	
Log Likelihood	-392.508	

Note: Perot coefficients normalized to zero. Standard errors in parentheses. ** indicates significance at the 0.05 level, * indicates significance at the 0.10 level.

Figure 2.2: First Differences, Clinton on Government Services

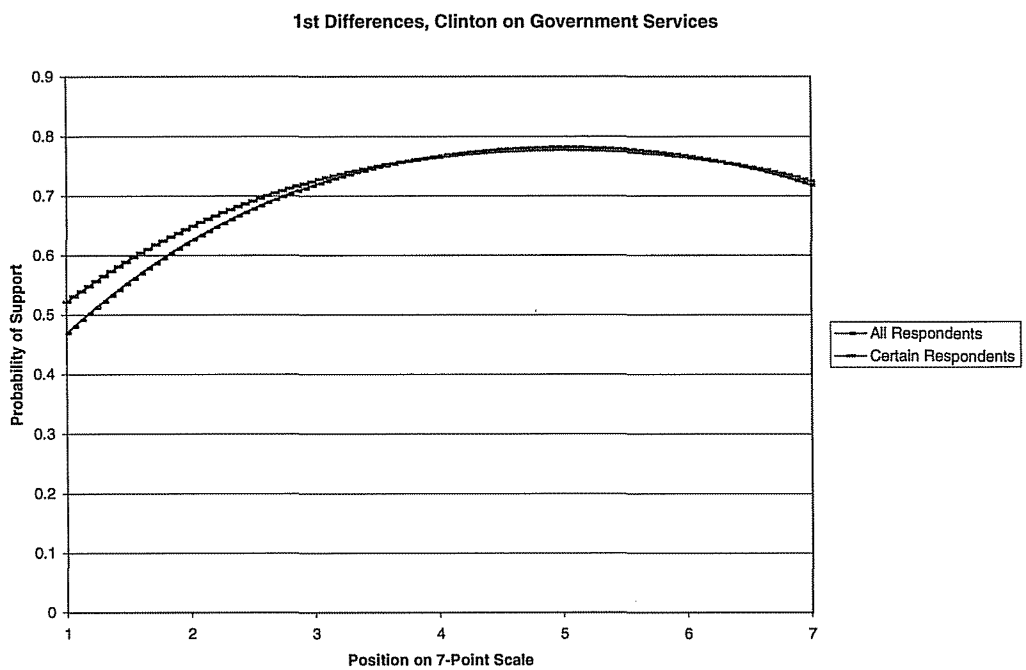


Figure 2.3: Vote Shares, Clinton on Government Services

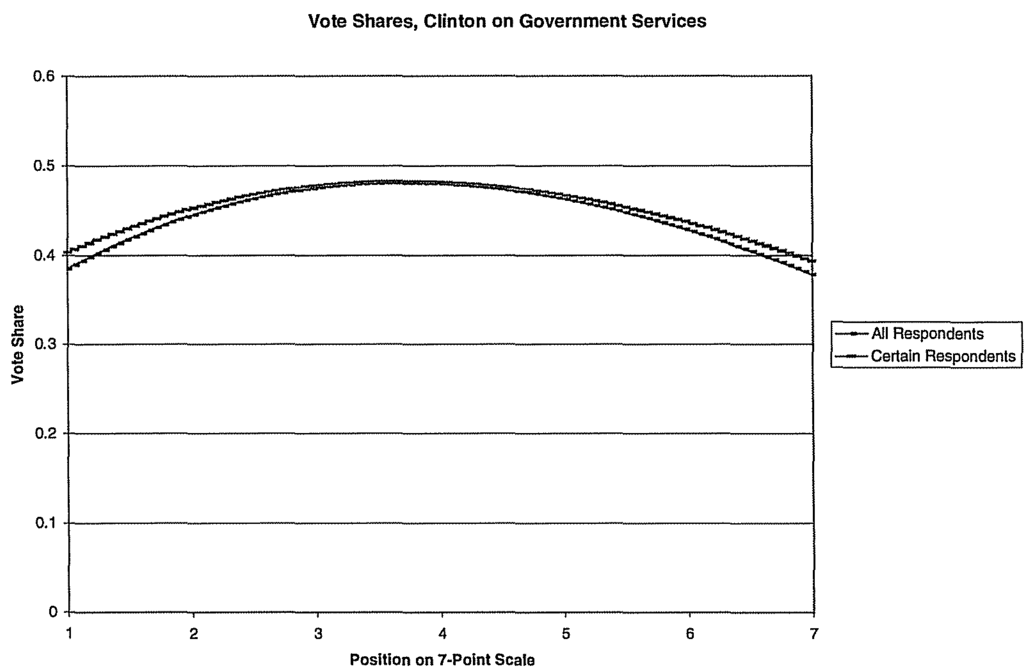
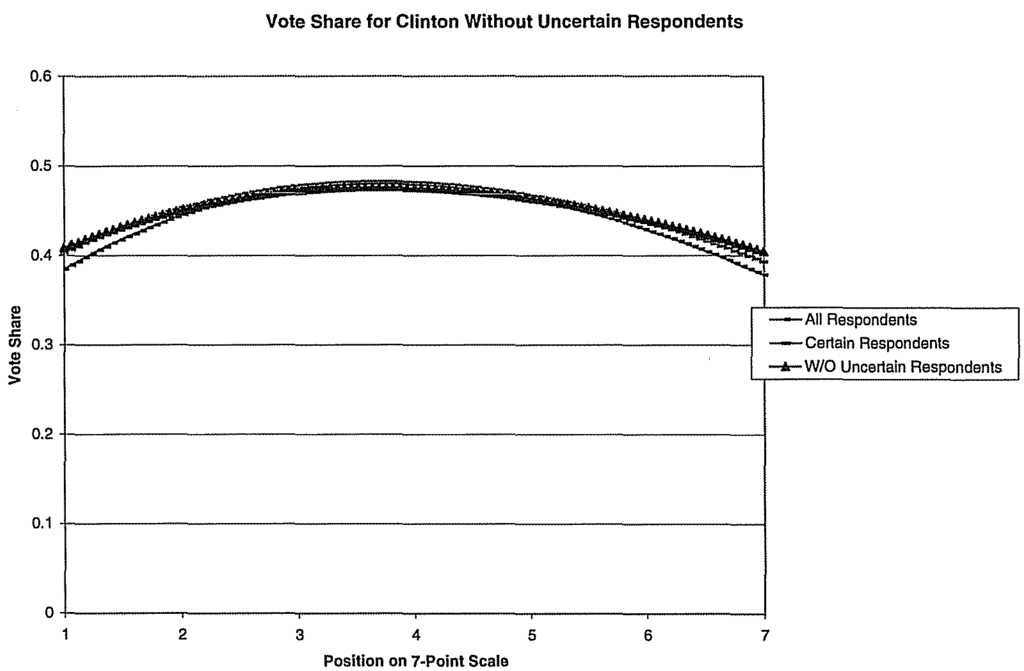


Figure 2.4: Vote Shares for Clinton Without Uncertain Respondents



Chapter 3 Survey Measures of Issue Salience

As discussed in the previous chapter, in order to examine the effect of heterogeneity in issue salience on election outcomes we must examine issue salience at the individual level. A simple and intuitive way to do this is through survey questions answered by each voter. Rather than estimate an average weight for the population and then attempt to examine the effects of heterogeneity on this weight, survey questions allow each voter to tell us how he or she weights each issue when voting. In this chapter I will examine self-reports of issue weights as a potential solution to the problems imposed by the homogeneity assumption. Unfortunately, I find that respondent answers to questions about which issues matter to them are too unreliable to give us any insight into how individuals are making their voting decisions.

Earlier empirical research that has examined self-reports of issue salience has failed to consistently find salience effects among voters. RePass (1971) discovered that individuals who reported an issue as salient in response to an open-ended question were able "to perceive party differences on those issues that were salient to them" and that "salient issues had almost as much weight as party identification in predicting voting choice." Shapiro (1969) utilized a similar open-ended responses to measure issue salience and concluded that when attempting to predict candidate preference, "the salience portion of the calculus contributes positively to the overall prediction." Rabinowitz, Prothro, and Jacoby (1982) test issue salience in a model of candidate preference and find that "any issue singled out personally as most important plays a substantially greater role for those who so view it than it does for others." However, Hinckley, Hofstetter, and Kessel (1974) and Niemi and Bartels (1985) report that various scales upon which respondents can indicate the salience of an issue appear to add little explanatory power when examining candidate preference in spatial voting models. Markus and Converse (1979) reach a similar conclusion when attempting to incorporate issue salience into a spatial voting model using responses to open-ended questions. The conclusion of these studies is that "issue salience, as measured in these studies, is of little use in explaining electoral choices" (Niemi and Bartels 1985).

What accounts for these inconsistent findings? First, different survey questions were employed in each of these studies to measure which issues were salient to each respondent. It is possible that some of the questions used were more effective at determining issue salience than others. Determining which of these survey instruments is most effective is the first step in employing self-reports of issue salience in spatial models of voting. Unfortunately, each of these studies also employs a different methodology to determine if these different issue salience questions improve our understanding of voter behavior. Without a unified methodology for testing the various measures of issue salience employed in surveys, it is impossible to say which, if any, are effective.

The following section examines the survey questions employed by the American National Election Study from 1968 to 1996, the 1976 Patterson panel survey, and the 1968 Comparative States Election Project (CSEP) to measure issue salience, and discusses which types of survey instruments are most likely to accurately measure the weight a respondent places on an issue. Section 3.2 explains the model of vote choice that I use to test the different measures of issue salience. Section 3.3 presents the results of the vote choice models, comparing the results of models that do not attempt to account for issue salience heterogeneity with the weights provided by survey respondents to those that do. I find that for nearly every type of question employed in surveys, weighting issues in a spatial model of voting by the self-reported weights of survey respondents does not improve our understanding of voter behavior. However, the results of the unique question employed by the 1968 Comparative States

Election Project suggest that self-reported issue weights derived from questions of this type may hold some explanatory power. Section 3.4 concludes.

3.1 The Reliability of Survey Measures of Issue Salience

The questions employed by the surveys examined here to determine which issues voters found important can be grouped into three types.[1] The first are what I will call the *open-ended questions.* Respondents are asked which issue or issues are most important to them, and are free to name anything that concerns them (even non-issue concerns). Their responses are not limited to any particular list of issues. RePass (1971) utilized open-ended questions to measure issue salience under the theory that responses to queries about important issues were "measuring an attitude which is on the respondent's mind (salient) at the time of the interview — an attitude which presumably was salient before the interview and will remain so afterwards." A major drawback to utilizing this type of salience measure in a spatial voting model is that possible respondent answers are limitless, but only a limited number of issue scales that measure the positions of respondents and candidates can be included. It is quite possible that too few respondents will name the issues represented by the placement scales as salient with the open ended question to allow for statistical analysis of salience effects in a spatial voting model. Another type of question employed on the surveys I examine here I term *scale questions.* These questions are typically asked immediately following one or more placement scale questions and ask the respondent to evaluate how important they feel the issue represented in the placement scale is to them. Obviously, the scale question limits which issues a respondent can name as

[1]See the Appendix for the exact question wording of each of the questions employed in these studies.

salient, but measures of issue salience are provided for a large number of respondents on the available issue placement scales, facilitating the estimation of a spatial voting model. Finally, I examine the rather unique issue salience question utilized by the 1968 Comparative States Election Project. This measure first asks a series of scale-type salience questions for each issue placement scale and then asks respondents to identify which of the issues that were identified as salient was *most* salient. Obviously, this measure of issue salience is subject to the same limitations as the scale questions.

Psychological experiments have raised concerns about the effectiveness of the two types of questions described above. Nisbett and Wilson (1977) review a number of psychological experiments that suggest that individuals are not able to discern what was salient when they made a decision, or at least are unable to describe what was salient to their decision. Most of these experiments exposed subjects to some stimulus that had a statistically significant effect on the decision to be made, and then asked the subjects what had influenced their decision. In many cases subjects did not accurately identify the stimulus that was known to affect the decision. Instead, many respondents named something as salient to their decision because it seemed plausible that it *should be* salient. Such findings cast doubt on the accuracy of survey measures of issue salience, as a respondent claiming that candidate positions on a particular issue were important to their vote decision may in fact be merely reporting a plausible justification for a vote decision that was made for other reasons. This could result in an overestimate of issue salience effects, as respondents could conceivably form a preference for a candidate without considering the issue positions of a candidate, and then place the candidate close to their ideal point on one or more issues and name those issues as salient to their decision. Brody and Page (1972) find evidence of this kind of rationalization. To avoid this I do not use respondent placements of candidates to measure issue distances; instead I assume that errors and rationalization in respondent placement of candidates are symmetrically distributed around the true position of the candidate and use the mean placement of the candidate.

Another concern exists for the scale measures of issue salience. Studies that directly examine the relationship between subjective (reported) and objective (actual or computed) weights on factors in decision making reveal that while the reliability of self-reported weights is greater than zero, there are often large discrepancies between the weights that subjects report placing on a piece of information and the weights calculated (through statistical models) based on their decisions. Slovic and Lichtenstein (1971) review a number of these studies, and note that individuals tend to overestimate the weight of low salience items in their decision rules, while underestimating the extent to which they rely on one or a few criteria to reach a decision. Thus the scale measures of issue salience are biased upwards for issues of little or no salience to the actual vote decision. All of the scale measures considered here display this type of bias. For example, the salience measure on the 1980 NES pre-election survey asks individuals to provide their rating of the salience of each issue in the survey on a scale from 0 to 100. On every issue more than half of the respondents provided a salience score of 75 or above. This tight grouping at the high end of the scale tends to mask any salience effects, as *all* issues seem to be salient to voters. Unsurprisingly, studies which have searched for salience effects using these types of linear scales have found little to report (Niemi and Bartels 1985; Hinckley, Hofstetter, and Kessel 1974; Markus and Converse 1979).

A more fruitful approach may be to ask survey respondents which issue is *most* important to them, rather than asking for salience measures on all issues. Most individuals appear to employ relatively simple decision rules (Slovic and Lichtenstein 1968; Tversky and Kahneman 1974). One aspect of this hypothesized information processing strategy is to rely on a limited number of cues when making a decision. This in turn implies that individuals place most salience on one or a few dimensions. Therefore, examining the effect of candidate positions on the "most important" issue on vote choice would be more likely to reveal a salience effect than the scale measures. All of the studies mentioned in the introduction to this chapter that found salience effects used some version of a "most important issue" question; the RePass (1971) and Shapiro (1969) studies utilized open-ended measures of issue salience, and Rabinowitz, Prothro, and Jacoby (1982) utilized the salience question in the 1968 Comparative States Election Project, which asked respondents to select one of the 15 issues represented in their issue placement scales as most important.

Thus, if the self-reported issue weights of respondents do actually contain some information about how they make their vote decision, it is most likely revealed through what is identified as most important, rather than through reports about the relative salience of every issue in the survey. The open ended measures of issue salience in the datasets I examine here specifically ask each respondent to judge which issue is most important to them. For the scale measures of issue salience I simply code the issue or issues that are ranked the highest on the scale as most important. Thus, I am searching for an issue salience effect *only* on the issue or issues identified by the respondent as the most important. The next section demonstrates how I include these issue salience measures in a spatial model of voting and how to determine if these measures improve our understanding of voter behavior.

3.2 Survey Measures of Issue Salience in a Spatial Model of Voting

The spatial model of voting assumes each individual has an ideal point x_i in a multidimensional issue space $\mathcal{X}$, which represents his or her most preferred policy outcome. Candidates adopt issue platforms $\theta_j \in \mathcal{X}$, and individuals determine their preference for candidates as some function of the distance from θ_j to x_i. Thus, the utility yielded by candidate j to individual i is given by

$$u_{ij} = (x_i - \theta_j)' A_i (x_i - \theta_j) \tag{3.1}$$

The matrix A_i is a matrix of issue weights; a standard assumption is that A_i is diagonal so that issues are separable. Further, voter utility functions are assumed to be symmetric around and single peaked at x_i, implying that the diagonal elements of A_i are non-positive. Estimating the salience of each issue in the spatial model of voting involves estimating the diagonal elements of A_i; as the absolute value of an element of A_i increases, more weight is placed on the corresponding issue by the voter and the greater is the utility loss when considering a candidate a given distance from his or her ideal point on that issue. Notice that the weight matrix is subscripted by i, allowing each individual voter to place different weights on each issue. This weight matrix is generally estimated under a homogeneity assumption, restricting A_i to be identical for all voters; with this assumption equation 3.1 can be simplified to

$$u_{ij} = \beta' X_{ij} \tag{3.2}$$

where the elements in the vector β correspond to the diagonal elements in A, and the elements in the vector X_{ij} correspond to the distance between x_i and θ_j. Estimates of β are estimates of the *average* salience of an issue.

The survey measures of issue salience provided by each respondent can be used in a spatial voting model to allow for heterogeneous issue weights. If an issue salience effect exists and the self-reported measures of issue salience capture this effect, then I expect issues which are salient to the voter to carry more weight in the vote decision than issues which are not salient. Thus, if a respondent identifies an issue as salient, the element of β that corresponds to that issue for that individual should be larger in absolute value than for respondents who view that issue as non-salient. Thus, β is likely an underestimate of the weight that an individual places on a salient issue (and an overestimate of the weight an individual places on a non-salient issue). In this case the utility function becomes:

$$u_{ij} = \beta' X_{ij} + \lambda'(\delta_{ij} X_{ij}) \tag{3.3}$$

δ_{ij} is an indicator variable coded one if respondent i names issue j as salient, and zero otherwise. Thus, λ measures the additional effect that the issue distances of salient issues in X_{ij} have on the vote choice. Since I am searching for an issue salience effect on only the most important issue or issues, the additional term λ will generally only be estimated for one issue for each voter. If λ significantly improves the fit of the vote choice model, then the survey measures of issue salience improve our understanding of voter behavior. Conversely, if equation 3.3 does not fit the data any better than equation 3.2, then the survey measures of issue salience tell us nothing about the choice rules employed by voters.

Models of vote choice are typically set up as discrete choice models, where the vote decision is motivated through a random utility model. This means that equations 3.2 and 3.3 become

$$y^*_{ij} = \beta' X_{ij} + \varepsilon_{ij} \tag{3.4}$$

$$y^*_{ij} = \beta' X_{ij} + \lambda'(\delta_{ij} X_{ij}) + \varepsilon_{ij} \tag{3.5}$$

where y^*_{ij} represents a latent variable that indicates the utility that individual i receives from voting for candidate j, and ε_{ij} indicates the unmeasured idiosyncratic elements of the individual and the choice. In practice, we do not directly observe y^*_{ij}; instead we observe a discrete realization of this variable (the vote choice). We then estimate a discrete choice model; estimation of this model depends on the assumption we make about the distribution of the error term ε_{ij}. In this chapter I assume that

ε_{ij} is distributed normally, and estimate equations 3.4 and 3.5 as probit models. I make this assumption because there are several three candidate elections among the datasets I examine. With normally distributed error terms I can estimate multinomial probit models, which are the most appropriate and flexible models in this case (Alvarez and Nagler 1998).

To test the improvement that the survey measures of issue salience offer to our understanding of voter behavior, I use a likelihood-ratio test. If we define the log-likelihood of the estimate of equation 3.4 as L_0, and the log-likelihood of the estimate of equation 3.5 as L_1, then the likelihood-ratio test statistic is $-2(L_0 - L_1)$, and is distributed as a χ^2 variable with degrees of freedom equal to the number of restrictions imposed (all of the tests in the following section have 1 degree of freedom). The likelihood-ratio test offers a clear and rigorous measure of how much the survey measures of issue salience improve the fit of each model of vote choice. The next section applies the above methodology to a variety of self-reported measures of issue salience in an effort to determine what effect these measures have on models of vote choice.

3.3 Empirical Application of the Survey Measures of Issue Salience

The datasets I employ for the empirical analysis in this chapter are drawn from the ANES pre- and post-election surveys in every presidential election year from 1968 through 1996, with the exception of 1992, when no question on issue salience was included on the survey. Thomas Patterson's 1976 panel study and the 1968 CSEP are also included.

For each dataset I estimate two probit models of vote choice (one without the measure of issue salience and one including it), with the vote cast by the respondent as the dependent variable. For the two candidate elections I coded a vote for the Democratic candidate as one, and a vote for the Republican candidate as zero. For the three candidate elections (1968, 1980, 1996) I estimate a multinomial probit model.

All of these studies include a number of seven-point issue placement scales. Respondents were asked to place themselves and the major presidential candidates on these issue scales. I measure the distance between the candidate and the respondent by the squared distance between the respondent's self placement on the scale and the mean placement of the candidate on the scale. I use the mean placement of the candidate to avoid the rationalization problem discussed in section 3.2.

The issue distance variable included in the two candidate vote choice models is the average issue distance of the Democratic candidate across all issues minus the average issue distance of the Republican candidate across all issues. A positive number on this variable indicates that the Democratic candidate was further from the respondent on average than the Republican candidate. This variable should have a negative coefficient. For the multinomial probit models issue distance is included as a choice characteristic; the coefficient on issue distance represents the effect of the differences in issue distances across candidates on the vote choice.

To test for the effect of the self-reported salience measures on the model of vote choice, I create a most important issue variable in the same way as the issue distance variable, except this variable only includes issues identified by the respondent as the most important.

I also include a number of control variables. Party identification is a variable coded -1 for individuals who identify themselves as Republicans, 0 for Independents, and 1 for Democrats. Race is coded 1 for minorities and 0 for all others. Gender is coded 1 for women and 0 for all others. Age is merely the age of the respondent. Education is a four point linear scale. In the multinomial probit models I include these variables as individual characteristics, meaning that I must normalize one set of coefficients to 0. In all three multinomial probit models I normalize the coefficients for the Independent candidate to zero; the left hand column in each model lists the effects of the independent variables on the choice between the Democrat and the Indpendent, while the right hand column lists the effects of the independent variables on the choice between the Republican and the Independent.

The coding of the variables in the multinomial probit model that examines the salience question in the 1968 CSEP is slightly different, for reasons that will be explained below. Race was excluded from these models, and party identification and age were broken up into a series of dummy variables (for Democrats and Republicans, and for ages 18-29, 30-44, and 45-59).

I first examine the effect of the open ended survey measures of issue salience on the vote choice model. The 1972, 1976 and 1988 ANES studies included only the open ended measure of issue salience. The results of estimating vote choice models in these datasets both with and without a measure of issue salience are presented below.

Tables 3.1, 3.2, and 3.3 Here

Issue distance takes on the hypothesized negative coefficient in all three models, indicating that the basic assumption of the spatial model holds (voters tend to prefer candidates who are closer to their ideal point in the issue space). Party ID is positive as expected, and statistically significant in every instance. However, including an additional variable to add weight to the issue identified as most important does not improve the fit of the model. In none of the models is the coefficient on the most important issue variable significant. Further, the likelihood-ratio tests indicate that the addition of this variable does not statistically improve the fit of the vote choice models.

The situation is no better when I consider the scale measures of issue salience.[2]

[2]I also estimated models omitting the most important issue variable, and instead weighting issue

The 1968, 1980, 1984, and 1996 ANES studies all had some version of a scale measure of issue salience. Additionally, the 1976 Patterson Study also included a scale measure of issue salience. The models estimated for these datasets are presented below.

Tables 3.4 - 3.8 Here

Once again issue distance is negative and significant in all models. Party ID has the correct sign in all models (positive in the two choice models, positive in the three choice models where I compare a Democratic and an Independent, and negative in the three choice models where I compare a Republican and an Independent). Once again an additional variable that measures the additional explanatory power of the issue or issues identified by the respondent as the most important adds nothing to the vote choice model. None of these variables are statistically significant, and the likelihood-ratio tests indicate that they add nothing to the explanatory power of the vote choice models except in the case of the 1996 NES. For the 1996 NES t he likelihood-ratio test is significant at the 0.10 level, but both issue distance and the most important issue variable in the model that includes the measure of issue salience are statistically insignificant. Thus, even though the overall fit of the model is better, the substantive interpretation of the results would lead us to believe that candidate issue positions do not have a significant impact on vote behavior. Thus, even in this case the contribution of the salience question to our understanding of voter behavior is minimal, if not negative.

Finally, I consider the issue salience question utilized in the 1968 CSEP. Based on the discussion in section 3.2, this is the type of question that would be most likely to elicit a true measure of issue salience, since it is focused on determining which issue is most important, rather than on a ranking of all issues. This measure also does

distances by the scale measures. This is the same procedure used in many past studies (Hinckley, Hofstetter, and Kessel 1974; Markus and Converse 1979; Niemi and Bartels 1985). In every case the weighted model fit the data worse than the unweighted model.

not have the shortcomings of the open-ended questions, since respondents are limited in their answers to the available issue placement scales. Thus, I would expect this type of issue salience question to have the greatest possibility of success in discovering heterogeneity in issue salience in a spatial model of voting. The models estimated for the 1968 CSEP, one with the "most important issue" variable and the other without, are presented below.

Table 3.9 Here

As for the other salience questions issue distance is negative and significant in these models, and the individual-specific variables behave as predicted (Wallace supporters are more likely to be young, male, and Independents). However, the addition of a variable to measure issue distance on the "most important issue" has a significant impact on the overall fit of the model (the likelihood-ratio test is significant at the 0.05 level). This variable is also statistically significant at the 0.05 level. Further, unlike the 1996 NES results, the addition of this variable does not cause the substantive results of other variables to change in unpredictable ways. Thus it appears that the type of question used in the 1968 CSEP did elicit accurate information about issue salience — the positions of candidates on issues that individuals identified as most important to them had a statistically significant impact on vote choice, even when controlling for candidate positions on all issues.

However, there is one point of concern with these results. The sample size of the 1968 CSEP is extremely large, especially relative to the sample sizes available for the other datasets. The number of individuals available for analysis in the 1968 CSEP was 5849, while all of the other models were estimated using 200 to 800 observations. Such a large sample will produce standard errors on the estimated coefficients that are small relative to the models that used less observations. Thus, the large sample size of the 1968 CSEP could be the reason that issue salience is estimated to have a statistically significant impact on vote choice, rather than any actual relationship. To test for this possibility, I performed a series of simulations using the 1968 CSEP data. I first randomly drew a 10% subsample of the 1968 CSEP dataset. This yielded approximately 600 observations — about the same sample size used to estimate the other models. I then re-estimated the multinomial probit model that included the issue salience variable, and examined the estimated coefficients and standard errors. This process was repeated 100 times. In table 3.10 I present the average coefficients, the average standard errors, the number of times a variable was estimated to be significant at the 0.05 level (out of 100 simulations), and the average coefficient divided by the average standard error.

Table 3.10 Here

The average standard errors estimated on the 10% subsamples are larger than their counterparts in the model using all of the observations, as expected. Many variables that appeared to have statistically significant impacts on vote choice in table 3.9 are insignificant on average here (for example, the age variables). Notice that the impact of issue distance on vote choice remains strong, emerging as statistically significant in 96 of the 100 simulations with an average t-statistic of 3.36. Most importantly, the issue salience question also fared well, although its effects are not as strong as table 3.9 suggests. This variable was significant in 47 of the 100 simulations, with an average t-statistic of 1.27. This is far more influence than we would expect to see from mere chance variation across the simulations. Although this is not overwhelming evidence that the issue salience question employed in the 1968 CSEP is truly capturing issue salience effects, these results, along with the psychological theories that predict the success of this type of question, suggest that further exploration in this direction is warranted.

3.4 Discussion

The utility of survey measures of issue salience in discovering heterogeneity in the impact of issues on vote choice is limited. Both the open-ended and the scale measures of issue salience did not reveal any issue salience effects. The open ended measures do not provide enough answers that overlap with the issue placement scales to estimate a salience effect in a spatial model of voting. Most surveys only have a small number of issue placement scales available for the estimation of a spatial model, yet the possible responses an individual can offer on the open ended questions are endless. In all three datasets examined here there is little correspondence between the open ended responses and the available seven-point issue scales. With so few respondents naming an issue for which a placement scale was available as salient, estimation of the vote choice model with the salience measure was nearly identical to estimation of the vote choice model without it.

The scale measures of issue salience elicit salience judgments for all of the issues represented by the issue placement scales, but exhibit a strong upwards bias, with respondents reporting nearly every issue as salient. Often, multiple issues were assigned the highest salience ranking, or identical high salience rankings. This introduced a great deal of multicollinearity into estimation of the vote choice model, as the issues named as most important were often a large subset of all of the issues included in the model. Survey respondents appear to have a strong psychological bias towards appearing informed to the interviewer, inducing them to indicate that they consider many issues when making a vote decision. *Any* type of scale measure of issue salience will reflect this bias. This interpretation is supported by the experimental psychological literature (Slovic and Lichtenstein 1971). Open ended questions are better in this respect, but are unlikely to provide enough useful responses to improve the fit of the unweighted spatial model of voting.

The results obtained using the "most important issue" question employed by the 1968 CSEP are encouraging, if not overwhelming. Perhaps better survey measures of issue salience would allow for the study of heterogeneity in issue weights using these measures. Unfortunately, survey questions of this type are not generally available in most datasets on the American electorate, which instead employ the open-ended or scale measures.

The failure of the most common types of self-reported measures of issue salience to improve our understanding of voter behavior and allow us to relax the assumption of homogeneous issue weights means that heterogeneity in issue salience must be examined by other means. An alternative strategy to directly asking voters what they find important is to infer it by examining their actions in a political context. The next chapter develops a method designed to do just that — observe the choices individuals make from among a set of candidates, and then determine which issues were most important to each individual when making those choices.

3.5 Appendix

These are the question wordings for the survey measures of issue salience employed by the ANES in Presidential election years from 1968 through 1996 (except for 1992, for reasons described above), the 1976 Patterson survey, and the 1968 Comparative States Election Project. The questions followed the placement of self and candidates on seven-point issue scales for the NES surveys of 1968, 1980, and 1984, and the 1976 Patterson survey. They followed self placement on a seven-point issue scale and a question about the respondent's certainty about that placement in 1996. The CSEP question followed the placement of self and candidates on all seven-point scales. The open ended measures of 1972, 1976 and 1988 did not immediately follow or proceed the placements on seven-point issue scales.

1968

How important was this problem [name of issue] to you in deciding how you would vote in the election for the President – the most important single thing, very important, somewhat important, or not very important? [code response].

1968 CSEP

Now I'm going to read back the items you said were "very important" to you. I'd like you to tell me which one of the items is most important to you. [read back items and code response].

1972 and 1976

What do you think are the most important problems facing this country? [code responses] Of all you've told me, what would you say is the single most important problem the country faces? [code response].

1976 Patterson

Of these nine issues, which are most important to you, which are somewhat important to you, and which are least important to you? [Respondent is asked to place three issues in each category].

1980

You placed yourself at point [position of respondent on 7-point issue scale] and what the government is doing at point [respondent placement of the Federal Government on 7-point issue scale]. Using the blue card [which displays a 100 point scale] tell me: How important is it to you that the government continue/change what it is doing so that it stays close to/comes closer to your own position on this issue? [code response].

1984

How important is it to you that the Federal Government do what you think is best on this issue of [name of issue]? Is it extremely important, very important, somewhat important, or not important at all to you? [code response].

1988

What do you think are the most important problems facing this country? [code responses] Any other important problems facing the country? [code responses] Of those you've mentioned, what would you say is the single most important problem the country faces? [code response].

1996

How important is this issue [named in previous questions] to you? Extremely important, very important, somewhat important, not too important, or not important at all? [code response].

Table 3.1: Vote Choice, 1972 NES

Independent Variables		
Issue Distance	-0.20**	-0.20**
	(0.03)	(0.03)
Most Important		0.01
Issue		(0.03)
Party ID	0.96**	0.96**
	(0.13)	(0.13)
Race	0.80*	0.81*
	(0.42)	(0.42)
Gender	0.55**	0.55**
	(0.18)	(0.18)
Age	0.00	0.00
	(0.01)	(0.01)
Education	0.11	0.11
	(0.09)	(0.09)
Constant	-1.02**	-1.02**
	(0.42)	(0.42)
Number of Obs.	332	332
Log Likelihood	-129.60	-129.56
Log Likelihood Test	**0.08**	

Note: Standard errors in parentheses. ** indicates significance at the 0.05 level, * indicates significance at the 0.10 level.

Table 3.2: Vote Choice, 1976 NES

Independent Variables		
Issue Distance	-0.18**	-0.16**
	(0.05)	(0.05)
Most Important Issue		-0.04
		(0.03)
Party ID	0.82**	0.82**
	(0.10)	(0.10)
Race	1.16**	1.19**
	(0.38)	(0.38)
Gender	0.18	0.18
	(0.15)	(0.15)
Age	0.00	0.00
	(0.00)	(0.01)
Education	-0.08	-0.09
	(0.08)	(0.08)
Constant	0.09	0.11
	(0.34)	(0.35)
Number of Obs.	384	384
Log Likelihood	-188.12	-187.34
Log Likelihood Test	**0.78**	

Note: Standard errors in parentheses. ** indicates significance at the 0.05 level, * indicates significance at the 0.10 level.

Table 3.3: Vote Choice, 1988 NES

Independent Variables		
Issue Distance	-0.30**	-0.33**
	(0.06)	(0.10)
Most Important		0.01
Issue		(0.02)
Party ID	1.29**	1.29**
	(0.19)	(0.19)
Race	1.21**	1.20**
	(0.49)	(0.49)
Gender	0.38	0.39
	(0.27)	(0.27)
Age	-0.00	-0.00
	(0.01)	(0.01)
Education	-0.17	-0.17
	(0.14)	(0.14)
Constant	0.20	0.19
	(0.66)	(0.66)
Number of Obs.	210	210
Log Likelihood	-57.79	-57.71
Log Likelihood Test	**0.16**	

Note: Standard errors in parentheses. ** indicates significance at the 0.05 level, * indicates significance at the 0.10 level.

Table 3.4: Vote Choice, 1968 NES

Independent Variables	Coefficients for Humphrey	Coefficients for Nixon	Coefficients for Humphrey	Coefficients for Nixon
Issue Distance	-0.15**		-0.15*	
	(0.04)		(0.08)	
Most Important Issue			-0.00	
			(0.03)	
Party ID	0.65**	-0.77**	0.67**	-0.75**
	(0.21)	(0.21)	(0.20)	(0.22)
Race	2.59	1.06	2.67	1.13
	(1.26)	(1.20)	(5.32)	(4.86)
Gender	0.30	0.40*	0.33	0.42
	(0.25)	(0.22)	(1.01)	(0.82)
Age	0.02**	0.02**	0.02	0.02
	(0.00)	(0.00)	(0.03)	(0.02)
Education	0.43**	0.45**	0.44	0.46
	(0.16)	(0.14)	(0.36)	(0.36)
Constant	-1.32**	-0.85**	-1.33	-0.84
	(0.40)	(0.39)	(1.63)	(0.96)
δ_{HW}	-0.71		-0.83	
	(0.89)		(4.12)	
δ_{NW}	0.11		0.11	
	(0.55)		(0.89)	
Number of Obs.	784		784	
Log Likelihood	-489.94		-489.62	
Log Likelihood Test	**0.64**			

Note: Wallace coefficients normalized to zero. Standard errors in parentheses. ** indicates significance at the 0.05 level, * indicates significance at the 0.10 level.

Table 3.5: Vote Choice, 1976 Patterson

Independent Variables		
Issue Distance	-0.20**	-0.16**
	(0.04)	(0.06)
Most Important		-0.02
Issue		(0.04)
Party ID	0.80**	0.80**
	(0.12)	(0.12)
Race	0.22	0.22
	(0.36)	(0.36)
Gender	-0.29	-0.28
	(0.19)	(0.19)
Age	-0.01*	-0.01
	(0.01)	(0.01)
Education	-0.13	-0.12
	(0.10)	(0.10)
Constant	0.90*	0.87*
	(0.47)	(0.47)
Number of Obs.	272	272
Log Likelihood	-114.79	-114.56
Log Likelihood Test	**0.46**	

Note: Standard errors in parentheses. ** indicates significance at the 0.05 level, * indicates significance at the 0.10 level.

Table 3.6: Vote Choice, 1980 NES

Independent Variables	Coefficients for Carter	Coefficients for Reagan	Coefficients for Carter	Coefficients for Reagan
Issue Distance	-0.20**		-0.21	
	(0.04)		(0.17)	
Most Important Issue			0.01	
			(0.04)	
Party ID	1.02**	-0.47**	1.02**	-0.48**
	(0.26)	(0.21)	(0.32)	(0.24)
Race	0.54	0.02	0.55	0.00
	(1.61)	(0.40)	(1.87)	(0.40)
Gender	-0.09	-0.16	-0.09	-0.16
	(0.43)	(0.20)	(0.23)	(0.23)
Age	0.00	0.01**	0.00	0.01
	(0.01)	(0.00)	(0.01)	(0.00)
Education	-0.17	-0.04	-0.17	-0.04
	(0.15)	(0.16)	(0.14)	(0.10)
Constant	0.17	0.32	0.18	0.33
	(0.51)	(0.46)	(0.57)	(0.43)
δ_{CA}	0.51*		0.51	
	(0.29)		(0.32)	
δ_{RA}	0.72**		0.71**	
	(0.15)		(0.34)	
Number of Obs.	300		300	
Log Likelihood	-210.39		-210.26	
Log Likelihood Test	**0.26**			

Note: Anderson coefficients normalized to zero. Standard errors in parentheses. ** indicates significance at the 0.05 level, * indicates significance at the 0.10 level.

Table 3.7: Vote Choice, 1984 NES

Independent Variables		
Issue Distance	-0.16**	-0.18**
	(0.02)	(0.03)
Most Important		0.03
Issue		(0.02)
Party ID	1.09**	1.10**
	(0.11)	(0.11)
Race	0.24	0.23
	(0.33)	(0.33)
Gender	0.06	0.04
	(0.16)	(0.16)
Age	-0.00	-0.00
	(0.01)	(0.01)
Education	0.16	0.15
	(0.10)	(0.09)
Constant	-0.81*	-0.74*
	(0.42)	(0.39)
Number of Obs.	438	438
Log Likelihood	-165.70	-164.85
Log Likelihood Test	**0.85**	

Note: Standard errors in parentheses. ** indicates significance at the 0.05 level, * indicates significance at the 0.10 level.

Table 3.8: Vote Choice, 1996 NES

Independent Variables	Coefficients for Clinton	Coefficients for Dole	Coefficients for Clinton	Coefficients for Dole
Issue Distance	-0.11**		-0.07	
	(0.02)		(0.17)	
Most Important Issue			-0.04	
			(0.11)	
Party ID	1.38**	-0.39**	1.38**	-0.42
	(0.18)	(0.19)	(0.18)	(0.30)
Race	0.87**	0.16	0.81	0.13
	(0.33)	(0.21)	(0.95)	(0.20)
Gender	-0.14	-0.01	-0.16	-0.01
	(0.19)	(0.08)	(0.31)	(0.13)
Age	0.00	0.01**	0.00	0.01**
	(0.00)	(0.00)	(0.02)	(0.00)
Education	-0.10	0.01	-0.10	0.01
	(0.10)	(0.05)	(0.14)	(0.05)
Constant	0.86*	-0.05	0.85	-0.09
	(0.48)	(0.24)	(1.44)	(0.14)
δ_{CP}	-0.11		-0.06	
	(0.21)		(0.33)	
δ_{DP}	0.91**		0.91**	
	(0.09)		(0.11)	
Number of Obs.	765		765	
Log Likelihood	-406.28		-404.89	
Log Likelihood Test	**2.78***			

Note: Perot coefficients normalized to zero. Standard errors in parentheses. ** indicates significance at the 0.05 level, * indicates significance at the 0.10 level.

Table 3.9: Vote Choice, 1968 CSEP

Independent Variables	Coefficients for Humphrey	Coefficients for Nixon	Coefficients for Humphrey	Coefficients for Nixon
Issue Distance	-0.40**		-0.38**	
	(0.03)		(0.03)	
Most Important Issue			-0.06**	
			(0.01)	
Democrat	0.79**	-0.21**	0.76**	-0.24**
	(0.11)	(0.09)	(0.11)	(0.09)
Republican	0.47**	1.75**	0.45**	1.75**
	(0.12)	(0.09)	(0.13)	(0.10)
Gender	0.11	0.20**	0.09	0.20**
	(0.07)	(0.07)	(0.07)	(0.07)
Age1829	-0.30**	-0.42**	-0.24**	-0.40**
	(0.09)	(0.09)	(0.08)	(0.08)
Age3044	-0.12**	-0.20**	-0.05	-0.18**
	(0.06)	(0.06)	(0.06)	(0.06)
Age4559	-0.15**	-0.23**	-0.09*	-0.21**
	(0.06)	(0.06)	(0.06)	(0.05)
Education	0.22**	0.33**	0.23**	0.34**
	(0.04)	(0.04)	(0.04)	(0.04)
Constant	0.17**	-0.09	0.09	-0.13
	(0.08)	(0.09)	(0.08)	(0.09)
δ_{HW}	0.61**		0.60**	
	(0.04)		(0.05)	
δ_{NW}	-0.02		0.02	
	(0.16)		(0.16)	
Number of Obs.	5849		5849	
Log Likelihood	-3583.17		-3563.43	
Log Likelihood Test	**39.48****			

Note: The issues used in this analysis were limited to the 9 issues identified as "non-valence" issues by Rabinowitz, Prothro, and Jacoby (1982). Wallace coefficients normalized to zero. Standard errors in parentheses. ** indicates significance at the 0.05 level, * indicates significance at the 0.10 level.

Table 3.10: Reduced Sample Size Simulations, 1968 CSEP

Variable	Coefficient	Standard Error	# Significant	Coeff./s.e.
Issue Distance	-0.38	0.11	96	3.36
Most Impt. Issue	-0.06	0.05	47	1.27
Democrat H/W	0.81	0.46	73	1.77
Republican H/W	0.44	0.59	32	0.76
Gender H/W	0.05	0.27	9	0.17
Age1829 H/W	-0.22	0.47	15	0.46
Age3044 H/W	-0.06	0.40	5	0.14
Age4559 H/W	-0.08	0.38	8	0.20
Education H/W	0.27	0.12	76	2.17
Constant H/W	-0.00	0.46	7	0.00
Democrat N/W	-0.24	0.40	21	0.59
Republican N/W	1.84	0.49	94	3.77
Gender N/W	0.16	0.27	18	0.60
Age1829 N/W	-0.41	0.46	36	0.89
Age3044 N/W	-0.19	0.38	14	0.51
Age4559 N/W	-0.21	0.37	17	0.55
Education N/W	0.38	0.13	89	2.89
Constant N/W	-0.26	0.47	13	0.54
δ_{HW}	0.56	0.20	82	2.77
δ_{NW}	0.02	0.68	10	0.04

Note: Based on 100 simulations using a 10% subsample of the original dataset.

Chapter 4 Issue Salience and the Costs of Information

The results of the previous chapter reveal that most attempts to determine the weights that an individual places on issues through direct survey questions will not succeed. The survey questions typically employed for this purpose produce answers that bear no relationship to actual vote decisions. For this reason it appears that the only way to determine which issues were salient to a particular voter is to infer which issues were important by observing the voter's candidate preferences. That is, since we cannot ask voters directly which issues are important to them when choosing candidates, we must observe which candidates they prefer and then determine which issue positions of the preferred candidates were most important to that voter.

In this chapter I develop a method for inferring which issues carried weight for each voter in determining candidate preference. This method is based on the premise that if we are able to observe a voter make enough choices from among sets of candidates, we can then observe what characteristics the preferred candidates have in common, including which issue positions these candidates have relative to the voter's issue positions. If a voter consistently prefers candidates who are close to his or her ideal point on a particular issue, we may infer that this issue is salient to that voter. In this section I use the choices each voter makes in creating a rank-ordering of candidates and the characteristics of those candidates to infer which issues were salient to each voter. Rivers (1988) used this method to examine heterogeneity in the weights voters placed on ideology and party identification in the 1980 election. Here I will apply this method to data from the 1976 and 1980 presidential elections, revealing heterogeneity in the weights that voters place on issues and how issue salience is related to costs of information.

The next section describes a method of measuring issue salience for each voter using rank-ordered data. I then apply this method to data from the 1976 and 1980 presidential elections in section 4.2, revealing a great deal of heterogeneity in the weights that voters place on issues when determining candidate preference. Section 4.3 relates this measure of issue salience to a voter's costs of information. The greater the costs of information to a voter, the less likely it is that that voter will utilize issues when determining candidate preference. Section 4.4 concludes, discussing the implications of these results and the limitations of the methodology developed in this chapter.

4.1 Measuring Issue Salience in a Spatial Voting Model with Rank Ordered Data

Typically, survey data on voting gathers information on which candidate was most preferred by each voter (i.e., who each voter voted for), as well as information about the voter's perceptions of the candidates and the voters themselves. In this type of data each voter is observed making one choice, voting for a single candidate in a single election. Thus, when determining the impact of issues on vote choice each voter constitutes a single observation, as only one vote decision is observed for each voter. Empirically, estimating the impact of issues on vote choice with this kind of data uses each vote choice the dependent variable, and some measure of issue distance among the independent variables. The vote choice models presented in Chapter 2 are an example of this kind of empirical model. These models allow us to estimate the effect that distance on a particular issue had on preference for a candidate *on average*, but do not reveal the effect proximity on this issue had on the preferences of *each voter*. As explained above, failure to account for this heterogeneity has both methodological and substantive consequences.

These models assume homogeneity in issue weights in part because of the kind of survey data typically available. Observing a single choice for each voter only tells us that the candidate that voter most preferred had the most desirable issue positions overall among candidates in the choice set. We cannot determine specifically which issues were most salient to the individual voter and which were irrelevant. For instance, if a particular voter is both pro-life and in favor of a tax cut and this voter casts a vote for a candidate that is both pro-life and in favor of a tax cut, we cannot determine which issue positions of the candidate greatly influenced this voters choice, and which had no impact. However, if we were able to observe this individual voter over many elections, choice patterns might emerge that would give some insight into which issues are salient to this voter. For example, if over a series of elections this voter always voted for a pro-life candidate, even if that candidate was not in favor of a tax cut, then this would be evidence that the issue of abortion was more salient to this voter than the tax rate. If this kind of data were available, it would allow for the study of heterogeneity in issue weights in great detail.

Unfortunately, there is almost no survey data available that contains enough observed vote choices for each voter to pursue this strategy. Elections are relatively infrequent events; the American National Election Studies panels span four years, and observe three vote choices per respondent at most (two for presidential elections). However, there is another type of data that allows us to observe multiple preference choices from among a set of candidates, even for a survey conducted during a single election. If preference rank-orderings of candidates by voters are available, they can be used to determine which issues are salient to each voter. To construct a rank-ordering the voter must make a series of choices, determining where each candidate will be ranked. By examining the characteristics of the candidates and their position in the rank-ordering, we can determine which characteristics are salient in determining candidate preference and which are not. To continue the example above, suppose a voter provides a rank-ordering of candidates that consistently ranks pro-life candidates above pro-choice candidates, but does not rank candidates in any particular order based on their positions on a tax cut. This is evidence that for this voter the abortion issue is more salient than the tax cut issue.

In the remainder of this section I will first show how the usual survey data and estimation techniques employed in political science only allow for the estimation of the average salience placed on an issue in the electorate. I will then show how the use of rank orderings of candidates can be used to derive estimates of which issues are salient to *each voter*, thus revealing heterogeneity in the issue weights employed by voters when deciding which candidate to vote for.

The spatial model of voting assumes each individual has an ideal point x_i in a multidimensional issue space $\mathcal{X}$, which represents his or her most preferred policy outcome. Candidates adopt issue platforms $\theta_j \in \mathcal{X}$ and individuals determine their preference for candidates as some function of the distance from θ_j to x_i. Thus, the utility yielded by candidate j to individual i is given by

$$u_{ij} = (x_i - \theta_j)' A_i (x_i - \theta_j) \tag{4.1}$$

The matrix A_i is a matrix of issue weights; a standard assumption is that A_i is diagonal so that issues are separable. Further, voter utility functions are assumed to be symmetric around and single peaked at x_i, implying that the diagonal elements of A_i are non-positive. Estimating the salience of each issue in the spatial model of voting involves estimating the diagonal elements of A_i; as the absolute value of an element of A_i increases, more weight is placed on the corresponding issue by the voter and the greater is the utility loss when considering a candidate a given distance from his or her ideal point on that issue. Notice that the weight matrix is subscripted by i, allowing each individual voter to place different weights on each issue. Equation

4.1 can be simplified to

$$u_{ij} = \beta_i' X_{ij} \tag{4.2}$$

where the elements in the vector β_i correspond to the diagonal elements in A_i, and the elements in the vector X_{ij} correspond to the distance between x_i and θ_j.

Models of vote choice are typically set up as discrete choice models, where the vote decision is motivated through a random utility model. This means that equation 4.2 becomes

$$y_{ij}^* = \beta_i' X_{ij} + \varepsilon_{ij} \tag{4.3}$$

where y_{ij}^* represents a latent variable that indicates the candidate that the individual chooses to vote for and ε_{ij} indicates the unmeasured idiosyncratic elements of the individual and the choice. In practice we do not directly observe y_{ij}^*; instead we observe a discrete realization of this variable (the vote choice). We then estimate a discrete choice model; estimation of this model depends on the assumption we make about the distribution of the error term ε_{ij}. For instance, under the assumption that this error term is independently and identically distributed Type I Extreme Value, the probability that an individual with ideal point x_i and issue weights β_i most prefers candidate j from a choice set C consisting of m candidates is given by:

$$Pr(j|x_i, \beta_i, C) = \frac{e^{\beta_i' X_{ij}}}{\sum_{k \in C} e^{\beta_i' X_{ik}}} \tag{4.4}$$

This is conditional logit, where the choice characteristics of the equation are the issue distances between the candidate's platform and the individual's ideal point. Equation 4.5 is the probability of selecting the most preferred candidate from among all candidates; typically this is the only choice information available in survey data. With only one observation per voter it is impossible to estimate separate issue weights for each individual. Thus, a strong homogeneity assumption about issue weights is generally imposed, requiring that the elements of β_i be identical for all voters, yielding the familiar conditional logit specification

$$Pr(j|x_i, \beta, C) = \frac{e^{\beta' X_{ij}}}{\sum_{k \in C} e^{\beta' X_{ik}}} \tag{4.5}$$

where β is a vector of the average salience placed on each issue in the electorate. Of course, models of this type ignore the possibility of heterogeneity in issue weights, leading to problems both methodologically and substantively.

A superior technique for estimating the impact of issues on vote choice would account for heterogeneity of issue salience across voters. Ideally, this technique would produce a unique weight for each individual in our sample, thus perfectly accounting for heterogeneity of issue weights across individuals. In terms of the model described above, this would involve estimating a separate β for each voter.

In order to estimate β_i we must observe multiple choices for each individual. If preference rank-orderings of candidates as provided by voters are available, they can provide enough information to determine which issues are salient to each voter, as discussed above. Rank-orderings provided by individuals can be decomposed into a series of choices, giving us enough information to estimate a separate vector of weight parameters for each voter, as *m-1* choices must be made to construct a rank ordering of m candidates (Marschak 1959; Luce and Suppes 1965).

To see this, suppose voters construct their rank orderings of candidates with the following procedure. First, the voter selects a most preferred candidate from the choice set of m candidates. Then, the next most preferred candidate is selected from the remaining set of *m-1* candidates. The third favorite is selected from the original choice set except for the first and second candidates, and so on, with the last choice being binary. If a voter provides us with a rank ordering of m candidates, and the *m-1* choices that must be made to construct the rank ordering are statistically independent, then the original rank ordering can be decomposed into *m-1* statistically independent choices. Each choice can then be used as an observation, yielding multiple observations per voter. Chapman and Staelin (1982) refer to this process of exploiting the information contained in a rank ordering as "exploding" the observation, although they do not apply it to estimate coefficients for each individual in the sample.

Two conditions must hold in order to decompose the rank ordering into *m-1* statistically independent choices. The first is that decision makers construct their rank orderings from top to bottom, as described above. Other possible methods of constructing rank orderings have been explored (Marschak 1959; Luce 1959; Luce and Suppes 1965), but ranking from most to least favorite is intuitive and simple, and thus I employ it here. The second is that each choice is statistically independent of the others. This assumption is more problematic, as it seems likely that there will be some correlation between choices in the rank ordering. This is another version of the independence of irrelevant alternatives (IIA) problem, which is generally not a desirable property in models of candidate choice (Alvarez and Nagler 1998). However, IIA cannot be dispensed with here, as the simple decomposition of the rank ordering into individual choices depends upon it.

For each voter, I model each of the *m-1* choices made by the individual in constructing the rank ordering by conditional logit, making the probability of observing the complete rank ordering provided by the voter

$$Pr(u_{ir_{i1}} \geq \ldots \geq u_{ir_{im}}) = \prod_{j=1}^{m-1} \left[\frac{e^{\beta' X_{i,r_{ij}}}}{\sum_{k=j}^{m} e^{\beta' X_{i,r_{ij}}}} \right] \tag{4.6}$$

This estimator is identical to successive applications of conditional logit, with each successive application estimating the probability of the particular choice from the choice set that remains once the choices made in previous applications are removed. As each choice is assumed independent, the probabilities of each choice can be multiplied to obtain the probability of the rank ordering. Provided each individual ranks enough alternatives, this estimator can be applied individually to *each respondent* in a sample to estimate a separate β for each individual.[1] The following section applies the estimator in equation 4.6 to data from the 1976 and 1980 presidential elections, revealing a great deal of heterogeneity in issue weights in the American electorate.

4.2 Issue Salience and Heterogeneity

In order to use the estimator in equation 4.6 I need datasets that allow voters to rank-order a fairly large set of candidates. Unfortunately, most surveys of the American electorate are conducted within a few months of an election, which generally means that data is collected only on the two remaining viable candidates. However, panel surveys in election years begin interviews much earlier, when a relatively large group of candidates are still competing in the primaries. Thus, the early waves of panel studies will likely contain enough candidates in the choice set to allow estimation of equation 4.6. I use two panel studies from American presidential election years in the empirical analysis below. In 1976 Thomas Patterson conducted a panel survey, with the first three waves taking place in February, April and May, and June and July, respectively. In 1980 the American National Election Study conducted a panel survey, with the first wave interviews taking place in January and February of the election year (there was not enough data on multiple candidates to use the second wave, which took place in June and July).

Neither the 1976 Patterson survey nor the 1980 ANES specifically asked respon-

[1]How many observations constitute "enough" is still an open question. In the empirical work of the following section I only include respondents who ranked at least five candidates (yielding at least four observations per respondent).

dents to rank order the candidates in the choice set. However, rank orderings can be constructed from other questions in the survey which elicit the respondent's relative preferences for the candidates. In 1976 respondents were asked to place the candidates on a 7-point scale with a one indicating the respondent had very favorable feelings about the candidate, and a seven indicating very unfavorable feelings. In 1980 a similar question using a 101-point scale was included on the survey, with a 0 indicating very unfavorable feelings about the candidate and a 100 indicating very favorable feelings about the candidate. Rank orderings were constructed by ranking the most favorably evaluated candidate highest, then next most favorably evaluated candidate second, and so on. Ties in the rankings were broken randomly.[2]

Both the 1976 and 1980 surveys asked respondents to place candidates on a number of 7-point issue scales.[3] A 7-point scale on ideology was also included. The distance between respondents and candidates was measured as the squared difference of the respondent's self-placement on the 7-point scale and the mean placement of the candidate on the 7-point scale. Issue distances were not calculated between respondents and candidates who the respondent could not place on the 7-point scale.

I estimated equation 4.6 for each respondent who was able to rank at least five candidates for whom issue distances were available.[4] Due to the limited number of observations per respondent (four to nine) I only estimate weights for a single issue

[2]A potential methodological problem with this method of constructing rank orderings is the tendency of respondents to place candidates about whom they know nothing at the midpoint of the evaluation scale, despite the presence of a filter question designed to prevent respondents from evaluating these candidates (Alvarez and Franklin 1994). This is discussed more thoroughly in Chapter 2.

[3]In 1976 the issue scales were abortion, busing to achieve school integration, level of defense spending, government provision of jobs, level of welfare spending, and the distribution of a tax cut. In 1980 the issue scales were level of defense spending, level of government services, relations with the Soviet Union, and fight inflation or unemployment.

[4]This non-random deletion means that the subset of the data used for the empirical analysis was slightly more educated than the entire sample (mean education was about two years higher), as respondents included here had to be willing to rank at least five candidates and place them on at least one issue scale. If anything, this property of the subsample used here would bias the findings of the next section downward by reducing educational differences within the sample, thus making cost of information effects across individuals harder to find.

at a time (meaning that β consists of a single element).

Estimation of equation 4.6 yields a single coefficient for one respondent on one issue. These coefficients cannot be directly compared across respondents since estimation of each probability in equation 4.6 depends upon the error term, which represents unobserved and idiosyncratic characteristics of the choice and of the individual, which undoubtedly vary across respondents. However, we can still learn something about heterogeneity in issue salience by examining the sign of the estimated coefficients for each individual. A negative coefficient indicates that the distance between the respondent and the candidate tends to increase as candidate rank increases. This implies that distance on that issue carried some weight in the construction of the rank ordering, as respondents tend to prefer candidates closer to them on the issue to those further away. Likewise, a nonnegative sign on the estimated coefficient indicates that the issue did not carry any weight in the construction of the rank-ordering, as candidates closer to the respondent are not necessarily preferred to those further away (this follows from the theoretical assumption that issue weights must be nonpositive). Thus, a negative coefficient on an issue implies that the issue was salient in the respondent's choice rule, while a nonnegative coefficient implies the issue was not salient.

Of course, examining the signs of each estimated coefficient does not rule out the possibility that the true value of the coefficient is zero and the observed sign is merely the result of statistical variation in the estimation. If this were the case we would expect to see about half of the sample with negative coefficients and half with positive coefficients. I test for this possibility for each issue with a one-sided binomial hypothesis test against the null hypothesis that the number of observed negative coefficients will be 1/2. Table 4.1 presents the negative, nonnegative, and total number of coefficients estimated with the 1976 and 1980 datasets, and the results of the binomial hypothesis test with the critical value of each test set to the $p = 0.05$

level.

Table 4.1 Here

First, note that for each issue more individuals are estimated to place weight on the issue than not. On every issue except one (busing for 1976, Wave 3) the binomial hypothesis test rejects the null hypothesis of zero issue salience in the population. Thus I can state with confidence that there is a clear relationship between issue distance and a candidate's position in the preference ranking.

However, the large number of individuals who seem to find each issue salient is a point of concern. Issue information is difficult to use, which should limit the number of respondents using issue information to construct their rank-orderings and limit the number of issues used by each individual. Examination of Table 4.1 reveals that many individuals appear to use each issue. The number of issues each individual seems to find salient is also high. Table 4.2 lists the number of issues related to the rank-ordering of each respondent. Directly counting the numbers of issues each individual seems to find salient (in a similar way to the analysis of "issue publics" undertaken by Converse (1964)) is problematic due to the large amount of missing data across issues. However, by making the rather strong assumption that all missing data should be coded as non-salient, I can then tabulate the number of issues that each individual who provided a rank-ordering appears to find salient.

Table 4.2 here

Recall that seven issues (including the ideology scale) were available for the first two waves of the Patterson study, ten in the third wave, and five issues in the first wave of the 1980 NES Major Panel study. Examination of table 4.2 reveals that most individuals in the sample appeared to use at least one issue, and many were coded as salient on more than that. It seems unlikely that voters have the complex decision rules suggested by these results. Correlation between the issue positions of each candidate across all issues is most likely responsible for this apparent overprediction of the complexity of choice rules. Any candidate with a coherent ideological stand will have highly correlated issue positions, and if the respondent also has fairly consistent issue positions, then it is extremely difficult to determine which issue or issues are truly salient to the individual, and which only appear salient because of the induced relationship between issue distance and candidate rank. To return to the example from the previous section, we would be unable to determine if a voter found pro-life or tax considerations more salient, even with multiple choice observations, if all pro-life candidates were also in favor of a tax cut.

One interesting result is the increase in the number of respondents for whom coefficients could be estimated between each wave of the 1976 Patterson survey, even though the number of viable candidates was decreasing. More respondents were able to rank at least five candidates and place these candidates on issues as the campaign went on. In a similar vein, respondents appeared to use more issues to construct their rank-orderings as the campaign progressed. This is evidence of voters learning from political campaigns. As the political campaign progressed, more information became available to voters about the candidates, and more voters felt they had enough information to form opinions about their relative preferences for different candidates, and to place these candidates on issue scales. This implies that issue salience is related to the costs of information faced by a voter. Only with information about candidate positions on an issue can a voter use that issue to help determine candidate preference. Thus, candidate issue positions should be more salient to those voters with lower costs of information. The effect of the costs of information on the estimates of issue salience presented here is the subject of the next section.

4.3 Issue Salience and the Cost of Information

As it is difficult for voters to gather and use information about the issue positions of candidates, I expect that the measure of issue salience developed in the previous section will be related to variables that measure a voter's costs of information. Individuals with lower costs of information should be more capable of using information about the issue positions of candidates in their choice rules. Thus I expect that there is a negative relationship between costs of information and issue salience.

To determine the relationship between issue salience and the costs of information, I first estimated a series of logit models, one for each issue in the sample. The dependent variable in these logit models is coded one if an issue was calculated as salient for an individual (negative in table 4.1) and zero otherwise (nonnegative in table 4.1). To measure the information costs for each individual, I include independent variables that indicate how often the individual watches the nightly television news, the strength of partisan identification, the extremity of ideological position, education, race, and gender.[5] I predict that as the costs of information decrease for an individual, he or she will find it easier to incorporate issue information into decisions about candidate preference and thus issues are more likely to be salient in that individual's choice rule. If the measure of issue salience presented here is actually a measure of an individual's use of candidate issue positions to help determine preference, then a relationship with a respondent's costs of information should be apparent.

Exposure to information through the nightly television news and higher levels of education are both expected to reduce the cost of using issue information, leading

[5]The television news variable is a 4-point scale in both 1976 and 1980, running from one (indicating the respondent watches the national television news every night) to four (never watches the national television news). Education is a 4-point scale, with higher numbers indicating more education. Strength of partisan identification is a 4-point scale based on self-placement on a 7-point scale, running from zero for true independents to three for strong partisans. Ideological extremity is also a 4-point scale based on self-placement on a 7-point ideology scale, running from zero for absolute moderates to three for extreme right or left wing respondents. Gender and race are dummy variables, coded one for women and minorities, respectively.

me to expect a positive sign on these variables. I also expect strong partisanship and ideological extremity to have a positive effect on issue salience, as these individuals are more likely to be interested in the political process. I predict negative coefficients on the gender and race dummy variables, reflecting the higher costs of political information faced by these subsets of the electorate. The results of the logit estimations are presented in tables 4.3 (1976, Wave 1), 4.4 (1976, Wave 2), 4.5 and 4.6 (1976, Wave 3), and 4.7 (1980).

Tables 4.3 - 4.7 Here

Examination of these tables clearly reveals a relationship between costs of information and the measure of issue salience developed in the last section, especially for 1976. As predicted, education, strength of partisanship, and strength of ideology all have a significant impact on an individual's use of many of the issues examined here. However, gender and race are estimated to have effects opposite those predicted in 1976 — women and minorities are estimated to be more likely to find many of these issues salient. This was not true in 1980, where these variables reflect my hypothesis that women and minorities face greater costs of information, and thus are less likely to use issues to determine candidate preference. Greater exposure to television newscasts had little impact on an individual's use of issues.

The relationship between ideological extremity and issue salience is also of interest for methodological reasons. Since individuals with more extreme ideologies are also more likely to find issues salient, this means that there is likely a relationship between an individual's position on an issue and the weight they place on that issue. This means that for models that attempt to estimate the impact of issues on vote choice, the coefficients we are interested in are correlated with the variables in our model. This can lead to serious coefficient bias, calling into question the results of any model that does not account for this heterogeneity (Rivers 1988, Jackson 1992).

Another way to examine the effect of the cost of information on issue salience is to relate costs of information to the total number of issues an individual found salient. To test this I estimated a series of regression models. The dependent variable was the number of issues coded as salient for each individual, while the independent variables were identical to those in the logit estimations in this section.[6] These independent variables are expected to have the same effect on the number of issues coded as salient as they did on the likelihood of each particular issue being coded as salient. The regression results are presented in table 4.8.

Table 4.8 Here

The relationship between costs of information and the number of issues estimated to be salient to each individual emerges even stronger here than in tables 4.3 through 4.7. Education, strength of partisanship, strength of ideology, and gender all have statistically significant effects on the number of issues coded as salient in the expected direction (with the exception of strength of partisanship in the last wave of the Patterson study). Exposure to the television news does not have a statistically significant effect, and race has inconsistent effects across the datasets. In light of these results and the earlier results in this section, I can say with confidence that a clear relationship exists between costs of information and the measure of issue salience developed in the previous section.

[6]The dependent variable ranges from zero to seven in the first two waves of the 1976 Patterson study, from zero to ten in the third wave, and from zero to five in 1980. With relatively few values possible for the dependent variables a natural question is whether the relatively discrete nature of these variables necessitates the use of a method other than regression, such as ordered probit. As this would result in the estimation of models with six to eleven categories, I chose to regard the dependent variable as continuous and estimate the model with linear regression.

4.4 Discussion

The heterogeneity in issue weights revealed in this chapter has important substantive and methodological implications for the study of voter behavior. Although heterogeneity in issue weights is not surprising theoretically, few studies of the American electorate address this possibility. Failure to account for the differences across voters on issue salience means that we have an incomplete picture of the use of issues among American voters, and much of what is interesting about political campaigns remains obscured. Issue salience is determined in part by the costs of information. Individuals who face high costs of information are less likely to find any particular issue salient. These individuals are also less likely to consider multiple issues when deciding who to vote for.

The heterogeneity revealed here has methodological implications for the study of issue salience in the American electorate. Most studies ignore the possibility of heterogeneity in issue weights, instead offering information on the "average" impact of an issue on vote choice. However, the strong relationship of strength of ideology to issue salience revealed here casts doubt on the findings of those studies. Individuals who are relatively more extreme politically also have more extreme issue positions relative to the population at large. This chapter has revealed that these individuals also tend to be more likely to find a given issue salient than the rest of the American electorate. This means that there is a correlation between an individual's position on an issue and the weight that an individual places on an issue. This correlation will induce bias in estimates of the "average" weight placed on an issue if it is ignored — as it is in most studies of the use of issues in vote choice.

Although the empirical findings of this chapter are valuable, the estimator used to obtain them has several serious limitations. Since a separate estimation must be performed for each individual in the sample, it is very difficult and time-consuming to implement, and the estimated salience of each individual cannot be directly compared to the results for other individuals. Most importantly, there is very little data available that is suitable to the application of the technique developed in this chapter. A rank-ordering over a large number of candidates is required, which limits us to surveys taken during the primary season when studying American elections. Most survey data on the American electorate consists of cross-sectional data obtained at a time very closely prior to or following an election, when only two candidates are generally viable. Thus, this technique is unsuitable for use in studying the great majority of survey data that is available on the American electorate. What is required is an estimation technique that accounts for the heterogeneity we now know is present in the issue weights employed by the American electorate, but that still remains flexible enough to be used to study a wide variety of elections. Random parameters logit has these characteristics, and is the focus of the next chapter.

Table 4.1: Estimated Issue Salience Coefficient Signs

Issue	Negative	Nonnegative	Total	$p < 0.05$
Wave 1, 1976				
Abortion	135	90	225	Yes
Busing	197	148	345	Yes
Defense	233	129	362	Yes
Government Jobs	209	108	317	Yes
Tax Cut	217	135	352	Yes
Welfare	250	175	425	Yes
Ideology	383	162	545	Yes
Wave 2, 1976				
Abortion	157	123	280	Yes
Busing	260	221	481	Yes
Defense	280	173	453	Yes
Government Jobs	290	163	453	Yes
Tax Cut	271	162	433	Yes
Welfare	260	220	480	Yes
Ideology	431	174	605	Yes
Wave 3, 1976				
Abortion	215	171	386	Yes
Busing	282	269	551	No
Defense	337	206	543	Yes
Government Jobs	344	181	525	Yes
Tax Cut	296	209	505	Yes
Welfare	312	205	517	Yes
Foreign Intervention	290	240	530	Yes
Law & Order	341	211	552	Yes
Wage/Price Control	250	204	454	Yes
Ideology	467	171	638	Yes
1980				
Defense	220	112	332	Yes
Government Services	220	124	344	Yes
Inflation/Unemployment	173	114	287	Yes
Relations USSR	201	143	344	Yes
Ideology	268	91	359	Yes

Table 4.2: Number of Issues Salient to Respondents, in Percentages

Number of Issues	1976, Wave 1	1976, Wave 2	1976, Wave 3	1980
0	12.2	8.2	4.9	8.7
1	22.3	19.4	11.1	25.6
2	19.5	16.9	9.3	23.7
3	13.5	18.3	11.7	18.2
4	12.9	12.7	11.9	17.2
5	9.9	12.5	14.3	6.6
6	7.0	8.4	13.6	-
7	2.8	3.7	11.0	-
8	-	-	6.3	-
9	-	-	4.7	-
10	-	-	1.3	-
N	615	656	700	472

Table 4.3: Costs of Information and Issue Salience, 1976 (Wave 1)

Independent Variable	Abortion	Busing	Defense	Gov't Jobs	Tax Cut	Welfare	Ideology
Gender	0.45	0.28	0.51**	0.19	0.52**	0.09	0.09
	(0.32)	(0.25)	(0.25)	(0.27)	(0.25)	(0.22)	(0.21)
Race	-0.68	-0.20	-0.55	0.07	0.02	0.34	-0.16
	(0.46)	(0.38)	(0.38)	(0.40)	(0.38)	(0.37)	(0.35)
Education	0.21**	0.12*	0.15**	-0.04	0.02	0.09	0.23**
	(0.09)	(0.07)	(0.07)	(0.08)	(0.07)	(0.06)	(0.06)
Watch TV News	0.01	0.12	0.05	0.02	0.33**	0.02	-0.22**
	(0.14)	(0.11)	(0.11)	(0.12)	(0.11)	(0.10)	(0.09)
Strength PID	0.24	0.14	0.01	0.41**	0.10	0.18	0.31**
	(0.18)	(0.13)	(0.13)	(0.14)	(0.13)	(0.12)	(0.12)
Strength Ideology	-0.27*	0.23*	0.05	0.27*	0.32**	0.08	0.44**
	(0.16)	(0.13)	(0.13)	(0.14)	(0.13)	(0.11)	(0.11)
Constant	-1.08	-1.24**	-0.59	-0.32	-1.04*	-0.73	-0.99**
	(0.69)	(0.52)	(0.52)	(0.58)	(0.56)	(0.48)	(0.46)
N	199	299	316	278	306	362	497
χ^2	12.98**	13.29**	12.59**	14.77**	22.09**	6.47	45.78**

Note: Standard errors in parentheses. ** indicates significance at the 0.05 level, * indicates significance at the 0.10 level.

Table 4.4: Cost of Information and Issue Salience, 1976 (Wave 2)

Independent Variable	Abortion	Busing	Defense	Gov't Jobs	Tax Cut	Welfare	Ideology
Gender	0.59**	-0.11	1.04**	-0.00	-0.25	0.30	-0.30
	(0.27)	(0.20)	(0.23)	(0.21)	(0.21)	(0.20)	(0.19)
Race	-0.12	0.78**	0.47	0.52	0.69*	1.12**	-0.14
	(0.41)	(0.33)	(0.35)	(0.35)	(0.36)	(0.35)	(0.31)
Education	0.25**	0.03	0.15**	0.07	0.08	0.07	0.16**
	(0.08)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)
Watch TV News	-0.10	0.19**	0.09	0.19*	0.12	0.13	0.03
	(0.12)	(0.09)	(0.10)	(0.10)	(0.10)	(0.09)	(0.09)
Strength PID	-0.24	-0.14	-0.02	0.07	0.23*	0.10	0.27**
	(0.15)	(0.11)	(0.12)	(0.12)	(0.12)	(0.11)	(0.10)
Strength Ideology	0.28**	0.35**	0.33**	0.35**	0.13	0.46**	-0.01
	(0.14)	(0.10)	(0.11)	(0.11)	(0.11)	(0.10)	(0.09)
Constant	-0.90	-0.55	-1.27**	-0.71	-0.76	-1.44**	-0.35
	(0.63)	(0.45)	(0.48)	(0.48)	(0.49)	(0.46)	(0.42)
N	253	435	408	411	391	436	570
χ^2	22.51**	26.17**	39.13**	20.16**	14.76**	38.66**	18.01**

Note: Standard errors in parentheses. ** indicates significance at the 0.05 level, * indicates significance at the 0.10 level.

Table 4.5: Cost of Information and Issue Salience, 1976 (Wave 3)

Independent Variable	Abortion	Busing	Defense	Gov't Jobs	Tax Cut	Welfare	Ideology
Gender	0.26	-0.08	0.75**	0.23	-0.17	0.21	-0.11
	(0.22)	(0.18)	(0.20)	(0.20)	(0.20)	(0.20)	(0.19)
Race	0.23	0.35	0.03	0.68**	0.54*	0.35	0.43
	(0.33)	(0.28)	(0.30)	(0.33)	(0.32)	(0.30)	(0.32)
Education	0.25**	0.06	0.13**	0.10*	0.08	0.10*	0.11**
	(0.07)	(0.05)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)
Watch TV News	0.07	0.05	0.06	0.17*	0.12	0.06	0.01
	(0.10)	(0.08)	(0.08)	(0.09)	(0.09)	(0.08)	(0.08)
Strength PID	0.07	-0.09	0.03	0.03	0.23*	0.01	0.07
	(0.13)	(0.11)	(0.11)	(0.12)	(0.12)	(0.12)	(0.11)
Strength Ideology	-0.12	0.23**	0.20**	0.28**	0.20**	0.18*	0.18*
	(0.11)	(0.09)	(0.10)	(0.10)	(0.10)	(0.10)	(0.09)
Constant	-1.40**	-0.48	-0.96**	-0.76	-1.16**	-0.62	0.10
	(0.55)	(0.44)	(0.46)	(0.47)	(0.47)	(0.46)	(0.45)
N	347	493	482	476	453	465	601
χ^2	17.00**	10.70*	23.99**	20.04**	20.67**	10.18	11.15*

Note: Standard errors in parentheses. ** indicates significance at the 0.05 level, * indicates significance at the 0.10 level.

Table 4.6: Cost of Information and Issue Salience, 1976 (Wave 3), continued

Independent Variable	Foreign Intervention	Law & Order	Wage/Price Controls
Gender	0.42**	0.32*	0.36*
	(0.19)	(0.19)	(0.21)
Race	-0.26	0.15	0.16
	(0.29)	(0.30)	(0.30)
Education	0.20**	0.04	0.02
	(0.06)	(0.06)	(0.06)
Watch TV News	-0.17*	0.08	0.17*
	(0.08)	(0.08)	(0.09)
Strength PID	0.23*	0.07	0.00
	(0.11)	(0.11)	(0.12)
Strength Ideology	-0.06	0.32**	0.20**
	(0.09)	(0.10)	(0.10)
Constant	-1.18**	-0.51	-0.66
	(0.46)	(0.45)	(0.50)
N	472	493	403
χ^2	24.76**	16.33**	10.10

Note: Standard errors in parentheses. ** indicates significance at the 0.05 level, * indicates significance at the 0.10 level.

Table 4.7: Costs of Information and Issue Salience, 1980

Independent Variable	Defense	Gov't Spending	Infl./Unemp.	USSR	Ideology
Gender	-0.02	-0.26	0.05	-0.24	0.08
	(0.28)	(0.26)	(0.25)	(0.29)	(0.26)
Race	-0.97**	-0.04	-0.14	-0.70	-1.46**
	(0.49)	(0.47)	(0.46)	(0.50)	(0.43)
Education	0.01	0.01	0.02	0.19**	0.15**
	(0.08)	(0.07)	(0.07)	(0.08)	(0.08)
Watch TV News	0.05	-0.05	-0.02	0.07	-0.11
	(0.13)	(0.12)	(0.12)	(0.13)	(0.12)
Strength PID	0.09	0.10	0.14	0.07	0.19
	(0.15)	(0.13)	(0.13)	(0.15)	(0.14)
Strength Ideology	0.13	0.16	0.14	0.39**	0.51**
	(0.16)	(0.16)	(0.15)	(0.17)	(0.16)
Constant	0.40	0.42	-0.02	-1.07*	-0.23
	(0.60)	(0.55)	(0.54)	(0.62)	(0.57)
N	270	285	279	243	357
χ^2	5.39	2.99	2.59	16.31**	27.30**

Note: Standard errors in parentheses. ** indicates significance at the 0.05 level, * indicates significance at the 0.10 level.

Table 4.8: Costs of Information and Number of Issues Salient

Independent Variable	1976, Wave 1	1976, Wave 2	1976, Wave 3	1980
Gender	-0.46**	-0.36**	-0.42**	-0.51**
	(0.16)	(0.15)	(0.19)	(0.14)
Race	0.42	1.03**	1.05**	-0.49*
	(0.28)	(0.25)	(0.30)	(0.27)
Education	0.41**	0.39**	0.61**	0.26**
	(0.08)	(0.07)	(0.09)	(0.07)
Watch TV News	0.05	0.04	-0.06	-0.07
	(0.07)	(0.07)	(0.08)	(0.07)
Strength PID	0.30**	0.19**	0.14	0.13*
	(0.09)	(0.08)	(0.12)	(0.08)
Strength Ideology	0.29**	0.34**	0.44**	0.26**
	(0.08)	(0.07)	(0.09)	(0.08)
Constant	0.79**	1.21**	2.38**	1.68**
	(0.34)	(0.31)	(0.43)	(0.29)
N	524	593	628	383
Adj. R^2	0.11	0.12	0.12	0.10

Note: Standard errors in parentheses. ** indicates significance at the 0.05 level, * indicates significance at the 0.10 level.

Chapter 5 Heterogeneity in Issue Salience in the American Electorate

Most studies of the impact of issues on vote choice assume that the weights placed on issues are homogeneous across voters. Estimating such a model tells us if an issue was salient to the electorate on average, but gives us no information about heterogeneity in the use of the issue. This homogeneity assumption is problematic from a substantive point of view, but until recently no methodology has been available that would allow for heterogeneity in issue weights. The previous chapter adopted the opposite approach — attempt to completely model the heterogeneity present in issue salience by estimating a unique coefficient for each individual on each issue. While such a technique will give us a great understanding of the differences across individuals in the use of issues, it is not generally applicable to the data usually available for study of the American electorate. What is needed is a model that allows the estimated impact of issues on vote choice to vary across individuals, yet still remain tractable for a wide selection of datasets and elections.

The development of such a model can contribute to our understanding of heterogeneity in the impact of issues on vote choice, even if it does not completely describe this heterogeneity. To see this consider figure 5.1. Figure 5.1 represents possible combinations of issue salience and heterogeneity for a given issue. The "yes" and "no" for the columns indicate whether or not an issue was salient to the electorate on average. In other words, did candidate positions on this issue have an impact on vote choice on average? The "yes" and "no" for the rows indicate whether or not there was a significant degree of heterogeneity in the weight placed on the issue. Did all voters place about the same weight on an issue when voting, or was there a great deal of variation in the weight placed on this issue?

Figure 5.1 Here

Ignoring the possibility of heterogeneity in issue weights restricts the analysis of the impact of issues on vote choice to the top two cells in figure 5.1. If we estimate an issue to be salient and we assume homogeneity, then we are assuming that *every* voter found this issue salient. Likewise, if we estimate an issue not to be salient and assume homogeneity, then we are assuming that *no* voter found this issue salient. The homogeneous issue weight assumption is tantamount to assuming that *every single voter behaves in exactly the same way.*

Allowing for heterogeneity in issue weights allows for a much more complete picture of the impact of issues on vote choice. We are saying two very different things when we say an issue was important to *everyone*, versus an issue was important *on average*. Was this issue something that concerned nearly everyone in the American electorate, or the focus of an intense subgroup? We cannot distinguish between these two possibilities without studying heterogeneity in issue weights.

The remainder of this chapter is organized as follows. In the next section I discuss two assumptions we can make about the individual issue weights (β_i) I derive in the "ideal" model of vote choice in Chapter 1 to make an empirical model tractable. The first is the widely prevalent homogeneity assumption, which is embodied in most of the discrete choice models used to study voter behavior. This assumption requires β_i to be identical for all i. The second is a distributional assumption; I assume that issue weights are distributed among voters by some known probability distribution and estimate the parameters of that distribution. This assumption maintains that β_i is distributed across voters by some known probability distribution, and leads to a random parameters logit model. Section 5.2 presents the results of a random parameters logit model for the 1996 presidential election, and compares these results to those from a conditional logit model with the homogeneity assumption. I show that random parameters logit contains all of the information that models that assume homogeneity do, plus I uncover evidence of heterogeneity in the weights placed on issues by voters. Section 5.3 concludes, and discusses some of the sources of the heterogeneity we observe in issue weights.

5.1 Homogeneity, Distributions, and Random Parameters Logit

Recall the "ideal" model of voter choice from Chapter 1. This model represents the probability that voter i votes for candidate c as:

$$P_{ic} = \frac{e^{X_{ic}\beta_i}}{\sum_k e^{X_{ik}\beta_i}} \tag{5.1}$$

With the survey data commonly available in political science this model cannot be estimated. Some restrictions must be placed on the estimated issue weights in order to estimate this model. By far the most common assumption about issue weights employed in empirical research is the homogeneity assumption. Rather than attempt to estimate a separate set of issue weights for each voter, we assume that all voters place the same weight on a given issue, meaning $\beta_i = \beta$ for all i. If we maintain the assumption that the unobserved portions of utility are distributed independently and identically as Type I Extreme Value distributions then this leads to the familiar conditional logit specification.

$$P_{ic} = \frac{e^{X_{ic}\beta}}{\sum_k e^{X_{ik}\beta}} \tag{5.2}$$

This is an easy model to estimate, and most software packages include commands that will estimate models of this type. Thus conditional logit and its variants are popular among researchers because they are simple models that yield some information about the impact of candidate issue positions on vote choice. Of course, the drawback to this type of model is that it assumes that all voters behave in exactly the same way. Thus, models of this type are of no use in studying *heterogeneity* in the impact of issues on vote choice, as all heterogeneity was assumed away in order to make the model tractable.

What is needed is an assumption about β_i across voters that allows for heterogeneity in issue weights, while still leading to a tractable model. One possibility is to assume that the weight placed on a particular issue by voters is random, but is distributed among voters by some known probability distribution. That is, for issue j, $\beta_j \sim f(\beta_j|\bar{\beta}_j, \sigma_{\beta_j})$. Assuming a probability distribution f, our goal will be to estimate the mean $\bar{\beta}_j$ and the standard deviation σ_{β_j} of this distribution. The mean gives us a measure of the average weight placed on the issue in the electorate, while the standard deviation will give us a measure of the heterogeneity in the weight placed on the issue. This assumption strikes the middle ground between estimating a unique set of weights for each voter, as I did in Chapter 4, and assuming all voters are the same, as I did in Chapter 2. This distributional assumption is the motivation behind random parameters logit.

Consider equation 5.1 again. This is the probability that voter i chooses candidate c conditional on β_i. If we knew β_i for each voter the solution to equation 5.1 for each individual would be trivial. However, without this information estimation of equation 5.1 will generally not be possible. If β_i represents the weights on Q issues, then the choice probability is conditional on Q random variables. Without some information about these random variables it is not possible to determine the choice probability in equation 5.1.

However, if the distribution of the Q random variables is known then it is possible for us to determine the unconditional choice probability. I assume throughout this chapter that these Q random variables are independently distributed. To obtain the unconditional choice probability of individual i choosing candidate c we must integrate equation 5.1 with respect to the Q independent random variables.

$$P_{ic} = \int_{-\infty}^{\infty} \cdots \int_{-\infty}^{\infty} \left[\frac{e^{X_{ic}\beta_i}}{\sum_k e^{X_{ik}\beta_i}} \right] f(\beta_1) \ldots f(\beta_Q) \partial\beta_1 \ldots \partial\beta_Q \tag{5.3}$$

The intuition behind this estimator is actually quite simple. Let us assume for a moment that there is only one random parameter, β_j, and that parameter follows a known probability distribution f. Essentially, for each individual we are calculating the probability that that individual selects candidate c for every possible value of β_j, and weight the contribution of each particular calculated probability to the likelihood function by the density f. Thus, values of β_j far out into the tails of a continuous distribution f may produce very different calculated probabilities of selecting candidate c for a particular voter, but they will not carry much weight in the overall likelihood function. However, as $\sigma^2_{\beta_j}$ increases more weight is assigned to values of β_j that are further from the mean. This might improve the calculated likelihood for some individuals, since their particular values of β_j may be far from the mean. If enough individuals are far from the mean then this estimator will estimate a significant standard deviation on β_j — this is how random parameters logit determines if there is significant heterogeneity in the weight placed on a particular issue. Thus, random parameters logit offers a clear statistical test for heterogeneity in the impact of issues on vote choice.

Another useful property of random parameters logit is that it is not burdened with the IIA property that plagues conditional logit. Examination of equation 5.3 reveals that the ratio of P_{ic} to P_{id} for $c \neq d$ depends on all candidates in the choice set. Because we are estimating individual-specific unobserved portions of the utility function, we are also estimating correlation in the unobserved portion of utility over candidates.[1] Random parameters logit can approximate any substitution pattern that any other discrete choice model can estimate, depending on the specific specification of the random parameters logit model (McFadden and Train 1998). For instance, a random parameters logit model can be specified that will approximate the substitution patterns that could be estimated with a multinomial probit model (Brownstone and Train 1999). However, in the specific context of this chapter it is unclear how much of the correlation between choices is accounted for. Correlation between choices in the empirical application below is solely a function of variation in the estimated issue weights, and not of *all* portions of unobserved utility as it is in many multinomial probit models utilized in political science (e.g., Alvarez and Nagler 1998).

To estimate the random parameters logit model we set up the following log-likelihood function:

$$\mathcal{L}(\theta) = \sum_{i=1}^{I}\sum_{c=1}^{C} y_{ic} log \left[\int_{-\infty}^{\infty} \cdots \int_{-\infty}^{\infty} \left\{ \frac{e^{X_{ic}\beta_i}}{\sum_k e^{X_{ik}\beta_i}} \right\} f(\beta_1)\dots f(\beta_Q)\partial\beta_1 \dots \partial\beta_Q \right] \quad (5.4)$$

where I is the set of all voters, C is the set of all candidates, and

$$y_{ic} = \begin{cases} 1 & \text{if } i \text{ chooses } c \\ 0 & \text{otherwise} \end{cases}$$

The log-likelihood function in equation 5.4 involves estimation of a Q-dimensional integral, where Q is the number of random parameters. This integral cannot be evaluated analytically since it does not have a closed-form solution. If Q is equal to one or two the integration may be performed numerically. However, when Q is greater than two numerical techniques cannot compute the integral with sufficient precision

[1] To see this, rewrite individual i's utility for voting for candidate c as $U_{ic} = \beta' X_{ic} + \delta_i X_{ic} + \varepsilon_{ic}$. The unobserved portion of utility is $\delta_i X_{ic} + \varepsilon_{ic}$, which is correlated across choices due to the common influence of δ_i.

(Revelt and Train 1997).

Since we cannot compute the integral numerically when Q 2 we must apply Monte Carlo simulation techniques to approximate the choice probabilities in the log-likelihood function of equation 5.4. We then maximize the resulting simulated log-likelihood function.

The Monte Carlo simulation technique I employ here approximates the choice probabilities in equation 5.4 by computing the integrand in equation 5.4 at randomly chosen values for each β_{iq}. For each individual, for each random parameter, I first draw a random variable from the distribution I have assumed the random parameter follows. Since I have assumed that the random deviations from the mean weight placed on an issue are independent across individuals and issues, I generate a matrix of $I \times Q$ independent random variables drawn from the appropriate distributions (f(β_q) for the qth random parameter). I then compute the corresponding choice probabilities for a given value of the parameter vector θ. I then repeat this process R times for the given value of the parameter vector. Let $\hat{P}^r_{ic}(\theta)$ be the realization of the choice probability for the rth draw. I approximate the choice probabilities for a given parameter vector θ by averaging over the values of $\hat{P}^r_{ic}$:

$$\hat{P}_{ic}(\theta) = \frac{1}{R}\sum_{r=1}^{R}\hat{P}^r_{ic}(\theta) \tag{5.5}$$

$\hat{P}_{ic}(\theta)$ is the simulated choice probability of individual i choosing candidate c given θ. This simulated choice probability is an unbiased estimator of the actual probability $P_{ic}(\theta)$, with a variance that decreases as R increases. It is also twice differentiable and strictly positive for any realization of the finite R draws. These properties are especially appealing because they imply that log-likelihood functions constructed with $\hat{P}_{ic}(\theta)$ are always defined and can be maximized with conventional gradient-based optimization methods.

Thus, we construct a simulated log-likelihood function:

$$\mathcal{SL} = \sum_{i=1}^{I} \sum_{c=1}^{C} y_{ic} log \left[\hat{P}_{ic}(\theta) \right] \tag{5.6}$$

The parameter vector θ is the vector that maximizes the simulated log-likelihood function. Under weak conditions this estimator is consistent, asymptotically efficient, and asymptotically normal (Lee 1992). However, this estimator does display some bias at low values of R, which decreases as R increases. The bias is exceedingly small when $R = 250$ (Brownstone and Train 1999); most empirical work uses R equal to 500 or 1000.

The next section applies a random parameters logit model to the 1996 presidential election and reveals a significant degree of heterogeneity in the weights that voters place on issues. A conditional logit model is also estimated in order to show that random parameters logit reveals all of the information that conditional logit does, plus information on heterogeneity in issue weights.

5.2 An Application to the 1996 Presidential Election

To test the effectiveness of random parameters logit in the analysis of the impact of issues on vote choice, I applied it to the 1996 presidential election. The dataset I used was the 1996 National Election Study.

In order to estimate the impact of issues on vote choice with either conditional logit or random parameters logit, we need a measure of vote choice for the dependent variable, and a measure of the distances between voters and candidates and issues for the independent variables. Vote choice was simple to operationalize — the NES included a question about vote choice in the post-election wave of the survey. For the spatial issue distances I used the 7-point issue scales included in the survey. The NES asked respondents to place themselves and candidates on 7-point scales representing possible positions on an issue, with one endpoint representing an extremely liberal position and the other endpoint representing an extremely conservative position. I measured issue distance as the squared difference between a voters self-placement on the 7-point scale and the mean placement of the candidate on the scale by all respondents. The mean placement was utilized to avoid possible projection effects, where a voter first forms a preference for a candidate and then begins to perceive that candidate as close to them on all issues. I examined five issues in 1996; general ideology, the level of services the government should provide, to what extent the government should help people find work, to what extent the government should help African-Americans, and whether the government should protect jobs or the environment. I also created dummy variables measuring each respondent's gender, age, and partisan identification. After eliminating missing data 717 voters were available for analysis.[2]

I first present the results of a conditional logit model for the 1996 presidential election. These results are presented in table 5.1. Three issues are estimated to have a statistically significant impact on vote choice: general ideology, the level of government services, and jobs vs. the environment. These estimates imply that these three issues had an impact on voter behavior, while the government jobs and government aid to African-Americans did not.

Table 5.1 Here

While these results give us information about the *average* impact of issues on vote choice, they give us an incomplete picture of voter behavior. Taken at face value, the

[2]The large number of respondents removed from the analysis is a cause for concern. Since the sample used here only includes those individuals who were able to place themselves on all five 7-point scales it is likely that removing missing data through listwise deletion is a non-random process, with potential implications for the following analysis (Sherman 1999). However, solving these missing data problems through techniques such as multiple imputation may actually make the problem worse. The heterogeneity in issue weights evident in this work suggest that attempting to impute a portion of an individual's decision rule is a dubious exercise at best.

results of the conditional logit model suggest that *all* voters were concerned with candidate positions on ideology, government services, and jobs vs. the environment, while *no* voters were concerned with candidate positions on government jobs or government aid to African-Americans. It is doubtful that any researcher believes that such homogeneity in issue salience exists in the American electorate, yet we are unable to determine how much heterogeneity exists in issue weights because this model assumes it away. Figure 5.2 represents this incomplete picture of the 1996 election provided by conditional logit. We can categorize issues by average salience (the columns), but we are unable to determine if there is heterogeneity in the weights placed on issues.

Figure 5.2 Here

The results of a random parameters logit model for the 1996 presidential election are presented below. For this model I assumed that issue weights were distributed normally across voters, and used 500 draws of β_i for each simulated maximum likelihood iteration. $\bar{\beta}$ represents the mean of these estimated distributions, while σ_β represents the standard deviation of these distributions.

Table 5.2 Here

First, note that the means of the distributions for general ideology, government services, and jobs vs. the environment are all estimated to be statistically significant. This indicates that the means of the distributions in random parameters logit give us the same information as the coefficients in conditional logit. The mean of the distribution of government aid to minorities is also estimated to be statistically different from zero; this could be due to bias in the conditional logit estimate due to heteroscedastic errors as discussed above. In any case, this estimate is not very different from the conditional logit estimate (which was significant at $p = 0.13$). Further, note that the coefficients of the random parameters logit are always larger in magnitude than the corresponding conditional logit estimates. This is because the scale of the coefficients in logit models is determined by the normalization of the unobserved portion of utility ε. In random parameters logit some of the utility that is unobserved in the conditional logit (and thus captured in ε) is captured by the standard deviation terms. Thus random parameters logit is scaled to an unobserved portion of utility that has less variance than that for conditional logit, leading the random parameters logit coefficients to be scaled up relative to the conditional logit coefficients.

Second, a statistically significant degree of heterogeneity was estimated for three of the five issues examined here (ideology, government jobs, and jobs vs. the environment). Since the estimated standard deviations of the distributions of issue weights are statistically different from zero, this indicates that all voters did not place the same weight on these issues when voting. A more complete picture of the impact of issues on vote choice in the 1996 presidential election thus emerges, as pictured in figure 5.3.

Figure 5.3 Here

The estimated impact of these issues on vote choice can be broken down into four categories. The first, represented by the top left square in figure 5.3, is *non-salient and homogeneous.* These issues had no impact on average on vote choice, and there was little variation around this low weight across voters. These types of issues might best be described as "non-issues." No issues in this analysis of the 1996 election fell into this category. The second category is *non-salient but heterogeneous*, and is represented by the top right square in figure 5.3. These issues had no impact on vote choice on average, but there was a great deal of variance in the weight placed on this issue. For a small subset of voters these issues did carry weight in their vote choice. The issue of governmental assistance in finding work fell into this category for the 1996 election. The third, represented by the bottom left square in figure 5.3, is *salient* *and homogeneous*, which includes government services and aid to African-Americans. These issues were important to voters on average, and there was not a significant degree of variation in the weights that individuals placed on these issues. Thus we can regard these issues as key issues in the 1996 election. Since welfare reform and the fate of affirmative action were salient topics in the media at that time, it seems likely that these issues were prominent for many voters in the 1996 election. Finally, the fourth category, represented by the bottom right square in figure 5.3, is *salient but heterogeneous*, and includes ideology and jobs vs. the environment. It is not hard to imagine that some voters might find environmental concerns salient while others would not, but this result for ideology seems puzzling, since ideology often emerges as the strongest predictor of vote choice in spatial models of voting that assume homogeneity. A possible source of this heterogeneity in ideology weights is discussed in the next section.

5.3 Discussion

One possible source of the heterogeneity in the weight placed on ideology is the unusual electoral context of 1996. 1996 was an unusual election in terms of ideology for two reasons. First, there was a third party candidate, H. Ross Perot. Although conservative leaning, he did not fit neatly into the ideological spectrum many voters were familiar with from two party races. Second, Clinton pursued a strategy of moderation in 1996, moving to centrist positions on many issues and away from liberal positions. These factors may have led many voters to abandon ideology as a criterion for their vote decision as the distinctions between the candidates grew less clear.

Another possible source of this heterogeneity is the relative cost of using ideology as a voting criteria for different segments of the population. Many researchers in political science have documented the higher cost of using issues when voting (especially an abstract concept such as ideology) for certain subsets of the population, such as the less educated (Alvarez 1997; Bartels 1986; Converse 1964; Popkin 1991). In this case individuals with lower costs of information would be able to place more weight on ideology, while those with higher costs of information would choose candidates on the basis of other factors.

One way to determine if it is electoral context or costs of information that determine heterogeneity in the use of ideology is to compare the estimates from 1996 to results from a more "typical" year. I compared the 1996 results to the results from a random parameters logit model estimated for the 1988 presidential election. 1988 was a much different year than 1996 in terms of electoral context. This was a two candidate race, and the ideology of the candidates was much more prominent in the media and more clearly differentiable between the candidates. Much of the election strategy pursued by Bush in this election revolved around depicting Dukakis as too liberal for the American people ("a card-carrying member of the ACLU"). However, we do not expect there to be dramatic differences in the relative costs of information to different subgroups in the electorate between 1988 and 1996. Thus, a comparison of the results between 1988 and 1996 could shed some light on the source of heterogeneity in the weight placed on ideology.

The results of a random parameters logit model for the 1988 presidential election campaign are presented below. The data is from the 1988 National Election Study, coded in the same way as the data from 1996.

Table 5.3 Here

Of the five issues examined for 1988, four had means statistically different from zero, including ideology; two had standard deviations statistically different from zero. However, the standard deviation of the distribution of ideology weights was not statistically significant. This means than in 1988, unlike 1996, ideology was a key issue in the election. To demonstrate the difference in the impact of ideology in 1988 versus 1996 I calculated first differences in both years for the average voter in the sample. To do this I set the independent variables to their mean or modal values (with the exception of partisan identification), and multiplied these values by the estimated coefficients for the independent variables in each year.[3] This gives the probability of the average voter voting for each candidate. Three different weights for ideology were employed in each graph; the mean weight placed on ideology, one standard deviation above the mean, and one standard deviation below the mean. Thus I calculate the probability that the average voter supports each candidate if he placed little weight, average weight, or a great deal of weight on ideology relative to all voters. Figures 5.4 and 5.5 below graph the probability that the average voter would vote for the Democratic candidate (Dukakis in 1988, Clinton in 1996) as the candidate moves across the ideology scale.

Figures 5.4 And 5.5 Here

There are clear differences between figure 5.4 (1996) and figure 5.5 (1988). In figure 5.4 there are large differences in the impact of Clinton's ideological position on vote choice between the "low," "average," and "high" weight cases. For some individuals the ideological position of Clinton had a large impact on vote choice; for others it had little to no effect. However, in figure 5.5 there is little difference in the impact of the ideological position of Dukakis on the vote choice of the average voter between the "low" weight case, the "average" weight case, and the "high" weight case. This suggests that electoral context is responsible for much of the heterogeneity observed in 1996, as the relative costs of information to different subgroups of voters likely did not change much between 1988 and 1996.

[3]Setting all independent variables to their means or modes yielded a male Republican between the ages of 30 and 44. Changing partisan identification to Democrat from Republican shifts the probability curves in figures 4 and 5 upwards for ease of interpretation.

Figure 5.1: Heterogeneity and Salience

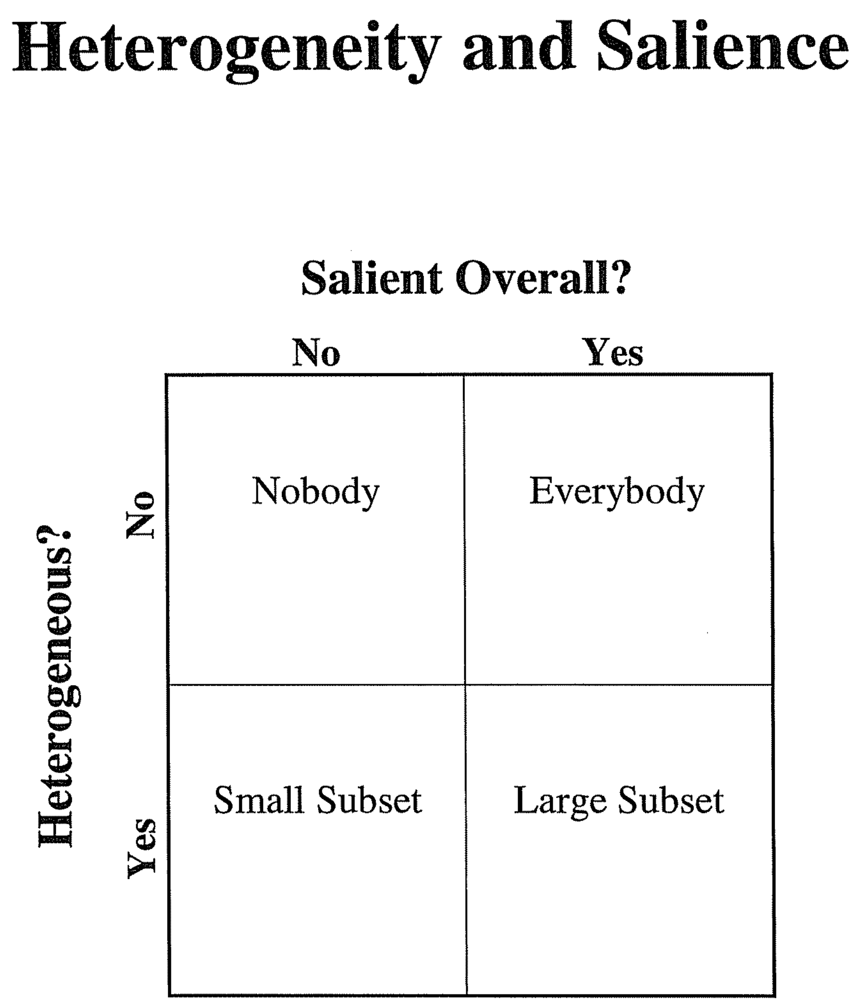


Table 5.1: Conditional Logit, 1996

Independent Variables	Coefficients for Clinton	Coefficients for Dole
Ideology	-0.18**	
	(0.03)	
Government Services	-0.11**	
	(0.03)	
Government Jobs	-0.02	
	(0.02)	
Gov't Help Blacks	-0.03	
	(0.02)	
Jobs vs. Environment	-0.09**	
	(0.04)	
Gender	0.03	0.15
	(0.31)	(0.32)
Age 18-29	-0.98	-0.90
	(0.61)	(0.64)
Age 30-44	-1.22**	-0.78*
	(0.42)	(0.42)
Age 45-59	-0.41	-0.24
	(0.48)	(0.49)
Democrat	2.02**	-1.07*
	(0.63)	(0.59)
Republican	1.41**	1.62**
	(0.66)	(0.56)
Constant	0.58	1.00
	(0.70)	(0.64)
N	717	
Log-likelihood	-366.27	

Note: Perot coefficients normalized to zero. Standard errors in parentheses. ** indicates significance at the 0.05 level, * indicates significance at the 0.10 level.

Figure 5.2: Heterogeneity and Salience, Conditional Logit

Heterogeneity and Salience, Conditional Logit

		Salient Overall?	
		No	**Yes**
Heterogeneous?	**No**	Government Jobs Gov't Aid to Blacks	Ideology Government Services Jobs vs. Environment
	Yes	?	?

Table 5.2: Random Parameters Logit, 1996

Independent Variables		Coefficients for Clinton	Coefficients for Dole
Ideology:	$\bar{\beta}$	-0.24**	
		(0.06)	
	σ_β	0.13*	
		(0.10)	
Government Services:	$\bar{\beta}$	-0.14**	
		(0.04)	
	σ_β	0.04	
		(0.13)	
Government Jobs:	$\bar{\beta}$	-0.03	
		(0.03)	
	σ_β	0.14**	
		(0.07)	
Gov't Help Blacks:	$\bar{\beta}$	-0.04*	
		(0.03)	
	σ_β	0.05	
		(0.06)	
Jobs vs. Environment:	$\bar{\beta}$	-0.12**	
		(0.06)	
	σ_β	0.18*	
		(0.13)	
Gender		0.05	0.13
		(0.35)	(0.33)
Age 18-29		-1.27**	-0.96*
		(0.70)	(0.67)
Age 30-44		-1.38**	-0.80**
		(0.48)	(0.45)
Age 45-59		-0.43	-0.27
		(0.54)	(0.51)
Democrat		2.46**	-1.18**
		(0.80)	(0.64)
Republican		1.38**	1.61**
		(0.76)	(0.61)
Constant		0.50	1.08*
		(0.81)	(0.68)
N		717	
Log-likelihood		-364.02	

Note: $\bar{\beta}$ represents the mean and σ_β the standard deviation of the estimates of issue salience. Perot coefficients normalized to zero. Standard errors in parentheses. ** indicates significance at the 0.05 level, * indicates significance at the 0.10 level.

Figure 5.3: Heterogeneity and Salience, Random Parameters Logit

Heterogeneity and Salience, Random Parameters Logit

Salient Overall?

Heterogeneous?	**No**	**Yes**
No		Government Services Gov't Aid to Blacks
Yes	Government Jobs	Ideology Jobs vs. Environment

Table 5.3: Random Parameters Logit, 1988

Independent Variable		
Ideology:	$\bar{\beta}$	-0.20**
		(0.06)
	σ_β	0.04
		(0.18)
Government Services:	$\bar{\beta}$	-0.12**
		(0.06)
	σ_β	0.21*
		(0.06)
Defense Spending:	$\bar{\beta}$	-0.12**
		(0.04)
	σ_β	0.00
		(0.11)
Gov't Insurance:	$\bar{\beta}$	-0.08**
		(0.03)
	σ_β	0.08
		(0.09)
Standard of Living:	$\bar{\beta}$	-0.05
		(0.05)
	σ_β	0.16**
		(0.10)
Gender		0.41
		(0.38)
Age 18-29		-0.17
		(0.59)
Age 30-44		-0.71
		(0.51)
Age 45-59		-0.39
		(0.54)
Democrat		1.801**
		(0.48)
Republican		-2.83**
		(0.63)
Constant		0.20
		(0.47)
N		508
Log-likelihood		-162.63

Note: $\bar{\beta}$ represents the mean and σ_β the standard deviation of the estimates of issue salience. Standard errors in parentheses. ** indicates significance at the 0.05 level, * indicates significance at the 0.10 level.

Figure 5.4: Heterogeneous Effect of Ideology on Probability of Supporting Clinton, 1996

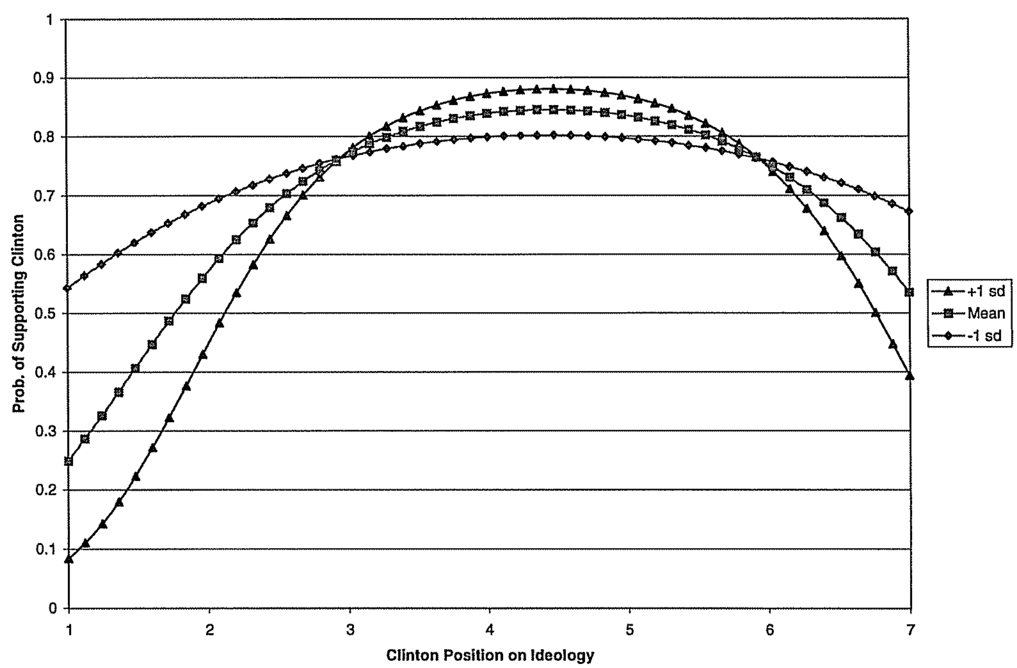
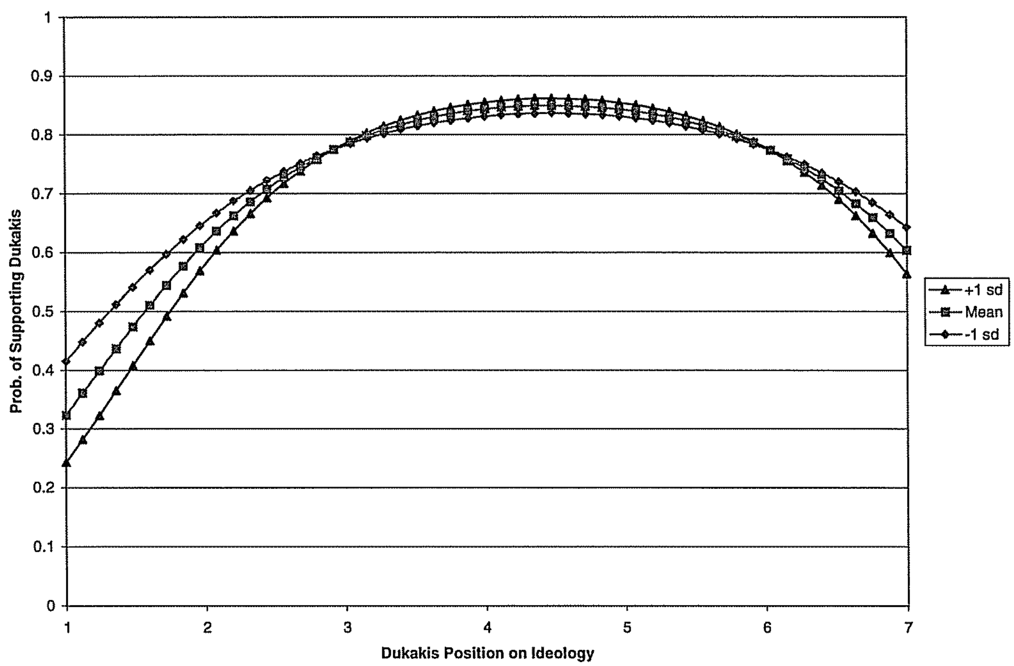


Figure 5.5: Heterogeneous Effect of Ideology on Probability of Supporting Dukakis, 1988



Chapter 6 Conclusions

There are two major substantive conclusions to draw from this work. First, heterogeneity in issue weights is widespread in the American electorate. Different voters have different concerns and statistical models that address the role of issues in elections without considering this are misleading both methodologically and substantively. Second, the heterogeneity in issue salience we observe is related to the costs of information that each voter faces. Individuals who are better able to gather and process information about politics are also more likely to consider the issue positions of candidates when voting. I will discuss each of these conclusions and their implications in turn.

The heterogeneity in the impact of issues on vote choice revealed here should come as no surprise. Most researchers would find the assertion that different voters care about different things uncontroversial. However, most empirical research in political science has ignored the tremendous diversity of the concerns of the American electorate, instead choosing to focus on the effect of candidate issue positions on the aggregate electoral outcome. Models of this type do not tell us much about individual voter behavior. This was demonstrated in Chapter 2. Even when I corrected aggregate estimates of issue salience for voter uncertainty about candidate issue positions, the overall predictions of the model did not change significantly. In light of the obvious differences between certain and uncertain people in their use of the issue placement scales, the failure to find any differences in the use of issues through estimates of aggregate issue salience once uncertainty is taken into account underscores the need for models that address the heterogeneity that exists in issue weights. Chapters 4 and 5 do address this heterogeneity. Chapter 4 reveals clear differences across voters in the relationship between issue proximity and candidate preference. However, it is Chapter 5 that reveals with certainty the heterogeneity present in issue weights. Estimating standard deviations for issue weights through random parameters logit gives us a clear statistical test for heterogeneity in the impact of issues on vote choice. Thus I have great confidence that heterogeneity in issue weights exists, and must be studies in order to completely understand the role of candidate issue positions in voter behavior in the United States.

However, even models that concede that they paint an incomplete picture of voter behavior and instead attempt to estimate the "average" impact of an issue on vote choice are likely to be wrong. If heterogeneity in issue salience is correlated with voter issue positions, then any model which does not account for this will have biased coefficient estimates, and thus a misleading picture of the impact of issues on vote choice. Chapter 4 reveals that there *is* a correlation between an individual's issue position and the weight he or she places on an issue — exactly the situation that will render models that assume homogeneity misleading. Therefore, studying heterogeneity in issue salience has methodological as well as substantive advantages.

The source of heterogeneity in issue weights is also addressed in this work. Chapter 4 clearly reveals many of the differences across individuals in the weight they place on an issue can be traced to differences in their relative costs of information. Individuals who face lower costs of information are better able to gather and process information about the issue positions of candidates. This in turn is reflected in the greater weight they place on issues and the larger number of issues they find relevant when voting. Further, I am able to relate heterogeneity in issue weights to the information made available in political campaigns. Heterogeneity in issue salience increases when voters are presented with confusing or contradictory information. This is presented in Chapter 5, which examined the differing levels of heterogeneity in the weight placed on ideology in 1988 and 1996.

Much work still remains to be done before heterogeneity in the impact of issues on vote choice is completely understood. Although heterogeneity in issue salience clearly exists, I cannot accurately determine the source of the heterogeneity without the kind of datasets used in Chapter 4. A major advance in this line of research would be to specify the standard deviations of the issue weight distributions estimated in Chapter 5 as functions of variables thought to affect individual issue salience. The results from Chapter 4 suggest that the cost of information faced by each individual would be a good starting point. Further exploration of survey questions to determine issue salience is also necessary. Chapter 3 revealed that most survey questions that attempt to uncover issue weights are ineffective, but the unique question employed in the 1968 Comparative States Election Project appeared to uncover some salience effects. As an effective direct survey question would be the easiest way to examine heterogeneity in issue salience, research in this direction could prove to be valuable.

Finally, this work also has some implications for the political process in the United States. The costs of information to an individual plays a large role in determining if that individual will consider the issue positions of candidates when voting. Those voters who find political information to be costly are less likely to place weight on issues when determining candidate preference. This in turn has implications for candidate behavior in political campaigns. If candidates behave as we posit in the spatial model of voting, adjusting their issue positions to maximize their vote share, then this finding suggests that candidates will offer issue positions designed to appeal to those voters with low information costs, as these are the only voters for whom issue positions have an impact on vote choice. As these voters are primarily well-educated, male, and white, this suggests that candidates have incentives to take positions on issues that might systematically disadvantage certain segments of the American electorate. The serious nature of this implication underscores the importance of understanding heterogeneity in the impact of issues on vote choice and its source. A complete understanding of American politics is not possible without an understanding of the differences between its most basic elements, the voters.

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