

POLITICAL GROUND TRUTH: HOW
PERSONAL ISSUE EXPERIENCE COUNTERS
PARTISAN BIASES

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Abstract

Partisan attachments create pervasive bias in the way citizens process information. Political scientists, psychologists, and recently neuroscientists find that people will believe nearly anything if a favored politician espouses the view. Yet, even though partisan affiliation is one of the most, if not the most, stable political attitudes, large segments of the public switch their vote choice from one party to the other between elections or split their tickets within a single election. This dissertation examines one explanation for shifting political views: personal experience with specific issues.

Campaigns work to attract more support, but partisan biases hinder their efforts when predispositions lead voters to doubt statements made by disfavored politicians. This dissertation explores the theory that campaigns can successfully target voters who have experience on a particular political issue. The voter will use her independent knowledge on the topic to judge, or “ground truth,” the politician’s views; if the voter and the politician agree, the voter will hold the candidate in higher esteem. With the advent of massive campaign databases of information on voters, campaigns are now able to identify these critical voter-issue linkages.

The Personal Experience Model explores why personal experience plays such a crucial role in political judgments. This formal model is an extension of Zaller’s Receive-Accept-Sample model. The theory behind the Personal Experience Model is presented, related to existing theories, and supported by empirical evidence. Observational data from the 2000 presidential campaign, two survey experiments, and two field experiments all support the model’s hypotheses. Finally, the strategic implications for campaigns, and the normative implications for democracy, are considered.

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Chapter 1

Introduction

Prominent research in political science (Campbell *et al.*, 1960; Bartels, 2002) emphasizes the long-lasting attachments voters have to political parties. Yet large portions of the electorate switch parties from election to election (Key, 1968) or split their ticket within one election (Fiorina, 1996). These defections are often attributed to the preferences of voters relative to the candidates (Downs, 1957; Enelow and Hinich, 1984; Carmines and Stimson, 1990); the debate over the relative effects of partisan identification versus issue opinion continues in recent research (Ansolabehere *et al.*, 2008). This dissertation synthesizes the arguments from both schools of thought, demonstrating how party identification and issue opinions interact to form individuals' political judgments. To provide observable predictions of the theory, the model and the evidence presented highlight the role of personal experience in political evaluations.

Two recent anecdotes illustrate this connection. From the 2004 to the 2006 elec-

tions, the percentage of Hispanics identifying as Democrats jumped by 15 percentage points (from 43% to 58%), while non-Hispanics showed no increase in their inclination to be identified as Democrats.¹ Hispanics' responses to another question in the exit poll shed light on the underlying reason for the massive movement: 37% of Latinos indicated that the issue of "illegal immigration" was "extremely important" in their voting decision (compared to only 29% of the non-Latino population). While immigration policies might not personally affect these voters (as they were already citizens), their involvement in the Hispanic community most likely gave them first-hand experience with the immigration issue. And despite illegal immigration falling off as a key concern in 2008, this trend of Hispanics favoring the Democrats continued in the 2008 election. As measured by the National Exit Poll, Obama garnered 67% of the Hispanic vote, compared to 53% for Kerry.

As Hispanics were flocking to the Democratic party, active duty military personnel were leaving the Republican party in droves. A 2004 mail survey of subscribers to *Military Times* found that 60% of active duty personnel identified as Republicans. The same survey in 2006 found that this percentage had dropped to 46%. Republican affiliation among the electorate at large (as measured by exit polls) dropped only 1.5 percentage points over these two years. Almost assuredly, the wars in Iraq and Afghanistan had a profound effect on the political views of the military. In 2008, Obama outperformed Kerry among the active military and veterans despite the facts that both Kerry and McCain—Obama's opponent—were veterans.

This dissertation argues that an individual's political allegiance is likely to shift

¹Source: National Exit Polls

when the political parties take identifiable positions on issues with which the individual has significant personal experience. When a large group of people have experience with a prominent issue (e.g., Hispanics and immigration, the military and the Iraq War), substantial changes can occur in the political landscape. Campaigns can use recent technological advances to identify (i.e., microtarget) the segments of the population that have experience with certain issues and that thus may be ripe for a political change of heart.

Generally, an individual's partisan bias weighs heavily on her political decision-making process as she adopts the positions of her party's elites and does not adjust her political worldview.² A telling example of this lack of critical thinking is provided by an experiment performed by neuroscientists on partisans during the 2004 election (Westen *et al.*, 2006). Subjects were presented with contradictory statements by George W. Bush and John Kerry. For example, the subject saw Kerry making two statements: one in 1996 that Congress had to consider raising the retirement age to save Social Security, and a second in 2004 that he would never consider raising the retirement age. When asked whether the candidates' statements were internally inconsistent, partisans were quick to pass judgment on the other party's nominee but not their own. In fact, when evaluating their own party's nominee, a sector of partisans' brains that dealt with reward (ventral striatum) showed significant activity. Not only did partisans seek to diminish displeasure by explaining away uncomfortable facts, but their brains actively sought positive reinforcement.

The brain's attempt to diminish displeasure and seek positive reinforcement is

²Throughout this dissertation the female pronoun is used to identify an individual voter. The male pronoun is used to identify an individual candidate.

the neurological basis for humans' preference for obtaining conclusions that are consistent with their prior beliefs—a process psychologists label “motivated reasoning” by psychologists (Lord *et al.*, 1979). When citizens fall prey to this psychological process in the political arena (Lodge and Taber, 2000), large partisan biases are seen. For instance, among Republicans in 1996, twice as many thought the deficit had increased during Clinton's first term as thought it had decreased (Achen and Bartels, 2006). In fact, the deficit had fallen dramatically, by over 90%.

These partisan biases help keep party affiliation more stable over time than political issues (Ansolabehere *et al.*, 2008). The public takes cues from like-minded elites and adopts those positions on issues (Gilens and Murakawa, 2002). For instance, during the 2000 campaign, Democrats adopted the anti-privatization position espoused by Gore while Republicans adopted the privatization position espoused by Bush (Richard Johnston, 2004). The exception, as detailed in Chapter 3, was older Americans, who were more likely to stay consistent in their view (which was, more often than not, anti-privatization). This dissertation hypothesizes, and demonstrates with data from observational data, survey experiments, and field experiments, that seniors' personal experience with the Social Security system moderated their motivated reasoning and cue-taking. Further, personal experience with an issue enables voters to judge politicians on this issue and can counter partisan biases that would usually hold.

Personal experience is defined as interaction with a political issue. The key feature of personal experiences that they enable voters to have stable opinions on political issues independent of their political predispositions. Without these experiences, vot-

ers are reliant on political elites to point them in the right direction. This distinction is crucial: if politicians find it more expedient to switch sides on an issue (e.g., the legitimacy of judicial filibuster) and the voters follow, then the voters' opinions can hardly be considered "stable."

The theory presented here is premised on the idea that experience with an issue induces stable opinions. Issue interactions often produce points of reference, or to use the political science term, "considerations," on which an individual can base her opinions. Because these considerations are generated through an individual's personal interactions, they are likely to be trusted even if they go against the person's preconceptions (i.e., "seeing is believing"). Thus, personal experiences enable individuals to generate stable issue opinions independent of their overall political views.

This dissertation elaborates this personal experience-issue opinion connection, derives hypotheses, provides evidence in support of the hypotheses, and discusses the hypotheses' implications. Chapter 2 presents the Personal Experience Model, a learning model based on Zaller's (1992) Receive-Accept-Sample (RAS) model that generates two main hypotheses. First, if political elites start debating an issue, citizens with experience judge politicians on the issue, comparing their experience to the politician's argument. In effect, an individual "ground truths" an elite's views by evaluating how consistent the elite's arguments are with the voter's first-hand experience.

The second main hypothesis is that voters with experience shift their issue opinion less in the direction of a politician's appeal than do individuals without experience.

Simulations illustrate the model at work in the campaign setting. Existing research is shown to be consistent with the Personal Experience Model, noting how the foundations of the model differ from research on issue publics and self-interest.

Chapter 3 highlights two observational cases from the 2000 presidential campaign that illustrate the model in action: Social Security privatization and the Patient's Bill of Rights. Regarding the first issue, seniors, who have experience with Social Security, judged Bush and Gore more on privatization than did younger voters. Younger voters were more apt to adopt the position of their preferred candidate than were seniors. An analogous phenomenon occurs among voters insured by HMOs and the Patients' Bill of Rights.

Chapter 4 looks for the effects predicted by the Personal Experience Model in a survey experiment setting. Two Internet panel surveys, one of Princeton students ($n=273$) and one of the public nationwide ($n=391$), asked respondents about hypothetical candidates and real-world issues. Respondents were also queried about their experiences relating to these issues. The results are generally supportive of the Personal Experience Model's two main hypotheses but are noisy because of low n -sizes.

Chapter 5 develops a methodology for analyzing field experiments that identifies voters who are responsive to candidate appeals. Off-the-shelf non-parametric data-mining techniques are applied to both the treatment group and the control group. For each segment of the population, the difference between the estimated effect for the two treatment assignments is the treatment effect. Resource allocation algorithms are applied to these estimates to determine the optimal campaign strategy. The

method is general enough to be applicable in both non-partisan (i.e., get-out-the-vote) and partisan settings. Examples with experienced-voter segments demonstrate the power of this method and validate the candidate evaluation hypothesis of the Personal Experience Model.

With the evidence for the Personal Experience Model laid out, the final chapter explores the implications of the model for campaigns and democracy. In recent decades, campaigns and election-oriented organizations have expanded their capacity to capture political data to the point where both major parties have access to information about every voter nationwide. Commercial and census data supplement these database and provide even more knowledge about individuals. Rather than segment the population into distinct clusters (as campaigns used to do), campaign practitioners now assign a probability score for a certain trait (e.g., probability of being undecided) to each individual. This process, called “microtargeting”, is related to the Personal Experience Model because the technology behind microtargeting can be used to link voters to issues in a manner recommended by the model.

A game theoretical model explicates the situations in which a campaign should spend its money microtargeting voters rather than broadcasting its candidate’s position on an issue to all voters. In general, broadcasting is a gamble that may have large returns for a campaign, but more often may be useless or even backfire. Thus, campaigns that are behind in the polls find this risky strategy useful, while advantaged campaigns often prefer to microtarget.

The normative implications for democracy are mixed, depending on one’s perspective. The Personal Experience Model, combined with modern campaign tools,

increases the efficiency of microtargeting. As with many tools, these advancements may be used for positive or negative purposes. Information may be disseminated to the public in a more relevant fashion as voters are matched with issues they care about. The information gain is viewed as a positive for the democratic process. However, the increased party attachment that microtargeting produces in some segments of the public may lead individuals to accept the statements of political elites more easily even if those arguments are completely fabricated.

In sum, the Personal Experience Model explains a voter-issue linkage that limits the partisan bias that pervades the political arena. The micro-level model provides deeper understanding of the research on issue publics and self-interest. Campaigns can leverage the implications of the model to increase the impact and efficiency of their appeals.

Chapter 2

The Personal Experience Model

2.1 Theory and Hypotheses

As demonstrated by Hispanics and the military after the 2004 election, large segments of the population can be persuaded to change parties from one election to the next. However, most research on political persuasion does not account for these changes, especially when the changes are pronounced in specific groups. The Personal Experience Model seeks to address this discrepancy, at least among a subset of voter-issue interactions.

The so-called “Michigan model” (Campbell *et al.*, 1960) highlights the role of early-life events and relationships in the formation of long-standing partisan identification. Interactions with the political system at an early age form individuals’ partisan loyalties, which are dubbed the “unmoved mover” by Campbell *et al.*: “only an event of extraordinary intensity can arouse any significant part of the electorate

to the point that its established political loyalties are shaken” (Campbell *et al.*, 1960, p. 151).

The mechanism for stable partisanship has been elucidated over the years and scholars have reached a consensus. Consistent with the psychological concept of cognitive dissonance (Festinger, 1957), individuals are more likely to accept and process political information and assertions that are consistent with their current views. Prominent research (Zaller, 1992; Bartels, 2002; Taber and Lodge, 2006) applies this concept to politics, formalizing the phenomenon and demonstrating how the predictions are consistent with observations of public political opinions. Dozens of micro studies, including some from neuroscience (Knutson *et al.*, 2006), have verified that partisan identification skews individuals’ perceptions of the world in a self-confirming manner, leading to hardened political opinions.

One emblematic explanation for the micro-foundations of this “partisan bias” is offered by Lupia and McCubbins’s (1998) model of persuasion. In this model, voters are persuaded by elites with both “perceived common interest” to the voter and “perceived knowledge” of the subject at hand. Listening to trusted politicians leads to further agreement between the voter and the elite (i.e., cue-taking, Gilens and Murakawa, 2002), and thus more perceived common interest. This positive feedback loop, or “cycle of partisan bias,” begs two questions. First, what is the origin of “perceived common interest?” Second, if politicians cannot persuade voters to cast a ballot for previously untrusted candidates or parties (i.e., those without perceived common interest), then why do some voters switch parties between elections or split their votes within an election?

The Michigan model clearly answers the first question with the notion that voters adopt the party identification of their parents and the social atmosphere in which they are raised. But the answer to the second question, change in party identification, is less clear: what is an “event of extraordinary intensity” (Campbell *et al.*, 1960) that can break the usually dominant role of party identification? The lack of theory on the determinants of party-switching has left the door open to other approaches.

Two large areas of work that explain a shifting electorate are retrospective voting and issue voting. Fiorina (1981) argues that voters are affected by how parties and candidates performed their governing duties while in power. Retrospective voting, especially on the economy, certainly plays a role in candidate and party evaluations (Mueller, 1970). However, these types of judgments should be relatively uniform across the populace, and do not account for heterogeneous movements, such as with Hispanics and the military after 2004.

A second answer to the vote-switching question is presented by scholars who analyze voters’ issue opinions. The Hotelling-Downs (Hotelling, 1929; Downs, 1957) model presents voters as rational actors who vote for the party (or candidate) that most closely matches their issue positions.¹ Downs’ uni-dimensional, one-valued utility is expanded into several issues of varying importance (or “salience”) by Enelow and Hinich (1984). Certain segments of the population altering their issue opinions or issue saliences could account for the observed shifts in the electorate’s political views. However, if voters cue-take from preferred politicians via the cycle of partisan

¹That voters are rational actors in formalized models such as Hotelling-Downs and Fiorina does not rule out the possibility that voters are rational when succumbing to partisan bias. It may be rational to minimize the displeasure of believing two seemingly contradictory ideas.

bias, then changes in issue opinion will only polarize the electorate. No shifts from one party to the other, or one candidate to the other, will be observed.

Two other subjects discussed in the literature, self-interest (e.g., Sears and Funk, 1990) and issue publics (e.g., Krosnick, 1990), would predict heterogeneous shifts in public opinion. While both the model presented here and these theories emphasize voter-issue link, this dissertation distinguishes itself from existing research in the following two ways, and offers an alternative causal mechanism. First, in contrast to the research on self-interest, this dissertation incorporates cue-taking directly into a formal model. Second, it details the origins of voter-issue linkages, suggesting they are formed before an issue is politicized.

2.1.1 Psychological Model of Personal Experience and Issue Stability

A mechanism for breaking the cycle of partisan bias—which emphatically does not rule out other causes—is personal experience. Individuals create and strengthen political opinions through personal experience on a subset of the many issues that political elites must address. This subset of issues forms a benchmark against which to judge parties, candidates, and political elites, enabling an individual to develop a political worldview.

First, this chapter presents the psychological flows of political information, and then I develop a learning model that formalizes these flows. The flows of information are a superset of Zaller’s (1992) Receive-Accept-Sample (RAS) model, and I call my model the “Personal Experience Model.” Figure 2.1 presents a box-and-arrow

depiction of the Personal Experience Model.

A review of Zaller’s model is crucial for understanding the how the Personal Experience Model fits within the current political science literature. Under RAS, an individual incorporates information into a political opinion by first receiving the information. As noted by Downs (1957), individuals can either seek out this information or happen upon it accidentally. More politically attentive individuals are more likely to receive political information.

Next, individuals (either consciously or subconsciously) accept or reject a piece of political information based on their worldview. In Zaller’s words, “People tend to resist arguments that are inconsistent with their political predispositions” (p. 44). This accept/reject process, based on what I label an individual’s “worldview,” is the key for producing the stable partisan affiliation and partisan biases found by Campbell *et al.* (1960), Bartels (2002), and others. An individual’s worldview is an online aggregation of that person’s evaluations of important political figures, candidates, and parties. Even Zaller acknowledges that voters’ evaluations of other people (rather than issues) act more like an online model (p. 281).² If the argument (i.e., “consideration”) is accepted, then it is stored among all other considerations. Recently accepted (or “thought about”) considerations are most accessible to the individual.

Figure 2.1 depicts this relative availability of political arguments with a First-In-First-Out (FIFO) queue, a computer science concept. The first political considera-

²An alternative explanation is based on cognitive dissonance rather than source evaluation (or credibility). In this case, voters accept only considerations that are consistent with their existing issue beliefs. However, numerous studies find that voters often switch their position to adopt the stance of their favored candidate. See discussions in Sections 2.2.3 and 3.2.2.

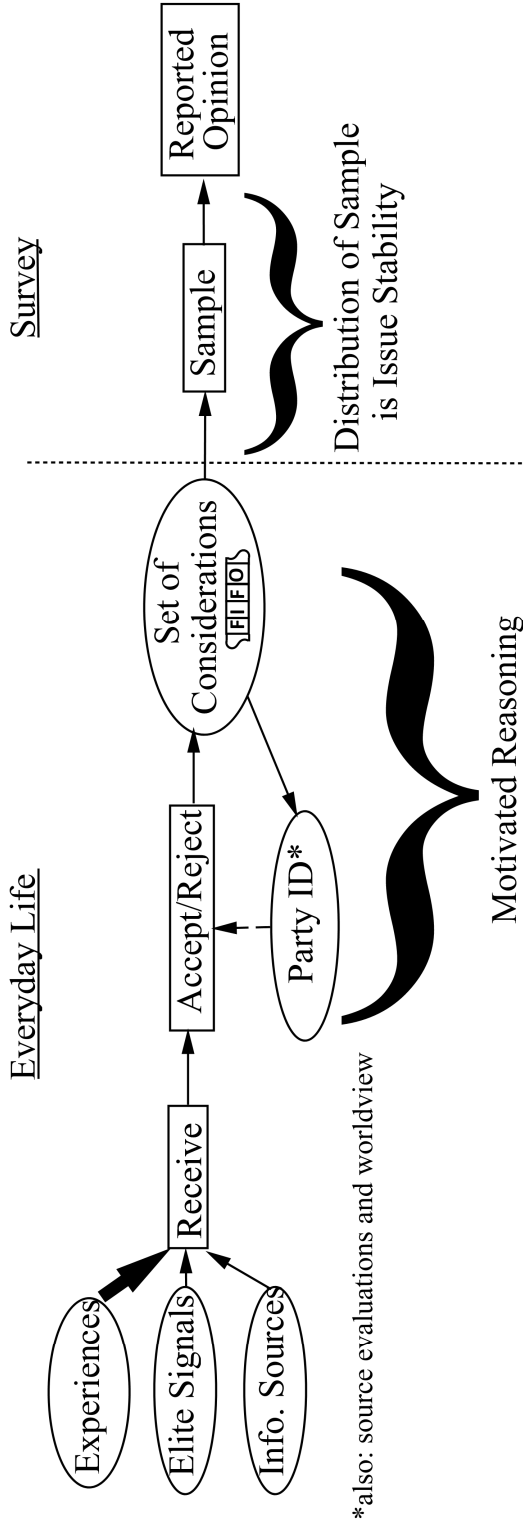


Figure 2.1: The flow of political information through the mind of an individual, based on Zaller's (1992) Receive-Accept-Sample (RAS) model. Rectangles represent ephemeral processes that information flows through; ovals represent stable stores of information (or sources of information). Solid arrows indicate information flow; the one dashed arrow indicates a cause and effect (i.e., partisan identification and worldview affect which pieces of information are accepted or rejected). The FIFO symbol under "Set of Considerations" represents the computer science term "First In-First Out" queue and is a simplistic representation of the human brain's memory capability.

tion heard (if never thought of again) works its way down to the end of the queue (i.e., human memory) until it is completely forgotten (or at least, inaccessible). Considerations already in memory that are primed or re-accepted move to the front of the queue and become more accessible. While some political psychologists (Weston, 2007) would take issue with this simplistic view of the brain, it provides a useful framework.

When an individual is asked, either by a survey interviewer or a friend, to report her issue opinion, Zaller asserts that the accessible considerations relevant to this issue are sampled, and the average of these considerations is reported. Opinion stability can be defined as the inverse of the variance of repeated sample averages of considerations. Individuals often appear to have unstable opinions about issues (Converse, 1964) because at any point in time very few considerations about an issue may be accessible and the accessible considerations may depend on seemingly random life occurrences (e.g., radio report, water cooler conversation). The model predicts that this instability will be especially acute when an individual rarely receives and accepts arguments about that issue and further does not perceive a link between her political worldview and considerations about the issue. Stability increases when issues are averaged together, since a large set of considerations is relevant. This prediction is consistent with recent evidence from surveys (Ansolabehere *et al.*, 2008).

Although Zaller contrasts his theory with an online model (Lodge *et al.*, 1989), the differences between the two perspectives are not significant for the purposes of this dissertation.³ While memory-based and online models differ in the causal mech-

³In the online framework, voters maintain and update an aggregate opinion of issues, people, and information sources; voters do not remember the reasons underlying such opinions.

anisms of political opinions, the outcomes are generally not in conflict. Specifically, Lodge *et al.* (1989) argue that memories cannot be sampled and evaluated in an unbiased manner, but Zaller’s 1992 Resistance Axiom incorporates this bias. Zaller argues that for political issue opinions (as opposed to evaluations of politicians), the online model does not account for the wide variance in people’s opinions over time. However, the online model never specifies how prone the current evaluation is to change. Also, despite Zaller’s “top of the head” language (p. 49), he allows the full history of consideration to be sampled (p. 121). This time-invariant weighting of considerations compares favorably to the online model’s integration of all considerations over time into one evaluation. Importantly, both models (Zaller, 1992; Lodge and Taber, 2000) hypothesize motivated reasoning, in which individuals’ conclusions are biased by their preconceptions. Thus, while these two models disagree on the inner workings of voters’ minds, they share fairly consistent predictions.

The theory outlined here is an extension of Zaller’s model rather than the online model for two reasons. First, Zaller’s RAS model, especially the “accept” step, is consistent with the cycle of partisan bias. Second, in stark contrast to the online model, Zaller’s “sample” step implies that reported political judgements are drawn from random variables.

This sampling also differentiates Zaller’s model from a Bayesian updating process (e.g., Gerber and Green, 1998). If voters were pure Bayesians, they would report a summary statistic of their beliefs when queried on a survey. But as early psychological experiments (Grant *et al.*, 1951) persuasively demonstrate, individuals draw from their belief distribution when reporting opinions. For instance, in Grant *et al.*

(1951), laboratory participants were asked whether a light bulb would turn on or not. They quickly learned (in one set of trials) that the light bulb would turn on 75% of the time, but instead of maximizing their probability of being correct and always predicting the light would turn on, 25% of the time they predicted the light would not turn on.⁴ Given this empirical evidence, the Personal Experience Model assumes that individuals draw from top-of-the-head considerations and are not perfect Bayesians.

However, Bayes rule does provide a convenient mathematical way to combine new data into a distribution. Bayes rule is therefore referenced when calculating the mean of posterior distributions of considerations. Certainly, these theoretically determined distributions are subject to human fallacies, such as forgetting information (i.e., considerations) at variable rates. These errors are unmodeled and do not alter the basic hypotheses.

2.1.2 Extending Zaller by Introducing Personal Experience

To answer the questions of where partisan biases originate and why certain segments of the population shift partisan loyalties, Zaller’s model is extended by adding personal experience as a source of political considerations. In the Personal Experience Model, a steady flow of experiences related to a political issue leads to a relatively

⁴By always predicting that the light bulb will turn on, a perfect Bayesian would be correct 75% of the time. Zalleresque individuals, sampling from a set of considerations of previous light bulb results (the FIFO queue), would predict the bulb to turn on 75% of the time (and be correct 62.5% of the time). In the experiments, across the entire participant group, 75% of predictions were for the bulb to be on, meaning that there was not a mix of Bayesians and Zalleresque individuals, but only Zalleresque individuals in the population. These Zaller-following individuals would have to sample only one consideration to make the “on” prediction 75% of the time. Zaller admits that sampling one consideration is possible (p. 49).

constant set of accessible considerations, and hence a stable political opinion. That claim is formally stated as a postulate below; it is one of the four predictions of the Personal Experience Model, along with two main hypotheses and one corollary.

“Personal experience” is defined as interacting with a political issue, whether this interaction is sought after (e.g., being an environmental activist) or merely incidental (e.g., being retired and receiving Social Security checks). Frequent conversations about political issues or major life events also count as personal experiences. The key factors for determining whether an interaction is considered personal experience in this context are (1) the individual plays an active role, and (2) the interaction produces an increased flow of received considerations on the issue. Examples include owning a gun, immigrating, having an abortion, being in an occupation that deals with a political issue (e.g., doctor, teacher), and discussing politics with friends who have a large stake in a political outcome (e.g., gays and equal rights). An “active role” need not be a large role: cashing a Social Security check counts as active (though barely), but listening to political news does not.

The first criterion, that the individual plays an active role, is necessary to lessen the degree to which partisan filters affect which information is received. Considerations as a result of personal experience are more likely to be believed and accepted, even if they contradict preconceptions. Certainly, there are exceptions to the rule, in which prior beliefs or norms dominate people’s first-hand perceptions of the world (Sherif, 1936). However, experiments demonstrate that even young children understand the concept of “seeing is believing” (Mitchella *et al.*, 1997).

Receiving information from elite sources, such as the media, fails to meet this

criterion because (1) a person’s political worldview may affect which news sources she trusts and (2) news reports often present political parties commenting on current events. Zaller cites a journalist stating, “we don’t deal in facts, but in attributed opinions” (page 315). News information flows through partisan filters and cue-taking continues unabated.

The second criterion for political experience, an increased flow of considerations (represented by the thick arrow in Figure 2.1), leads to stable considerations in three ways. First, the experience is often based on repeat interactions or one important event, so the distribution of considerations is narrow. Second, experience leads individuals to process these considerations in a consistent manner (Wood, 1982). Third, the increased frequency of acceptance of considerations leads to a larger number of political arguments being accessible. Thus, when the set of considerations of an individual with issue experience is sampled (e.g., by a survey interviewer), a consistent set of considerations is accessible and the resulting opinion distribution has a small variance.

That some political experiences consist of interactions of a single type causes the resulting considerations to be narrow in scope. For instance, consider a teacher who works at a crumbling school. Experiences generated from this interaction are likely to indicate that public schools need more funding. The single-sided considerations generated by this personal experience contrast with the two-sided considerations presented in news reports about school budgets or vouchers.

Not only do some individuals receive similar experiences over time, but the similar situations in which they have these interactions are most likely to be stable. Consider

a new nurse in the health care field. As the nurse learns the ins and outs of the hospital at which she works, she develops a better understanding of the successes and failures of the health care system. A nurse and a patient who both witness a failure of the health care bureaucracy may reach different conclusions about the system. In fact, the patient might not be able to accurately identify the underlying problem. Individuals with repeating personal experiences are better able to generate considerations from interactions.

The result of repeated, narrow experiences being processed under similar circumstances leads to a locus of considerations, often on one side of the issue. Since the individual is experiencing these considerations herself (rather than receiving the information from another party), the considerations are likely to be accepted. While these considerations may not be explicitly political, current events, from time to time, may encompass the issues that a voter deals with on a daily basis.⁵ Consequently, considerations generated by experience are likely to be sampled when the issue is explicitly raised by a politician or a survey interviewer.⁶ The output of Zaller's model under repeated experiences is a stable (though not necessarily extreme) political opinion.

Stability Postulate: *Individuals who have experience with an otherwise political issue in their non-political lives will have more stable opinions on the issue.*

The three components of the second criterion are not individually necessary for

⁵Zaller's 1992, Chapter 4 example of a teacher who realizes schools' need for funding yet is confused about the Federal budget is an example of considerations generated through personal experience that are not political in nature

⁶Similar conceptions of repeated interactions are present in advertising literature, which emphasizes that repeating pictures or phrases affect future actions (Sawyer, 1973).

the Stability Postulate to hold. For instance, the relationship between experience and stability holds regardless of whether the experiences received are ideologically one-sided or two-sided. In the former case, where the voter's considerations are all on one side of the ideological spectrum (e.g., owning a gun and wanting to keep it for hunting), the process of developing a stable opinion is straightforward. However, the personal experience of the nurse dealing with the health care system might lead her to understand both sides of the ideological debate. In this case, the desire to hold a consistent worldview (the mechanism behind cognitive dissonance) might lead the nurse to develop a nuanced view of health care policy.

As detailed in Section 2.2.2, studies demonstrate that personal experience often leads voters to develop a more sophisticated approach to the issue in question. The key feature of personal experience is the heightened flow of received and accepted political considerations that are independent of political predispositions.

A second set of circumstances in which personal experience may lead to stable issue opinion without the effects of the three sub-criterion occurs when an individual experiences by a single, life-altering incident. After an experience, such as having an abortion or being the victim of a violent crime, the voter will carry considerations generated by the experience, which may never be forgotten and always be readily accessible. Thus, the experience has the same effect of the first and third sub-criterion—narrow, frequent interactions—in that the same considerations are always accessible when touched upon by the politics events.

Returning to Zaller (1992), this stability framework is referenced when he discusses attitude change (Chapter 7). When an individual receives political communi-

cation on an issue, she combines this new information with existing considerations. If the existing considerations carry a large weight relative to the new information, then the new information will have little impact on the reported opinion. The next section further develops this idea using a learning model, which will demonstrate why issue stability is crucial in the arena of voter persuasion.

2.1.3 Learning Model: Issue Positions

Following the lead of Achen and Bartels (2006), the Personal Experience Model represented in Figure 2.1 can be formalized using a learning model. In its simplest form, the model includes one voter, one issue, and one candidate.⁷ The model has two periods: before and after the candidate sends a signal (i.e., political communication) on the issue. Prior to receiving a candidate’s signal, the voter has a distribution of Zalleresque considerations about the issue, centered at δ_1 . This opinion has a precision (Bartels, 1993), τ_1^2 , which, if the Stability Postulate is correct, increases with personal experience.⁸ For simplicity, I assume that this prior is normally distributed; hence, in period 1, the voter’s issue position, x_1 , is the distribution,

$$x_1 \sim \mathcal{N}(\delta_1, \frac{1}{\tau_1^2}). \quad (2.1)$$

At the end of period 1, a candidate announces a position, γ , on the issue. Not all

⁷For clarity, I drop the usual subscript i to indicate a single voter.

⁸Instead of modeling stability in terms of variance, I use precision (the inverse of variance) because precision more closely aligns with the concepts of the model.

signals are created equal. The persuadability (ψ^2) of the candidate’s message (i.e., signal) depends on political factors such as how forcefully the candidate argues for the position and whether voters consider the position “cheap talk.”

Voters update their beliefs about the best policy by adding the candidate’s consideration to the original distribution.⁹ To avoid discretization of the posterior belief, I model the candidate’s announcement as a normal curve centered on γ and with precision ψ^2 . The voter’s period 2 issue opinion is a mixture distribution with a mean and a variance of

$$\mathbb{E}[x_2] = \frac{\delta_1 \tau_1^2 + \gamma \psi^2}{\tau_1^2 + \psi^2} \quad (2.2)$$

$$\text{Var}[x_2] = 1 + \frac{\tau_1^2 (\delta_1 - \mathbb{E}[x_2])^2 + \psi^2 (\gamma - \mathbb{E}[x_2])^2}{\tau_1^2 + \psi^2} \quad (2.3)$$

The posterior distribution (x_2) does not follow Bayesian updating because Zaller’s framework implies a mixture distribution (see discussion 2.1.1). However, both framework’s predict the same mean (Equation 2.2).

A concrete example of this model, albeit outside of the campaign framework, is Al Gore’s movie *An Inconvenient Truth*. Before the movie was released, the environment was not often a topic in America’s political discourse. Even liberals, while generally believing in environmentalism, may have held unstable beliefs about how many resources the United States should commit to stop global warming. This uncertainty is depicted by the wide distribution in the left panel of Figure 2.2. Gore’s

⁹In this instantiation of the model, voters are assumed to retain all considerations. Forgetfulness (i.e., the FIFO queue) is revisited in succeeding sections. However, forgetting period 1 considerations can be approximated by increasing ψ^2 , thus increasing the impact of the candidate signal.

documentary sends a strong signal to the left of the voter’s mean prior distribution (center panel). The voter accepts this signal and becomes a fervent environmentalist (right panel).

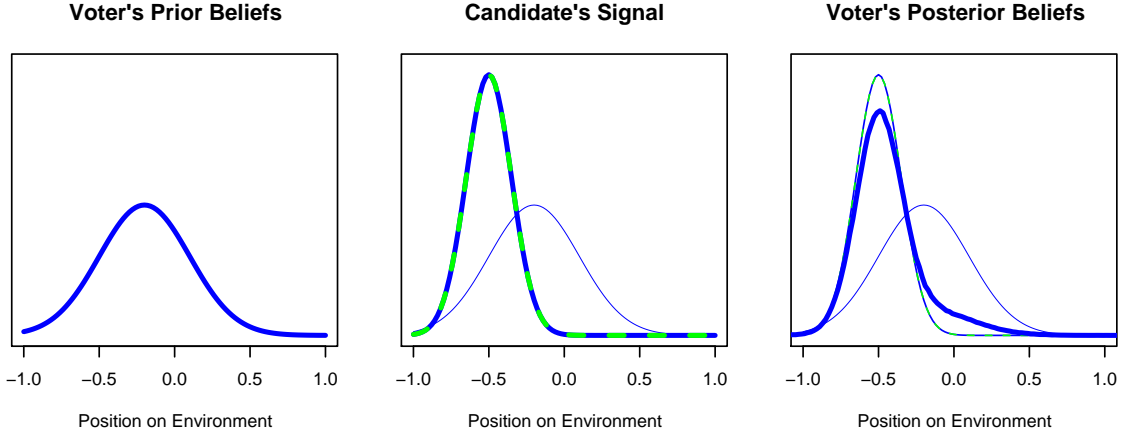


Figure 2.2: A hypothetical liberal’s response after viewing *An Inconvenient Truth*. The liberal’s initial position (left panel) is moved close to the position espoused by Gore (center panel), who is a favored politician. The right panel displays the resulting issue opinion distribution in bold. Parameters: $x_1 = -0.2$; $\tau_1^2 = 1/(0.3^2)$; $\gamma = -0.5$; $\psi^2 = 1/(0.15^2)$.

Brody and Page (1972) would label this interaction between the liberal citizen and Al Gore’s documentary “persuasion.” However, since the liberal knew little about environmentalism before viewing the documentary, she could not have thought critically about the subject. Instead, the liberal accepted the cue from Al Gore, with no ability to judge the quality of the arguments. Following other scholars (e.g. Gilens and Murakawa, 2002), I label the shift of opinion by the liberal as “cue-taking.” I reserve the term “persuasion” for circumstances akin to “central route processing” (Petty and Cacioppo, 1981), in which a voter’s issue opinion shifts based on critical

analysis of the current set of issue considerations.

Because most people go about their lives generally oblivious to many political issues, cue-taking is prevalent in politics. Campbell *et al.* (1960) emphasize a similar point when they note, “For many voters the details of the political landscape may be quite blurred until they are brought more into focus during the campaign period” (pp. 135-136). If the campaign environment induces cue-taking, then a straightforward application of the model predicts that campaigns with dueling messages should polarize public opinion when a new issue is introduced to the political landscape.

Consider a campaign environment in which both the Democratic and the Republican candidates provide opposing signals to two voters (also one Democrat and one Republican) about an issue. The voters accept only the signal from the candidate they trust more.¹⁰ If the voters have unstable opinions about the issue (i.e., little personal experience), then their opinions will polarize (Figure 2.3). This conclusion, supported by existing research (Ansolabehere *et al.*, 1994; Parker-Stephen, 2007), is crucial: when voters do not have experience on an issue and this issue is emphasized during the campaign, the electorate polarizes and individuals’ existing political worldviews are not altered.

Alternatively, if an individual has experience on an issue, signals from elites may fail to confirm the individual’s current worldview. Consider the following example of a campaign between two candidates of the major parties who are debating the issue of gun control. The Republican candidate has a moderate position, in contrast to the Democratic nominee’s more orthodox, left-wing view. Of the two voters analyzed in

¹⁰See Section 2.1.5 for a formalization of this statement.

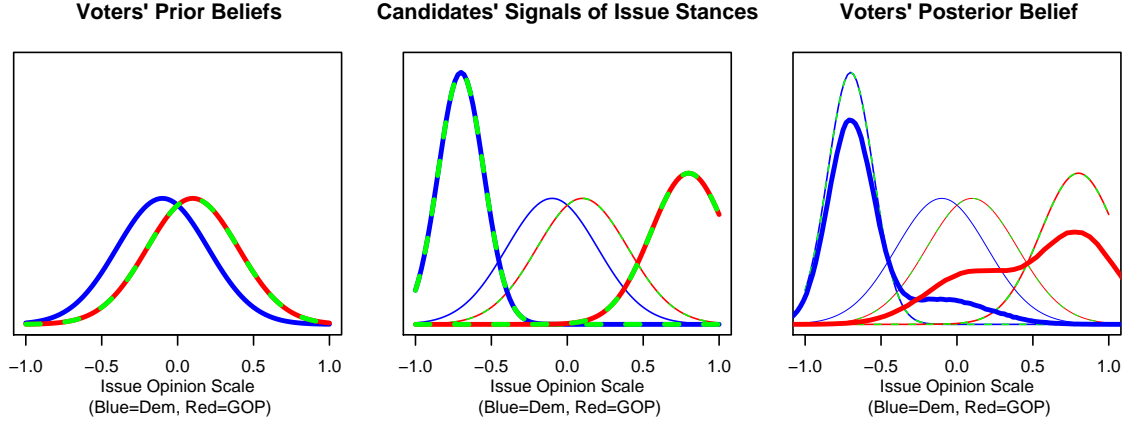


Figure 2.3: Issue polarization. When two opposing candidates send signals (center panel) to two moderate voters of different parties (left panel), the voters' opinions diverge in opposing directions (right panel). Democratic voter and candidate parameters: $x_1 = -0.1$; $\tau_1^2 = 1/(0.3^2)$; $\gamma = -0.7$; $\psi^2 = 1/(0.15^2)$. Republican voter and candidate parameters: $x_1 = 0.1$; $\tau_1^2 = 1/(0.3^2)$; $\gamma = 0.8$; $\psi^2 = 1/(0.25^2)$.

this example (Figure 2.4, left panel), the Democrat is a hunter who has experience with the issue (i.e., precise prior opinion) while the Republican does not (wide prior opinion). In between periods 1 and 2, the Democratic candidate sends a leftist signal and the Republican candidate sends a moderate, right-of-center signal (Figure 2.4, center panel). While the Republican voter cue-takes and moves slightly to the right to follow the Republican candidate, the Democratic hunter does not move left to any significant degree (Figure 2.4, right panel). In general, this phenomenon, derived mathematically as $\frac{\partial |\gamma - \mathbb{E}[x_2]|}{\partial \tau^2} < 0$, forms the first of the two main hypotheses:

Cue-Taking Hypothesis: *Ceteris paribus, when a favored political elite provides a signal about his position on an issue, the segments of the population that have the least personal experience with the issue are most likely to cue-take (i.e., alter their*

issue position in the direction of the signal).

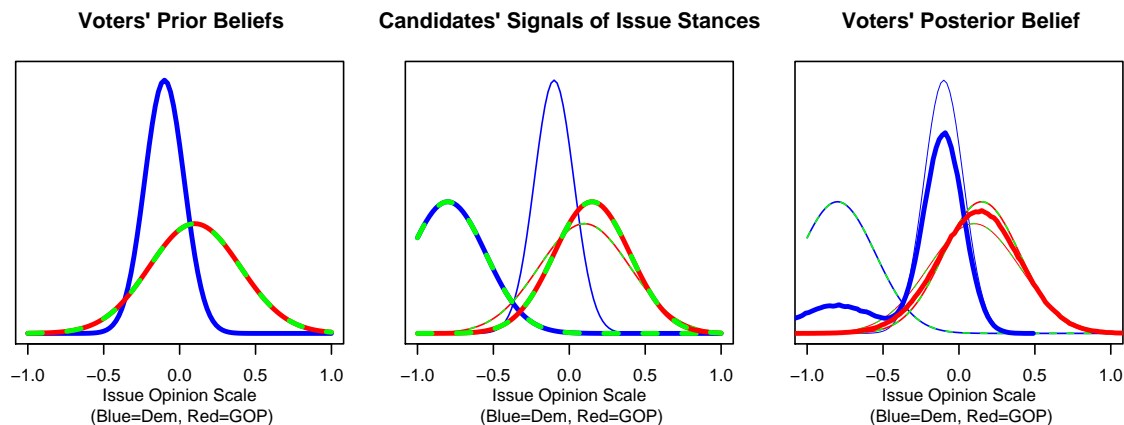


Figure 2.4: Experienced voters do not cue-take. The Democratic hunter does not cue-take from her preferred politician on this issue because of her highly-informed prior on the issue. The non-experienced Republican voter shifts her issue opinion toward the stance of her preferred candidate. Democratic voter and candidate parameters: $x_1 = -0.1$; $\tau_1^2 = 1/(0.13^2)$; $\gamma = -0.8$; $\psi^2 = 1/(0.25^2)$. Republican voter and candidate parameters: $x_1 = 0.1$; $\tau_1^2 = 1/(0.3^2)$; $\gamma = 0.15$; $\psi^2 = 1/(0.25^2)$.

Returning to the example in Figure 2.4, the Democratic voter's opinion is closer (on average) to the Republican candidate's view on this issue, causing a contradiction in the previously loyal Democrat's worldview. To calculate how much more negatively the Democratic voter would rate the Democratic nominee, one must consider both where the voter thought the candidates stood on the issues in period 1 and how the voter judges politicians.

2.1.4 Voters’ Beliefs About Candidate Positions

Voters have beliefs about where candidates stand on the issues; these beliefs become more certain after receiving signals about the candidates’ platforms. Before a signal is sent, a voter’s beliefs about the candidate’s positions often suffer from “projection” (Brody and Page, 1972), whereby the voter assumes that her preferred candidate holds the same position that she does.¹¹ I do not explicitly model the determinants of projection, instead allowing the center of the distribution of prior beliefs about the candidate’s position, μ_1 , to be an input parameter. Under complete projection, $\mu_1 = \delta_1$. Voter have certainty about these beliefs, v_1^2 , which most likely increase with political attentiveness and sophistication. Similar to equation 2.1, the prior belief y_1 is assumed to be the normal distribution,

$$y_1 \sim \mathcal{N}(\mu_1, \frac{1}{v_1^2}). \quad (2.4)$$

The candidate’s signal helps the voter identify where the candidate stands on the issue. The signal has the same center point, γ , and precision, ψ^2 , as in Section 2.1.3. A candidate’s signal could be unpersuasive (i.e., not move an individual’s issue position) yet credible (i.e., be informative about where the candidate stands), so that learning and cue-taking are based on different interpretations of a single signal; for simplicity, I model these signal characteristics as the same parameter. Certainly, these qualities could be correlated in certain cases. For example, a politician who

¹¹In addition to projection, a voter’s prior belief on a candidate’s position may be based on general factors such as the candidate’s party.

appears to be pandering would produce an un-credible and non-persuasive issue appeal.

As with the voter's own issue position, the voter updates her belief about the candidate's positions by introducing considerations generated by the candidate signal. Beliefs at period 1 are treated as priors in period 2. The updated, period 2, beliefs about the candidate are a mixture model with mean and variance,

$$\mathbb{E}[y_2] = \frac{\mu_1 v_1^2 + \gamma \psi^2}{v_1^2 + \psi^2} \quad (2.5)$$

$$\text{Var}[y_2] = 1 + \frac{v_1^2(\mu_1 - \mathbb{E}[y_2])^2 + \psi^2(\gamma - \mathbb{E}[y_2])^2}{v_1^2 + \psi^2} \quad (2.6)$$

Returning to the case of the Democratic hunter and gun control, imagine that the Republican candidate microtargets the Democratic hunter, highlighting both candidates' positions. Before the signals are sent, the voter might have weak priors on the candidates' positions according to their parties (left panel, Figure 2.5). The Republican sends a mailing to the gun owner's household indicating a moderate-right stance for the Republican and an extreme liberal position for the Democrat (center panel). The Republican has more credibility in revealing his own position than his opponent's because the Republican might be held to account for his stated issue opinion if he wins (Ferejohn, 1986). These signals are combined with the voter's prior and result in a posterior belief about the candidates' positions (right panel).

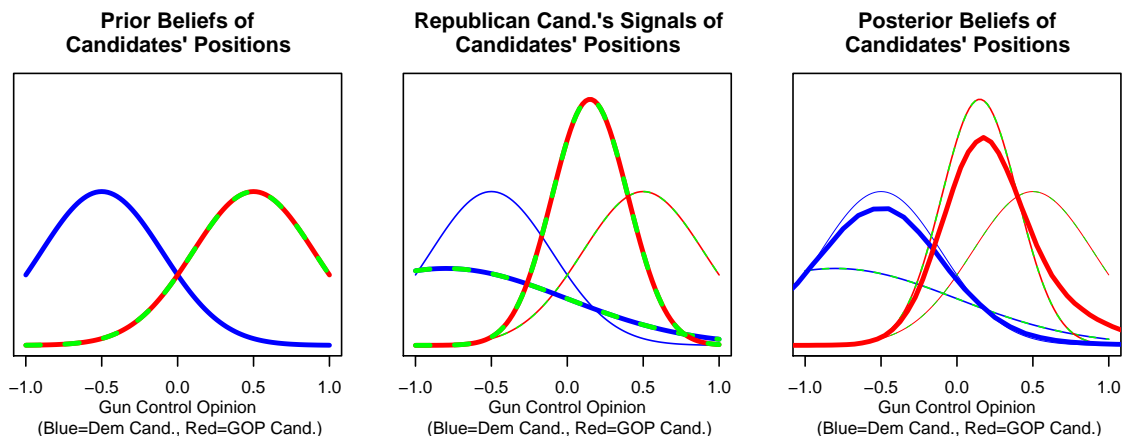


Figure 2.5: A Voter integrates her projection-based beliefs with one candidate's signals about both candidates' opinions. The voter starts out with prior beliefs about both candidates' positions based on their party. The Republican candidate signals that he has a moderate-right position and signals, with less credibility, that the Democrat has an extreme left position. The voter updates her beliefs about the candidates' positions accordingly. Parameters for belief and signal about the Democratic candidate: $y_1 = -0.5$; $v_1^2 = 1/(0.4^2)$; $\gamma = -0.8$; $\psi^2 = 1/(0.8^2)$. Parameters for belief and signal about the Republican candidate: $y_1 = 0.5$; $v_1^2 = 1/(0.4^2)$; $\gamma = 0.15$; $\psi^2 = 1/(0.25^2)$.

2.1.5 Voters' Candidate Evaluations

Traditionally, candidate evaluation is modeled as utility maximization (Downs, 1957) over a range of issues (Enelow and Hinich, 1984). These types of models, where voters place weights on a range of issues, are consistent with the issue public literature (Krosnick, 1990). Members of an issue public place above-average weight on a specific issue. These models of voter utility require a lot from citizens. First, voters must know their own position on all the issues. Second, voters must know the politician's view on each issue. Third, voters must assign a weight to each issue. The weight-

based model requires that voters keep track of all this information.

Instead, I propose a more Zalleresque model of candidate evaluation. Voters compare a candidate's issue signal against their considerations of the issue. For instance, when a candidate delivers a signal about an issue, the voter updates her belief about the candidate's position, forming the posterior belief y_2 (as in Section 2.1.4). Next, to evaluate the candidate on this issue, the voter compares her prior belief about the issue to the candidate's perceived position. This comparison is formalized with the Kullback-Leibler distance,

$$KL(y_2||x_1) = \int_{-\infty}^{\infty} y_2(z) \log \frac{y_2(z)}{x_1(z)} dz, \quad (2.7)$$

where z is the issue dimension and, as above, x_1 is the voter's issue position at period 1.¹² The use of the Kullback-Leibler distance is appropriate for a Zalleresque model because the entire distribution of considerations is compared. This contrasts to a Bayesian model, in which means (or other summary statistics) are compared (e.g., Enelow and Hinich, 1984) yet the exact distribution is unimportant.

For Gaussian distributions, the Kullback-Leibler distance has the analytical solution,

$$KL(y_2||x_1) = \frac{1}{2} \left(2 \log \left(\frac{v_2}{\tau_1} \right) + \left(\frac{\tau_1^2}{v_2^2} \right) + (\mu_2 - \delta_1)^2 \tau_2^2 - 1 \right), \quad (2.8)$$

where μ_2 and v_2^2 are the mean and precision of y_2 (Equations 2.5 and 2.6). However,

¹² $x_1(z)$ and $y_2(z)$ are the densities of x_1 and y_2 at z , respectively.

x_2 and y_2 approximate an unmixed Gaussian distribution only in cases in which one of their constituent Gaussian distributions dominate the others. In addition, Equation 2.8 is an idealized, continuous version of the discrete process of comparing a voter’s considerations about an issue to considerations of a candidate’s platform. Thus, Equation 2.8 is sometimes a poor approximation for Equation 2.7.

Candidate stances on issues for which the voter has a vague prior will have little impact on the voter’s worldview. The uncertainty of the voter’s position means the Kullback-Leibler distance will not be extreme in either distance or closeness. Once the voter cue-takes on this issue (Section 2.1.3), the K-L distance will shrink, reinforcing existing predispositions.

Candidate evaluations may not be reinforced when the voter has a precise prior on the issue in question. In this case, the voter compares her beliefs with the candidate’s and the difference may be stark. An apt analogy is that the voter treats her personal experience as the “ground truth” for judging the elite’s reliability. One incongruent signal from a preferred candidate might be enough to induce the voter’s defection. Understanding the full voter-candidate interaction requires the consideration of multiple issues.

To calculate the voter’s overall utility of a candidate, all considerations on the top of a voter’s head must be taken into account, and these considerations may be on multiple issues. Let the scope of J issues be represented by $j = 1...J$ and the positions of the voter and the candidate at time t be x_{jt} and y_{jt} , respectively. The voter need not have all these issues on the top of her head at one particular time. Which combination of issues is on her mind determines the voter’s candidate

evaluation, which is formally,

$$U(y_t|x_t) = - \sum_{j=1}^J \delta_j * KL(x_{tj}||y_{tj}), \quad (2.9)$$

where δ_j is the proportion of a voter's considerations dealing with issue j . The voter need not take an active role in consciously setting δ_j for all issues; for issues the voter is unfamiliar with, $\delta_j = 0$. In a two-sided issue debate, the model assumes voters receive only signals from the candidate with the higher $U(y_t|x_t)$.

As noted, a candidate signal on a new, unfamiliar issue would lead to a small K-L distance after cue-taking, thus reinforcing predispositions. However, if considerations of this new issue replace considerations of an older issue for which the voter also took an elite cue, candidate utility would not change at all.

The chance of a switch in candidate support is particularly acute in three situations. In the first, the voter is nearly undecided in the first period; e.g., $KL(x_1||y_1^D) \approx KL(x_1||y_1^R)$, where D and R superscripts represent the two candidates. In this case, a small change in the relative K-L distances results in a change in vote choice.

Second, priming may occur; "priming" is a traditional political science explanation of why voters alter their opinions of candidates once a signal is received (Iyengar and Kinder, 1989). The signal about a particular issue (j) causes considerations about that issue to become more accessible in period 2. When asked to evaluate the candidates, the voter relies more heavily on these primed considerations; formally, δ_j increases.

Third, if the voter has a precise prior about only the one issue at hand (i.e., the voter has no experience on other issues), then the voter is susceptible to micro-targeting by the non-preferred candidate. Consider the example of the Democratic hunter. The Republican’s signals about gun control indicate that the Republican candidate is closer to the voter on this issue. Remaining loyal to the Democratic candidate would cause cognitive dissonance; the hunter does not cue-take from her initially preferred candidate (the Democrat) since she is set in her ways. The equations above demonstrate that the voter will alter her perceptions of the candidates to favor the Republican. Transforming the voter’s worldview and cue-taking on all the other (non-experiential) issues from the Republican candidate causes no dissonance. Hence, this Democratic hunter is susceptible to defection by a well-targeted Republican appeal.

This dissertation focuses on the third mechanism: voters’ political worldviews can be altered by candidates’ stances on the issues with which the voter has experience. This phenomenon, derived mathematically as $\frac{\partial KL(y_2||x_1)}{\partial |\mu_2 - \delta_1| \partial \tau_1^2} > 0$, results in the following prediction, which is the main hypothesis of this dissertation:

Candidate Evaluation Hypothesis: *Ceteris paribus, after receiving a candidate’s signal on an issue, the segments of the population that have the most personal experience with the issue will alter their perceptions of the candidate more than the segments of the population that have no personal experience.*

Political worldviews originate with and change based on issues for which voters have experience. For these issues, voters know the “ground truth” and need not rely on political elites for an indication of what to believe.

This hypothesis might be particularly relevant during primaries, where no partisan differentiation exists. Voters’ preferences between candidates with similar ideologies could easily hinge on the evaluations generated by this ground truth effect. Especially in primaries, candidates may agree on the salient, oft-discussed issues. Since the Candidate Evaluation Hypothesis does not rely on the pivotal issue being of extrinsic importance to the voter, the hypothesis still predicts changes in political judgments based on a familiar issue.

Consider the hypothetical example of a primary election between two candidates with an electorate of three voters, each of whom has experience on a particular issue. The 20-day campaign moves through three phases and focuses on two issues: health care and education. The three voters are Alice the architect, Ted the teacher, and Doris the doctor; they must decide between two the candidates, Mandy and Nathan. Figure 2.6 tracks the hypothetical voters’ candidate evaluations over the course of the campaign.¹³ They start with opposing predispositions about the candidates, with Alice favoring Mandy, Ted favoring Nathan, and Doris undecided. These predispositions may be attributable to valence evaluations (e.g., competence, experience) or other traits (e.g., shares my values), which in turn may originate from identity politics (e.g., voter-candidate shared gender or race).¹⁴ Candidate traits are modeled just as issues are; for traits, voters are very certain about where they stand (e.g., competence is good) but less certain about politicians’ stances (e.g., claims of competence are cheap talk).

¹³See Table A.1 of Appendix ?? for the exact parameter values that generated the figure.

¹⁴In a general election, these predispositions are often aligned with partisan allegiances and are very strong. A primary campaign magnifies the effect of issues.

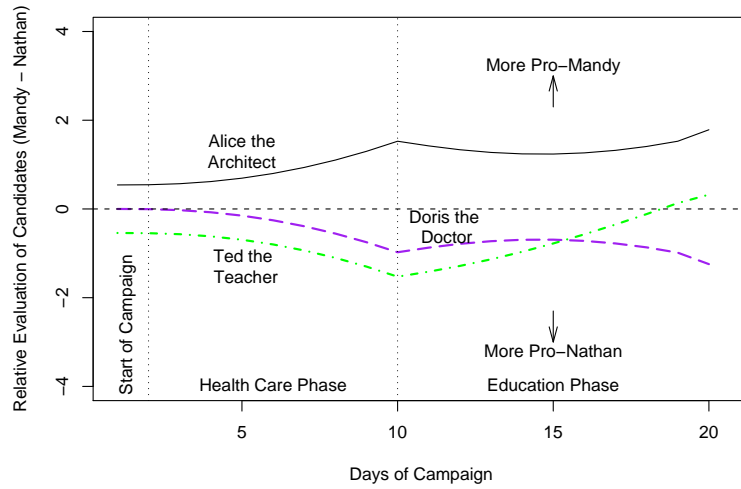


Figure 2.6: A hypothetical primary campaign with three voters, two candidates, and two issue phases (three phases total). In the first issue phase, when health care is discussed, the initially undecided doctor (Doris) sides with the candidate (Nathan) who concurs with her stable opinion on health policy. The other two voters polarize. In the second phase, when education is the hot topic, the teacher (Ted) switches candidate allegiances because his previously preferred candidate (Nathan) takes what Ted considers an incorrect stance.

The left-most portion of Figure 2.6 displays these starting preferences. No issue considerations are on the top of voters' heads on the initial day of the campaign (phase 1).

In the next phase of the campaign (days 2-10), the issue of health care becomes prominent and politicians stake out positions. Considerations related to health care are added to the tops of voters' heads. The only voter with experience on this issue is Doris (who is a doctor). She sides with candidate Nathan on the issue, and increases her relative evaluation of him. The other two voters polarize in their opinion of the

candidates, as actual issue information (rather than trait information) solidifies their respective choices.

After the candidates have finished debating health care, education policy becomes relevant in phase 3, days 11-20. Alice and Doris cue-take from their preferred candidate; Ted the teacher sides with his previously unfavored candidate, Mandy. The education debate eventually crowds out health care considerations. By this point, on the last day of the hypothetical campaign, Ted switches candidate allegiances and supports Mandy over Nathan.¹⁵

This simulation illustrates the futility of campaigns' attempts to alter the minds of voters on a host of issues with which the voters have no experience.¹⁶ In the normal course of a campaign, two-sided elite messaging on issues unfamiliar to voters leads to polarization, just as Alice and Ted diverge in the health care phase of the campaign. A real-world example from the 2008 general election is the sudden emphasis on wealth redistribution after the third debate between Obama and McCain (in which "Joe the Plumber" was referenced 24 times). Despite this shift in campaign dialogue, the polls barely moved.¹⁷

The simulation also demonstrates a distinction between the Personal Experience Hypothesis and other alternative hypothesis: issue salience is constant across voters

¹⁵The decrease in polarization for Alice and Doris at the beginning of the education phase is caused by a decrease in polarized health-care considerations, which are partially offset by education considerations that have yet to become fully polarized. As voters learn the candidates' positions on education and adopt the position of their preferred candidate, education becomes as polarized as health care and voters' preferences diverge.

¹⁶As discussed in Chapter 6, this futility is only a problem for campaigns trailing in the polls.

¹⁷See Charles Franklin's moving average (<http://www.pollster.com/polls/us/08-us-pres-ge-mvo.php>) for the flat McCain and Obama lines before and after the October 16, 2008 debate.

yet heterogeneous political judgments occur. The critical factor for the an issue to induce political ground truthing is a stable opinion on the issue. Personal experiences, which occur regardless of which issue is on the political front-burner, are an excellent generator of these stable opinions.

2.1.6 Issue Experience as Signals

In the Personal Experience Model candidate signals and issue experiences are variations on the same theme. They are both considerations that are received by voters and subsequently accepted or rejected (Figure 2.1). The most important distinction between these two types of considerations is that acceptance of candidate signals depends on the voter’s evaluation of the candidate, while acceptance of personal experiences hinges on the proximity of the voter-issue interaction.

When a voter interacts with a non-politicized issue, her issue opinion proceeds analogously to the logic of Section 2.1.3. A real-world experience (e.g., a teacher sees the roof of a school cave in) generates an additional consideration for her issue opinion distribution (e.g., schools need more funding because they are crumbling). How much this consideration affects the voter’s opinion depends on the weight (i.e., precision) of the new consideration (ψ^2) relative to the weight of existing considerations (τ^2).

With the model formally explicated, the three properties of personal experience discussed in Section 2.1.2 can also be formally linked to greater issue stability. First, repeated considerations at the same point on the issue spectrum create a narrow distribution of experiences and a higher precision, ψ^2 . Second, easier processing of experiences leads to higher reception of considerations, and again a tighter distribu-

tion of experiences and a larger ψ^2 . Third, since voters forget considerations over time, repeated considerations lead to voters having experienced-based considerations on the top of their head more often. As long as the precision of experiential considerations (ψ^2) is greater than the background noise considerations (τ^2), increasing the proportion of experiential considerations will lead to lower issue opinion variance.¹⁸ Formally, $\psi^2 > \tau^2 \rightarrow \frac{\partial \text{Var}[x_2]}{\partial \psi^2} < 0$. Infrequent, forgettable voter-issue interactions may increase the variance of a voter’s opinion.

The process of issue opinion formation becomes more complicated when the individual has experience with an already politicized issue. For instance, assume a conservative parent has a narrow prior on the issue of gay marriage because the issue is often discussed in the political arena and this individual accepts only conservative arguments. If the parent’s child “comes out of the closet,” then the parent’s personal experience will directly conflict with her existing issue opinion. If the parent accepts these personal experience considerations, then her issue opinion distribution becomes bimodal, and the parent may have a difficult time deciding where to stand on the issue (Figure 2.7).¹⁹ This bimodal distribution does not generate as clear predictions for candidate evaluations as the situations discussed in Section 2.1.5 where personal experience occurs before issue politicization. As Figure 2.7 displays, personal experience can balance political predispositions – a result found even in the highly

¹⁸Another type of experience is a one-time, high-impact experience. If these considerations are forgotten at a slower rate than other considerations (e.g., mass media-based), then the math operates in the same way as for repeated, more ephemeral experiences.

¹⁹The initial “if” in this sentence is a “big if” in that the parent’s prior distribution would normally mean that she would not accept liberal consideration. Only because the source of these considerations is so close to her might these considerations be accepted, and even then perhaps at a slow rate.

politicized environment of Congress (Washington, 2008).

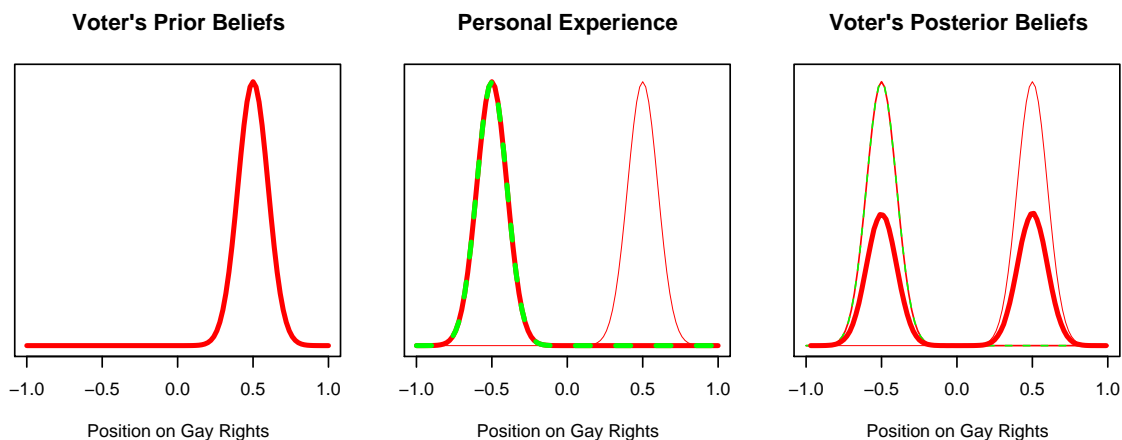


Figure 2.7: A hypothetical conservative parent's issue consideration distribution after her child comes out of the closet. The conservative's initial position on gay rights (left panel) is balanced by personal experience (center panel). The right panel displays the resulting issue opinion distribution in bold. Normally, the conservative would reject the liberal considerations of the center panel, but these considerations are generated by a close, personal situation. Parameters: $x_1 = 0.5$; $\tau_1^2 = 1/(0.15^2)$; $\gamma = -0.5$; $\psi^2 = 1/(0.1^2)$.

2.1.7 Model Extensions and Details

The model, as presented in its most limited form, can be applied in alternative situations. The model works just as well when considering political parties, news organizations, or politically active citizens as when considering candidates and is flexible enough to be used in partisan and non-partisan situations.

As modeled, signals from non-preferred candidates do not contain negative information. As Zaller (1992) demonstrates with opinions about the Vietnam War, if

only the conservative elite is communicating to the public, then even liberal voters will shift their opinions toward the conservative end of the spectrum. The shift of liberal opinion is less than the shift in conservative opinion and may reflect the lower probability of a liberal accepting a consideration from a conservative elite.

The probability of a voter receiving a signal does not appear in the Personal Experience Model, but the effects of paying more or less attention to politics can be captured by the precision of a candidate’s signal. In fact, small acceptance probabilities are captured in the hypothetical election simulations by assuming weak candidate signals (small ψ^2). Alternatively, an additional parameter and process could be explicitly added to the model.

The model can be applied beyond political issues. For example, character traits can be a powerful force in politics because voters judge individuals in their daily lives. Consider the trait of honesty. Voters’ ideal points, x_{tj} are all essentially grouped at positive infinity (or the upper limit of the trait dimension)—voters want their politicians to be extremely honest. Also, most voters know with a high degree of certainty that they prefer honest people to dishonest people (since they have experience dealing with both in their daily lives), so τ_j^2 is large. Candidate cues on this topic may lack credibility (i.e., ψ^2 is low) because politicians often cannot credibly state “I am honest.” Thus, a credible cue from a media source that a candidate is dishonest can have a devastating effect on voters’ evaluations of that candidate.

Character traits are an example of an “issue” with which most of the electorate has extensive experience. Individuals must judge the honesty, trustworthiness, and

empathy of others on a daily basis. The model’s implications extend to these widely familiar issues. Aggregating the conclusion from the Candidate Evaluation Hypothesis across the electorate implies that mass communication about issues with which more voters are familiar (i.e., the “easy issues” of Carmines and Stimson, 1990) will influence candidate evaluation more than communicating about complex, niche issues.

Broadcast Corollary: *Signals on familiar issues or candidate character traits influence voters’ perceptions more than information about more complex issues.*

The Candidate Evaluation Hypothesis and the Broadcast Corollary have direct implications for political campaigns. If a campaign is aware that a particular voter has personal experience with an issue, then the campaign would benefit from communicating to the voter on that issue (provided the voter and the candidate have congruent opinions). However, campaigns are often unable to procure this type of information; instead, they rely on mass communication such as television advertising. In the case of mass communication, campaigns would do well to follow the Broadcast Corollary and advertise about issues that intersect with the lives of the greatest number of people.

2.2 Concurrence with Other Theories in the Literature

The literature substantiates much of the Personal Experience Model, especially the claims about issue opinion stability (Stability Postulate), cue-taking (Cue-Taking

Hypothesis), and easy issues (Broadcast Corollary). Circumstantial evidence supports the experience-issue interaction (Candidate Evaluation Hypothesis), yet no study directly tests the effect of personal experience on cue-taking and candidate evaluation. The following sections review the existing evidence and identify the gap that the Personal Experience Model fills with the Candidate Evaluation Hypothesis.

2.2.1 Definitions of Concepts in the Literature

Over the decades, various terms (e.g., “projection,” “persuasion”) have represented distinct concepts. Before exploring the existing research and discussing the empirical results in later chapters, it is useful to review and define some of these terms.

- **Issue Opinion Stability** is the precision of the distribution of repeated samples of an individual’s accessible considerations of an issue. A helpful way to think about opinion stability is to imagine asking an individual to report an opinion on a repeated basis. The variance of her reported opinions is the inverse of her issue stability.
- **Self-Reported Issue Opinion Confidence** is an individual’s belief about her stability on the issue. Confidence should not be conflated with issue stability as individuals are often poor judges of their own characteristics.
- **Candidate projection** is the phenomenon whereby a voter assumes her preferred candidate agrees with her on an issue that she has relatively little information on. This mechanism often before candidates send strong signals on the issue. See “projection” in Markus and Converse (1979).

- **Learning** is the process by which the voter ascertains the true issue position of the candidates. It occurs after the voter receives strong signals on the issue. See Lenz (2006) for an excellent discussion.
- **Cue-taking** is the process whereby the voter agrees with her preferred candidate’s issue position without any critical thinking. See “projection” in Iyengar and Kinder (1989), “persuasion” in Markus and Converse (1979), and “peripheral route processing” in Petty and Cacioppo (1981).
- **Persuasion on an issue opinion** occurs when the voter thinks critically about issue considerations and rejects them in favor of other considerations. Replacement of accessible considerations over time is not considered persuasion. See “central route processing” in Petty and Cacioppo (1981). Persuasion does not play a large role in the Personal Experience Model.
- **Priming** is the mechanism by which voters increase the salience of a particular issue in the vote decision. This salience may be raised directly by stressing the importance of an issue or indirectly by mentioning the issue and thus increasing the accessibility of considerations related to the issue. See Iyengar and Kinder (1989).

2.2.2 Personal Experience Yields Nuanced and Stable Opinions

The finding that personal (or “direct”) experience with an issue induces attitude stability originates in the psychology literature. Regan and Fazio (1977) employ

both a field experiment and a laboratory experiment to test the effect of direct experience on attitude-behavior consistency. Their experiments randomly assigns the direct experience treatment. In the field experiment, college students are assigned to permanent or temporary housing. In the laboratory experiment, some participants are assigned puzzles to work on, while others receive only descriptions of the puzzles. In both experiments, the reported attitudes of the participants assigned to the “direct experience” treatment are more consistent with the participants’ actions than for the students assigned to the peripheral experience.

Wood (1982) examines how existing experiences affect the amount of variation in issue opinions. Subjects in this experiment are asked to “to list specific instances of times when they had engaged in actions relating” to the environment and to report their opinions about environmentalism. A month later, Wood requests that the subjects prepare a persuasive, pro-environmentalism talk in exchange for five dollars. On average, this offer of money induces subjects to report views that are more anti-environmentalism than their original position (presumably because the offer of money makes the arguments appear fraudulent). However, individuals with prior experience with the environmental movement are less likely to change their opinion.²⁰

Observational studies demonstrate that individuals with experience on an issue have more stable (and sometimes more nuanced) opinions, supporting the Stability Postulate. Sotirovic (2001) conducts a telephone survey of 395 Wisconsin adults to examine their attitudes toward crime policy and the death penalty. The respondent’s

²⁰This change is not caused by differences in initial opinions between the experienced and unexperienced groups.

answers to open-ended questions are coded for number of distinct ideas and integration between ideas; the answers are then aggregated into a “complexity” measure. Respondents who have experience with non-trivial crimes (either personal or through friends) demonstrate higher thought complexity.

McFadyen (1998) conducts in-depth interviews with 67 employed Britons to probe their views on unemployment. The author asks participants about stereotypes of the unemployed, the efficacy of government actions, and their thoughts about possible solutions. To gauge the level of experience that participants had with unemployment, McFadyen queries the subjects about their relationships with unemployed family or “close” friends, as well as any direct experience they have had with being unemployed. A multivariate analysis finds that amount of experience with the unemployed is the best predictor of how few stereotypes the respondents express, with experience being more predictive than either ideology or class and leading to fewer stereotypes.

In both the crime and unemployment studies, experience does not lead to polarization of issue opinion. In fact, just the opposite occurs. In the crime study, Sotirivic finds that the respondents with the most extreme views had the least complex thought processes. And personal experience with the unemployed does not push the Britons in McFadyen’s study to the left on unemployment policy; political ideology is a much better predictor of issue opinion than level of issue involvement. Consistent with these findings, the direct effect of experience on left-right issue position is not specified by the Personal Experience Model.

The impact of personal experience on issue opinion stability is directly measured by van Knippenberg and Daamen (1996). The authors poll the attitudes of the Dutch

on energy generation twice, through surveys two months apart. In each survey, respondents are given a range of six methods of generating energy and are asked to pick two. In the first survey, brief descriptions of each option are provided. Van Knippenberg and Daamen measured issue involvement on a “slightly modified version” of the scale developed by Verplanken (1991), which queries respondents about their activities with respect to the issue (e.g., talking with friends about the issue). While they do not provide exact statistics, the authors report that higher involvement leads to increased stability across the two-month period.

Taken in sum, these studies demonstrate that direct experience, personal involvement, or even the experience of close friends or family members induces a more complex thought process about an issue. The resulting opinions of individuals with personal experience are more stable than those of the public at large. Thus, the evidence for the Stability Postulate is strong.

2.2.3 Evidence for Cue-Taking and the Role of Experience

The psychological literature provides the basis for cue-taking. Similar to Bartels’ (2002) findings that the same information generates polarized responses between members of opposing parties, Lord *et al.* (1979) show that conflicting studies on capital punishment have a polarizing rather than moderating effect. Undergraduates who hold prior beliefs in favor of capital punishment consider the pro-capital punishment study more convincing; consequently, their issue opinions become more extreme. The opposite holds for the participants who enter the experiment with anti-death penalty views. Similar to the Al Gore and global warming hypothetical

in Section 2.1.3, individuals generally accept arguments that are congruent with their existing beliefs and adjust their views accordingly.

Political science research provides several examples of cue-taking. Zaller (1992) demonstrates how elite consensus leads to mass consensus. In contrast to Zaller's one-stream example, campaigns provide an example of a two-stream environment. As the election was heating up in the summer of 2004, Democrats and Republicans diverged over even the relatively factual issue of whether Saddam Hussein was involved in the September 11th attacks (Parker-Stephen, 2007). In a striking example of issue opinion following elites from one end of the spectrum to the other, Lauderdale (2008) finds that a change in the party that controls the White House alters whether conservatives or liberals favor an activist foreign policy.

In one of the clearest examples, Lupia (1994) provides evidence of cue-taking in the 1988 California car insurance elections. Voters who have little knowledge of the substance of the ballot initiatives, yet know where various interest groups stood on the measures, mirrored the behavior of high-knowledge voters. Individuals who lack both substantive and endorsement awareness, on the other hand, deviate from the voting patterns of the more knowledgeable groups.²¹ Small cues from advocacy organizations help citizens cut through the clutter of political issues.

The Cue-Taking Hypothesis, however, does not merely assert that cue-taking occurs; it predicts that personal experience moderates the effects of cue-taking. Experiments from psychology provide evidence. In Wood's (1982) experiment on the

²¹In this case, a cue from an untrusted source (e.g., the insurance industry) appears to provide information to individuals about what *not* to believe. However, since two streams of information exist (e.g., Ralph Nader countering the insurance industry), it is unclear whether the voters are using positive or negative cues.

environment, the participants are asked to list their personal connections with an environmental issue, e.g., membership in the Sierra Club or Audubon Society. All subjects are then exposed to a fabricated recording of an interview with a graduate student in which the graduate student presents several arguments against preservation. Wood finds that subjects who report more personal experience with the environment are less susceptible to the graduate student's persuasion even when controlling for the subjects' initial views.

One of the experiments used to differentiate between “central route” and “peripheral” processing speaks directly to the Cue-Taking Hypothesis. Undergraduate participants are presented with a set of arguments for a change in university policy. While some students are under the impression that the policy would affect their school, others are told that the policy is under consideration at a nearby institution. The arguments (all against the policy) vary by logical soundness and overall appeal. Students who are personally involved in the issue (i.e., those under the “own school” condition) discriminate between the compelling and non-compelling arguments, while those not involved are persuaded by the speaker regardless of the argument's quality. Perhaps *both* self-interest and issue experience play a role in inducing students to think critically about the arguments, but cue-taking is clearly at work in the “other school” condition.

The Cue-Taking Hypothesis dovetails well with the Lupia and McCubbins (1998) model of persuasion, which predicts that less persuasion (i.e., cue-taking) will occur when “perceived speaker knowledge” is low. If personal experience increases a voter's knowledge (or self-perceived knowledge) of an issue—a reasonable assumption—then

the relative knowledge of the speaker decreases and the Cue-Taking Hypothesis is supported by the experiments that Lupia and McCubbins (1998) conduct in the laboratory.

Shifting to the Candidate Evaluation Hypothesis, Mutz (1992) finds an interesting interplay between personal experience with the economy and political evaluations. She traces the effects of experience with unemployment and knowledge gained from the mass media through the perception of the economy and incumbent politicians (governor and president). Consistent with the Personal Experience Model, being unemployed has an impact on state-level judgments. At the national level, the mass media has much more influence in shaping people's opinion about the national economy. Specifically, Mutz writes, "These overall patterns suggest that personal experience may indeed have an indirect influence on political evaluations at the state level by means of their influence on personal and ultimately social concerns. At the national level, however, the path that translates these concerns to political significance is incomplete." This latter finding might appear to refute the Candidate Evaluation Hypothesis, but being unemployed is a stronger signal of the state economy rather than the national economy (since the reason for the unemployment might be localized). The finding that individuals are properly incorporating information from multiple sources by discounting their personal experiences when making national judgments is encouraging for any hypotheses grounded in learning models.

Examining political judgments from a similar angle, Fiorina (1981), divides retrospective evaluations into two categories: "simple," which are the result of direct experience and "mediated," which are filtered through secondary sources such as the

media. Simple retrospective evaluations affect voters' political evaluations and thus shade how they receive mediated evaluations. Fiorina reaches analogous conclusions to the Personal Experience Model, but from the perspective of voters' experience with policy outcomes rather than issue positions.

While the direct evidence that personal experience moderates cue-taking is established in the psychology literature, minimal research exists that linking personal experience to political evaluations. Gilens and Murakawa (2002) characterize the state of research by noting, "We are not aware of any research that explicitly compares citizens' decision-making with regard to high-involvement versus low-involvement issues."²² The Personal Experience Model and the empirical examples presented in later chapters aim to fill that void.

2.2.4 Easy Issues and Retrospection Affect Political Evaluations

Existing research also supports the Broadcast Corollary. Kelleher and Wolak (2006) combine presidential approval ratings and content analysis of media stories to examine the priming effects of easy and hard issues. Since the dependent variable (presidential approval) is dichotomous, the Broadcast Corollary would predict that changes attributed to priming would be observable only for familiar (or "easy") issues. On complex (or "hard") issues, individuals who approve of the President would take the President's side and continue to approve of him; individuals who do not ap-

²²Recent work (Hillygus and Shields, 1991) that compliments this dissertation makes this statement less true in 2009.

prove of the President would act analogously (assuming two issue streams). Thus, even if considerations of the complex issue are more likely to be on the top of a person's head (Zaller, 1992), there would be no change in the correlation between issue opinion and presidential approval before and after the increase in media stories. On the other hand, individuals' opinions of familiar issues are not as susceptible to cue-taking; thus, issue priming by the media might alter their perceptions of the president.

Kelleher and Wolak's findings are consistent with this line of reasoning. When the media reports on easy issues (e.g., the economy, the President's character), Kelleher and Wolak observe the priming effects. On the other hand, their data do not exhibit the effects of priming when the media emphasizes hard issues (e.g., foreign policy).

Lenz (2006) finds similar results when he examines over a dozen cases of suspected priming and determines that priming occurred in only a handful of cases. Of the 13 examples of supposed priming, Lenz argues that just four are actual examples of priming: two character issues, the economy in 1992, and defense spending after 9/11. Scholars consistently label character issues and the economy as easy issues. The priming of defense spending is trickier: perhaps the lack of a competing stream of information prevented Democrats from polarizing away from the President.

When elite signals on a topic are one-sided, a similar phenomenon to easy issues occurs. Often, one-sided news occurs because of the resolution of an issue, such as when there is consensus that a policy succeeded or failed (Canes-Wrone *et al.*, 2001). This consensus fills the tops of all voters' heads with one-sided considerations; if these considerations are prevalent (such as constant reporting on the war or economy), the

resolved issue mimics an easy issue. The Broadcast Corollary predicts that these resolved issues have large effects on vote choice.

Empirical research confirms this prediction. Mueller (1970) finds that retrospective voting on these oft-reported issues (in the spirit of Fiorina, 1981) have a consistent effect on presidential voting, which is a highly partisan contest. Recent research (Achen and Bartels, 2005) demonstrates that this effect can be so strong that the outcomes need not be logically connected to actual policy. As the Broadcast Corollary indicates, candidates who can take advantage of issues that resolve in their favor are probably better off focusing on those issues rather than microtargeting certain experienced voters.

The Personal Experience Model, by detailing a fine-grained relationship between voters and issues, predicts the conclusions reached by less granular studies that examine decisive issues. Easy issues are issues for which the voter does not need to rely on elites to form an opinion (which corresponds to the first criterion of personal experience) and are often major issues such as race relations (which keeps considerations at the top of the head, meeting the second criterion). While not all easy issues come about by the result of personal experience, a voter with experience on an issue would consider that issue to be easy. Hence, the results of the issue-centric political science research are consistent with the Personal Experience Model.

These discussions demonstrate that existing psychology and political science literature provides solid support for the Stability Postulate, the Cue-Taking Hypothesis, and the Broadcast Corollary. There is also circumstantial evidence for the Candidate Evaluation Hypothesis, although the political science literature is lacking on

this subject.

2.3 Alternative Voter-Issue Linkages in the Literature

While much of the political science literature focuses on the characteristics of a voter (e.g., attentiveness) or an issue (e.g., complexity) separately, strains of the literature emphasize linkages between voters and issues. Specifically, research on self-interest and issue publics theorize why voters might rely on certain issues more than others in their political decisions. However, studies demonstrate that self-interest does not affect vote choice in a consistent manner.

The Personal Experience Model generally captures the evidence of the self-interest literature. With regard to issue publics, the Personal Experience Model provides a logical foundation for the conclusions reached by the issue publics literature; this logic also broadens the scope of the theory to include both issues and character traits.

One perspective on issue-voter interaction is that voters base their political decisions on self-interest. Chong *et al.* (2001) demonstrate that self-interest in a policy can be primed or unprimed depending on the political communication delivered. Individuals with a vested interest in a certain policy change (e.g., domestic partner health benefits) display a higher propensity to favor the change after their self-interest in the change is highlighted. Although the authors do not measure voters' evaluations of candidates who take a position on the policy changes tested in the

experiment, one logical conclusion might be that politicians should communicate to voters on issues in which the voters have a self-interest and that these communications should emphasize that connection. On the other hand, Chong *et al.* also find that self-interested voters can be swayed against their direct economic interests with sociotropic arguments. In a climate with conflicting message streams (one that primes self-interest and one that primes sociotropic considerations), it is unclear how much self-interest would affect political judgments.

Consistent with Chong *et al.*'s finding that political communication can reduce the salience of self-interested consideration, Sears and Funk (1990) find that self-interest is rarely a factor in vote decision; instead, symbolic politics often drives individuals' policy stances. The Personal Experience Model predicts the influence of symbolic politics: voters cue-take from their respective group's leaders, polarize, and do not alter their political evaluations. In some cases, however, Sears and Funk find that self-interest does play a role in politics—specifically when the benefits are clear or the stakes are high (i.e., easy issues). By focusing on which issues are easy for which voters, the Personal Experience Model extends the findings of Sears and Funk and yields more nuanced implications.

In a second thread of political science research, Krosnick (1990) develops the idea of issue publics first presented by Converse (1964). Although the vast majority of voters do not closely follow the political debate on most issues, many voters find one or two issues to be important. Krosnick emphasizes self-interest, group identification, and personal values as the bases for how voters choose issue publics. Voters in an issue public have more stable opinions about the issues and base their political decisions on

these issues; Gershkoff (2006) confirms these findings in an extensive analysis of issue publics. Malhotra and Kuo (2009) demonstrate that, in the aftermath of Hurricane Katrina, increased personal importance of the hurricane devastation moderates the effects of partisan polarization and cue-taking.

The Personal Experience Model shifts and extends the idea of issue publics in two ways. First, the level of personal experience explains why a person might enter an issue public. For instance, in the preface of Gershkoff's (2006) dissertation, she relates a story about a Russian hairdresser who was in the immigration issue public. Left unsaid is the high likelihood that the hairdresser was in the immigration issue public because of her personal experience emigrating. Second, the Personal Experience Model does not rely on significant differences in issue salience to affect political preferences.

In the issue publics framework, certain issues are crucial for political judgments because of the conscious weight that a voter places on them. These issues are most likely to be reported as "most important" on a political survey. In contrast, in the Personal Experience Model, the mechanism by which some issues are more predictive of political preference than others—the desire to avoid cognitive dissonance—is the result of life-happenstance. Voters often have these experiential issues foisted upon them (e.g., receiving Social Security checks, emigrating from Russia) rather than choosing to be a member of an issue public. The Personal Experience model focuses on issues—big or small, inherently political or not—that form the bases for voters' "ground truth" for judging politicians.

Finally, Fazio and Zanna (1978) propose that confidence is an intervening factor

between the experience-issue stability link. Individuals with direct experience with a topic are more likely to have higher confidence in their attitudes as well as to match their behavior to their attitudes. More pertinently, when Fazio and Zanna exogenously increase confidence in an attitude (independent of how the attitude was formed), the correlation between attitude and subsequent behavior increases as well. Thus, voters who have more confidence in all their opinions (regardless of whether this confidence is justified) may exhibit less cue-taking than would be otherwise expected. If this research is correct, while the Personal Experience Model would still hold as presented (because direct experience would lead to confidence, which would moderate cue-taking), part of the picture would be unmodeled (i.e., more confident people are less prone to cue-taking). This causal mechanism is explored in Chapter 4.

In sum, the Personal Experience Model hypothesizes that personal experience plays a crucial role in political evaluation. The important features of personal experience is that (1) the individual plays an active role thereby circumventing partisan filters and (2) the considerations generated by the individual's experience are accessible. This type of personal experience allows a voter to ground truth candidates' statements and explains some observed heterogeneous movements in party and candidate preferences.

The theory generates two main hypotheses. First, it predicts that personal experience moderates voters' adoption of political elites' issue opinions (i.e., cue-taking) based on an individual's political predispositions. Second, a candidate stakes out a position on an issue, voters with personal experience involving that issue will al-

ter their evaluations of the candidates more than voters who lack such experience will. These candidate preference changes may run counter to existing partisan biases, which makes them important to campaigns which aim to persuade voters.

Chapter 3

Experienced Evaluations and Self-Interested Opinions: Observational Evidence from the 2000 Presidential Campaign

3.1 The Personal Experience Model and the 2000 Presidential Campaign

3.1.1 The Campaign about Nothing

From the perspective of political practitioners, the 2000 presidential campaign occurred at just the wrong moment in history. While it would be another two to

six years before microtargeting became prevalent in national politics, the 2000 electorate was highly microtargetable because no single issue dominated the campaign discourse. Gore and Bush each focused their attention on several issues, sometimes talking past each other. While the campaigns delivered competing talking points about Social Security privatization, Gore also made a push for the Patients’ Bill of Rights. These two campaign issues have a common feature: they exhibit evidence of issue-driven vote preference among the segment of the population with experience on the issue. This main finding is based on the Annenberg 2000 dataset, which includes panel data recorded before and after the parties’ nominating conventions.

Specific segments of the electorate—individuals with personal experience on a political issue—were susceptible to targeting by the campaigns. When Bush or Gore emphasized an issue in his convention speech, experienced voters learned about the candidate’s stance on that issue faster than the rest of the public and judged the candidate on that issue. This evidence provides support for the Candidate Evaluation Hypothesis presented in Chapter 2.

Analyses indicate another phenomenon at play: self-interest. Voters with personal experience with an issue may also have a stake in the policy outcome. Candidates may prime these concerns and shift individuals’ issue opinions—an effect that contradicts the predicted reduced opinion shift of the Cue-Taking Hypothesis. The data find evidence of both phenomena occurring in the 2000 election.

Voters in the 2000 electorate could not agree on a single most important issue. In one poll, the modal response (representing 20% of responses) to the question, “What is the most important problem facing the country?” was education—an area

in which the federal government has little say.¹ This result contrasts with the 2004 campaign, when the war on terrorism and the war in Iraq combined to become the single most important issue for a third of the electorate, with the economy not far behind. In the 2008 campaign, after the mid-September financial crisis, the economy mattered most to over a third of the public.

In this varied issue landscape, it is not surprising that Bush's August 3, 2000, convention speech was largely devoid of issues while Gore focused on several minor issues in his August 17 convention speech. Bush spent the bulk of his speech defining who he is. For instance, he explained the term "compassionate conservative" with multiple vignettes. This tactic appeared to work, as Bush opened up a double-digit point lead after the convention. However, the Republican nominee's speech did touch upon four concrete policy proposals: education, Social Security privatization, military readiness, and taxes.

Bush made an especially forceful push for Social Security privatization, saying:

Social Security has been called the "third rail of American politics," the one you're not supposed to touch because it shocks you. But if you don't touch it, you can't fix it. And I intend to fix it. To seniors in this country: You earned your benefits, you made your plans, and President George W. Bush will keep the promise of Social Security. No changes, no reductions, no way. Our opponents will say otherwise. This is their last, parting ploy, and don't believe a word of it. Now is the time for Republicans and Democrats to end the politics of fear and save Social Security, together.

¹ABC News. November 1, 2000. <http://abcnews.go.com/images/pdf/836a16Tracking16.pdf>

For younger workers, we will give you the option—your choice—to put a part of your payroll taxes into sound, responsible investments.

Gore, in direct contrast to Bush, touched on dozens of issues in his nomination acceptance speech, some rather minor (e.g, tobacco advertising to children, Internet privacy). The convention as a whole was a success, giving Gore a lead in the polls that he would hold until the first debate in October. Perhaps the lasting legacy of the convention was Gore’s coining of the oft-parodied term “lockbox”:

At a time when most Americans will live to know even their great-grandchildren, we will save and strengthen Social Security and Medicare—not only for this generation, but for generations to come... .

And to me, family values means honoring our fathers and mothers, teaching our children well, caring for the sick, respecting one another—giving people the power to achieve what they want for their families.

Putting both Social Security and Medicare in an iron-clad lockbox where the politicians can’t touch them—to me, that kind of common sense is a family value.

Even though the media focused on the lockbox and hence Social Security, Gore actually devoted more of his speech to vilifying health maintenance organizations (HMOs) and to rallying support for a Patients’ Bill of Rights:

And I will never forget a little boy named Ian Malone—who suffered from a medical mistake during childbirth, and needs full-time nursing care for

several years. I met him and his parents in Seattle, near their home in Everett, Washington. Their HMO had told the Malones it would no longer pay for the nurse they needed, and then told them they should consider giving Ian up for adoption... .

Dylan and Christine Malone are here with us tonight. Ian's here, too. And I say to them, and to all the families of America: I will fight for a real, enforceable Patients' Bill of Rights.

It's just wrong to have life and death medical decisions made by bean-counters at HMOs who don't have a license to practice medicine, and don't have a right to play God. It's time to take the medical decisions away from the HMOs and insurance companies and give them back to the doctors, the nurses, and the health care professionals.

In the week after the convention, Gore produced two television commercials about the Patients' Bill of Rights, one of which focused on the case of Ian Malone.

3.1.2 Issue-Driven Vote Choice

Political science has its own version of the chicken and egg question: Which comes first, the vote preference or the issue opinion? Researchers often attempt to find evidence of "priming," issue-driven effects of a campaign (or other political elites) emphasizing an issue and thus altering voters' political judgments through the issue's increased salience (e.g., Iyengar and Kinder, 1989). As discussed in depth by Lenz (2006), reverse causation is a troubling problem when attempting to discern the ef-

fects of issue opinion on vote preference. As with cue-taking (discussed in Chapter 2), voters often adopt the issue opinions of their favored candidate; therefore, analyzing the correlations of simultaneous issue opinion and vote choice is problematic.

A more useful approach involves correlating previous issue opinion with change in vote using panel data. If the correlation increases over time, then issue opinion must be driving vote choice and not vice versa. A change in vote choice in July, for example, cannot alter a voter's issue opinion in June. One caveat is that if the issue in question already dominates the June vote choice and continues to dominate in July, the analysis will not detect an effect even though the issue opinion is affecting vote choice. For analytic purposes, the best issues to examine are those that increase in salience in between waves of a panel data set. This empirical necessity dovetails with the Personal Experience Model, as the model produces cleaner predictions when the issue starts with few elite-driven considerations (see discussion in Section 2.1.6).

The issues of Social Security and the Patients' Bill of Rights were selected for analysis for two reasons. First, they meet the requirement of being lesser-known issues that were emphasized during the 2000 campaign. Other issues, such as the licensing of handguns, also fit that description. However, data on personal experience for these other issues are lacking. For instance, the Annenberg survey did not ask respondents about gun ownership. The three issues highlighted here also meet the requirement that data on personal experience be available.

Both issues fit the assumptions of the Personal Experience Model and can be used to test the model's predictions. The model assumes that there is little to no political discussion of the issue in period 1 and that subsequently a candidate delivers

a signal about the issue. For each issue, the analyses verify that the public entered the convention phase of the campaign with little knowledge of where candidates stood on the issue and that the electorate learned about these stances over the post-convention weeks. The text of the convention speeches provides evidence that Bush sent signals about Social Security and that Gore emphasized his positions on Social Security and the Patients' Bill of Rights.

The Personal Experience Model also requires an observable measure of voters' personal experience with an issue. For Social Security, it is assumed that voters over the age of 65 have experience with Social Security since they receive a check from the Social Security Administration each month. They have experience with how reliable the government agency is and how much the money helps them pay for expenses. This measure is of debatable quality, however, because these voters do not have experience with Social Security privatization.

For the Patients' Bill of Rights, it is assumed that individuals with health care through an HMO have experience with this issue. These voters know how helpful additional rights (such as the ability to sue) would be to them in their dealings with the HMO. While the Patients' Bill of Rights would apply to all citizens (not just the HMO-insured), Gore closely tied the Bill of Rights to HMOs, believing it to be most relevant for the HMOs' customers.

With these assumptions validated, the Personal Experience Model makes two testable predictions. First, experienced voters do not cue-take from politicians as much as non-experienced voters. This prediction is difficult to verify with the data at hand because of the self-interest connection between issue experience and issue

position. For example, retirees might believe that their Social Security checks are at risk under a privatization plan. HMO customers would benefit from additional rights.

Thus, when a candidate emphasizes an issue, an experienced voter with a self-interest on one side of the issue may be pulled in two different directions. On one hand, the voter's issue considerations from experience may help outweigh the candidate's argument. On the other hand, the candidate's point may be of particular importance to the voter (Chong *et al.*, 2001).

The best example of this second phenomenon is Social Security privatization. Seniors have no more experience with how privatization would be implemented than other voters have. Thus, when Gore claims that privatization would cost seniors their benefits, these older voters have no experiential considerations to counter this argument. Naturally, some of them shift their issue position to be against privatization. This pattern is evidenced in the data.

The second prediction of the model is that experienced voters judge politicians on the issue for which they have experience (when a politician sends a signal on that issue). The empirical test of this hypothesis is whether the correlation between first period (in this case, pre-convention) issue opinion and change in vote preference is greater for those with personal experience than for those without. This effect is labeled "differential evaluation"—candidate evaluations among a certain segment of the population. Differential evaluation is a result of experienced voters learning the candidates' positions on an issue and, possibly, the issue becoming more salient, or primed. This latter effect is not required, and the analysis finds only weak support

for a priming effect separate from learning.

Crucially, the self-interest effect counters the effects of observable differential evaluation. A senior who shifts her opinion from pro- to anti-privatization and from Bush to Gore *reduces* the correlation between prior issue opinion (pro-privatization, the Republican stance) and change in vote (toward Gore, the Democrat). The key, verifiable assumption is that experienced voters who shift their issue opinions in the direction of the Democratic position do not, at the same time, switch their vote choice toward Bush (or vice versa). If that consistency holds, evidence of differential evaluation among experienced, potentially self-interested voters is likely to be understated.

As with many observational studies, a word of caution is necessary. The data are used to support hypotheses that make causal claims, yet without random assignment of treatment, causal statements are difficult to justify. While findings show that voters experienced with issues differed in their actions from non-experienced voters, these differences in behavior cannot be directly tied to personal experience. However, alternative hypotheses are tested in efforts to rule out spurious relationships and provide more confidence in the conclusions drawn.

3.1.3 Data from the 2000 Annenberg Survey

To isolate these effects, the Republican and Democratic National Convention panel data from the Annenberg 2000 presidential survey are analyzed. The Annenberg Center initially interviewed 1,197 respondents during July as a part of its normal cross-sectional study. The Republican convention was held from July 31 to August 3

and the respondents were re-interviewed from August 4 through 13. For the Democratic National Convention, 1,230 respondents were interviewed first from August 4 to 13 and then after the Democratic National Convention, which ran from August 14 to 17.

Ideally, those labeled as having experience with Social Security would be respondents who receive a Social Security check, but that question is not directly asked on the survey. Instead, respondents 65 years old or older are assumed to receive Social Security checks. This group comprises 16.6% of the cross-sectional national study and about the same proportion in the panel studies. In the pre-convention period (May through July), seniors are less likely to support privatization (31% support) than younger voters are (62% support).

The experience measure for the Patients' Bill of Rights issue is whether the respondent self-reports having her "main insurance through an HMO." This group encompassed over 43% of survey respondents in the national cross section. Prior to the nominating conventions, HMO customers were slightly more likely to favor "giving patients the right to sue their health maintenance organization or HMO" than non-HMO customers by 78% to 75%.

3.2 Results and Analysis

3.2.1 Learning Over the Course of the Campaign

Data on Social Security and the Patients' Bill of Rights indicate that voters learned about these issues over the course of the campaign. Learning was especially prevalent

among experienced voters, a crucial point since the Personal Experience Model and other research (Lenz, 2006) present learning as a necessary condition of issue-driven vote preference shifts. If learning is more prevalent among experienced voters, then the implications for campaigns of the Candidate Evaluation Hypothesis are even more stark than in a situation in which all voters learn the candidates' positions.

Voters initially are largely ignorant of Gore's opposition to Social Security privatization. In the first month that the survey asked about Gore's position (May 19 to June 15, $n=605$), only 41% of respondents answer "no" to the question "Al Gore—do you think he favors or opposes allowing workers to invest some of their Social Security contributions in the stock market?" By contrast, a majority (51%) of respondents correctly report that Bush favored personal investment for the retirement program. Seniors, during this early stage of the campaign, are not statistically significantly more knowledgeable than the rest of the population, though slightly more (56%) know that Bush opposed privatization ($n=95$).

Voters learn about the candidates' positions during the campaign, through nominating conventions, debates, and advertisements. In the last three weeks before the election, 61% of respondents know that Gore opposed privatization and 67% report that Bush favored the policy change ($n=2,753$). Seniors learn about the candidates' platforms to a larger extent, with 72% and 77% correctly reporting Gore's and Bush's positions ($n=460$). The knowledge differences on this issue between seniors and younger voters are statistically significant.

Figure 3.1 illustrates learning over the course of the campaign. Learning is slow and steady through the summer, with an acceleration during the nominating con-

ventions. Seniors learn faster during the convention period than the rest of the population. Then, after the conventions, voter knowledge stagnates, only to rise again—very quickly—starting with the first debate in the beginning of October.

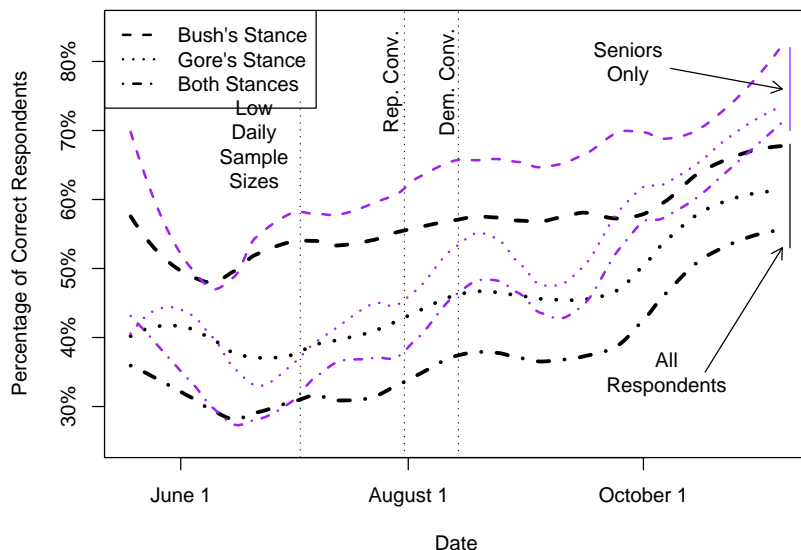


Figure 3.1: Loess smoothed curves of voters’ knowledge about Bush’s and Gore’s positions on Social Security. While both young and old voters learn about their issue positions during the course of the campaign, seniors gain knowledge faster. Daily sample sizes average 23 prior to July 4 (inclusive) and 149 after July 4.

As with Social Security, the campaign begins with voters generally ignorant of the candidates’ stances on the Patients’ Bill of Rights. The Annenberg survey asks voters whether they thought Bush (and, in a separate question, Gore) supported a patient’s “right to sue” her HMO. Bush’s position on this topic is genuinely ambiguous: he vetoed a Patients’ Bill of Rights in Texas in 1995 but let a subsequent bill become law

without his signature when a veto-proof majority of the Texas legislature passed it. However, in the third debate, Bush claimed credit for this law and touted its provision that gives patients the right to “sue an HMO for denying you proper coverage.”²

Gore’s position on the Patients’ Bill of Rights, however, is unambiguous: he supported the right of patients to sue their HMOs. Despite this clear position, in the first month of the Annenberg survey, only 42% of respondents know Gore’s position (with 38% claiming not to know). By the final two weeks of the campaign, this figure increases to 48% (with 31% “don’t know”). Learning among voters who used an HMO for health insurance is slightly faster, increasing from 42% to 51% over the same time period. The difference in knowledge at the end of the campaign between voters who are experienced with HMOs and those who are not is statistically significant.

3.2.2 Cue-Taking and Self-Interest

The issues discussed in this chapter—Social Security and the Patients’ Bill of Rights—are issues in which experienced voters have vested personal interests. The Personal Experience Model and theories of self-interest yield competing hypotheses, with the 2000 Annenberg data helping to adjudicate this dispute. The results, however, are mixed: both experience and self-interest affect changes in voters’ opinions. In the three cases tested, one case (Patients’ Bill of Rights) supports the Cue-Taking Hypothesis, another case (Social Security during the Democratic convention) supports

²As President, Bush’s Department of Justice successfully argued in *Aetna Health, Inc. v. Davila*, 542 U.S. 200 (2004), that federal law superseded the Texas Patients’ Bill of Rights, thus disallowing patient lawsuits.

the theory of self-interest, and a third case (Social Security during the Republican Convention) yields mixed evidence. Most likely, both phenomena occur in all cases and the resulting effect depend on the strength of the self-interest and the personal experience.

Before analyzing whether personal experience or self-interest hold sway over voters, another hypothesis—issue-opinion cognitive dissonance—must be considered. If, as the issue-opinion cognitive dissonance hypothesis predicts, voters accept only congruent signals on issues, then no voter would ever alter her issue position. If, on the other hand, the Personal Experience Model’s assumption is accurate and voters accept signals only from favored politicians, then voters should adopt the positions of these politicians as issues become politicized (see discussion in Section 2.1.1). Theories of self-interest suggest a similar voter shift, though with different causal connections: in that model, voters are primed on self interest and change their issue opinion and candidate evaluations accordingly. Hence, both the Cue-Taking Hypothesis and self-interest theories predict increased correlation between issue opinion and candidate preference as an issue becomes politicized.

The data from the 2000 campaign support these latter two hypotheses. For each of the four issue-convention pairs, the correlation between pre-convention vote preference (trichotomous) and issue position increases over the course of the convention. The panel nature of the data ensures that reverse causation does not affect these results (i.e., post-convention vote preference is ignored). Only the Social Security correlation boost during the Republican convention meets standard levels of statistical significance ($p = 0.10$, two-tailed). However, as the left panel in Figure 3.2 shows,

all four shifts in correlation are in the expected direction, and jointly the analysis is significant ($p = 0.09$).³ The right panel of Figure 3.2 displays the correlations between the more granular 7-point party affiliation and issue opinion, revealing a similar pattern.

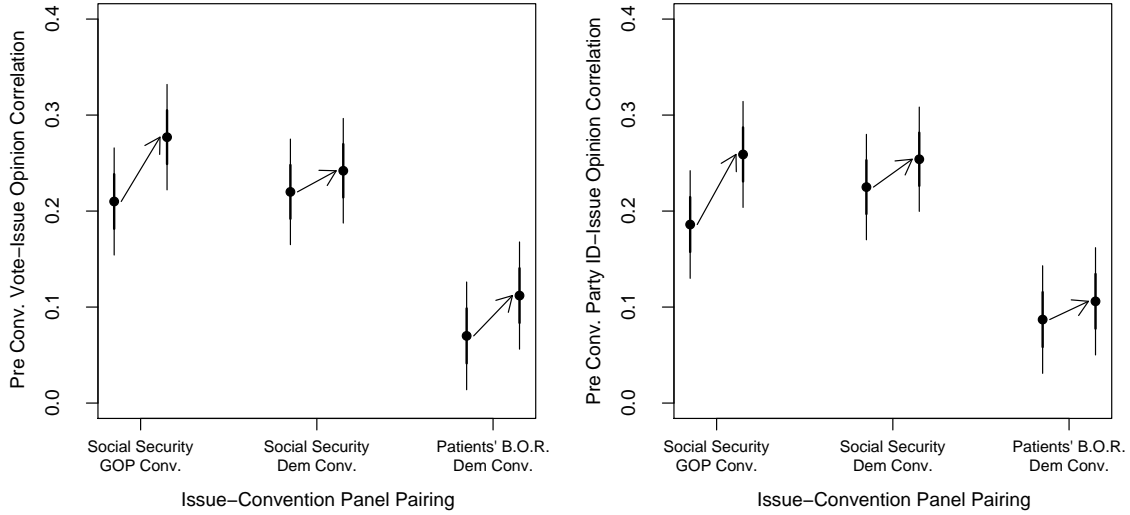


Figure 3.2: Change in predisposition-issue correlations before and after the conventions. Predispositions are measured by trichotomous vote choice (left panel) or 7-point party affiliation (right panel). Issue opinion measures have three and two possible values for Social Security and Patients' Bill of Rights, respectively. Each correlation includes about 1,200 cases in each correlation.

Evidence for the Cue-Taking Hypothesis exists but is weak. Of the three issue-convention pairs, two have the expected sign of the Cue-Taking Hypothesis, although only one, Patients' Bill of Rights, is statistically significant. The other, Social Secu-

³The calculation of a joint p -value assumes that the tests are independent. When comparing analyses of separate groups of experienced voters on separate issues, this assumption is probably valid.

rity during the Democratic convention, is nearly exactly zero. For the Republican convention, seniors are less likely than other voters to have stable opinions. This phenomenon is a result of seniors shift, in a self-interested manner, from a pro- to an anti-privatization stance.

Support for the Cue-Taking Hypothesis is measured with a logistic regression of post-convention issue opinion on pre-convention issue opinion with an experience interaction term. Controls for convention watching, income, political interest, and party (including their interaction terms) are included. Figure 3.3 displays the quantity of interest: the difference in probability of issue opinion change between experienced and non-experienced voters. Negative values are indicative of the cue-taking moderation: experienced voters shifting their opinion less than non-experienced voters. Regression coefficients are presented in Table B.1 of Appendix B.

The positive result for the Cue-Taking Hypothesis in the case of the Patients' Bill of Rights holds even when controlling for alternative explanations. Potentially, voters who watched the convention might have been more likely to shift their opinions, but such an interaction term was in the opposite direction and was near zero. Also, more informed voters may have had more stable opinions; the evidence supports this idea but does not diminish the importance or significance of the experience. The positive coefficient is not solely an artifact of there being fewer non-HMO individuals who are against a Patients' Bill of Rights; a lower proportion of experienced individuals defected from that position than did non-experienced individuals. The result also disappears when experience with Social Security is entered into the regression in place of support for a Patients' Bill of Rights, thus eliminating the possibility that

HMO-experienced individuals happen to have more stable opinions across the entire political spectrum.

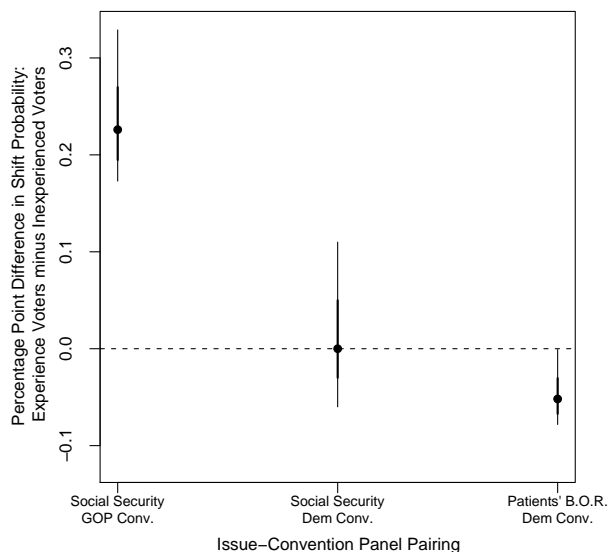


Figure 3.3: Increased or decreased probability of issue opinion change for voters experienced with the issue. Issue opinion is dichotomized. Point estimates (circles), one bootstrapped standard error (bold lines), and 95%-confidence interval (non-bold lines) are displayed. Regression details are presented in Table B.1.

Social Security recipients, on the other hand, exhibit less cue-taking moderation or none at all. This finding is especially apparent in the Republican convention panel data, in which a significant proportion of seniors were alienated by Bush's privatization message. Most likely, these seniors believed that their Social Security checks were endangered by Bush's plan, even though Bush explicitly protected seniors in his policy proposal.

For the Democratic convention data, shades of self-interest are apparent. Over

a quarter of seniors (27%) who begin the convention period in favor of privatization switch their opinion by the end of the convention. Less than a tenth of younger voters do the same. The experience interaction coefficient (Table B.1) is positive for this issue-convention pair because among those initially anti-privatization, more seniors stick with that position.

The anti-privatization movement among seniors is consistent with Chong *et al.*'s (2001) experiments on priming self-interest. The Annenberg survey asks respondents whether they agree with the statement, "Allowing younger people to invest some of their Social Security contributions in the stock market will reduce Social Security benefits for older people." Even at the end of the campaign (which is the only period during which the question is put to respondents), after so much information about Social Security had been disseminated, 40% of voters agreed that seniors' benefits would be reduced under privatization.⁴

As discussed in Section 3.1.2, the finding that experienced voters are also influenced by self-interest biases the results in Section 3.2.3 downward. While self-interest is the likely cause for the issue opinion defection pattern of experienced voters, this bias would exist regardless of the mechanism. The sufficient condition is that issue opinion shifts are accompanied by like-minded voter preference shifts. The data clearly show that they are. For example, Gore's margin increases by 29 percentage points among seniors who shift their issue opinions against privatization during the Democratic Convention.

Of all the personal experiences tested in this dissertation, receiving a Social Secu-

⁴The Gore campaign ran an advertisement claiming, perhaps disingenuously, that Bush's plan "could cut benefits for seniors."

ality check is the weakest. Receiving a Social Security check provides evidence apart from partisan predispositions that the system “works” (i.e., that they receive checks) but lends little insight into how the system works. It is not surprising then that the evidence for the Cue-Taking Hypothesis is mixed, at best. In sum, the results lean toward the opposite hypothesis preferred by the self-interest literature: seniors are inclined to shift their opinion toward anti-privatization.

In contrast, being a member of an HMO does give an individual at least some insight into the health insurance bureaucracy. For this issue, the evidence for the Cue-Taking Hypothesis is strong. Accounting for the amount of time individuals watched the convention, political knowledge, and pre-convention position disparities does not weaken the relationship. In this case, experienced voters are less likely to adopt the position of elites.

3.2.3 Experienced Voters Judge Politicians on Issues

Consistent with the Candidate Evaluation Hypothesis, the Annenberg data demonstrate that voters judge candidates on issues with which they have experience. Two of the three issue-convention pairs’ results near statistical significance. When the negative effects of self-interest are corrected for, all effects are in the expected direction. Analyses also examine the role of priming apart from voter learning.

Support for the Candidate Evaluation Hypothesis is provided by variations on one ordinal regression. Change in vote from the pre-convention period to the post-convention period is regressed on issue experience, pre-convention issue opinion, and the interaction between these two terms. A negative coefficient for experi-

ence and a positive interaction term indicate that experienced voters relied on their pre-convention issue position to evaluate politicians more than did voters without experience.

Two of the three cases exhibit higher degrees of issue-driven candidate evaluation by experienced voters. The Republican convention data indicate that the average undecided voter who enters the convention against privatization has a 1% chance of shifting her vote to Gore. A similarly situated senior has a 5% chance of altering her vote preference for Gore. For the Democratic convention, an undecided voter who favors a patient's right to sue has a 14% chance of altering her vote in favor of Gore; a similarly situated voter who belongs to an HMO health care plan has a 19% chance. Figure 3.4 displays the differences in these probabilities (4 and 5 percentage points, respectively) added to the analogous probabilities for voters who enter the conventions with opinions on the Republican side of the spectrum.

As noted, the shift of experienced voters' issue positions based on their self-interest biases these results downward. To tease out issue-driven effects that are not a result of self-interest, the regressions are restricted to voters who stick with their issue position throughout the convention (Figure 3.4, squares). In all cases, voters with experience and stable opinions are more likely to evaluate politicians on these issues than are their stable, non-experienced counterparts. Voters who have an HMO and do not switch their position on the Patients' Bill of Rights are very likely to judge the candidates on that issue.

These analyses demonstrate that voters' evaluations hinge on issues with which they have experience. They do not, however, demonstrate an increase in the salience

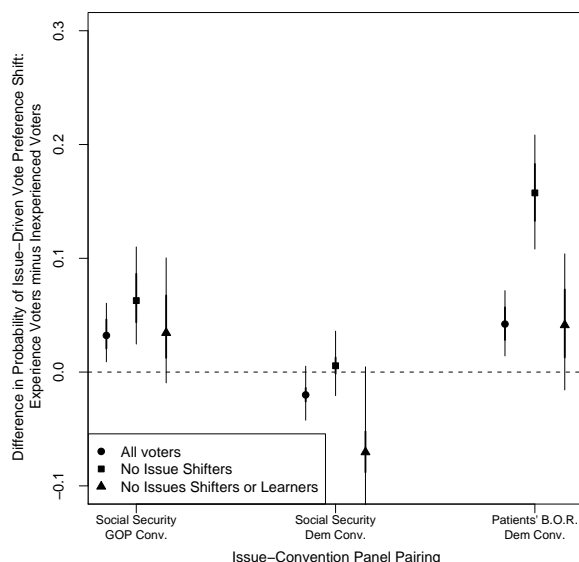


Figure 3.4: Increase in probability of an experienced individual shifting her vote because of pre-convention issue opinion over the analogous probability for non-experienced voters. Point estimates (circles, squares, triangles), one bootstrapped standard error (bold lines), and 95%-confidence interval (non-bold lines) are displayed. Regression details and coefficients for the “no issue shifters” condition are presented in Table B.2.

of the issue, or priming. Lenz (2006) raises the point that learning, not priming, may be driving vote choice. The Personal Experience Hypothesis takes a similar view: learning drives both priming and changes in vote choice. To check for the possibility of priming in the absence of learning, the regression is further restricted to those voters who answered the same number (or fewer) of “candidate position” questions correctly.

The results from the Democratic convention indicate that no priming occurred apart from learning (Figure 3.4, triangles). In each case, the difference between

experienced and non-experienced voters decreases, indicating that learning plays an important role in issue-driven candidate evaluation.

The results include controls (including interaction terms) for income, convention watching, political interest and party affiliation. Experience does not cross issues; for instance, the interaction of HMO customers and Social Security privatization during the Democratic convention has a coefficient of nearly exactly zero.

Regression discontinuity (Thistlewaite and Campbell, 1960) analysis provides more evidence that receiving a Social Security check generates experience with that issue and tightens the relationship between that issue and Social Security. The analysis divides the population into two group: those 65 years of age or older (who are assumed to receive Social Security checks) and younger voters. If experience with Social Security is driving the results then no issue-driven vote changes will be observed in the younger group—even among those near retirement age in this group. To eliminate the possibility of self-interest contaminating the results, the regressions are restricted to voters who did not change their issue positions during the conventions.

The results (Figure 3.5) indicate that as a voter turns 65, the impact of pre-convention opinion on privatization and change in vote during the convention does increase. For a 65-year-old voter, a change in her pre-convention opinion increases her chance of shifting her vote toward Gore by 4 percentage points.⁵ For an analogous 64-year-old voter, the change in Gore probability is nearly exactly zero. This 3 to 4 percentage point difference is consistent with the ordinal probit regression's findings of Figure 3.4 (left-most square) for Social Security during the Republican

⁵The regression coefficient that drives this calculation is not statistically significant (Table B.3).

Convention.⁶

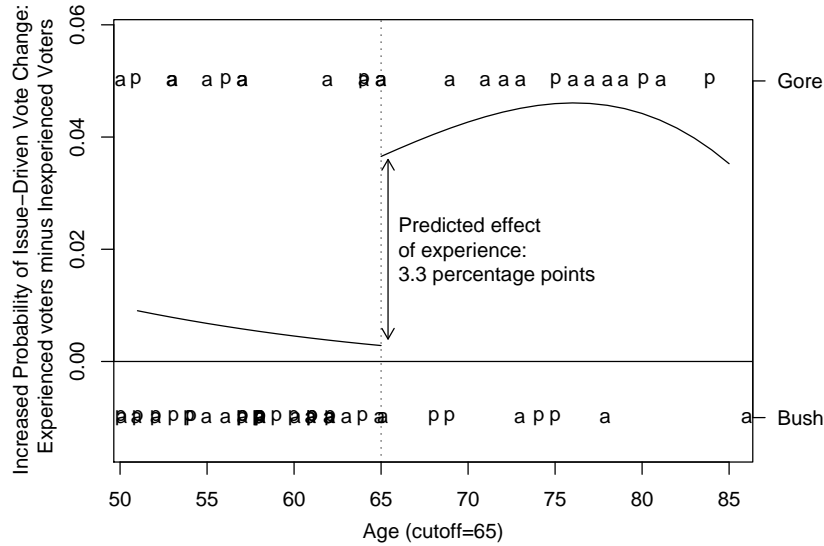


Figure 3.5: Regression discontinuity of voters around retirement age show issue-driven effects for seniors only. Lines represent predicted impact of pre-convention Social Security privatization opinion on the probability of a pro-Gore shift in vote preference. Points labeled "p" represent voters who are pro-privatization; points labeled "a" are those anti-privatization. Points on the top line are voters who alter their candidate preferences toward Gore (with age jiggered); on the bottom line, toward Bush. Voters who do not shift their voter preferences are not displayed (for clarity), but are included in the analysis. Coefficients and regression specification reported in Table B.3.

Once experienced voter alter their candidate preferences, they cue-take from their preferred candidate. For example, members of HMO who have a stable opinion in favor of a Patients' Bill of Rights and shift their vote toward Gore during the

⁶To check for a spurious pattern in the data, the same regression discontinuity is applied to pre-convention vote. The difference in predicted vote between the two coefficients is highly statistically insignificant. Low n-sizes affects both of these analyses.

Democratic convention also become more against Social Security privatization. The rest of the respondent population exhibits equal pro- and anti-privatization shifts.⁷ This behavioral pattern supports the dynamic nature of the Personal Experience Model (Section 2.1.5).

3.2.4 Discussion

Observational evidence from the 2000 presidential campaign indicates that experienced voters act differently from voters who lack experience with a given political issue. Experienced voters learn about an issue faster and as they learn, they judge politicians on the issue. Issue-driven candidate evaluation independent of learning, such as priming, may occur but the evidence is weaker.

Self-interest also plays a role in the issue-vote choice interaction. Candidates can emphasize a voter's self-motivated preference for an issue position, making that voter more likely to adopt that position. Since self-interested voters are often experienced voters, this effect is in tension with the Cue-Taking Hypothesis. This chapter addresses this tension by attempting to tease out the different effects of self-interest and experience among the same group of voters. The next chapter, in contrast, identifies voters who have experience with an issue but no self-interest in the outcome.

The analyses of this chapter, as well as all analyses of this dissertation, cannot state truly causal claims. Causal inference relies on manipulation and randomization

⁷Among the experience subgroup, 22% become anti-privatization while 8% become pro-privatization (n=49). Among other voters, the proportions are 11.3% and 11.8%, respectively (n=1,163). This difference is statistically significant at conventional levels ($p = 0.09$, two-tailed). The difference holds when restricting the latter group to pre-convention supporters of a Patients' Bill of Rights.

of units (Fisher, 1926; Rubin, 1978; Holland, 1986). Tests of the Personal Experience Model suffer from the problem that it is difficult to randomize personal experience. Instead, this dissertation emphasizes conclusions of form: individuals with personal experience act in a certain fashion. Results are consistent with the Personal Experience Model's causal mechanism and sufficient for campaign practitioners who care about outcomes rather than causal chains.

Because of the interplay between experience and self-interest, evidence for the Cue-Taking Hypothesis from the 2000 campaign is mixed. In one case, the Patients' Bill of Rights, voters experienced with HMOs moderate their cue-taking as the Personal Experience model would predict. For Social Security, however, seniors shift their issue opinions toward their perceived self-interested position—against privatization. The differences in the two levels of experience, along with being potentially unaware of the inner workings of the Social Security trust fund, may explain some of this difference.

The evidence for the Candidate Evaluation Hypothesis is moderately strong. The panel nature of the Annenberg data enables detection of the issue-driven candidate evaluation (Lenz, 2006). Even though the effects of self-interest counteract these issue-driven vote changes, experienced voters rely more on their issue position in two of the three cases tested. When the effects of the Personal Experience Model are separated from self-interest by examining a subset of the data, the findings become clearer.

For campaign practitioners, these analyses indicate that personal experience with an issue can drive vote choice. But the 2000 campaign also provides a warning.

Experienced voters often have a stake in the policy outcome, and this self-interest may cause issue opinion shifts that would not otherwise occur among experienced voters.

From the point of view of the Personal Experience Model, campaigns should target experienced voters who agree with the candidate's stance. The evidence demonstrates that such targeting is a net positive. However, a more holistic view that took self-interest into account would be more efficient at garnering voters.

Chapter 4

Survey Experiments of Princeton Students and Adults Nationwide

A central aspect of many political campaigns is persuasion: convincing voters who would otherwise cast a ballot for the opponent to support the campaign's candidate. Several micro-theories of American politics (Campbell *et al.*, 1960; Zaller, 1992; Lupia and McCubbins, 1998) detail the difficulty of changing an individual's partisan predispositions and imply that campaigns' persuasive efforts face an uphill battle. The Personal Experience Model predicts that campaigns' emphasis on issues with which voters have personal experience can alter the voters' evaluations of the candidates counter to the voters' predispositions. Two randomized survey experiments with hypothetical candidates and real-world issues support the model's predictions.

This analysis moves away from the partisan biases literature and focuses on why citizens might change their vote choice during a campaign. The literature on partisan

biases has expanded from the fields of political science (Markus and Converse, 1979), political psychology (Taber and Lodge, 2006), and neuroscience (Knutson *et al.*, 2006). Dozens of studies find that partisans react more positively to arguments from elites of their own party (see Bartels, 2002, for a review). If Democratic-leaning voters listen only to Democratic elites and Republican-leaning voters listen only to Republican elites, then the electorate polarizes. Indeed, this phenomenon occurred in the 2004 campaign over the issue of whether Saddam Hussein was involved in the September 11 attacks (Parker-Stephen, 2007).

Partisan biases abound, but they are not helpful for campaigns seeking to persuade voters to cast a ballot for a specific candidate. The goal of shifting the electorate (rather than polarizing it) is more relevant for a campaign that is underperforming in public opinion polls, but even leading candidates may want to increase their win percentage to scare off challengers (Levitt and Wolfram, 1997). For a campaign to increase its vote share, it must convince voters who would not have voted for its candidate to cast a ballot for that candidate. Convincing these voters requires that the campaign increase the standing of its candidate in the voters' eyes relative to the other candidate(s).¹ Survey experiments demonstrate that certain subgroups of voters (e.g., veterans) respond strongly to candidate signals on issues with which they have personal experience (e.g., the Iraq war), and that these interactions influence voters' candidate evaluations even if they run counter to existing partisan biases.

¹These claims assume an electorate of fixed size, but in models that correlate uncertainty of choice with abstention (Sanders, 2000), increasing a candidate's standing among the electorate will increase turnout as well as vote share.

4.1 Theory and Hypotheses

Since at least as far back as Downs (1957), political scientists have modeled political preferences as a function of ideology. This ideology can be thought of as a combination of issues, with voters preferring those candidates whose issue opinions are closest to their own opinions. Thus, when an individual receives information (i.e., a “signal”) from a candidate that indicates that he holds a similar position to the individual, the individual should improve her evaluation of the candidate. Analogously, her evaluation should deteriorate when the respondent receives an incongruent cue.

Lemma 1: A congruent signal from a candidate will improve the respondent’s evaluation of the candidate. An incongruent signal will lessen the respondent’s evaluation. (A congruent signal is defined as information that informs an individual that the candidate supports the same side of the issue that the individual supports.)

This Lemma assumes that voters receive and incorporate signals about politicians’ ideologies into their issue beliefs. However, Zaller (1992) persuasively demonstrates that voters filter out a great proportion of political information based on their partisan predispositions. Research on deference to elites (Lupia and McCubbins, 1998) and cue-taking (Gilens and Murakawa, 2002) shows how voters fundamentally alter their issue positions based on the stances of their preferred elites. For example, a large proportion of Democrats were pro-Social Security privatization (and vice versa for Republicans) before George W. Bush and Al Gore took public stances during the 2000 campaign (Richard Johnston, 2004); after the candidates made public statements, the partisans sorted into their respective positions.²

²For this experiment, a candidate’s signals will always contain new information about the can-

As elaborated in Chapter 2, personal experience on an issue provides a basis on which a voter can judge politicians independent of partisan biases. This political “ground truthing” of candidates’ statements leads voters to critically evaluate politicians on issues with which they have experience. Examples include retirees who receive Social Security checks, hunters and guns, Hispanics about immigration, and veterans about war policy. This “responsiveness” to an issue can either be positive (i.e., holding the candidate in higher regard) or negative. Recasting the Candidate Evaluation Hypothesis from Chapter 2 into a prediction specific to candidate statements yields the first of two main hypotheses of this chapter:

Hypothesis 1 (Candidate Evaluation): Individuals with personal experience with an issue are more responsive to a candidate signal on that issue than are those with no personal experience. This responsiveness will be present even when signals run counter to existing partisan biases (or candidate preferences).

Personal experience also moderates cue-taking from politicians on issues because the voter’s experiences crowd out elite-generated considerations. For example, as shown in Chapter 3, during the 2000 election, Republican retirees did not become ardent supports of Social Security privatization because in their experience the system worked well for them. This idea is formalized in the learning model presented in Chapter 2. Modifying the Cue-Taking Hypothesis to fit the experiments presented in this chapter yields:

Hypothesis 2 (Cue-Taking): Individuals who have personal experience with a political issue, when presented with information about their preferred candidate’s

 didate’s stance.

stance on the issue, alter their issue opinion to match their preferred candidate's opinion (i.e., cue-take) less than those individuals who lack personal experience.

These hypotheses are extremely important for campaigns that seek to alter the preferences of the electorate. If a losing campaign shifts the political discussion to an issue that people know very little about (even if initial public opinion polls show support for one position), voters will sort by their existing predispositions. Given these hypotheses, campaigns would be more successful targeting voters with messages on issues with which they have personal experience.

This survey also measures characteristics of individuals that relate to alternative and mediating hypotheses to those above. Perhaps individuals with generally high political knowledge are likely to have stable opinions on all opinions and experience has little or no effect. Another possibility is that self-interest rather than personal experience causes issue-driven shifts in political judgments. Also, experience may increase opinion certainty (i.e., confidence that an opinion is correct) and this certainty may drive later behavior (Fazio and Zanna, 1978).

4.2 Survey Design

4.2.1 Overall Goals

To test these hypotheses, two two-wave survey experiments are conducted: one pilot experiment of Princeton undergraduates ($n=273$) and one survey of adults nationwide ($n=391$). Both experiments are very similar in nature, with respondents of the first wave being re-interviewed about a month later. All interviews are conducted

online.

The surveys are conducted in two waves to better capture the effects of candidates signaling on respondents' issue opinion and candidate evaluation. The first wave provides a baseline for respondents' opinions absent the key parts of the candidates' platforms. Over a month later, respondents are re-asked the same questions, this time after the candidates reveal their issue positions. Cross-tab and regression analyses of the change in respondents' political opinions across waves test the validity of the two hypotheses. The month lag between waves limits the respondent's ability to remember her wave one responses and lowers the possibility of the respondent attempting to game the survey.³

The two hypotheses tested have different dependent variables of interest. The Candidate Evaluation Hypothesis requires that respondents judge politicians and the Cue-Taking Hypothesis requires that respondents report issue positions. The survey asks respondents to evaluate fictional candidates and real issues. Fictional candidates are used for two primary reasons: (1) to limit the amount of prior information, biases, or predispositions the respondent has about the candidate, and (2) so that the candidate can plausibly take either side of issues. Since the survey tests the interaction of personal experience with political judgments, actual issues are used. Both surveys test two hypothetical candidates and three real issues.

The basic structure of the surveys is: (1) respondents rate hypothetical candidates based on paragraph descriptions, (2) respondents report issue opinions, (3)

³For instance, if no lag between the waves were included, respondents could purposely report the same issue positive in both waves to prove that they hold a consistent opinion regardless of the cues they receive.

respondents are queried on their issue experience, (4) a month later the same candidate paragraphs are presented with the candidates taking stances on different issues, and (5) respondents rate the candidates and report issue positions again. This setup allows the effect of candidate position-taking on both candidate evaluation and issue opinion, and the interaction of personal experience with these effects, to be tested.

Because the candidates are hypothetical and the issues are real, change in candidate evaluation is more likely than change in issue opinion. Thus, the surveys are created with the goal of fostering cue-taking. First, the candidate paragraphs attempt to mimic the partisan division of the real political arena. (See Appendix C.1.1 for candidate descriptions.) If Democrats feel an affinity to the hypothetical candidate, for example, they are more likely to cue-take. Thus, every respondent sees the same hypothetical match-up between one Democrat and one Republican. Second, although the candidate signals include no new information on the issue, they are attempts to reflect the actual debate and are designed to be forceful enough to move respondents. Third, the evaluations and issue opinions are reported on 101- and 21-point scales respectively to detect small movements. The web format facilitates this granularity by allowing respondents to choose their response via a slider (Figure 4.1).

In the second wave, the respondent views the entire candidate paragraph description again, but at the end of the paragraph sees the statement, “[Candidate name] recently made the following comments about the debate over [Issue]: [Issue statement].” Each issue has two issue statements related to it, one liberal and one conservative. Candidates are assigned issues and issue statements randomly with one

2-B. With regard to the millions of illegal immigrants in this country, do you think the government should:

A) Deport illegal immigrants as quickly as possible to discourage further unlawful entry into this country.

B) Provide a path to citizenship for undocumented workers who have held jobs, paid taxes, learned English, and been good community members.

↑ Completely Agree w/ Statement A ↑ Neutral Completely Agree w/ Statement B ↑

Your opinion response: B:2

← Very certain about above opinion

← Somewhat certain about above opinion

← Not at all certain about above opinion

Your level of certainty: 0

Figure 4.1: Screenshot of survey question. Respondents report their issue opinion by sliding a shuttle left or right across the screen. The web browser informs the respondent of the shuttle current position (which, in the example above, is B:2, or 2 out of a maximum 10 on the B-side of the issue). Candidates are evaluated on a similar scale, though with more granularity. For both issue opinion and candidate evaluation, each respondent uses the vertical slider to indicate her certainty of her reported belief.

constraint: candidates cannot take two stances on the same issue. Thus, for every respondent, the Democratic candidate takes a stance on one issue, the Republican candidate sends a signal on a different issue, and the third issue is left unmentioned. This constraint allows for the source of any change in a voter's opinion to be clearly identified. Half the time the two candidates send two liberal or two conservative signals (although again on different issues).

4.2.2 Specifics of Princeton Survey Design

The first wave of the Princeton survey was distributed to 1,600 students on December 6, 2007. A \$100 gift certificate to either amazon.com or iTunes was offered as an

incentive to participate, with the winner to be chosen at random from students who completed the survey. A reminder about the survey was sent out a week after the initial email, with a second incentive (a \$50 gift certificate) for the 400th respondent. The survey was open for four weeks, during which 418 undergraduates completed the survey (26% response rate). Students who completed the survey are referred to as “respondents.”

The candidate evaluation pitted a former governor (Richard Miller, Democrat) against a Retired Admiral (Mark Jones, Republican) in a race for a U.S. Senate seat of an unspecified state. Basic biographical information and endorsements were mentioned in the candidate paragraphs.

Respondents were asked for their opinions on three issues: gay marriage, environmental regulation, and foreign aid. The gay marriage question informed respondents that their state supreme court had ruled that the state must offer same-sex couples either civil unions or marriage. The respondent was asked to report which one of these options she preferred and how strongly. The question about environmental regulation asked respondents to choose between two solutions to global warming: a cap-and-trade system or a less restricted, incentive-based solution. With respect to foreign aid, respondents were asked to indicate whether they favored doubling or halving the foreign-aid budget.

The order of candidates and issues was not random, but differed by class year and remained constant across both waves. For issues, the relative position of the traditionally liberal side and conservative side was constant across the three issues and waves. No statistically significant order effects were found.

To measure issue experience, respondents were asked about their personal habits. To evaluate experience with gay marriage, respondents reported how often they communicated with any gay and lesbian friends and family. With regard to the environment, students were queried about the number of outdoor excursions they went on in the past year. To gauge experience in foreign policy (specifically foreign aid), respondents indicated how much time they had spent abroad (excluding Europe) in the past five years. Finally, respondents were asked standard demographic questions about their gender, age, party affiliation, and ideology, as well as how closely they follow politics.

On February 11, 2008, two months after the initial wave, an email alerted first wave respondents that the second-wave survey would be available within a day. This email also provided (with permission) the names of the gift certificate winners of the first survey. The second-wave survey was delivered to students' inboxes the following evening and again was open for a month. Gift certificate incentives were provided, as with the first survey. Of the 418 first-wave respondents, 283 completed at least some questions in the second wave (273 finished the entire survey).

4.2.3 Specifics of Nationwide Survey

The first wave of the nationwide survey was distributed to 18,812 people on Survey Sampling, Inc.'s email list on July 28, 2008. A standard incentive (points in Survey Sampling Inc.'s program) helped motivate individuals to take the survey. A reminder was sent out two days later. Of the recipients, 540 completed the survey within a

week of the survey’s launch, for a 3% response rate.⁴ At the end of the survey, the respondents were told that a second survey would be coming “next month.”

The candidate evaluation pitted a former governor (Richard Miller, Democrat) against the current attorney general (Mark Jones, Republican) in a race for a U.S. Senate seat of an unspecified state. In addition to biographical information and endorsements, each description ended with a reason why opposing party leaders disliked the candidate in question.

After completing the candidate evaluations, respondents were asked for their opinions on three issues: immigration, the Iraq war, and gay marriage. For immigration, the choices were between deporting illegal immigrants and providing a path to citizenship. On the Iraq war, respondents chose between keeping troops in Iraq until that country is a “stable, functioning democracy” and withdrawing troops “as quickly as the Defense Department believes is safe.” For the issue of gay marriage, the respondents were presented with the situation in which a state supreme court recently mandated legalizing same-sex marriage. The respondents then indicated whether they supported passing a constitutional amendment to overturn the decision or to recognize gay marriage.

The nationwide survey included a few additional features. First, for each evaluation and opinion, respondents were asked to report the certainty of their response on a 0 to 10 scale (Figure 4.1). Also, after the candidate descriptions, respondents

⁴Completion of the survey required not only going through all the questions, but also touching or shifting at least one evaluation slider and at least one confidence slider. This eliminated respondents who had technical difficulties. Another 10 respondents were eliminated from the analysis because their responses and the amount of time it took them to record their responses indicated that they had not read the questions. No wave two respondents were eliminated, reducing the possibility that this judgement affected the results.

were asked to guess what each candidate’s opinion would be on one issue (the same issue the candidate would take a stance on in wave two).

Several measures of issue experience were recorded. First, respondents were asked to think about their social network, specifically, those people they talk to when “important issues or problems come up in life.” After reporting how many people were in this group of close friends and family, respondents gauged what percentage of their important conversations were with: individuals currently serving in the military, former military personnel, immigrants, Hispanics, and gays or lesbians.

Other measures of issue experience were tested as well. With respect to experience with immigration, Survey Sampling, Inc., provided the respondents’ race and ethnicity (i.e., whether the respondent was of Hispanic descent) and the respondent’s zip code, which was matched with the percentage of Hispanics in the respondent’s zip code according to the U.S. census. On wave two, respondents were asked what proportion of their co-workers were Hispanic. For gay marriage, respondents were asked whether they considered themselves gay or lesbian (at the end of wave two). For additional measures on experience with the Iraq war issue, respondents were asked if they are currently serving (or had served) in the military or whether this applied to another person in their household.

Finally, respondents were asked standard demographic questions about their party, ideology, and political attentiveness. To determine whether the respondents represent potential voters, they were asked whether they voted in 2006 and their intentions to vote in 2008. At the end of the survey, the respondent was thanked for her time and told that a follow-up survey would be delivered to her inbox in about

three weeks.

On August 18, 2008, exactly three weeks after the initial wave, an email alerted first-wave respondents to the availability of the new survey. Of the 540 first-wave respondents, 397 completed at least some questions in the second wave (391 finished the entire survey). These numbers translate into a response rate of 74% on the second survey.

Finally, respondents were asked to evaluate and comment on the survey. Specifically, respondents were asked if they felt “forced” to choose an option they “didn’t particularly like.” Of the 391 respondents who reached that question, four objected to the issue questions in general, two to immigration specifically, one to the Iraq war, and two to the gay marriage option for the gay marriage question. Also, 14 respondents specifically praised the range of options provided for the issues.

The real-world political scene during the period between the surveys was relatively quiet. The biggest news during the first wave of the survey was the residual effect of Barack Obama’s Europe trip and the launching of John McCain’s “celebrity” advertisement (July 30). The second wave closed just as Obama announced the selection of his running mate, Joe Biden. No major events occurred that were related to any of the three issues tested in the survey.

4.3 Design Checks

4.3.1 Characteristics of the Survey Respondent Population

The characteristics of the Princeton survey’s population are constrained by the fact that the respondents are all undergraduates at Princeton University. The population is 54% female and a plurality are first-year students. Only 7% indicate that they follow politics “a great deal,” with a plurality placing themselves in the middle of the scale (“some”).

For the national survey, the population is not restricted to registered voters or likely voters because individuals’ decisions to register to vote or to cast a ballot are ongoing decisions. For instance, someone might want to register or decide to vote only after receiving positive information about a candidate (Sanders, 2000). That said, one goal of conducting a nationwide survey is to produce a respondent population that is similar to the national electorate.⁵ Certainly very good social science can be performed in a laboratory with a participant group that looks very different from the population at large. However, treatment effects observed in one segment of the population might be counterbalanced by opposite effects in other segments of the electorate that are not included in the experiment.

As a reference point, the demographic composition of the survey respondents is compared to the composition of the National Election Pool’s 2004 general election exit poll.⁶ Overall, the demographics of the two groups are strikingly similar (Table

⁵The electorate and not the adult population is used as a reference point because the theory’s effects on nonvoters are inconsequential. Applications of this theory would be focused on likely voters and they decide which candidate wins or loses.

⁶As of June 2009, individual data for the 2008 exit poll is not available.

4.1), especially considering the nature of an Internet survey. One might expect older, poorer, and minority individuals to be underrepresented, as those groups traditionally use the Internet less. However, these demographics are well-represented in the survey, meeting or exceeding their percentages in the electorate. The only troubling statistic is the overrepresentation of non-churchgoers in the survey experiment: 32% of respondents report that they never attend church, while 15% of the electorate report the same. The overall similarity between the two populations is a benefit of the fact that Survey Sampling, Inc., is a professional organization that produces nationally representative surveys.

Because Democrats have gained significantly in party identification since November 2004, Pew Research Center's August 2008 poll is used to compare partisanship. The two surveys report approximately the same proportion of Democrats and Republicans, although the survey experiment includes more self-reported Independents than Pew reports. This result may be due to differences in question wording (all options, including "lean Democrat/Republican," are immediately presented to the respondent in the survey experiment, unlike in Pew).

4.3.2 Features of the Survey

Candidate Descriptions. To foster cue-taking in the second wave of the survey, the paragraph descriptions of the candidates are designed to elicit both positive evaluations and partisan differences. The nationwide survey fixes some deficiencies of the Princeton survey to achieve these goals.

For the Princeton survey, respondents of all political affiliations are likely to

Attribute	2008 Internet Survey	2004 Electorate: Exit Poll	Diff.	Attribute	2008 Internet Survey	2004 Electorate: Exit Poll	Diff.
Gender				Church Attendance			
Male	43%	46%	-3%	> Weekly	13%	16%	-3%
Female	57%	54%	3%	Weekly	19%	26%	-7%
				≤ Monthly	9%	14%	-5%
Race*				A few times			
White	79%	77%	2%	a year	26%	28%	-2%
Afr-Amer	14%	11%	3%	Never	32%	15%	17%
Latino	13%	8%	5%				
Asian	4%	2%	2%	Whites: Are you born again/evangelical?			
Other	10%	2%	8%	Yes	29%	23%	6%
Refused	4%	0%	4%				
Age				Have you ever served in the military?			
18-29	16%	17%	-1%	Yes	16%	18%	-2%
30-44	25%	29%	-4%				
45-59	31%	30%	1%	Are you currently married?			
60+	28%	24%	4%	Yes	59%	63%	-4%
Party ID†							
Democrat	31%	37%	-6%	Are you gay, lesbian, or bisexual?			
Republican	25%	28%	-3%	Yes	6%	2%	4%
Ind/Oth	44%	35%	9%	No	92%	45%	47%
Education				Refused	2%	54%	-52%
< H.S. Grad	2%	4%	-2%	Income			
H.S. Grad	18%	22%	-4%	under \$30K	24%	20%	4%
Some College	38%	32%	6%	\$30K-50K	22%	18%	4%
Coll Grad	27%	26%	1%	\$50K-75K	20%	21%	-1%
Post Coll	15%	16%	-1%	\$75K-100K	10%	12%	-2%
Religion				\$100K-150K	7%	10%	-3%
Protestant‡	33%	37%	-4%	\$150K+	3%	7%	-4%
Catholic	22%	19%	3%	Refused	15%	11%	4%
Mormon/LDS	1%	1%	0%	Region			
Jewish	4%	2%	2%	East	22%	22%	0%
Muslim	0%	0%	0%	Midwest	20%	26%	-6%
Other/None	40%	11%	29%	South	39%	32%	7%
Refused	0%	29%	-29%	West	20%	20%	0%

*Internet survey allowed more than one race to be specified

†From Pew (August 2008) instead of exit poll

‡Includes other Christians

Table 4.1: Demographics of survey experiment are similar to those of the November 2004 electorate. Because of the similarities, the national survey is not weighted. The exit poll results are weighted according to the documentation.

rate both candidates positively, although Democrats rate the Democratic candidate more positively than the Republican candidate (and vice versa for the Republicans). Independents fall in between the partisans, rating the Democratic nominee more highly, although this difference does not reach statistical significance ($p = 0.15$). On a scale from -10 (worst) to 10 (best), the average rating for the Democratic candidate is 5.2 and for the Republican candidate is 3.3 ($p < 0.01$). The correlation between the two ratings is positive ($\rho = 0.14$), meaning that the descriptions did not elicit strong partisan views. This correlation indicates that partisan feelings are often trumped by the amount of “trust” (or some other valence characteristic) that respondents afford to hypothetical candidates for which they have only a brief description.

Across all respondents, the hypothetical candidates are rated slightly positively, with means of 58 and 56 for the Democrat and Republican respectively (Figure 4.2). When regressed on 7-level partisanship, the relative evaluation of the Democrat at the intercept is only 0.2 points above the Republican (a statistically insignificant difference). Thus, controlling for the partisanship of the respondent, the candidate profiles are equally positive. Within respondent, the correlation between the Democratic and Republican evaluations is negative and statistically significant ($\rho = -0.16$), meaning that in rating the candidates, partisan feelings trump any propensity to rate hypothetical candidates positively or negatively in general.

Issue Opinion. In both surveys, opinions are relatively split across all three issues. In the Princeton survey, no side of any issue garners more than 60% support. Students support gay marriage over civil unions 55% to 36% (with 10% neutral). A smaller plurality supports a cap-and-trade system to regulate greenhouses gases

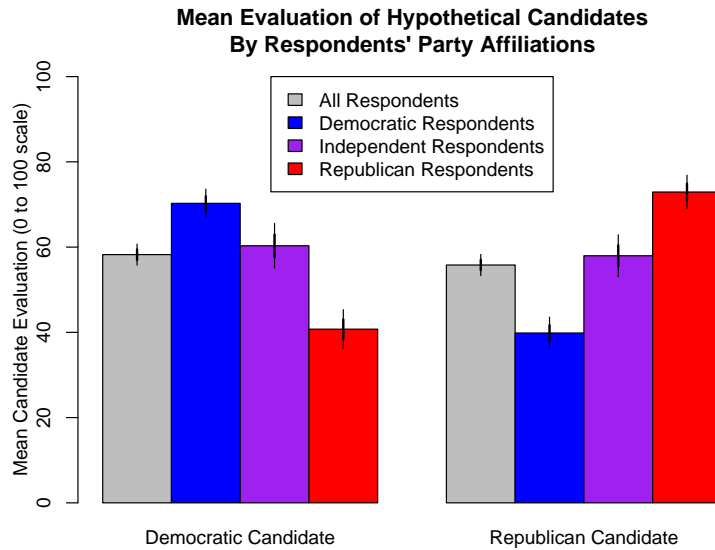


Figure 4.2: Mean evaluations of hypothetical candidates by party for nationwide survey. N-size is 397 for all respondents, 258 for Democrats, 66 for independents and 90 for Republicans. Thick lines show plus or minus one standard error; thin lines are plus or minus two standard errors.

(49%) over encouraging businesses to be green while letting the market rule (42%; 8% neutral; 1% refused). On the issue of foreign aid, 59% of respondents want to increase the budget for foreign aid, 21% want to decrease it, and 20% are neutral.

Similar splits are seen in the nationwide survey. On a +10 (most liberal) to -10 (most conservative) scale, the mean responses are +1.4, +1.7, and -1.0 for immigration, the Iraq war, and gay marriage, respectively. Across all issues, the highest proportion of respondents on one side of the issue is 62% favoring a path to citizenship for immigrants. All three issues correlate as expected with party; the Iraq war polarizes partisans the most (Figure 4.3).

Candidate Signals. Hypothetical candidates' attempts to persuade voters

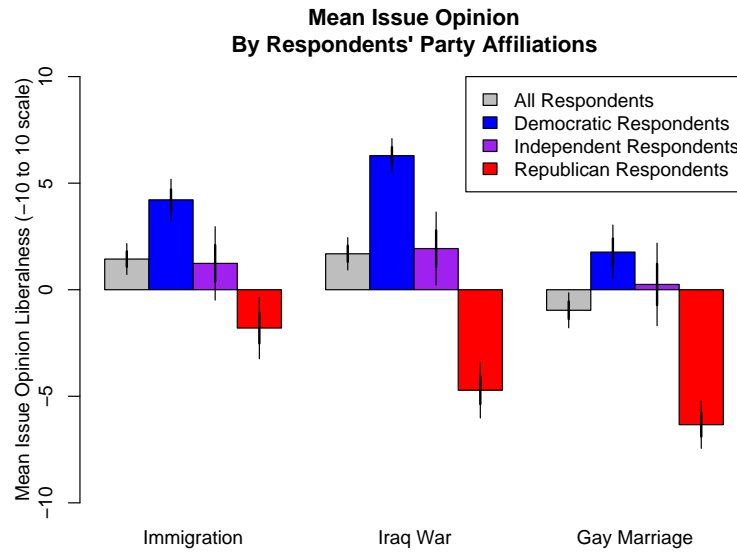


Figure 4.3: Mean issue opinions by party for the nationwide survey. N-size is 397 for all respondents, 258 for Democrats, 66 for independents and 90 for Republicans. Thick lines show plus or minus one standard error; thin lines are plus or minus two standard errors.

through a static text cannot be expected to move voters' issue opinions very far. Two other factors lower expectations even further. First, the persuasion is not directly aimed at the respondent; the candidate only states his own issue opinion. Second, half of the signals emanate from disliked candidates. While the signals generally work as expected, these low expectations are met in both surveys.

In the Princeton survey, candidate signals prove somewhat effective in two of the three issues: gay marriage and the environment. Despite the entire survey population moving more conservative on gay marriage and more liberal on the environment, candidate signals move respondents about 0.5 points (on average) on a 21-point scale in the direction of the signal (beyond any overall survey population movement). A

similar magnitude is seen for the effect of the conservative foreign aid signal, but the liberal signal also pushes respondents in the conservative direction.⁷

For the nationwide survey, the most any signal moves voters is 1 point (on average) on a 21-point scale (Figure 4.4). Immigration is an ideal case, with the electorate not shifting opinion between waves and the signals moving opinion by about a point. The survey population shifts to the left on the Iraq war between waves, but the conservative signal dampens this migration. Across the three issues, the liberal signal on gay marriage is the only signal that does not shift opinion in the expected direction when compared to the group that does not receive a signal. However, the liberal gay marriage signal proves effective when the signal is delivered by a preferred candidate.

4.3.3 Definitions of Issue Experience

Although the definition of issue experience is somewhat arbitrary, the surveys attempt to elicit the amount of interaction between the respondent and a political issue. These survey measures can certainly be called into question, especially for the Princeton survey. The nationwide survey attempts to gauge issue experience more accurately via either life experience (e.g., veteran and Iraq war) or contact with people directly affected by the issue (e.g., having close gay friends or family and same-sex marriage).

The Princeton survey has admittedly poor measures of issue experience. For example, number of outdoor excursions in the past year is the chosen proxy for experience with the environment. Potentially worse, amount of time spent abroad

⁷Foreign aid is consistently an ineffective issue in the Princeton survey, which lead to its omission in the nationwide survey.

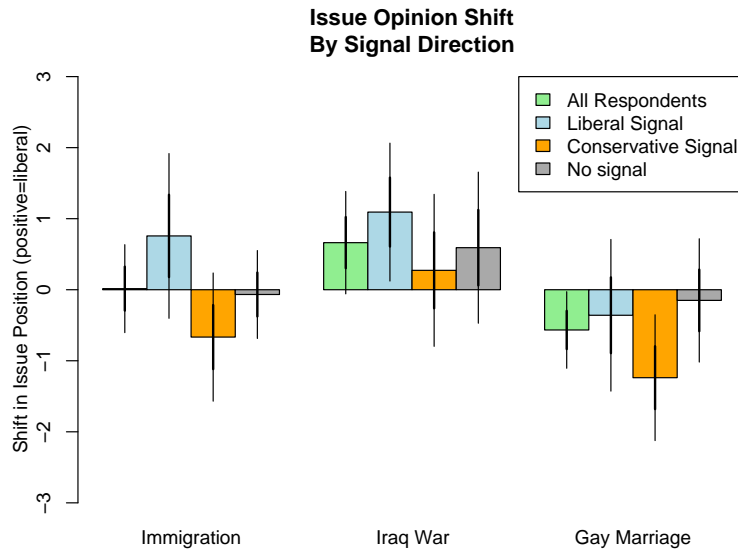


Figure 4.4: Mean shift in the liberal direction of issue opinions from wave one to wave two in the nationwide survey. Although the relative effect of the liberal and conservative signals are in the expected direction in nearly all cases, none of the signals are particularly powerful.

(outside North America and Europe) in the past five years is the measure for experience with foreign aid. The gay marriage measure is probably a more accurate depiction of experience; respondents are asked how often they communicate with gay and lesbian friends and family.

The nationwide survey contains several measures of experience, with an emphasis on conversations with individuals affected by the issue in question. (See Appendix C.1.3 for question wording.) These respondent characteristics are combined into one measure of experience for each issue. For the issues of immigration and the Iraq war, the disparate potential sources of issue experience are amalgamated into one measure using factor analysis. (Factor loadings are described in Table 4.3.3.) For

Immigration		Iraq War	
Variable	Loading	Variable	Loading
Perc. of convs. with Hispanics	0.88	Perc. of convs. with military	.50
Respondent is Hispanic	.55	Perc. of convs. with veterans	0.69
Perc. of convs. with immigrants	.52	Someone in household serves	0.5
Perc. Hispanic in zip code	0.5		
Perc. Hispanic in workplace	.38		

Table 4.2: Factor loadings for immigration and Iraq war experience measures.

measures in both surveys, when issue experience is dichotomized for easier display in figures or hypothesis testing, the top 30% of respondents (approximately) in each of the three experience measures are labeled “experienced.”

4.4 Support for Hypotheses

4.4.1 Candidate Evaluation

The changes in candidate evaluations are the crucial piece of this analysis; these shifts indicate how the voters might take a second look at a previously non-preferred candidate in an election. The signals work well, producing large shifts predicted by Lemma 1: when the candidate announces an issue stance close to a respondent’s position, that respondent evaluates the candidate more highly.⁸ The opposite happens

⁸When signal congruity appears in a dichotomous context, congruous signals are only those on the same side of the issue as the respondent’s wave-one opinion. When the concept is measured as a continuous variable, it is operationalized as the distance between the respondent’s wave one opinion and either +10 (for liberal signals) or -10 (for conservative signals).

when the candidate announces an issue stance far from a respondent’s own view. These two situations are described as the candidate delivering a “congruent” or an “incongruent” signal. The large (and statistically significant) difference between the effects of these two types of signals for the nationwide survey is displayed in Figure 4.5. Similar effects are present in the Princeton survey.⁹

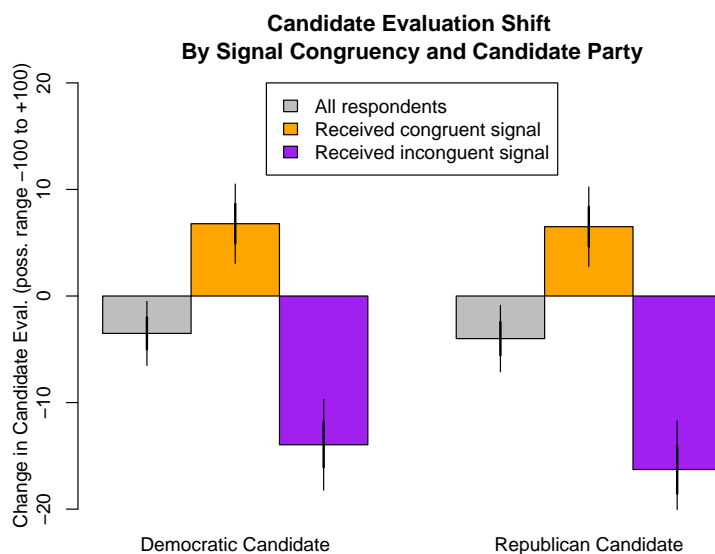


Figure 4.5: Mean difference between candidate evaluations in wave one and wave two. Respondents who are neutral on an issue are mixed in with respondents who received a congruent cue. N-sizes are 397 overall, with 200 receiving congruent cues from the Democrat (197 incongruent) and 214 receiving congruent cues from the Republican (183 incongruent). Thick lines show plus or minus one standard error; thin lines are plus or minus two standard errors.

Voters with personal experience on related issues exhibit larger swings in their

⁹The average re-evaluation of the Democratic candidate is 0.1 points higher than the wave one evaluation when he delivers a congruent signal, and lower by 2.5 points when he delivers an incongruent signal (20-point scale). The analogous effects for the Republican candidate are 1.6 and -2.1. These differences are highly statistically significant.

candidate re-evaluations as the Candidate Evaluation Hypothesis predicts. The data can be analyzed two ways: by candidate (combining issue signals) and by issue (combining candidate evaluations). As an example of the former, in the Princeton survey, the average difference in the change in Democratic candidate evaluation is 2.6 points (21-point candidate scale). For individuals experienced on the issue on which the Democratic candidate delivered his signal, this change in evaluation is higher: 3.75 points ($p = 0.18$, all reported p-values are two-tailed), as the Candidate Evaluation Hypothesis predicts. For the Republican candidate's evaluation, a similar effect is apparent: a change of 4.1 points for experienced individuals and 2.8 points for non-experienced individuals ($p = 0.32$). These results are noisy, but supportive of the hypothesis.

When the evaluations of the Democratic and Republican candidates are combined into one evaluation margin (e.g., Democratic evaluation minus Republican evaluation) for each issue, issue-specific effects are quantified. For instance, the average difference in Democratic margin from wave one to wave two when the Democrat delivers a congruent signal on gay marriage or the Republican delivers an incongruous signal is 5.1 points (21-point candidate scale).¹⁰ For those with experience on the issue, however, this margin jumps to 7.9 points ($p = 0.06$). Analogously, for the environmental issue, experienced respondents alter their candidate margin by 2.9 points in the direction of the congruity of the signal, while non-experienced respondents alter their margin by 1.8 points ($p = 0.62$). Foreign aid exhibits the characteristic of a weak experience variable, with the margin difference increasing from 3.1 for

¹⁰This figure includes the change in Republican margin when the Republican delivers a congruent signal on gay marriage or the Democrat delivers an incongruous signal.

respondents without experience to 3.9 for respondents with experience ($p = 0.82$). The noise in these supportive results is from the issues of environment and foreign aid.

The nationwide experiment produces similarly supportive but noisy results. As Figure 4.6 shows, for each issue, experienced voters adjust their evaluations of candidates in the direction of the signal (i.e., upward for congruent signals and downward for incongruent signals) further than non-experienced respondents. Assuming the tests are independent (implied by the randomized treatment assignment) the relationship is significant at the 10% level (two-tailed) across all (but not within each) issues. Regressions (one for each issue) with one interaction term (congruency crossed with experience), the requisite main effects (in their continuous form), and no controls yield similar, though slightly less noisy, results (Table C.1).

These results validate the main hypothesis, but two additional analyses are crucial to bolstering the claim. First, alternative hypotheses, such as political attentiveness and self-interest, are considered. Second, respondents who are reacting to traditional partisan biases are weeded out so that potential vote switchers are isolated.

The data indicate that political attentive respondents hinge their candidate evaluations on the candidates' signals. Regression analysis (Table C.1) demonstrates that political attention strongly interacts with candidate signals. Respondents who pay attention to politics rely on candidate issue positions when judging these candidates to a greater degree than their less-attentive counterparts.

A similar conclusion cannot be reached for self-interest as the results are mixed. Two of the three issues have measures of self-interest: the Iraq war (active military

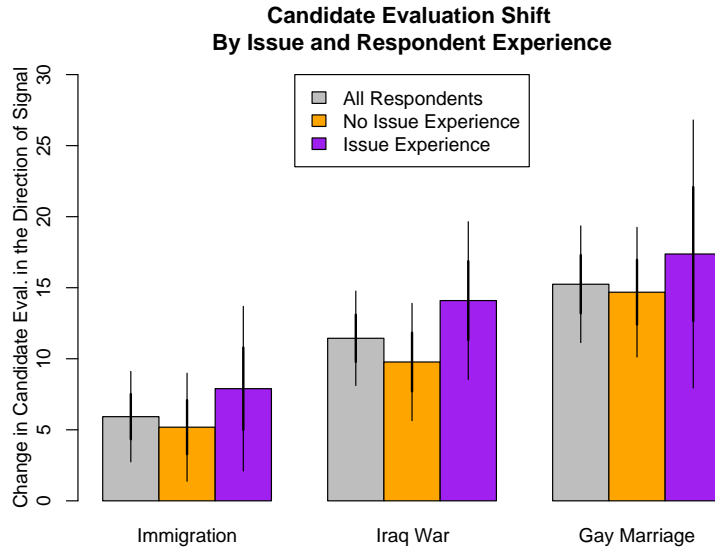


Figure 4.6: Mean difference between candidate evaluations in wave one and wave two, coded so that the direction of the shift matches the direction of the signal. Experienced respondents are more responsive to the candidate signals than non-experienced respondents. Thick lines show plus or minus one standard error; thin lines are plus or minus two standard errors. National survey.

members) and gay marriage (gay respondents).¹¹ Self-interest for gay marriage works as expected; gay and lesbian respondents are more sensitive to the candidate's stances on extending marriage rights. The reverse is true for the Iraq war; current members of the military are less responsive to the candidate's position on this issue.

The Candidate Evaluation Hypothesis holds even when controlling for both of these effects. All the signs are in the correct direction, and jointly the results are statistically significant at conventional levels ($p = 0.06$, one-tailed). Self-interest

¹¹Answers to the vote questions indicate that all respondents are U.S. citizens; thus, no self-interest measure is available for immigration. For the other two issues: 20 respondents currently serve in the military and 24 respondents identify as gay, lesbian, bi-sexual, or transgender.

soaks up much of the effect of personal experience for the issue gay marriage. These two measures are highly correlated ($\rho = 0.46$) so teasing out the independent effects of self-interest and personal experience is more difficult.

Issue certainty also affects political judgements in the expected direction, but does not appear to be a mediator for political experience. Respondents with more certainty about their opinion on the issue are more sensitive to the candidate's position on this issue. The magnitudes of the effects of personal experience do not decrease when this potential mediator is added the regression indicating that these effects are independent of each other.¹²

The effects of personal experience are apparent, though weaker, when the candidate signals counter partisan biases. A signal is said to go against partisan biases if: (1) it is a congruent signal delivered by a candidate that the respondent did not favor in the first wave, or (2) it is an incongruent signal delivered by a candidate that the respondent did favor in the first wave. An example would be a Democratic respondent who follows her party affiliation in wave one and rates the Democratic candidate more highly but receives a signal in wave two that the candidate opposes ending the Iraq war. As the Iraq war is the most polarizing issue, the Democratic respondent mostly likely assumed that the Democratic candidate supported ending the war. She now lowers her opinion of the Democratic candidate, and, depending on the signal sent by the Republican candidate, might even rate the Republican higher.

When restricting the analyses to these types of signals, the effect of personal experience generally remains. Regression analyses of the two candidate evaluations, lim-

¹²Causal mediation analysis would be a more proper method of assessing the causal mechanism.

ited to anti-partisan bias signals, finds positive and significant effects in the Princeton survey (joint $p = 0.04$, one-tailed).¹³ The national survey analyses control for political attentiveness and self-interest and find effects consistent with the Candidate Evaluation Hypothesis in two of three issues (joint $p = 0.15$, one-tailed). With regard to the Iraq war, a change from below-average experience to above-average experience (i.e., a two standard deviation change) increases the relative candidate evaluations (100-point scales) by 6 points when that candidate takes a congruent rather than incongruent stance on the war. (Details for each group of interest are listed in Table C.3.) Shifting an individual's views against their partisan predispositions is difficult, but sending congruent signals about an issue with which the voter has experience helps grease the wheels.

4.4.2 Issue Opinions and Experience

The Cue-Taking Hypothesis—that issue experience moderates cue-taking—is supported by the evidence. The data are broken down by issue and whether the signal is received from the more favored candidate (as defined by the evaluations in wave one), yielding six tests. The Cue-Taking Hypothesis predicts that in each case, but especially when a favored candidate delivers a signal, individuals without personal experience on the issue will shift their opinion in the direction of the candidate signal more than those with experience. In both surveys, this relationship is observed in five of the six cases.

The signals in the Princeton survey all produced (on average) very small move-

¹³Only the two main effects, congruent signal and experience, and the interaction term are included in these regressions.

ments in issue opinion. The largest amount of cue-taking is among non-experienced respondents on the gay marriage question; these respondents shifted less than half a point (on a 21-point issue scale) in the direction of a favored candidate's signal. When signals are delivered by favored candidates, the average shift is always toward the candidate's position except for experience respondents on the environment issue, who counterargued against the signal (Figure 4.7). Only signals from unfavored candidates on the issue of foreign aid generated an unexpected relationship between experience and cue-taking; that reverse relationship is far from statistically significant.

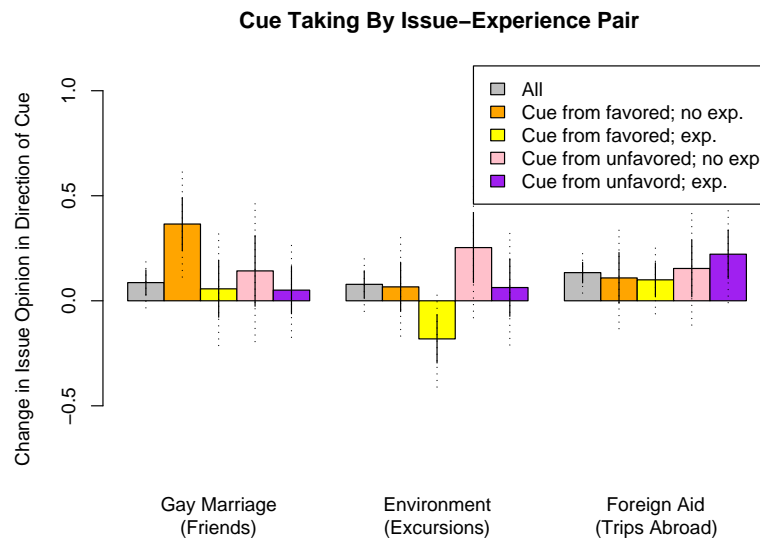


Figure 4.7: Mean shift, in the direction of the received signal, of issue opinions from wave one to wave two in the Princeton survey. In five of six cases, non-experienced respondents shift their opinions in the direction of the signal further than experienced respondents.

In the nationwide survey, the immigration signal from a favored candidate yields

a stark contrast between individuals with experience (who counterargue the signal) and those without experience (who shift toward the candidate's position by over one point on the 21-point issue scale). All six relationships are displayed in Figure 4.8; only a signal from a favored candidate on the Iraq war produces an unexpected relationship.¹⁴ More counterarguing of signals from disfavored candidates is apparent in the nationwide survey than in the Princeton survey, perhaps because more partisan feelings were aroused by the candidate descriptions (which include more partisan language). Table C.3 breaks down these effects by specific experience measures.

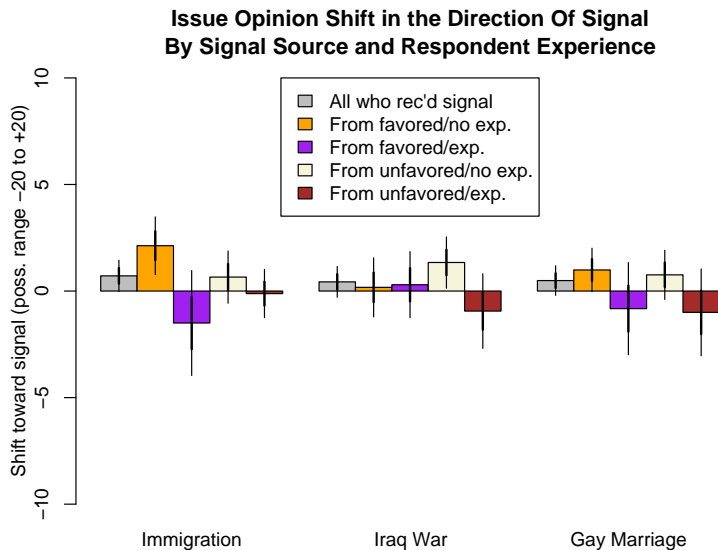


Figure 4.8: Mean shift, in the direction of the received signal, of issue opinions from wave one to wave two in the nationwide survey. In five of six cases, the non-experienced respondents demonstrated cue-taking more than the experienced respondents.

¹⁴When experience is measured dichotomously and favored/unfavored signals are combined, t-tests are significant at the 5% level for immigration and gay marriage.

In contrast to the clear link between cue-taking and experience, there is much less of a relationship between cue-taking and attentiveness. The phenomenon of attentiveness mediating cue-taking is not statistically significant, and for the issue of the Iraq war the relationship runs counter to the hypothesized relationship (see dichotomized results in Figure 4.9). No consistent effect is found for self-interest either (Table C.2). Certainty about one's opinion has no effect on change in opinion demonstrating that individuals are poor judges of themselves. Overall, the Cue-Taking Hypothesis is robust to alternative explanations.

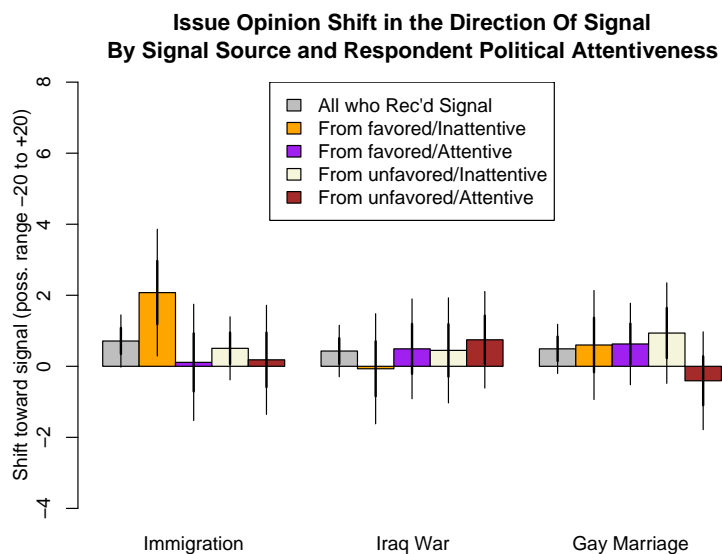


Figure 4.9: Mean shift, in the direction of the received signal, of issue opinions from wave one to wave two. Attentive respondents are defined as those who read a presidential campaign story at least daily (n=193).

4.5 Discussion

The results of these two survey experiments generally confirm the Personal Experience Model: personal experience with issues plays a large role in the formation of political judgments. Even taking political attentiveness and self-interest into account, experience with political issues leads to less cue-taking from politicians and to more issue-driven evaluation of those politicians.

Campaigns should especially take note of the magnitude of the Candidate Evaluation Hypothesis's effects. In both the Princeton and nationwide surveys, the average increase in the magnitude of candidate evaluation shift due to experience is large enough to switch the preferences of an additional 3% of respondents. In many close races, 3% is the difference between winning and losing. Further, the effects in the national survey occur for minor issues; the economy is cited as the most important issue, by far, in contemporaneous surveys.¹⁵

Many of the individual results are not statistically significant at conventional levels. Much of this noise is probably due to the use of hypothetical candidates as proxies for real-world politicians and low sample size.¹⁶ Interestingly, however, the cue-taking results are less noisy and less susceptible (at least in the nationwide experiment) to alternative hypotheses than the candidate evaluation results. This difference runs counter to an intuitive prior belief that because it should be easier to move individuals' opinions of hypothetical candidates, the differences in candidate

¹⁵Cooper, Michael and Dalia Sussman. "Voters in Poll Want Priority to Be Economy, Their Top Issue." *The New York Times*. Also see August 18-24 Diageo/*The Hotline* poll.

¹⁶Power analysis of the Princeton results indicates that a sample size of 1,000 would generate two-tailed p-values of at most 0.05 about two-thirds of the time.

evaluation among subgroups should be easier to identify. While the premise of that belief is correct (both surveys showed that as a percentage of the scale, candidate evaluations shifted more on average than issue opinions), the implication does not follow. Furthermore, while many of the results do not independently reach statistical significance, nearly all point in the direction predicted by the hypotheses.

A secondary finding is that non-experienced respondents did not counter-argue signals from unfavored politicians. The theory on this topic is mixed, with Zaller (1992) claiming that in a one-issue environment all voters take cues (even from out-party politicians) and Lupia (1994) finding that voters can glean negative information from endorsements by ideologues on the other end of the spectrum. The evidence here lends some support to Zaller, but perhaps the one-issue environment tilts the playing field unfairly in that direction.¹⁷

Another more tentative finding (Table C.1) is that self-reported certainty may play a role similar to personal experience when judging candidates. The data do not indicate that certainty is a mediator of the Personal Experience Model's causal mechanisms; instead, voters may evaluate candidates on issues about which they hold confident opinions independent of personal experience. However, certainty about an individual's own opinion does not temper that individual's propensity to change her opinion later.

¹⁷Lupia's finding comes from a ballot initiative where even if only one side of the argument is heard, clearly there are two active sides to the referendum (otherwise one side would not be spending money to put out its message). In the case of the Princeton and nationwide survey experiments, each issue receives at most one signal, thereby eliminating the possibility of two-sided debate.

Chapter 5

Randomized Field Experiments: Optimizing Campaign Strategy and Evidence for the Personal Experience Model¹

5.1 Introduction

For campaigns or political organizations to apply the Personal Experience Model, they must be able to identify and target individuals with personal experience. The widening scope of campaign databases, which now include not just basic information such as age and gender, but also commercial (e.g., magazine subscriptions), gov-

¹Large sections of this chapter are adapted from Imai and Strauss (2009).

ernmental (e.g., fishing licenses), and census (e.g., percent poverty in census block) data, is both a help and a hindrance to campaigns. While campaigns have more granular information at their fingertips, they may not be equipped to sift through the mounds of data. This chapter develops a methodological process for identifying voters who are responsive to campaign appeals by utilizing and discriminating among information gathered from randomized experiments. Second, this chapter examines two cases in which the results of field experiments are consistent with the Personal Experience Model.

Over the last decade, political scientists have shown renewed interest in the use of randomized field experiments to study voter turnout and persuasion (e.g., Gerber and Green, 2000; Nickerson, 2007, among many others). Building on work from more than a half century ago (e.g., Gosnell, 1927; Hartmann, 1936; Eldersveld, 1956), these researchers have developed creative methods for conducting field experiments with a large number of voters in real electoral environments as a way to test various theories of voter turnout (e.g., Gerber *et al.*, 2003; Nickerson, 2008). The empirical findings of these studies have the potential to significantly affect the practice of get-out-the-vote (GOTV) efforts and persuasion campaigns in the real world (Green and Gerber, 2008).

Political science research that reports the results of field experiments tends to focus on the statistical significance of the estimated *overall* average treatment effect (ATE) of each campaign appeal. In addition, many researchers implicitly assume the constant additive treatment effect across individual voters when using regression models for statistical analysis. This leads to the standard practice of reporting a

single estimate (or at most a small number of estimates) summarizing the efficacy of each mobilization method.

The findings based on such an approach may not be of much use for campaign planners for two reasons. First, a planner must consider the problem of *treatment effect heterogeneity* where each of the available campaign tactics may mobilize different voters to a varying degree. The Personal Experience Model predicts one type of heterogeneity: Voters with experience on an issue will be more responsive to campaign appeals on that issue. The second and related problem is that a planner faces budget constraints and must evaluate the *cost-effectiveness* of available strategies, which may vary across different voters. Thus, uniformly applying a single appeal to the entire target population is at best suboptimal and sometimes is not even feasible. This means that the standard practice of academic researchers reporting only the estimated overall ATE may not provide useful information from a practitioner’s perspective. Similarly, the common assumption of constant additive treatment effect is too restrictive and does not serve the purpose of campaign planners.

This gap between academic research and policy making can be addressed through an essential and yet missing methodological tool. A formal decision-theoretic framework (Imai and Strauss, 2009) allows campaign planners, both partisan and nonpartisan, to use the results of field experiments effectively when planning their mobilization campaigns. In the proposed Bayesian-decision theoretic framework, a partisan planner maximizes the posterior probability that the party’s own candidate wins the election subject to a budget constraint, whereas the objective function of a nonpartisan planner is the posterior expected turnout among a target population of voters.

A planner starts with a prior belief about the effectiveness of each mobilization technique under consideration for voters with different characteristics and updates this belief based on the available experimental data. With this framework, campaigns can use the data from randomized field experiments to develop the optimal campaign strategy for each target population.

This procedure is applied in three cases. First, in a nonpartisan setting, the non-parametric method finds that recipients of mobilizing text messages in 2006 (Dale and Strauss, 2009) who were between the ages of 20 and 24 were most responsive to the GOTV appeal. Second, in the first of two examples that relate to the Personal Experience Hypothesis, a mailing campaign about education attempting to persuade individuals to vote for a Kentucky gubernatorial candidate had the most effect on parents. And finally, an anti-McCain 2008 mail and robo-call program that emphasized the economy had the most effect on individuals living in economically distressed areas.

5.1.1 Background of the Methodological Problem

The problem of optimizing campaign tactics across voter characteristics was first introduced by Kramer (1966) more than forty years ago. In that research, a campaign manager is assumed to face the decision of whether to conduct blind or selective canvassing across precincts subject to a budget constraint. After illustrating his decision-theoretic approach with artificial data about the partisan make-up of precincts, Kramer (1966) concludes that “the use of quantitative methods for policy analysis has proved to be fruitful in many different fields, and these methods deserve

to be more widely known, and used, in political science (p. 160).”

Unfortunately, few scholars who conduct field experiments have followed up on Kramer’s proposal to inform policy makers with a formal decision-theoretic analysis. One exception is a small number of researchers who have examined the related question of which subgroups exhibit larger treatment effects (e.g., Gerber, 2004; Nickerson and Arceneaux, 2006; Arceneaux and Kolodny, 2009). Campaign managers can use these findings as a basis for planning their GOTV or persuasion campaign.

However, an important and well-known methodological problem is that if subgroups are formed after the experiment is conducted in an ad hoc manner, the analysis runs a risk of finding statistically significant results when no true relationship exists (Pocock *et al.*, 2002). Moreover, these studies do not examine the issue of cost-effectiveness in the presence of a budget constraint, which is an essential consideration for campaign planners. Thus, the planner needs a principled and systematic approach for deriving the optimal campaign strategy from experimental data while avoiding the post-hoc subgroup analysis and related statistical problems.

The proposed methodology extends Kramer’s pioneering work by placing the campaign planner’s problem in the formal framework of statistical decision theory and applying modern statistical methods. The decision-theoretic framework is based on literature about treatment choice (e.g., Manski, 2005). This framework differs from the literature by adopting a Bayesian approach rather than a frequentist approach based on the maximin or minimax-regret criteria (see Dehejia, 2005, for a notable exception). The standard linear programming algorithm can be used to derive the optimal campaign strategy within this framework.

To address the subgroup analysis problem, which has been somewhat neglected in the treatment choice literature a new variable selection algorithm is presented and then used in combination with nonparametric methods and cross-validation procedures in order to avoid the over-fitting of statistical models. These methods are then extended to the cases of optimal partisan campaign planning. This set of methods can be used to derive the optimal campaign strategy from randomized field experiments.

5.2 The Formal Framework of GOTV Campaign Planning

The problem of deriving the optimal nonpartisan GOTV campaign strategy from experimental data can be formalized as a statistical decision problem where the choices are treatment applications (e.g., Manski, 2005). This framework can then be extended to the optimal partisan persuasion (and possible partisan GOTV) campaign. Rather than taking a frequentist approach, which is dominant in the treatment choice literature, this method is based on Bayesian statistical decision theory (Berger, 1985) and assumes that a GOTV campaign planner learns about the effectiveness of various mobilization methods for different voters by analyzing randomized field experiments. The planner then maximizes the posterior expected turnout among a target population of voters subject to the budget constraint.²

²The following sections describe the proposed methodology as if a campaign planner both analyzes the data and makes the decision. The methods apply equally to the situation where a planner makes a decision based on the recommendations of a data analyst.

5.2.1 The Planner's Decision Problem

The first step of the approach is to formally state the decision problem faced by a nonpartisan GOTV campaign planner. Let \mathcal{P} denote this planner's target population of voters where this population is assumed to be finite and of size N . Typically, the target population is the registered voters in the electoral district, whose complete list is available to the planner (at least in the U.S.). Then, the planner's decision problem is to assign one of K available mobilization techniques (i.e., treatments) to each member i of this population. If a GOTV campaign can be planned at the level of households or precincts, then i indexes the appropriate units rather than individual voters. Although the units of analysis are represented as individual voters for notational simplicity, the proposed methodology is directly applicable to aggregate units.

An unordered set $\mathcal{T} \equiv \{0, 1, \dots, K - 1\}$ where $K \geq 2$ denotes the finite set of mobilization techniques from which the planner makes a selection for each voter in \mathcal{P} . Note that $T = 0$ represents the strategy of not mobilizing (i.e., doing nothing). For example, the planner may consider three strategies (i.e., $K = 3$) where $T = 2$ and $T = 1$ represent a GOTV method based on a phone call and a postcard, respectively, and $T = 0$ denotes a status quo strategy that involves no such phone call or mailing. Alternatively, mobilization techniques may differ in their frequency, timing, content of messages, and other aspects.

Next, suppose that the planner observes the J -dimensional (pre-treatment) covariates X for each member of this population \mathcal{P} . Since \mathcal{P} is a finite population, this means that the planner knows the population distribution of X , i.e., $P(X)$, whose

support is denoted by \mathcal{X} . For example, if the target list of voters is obtained from the voter roll, such covariates may include age, gender, voting history, party registration, and zip code. Since the values of these covariates are observable for every voter on the list, the distribution of X is known to the planner.

Finally, following the statistical literature on causal inference, let $Y_i(t)$ represent the potential turnout of voter i that will be realized if the planner applies the mobilization technique t to this voter where $i \in \mathcal{P}$ and $t \in \mathcal{T}$. Then, the observed turnout is given by $Y_i = Y_i(T_i)$. The outcome variable is binary and is equal to 1 if voter i casts a ballot and is equal to 0 if the voter abstains. For the sake of simplicity, any interference between voters is ignored (Cox, 1958; Rubin, 1990). But, this assumption can easily be relaxed. If a voter's turnout decision depends on the treatment status of other voters within the same household (Nickerson, 2008), for example, then an analysis needs to be conducted at the household level.

Given this setup, the planner's mobilization strategy is characterized by the function,

$$\delta(\cdot, \cdot) : (\mathcal{T} \times \mathcal{X}) \mapsto [0, 1], \quad (5.1)$$

where the *mobilization strategy* $\delta(t, x)$ denotes the probability of receiving treatment $t \in \mathcal{T}$ for a voter with $X = x$. Alternatively, $\delta(t, x)$ may represent the fraction of voters with the observed covariate $X = x$ who are contacted by the planner using the mobilization method t . These two definitions become essentially identical when the number of voters is large, but have different implications for the way the optimization is conducted. In either case, voters with the same value of X are assumed to be

exchangeable since the planner does not have additional information to distinguish between them. Thus, the planner is interested only in determining the value of the function $\delta(t, x)$ for each value of $t \in \mathcal{T}$ and $x \in \mathcal{X}$. Given this definition, the set of feasible mobilization strategies, Δ , is the collection of functions $\delta(\cdot, \cdot)$ that satisfy the complement property constraint,

$$\Delta \equiv \left\{ \delta(\cdot, \cdot) : \sum_{t=0}^{K-1} \delta(t, x) = 1 \text{ for every } x \in \mathcal{X} \right\}. \quad (5.2)$$

A nonpartisan GOTV campaign planner's goal is to derive the optimal mobilization strategy to maximize turnout of the target electorate. The planner can achieve this by deriving the strategy that maximizes the expected turnout given the observed covariate information about X . Then, the planner's objective function can be written as a function of the mobilization strategy as well as the probability of a voter's turnout given the values of covariates and the actual mobilization strategy applied to the voter,

$$g(\delta, \rho) \equiv \mathbb{E} \left(\sum_{i=1}^N \delta(t, X_i) Y_i(t) \mid X \right) = N \sum_{x \in \mathcal{X}} P(X = x) \sum_{t=0}^{K-1} \delta(t, x) \rho(t, x), \quad (5.3)$$

where the *turnout profile* is denoted by $\rho(\cdot, \cdot) : (\mathcal{T} \times \mathcal{X}) \mapsto [0, 1]$ with $\rho(t, x) \equiv \Pr(Y(t) = 1 \mid X = x)$. The turnout profile represents the turnout probability given the characteristics of a voter and the mobilization strategy applied to this voter. Note that the function $\rho(\cdot, \cdot)$ is unknown to the planner. If the turnout profile is known (and there is no budget constraint), then the planner applies the mobilization technique t that yields the highest value of the function $\rho(t, x)$ given each voter's

covariate characteristics x . However, since $\rho(\cdot, \cdot)$ is unknown in practice, the planner must make the decision under uncertainty by learning about $\rho(\cdot, \cdot)$ from experimental data.

A typical voter mobilization method usually has a small effect on an individual's turnout probability relative to the individual's baseline predisposition to vote. For this reason, planners may cast the objective function of equation 5.3 in terms of *treatment effect* rather than turnout profile. In this framework, the planner maximizes,

$$g(\delta, \rho) = \mathbb{E} \left(\sum_{i=1}^N \delta(t, X_i) (\tau_i(t) + Y_i(0)) \mid X \right) \propto N \sum_{x \in \mathcal{X}} P(X = x) \sum_{t=1}^{K-1} \delta(t, x) \tau(t, x), \quad (5.4)$$

where $\tau_i(t) \equiv Y_i(t) - Y_i(0)$ is the treatment effect of mobilization strategy t on voter i and $\tau(\cdot, \cdot) : (\mathcal{T}, \mathcal{X}) \mapsto [-1, 1]$ with $\tau(t, x) \equiv \Pr(Y(1) = 1 \mid X = x) - \Pr(Y(0) = 1 \mid X = x)$. This setup is mathematically equivalent to equation 5.3. The decision whether to maximize turnout profile (equation 5.3) or treatment effect (equation 5.4) hinges on whether the planner can elicit a prior more easily for the turnout profile or treatment effects (see Section 5.3.2).

In practice, the planner cannot maximize the expected turnout without considering the differing costs of various GOTV techniques. This concept is formalized by assuming that the planner faces the following budget constraint,

$$\sum_{t=1}^{K-1} \mathbf{1} \left\{ \sum_{x \in \mathcal{X}} \delta(t, x) \neq 0 \right\} \kappa(t) + N \sum_{x \in \mathcal{X}} P(X = x) \sum_{t=1}^{K-1} \delta(t, x) \xi(t, x) \leq C, \quad (5.5)$$

where $\mathbf{1}\{\cdot\}$ is the indicator function and C is the fixed positive constant representing the maximum cost allowed for the GOTV campaign. In this formulation, the planner needs to consider two kinds of costs. The first is the fixed *overhead cost* denoted by the function, $\kappa(\cdot) : \mathcal{T} \mapsto [0, \infty)$ for each mobilization technique t . This cost is incurred so long as at least one voter is assigned to the mobilization method. The second component is the *cost per voter*, i.e., the cost of contacting each voter with covariate value $x \in \mathcal{X}$, which is represented by a known cost function $\xi(\cdot, \cdot) : (\mathcal{T} \times \mathcal{X}) \mapsto [0, \infty)$. Thus, the planner must determine which mobilization technique is most cost-effective for different voters, and whether the differences are large enough to warrant using multiple mobilization techniques. Finally, since $t = 0$ corresponds to the status quo strategy of not mobilizing, both the overhead and per voter costs are zero for this strategy, i.e., $\xi(0, x) = \kappa(0) = 0$ for all $x \in \mathcal{X}$. This is why the summation in equation 5.5 is taken with all possible values of t except $t = 0$. For the other mobilization strategies, the cost per voter is assumed to be positive, i.e., $\xi(t, x) > 0$ for all $x \in \mathcal{X}$ and $t > 0$, whereas the overhead cost is non-negative, i.e., $\kappa(t) \geq 0$ for all $t > 0$.

5.2.2 Data from a Randomized Field Experiment

Using the decision-theoretic framework, the planner can analyze the data from a randomized field experiment to derive the optimal GOTV campaign. Certain assumptions are required to link a field experiment with a planner's decision problem. First, the planner must assume that the experiment is conducted on a representative sample of size n taken from the target population \mathcal{P} . Without such an assumption,

the planner would be forced to model the non-random sample selection mechanism to infer characteristics about \mathcal{P} from the experiment. The observed data is denoted by $D = \{\tilde{Y}_i, \tilde{T}_i, \tilde{X}_i\}_{i=1}^n$ where \tilde{Y}_i is the binary turnout variable, $\tilde{T}_i \in \mathcal{T}$ is the treatment variable representing mobilization techniques, and $\tilde{X}_i \in \mathcal{X}$ is the same set of covariates used earlier. The potential outcomes are denoted by $\tilde{Y}_i(t)$ where $\tilde{Y}_i = \tilde{Y}_i(\tilde{T}_i)$ for $t \in \mathcal{T}$.

Another key assumption required for the planner to apply the results of a randomized field experiment to the decision problem is that the joint distribution of potential outcomes and covariates does not change, i.e., $P(\tilde{Y}(t), \tilde{X}) = P(Y(t), X)$. This assumption may be invalid if, for example, the election in which the experiment was conducted differs significantly from the election for which the planner is designing the GOTV campaign. Although in real world settings this assumption may hold only approximately, it is essential for learning about the planner's decision problem from a field experiment.

If these assumptions hold, the randomization of treatments in field experiments imply that the turnout profile, $\rho(\cdot, \cdot)$, is identified, i.e., $\rho(t, x) = P(\tilde{Y}(t) = 1 \mid \tilde{X} = x)$, for all $t \in \mathcal{T}$ and $x \in \mathcal{X}$. Although such large sample identification results are important, in practice the planner must estimate $\rho(\cdot, \cdot)$ from a finite sample and make the decision under uncertainty. (Similarly, the planner can identify $\tau(t, x)$ but must estimate it from a finite sample.) This problem can be addressed by deriving the optimal nonpartisan GOTV campaign strategy in this setting, where the planner is assumed to be Bayesian.

5.2.3 The Bayesian Planner

The framework of this method assumes that the planner is Bayesian and has a prior belief on the space of functions of $\rho(\cdot, \cdot)$. This prior distribution is denoted by $\pi(\rho)$. The Bayesian planner will update her belief via Bayes rule after observing the data from the randomized field experiment. This posterior belief about the turnout profile is represented by $\pi(\rho \mid D)$. In the Bayesian statistical decision framework (Berger, 1985), the optimal nonpartisan GOTV strategy δ^* maximizes the posterior mean of the expected turnout,

$$\delta^* = \operatorname{argmax}_{\delta \in \Delta} \int g(\delta, \rho) d\pi(\rho \mid D), \quad (5.6)$$

where the optimization is subject to the budget constraint given in equation 5.5.

There are several reasons why the Bayesian optimality criteria are used rather than a frequentist approach based on maximin or minimax-regret criteria, which is popular in the treatment choice literature. First, the Bayesian decision has a frequentist justification. To see this, consider an alternative class of GOTV mobilization strategies that depends directly on experimental data as well as the values of observed covariates. Such strategies are called “statistical treatment rules” and are characterized by the function $\delta(\cdot, \cdot, \cdot) : (\mathcal{T} \times \mathcal{X} \times \mathcal{D}) \mapsto [0, 1]$ (Manski, 2005). Thus, the set of feasible strategies Δ equals the set of all functions $\delta(\cdot, \cdot, \cdot)$ that satisfy $\sum_{t=0}^{K-1} \delta(t, x, D) = 1$ for all $(x, D) \in (\mathcal{X} \times \mathcal{D})$. In this setting, the frequentist

objective function (i.e., risk) is given by,

$$g(\delta, F_D, \rho) = \int_D N \sum_{x \in \mathcal{X}} P(X = x) \sum_{t=0}^{K-1} \delta(t, x, D) \rho(t, x) dF_D \quad (5.7)$$

with the following budget constraint,

$$\sum_{t=1}^{K-1} 1 \left\{ \sum_{x \in \mathcal{X}} \delta(t, x, D) \neq 0 \right\} \kappa(t) + N \sum_{x \in \mathcal{X}} P(X = x) \sum_{t=1}^{K-1} \delta(t, x, D) \xi(t, x) \leq C, \quad (5.8)$$

for all $D \in \mathcal{D}$. Again, the costs for the status quo strategy $t = 0$ are zero and are excluded from the budget constraint. It has been shown that in most practically relevant situations, the Bayesian decision δ^* defined in equation 5.6 agrees with the decision that maximizes the expected value of $g(\delta, F_D, \rho)$ averaging over the prior distribution of D on \mathcal{D} (see Berger, 1985, p. 159; Manski, 2005, p. 59). Also, if the size of the experimental data is large (as in many GOTV randomized field experiments) and little prior information is available, the Bayesian decision is essentially equivalent to the strategy that maximizes the expected turnout. Thus, the Bayesian decision can be justified from a frequentist perspective.

Second, an alternative optimality criterion is Wald's (1950) minimax regret principle (see Savage, 1951; Manski, 2005). One important advantage of the minimax regret criterion is that it avoids the subjectivity of Bayesian optimality because it does not require the use of prior information. On the other hand, unlike Bayesian decision theory, frequentist theory based on the minimax regret criterion typically does not lead to the unique optimal decision, which practitioners may find problematic. In addition, the strategies that meet the minimax regret criterion can include

no-data rules, which do not depend on the data at all (Stoye, 2009). Such strategies do not allow the planner to learn anything from the available experimental data. Furthermore, a minimax regret rule can be viewed as a Bayes rule with a prior (i.e., a least favorable prior) distribution (Berger, 1985, Chapter 5). Thus, depending on the planner’s subjective belief, the Bayesian GOTV strategy can meet the minimax regret criterion.

5.2.4 Bayesian Optimal Campaign Planning at A Glance

Figure 5.1 depicts the process by which a planner arrives at the optimal strategy via the proposed Bayesian decision theoretic framework. The planner must determine the costs of each mobilization strategy (both overhead and per voter) as well as the prior belief about their effects on voters with different characteristics. Since the cost function inputs are often exogenously determined (e.g., the cost of postage and phone calls), the planner’s only meaningful decision might be determining a prior belief. In many cases, the planner might use a diffuse prior centered around a belief that there is no *a priori* difference in effects of a mobilization method across different voters. This is especially appropriate if the mobilization technique has not been empirically tested (e.g., airplanes with reminder-to-vote advertisements). If the treatment is an oft-used mobilization technique that has been extensively studied in the past (e.g., canvassing), then the planner might center a prior around the estimated effects in previous experiments. Note that the influence of prior belief diminishes as the size of experimental data increases.

Once a prior belief is elicited and a randomized field experiment is conducted,

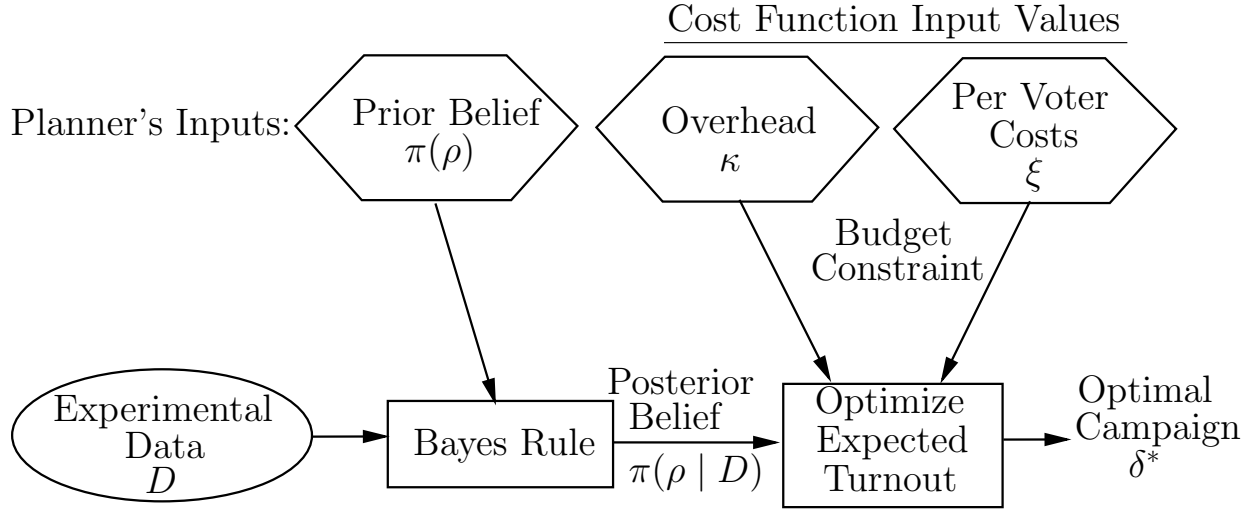


Figure 5.1: An Overview of the Bayesian Optimal Campaign Planning Process. Inputs over which the planner has direct control are represented by hexagons and are: (1) the prior belief about the effects of various mobilization strategies on different voters, $\pi(\rho)$, (2) the overhead costs of each mobilization method, κ , and (3) the cost per voter for each strategy, ξ . Data from randomized field experiments, D , are represented by the oval. These data and the planner's prior distribution are combined via Bayes rule to produce a posterior belief about the effects of mobilization strategies $\pi(\rho | D)$. Finally, the proposed optimization method uses this posterior belief and the exogenous costs, ξ , to find the optimal campaign strategy, δ^* , for the planner.

these two sources of information are combined via Bayes rule obtaining the posterior belief about the effects of mobilization strategies on different voters. The planner now has an updated belief about the most cost-effective way to mobilize each voter. Taking into account overhead costs, the optimal strategy may be to implement a subset of the available mobilization techniques, even if every technique is marginally optimal for at least one voter.

5.3 The Optimal Nonpartisan Campaign Strategy

Using the decision-theoretic framework, the optimal GOTV campaign strategy, as defined in equation 5.6, can be derived. One relative advantage of the proposed Bayesian framework over a frequentist's approach is that the planner can completely separate the derivation of the optimal campaign strategy from the analysis of experimental data. That is, the planner first uses statistical models to obtain the posterior belief of the turnout profile, $\rho(\cdot, \cdot)$. Conditional on this posterior turnout profile, the planner determines the optimal campaign strategy by solving an optimization problem subject to a budget constraint.

5.3.1 The Optimization Method

Before describing the method to obtain the posterior turnout profile, this section describes how to obtain the optimal nonpartisan GOTV campaign strategy given the posterior turnout profile. Let $\tilde{\rho}(t, x)$ be the posterior turnout profile for each $t \in \mathcal{T}$ and $x \in \mathcal{X}$. Then, the optimal campaign strategy can be obtained by solving the constrained optimization problem,

$$\delta^* = \underset{\delta \in \Delta}{\operatorname{argmax}} N \sum_{x \in \mathcal{X}} P(X = x) \sum_{t=0}^{K-1} \delta(t, x) \tilde{\rho}(t, x), \quad (5.9)$$

subject to the budget constraint given in equation 5.5.

To solve this optimization problem, first consider the case of no budget constraint. In this case, the solution is trivial because the most effective strategy for each stratum

defined by X is used. That is, the optimal campaign strategy is given by,

$$\delta^*(t, x) = \begin{cases} 1 & \text{if } t = \operatorname{argmax}_{s \in \mathcal{T}} \tilde{\rho}(s, x), \\ 0 & \text{otherwise,} \end{cases} \quad (5.10)$$

for any given $x \in \mathcal{X}$. However, in many cases, the budget constraint may prevent the planner from employing campaign strategy δ^* .

Next, consider the case where the budget constraint is binding so that the strategy defined by equation 5.10 is not feasible and yet there is no overhead cost. Unfortunately, in this case, the derivation of the optimal strategy is no longer trivial. Thus, as a general strategy, the planner solves the constrained linear optimization problem,

$$\delta^* = \operatorname{argmax}_{\delta \in \Delta} N \sum_{x \in \mathcal{X}} P(X = x) \sum_{t=0}^{K-1} \delta(t, x) \tilde{\rho}(t, x), \quad (5.11)$$

$$\text{subject to } \begin{cases} \delta(t, x) \geq 0 & \text{for all } x \in \mathcal{X} \text{ and all } t \in \mathcal{T}, \\ \sum_{t=0}^{K-1} \delta(t, x) = 1 & \text{for all } x \in \mathcal{X}, \\ N \sum_{x \in \mathcal{X}} P(X = x) \sum_{t=1}^{K-1} \delta(t, x) \xi(t, x) \leq C. \end{cases} \quad (5.12)$$

The standard linear programming algorithm can then be used to obtain the optimal strategy, δ^* . If $\delta(t, x)$ represents the proportion of voters rather than the probability of treatment assignment, then this can be formulated as a mixed integer programming problem, which is more difficult but can be solved by applying an appropriate algorithm. Moreover, as the sample size increases, this difference vanishes.

Finally, when the mobilization methods involve overhead costs, consider a case where only a subset of mobilization techniques is applied to at least one voter. In this

case, the planner can solve the optimization problem in the same manner as in the case without overhead costs except that the total overhead costs are subtracted from the maximum budget allowed for the campaign, i.e., $C - \sum_{t=1}^{K-1} 1 \{ \sum_{x \in \mathcal{X}} \delta(t, x) \neq 0 \} \kappa(t)$. The optimal strategy is obtained by considering all possible subsets and their corresponding optimal strategy, and then choosing the strategy that yields the greatest posterior expected turnout.

Although the proposed general strategy based on linear programming is easy to implement, in some cases an approximate method, which is more computationally efficient, may be preferred. Appendix D.1.1 details a fast approximate solution to the nonpartisan planner’s optimization problem, which is used in the nonpartisan application presented in Section 5.5.³

5.3.2 The Statistical Method

Numerous statistical models can be used to obtain the posterior distributions of the turnout profile. When choosing a model, certain statistical issues need to be addressed. First, a statistical model needs to be flexible to avoid strong functional form assumptions. In particular, a nonparametric model is useful because a planner does not know the exact functional form of the turnout profile *a priori*. Second, since many of the covariates available in GOTV field experiments are discrete (e.g., party registration, previous turnout history), a statistical model should be able to accommodate discrete covariates. This excludes the use of some binary nonparametric regression models that require covariates to be continuous. Third, the model fitting

³The strategy obtained with this approximation is still labeled “optimal” for ease of language.

procedure should require a minimal number of arbitrary decisions from a planner (or the data analyst who is working for the planner).

Finally, a model should not be overfitted to the data at hand and thus an appropriate set of pre-treatment covariates must be carefully selected. Overfitting tends to yield a model with poor performance in the actual election to which the derived mobilization strategy will be applied. This is the main problem of the post-hoc subgroup analysis described in Section 5.1. In practice, this consideration is important because the sample size may not be large enough to accommodate a high number of pre-treatment covariates, which are potentially useful for deriving the optimal campaign strategy. Thus, an appropriate variable selection algorithm is needed as a part of the model selection procedure.

Moreover, as Gunter, Zhu, and Murphy (2007) point out, most variable selection algorithms are developed for improving prediction rather than decision making. These concepts are closely related, but are not the same. For example, a powerful predictor of the outcome, i.e., a *predictive variable*, is not necessarily useful for decision making if its effect on the outcome is constant between the treatment and control groups. Similarly, a variable that explains a significant portion of treatment effect heterogeneity, i.e., a *prescriptive variable*, may not be selected by standard variable selection procedures if it does not predict the observable outcome (rather than the potential outcome) as well as other variables.

The proposed algorithm meets these criteria relatively well. The method is similar to that proposed by Gunter *et al.* (2007) but differs from their algorithm in that it uses a tree-based method (Breiman *et al.*, 1984) rather than Lasso (in part because

the outcome variable in political applications is categorical) and the measure of importance for prescriptive variables is somewhat different. It is also possible to use Bayesian regression tree models (Chipman *et al.*, 2008; Hill and McCulloch, 2008).

A Bayesian approach is used to model the turnout among voters with the same characteristics of covariates via the binomial distribution. For the moment, assume that the sample size is sufficiently large and thus there is no need for variable selection. Using a conjugate prior, this turnout model is,

$$W_{tx} \mid T = t, X = x \sim \text{Binom}(n_{tx}, \rho(t, x)), \quad (5.13)$$

$$\rho(t, x) \mid X = x \sim \text{Beta}(a_{tx}, b_{tx}), \quad (5.14)$$

for each $t \in \mathcal{T}$ and $x \in \mathcal{X}$ where W_{tx} is the number of voters with $T_i = t$ and $X_i = x$ who turned out, n_{tx} is the total number of such voters, and (a_{tx}, b_{tx}) are the prior parameters. This model yields the familiar posterior distribution,

$$\rho(t, x) \mid Y_i, X_i = x \sim \text{Beta}(W_{tx} + a_{tx}, n_{tx} - W_{tx} + b_{tx}), \quad (5.15)$$

where the posterior mean of $\rho(t, x)$ is given by $(W_{tx} + a_{tx}) / (n_{tx} + a_{tx} + b_{tx})$.⁴

Although its simplicity is attractive, this model is unlikely to work well in practice if the sample size is small relative to the number of unique values the observable covariates X take. In particular, if one conditions upon irrelevant covariates, then the sample size within each subgroup will be too small to yield informative inferences

⁴Alternatively, the planner may formalize a prior belief in terms of treatment effects. If a normal prior distribution is used, then the posterior of $\tau(t, x)$ can also be approximated by a normal distribution.

about $\rho(t, x)$. Such overfitting will then necessarily lead to a mobilization strategy that will perform poorly in the actual election. On the other hand, if important covariates are not used to define subgroups, the planner will fail to differentiate across voters and will choose a suboptimal campaign strategy. Thus, in most practical cases, we seek a principled way to select relevant variables and form subgroups before applying the above standard Bayesian model.

The proposed solution to this problem involves three steps. First, a variable selection algorithm is applied to decide which variable needs to be conditioned upon when deriving the optimal campaign strategy. Next, given the selected variables, a tree-based classification method (Breiman *et al.*, 1984) is fitted to each treatment/control group to identify relevant subgroups within the group.⁵ The data is cross-validated to avoid overfitting. Finally, once all subgroups are identified in this way, the Binomial-Beta model is applied within each subgroup to obtain the posterior distribution of $\rho(t, x)$ for all t and x . This approach is labeled semi-Bayesian because the data are used twice—once to form subgroups and again to calculate the posterior distribution.

The details of the proposed method are:

Step 1: (Selection of Predictive Variables) Fit a classification tree to the entire sample using all pre-treatment covariates and the treatment variable. Use K -fold cross validation on the misclassification rate to determine the value of the parameter that controls the complexity of the tree, e.g., the complexity parameter in `rpart()` implementation in R (Ripley, 1996, Chapter 7). Denote the predictive variables that are used in the final model by V , i.e., $V \subset X$.

Step 2: (Importance of Prescriptive Variables) Order each pre-treatment covariate, X_j for $j = 1, 2, \dots, J$, based on the statistic, $S_j \equiv g_{j1}^* - g_{j0}^*$, where g_{jk}^*

⁵This tree-based classification method is one of many nonparametric models. One disadvantage of this approach is that gradual changes in treatment effects across covariate groups are modeled as sharp discontinuities rather than smooth functionals.

is the optimal overall turnout using the turnout profile $\hat{\rho}_{jk}(t, x)$ for $k = 0, 1$. Obtain $\hat{\rho}_{j1}(t, x)$ by fitting a classification tree for the treated subset of the data (i.e., $\tilde{T}_i \geq 1$) and using V and X_j as covariates. Similarly, $\hat{\rho}_{j0}(t, x)$ is obtained by fitting a classification tree on the untreated subset of the data (i.e., $\tilde{T}_i = 0$). The value of the complexity parameter from Step 1 is also used to fit the trees in Step 2.

Step 3: (Model Fitting) For each $j = 1, \dots, J$ with $S_j > 0$:

- (a) Randomly divide the sample into K subsets for K -fold cross validation.
- (b) Using $K - 1$ training sets, fit classification trees (without pruning) separately to the treatment and control groups using V as well as the j most important prescriptive variables in both models. Select the values of the complexity parameters for the two models based on the mean of the optimal overall turnout across K validation sets. Denote the optimal overall turnout and the optimal campaign strategy corresponding to the selected values of complexity parameters by g_j^* and δ_j^* , respectively.

Step 4: (Derivation of Optimal Strategy) The optimal overall turnout is given by $g^* = \max_{1 \leq j \leq J} g_j^*$, whereas the optimal campaign strategy is given by $\delta^* = \delta_{\arg\max_{1 \leq j \leq J} g_j^*}^*$.

The first step of the algorithm selects predictive variables using a standard fitting procedure of tree-based methods. The second step orders each pre-treatment covariate (including those identified as predictive variables in Step 1) according to its importance as a prescriptive variable. The statistic, S_j , is designed to measure how much a planner can increase the optimal overall turnout by interacting the value of X_j with the treatment. This statistic provides a measure of the ability of X_j to explain heterogeneous treatment effects. The third step uses the K -fold cross-validation procedure, given all predictive variables and different subsets of prescriptive variables, in order to select the values of complexity parameters for classification trees fitted separately to the treatment and control groups. This is done by comparing the opti-

mal overall turnout corresponding to different values of the complexity parameters. Finally, Step 4 selects the final model among the ones chosen in Step 3 by again comparing the resulting optimal overall turnout and thus determines the optimal campaign strategy.

A main advantage of this semi-Bayesian approach is that it inherits the simplicity of tree-based methods. In particular, practitioners can interpret each of the subgroups that result from the final model. They can thus use available prior information within subgroups by specifying the parameters of the beta prior distribution. The proposed approach also addresses three key issues highlighted earlier. First, the tree-based classification models are nonparametric and can handle discrete covariates effectively. Second, the use of cross validation procedure avoids overfitting. Third, transparent algorithms such as the one proposed here prevent planners from making arbitrary decisions when deriving the optimal campaign strategy.

5.4 The Optimal Partisan Campaign Strategy

The proposed decision theory framework and the statistical and optimization methods can be applied to the case of partisan persuasion and GOTV campaign planning. A Bayesian planner can derive the optimal campaign strategy using randomized field experiments to maximize the (posterior) expected chance of winning the election. This case assumes that two major candidates are competing for the office. (Minor party candidates may exist, but their probability of winning the election is assumed to be negligible.)

5.4.1 The Decision Problem

Using the notation introduced in Section 5.2, the decision problem of the partisan campaign planner is to assign one of K different mobilization methods (including the status quo strategy of doing nothing, which is denoted by $T_i = 0$) to each member of the target population \mathcal{P} of finite size N . Again, the planner is assumed to know the distribution of a certain set of covariates $P(X)$. Thus, the planner's mobilization strategy can be characterized by $\delta(\cdot, \cdot)$ (see equation 5.1) and the set of feasible strategies is equal to Δ (defined in equation 5.2).

Unlike a nonpartisan campaign planner, a partisan campaign planner seeks the mobilization strategy that will lead to electoral victory. For this decision problem, the outcome variable Y_i needs to be redefined. Let $Y_i(t)$ represent the potential voting behavior of voter i that will be realized if the planner assigns mobilization method t to this voter where $i \in \mathcal{P}$ and $t \in \mathcal{T}$. The variable $Y_i(t)$ can take three different values; it equals 1 if voter i casts a ballot for the candidate of the planner's party, -1 if she votes for the opponent, and 0 otherwise (e.g., she votes for a third party candidate or abstains). Then, the planner's ultimate goal is to win the election, which can be represented as the indicator function,

$$h(\delta, V) \equiv 1 \left\{ \sum_{i=1}^n \delta(t, X_i) Y_i(t) > 0 \right\} = 1 \left\{ \sum_{x \in X} P(X = x) \sum_{t=0}^{K-1} \delta(t, x) \nu(t, x) > 0 \right\} \quad (5.16)$$

where $\nu(t, x) \equiv \sum_{i \in \{i': X_{i'} = x\}} Y_i(t) / \sum_{i=1}^N 1\{X_i = x\}$ is a random variable representing the *vote share differential* for the candidate that will result among voters with covariates $X = x$ if the planner assigns mobilization method t to them. Clearly,

$h(\delta, V)$ is equal to 1 if the candidate of the planner’s party wins the election, and 0 if he loses. In the statistical decision theory literature, such an objective function is called “0 – 1 loss function.”

Finally, the partisan planner typically faces a budget constraint similar to that confronted by the nonpartisan planner, and therefore equation 5.5 also applies to the partisan planner’s situation.

5.4.2 Data Requirements

As is the case for a nonpartisan GOTV campaign planner, certain assumptions are required for a partisan campaign planner to be able to use randomized field experiments to reach the optimal decision. These assumptions are essentially identical to those described in Section 5.2.2: (1) a field experiment is conducted on a representative sample from the same target population of voters \mathcal{P} , and (2) the joint distribution of potential outcomes and covariates, $P(Y(t), X)$, remains identical between the experiment and the actual election. However, one important difference is that the derivation of the optimal partisan campaign requires vote choice data as well as turnout data for the voters who are the subjects of field experiments; recall that in the case of a partisan campaign, $Y(t)$ represents a trichotomous variable rather than a binary variable. For example, in the United States, vote choice data, unlike turnout data, are not publicly available and cannot be verified for each voter. This means that a sample survey needs to be conducted to derive the optimal partisan mobilization strategy (unless the entire analysis and strategy planning are conducted at an aggregate level where validated election results are available).

5.4.3 Derivation of the Optimal Strategy

The optimal partisan campaign is derived via Bayes theorem strategy, as in the case of a nonpartisan GOTV campaign. In particular, the optimal strategy maximizes the posterior probability of winning the election,

$$\delta^* = \operatorname{argmax}_{\delta \in \Delta} \int h(\delta, \nu) d\pi(\nu | D), \quad (5.17)$$

subject to the budget constraint given in equation 5.5 where $\pi(\nu | D)$ is the posterior distribution of the vote share differential $\nu(\cdot, \cdot)$. Using the classification method and variable selection algorithm similar to those described in Section 5.3.2, the planner can estimate $\nu(\cdot, \cdot)$, except that the outcome variable is now trichotomous rather than binary. Most classifiers including tree-based methods can handle such categorical variables even when the number of categories is greater than two.

The problem, however, is that the optimization in equation 5.17 is not trivial for two reasons. First, the integration cannot be explicitly solved. Second, the objective function is an indicator function that is not continuous. These difficulties are often amplified by the reality that the optimization must be conducted over a high-dimensional space if the number of treatments and/or the number of subclasses is large. These computational considerations prevented Kramer (1966) from using the probability of winning as the objective function of a partisan campaign planner. Instead, he used the expected plurality of votes as the objective function while acknowledging that it may not be appropriate. Kramer (1966) noted that “the probabilistic objective is the more realistic. However, this formulation is computationally

quite difficult to work with” (p. 141). Indeed, to maximize the expected plurality, the partisan planner can solve the following constrained optimization problem by applying the standard linear programming algorithm, as explained in Section 5.3.1,

$$\delta^* = \operatorname{argmax}_{\delta \in \Delta} N \sum_{x \in \mathcal{X}} P(X = x) \sum_{t=0}^{K-1} \delta(t, x) \mathbb{E}(\nu(t, x) \mid D), \quad (5.18)$$

$$\text{subject to } \begin{cases} \delta(t, x) \geq 0 & \text{for all } x \in \mathcal{X} \text{ and all } t \in \mathcal{T}, \\ \sum_{t=0}^{K-1} \delta(t, x) = 1 & \text{for all } x \in \mathcal{X}, \\ N \sum_{x \in \mathcal{X}} P(X = x) \sum_{t=1}^{K-1} \delta(t, x) \xi(t, x) \leq C. \end{cases} \quad (5.19)$$

To overcome this computational difficulty, a fast and approximate solution to the partisan planner’s optimization problem can be applied. This method, detailed in Appendix D.1.2, is not guaranteed to yield an optimal campaign strategy, but is relatively fast and closely approximates an optimal strategy.

5.5 Empirical Evaluation of the Proposed Method

To assess how effective the proposed method of deriving the optimal GOTV campaign is in real world applications, the method is applied to three data sets of randomized field experiments. The intent is to use a randomly selected subset of the data as a test data set and to obtain an unbiased estimate of the actual turnout (or the probability of winning) by applying the resulting optimal campaign strategy derived from the rest of the data to this test data set. This procedure mimics the real world situation by using the test data set as the actual election to which the optimal campaign strategy is applied. Since the treatment is randomized and the test data

set is not used to derive the optimal strategy, the procedure results in an unbiased evaluation of the empirical performance of the proposed methodology.

The three applications demonstrate the power and effectiveness of this method. All examples consist of a single treatment; for more varied applications see (Imai and Strauss, 2009). In each case, the decision for the planner is which voters to treat with the appeal. The first application is a nonpartisan text messaging GOTV experiment from the 2006 Congressional election. The second example is a randomized mail experiment from the 2007 Kentucky gubernatorial campaign. One of three persuasive mailings was sent to potential voters; two of the mailings used a “control group” to analyze the heterogeneous effects of the third mailing, which was on education. The third application is a program of anti-McCain robo-calls and mailings that focused on the economy, which were sent to potential voters in 2008. A randomized control group did not receive any of the treatments. In both partisan examples (the 2007 and 2008 experiments), the outcome measure (candidate support) was gathered via a survey following treatment delivery.

The partisan applications demonstrate the powerful implications of the Personal Experience model in the real world. As detailed in Sections 5.5.3 and 5.5.4, parents of school-aged children were more likely to re-evaluate the candidates once they learned their stance on education and individuals most likely affected by the economy were more likely to re-evaluate McCain. In addition to using the nonparametric method, these results are verified using more standard generalized linear models. The findings show strong support for the Candidate Evaluation Hypothesis presented in Chapter 2. Matching voters to issues for which they have experience increased the candidate’s

margin by 10-15 percentage points.

5.5.1 Evaluation Method

To assess the effectiveness of the proposed method, an additional level of cross-validation is added to the procedure described in Section 5.3. The aim is to cross-validate the whole procedure (consisting of the three steps described in Section 5.3.2) and obtain an unbiased estimate of the resulting turnout under the optimal strategy from test data that are not used in derivation of the strategy. After randomly dividing the sample into L subsamples, one subsample is set aside as a test set and the proposed methodology is applied to the rest of the data. The derived optimal strategy is then applied to the test set to obtain an unbiased estimate of the resulting overall turnout. The random assignment of treatments and the random subsampling of the test set make the unbiased estimation possible. The entire procedure is repeated L times using each subset as a test set. Finally, the average value of the L estimated optimal turnout rates is taken as an estimate of the turnout that would result under the proposed methodology.

Each application uses a normal-normal conjugate prior for the treatment effect τ based on the setup defined in equation 5.4. The prior for each subgroup treatment effect distribution is Gaussian and is centered on the estimated population average treatment effect. The value of the prior variance is chosen so that it increases in proportion to the per capita budget constraint. In each case, a grid search is implemented to approximate the optimal complexity parameter. A 10-fold cross-validation procedure is used for Step 3 of Section 5.3.2 to determine the optimality of each com-

plexity parameter. In addition, the optimization problem is solved using algorithms that yield approximate (but fast) solutions (Appendices D.1.1 and D.1.2).

5.5.2 A Nonpartisan GOTV Campaign with a Single Mobilization Method

During the 2006 election, two nonpartisan organizations contributed the cell phone numbers of newly registered individuals to an experiment that tested the efficacy of text messages to mobilize voters (see Dale and Strauss, 2009, for details). The election was of moderate interest, with at least one gubernatorial or senatorial campaign on the ballot in most states. Subjects were included in the experiment when they registered to vote with a campus representative of the Student PIRGs or when they registered online with Working Assets. About 8,000 subjects nationwide were randomly assigned, with 50 percent probability, to either the treatment group or control group.

The treatment group received a short text message the day before Election Day. An example text message read “A friendly reminder that TOMORROW is Election Day. Democracy depends on citizens like you-so please vote! -PIRG.” (The text message appeals were varied slightly, but these differences are ignored for this analysis.) Subjects were matched to the voter file using information on their registration forms.

The outcome variable is dichotomous: one for having voted in 2006, and zero for not having voted. The estimated average treatment effect, or more precisely the overall intent-to-treat effect, is 3.0 percentage points with a standard error of 1.1.

Available covariates for the analysis include gender, age, race, past voting history, log of county population density, and registering organization.

Following the procedure outlined in Section 5.3, the optimal campaign strategy is derived using this experimental data set. The classification tree produced in Step 1 chooses the following variables as having predictive power (i.e., ν): age, log of county density, registering organization, whether the subject had voted in a previous election, and gender. The prescriptive variables chosen in Step 2 are age, density, and Hispanic (in decreasing order of S_j). Not all these variables are included in the final classification tree produced, however, as searching the complexity parameter space often finds that models with fewer variables result in higher overall turnout on validation sets.

The resulting final trees are presented in Figure 5.2. The tree for the control group is on the left; the tree for the treatment group is on the right. Left branches represent voters who meet the criteria of the nodes; right branches represent voters who would falsify the nodes' inequalities. The leaves show the predicted probability of voting conditional on their covariates; higher probabilities are to the right at each node. The control group tree demonstrates that, in this group, voters above the age of 24 are predicted to vote at a rate of 62%; whether the participant's age is known and county population density are important determinants of the voting rates for voters aged 24 and under. In the treatment group, the age cut-point is in between 19 and 20, with population density and voting history also providing information about turnout rates.

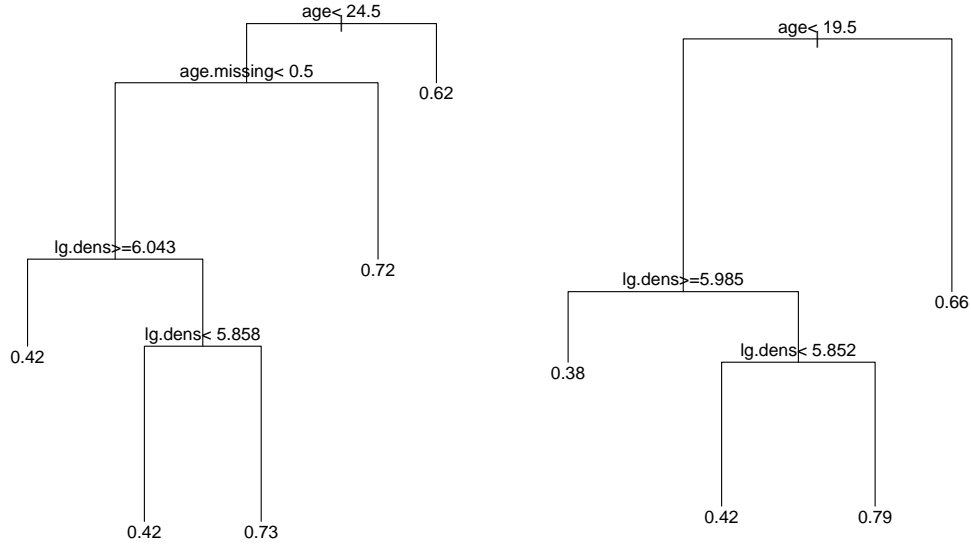


Figure 5.2: Final Classification Trees for the Control Group (left panel) and Treatment Group (right panel). The complexity parameters are chosen from 10-fold cross-validation using the algorithm described in Section 5.3.2 so that the resulting optimal turnout is maximized on the validation set. In this example, the planner’s budget allows treatment of at most 10% of the population. At each node, subjects who meet the node’s criterion are filtered through the left branch of the tree. Covariate abbreviations: `age` is the age in years of the subject, `age.missing` is whether the age of the participant is unknown, and `lg.dens` is the log of the subject’s county population density.

Much of the heterogeneous treatment effect can be explained by the voters' ages. Potential voters between the ages of 20 and 24 are very responsive to the treatment. In the control group (left panel of Figure 5.2), these individuals vote at a rate of 62%. In contrast, the classification tree for the treatment group assigns them a probability of voting of 66% (the right branch of the right panel of Figure 5.2) – a four percentage point increase above the average treatment effect. Also, the treatment model predicts a negligible or negative treatment effect for 18- and 19-year-olds, as their probability of voting is assigned at most 42% under the treatment unless they live in a county with a density within a narrow range. (Such age ranges could not be identified by a classic model such as logit with linear explanatory variables.)

Figure 5.3 displays the performance of the proposed methodology given the maximum proportion of voters that could be contacted. The turnout that would result under the optimal strategy is estimated using the difference in means estimator between the treated and untreated voters (solid lines with solid circles). The average turnout is computed for the treated voters who are assigned to the treatment group as well as for the untreated voters who are assigned to the control group under the optimal strategy. The latter is then subtracted from the former to yield the estimated overall turnout under the optimal strategy. The turnout rate achieved with the proposed method compares favorably with the turnout rate achieved using a naive strategy where randomly selected voters are contacted. This less-informed strategy, which is based solely on the estimated overall average treatment effect (“ATE strategy”), completely ignores covariate information and thus assumes zero treatment effect heterogeneity.

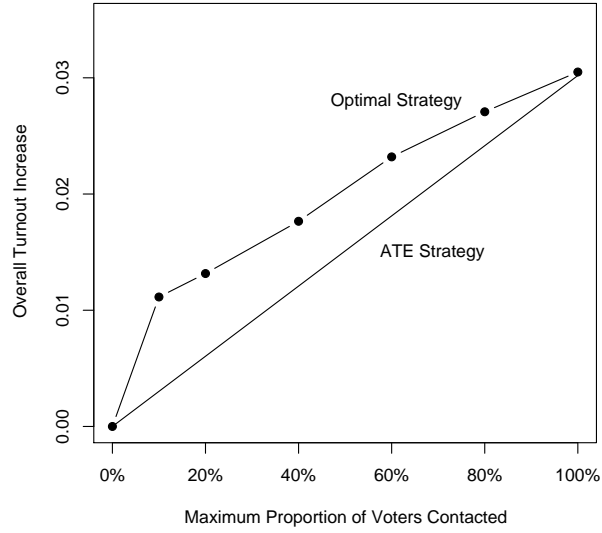


Figure 5.3: Empirical Evaluation of the Performance of the Proposed Method for the Text Messaging Experiment. The figure displays the overall turnout increase that results from two campaign strategies as a function of the maximum proportion of voters contacted. The first strategy is the average treatment effect or ATE strategy (solid line), which contacts randomly selected voters. The second strategy is an optimal approach based on the proposed methodology, which uses covariate characteristics of voters to determine which voters receive the treatment. Solid circles represent the estimated optimal turnout using the difference-in-means estimator. The estimator is applied to the test data which are not used to devise of the optimal strategy.

Figure 5.3 shows that the proposed method results in a higher overall turnout than an ATE strategy (at least on average), if an organization can afford to treat only a subset of the population. For a campaign that can afford to treat 10% of the population, for example, the optimal campaign strategy achieves an overall turnout increase on average over three times greater than the turnout increase under the ATE strategy. Because the nonparametric procedure does not isolate individuals who reacted negatively toward the treatment, no gain over the ATE strategy is seen when treating the entire population. This lack of negatively responsive individuals is not surprising given that little backlash was found to the text messages in a post-treatment survey (Dale and Strauss, 2008). Overall, for the text messaging application, organizations operating under tight budgetary constraints would be wise to use the proposed nonparametric procedure.

5.5.3 Partisan Example: Parents and Education Spending

In September 2007, a union delivered three mailings to its members in Kentucky in a randomized field experiment. Each participant received exactly one of the three mailings, which focused on schools, change, and corruption, respectively, with no control group. The mailings were sent out on September 13, and 1,321 participants were surveyed by telephone between September 17 and September 20. As predicted by the Personal Experience Model, the school mailing worked particularly well among parents.

The respondents to the survey were asked a standard vote question in which the parties of the candidates, Democrat Steve Beshear and Republican Ernie Fletcher,

were identified. Respondents reported which candidate they currently supported, indicating whether their support was “definite, probable, or lean.” Given that the respondents were union members, it is not surprising that they generally preferred the Democrat: 69% supported Beshear (including leaners), 17% supported Fletcher, and 13% were undecided. The results were similar for the subset who received the school mailing: 70% Beshear, 15% Fletcher, and 15% undecided (n=448).

Part of the schools mailing is pictured in Figure 5.4. The Personal Experience Hypothesis suggests that parents would be especially responsive to this piece because they are able to independently judge politicians on the state of Kentucky schools. Unfortunately, the survey of respondents did not ask whether the respondent was a parent. The survey did ask about marital status, however, and a linked commercial database includes data on children in the household. The 13% of respondents who have children in the household (as indicated by the commercial data) was combined with the 18% of respondents who are not single and are under 40 to compose the target group: the 26% of the population likely to have children. This group was labeled (with some hesitation) “parents.”

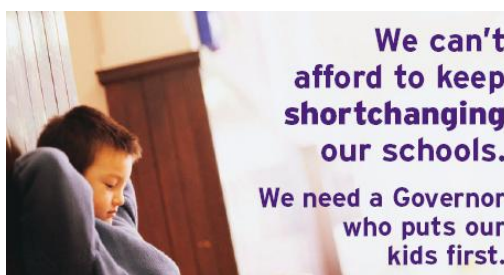


Figure 5.4: Part of the Kentucky Mailing.

Parents who received the school mailing favored Beshear 75%-12% (n=97) as dis-

played in Figure 5.5; parents who received other mailings favored Beshear 68%-22% (n=223). This result is at the edge of statistical significance. A linear regression using the 7-point vote preference, and controlling for the prior probability of supporting Beshear (the support score demographic model), the school mailing*parent interaction coefficient is significant with $p=0.03$, two-tailed. An ordinal regression with the trichotomous Beshear/Fletcher/undecided outcome variable (i.e., less granularity) and no controls produced a p-score for the interaction of 0.15, two-tailed. These regressions indicate that an independent parent increased his/her probability of supporting Beshear by 11 percentage points after receiving the school mailing (from 66% to 77%).

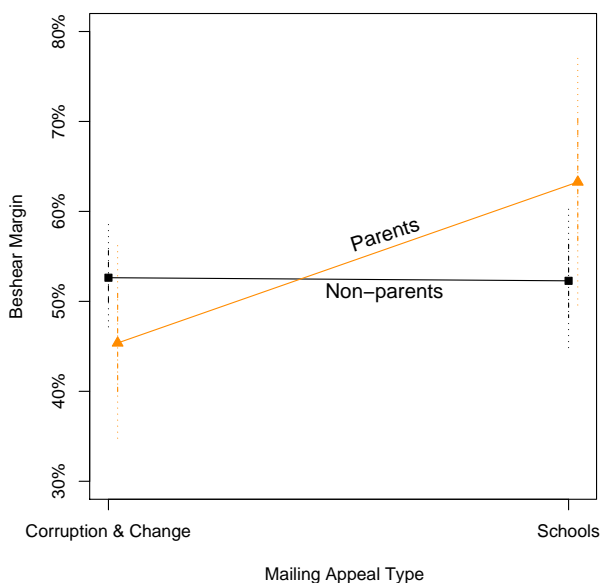


Figure 5.5: Parents React Strongly to School Mailing. Beshear's margin by type of mailing and whether the recipient is believed to be a parent are shown. Point estimates are represented by filled-in squares and triangles. Dashed lines represent one standard error; dotted lines represent two standard errors.

The population of the experiment, union members, is not representative of the Kentucky electorate. To maximize the mailing's effect on Beshear's margin of victory, Beshear is assumed to have a baseline margin of -3 percentage points. The mailing has an average treatment effect of 3.9 percentage points, thus treating 77% of union members (under the ATE approach) would push Beshear over the 50% change of winning mark.

Figure 5.6 displays the significant cost savings provided by the nonparametric algorithm. Beshear's probability of winning passes the coin-flip mark with just 10% of the population treated. With such a small sample, this 10% figure has a lot of noise; the fact that treating 20% of the population decreases the chance of winning is an indication of this noise. Nevertheless, the algorithm, which selects both the commercial data on parents and the imputed data in various iterations, provides clear benefits.

Certainly there are alternative explanations of why parents are more responsive. First, parents may be more likely to read the mailing because its subject is schools. This mechanism, however, is consistent with the Personal Experience Model: individuals might pay more attention to a mailing that they realize will inform their political judgments, and they are more capable of processing the political arguments of the mailing. Personal experience with political issues is expected to strengthen both these processes.

A second possible explanation is that parents have a self-interest in school funding. As with the observational data of Chapter 3, this experiment does not allow these two mechanisms to be disentangled.

A third explanation is that the mailing convinces a voter to support Beshear solely on the basis of her support of education spending. Since parents might be more inclined favor of education spending, they may increase their vote for Beshear more than the general population. Two factors mitigate this alternative hypothesis. First, this explanation assumes that voters do not cue-take from politicians; the evidence for cue-taking in Chapters 3 and 4 is strong. Second, Beshear's margin does not increase in the non-parents group, meaning any votes gained among non-parents who support education funding must be offset by non-parents moving against Bashear. Certainly movement against the candidate delivering a mail piece is possible, but the algorithm does not find large shifts against Bashear (Figure 5.6).

5.5.4 Partisan Example: Disadvantaged Voters and the Economy

In March 2008, while the Democratic presidential primary race was still undecided, a union tested three anti-McCain mail pieces (along with a control group) in Ohio. The focus of the mailings, with varying degrees of emphasis, was how McCain's policies would damage the economy and weaken the working- and middle-class. Figure 5.7 displays part of the most straightforward of the mailings, which were mailed to union members. These mailings were followed up with robocalls that reinforced the topic of the mailing. Participants were surveyed by telephone shortly after the mail pieces and robocalls were received. The Democrat's margin was 23 points (Dem 54% - McCain 31%, n=2,967) among those who received any mailing and 21 points (Dem 53% - McCain 32%, n=987) in the control group—not a significant difference.

The Personal Experience Hypothesis would predict that members who had personally experienced the economic downturn (or were close to those who had) would react more strongly to the mail and robocall program. The subgroup of interest is the set of individuals who live in economically distressed areas, defined by several census characteristics, such as percent unemployed and median household income. A factor analysis identifies the top 30% of respondents who live in disadvantaged areas (after individuals who could not be matched to census data were eliminated).⁶ The median household income of the disadvantaged group is about \$32,500, which was significantly lower than the average of nearly \$50,000 in the advantaged group.

This key group's support for the Democrat increased significantly after receiving the mailings and robocalls: from 16 points in the control group (Dem 48%, McCain 32%, n=227) to 28 points among anyone who received a mailing (Dem 58%, McCain 30%, n=710). Among those who lived in the 70% most well-off places, this margin decreased slightly between treatment and control, from 18 points to 16 points (Figure 5.8).

These data are suspicious because of the low Democratic margin among the disadvantaged in the control group. With only 227 disadvantaged control-group respondents, poor randomization may be affecting the results. To reduce this possibility, vote preference is regressed on the treatment condition and its interaction with the subgroup of interest, controlling for a demographic-based partisanship score provided by the union.⁷ With a linear regression on the 7-point vote question, the treatment effect for the advantaged subgroup is nearly exactly zero, but for the disadvantaged

⁶Special thanks to Catalist, LLC for its help in matching voters to census information.

⁷This score was developed before the experiment.

subgroup the coefficient is large and nearly statistically significant ($p=0.15$, two-tailed). The interaction coefficient can be interpreted as: the average union member living in a disadvantaged area moved one-third of a survey response unit (e.g., from “Dem: lean” to “Dem: probably”) after receiving the mailing.

An ordinal regression on the trichotomous outcome variable (i.e., the only options are voting for the Democrat, McCain, or undecided) indicates that a member with median characteristics would increase his/her probability of voting for the Democrat by 7 percentage points as a result of living in a disadvantaged area and receiving the treatment (from 38% to 45%).

When the nonparametric algorithm is applied to this data, both small- and large-budget operations benefit. As Figure 5.9 displays on the left panel, treating 10% of the population increases the Democrat’s probability of winning to 38%, while the ATE strategy produces a win only 24% of the time.⁸ In nearly every iteration, the algorithm selected the continuous variable of economic distress.

Big gains are also found under loose budget constraints. The ATE is 2.4 percentage points, yet treating 80% of the population under the proposed strategy would produce an effect of 4.5 percentage points. A backlash is present among some of the population. The algorithm, when the budget constraint is removed, estimates that 10% of the population is negatively treatment responsive (Figure 5.9, right panel), but that is probably an underestimate since the overall persuasion boost declines to 3.5 percentage points in this case.

As with the Kentucky test, alternative hypotheses are possible. Especially con-

⁸Again, the margin between the candidates is artificially tightened to examine differences between the algorithms.

cerning with this test is that disadvantaged members would react strongly to a variety of issues, not just the economy. Unfortunately, this proposition cannot be tested in a rigorous manner since there was no group that received a generic message. The only evidence offered is that in a mail test later in 2008 by the same union dealing with Social Security, the economically disadvantaged were *less likely* to react positively to the treatment than the economically advantaged.⁹ Also, as with the Kentucky test, prior issue position (in this case, belief that the economy is performing badly) might generate the difference between the two groups.

Both partisan experiments demonstrate large effects of targeting participants with personal experience. Targeting parents with a school mailing rather than a generic mailing increases the probability that a voter in this group shifts her preferred candidate by 11 percentage points. Targeting disadvantaged voters with an economic mailing increases the probability of vote change by 7 percentage points. These shifts might appear large, but often experiments with small average treatment effects significant subgroup differences (e.g., Arceneaux and Kolodny, 2009). Also, the union clearly identified themselves as the source of the mailing, and among members the union is likely a trusted source. This member-organization relationship probably increased the credibility of the message.

⁹This result is not statistically significant at conventional levels. Further, the Social Security mailing cannot be used as a test of the Personal Experience Hypothesis because the mailing was delivered to seniors only. Thus the experiment lacks crucial variance in the interacting variable of interest (seniors v. younger voters and Social Security appeals).

5.6 Concluding Remarks

More than forty years ago, Kramer (1966) observed,

In the past two decades, the use of quantitative methods as aids for decision-making has become common in many fields. [...] By and large, however, these efforts have not been made by political scientists. [...] This is unfortunate, for many of the traditional concerns of political scientists appear to be quite susceptible to this sort of analysis. (p.137)

Yet, political scientists have since generally neglected to use quantitative methods to directly inform policy makers who must make decisions using available data. This chapter takes up Kramer’s proposal and show how modern statistical methods can be used to help practitioners devise strategies and implement optimal policy using the Personal Experience Hypothesis.

The proposed methodology is agnostic to theories (e.g., the Personal Experience Model) about why certain subgroups should be more responsive to specific treatment. Nevertheless, these theories can help practitioners form priors, identify sources of potentially useful data, and better explain the results of the nonparemetric method. Such approaches demonstrate one application of Kramer’s larger goal: arming campaign strategists with the theory and methods to more accurately target voters who are susceptible to persuasive appeals.

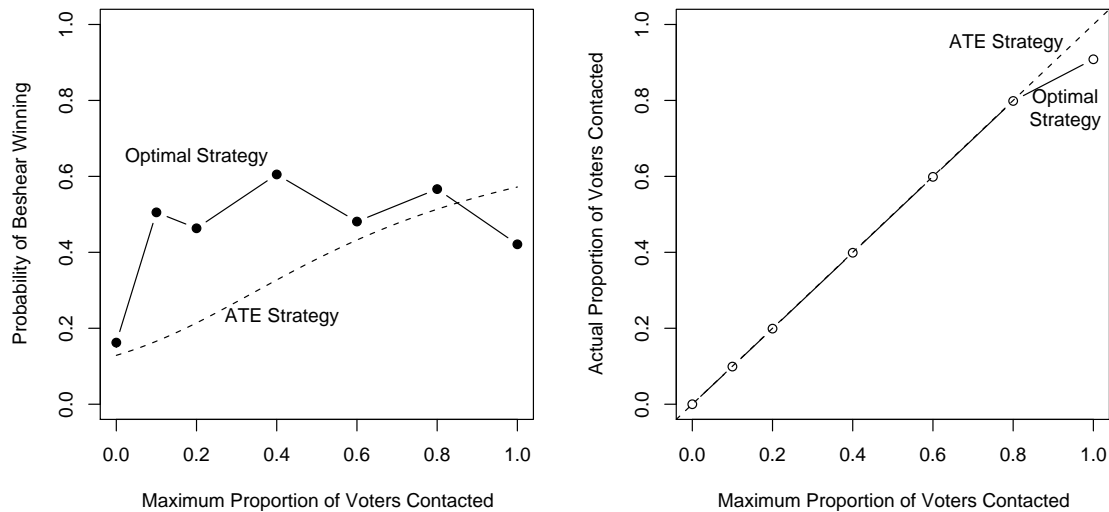


Figure 5.6: Empirical evaluation of the performance of the nonparametric method on the Kentucky data. The results are calculated based on 10-fold cross-validation. The left panel displays the estimated probability of Beshear winning under two treatment strategies plotted over the maximum proportion of the electorate treatable under the budget constraint. The dashed lines represent the “ATE strategy” in which random voters are contacted. The solid lines represent the optimal strategy based on the proposed methodology, which uses covariate characteristics of voters to determine which voters receive the treatment. The optimal strategy outperforms the ATE approach strategy under tight budget constraints. The right panel plots the actual proportion of voters contacted by the mailing against the maximum proportion of voters contacted, which is determined by budget constraint. Only in the situations where nearly all voters can be contacted, does the algorithm choose not to canvass some voters—and it chooses these untargeted voters poorly.



Figure 5.7: Part of the ant-McCain mailing.

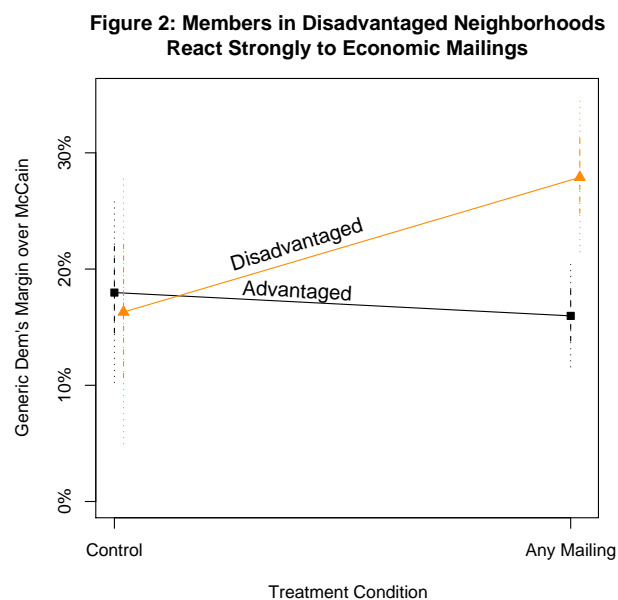


Figure 5.8: The Economically Disadvantaged React Strongly to Economy-focused Mailings. Generic Democrat's margin over McCain by treatment condition and whether the union member lives in a disadvantaged area are shown. Point estimates are represented by filled-in squares and triangles. Dashed lines represent one standard error; dotted lines represent two standard errors.

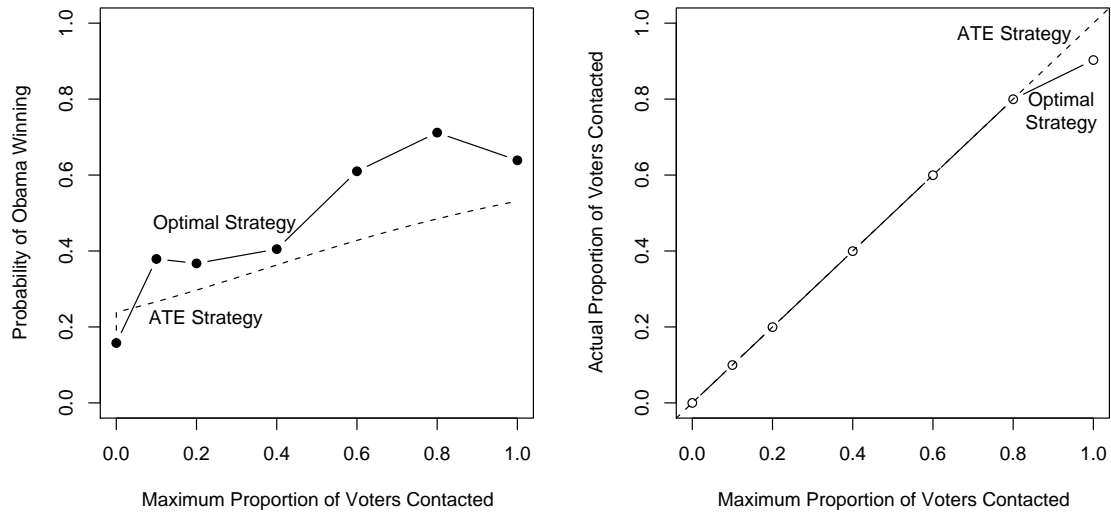


Figure 5.9: Empirical evaluation of the performance of the nonparametric method on the anti-McCain experiment data. The results are calculated based on 10-fold cross-validation. The left panel displays the estimated probability of the generic Democratic winning under two treatment strategies plotted over the maximum proportion of the electorate treatable under the budget constraint. The algorithm successfully finds voters who are very treatment responsive and negatively responsive. See Figure 5.6 for details.

Chapter 6

Campaign and Normative Implications of Microtargeting

6.1 Campaign Microtargeting

Campaign microtargeting is a method for identifying a subset of voters to which to direct a tailored message. The advent of electronic voter files and commercial databases has made this strategy more efficient and more widely applicable to groups of voters (Malchow, 2003). The Personal Experience Model is one theoretical connection between specific voters and issues. However, several alternative group-issue connections are described in both the academic (Krosnick, 1990; Chong *et al.*, 2001) and practitioner literature (Sosnick *et al.*, 2006). This chapter outlines the situations in which campaigns should leverage these theories to microtarget voters and the normative implications of that microtargeting on democracy.

Microtargeting is a powerful tool. If voter-issue linkages are identified correctly, campaigns can have an important effect on how voters judge candidates in an election. Chapters 3, 4, and 5 provide the empirical evidence to support this claim and demonstrate how campaigns can leverage personal experience to garner support from voters who would otherwise vote for the opposing candidate. In this chapter, first the situations in which campaigns would not choose to microtarget are outlined. In the broad sense, campaigns that need to change the landscape of a race dramatically would do best not to microtarget. Second, the normative implications for microtargeting are discussed.

Various methods for identifying voters who will be responsive to narrow issue appeals are available to campaigns. The easiest method, perhaps, is to use well-defined categories from readily available voter files. For example, a campaign might use birth year to target an age group, such as seniors. A second possibility is to use non-voter-file information (e.g., census data, licensing lists), match this data to the voter file, and identify specific groups, such as hunters or those with low incomes. The third, and most complex, method is to survey a group of voters, asking a question (e.g., “Do you have children under the age of 18?” or “What is the most important issue to you?”) the answer to which is not available in any database. After a sufficient number of voters (perhaps on the order of 2,000) have responded to a question, a campaign analyzes the data using either a parametric (e.g., logit) or a non-parametric (e.g., CHAID) method to correlate measures available for the entire electorate to the survey response of interest (Malchow, 2003). The campaign can then assign a probability of being in the specified subgroup to all voters. Similar

to the optimizations described in Chapter 5, the campaign would contact the voters with the highest probability of being in the target group.

Figure 6.1 displays the results of a hypothetical microtargeting of undecided voters. Voters in the top decile (by their probability of being undecided) are twice as likely to be undecided as the population as a whole (20% to 10%).

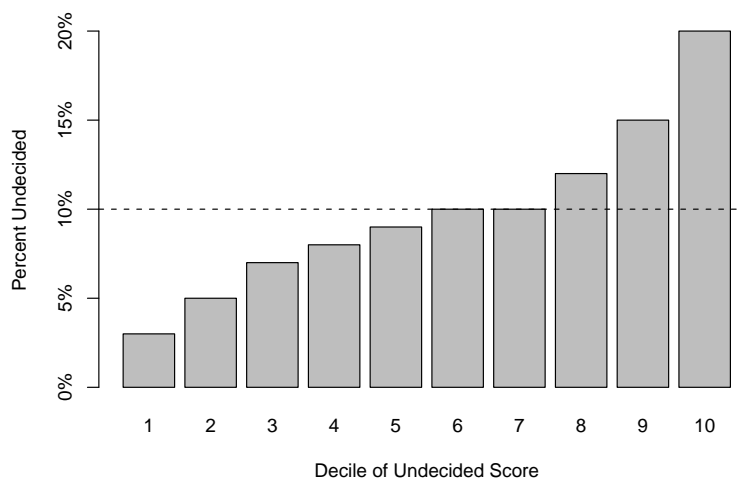


Figure 6.1: Example of the results of a campaign microtargeting undecideds. The top decile of voters (10) includes twice as many undecided voters as the population average. Targeting these voters is thus twice as efficient as a random strategy.

None of these methods perfectly identifies a list of voters who will change their votes if targeted with an appeal. In an attempt to maximize the probability of a targeted voter changing her vote choice, campaigns often also use the survey/CHAID method to identify voters who are on (or near) the fence for their vote choice decisions. Further error is induced when the targeted population is identified by survey, as electorate-wide covariates may not predict survey responses well. The use of a

training and test set can ensure that microtargeting models do not over-fit and that they do identify targeted voters better than if the campaign were to deliver messages randomly.

In essence, microtargeting increases the efficiency of campaign issue signals and the linkage between a candidate's stances and a shift in voters' candidate preferences. If a voter is experienced with an issue, belongs to an issue public, or has self-interest in an issue (all microtargetable subgroups), that voter is more likely to pay attention to campaign appeals on that issue. In all these cases, the voter more easily processes political arguments on the issue (as a result of their experience, appetites, or self-interest) and thus is less likely to ignore messages on the issue because the candidate's appeal is either too complex or uninteresting. Microtargeting increases the pace of voter learning about pivotal issues.

Applying the Personal Experience Model to various forms of voter targeting demonstrates how microtargeting enhances the connection between candidate stances and vote choice. Again, assume that campaigns target voters who have experience, who are in an issue public, or who have self-interest. Because each of these types of targeted voters has information or opinions that originate independently of political elites, the voter can "ground-truth" the stances taken by the candidates (see Chapter 2). This independent information allows the voter to judge the politicians on the issue when the voter cue-takes from the politicians' positions. Since cue-taking polarizes the electorate, and does not affect vote preferences, an increase in microtargeting (and hence a reduction in cue-taking) strengthens the relationship between pre-campaign voter attitudes, candidate stances and candidate evaluation.

6.2 Implications for Campaign Strategy

6.2.1 Microtargeting and Message Control

If a campaign can identify a subgroup of voters with experience on an issue, it will be able to deliver issue-specific messages to these voters. If the voters' opinions are congruent with the candidate's platform, then the campaign's appeal will raise the voters' evaluations of the candidate (on average). In some cases, these voters can make the difference between losing and winning.

However, in some situations, microtargeting is a net loss for the campaign. Microtargeting and message delivery cost the campaign both in terms of money and opportunity cost; thus the benefits must be proportional to the resources devoted to microtargeting.

In three situations, microtargeting is not helpful. First, independent of other options for resource allocation, microtargeting is not necessarily beneficial for a campaign. For instance, if all microtargetable voters disagree with the candidate on the issue in question, then clearly the campaign should not raise the issue. If microtargetable voters *do* side with the candidate on the issue, the campaign can identify these like-minded voters and deliver messages only to them. (For the rest of this chapter, the term "microtargetable" is restricted to this group of voters.)

Even if microtargetable, like-minded voters exist, sending these voters tailored messages is useful only if these individuals are unlikely to vote for the candidate in the absence of the appeal. Some of these individuals will likely abstain or vote for the opponent based on their predispositions if the campaign does not target them.

However, the proportion of these voters in this circumstance can be small in high-salience, polarized elections where the dimension of opinions on the issue in question is similar to the overall ideological dimension of the campaign.¹ While potentially small in number, some portion of the electorate would shift their vote choice only if microtargeted.

In addition to microtargeting, campaigns can spend resources attempting to control their overall message agenda. One example is the 2002 midterm elections, when Democrats pushed the issues of health care and corporate responsibility and Republicans attempted to put taxes and national security at the fore of voters' minds.² Because of cue-taking, these non-microtargeted issues often have little effect on the vote preferences of the electorate. For instance, the sudden shift in dialogue in the 2008 presidential election after the third debate to "spreading the wealth" and "Joe the Plumber" polarized the public on economic issues and did not move the overall vote.³ The exception to this rule is when the media or public agree that one party (or candidate) has outperformed the other on an issue. This occurs after the issue has resolved (Canes-Wrone *et al.*, 2001) and accounts for the importance of economic voting (Mueller, 1970) and retrospective voting in general (Fiorina, 1981). If a campaign chooses to spend resources to "broadcast" a message on a single issue and that issue resolves in its favor, then the electoral payoff can be large.

¹A "high salience election" means few registered voters abstain, so little get-out-the-vote effect is possible. A polarized electorate means that few voters are undecided or potential defectors. "Similar issue dimensions" means that few voters currently supporting the opponent are likely to be congruent with the candidate for the issue in question.

²Nagourney, Adam. "Domestic Concerns Take Center Stage In Congress Races." *New York Times*. September 1, 2002.

³See Gallup Polls on wealth redistribution and aggregate vote choice surveys on pollster.com.

6.2.2 Translating the Personal Experience Model into a Formal Game

To delineate the situations in which microtargeting is the optimal strategy, I develop a model that explores the campaign resource allocation decision. In the broad sense, I presume that a candidate (1) has decided to run for office, (2) has chosen a platform on which to run, and (3) must decide how to spend the campaign's limited resources (i.e., money). The candidate must choose between two methods of campaigning. First, the campaign can microtarget voter-issue pairs for which the voters have stable opinions that are congruent with the candidate's platform. Alternatively, the campaign can broadcast to all voters the candidate's stance on an issue for which the voters have unstable opinions but that may resolve in the candidate's favor.

I also assume that the campaign has a wealth of knowledge about the electorate to guide its decisions. Through public opinion polls (or other means), the campaign knows the general predispositions of the electorate. The campaign also has knowledge about what percentage of the electorate is microtargetable (i.e., has stable opinions) on each potential campaign issue. In addition, the campaign has accurate beliefs about the probability that certain issues will resolve in its favor by Election Day (e.g., an improving economy helps the incumbent party).

The Personal Experience Model demonstrates how specific segments of the electorate are disproportionately responsive to certain issue appeals when forming candidate evaluations. Campaigns generally have the ability to identify these voters to some extent; perfect identification is not necessary. If a campaign delivers targeted messages to these voters, the campaign can shift some of these microtargeted voters'

candidate preferences. I also assume that the more money a campaign invests in microtargeting, the more voters it can reach.

Any voter-issue pairs in which some voters have a stable opinion is labeled a “potentially microtargetable” pairing. The campaign whose platform is congruent with the voter’s opinion in this pairing would prefer that the voter learn about the candidate’s stances on the issue and have the issue on the top of her head come Election Day. However, the campaign does *not* want to emphasize the issue among voters who have stable opinions that are incongruous with its platform. Hence, even if wide swaths of the electorate have stable opinion on issues, campaigns can maximize their efficiency by microtargeting only the voters with congruent opinions.

Segments of the population who lack issue experience (or an alternative issue connection such as self-interest) are not likely to shift their vote on the issue in question. Instead, these voters cue-take from politicians, their vote choices polarize, and they do not change their vote choice. This polarization mechanism requires two streams of considerations (i.e., an appeal from each ideological side), a criterion that is not always met. The canonical example of one-sided issue streams is the early discussion of the Vietnam war (Zaller, 1992). In this case, both liberals and conservatives alike supported the war as that was the only position represented by political elites.

Message streams can become one-sided when an issue resolves. For instance, when the country’s economy tanked in the fall of 2008, only 5% of the public rated the economic situation of the country as “excellent” or “good.”⁴ Voters can then

⁴“How would you rate economic conditions in this country today – as excellent, good, only fair, or poor?” USA Today/Gallup Poll. Oct. 10-12, 2008. N=1,269 adults nationwide.

use the single stream of information from the media to “ground truth” politicians performance. The evidence that resolved issues affect large swaths of the electorate is clear when economic and war data are correlated with election results on the national (Hibbs Jr., 2000) and state levels (Campell, 1992; Cohen and King, 2004).

In the model, an issue can (1) resolve in favor of one candidate, (2) resolve in favor of the other candidate, or (3) not resolve during the course of the campaign. Campaigns can choose to focus their appeals on certain issues in an attempt to prime voters’ minds (i.e., place considerations about this issue on the tops of voters’ heads). In essence, campaigns can place bets that certain issues will resolve in their favor.

One possible exception to the cue-taking rule is issue ownership (Petrocik, 1996). Related to the Broadcast Corollary discussed in Chapter 2, the theory of issue ownership stipulates that wide swaths of the electorate favor one side of an issue. If a party “owns” an issue, it can be considered an “easy issue” (Carmines and Stimson, 1990) in that voters will likely have a stable opinion on the issue independent of cue-taking.

However, elections in which a large majority of voters side with one candidate on an “easy” or “owned” issue are usually uncompetitive elections. The campaign that has this majority of voters on its side most likely has a winning (and perhaps dominant) strategy to emphasize this issue. Since close campaigns are more interesting, the model instantiations in Section 6.2.5 usually consider cases in which a small percentage of the electorate is microtargetable.

6.2.3 The Model

In an election between two candidates, D and R , the campaigns decide how to allocate resources across two issues (A and B) and whether to microtarget or broadcast their messages about these issues. In the hypothetical world in which neither campaign makes any effort, the predispositions of the voters dominate. Both campaigns have common beliefs about their chance of winning in this no-campaign universe (i.e., a benchmark poll is taken before the campaign to test the mood of the electorate). This belief is represented by a mean percent of the vote for candidate i , μ_i , and a common uncertainty, σ^2 ($i \in D, R$). This representation is similar to a valence advantage in other models (Groseclose, 2001). The vote for candidate i , V_i , is distributed normally,

$$V_i \sim \mathcal{N}(\mu_i, \sigma^2). \quad (6.1)$$

Candidate i 's utility, U_i , is the campaign's probability of winning,

$$U_i = \Pr(i \text{ wins}) = \Pr(V_i > 0.5) = \Phi\left(\frac{\mu_i - 0.5}{\sigma}\right). \quad (6.2)$$

To simplify the analysis, I assume only two candidates in the race, $\mu_D = 1 - \mu_R$, and a fixed electorate with 100% turnout. The tiny tails of the vote distribution that extend beyond the logical range of V_i , $[0, 1]$, are ignored.

Implicitly in the model, ties are broken with a coin flip. If the campaigns garner exactly the same number of votes on average (i.e., $\mu = 0.5$), then the probability of winning approaches 0.5 as the uncertainty of the result goes to zero (i.e., $\sigma^2 \rightarrow 0$). This characteristic of the model is a result of the symmetry of the normal curve

about its mean.

Under all circumstances, campaigns want to increase their share of the vote, μ_i , since $\frac{\partial U_i}{\partial \mu_i} > 0$. They attempt to increase this share by taking stances on issues. For the moment, let the issues equal advantages for the campaigns. Issue A is an issue for which a portion of the electorate has experience, although some experienced voters side with candidate D and some with candidate R . Let the proportion of all voters who fall into one of those two categories (i.e., who are microtargeted by the candidates) be m_D and m_R , respectively. For now, assume a level playing field: $m_D = m_R$.

The other issue, B , is not microtargetable but has a chance of resolving by the election. If this issue resolves in candidate D 's favor, an occurrence with probability of p_D , q percent of voters switch their preference from R to D . A symmetric switch of q percent of the electorate occurs with probability p_R ; i.e., in this case, the issue resolves in candidate R 's favor. Let $p_D = p_R$.

The campaigns do not have the resources to fully utilize the advantages offered by both approaches. Instead, they must choose a combination of microtargeting and broadcasting. Assume that both campaigns have equal resources, a budget of 1, and campaign i spends $\delta_i \in [0, 1]$ on microtargeting. A campaign must spend its entire budget to gain the maximum votes from the strategy-issues combinations above.⁵ The resulting distribution of the percentage of votes for candidate D , given both

⁵If one campaign spends all its resources on broadcasting, then q percent of voters switch. If both campaigns only broadcast, then $2q$ voters switch.

campaigns disbursements, is

$$V_D(\delta_D, \delta_R) \sim \mathcal{N}(\mu_i, \sigma^2) + \delta_D m_D - \delta_R m_R + (2 - \delta_D - \delta_R)BS(p_D, p_R) \quad (6.3)$$

$$V_D(\delta_D, \delta_R) \sim \mathcal{N}(\mu_i, \sigma^2) + m(\delta_D - \delta_R) + (2 - \delta_D - \delta_R)BS(p, p) \quad (6.4)$$

where $BS(p_1, p_{-1})$ is a Bernoulli scheme with probability p_1 of outcome 1 and probability p_{-1} of outcome -1 (see Appendix E). The analogous equation shows the vote for candidate R . The mean and variance of V_i are,

$$\text{mean}(V_i(\delta_i, \delta_{\sim i})) = \bar{V}_i(\delta_i, \delta_{\sim i}) = \mu + m(\delta_i - \delta_{\sim i}) \quad (6.5)$$

$$\text{Var}(V_i(\delta_i, \delta_{\sim i})) = \sigma^2 + 2pq^2(2 - \delta_i - \delta_{\sim i})^2 \quad (6.6)$$

If neither campaign spends any resources broadcasting (i.e., $\delta_i = 1$), each candidate's contribution to the variance (Equation 6.6) goes to 0. As before, the utility for candidate i is the probability of winning, $U_i = \Pr(V_i > 0.5)$. For candidate D ,

$$\begin{aligned} U_D = & (1 - 2p)\Phi((\mu + m(\delta_D - \delta_R) - 0.5)/\sigma) \\ & + p\Phi((\mu + m(\delta_D - \delta_R) + q(2 - \delta_D - \delta_R) - 0.5)/\sigma) \\ & + p\Phi((\mu + m(\delta_D - \delta_R) - q(2 - \delta_D - \delta_R) - 0.5)/\sigma) \end{aligned} \quad (6.7)$$

This model includes two assumptions that are rough approximations of the real world and are not likely to hold in actual campaigns. First, the proportion of voters who will switch their candidate preference because of microtargeting (m) does not vary based on the resources spent on broadcasting ($1 - \delta$), or vice versa (with q and δ).

In essence, this simplification assumes a uniform distribution of the electorate across the ideological spectrum regardless of whether a candidate becomes more advantaged (i.e., the decision cutpoint on the ideological spectrum shifts); the number of nearly undecided (i.e., indifferent) voters is constant. Second, if the campaign microtargets voters who have a high probability of shifting their vote choice, the rate of successful microtargeting is not affected by spending on broadcasting. In other words, wasteful spending by campaigns that “doubles up” on voters—contacting them with both microtargeting and broadcasting when only one of the methods is necessary to shift the voter’s preference toward the candidate—is assumed not to occur.⁶

6.2.4 Best Response

The optimal strategy of candidate i , given the strategy of the other candidate (labeled $\sim i$) is the level of microtargeting (δ_i^*) that maximizes candidate i ’s utility,

$$\delta_i^*(\delta_{\sim i}) = \operatorname{argmax}_{\delta_i} U_i(\delta_i, \delta_{\sim i}) \quad (6.8)$$

To determine the best response to the opponent’s strategy, $\delta_{\sim i}$, the partial deriva-

⁶A myriad of real-world considerations are not included in the model such as diminishing returns, fixed costs, and economies of scale.

tive of candidate i 's utility is taken with respect to the campaign's strategy,

$$\begin{aligned} \frac{\partial U_i}{\partial \delta_i}(\delta_i, \delta_{\sim i}) = & (1 - 2p) \frac{m}{\sigma} \phi((\mu + m(\delta_i - \delta_{\sim i}) - 0.5)/\sigma) \\ & + p \frac{m - q}{\sigma} \phi((\mu + m(\delta_i - \delta_{\sim i}) + q(2 - \delta_i - \delta_{\sim i}) - 0.5)/\sigma) \\ & + p \frac{m + q}{\sigma} \phi((\mu + m(\delta_i - \delta_{\sim i}) - q(2 - \delta_i - \delta_{\sim i}) - 0.5)/\sigma) \end{aligned} \quad (6.9)$$

Under some circumstances, the resource allocation decision is trivial. If the number of votes that can be shifted with microtargeting (m) is greater than the proportion of votes possibly shifted if the issue resolves (q), then the campaign should spend all its money on microtargeting. Formally, $m > q \rightarrow \frac{\partial U_i}{\partial \delta_i} > 0$ (see Equation 6.4) and the candidate's utility is increasing in δ .

As an intuition for the whether a campaign has an incentive to microtarget or broadcast, consider the effect of broadcasting on the variance of V_i . Pouring more resources into broadcasting increases the percentage of the population that will switch under a resolved issue, and since issue B resolves stochastically, increased broadcasting increases the variance of V_i . For a mathematical intuition of this result, see equation 6.6 and note that $\frac{\partial \text{Var}(V_i)}{\partial \delta_i} = -4pq^2(1 - \delta_i - \delta_{\sim i})$ is negative, so the variance of the vote increases with the amount of resources spent on broadcasting.

Similar to the stochastic knapsack problem discussed (see discussion D.1.2), campaigns want to increase the variance of the election result if they are losing (i.e., the expected vote percentage is below 50%) and decrease the variance if they are winning (Carraway *et al.*, 1993). Applying this principle to the microtargeting vs. broadcasting model, we find an incentive for broadcasting only when a campaign cannot

reach 50% (on average) with a combination of predispositions and microtargeting.

To prove this result formally, note that adding or subtracting a value to the point on a Gaussian probability distribution has the property $x < 0 \leftrightarrow \phi(x+c) > \phi(x-c)$. Next, Equation 6.9 is rewritten to combine the terms influenced by the potential for microtargeting, m , and broadcasting, q ,

$$\begin{aligned}
\frac{\partial U_i}{\partial \delta_i}(\delta_i, \delta_{\sim i}) &= \frac{m}{\sigma} [(1-2p)\phi((\mu + m(\delta_i - \delta_{\sim i}) - 0.5)/\sigma) \\
&\quad + p\phi((\mu + m(\delta_i - \delta_{\sim i}) + q(2 - \delta_i - \delta_{\sim i}) - 0.5)/\sigma) \\
&\quad + p\phi((\mu + m(\delta_i - \delta_{\sim i}) - q(2 - \delta_i - \delta_{\sim i}) - 0.5)/\sigma)] \\
&- \frac{q}{\sigma} [p\phi((\mu + m(\delta_i - \delta_{\sim i}) + q(2 - \delta_i - \delta_{\sim i}) - 0.5)/\sigma) \\
&\quad - p\phi((\mu + m(\delta_i - \delta_{\sim i}) - q(2 - \delta_i - \delta_{\sim i}) - 0.5)/\sigma)].
\end{aligned} \tag{6.10}$$

For $\frac{\partial U_i}{\partial \delta_i}$ to be negative, the campaign must start in a losing position and not be able to make up this ground with microtargeting alone: $\mu + m(\delta_i - \delta_{\sim i}) < 0.5$. That condition is necessary, but not sufficient, for the optimal campaign strategy to be 100% broadcasting. The other necessary condition is that broadcasting must be sufficiently more potent than microtargeting ($q \gg m$) that Equation 6.11 is negative.

If the campaigns start on equal footing (i.e., $\mu_D = \mu_R = 0$ as well as $m_D = m_R = m$, $p_D = p_R = p$, and $q_D = q_R = q$), then the weakly dominating strategy is to spend all resources on microtargeting; if campaign $\sim i$ spends all its resources on microtargeting ($\delta_{\sim i} = 1$), then any money campaign i spends on broadcasting will be

wasted in the case of issue B not resolving. When the issue does not resolve (which occurs with probability $1 - 2p$), campaign i loses with probability $\Phi(\frac{m(1-\delta_i)}{\sigma})$, which is greater than 50%. If the issue resolves, then the half the time the issue resolves in campaign i 's favor nearly balances out with the other half the time it does not. But even in this case, the result is a net negative for campaign i since the mean point is negative and $x < 0 \rightarrow \Phi(x + c) < (1 - \Phi(x - c))$. If candidate $\sim i$ foolishly does not spend all his resources on microtargeting, then candidate i can take advantage of that error and win over half the time by following this logic and spending all his money on microtargeting.

Thus, in the case of a campaign in a marginal district with symmetric properties, microtargeting is a weakly dominating strategy. The strategy is not strictly dominant because of the case where issue B always resolves ($p = 0.5$). Figure 6.2 illustrates the relationship between the probability of issue B resolving and the usefulness of broadcasting relative to microtargeting. The utilities of candidate D for all possible combinations of microtargeting and broadcasting are shown under three scenarios, each with increasing probability of issue resolution. As the effect of microtargeting shrinks (m) relative to the effectiveness of broadcasting (q), the utility of a microtargeting-only strategy and the utility of a broadcasting-only strategy approach the same value: 50%.

6.2.5 Edge Equilibria

Extending this logic, in the case where candidates are on equal footing, only corner equilibria exist. In nearly all circumstances, these equilibria occur when both

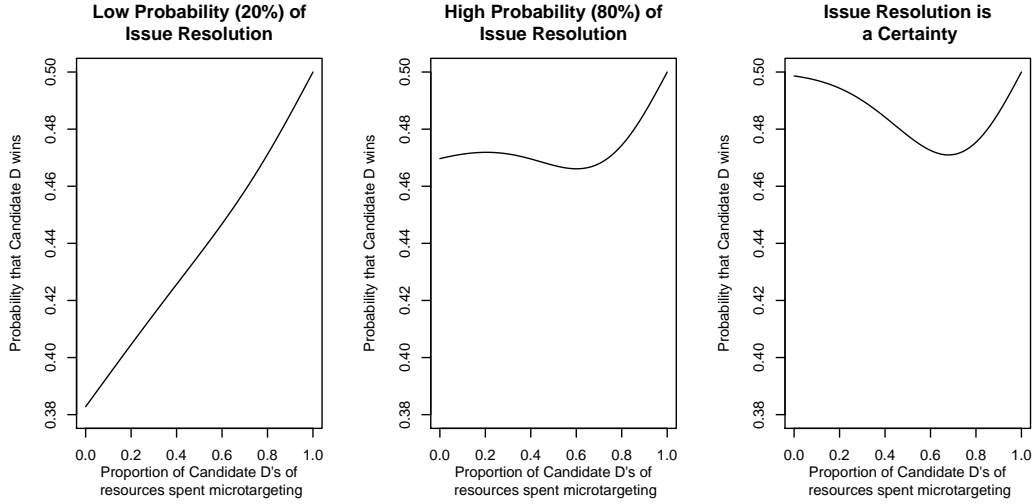


Figure 6.2: Candidate D 's utility under increasing probabilities of issue B resolving. In the examples depicted, 5% of the electorate is microtargetable by each campaign ($m = 0.05$) and 25% of the electorate shifts if the issue resolves ($q = 0.25$). The campaigns start on equal footing ($\mu = 0.5$), although uncertainty about the electorate is high ($\sigma = 0.08$). The panels depict candidate D 's utility under the strategy specified by the x-axis given candidate R spending all resources on microtargeting $\delta_R = 1$ and increasing probabilities of issue B resolution ($p = 0.1$, $p = 0.4$, and $p = 0.5$, respectively).

campaigns microtarget. In this section, restrictions on symmetry are relaxed; three scenarios are considered and depicted in Figure 6.3.

The first scenario is similar to the symmetric case considered in the previous section except that candidate D has an advantage with respect to broadcasting. More often the issue will resolve in candidate D 's favor ($p_D = 0.7$, $p_R = 0.3$) and more voters will switch to candidate D in the case of resolution ($q_D = 0.2$, $q_R = 0.1$). Thus, at high levels of microtargeting by candidate R (approximately, $\delta_R > 0.8$), candidate D optimally puts all resources into broadcasting. As shown as an “X”

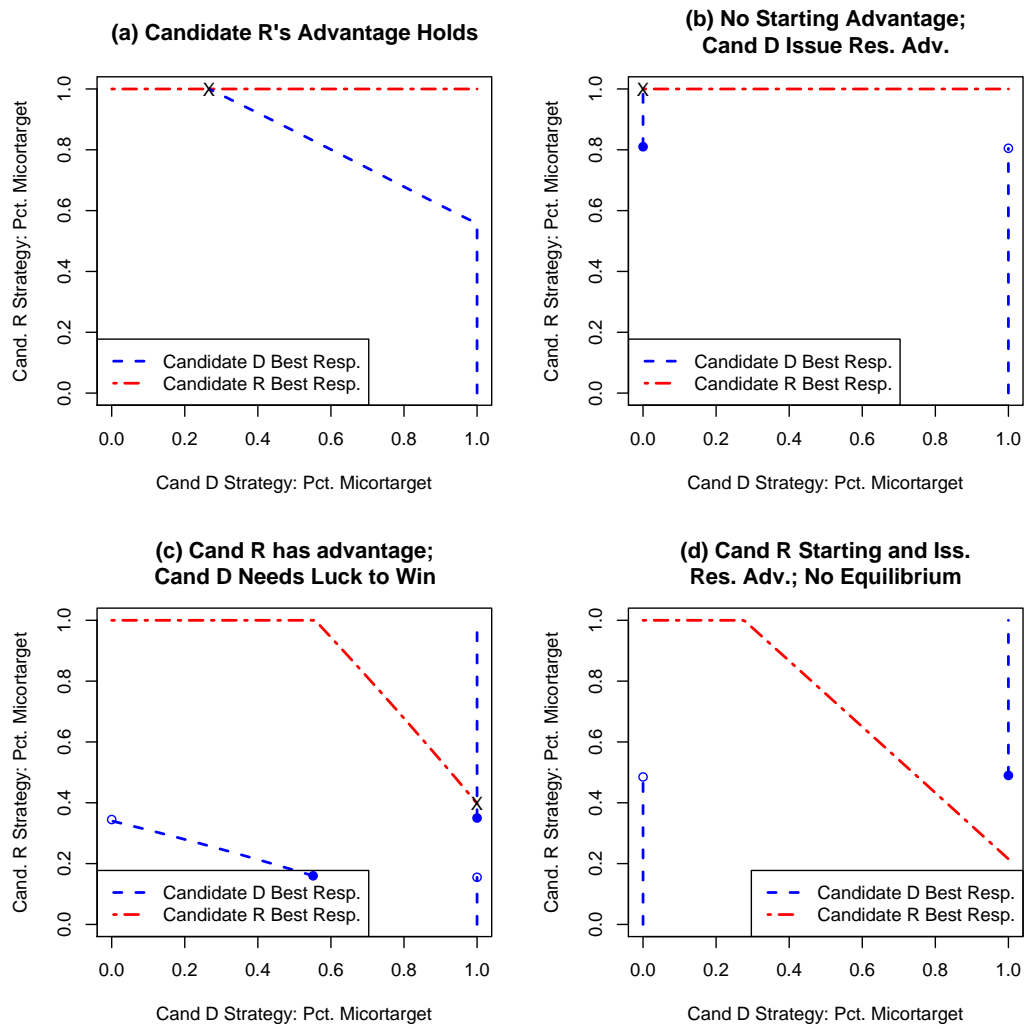


Figure 6.3: Best Response Plots of Four Scenarios.

in panel (a) of Figure 6.3, the equilibrium is candidate D fully broadcasting and candidate R fully microtargeting.

When candidate i has an advantage in the electorate (i.e., $\mu_i > 0.5$) that can be maintained when both campaigns microtarget (i.e., $\mu_i + m_i - m_{\sim i} > 0$), then campaign i 's best strategy is often to microtarget only. The microtargeting strategy is optimal because it lowers the variance of the election result compared to broadcasting. The disadvantaged campaign's best response is often a combination of microtargeting and broadcasting; the exact mix depends on the relative effectiveness of those two strategies.

An edge equilibrium of this type is depicted in Figure 6.3, panel (b). In this case candidate R has a pre-campaign edge ($\mu_R = 0.54$, $\sigma = 0.04$) and candidate D cannot recover this edge via microtargeting ($m_D = m_R = 0.03$). In equilibrium, R fully microtargets to bring his chance of winning up to 72%. Candidate D wants both a high vote mean and a high variance; microtargeting provides the former and broadcasting ($q_D = q_R = 0.2$, $p_D = p_R = 0.25$) provides the latter. Hence, candidate D spends 28% of his money on microtargeting and the rest on broadcasting.

An exception to the general rule that advantaged candidates microtarget is presented in panel (c). In this case, candidate R is advantaged both in the electorate's predisposition ($\mu_D = 0.445$, $\sigma = 0.067$) and issue resolution ($q_R = 0.1$, $q_D = 0.1$; $p_R = 0.7$, $p_D = 0.2$). By combining a microtargeting and a broadcasting strategy, candidate R can increase his probability of winning to 80%. Candidate D 's best response in this case is to fully microtarget; this pair of strategies is an equilibrium.

In this example, candidate D has an interesting best response curve, which has

three regimes. When candidate R does not microtarget much ($\delta_R < 0.2$) then candidate R can increase the mean vote to fairly close to a 50-50 election ($m_D = 0.044$, $m_R = 0.008$). Also, the emphasis candidate R places on broadcasting in this case increases the variance of the election, which also raises candidate D 's probability of winning. When candidate R microtargets to a substantial degree (approx. $m_D > 0.4$) then the benefit of raising the mean by candidate D via microtargeting is greater than the benefit of increasing the variance by broadcasting. In the middle of these two regimes, the need for candidate D to raise the mean is small enough to encourage broadcasting. However, candidate D cannot free-ride off candidate R 's full broadcasting effort, and it is worth candidate D 's while to broadcast himself.

No equilibrium exists in the final example, which is depicted in panel (d). Candidate R is advantaged in electorate predispositions and in issue resolution. This circumstance is interesting because both campaigns may have an incentive to broadcast. Candidate R can broadcast to increase the mean of his vote distribution. Candidate D can broadcast to increase the variance of his vote share. (The latter strategy is helpful to candidate D 's mean of vote share, which is always below 50%.) However, it is never the case that both candidates broadcast at the same time. As candidate D spends more resources on broadcasting only, he contributes to candidate D 's vote-share variance, so candidate D has an incentive to microtarget. As candidate D spends more on broadcasting, he contributes to candidate R 's vote-share mean, so candidate R has an incentive to microtarget and lower his vote-share variance. In this manner, the candidates never reach equilibrium.

6.2.6 No Internal Equilibria

In the microtargeting-broadcasting game, there are no internal equilibria. Nor are there edge equilibria in which one candidate fully broadcasts. To prove this formally for the general, non-symmetric case, first I derive the candidate i 's utility and first derivative in this case.

$$U_i(\delta_i, \delta_{\sim i}) = (1 - p_i - p_{\sim i})\Phi((\mu + m_i\delta_i - m_{\sim i}\delta_{\sim i} - 0.5)/\sigma) \quad (6.11)$$

$$\begin{aligned} & + p_i\Phi((\mu + m_i\delta_i - m_{\sim i}\delta_{\sim i} + q_i(2 - \delta_i - \delta_{\sim i}) - 0.5)/\sigma) \\ & + p_{\sim i}\Phi((\mu + m_i\delta_i - m_{\sim i}\delta_{\sim i} - q_{\sim i}(2 - \delta_i - \delta_{\sim i}) - 0.5)/\sigma) \\ \frac{\partial U_i}{\partial \delta_i}(\delta_i, \delta_{\sim i}) &= \frac{m_i}{\sigma}(1 - p_i - p_{\sim i})\phi((\mu + m_i\delta_i - m_{\sim i}\delta_{\sim i} - 0.5)/\sigma) \quad (6.12) \\ & + \frac{m_i - q_i}{\sigma}p_i\phi((\mu + m_i\delta_i - m_{\sim i}\delta_{\sim i} + q_i(2 - \delta_i - \delta_{\sim i}) - 0.5)/\sigma) \\ & + \frac{m_i + q_{\sim i}}{\sigma}p_{\sim i}\phi((\mu + m_i\delta_i - m_{\sim i}\delta_{\sim i} - q_{\sim i}(2 - \delta_i - \delta_{\sim i}) - 0.5)/\sigma) \end{aligned}$$

The proof that no equilibria exist where both candidates spend resources on broadcasting follows by contradiction. Assume that equilibrium of $(\delta_i^*, \delta_{\sim i}^*)$ exists where $\delta_i^* < 1 \wedge \delta_{\sim i}^* < 1$. The contribution of microtargeting alone to the candidate's utility is always positive: $\lim_{q_i \rightarrow 0} \frac{\partial U_i}{\partial \delta_i} > 0$. For candidate i 's optimal strategy (δ_i^*) to include some broadcasting, the first derivative is nonpositive: $\frac{\partial U_i}{\partial \delta_i}(\delta_i^*, \delta_{\sim i}^*) \leq 0$.

Thus, the broadcasting term of the first derivative is negative:

$$0 > -\frac{q_i}{\sigma} p_i \phi((\mu_i + m_i \delta_i - m_{\sim i} \delta_{\sim i} + q_i(2 - \delta_i - \delta_{\sim i}) - 0.5)/\sigma) \quad (6.13) \\ + \frac{q_{\sim i}}{\sigma} p_{\sim i} \Phi((\mu + m_i \delta_i - m_{\sim i} \delta_{\sim i} - q_{\sim i}(2 - \delta_i - \delta_{\sim i}) - 0.5)/\sigma)$$

But analogous logic for candidate $\sim i$ yields the result that negation of the right-hand side of Equation 6.13 must be negative. The negation of a negative cannot be negative. Contradiction.

6.2.7 Model Extensions: Multiple Issues and Platform Decisions

If more than two issues are at play in an election, the model will also inform a candidate's decision about which issues to focus his efforts on. A candidate who is advantaged against his opponent's optimal strategy seeks to increase the mean of his vote share and decrease the variance. Candidates who, on average, cannot win a majority of the vote seek to increase both their vote share and the variance of the outcome. The model can be extended to address multiple issues in a straightforward manner, although the strategy space would increase to $k - 1$ dimensions, where k is the number of issues considered. The logic of Section 6.2.6 holds within an issue: no two candidates would broadcast on the same issue, although candidates might optimally broadcast on two different issues.

Incorporating multiple issues enables the model to be extended to platform choice. Similar to the model of Groseclose (2001), candidates would have exogenous policy

preferences and weights that they would place on winning the election vs. policy outcome. The choice of which issues to emphasize (either with microtargeting or broadcasting) would be a function not only of whether the issues can help the candidate win, but whether the candidate's positions on the issues are consistent with his policy preferences.

6.2.8 Discussion

The model has three major implications. First, in general, campaigns that are behind microtarget and campaigns that are ahead broadcast. This implication may actually be understated by the model, as advantaged campaigns would not want to microtarget just to increase their vote share, but also to prevent voter defection. A natural extension of the theory presented in Chapter 2 suggests that delivering microtargeted appeals before issue resolution will prevent some voters from defecting. Thus, early microtargeting might be even more effective than demonstrated at lowering the variance of election results.

Second, a losing campaign may be in the situation where it must lower its expected vote share to increase its chance of winning. This circumstance was epitomized by the description provided to John McCain of Sarah Palin during his running-mate decision process: “high risk, high reward.”⁷ Since losing campaigns take risks that on average do not work out for them, more strategic thinking by campaigns may lead to fewer moderately close elections.

Third, campaigns never purposely talk to the same voters about the same issues.

⁷As publicly stated by A.B. Culvahouse, recounting his conversation with John McCain.

Opposing campaigns may microtarget the same issue, but they are targeting mutually exclusive groups: only voters who agree with the campaign on the issue. The empirical evidence demonstrates that opposing campaigns seek to emphasize distinct sets of issues (Sellers, 1998), although current events often foil these plans and force campaigns to talk about the same issues (Sigelman and Buell, 2004).

6.3 Normative Implications

Microtargeting increases the efficiency of individuals learning about candidates' positions. Whether or not the increased ability of campaigns to microtarget is helpful or detrimental to democracy depends on context and situation. Fundamentally, microtargeting is a tool, and like most tools (e.g., screwdrivers, TNT), it can be used for positive or negative purposes. Microtargeting has both positive and negative implications for democracy.

6.3.1 Heuristics and Judging Democracy

A fundamental debate rages in the study of American politics: How much information does a voter need to make an informed decision in the voting booth? On one side of the ledger are those who believe that Americans are ill-informed (Delli Carpini and Keeter, 1996), that they are generally incapable of forming coherent opinions (Converse, 1964), and that this lack of information is crucial to their decisions (Lau and Redlawsk, 2001; Bartels, 2005). In the other camp are scholars who believe that cognitive shortcuts are available (Popkin, 1994), voters seek the information that

interests them (Krosnick, 1990), and any errors cancel each other in collective public opinion (Page and Shapiro, 1992).

Often, when judging democracy, scholars analyze citizens' vote preferences (Lau and Redlawsk, 2001; Bartels, 1996). The argument from the "more information needed" camp is that there is a standard by which citizens should judge candidates. Lau and Redlawsk (2001) attempt to infer the weights that voters *should* place on various issues to determine a "correct" vote. Bartels (1996) assumes that if low-informed voters become more knowledgeable, they will process information similarly to their high-information counterparts—an assumption that is called into question by research on information processing in political situations (Gilens, 2001).

These assumptions about which candidate preference a voter should have are troublesome because they impose scholars' views on how citizens choose among political alternatives. A safer standard for judging democracy is to evaluate voters' knowledge of indisputable facts. The debate over heuristics is lively under this normative standard as well (Gilens, 2001; Bartels, 2002; Caplan, 2008). The downside is that the outcome of governments (democratic or otherwise) is policy decisions, and citizens' issue opinions may be farther from those policy positions than their vote decisions.

To balance these views, I use two standards for judging democracy. The primary standard is the amount of accurate information voters have. Often the accuracy of political opinion is in dispute; even when political elites agree on the optimal outcome (e.g., lower unemployment), they disagree about how to achieve that outcome. Thus, for this first standard, the analysis is constrained to the set of information that is

verifiable. Included in this set are candidate positions (which the candidate defines) and observable facts.

Second, I examine the more subjective standard of policy options and vote choice, albeit under certain crucial assumptions. Often voters must judge candidates' platforms before knowing the effect of the policy stances contained within those platforms. I assume that certain segments of the population have more knowledge about the probability of positive resolution of an issue under the various proposed policy options. If this segment of the population has more sway in the election outcome, the resultant government's policy choices are more likely to be optimal. (Optimal is defined as issue resolution that the most people approve of, e.g., good economy or winning a war).

6.3.2 Positives for Democracy

Microtargeting increases the efficiency of voters learning the candidates' positions. If campaigns microtarget, a voter with experience on a political issue is more likely to receive messages about that issue. Microtargeting increases the amount of information at voters' disposal and is thus a positive for democracy under the first standard.

An example of this process is seniors learning about Bush's and Gore's positions on Social Security (see Chapter 3 for details). At the beginning of the campaign (through May 2000), 42% of seniors (ages 65 and older) could correctly identify both candidates on Social Security, compared to 36% of younger voters: a difference of 6 percentage points. In August, this difference was 8 percentage points; in September,

10 points; and in October, 12 points. This interaction between dichotomous age and time is significant at conventional levels (logit regression, $p = 0.05$).⁸

It is unclear how much of this effect was due to microtargeting by the Bush and Gore campaigns, but clearly seniors were more actively engaged in the Social Security debate. If the campaigns had been able to use the techniques developed just two cycles later, perhaps more seniors would have learned about the candidates' positions. Even by the end of the campaign, over a third of seniors could not accurately identify both candidates' positions on Social Security.

Transitioning to the second standard—correct policy opinion—if experienced voters have more knowledge about which policy options will resolve favorably, then the increased information efficiency provided by microtargeting benefits democracy. In game theory parlance, experienced voters have more knowledge about the “state of the world” on that particular issue than non-experienced voters.⁹ In a situation similar to the “Swing Voter’s Curse” of Feddersen and Pesendorfer (1996), the non-experienced voters do not know which policy proposal is best on a particular issue. However, if the pool of voters who judge politicians on the issue for which they have experience (and thus, more in-depth knowledge) is larger than any underlying partisan or incumbency biases, then the candidate with the best policies will be elected.

As an illustration of why microtargeting helps in this case, consider a challenger

⁸For two other issues tested, vouchers and taxes, the interaction effect is in the same direction, but is half the magnitude and not statistically significant.

⁹If, for some reason, experienced voters are less likely to hold the correct policy position than the general public, then the analysis works in the opposite direction and microtargeting is detrimental to democracy.

facing an incumbent who is so incompetent that he is wrong on every issue. Assume that the candidate cannot credibly prove the incompetency of his opponent; instead, he can credibly offer proof of his opponent's issue positions. This situation would occur when the incumbent's preferred policies have not been implemented or have not yet resolved poorly.

If the challenger does not microtarget and instead broadcasts on one issue to all voters, then only the small subset of voters with experience on that issue will be affected (unless the issue resolves). The incumbent's resources (e.g., higher name recognition, more funds) might be sufficient to overcome a small block of voters casting ballots for the challenger. However, if the challenger uses modern technology to match voters to the issues they have experience with, several subsets of voters will judge the incumbent poorly, potentially increasing the challenger's probability of success to greater than 50%. As demonstrated in Section 6.3, the challenger will want to microtarget in this case—this strategy will prevent the incumbent from winning again and implementing wrong-headed policies.

6.3.3 Negatives for Democracy

There are potential downsides to microtargeting as well. Foremost, microtargeting may enhance the ability of candidates and parties to have individuals believe incorrect statements. As shown in the survey experiments in Chapter 4, delivering congruent cues to partisans increases their attachment to their party's candidates. This attachment leads to cue-taking (see Chapters 2 and 4), which means that individuals uncritically accept the position of their preferred elite. Thus, they may be

more prone to believe false information (Bartels, 2002).

As an example of individuals believing verifiably incorrect information, the 2008 Cooperative Congressional Election Survey (CCES) asked potential voters whether they knew Barack Obama's religion. Despite several statements by Obama that he was Christian and a highly covered debate in the spring of 2008 about controversial statements by Obama's *pastor*, over a quarter of the electorate believed (with at least some degree of certainty) that Obama was a Muslim. Conservative elites (e.g., Fox News) were peddling this falsehood and the individuals who believed it were nearly all conservative.¹⁰

Another reason why microtargeting might be detrimental to democracy is that people may have experience with issues that affect only a small part of their lives. For instance, an environmentalist might be microtargeted on global warming and vote for the pro-environment candidate even though she does not support that candidate's economic policies. Since global warming works over a decade- or century-long time frame, the economy is probably more relevant to the voter. But the voter may nonetheless vote for the suboptimal candidate based on the issue with which she has experience.

Undoubtedly voters sometimes have policy opinions that are incorrect, even by their own standards (with the benefit of hindsight). For instance, a third of the public went from believing the Iraq War was justified to believing it was a mistake from 2003 to 2006. Would a more informed electorate have had a different view of

¹⁰Of the respondents who were able to place themselves somewhere other than 50 on the 0-100 scale of liberal to conservative, 90% were in the conservative half.

the war in 2003?¹¹ Given that elites on both sides were advocating their respective positions and Americans were filtering their consideration intake (e.g., via Zaller’s RAS model), it is not clear that a more attentive electorate would have had a different opinion. Perhaps a more attentive electorate would have had more considerations at the tops of their heads, but in the same distributions.

The danger is that voters with strong party or elite affiliations may have tighter filters. Since microtargeting increases polarization and elite affection (see Chapter 2 for the theory and Chapter 4 for the empirical evidence), advancements in campaigns’ targeting abilities may increase cue-taking from elites; elected officials’ subsequent policy decisions may lead to negative outcomes.

6.3.4 Further Discussion: Party Structure and Alignment

The cue-taking effect that causes large segments of the population to believe falsehoods also leads to closer party affiliation. Political parties in the United States often include different “types” of voters (e.g., social conservatives, economic conservatives). Microtargeting on an issue a voter has a stable opinion about (e.g., abortion) raises her opinion of her party and leads her to more easily accept the party’s platform on other issues (e.g., the economy).

This artifact of microtargeting has both positive and negative implications for democratic participation. On one hand, voters polarize when affiliating with parties, thus increasing political participation (Dalton, 2008). The number of parties is kept

¹¹This question differs from that of whether better intelligence would have changed the minds of the elites. If more moderate Democrats (e.g., John Kerry, Hillary Clinton) had voted against the 2002 war resolution, a lower percentage of the public would have supported the war.

to a minimum (since parties can better keep factions under one roof), which also increases political participation (Blais and Dobrzynska, 1998). On the other hand, parties are less representative of voters' stable beliefs, which can produce negative results if the parties abuse the voters' affiliations by pursuing rent-seeking or ideologically extreme policies that are detrimental to the state of the nation (Sartori, 1976).

Whether parties that comprise disparate groups are beneficial to voters depends on the ideological alignment of voters and parties. Converse (1964) finds that most citizens hold ideologically incoherent opinions and that these opinions are highly unstable. The Personal Experience Model theorizes that many voters have stable opinions on a (potentially small) set of issues. If voters had personal experience with every issue would they agree with their party on that issue? The answer to that question, which is generally unknowable, would determine whether having a small number of big-tent parties is beneficial to voters.¹²

6.4 Conclusion

The Personal Experience Model provides a theory explains and can inform campaigns' microtargeting tactics. The more campaigns combine political science research with individual-level data, the more they can control their own destinies. Instead of simply hoping that an issue will resolve in the campaign's favor a week

¹²Even with increased cue-taking with microtargeting, voters may have ideologically incoherent issue opinions. The Cue-Taking Hypothesis requires that voters' know the parties' positions on issues. As the 2000 Social Security example shows, this condition holds only when an issue has become heavily politicized.

before the election, a campaign can plan well in advance which voters they will microtarget and when.

Microtargeting is a powerful tool that helps identify the voters who are most likely to change their vote preference as a result of a persuasive appeal. These voters are also more likely to receive information about candidates' stances that is relevant to their lives and that therefore makes their voting decisions easier. However, those easy decisions can lead to voters being too trusting of elites. Microtargeting thus offers both positives and negatives for democracy. Which side has more weight, as always, depends on one's perspective.

Chapter 7

Conclusion

Political scientists spend more time explaining why campaigns do not matter (e.g., Gelman and King, 1993; Campbell, 2005) than why they do (Gerber *et al.*, 2007). This perspective remains the norm for studies of micro-level behavior. Thousands of pages have been devoted to partisan bias (e.g., Campbell *et al.*, 1960; Markus and Converse, 1979; Bartels, 2002; Goren, 2007), motivated reasoning (e.g., Lodge and Taber, 2000), cognitive filters (e.g., Zaller, 1992), and cue-taking (e.g., Gilens and Murakawa, 2002). The field of neuroscience has continued this trend, exploring how the brains of Democrats and Republicans process information differently (Westen *et al.*, 2006; Knutson *et al.*, 2006).

However, research based on these paradigms cannot account explain why voters shift from one party to another—a phenomenon that has a tremendous impact on policy outcomes and the political trajectory of the country. Several presidential elections have yielded popular-vote results in which the margin of victory was

closer to one percentage point. Two times in the last decade, control of the Senate has been determined in a single election. Even small exceptions to the generally-accepted understanding of the role of partisan biases are extremely consequential. This dissertation's primary purpose is to explore one of those exceptions: personal experience.

The dissertation's second goal is to bridge the divide between researchers and political practitioners. The goal of all campaign managers is to win elections, and achieving that aim often necessitates persuading voters who would normally vote one way to vote another way. Research that demonstrates the pervasiveness of partisan biases is of little help to these campaign managers. They need a way to counter these biases and persuade individuals to alter their predispositions.

Political science does identify several mechanisms for persuasion, notably issue publics and self-interest. In these cases, a voter might evaluate politicians on what they know about an issue, a process here labeled political "ground truthing," instead of uncritically adopting the politician's opinion (i.e., cue-taking). This dissertation differs from the issue publics and self-interest threads of the literature in four ways. First, personal experience is introduced as a mechanism that voters use to develop a stable opinion on an issue independent of their political predispositions. Second, a micro-theory formally describes the reasons why voters cue-take from politicians in general but judge these elites on issues when the voters have issue experience. Third, the Personal Experience Model explains why an individual might join an issue public and why self-interest might not always dominate. Fourth, the Model is evaluated in terms of its usefulness to political practitioners, the people whose job it is to counter

political biases among the masses.

Personal experience with an issue, whether it is a politicized issue or not, leads to stable opinions regarding that issue. The proximity of the experience to the individual must be sufficient to circumvent the partisan filters that usually color voters' perceptions. This proximity is cast as the voter taking an active role in the experience, in effect demonstrating the phrase "seeing is believing." The experiential characteristics of *frequent*, *consistent in nature*, and *one-sided* also help individuals form stable opinions.

The Personal Experience Model demonstrates how personal experience forms the basis of political judgments. This model formalizes Zaller's (1992) RAS framework as a learning model. When an issue becomes politicized, voters with unstable opinions on the issue—often individuals who lack personal experience—adopt the position of their preferred elite. This cue-taking prevents voters from re-evaluating politicians on that issue.

In contrast, voters with experience have knowledge about the now-politicized issue apart from their political predispositions. These voters can ground truth politicians' stances and alter their perceptions of these political elites. This segment of the electorate is a key target for campaigns; experienced voters who agree with the candidate's issue positions are low-hanging fruit for persuasion while experienced voters with incongruent opinions are potential defectors.

The Personal Experience Model provides a richer understanding of voter-issue linkages such as issue publics and self-interest. Individuals who have experience with a non-politicized issue are likely candidates for the issue public if the issue becomes

politicized. The Personal Experience Model does not require an issue to be the most salient for an individual to drive vote changes, which might explain why large portions of the public can belong to issue publics (Gershkoff, 2006) while citing the same topic as the country's "most important issue."

The two hypotheses of the Personal Experience model help explain an incongruity in the literature on self-interest. Voters can be primed on self-interest in an artificial setting (Chong *et al.*, 2001), yet this effect is often unimportant in electoral contexts (Sears and Funk, 1990). The explanation offered here is: if a voter does not have experience understanding the complexities of an issue, the voter's initial opinion matters as she adopts the position of her preferred candidate. The voter will have a stable opinion and be able to judge the candidates only on issues that offer clear benefits to the voter.

Unlike recent research on voter persuasion (Hillygus and Shields, 1991) that focuses on voter movement apart from campaign treatment, this dissertation assesses the impact of campaign action on shifts in voter behavior. These shifts are particularly important when they counter existing partisan biases and lead to changes in vote choice.

Chapter 3 quotes the 2000 nomination speeches on Social Security and a Patients' Bill of Rights, finding that, on average, experienced voters increase their probability of defection by three to four percentage points. Chapter 4 explores the effect of hypothetical candidates taking random stances on issues and finds an increased probability of three percentage points for experienced respondents. Chapter 5 examines the effect of campaign literature on voters in real campaigns and finds increased

persuasion of about seven percentage points among experienced voters.

Each of these methods has its strengths and weaknesses. The observational data of Chapter 3 are useful because they demonstrate the effects of actual campaign activity during a very salient election. The data are noisy, however, and it is difficult to separate out the effects of self-interest from those of personal experience. The survey experiments of Chapter 4 discern the relative effects of personal experience, self-interest, and political interest. The price of these clean tests is external validity; hypothetical candidates are a poor substitute for real-life politicians. The field experiments of Chapter 5 demonstrate that applying the lessons of the Personal Experience Model increases campaign efficiency. However, the data provide no information on voters' issue opinions, making it difficult to test alternative hypotheses.

Also, all of these analyses rely on survey responses to represent actual voting behaviors. And none of the analyses randomize the variable of interest, personal experience; thus, causal inference is challenging. Even with these caveats, the combined weight of the evidence supports both hypotheses of the Personal Experience Model.

The Personal Experience Model presents a clear method for targeting voters. However, it is not always in the campaign's best interest to segment the electorate and microtarget. Notably, campaigns that are inherently disadvantaged and are trailing badly in the polls probably need a bigger boost than the single-digit returns that can be expected from microtargeting.

This limited use mitigates the broad impact of increased campaign microtargeting and hides its macro effects. Extensive use of microtargeting would probably lead to

more voters identifying as strong partisans as well as to increased shifts in party affiliation in the middle of the partisan spectrum. Campaigns would target voters with experiences congruent to their current party affiliation; this issue emphasis would lead voters to hold their party in even higher esteem.¹ American politics has experienced increased polarization since the advent of microtargeting tools, but other factors are certainly at play as well (McCarty *et al.*, 2006).

In contrast, voters who have experience on an issue and hold a view at odds with their party are likely to defect if microtargeted. As campaigns generate more precise databases of voters, these “cross-pressured partisans” (Hillygus and Shields, 1991) and independents are likely to be persuaded to one side or another depending on the issues that arise during a given campaign season. Viewing this trend over time would most likely require consistent, multi-election panel data, which is generally not available. Consistent with these two large-scale implications is that the proportions of Americans identifying as strong partisans and independents are both above their historical averages (ANES data, 2000-2008).

If microtargeting dominated macro trends, then strong partisans would be more loyal on Election Day as parties would be able to find a congruent issue position to prevent defection. The data are also consistent with this prediction, as the effect of strong partisans on presidential vote choice is at a historical high (ANES data, 2000-2008, compared with Bartels, 2000). The implication for partisan leaners is less clear as their party affiliation might move in tandem with vote preference changes. These synchronized shifts are most likely during a presidential election,

¹Parties might microtarget their own partisans to increase turnout in low-salience elections or to encourage increased participation in party politics.

which is also when the most resources are available to microtarget, further reducing the probability of observing a macro trend. Overall, the macro data are consistent with the implications of increased microtargeting, but microtargeting's contribution to these trends cannot be teased out and probably is small.

As for democracy as an institution, the effects of microtargeting are mixed. Voters receive more information that they can use to evaluate politicians, but these targeted appeals might skew their understanding of other, potentially more important, issues. Microtargeting is neither good nor bad; rather, it is a tool that can be wielded for many purposes. The Personal Experience Model and subsequent studies quantify just how powerful a tool microtargeting is and why it works.

Appendix A

Appendix for Chapter 2

A.1 Details for Candidate Evaluation Simulation

The following tables display the initial parameter values of the simulation in Section 2.1.5. Voters' issue opinions, beliefs of candidate stances, and candidate evaluation are updated each day of the hypothetical campaign using the formulae of the Personal Experience Model.

Voter	Voters' Prior Issue Opinions: Mean (Precision)		
	Traits	Health Care	Education
Alice the Architect	0.95 (10,000)	0 (6.25)	0 (625)
Ted the Teacher	0.95 (10,000)	0 (6.25)	0.5 (100)
Doris the Doctor	0.95 (10,000)	0.5 (400)	0 (625)

Table A.1: The mean (δ_1) and precision (τ_1^2), in parentheses, of voter's prior beliefs on issues and traits.

The voters' initial issue opinions are displayed in Table A.1. The precision on traits are extremely high because voters are sure that they want high valence (e.g.,

competent, trustworthy, shared-values) politicians. When occupation and policy intersect (e.g., Ted the teacher and education) the voter’s precision on this issue is higher than otherwise.

Voter	Voter’s Prior Beliefs about Candidate Mandy’s Positions		
	Traits	Health Care	Education
Alice the Architect	0.4 (6.25)	0 (6.25)	0 (6.25)
Ted the Teacher	0 (4)	0 (6.25)	0 (6.25)
Doris the Doctor	0.3 (4)	0 (6.25)	0 (6.25)
bottomrule			
Voter	Voter’s Prior Beliefs about Candidate Nathan’s Positions		
	Traits	Health Care	Education
Alice the Architect	0 (4)	0 (6.25)	0 (6.25)
Ted the Teacher	0.4 (6.25)	0 (6.25)	0 (6.25)
Doris the Doctor	0.3 (4)	0.5 (6.25)	0 (6.25)

Table A.2: The mean (μ_1) and precision (ν_1^2), in parentheses, of voter’s prior beliefs on issues and traits.

Candidate	Candidate Signals		
	Traits	Health Care	Education
Mandy	No signal	-0.5 (1.5)	0.5 (1.5)
Nathan	No signal	0.5 (1.5)	-0.5 (1.5)

Table A.3: The mean (γ_1) and precision (ψ_1^2), in parentheses, of the candidate’s signals about where they stand on the issues.

The precisions are low because I simulation that the topic of conversation about each issue lasts 10 days and that one signal is received by the voters each day from their preferred candidate. Alternatively, I could have simulated a higher precision and an additional parameter representing the chance that the voter receives a signal on a day that issue is discussed. (If a voter prefers the candidates equally, there is a

50% chance of receiving the signal from one candidate or the other.

Campaign Phase	Per-Day Change in Issue Weight		
	Traits	Health Care	Education
Phase 1 (day 1)	+1.0	0	0
Phase 2 (days 2-10)	0	+0.02	-0.03
Phase 3 (days 11-20)	No signal	-0.02	+0.03

Table A.4: The weight (δ_j) placed on each issue.

At the beginning of the campaign, voters know nothing about the candidates' issue position and only care about traits. During the second phase of the campaign, a discussion about health care begins, and voters add considerations about health care to their candidate evaluations. The third and final phase of the campaign sees the conversation shift to education to the detriment of health care. Weights are forced to be nonnegative.

Appendix B

Appendix for Chapter 3

B.1 Regressions for the Cue-Taking Hypothesis

Variable	Soc. Sec. GOP Conv.	Soc. Sec. Dem Conv.	PBR Dem. Conv.	Scale
Experience	1 (0.3)	0.6 (0.3)	-0.1 (0.3)	2
Experience*Opinion	-0.5 (0.4)	0.7 (0.4)	0.5 (0.4)	
Income*Opinion	0.8 (0.7)	2 (0.7)	2 (0.7)	
Conv. Watch*Opinion	0.1 (0.4)	-0.5 (0.4)	0.2 (0.5)	
Pol. Int.*Opinion	0.5 (0.7)	-0.1 (0.7)	0.4 (0.8)	
Party*Opinion	-0.2 (0.5)	0.7 (0.5)	-0.4 (0.5)	
Pre-Conv. Opinion	2 (0.6)	2 (0.6)	1 (0.7)	2
Income	-0.5 (0.5)	-2 (0.5)	0.4 (0.6)	9
Convention Watched	-0.4 (0.3)	0.4 (0.3)	-0.3 (0.4)	5
Political Interest	-0.8 (0.5)	0.3 (0.5)	-0.3 (0.6)	3
Party Affiliation	1 (0.4)	0.7 (0.3)	0.9 (0.4)	7
Female	0.2 (0.2)	0.3 (0.2)	0.2 (0.2)	2
Constant	-2 (0.5)	-2 (0.4)	-0.7 (0.6)	
n	1177	1209	1213	

Table B.1: Evaluating the Cue-Taking Hypothesis with logistic regressions of post-convention opinion regressed on pre-convention opinion, experience and interaction terms. Coefficients with standard errors in parentheses are reported. All variables are on a zero-to-one scale. The scale column indicates how many points are on the scale. For issues: Democratic positions is unity. Bolded coefficients are the coefficients of interest; the Cue-Taking Hypothesis predicts a negative coefficient for experience and a positive coefficient for the experience interaction. As mentioned in the text, the cue-taking moderation ability of HMO experience does not extend to Social Security: the main experience coefficient is zero and the interaction term coefficient is negative.

B.2 Regressions for the Candidate Evaluation Hypothesis

Variable	Soc. Sec. GOp Conv.	Soc. Sec. Dem Conv.	PBR Dem. Conv.
Experience	0.2 (0.4)	-0.1 (0.1)	-0.4 (0.3)
Experience*Opinion	0.8 (0.6)	0.04 (0.1)	0.5 (0.3)
Income*Opinion	0.7 (0.9)	-1.2 (0.4)	0.1 (0.5)
Conv. Watch*Opinion	0.2 (0.5)	-0.3 (0.3)	-0.5 (0.3)
Pol. Int.*Opinion	0.5 (0.9)	1.1 (0.4)	0.4 (0.6)
Party*Opinion	1.6 (0.6)	-0.1 (0.3)	0.2 (0.4)
Pre-Conv. Opinion	-2.1 (0.8)	0 (0.2)	-0.4 (0.5)
Income	-0.7 (0.5)	0.2 (0.2)	-0.3 (0.5)
Convention Watched	-0.5 (0.3)	0.5 (0.1)	0.8 (0.3)
Political Interest	0.5 (0.5)	-0.9 (0.2)	-0.9 (0.5)
Party Affiliation	-0.5 (0.4)	0.2 (0.2)	-0.2 (0.4)
Female	0.3 (0.2)	0.1 (0.1)	0.1 (0.1)
n	888	917	1,003

Table B.2: Evaluating the Candidate Evaluation Hypothesis with ordinal probit regressions of post-convention opinion regressed on pre-convention opinion, experience and interaction terms. Coefficients with standard errors in parentheses are reported. All variables are on a zero-to-one scale. For issues: Democratic positions is unity. Bolded coefficients are the coefficients of interest; the Candidate Evaluation Hypothesis predicts a negative coefficient for experience and a positive coefficient for the experience interaction. Regression restricted to voters who do not alter their issue opinion during the convention.

Variable	Age < 65	Age ≥ 65
Pre-convention Opinion	0.05 (0.46)	0.54 (0.45)
Age	-0.02 (0.03)	0.05 (0.04)
Age*opinion	-0.003 (0.05)	-0.02 (0.05)
DV = -2 DV = -1	-1.8 (0.3)	na
DV = -1 DV = 0	-1.1 (0.3)	-1.1 (0.3)
DV = 0 DV = 1	1.9 (0.3)	2.2 (0.4)
DV = 1 DV = 2	2.8 (0.4)	na
n	220	135

Table B.3: Regression discontinuity analysis: Social Security and the Republican convention. Ordinal probit regressions of voters who do not change their position on Social Security privatization during the convention. Coefficient of interest bolded. Dependent variable is change in vote (Bush, Gore, or undecided) before and after the Republican convention. The coefficient of interest is the effect of support for privatization on change in vote, which is higher in the second regression of seniors. Age is actual age minus 65, the cutoff for treatment, so that the coefficients of interest are comparable. The regression is restricted to those between the ages of (50,85)—lack of vote switchers precludes further restriction of the sample closer to the cut point. No seniors switched their vote more than one scale-point; hence, the na’s for two of the ordinal cut-offs.

Appendix C

Appendix for Chapter 4

C.1 Question Wording in Nationwide Survey

C.1.1 Candidate Descriptions

First, I'd like to get your feelings toward people – some real and some hypothetical. For each, please rate that candidate using something we call the feeling thermometer. Ratings between 51 degrees and 100 degrees mean that you feel favorable and warm toward the person. Ratings between 0 and 49 degrees mean that you don't feel favorable toward the person and that you don't care too much for that person. You would rate the person at 50 if you don't feel particularly warm or cold toward the person. Use the slider (with either your mouse or keyboard) to indicate your rating.

Then, on a **second slider**, I'd like you to rate your **certainty** of that feeling from 0 to 10. If you are very uncertain about your feeling, move the slider downward toward 0. If you are perfectly certain about your feeling, move the slider upward

toward 10.

- Former Governor Richard Miller has been nominated as the **Democratic** United States Senate candidate for your state.

Gov. Richard Miller grew up in a working-class family, won a scholarship to a top college, is now 52, is married and has two children. He served eight years as the state's governor, during which time he won re-election by a large margin. Gov. Miller won praise for crafting an innovative health care policy, promoting economic growth that outpaced the national average, and working well with state leaders of the opposite party. He is endorsed by the nurses' unions and several environmental organizations. Republican leaders, however, claim he will raise taxes too much.

- Attorney General Mark Jones has been nominated as the **Republican** United States Senate candidate for your state.

Attorney General Mark Jones grew up in a small town, graduated top of his class in law school, and began his career in the local U.S. District Attorney's office. After rising quickly in the ranks to head that office, he was elected Attorney General. As Attorney General, he reduced violent crime in the state and cracked down on corrupt politicians in the state capital; he easily won re-election. He is 62, married, has three children and five grandchildren. Jones is endorsed by the local farmers' organization and the Fraternal Order of Police. Democratic leaders, however, claim that his policies are too biased toward big business.

C.1.2 Candidates' Issue Signals

- America has always been a nation of immigrants and today's hard-working immigrants deserve the chance to achieve the American dream.
- Immigrants who entered the country illegally clearly have no respect for the rule of law and must be sent back to their country of origin.
- Not only is Iraq a distraction from dangerous terrorists in other countries, but the U.S. leaving Iraq will finally force the Iraqi government to take responsibility for their country.
- Not only does staying in Iraq provide America security against terrorists, but America also has a duty to see the Iraq situation through to a peaceful conclusion.
- We should recognize same-sex marriage so that all Americans are treated equally. America has long outgrown its history of discrimination and we need to extend marriage rights to all citizens.
- Marriage has always been between one man and one woman, and passing a constitutional amendment affirming that principle ensures that the courts cannot override the will of the people.

C.1.3 Experience Questions

- Next I'm going to ask about the characteristics of these people with whom you discuss important matters. Think about the proportion of important discussion

you have with any person that fits the description below.

- About what proportion (percent) of your important discussions is with a person who **currently serves** in the U.S. military?
 - About what proportion (percent) of your important discussions is with a person who **once served** in the U.S. military?
 - About what proportion (percent) of your important discussions is with a person who is an immigrant to the United States?
 - About what proportion (percent) of your important discussions is with a person who is Hispanic?
 - About what proportion (percent) of your important discussions is with a person who is gay or lesbian?
- Including yourself, has anyone living in your house or apartment ever served in the U.S. military? This includes the National Guard and the Reserves. Check all that apply.
 - How often do you attend religious services, apart from special events like weddings and funerals?
 - **If you are Christian:** Would you say you have been "born again" or have had a "born again" experience, that is, a turning point in your life when you committed yourself to Christ?
 - Regardless of whether you now attend any religious services, do you ever think of yourself as part of a particular church or denomination? Which one?

C.2 Auxiliary Regressions

Inter. Var.	Issue		
	Immigration	Iraq War	Gay Marriage
<i>No Controls</i>			
Issue Experience	0.24 (0.20)	0.15 (.20)	0.28 (0.22)
<i>With Controls</i>			
Issue Experience	0.22 (0.20)	0.15 (.20)	0.09 (0.22)
Political Attentiveness	0.92 (.76)	1.4 (0.74)	2.9 (0.8)
Self-Interest	–	-1.7 (1.0)	1.7 (1.0)
<i>With Certainty Mediator</i>			
Issue Experience	0.22 (0.20)	0.13 (.20)	0.09 (0.27)
Political Attentiveness	0.95 (.76)	1.4 (0.74)	2.9 (0.8)
Self-Interest	–	-1.7 (1.0)	1.4 (1.2)
Issue Certainty	0.59 (0.52)	0.9 (0.58)	-0.03 (0.7)
<i>Anti-Partisan Bias Signals Only</i>			
Issue Experience	0.19 (0.28)	0.15 (.20)	-0.07 (0.22)
Political Attentiveness	1.6 (1.1)	2.0 (1.0)	3.0 (0.8)
Self-Interest	–	-0.6 (1.4)	2.6 (1.8)

Table C.1: OLS regressions of shift in candidate evaluation. Dependent variable's potential range is -100 to +100. Signal incongruity is the distance (magnitude) of the candidate's signal (either -10 or +10) to the respondent's wave one position on that issue. All variables listed are interacted with signal *congruity*, meaning the expected sign is positive. Main effects are not shown; they are insignificant for all regressions. Political attentiveness and issue certainty (from wave one) are measured on a 0 to 1 scale. Self-interest is dichotomous. Top and bottom sets of coefficients represent two different regressions. N is about 270 for each regression.

Exp. Var.	Issue		
	Immigration	Iraq War	Gay Marriage
<i>Without Controls</i>			
Issue Experience	-0.54 (0.34)	-0.50 (0.35)	-0.84 (0.35)
Constant	0.72 (0.37)	0.41 (0.36)	0.45 (0.34)
<i>With Controls</i>			
Issue Experience	-0.47 (0.35)	-0.56 (0.36)	-0.94 (0.42)
From favored cand.	0.63 (0.74)	-0.39 (0.73)	0.34 (0.69)
Attentiveness	-0.24 (0.26)	0.26 (0.26)	-0.38 (0.23)
Self interest	—	-0.26 (1.7)	1.3 (1.9)
Constant	1.2 (0.96)	-0.21 (0.93)	1.4 (0.83)
<i>With Certainty Mediator</i>			
Issue Experience	-0.48 (0.35)	-0.39 (0.73)	-0.93 (0.42)
From favored cand.	0.65 (0.74)	-0.41 (0.74)	0.47 (0.69)
Attentiveness	-0.26 (0.26)	0.25 (0.26)	-0.37 (0.24)
Self interest	—	-0.35 (1.7)	1.4 (1.9)
Certainty	0.10 (0.15)	0.09 (0.15)	-0.02 (0.13)
Constant	0.47 (1.5)	-0.89 (1.5)	1.4 (1.2)

Table C.2: OLS regressions of issue opinion shift in the direction of the delivered signal. Dependent variable's potential range is -20 to +20. "From favored cand." is a dichotomous variable indicating whether the signal is delivered by the candidate that the respondent favored in the first wave. Political attentiveness and issue certainty (from wave 1) are measured on a 0 to 1 scale. Self-interest is dichotomous. Top and bottom sets of coefficients represent two different regressions. N is about 270 for each regression.

C.3 Issue Experience Measures and the Hypotheses

Group	Congruity:Exp.	Against Bias
Hispanic	0.57 (.59)	0.79 (0.80)
... in workplace (26%)	-.32 (.16)	-0.2 (0.2)
... in zipcode (31%)	0.0 (0.4)	0.14 (0.63)
Talk to hisp (32%)	0.46 (0.44)	0.35 (0.61)
Serve(d) in Mil.	-0.16 (.56)	-0.17 (0.75)
HH Served(s)	0.39 (.074)	0.40 (0.4)
Talk to vets/mil (33%)	0.13 (.44)	0.42 (0.59)
Resp is GLBT	1.5 (1.0)	2.3 (1.3)
Talks to GLBTs (30%)	0.6 (0.5)	0.33 (0.69)

Table C.3: OLS regression coefficients for various experience measures. (See Table C.1 for regression details; includes control for attentiveness.) The first column lists the experience measure and the percentage of the population included in the measure if there is not a self-evident boundary. The second column is the regression coefficient (and standard error), with all respondents who received a signal on that issue included (n is about 270). The third column is the same regression as column two but only among respondents who received a signal that went against their partisan predisposition (n is about 135).

Group	Shift in Direction of Signal
Hispanic	-0.9 pts (n.s)
... in workplace (26%)	-1.1 pts (n.q.s)
... in zipcode (31%)	no diff.
Talk to hisp (32%)	-1.4 ($p < .05$)
Serve(d) in Mil.	-0.1 (n.s.)
HH Served(s)	-0.6 pts (n.q.s)
Talk to vets/mil (33%)	-0.2 pts (n.s.)
Resp is GLBT	-1.1 pts (n.q.s)
Talks to GLBTs	-1.1 pts ($p < 0.1$)

Table C.4: Number of points in the direction of the signal (or cue) respondents shifted when compared with individuals not in the group listed. The Cue-Taking hypothesis predicts these values to be negative. When the values are significant at conventional levels, p-values are listed, n.s. means “not significant,” and n.q.s means “not quite significant at conventional levels.”

Thank you very much for taking my survey, which should only take 5 minutes of your time.

Your participation is completely voluntary and you may withdraw your consent and discontinue participation of the project at any time. Your refusal to participate will not result in any penalty. This study has been approved by the University's Institutional Review Panel for Human Subjects. If you have questions about the project please email Aaron Strauss <abstraus@princeton.edu>. For answers to any questions you may have about your rights as a research subject, contact Joseph Broderick, Secretary, Institutional Review Panel for Human Subjects (609.258.3976).

If you complete the survey you will be entered in a random drawing for a \$100 gift certificate to amazon.com or iTunes (your choice!).

The survey is on multiple pages; answer the first question below and click the "Next" button below to navigate through the pages.

1. What is your class year at Princeton?

2011 (Freshman).....	19
2010 (Sophomore)	20
2009 (Junior)	25
2008 (Senior)	36

[Candidates Rotated Below]

Below are descriptions of two hypothetical candidates running for United States Senate. For each, please rate that candidate using something we call the feeling scale. Positive ratings between 1 and 10 mean that you feel favorable and warm toward the person, with 10 being the warmest rating. Negative ratings between -1 and -10 mean that you don't feel favorable toward the person and that you don't care too much for that person, with -10 the coolest rating. You would rate the person at 0 if you don't feel particularly warm or cold toward the person.

2. Former Governor Richard Miller has been nominated as the **Democratic** United States Senate candidate for your state.

Gov. Miller grew up in a working-class family, won a scholarship to a top college, is now 52, married and has two children. He served eight years as the state's governor, during which time he won re-election by a large margin. Gov. Miller won praise for crafting an innovative health care policy, promoting economic growth that outpaced the national average, and working well with state leaders of the opposite party. He is endorsed by the state's farmers organization as well as the National Organization for Women.

-10: most negative	0		+1:	3	
-9:.....	0		+2:	6	
-8:.....	0		+3:	6	
-7:.....	0		+4:	6	
-6:.....	0		+5:	15	
-5:.....	0		+6:	11	
-4:.....	1		+7:	15	
-3:.....	1		+8:	14	
-2:.....	1		+9:	7	
-1:.....	2	7	+10: most positive.....	7	89
0: neutral	4		Refused	1	

3. Retired Admiral Mark Jones has been nominated as the **Republican** United States Senate candidate for your state.

Admiral Jones grew up in a small town, graduated from the Naval Academy, and climbed the ranks of the Navy quickly. He is 62, married, has three children and five grandchildren. After retiring from service, he served as Secretary of State of a Republican presidential administration. During his tenure as Secretary, Admiral Jones won accolades for achieving peace in several long-standing conflicts. Admiral Jones is endorsed by several local newspapers and the Fraternal Order of Police.

-10: most negative	0		+1:	4	
-9:.....	0		+2:	11	
-8:.....	0		+3:	8	
-7:.....	1		+4:	11	
-6:.....	0		+5:	11	
-5:.....	1		+6:	10	
-4:.....	2		+7:	7	
-3:.....	3		+8:	6	
-2:.....	4		+9:	3	
-1:.....	4	16	+10: most positive.....	3	75
0: neutral	9		Refused	0	

Prefer Democratic Candidate	63
Prefer Republican Candidate	20
Prefer Equally	15
Refused on either evaluation	1

Next, please consider the following political issues.

Read the following two statements and again rate them on a scale similar to that of the last two questions. If you agree with Statement A you have ten choices, from "A:1" which means you slightly agree with Statement A all the way to "A:10" which means you completely agree with Statement A. Similarly, if you agree with Statement B pick a value between "B:1" (slightly agree with B) and "B:10" (completely agree with B). Choose "0, Neutral" if you are unsure or agree with the two statements equally.

[Issue order rotated. A/B messages rotated]

4. With regard to U.S. foreign aid, do you think the federal government should:

A) Cut foreign aid in half because it is ineffective and costs taxpayers over 25 billion dollars a year.

B) Double foreign aid since it accounts for less than one percent of the federal budget and helps those in need.

A:10, completely		B:1, slightly	
agree w/ A.....	2	agree w/ B	5
A:9	0	B:2	7
A:8	1	B:3	9
A:7	0	B:4	8
A:6	2	B:5	6
A:5	2	B:6	7
A:4	3	B:7	5
A:3	3	B:8	4
A:2	3	B:9	2
A:1, slightly		B:10, completely	
agree w/ A.....	5	agree w/ B	6
0: neutral	20	Refused	0
			59

5. On a different issue, do you think the **federal** government should:

A) Encourage businesses to invest in new, more energy efficient technology, while letting the market shape the actions of businesses.

B) Implement a cap-and-trade system that would restrict the amount of greenhouse gases released by businesses to a government-mandated level.

A:10, completely agree w/ A.....	5		B:1, slightly agree w/ B	2	
A:9	3		B:2	5	
A:8	4		B:3	5	
A:7	5		B:4	4	
A:6	5		B:5	8	
A:5	7		B:6	6	
A:4	5		B:7	6	
A:3	4		B:8	5	
A:2	2		B:9	2	
A:1, slightly agree w/ A.....	4	42	B:10, completely agree w/ B	7	49
0: neutral	8		Refused	1	

6. A **state's Supreme Court** recently mandated that the state government must legalize same-sex unions, either through civil unions or gay marriage.

In your opinion, should the state:

A) Implement civil unions--a less divisive solution that provides equal rights to same-sex couples.

B) Recognize gay marriage; anything less would be discriminatory against gays.

A:10, completely agree w/ A.....	11		B:1, slightly agree w/ B	4	
A:9	1		B:2	3	
A:8	2		B:3	2	
A:7	2		B:4	3	
A:6	3		B:5	5	
A:5	4		B:6	2	
A:4	3		B:7	4	
A:3	4		B:8	4	
A:2	3		B:9	3	
A:1, slightly agree w/ A.....	4	36	B:10, completely agree w/ B	25	55
0: neutral	10		Refused	0	

7. On average, how many times a month have you attended a spiritual or religious event or service (e.g., church, synagogue, mosque, meditation) during Fall term?

Never	40
Less than once a month	23
Once a month.....	6
Twice a month	6
Four times a month.....	15
More often than weekly.....	8
Refused	1

8. Over the past twelve months, how many outdoor trips or excursions have you gone on (e.g., camping, hiking, ski cabin, quiet beach)?

0:.....	10
1:.....	10
2:.....	17
3:.....	15
4:.....	10
5:.....	9
6:.....	6
7:.....	3
8:.....	2
9:.....	1
10 or more.....	15
Refused	1

9. In the past five years, about how much cumulative time have you spent outside of the U.S., Canada, Mexico, and western Europe (e.g., South America, Asia, Africa, eastern Europe)?

None	21
One week	6
Two weeks.....	6
Three or four weeks.....	8
One month	7
Two months	15
Three to size months.....	19
Seven months to a year.....	5
More than one year	12
Refused	1

10. Do you have friends or family members who are gay, lesbian, bisexual or transgender?
- | | |
|---------------|----|
| No | 28 |
| Yes | 72 |
| Refused | 0 |
11. If so, how often do you communicate with these individuals? (Feel free to check multiple frequencies below if they are applicable to different friends and/or family.)
- | | |
|--|----|
| Never | 1 |
| On occasion | 16 |
| Monthly | 12 |
| Weekly..... | 11 |
| Two or three times a week..... | 11 |
| Daily | 21 |
| Answered "No" in previous question | 28 |
| Refused in either question | 1 |
12. Generally speaking, do you think of yourself as a Republican, a Democrat, an Independent, or another party? And how strong is your affiliation? If you are an Independent, do you tend to favor (i.e., lean to) Republican candidates or Democratic candidates?
- | | |
|------------------------------------|----|
| Strong Republican | 5 |
| Not so strong Republican | 7 |
| Independent, lean Republican | 10 |
| Independent | 16 |
| Independent, lean Democrat | 24 |
| Not so strong Democrat..... | 24 |
| Strong Democrat..... | 14 |
| Other party..... | 0 |
| Refused | 0 |

13. When it comes to politics, do you usually think of yourself as:

Extremely Conservative	2
Conservative	10
Slightly conservative	11
Moderate; middle of the road	17
Slightly liberal	21
Liberal.....	32
Extremely liberal	6
Other party.....	0
Refused	0

14. Please indicate your sex:

Female	54
Male.....	45
Refused	1

15. Please Enter your age in the box to the right

17-18:.....	28
19:.....	27
20:.....	19
21:.....	18
22-24:.....	6
Refused	1

16. Compared to other Princeton students, how much do you pay attention to political news?

A great deal.....	7
Quite a bit	20
Some	39
Very little.....	28
Not at all	6
Refused	0

Wave Two Candidate Signals

[Respondent receives two signals on distinct issues.]

Signals:

Gay Marriage

- Marriage has always been between one man and one woman. Civil unions provide the same rights to same-sex couples without alienating the more traditional segments of the population.
- We should recognize same-sex marriage so that all Americans are treated equally. America has long outgrown its era of discrimination and we need to extend marriage rights to all citizens.

Environment

- To combat global warming, we need a cap-and-trade system that will restrict the amount of dangerous greenhouse gasses released into the atmosphere. Businesses will always try to cut costs; without tight restrictions, our environment will continue to suffer.
- A market-based solution to climate change is the best way to ensure the health of the planet while maintaining a strong economy. Innovative, eco-friendly businesses will prosper, leading to a healthy environment and continued job growth.

Foreign Aid

- America has the world's largest economy by far, and as global leaders we have the responsibility to assist those less fortunate than us.
- Foreign aid is wasted on corrupt foreign governments. We should spend taxpayers money in America, where we can better evaluate its effectiveness.

Appendix D

Appendix for Chapter 5

D.1 Computational Appendices

This appendix presents fast and approximate solutions to the planner’s optimization problem in both nonpartisan and partisan cases.

D.1.1 Nonpartisan Case: the Knapsack Problem

To approximate the solution to the nonpartisan planner’s optimization problem defined in Section 5.3.1, the key is to notice that the linear optimization problem is identical to the canonical *knapsack problem*. In the knapsack problem, one maximizes the total value of objects to be placed in a knapsack of fixed sized, with each object having its own value and size. The analogous case for the nonpartisan planner is maximizing the number of voters given a budget constraint where each individual-treatment pairing may be thought of as an object.

Following Dantzig (1957), the exact solution of this linear programming problem is approximated by ordering the individual pairs by their maximum vote per dollar ratio and treating the individuals with the highest such ratio first until the budget is exhausted. If the ratio is non-positive (i.e., the best non-control treatment for an individual does not outperform the control), this individual is not treated. In most cases, this approximation yields solutions very close to the optimal result because the ratio of the per-use cost of the most expensive treatment (e.g., \$15 for a canvassing shift) is tiny compared to the overall budget (usually at least \$10,000). Thus, when the addition of an expensive and efficient treatment runs just over budget and a cheaper yet less efficient tactic should be used in its place, inefficiencies at the edge of the problem are of little importance.

D.1.2 Partisan Case: the Stochastic Knapsack Problem

To derive a fast and approximate solution to the partisan’s optimization problem defined in Section 5.4.3, the key is to notice that this optimization problem is identical to the *stochastic knapsack problem*, in which the probability is maximized that the total value of items in the knapsack equals or exceeds a target value where each object has a random value and a known size. As in the nonpartisan case, each individual-treatment pair can be considered an item.

As an approximate solution to this problem, an algorithm based on Geoffrion (1967) is used; subgroups are ordered by the weighted combination of the mean and standard error of their posterior vote choice profile, $\pi(\rho)$. Optimization is performed over the weight parameter, which can take values between 1 (i.e., only the means of

the posteriors matter) and 0 (i.e., only the standard errors matter). (For a discussion of when this approximation fails to yield the optimal result, see Henig (1990)). The intuition behind this algorithm can be developed by considering the following scenarios. Campaigns with a natural advantage (i.e., they would garner a majority of the vote without treatment) could further increase their probability of winning by contacting voters who are highly responsive on average and have a low variance of their treatment response. On the other hand, campaigns that are behind aim to treat segments of the population that are *both* highly responsive and have high variance. Thus, unlike in the nonpartisan case, the optimal subgroups to treat change depending on the outcome under the control. The algorithm finds an approximate solution by limiting its search to the subspace defined by the weight parameter, which makes optimization feasible when the dimension of δ is large.

Appendix E

Appendix for Chapter 6

E.1 Analytical Solution for Variance of Vote Share

The general formula for the variance of a random variable X that is composed of two normal distributions that occur with probability p and $1 - p$ respectively is derived. For an example, Figure E.1 shows the distribution with $p = 0.5$ and sub-distributions of $\mathcal{N}(1, 0.16)$ and $\mathcal{N}(-1, 0.16)$.

To determine the variance of X , let Y be a Bernoulli random variable that determines which Gaussian produces x . If the two normal distributions that constitute

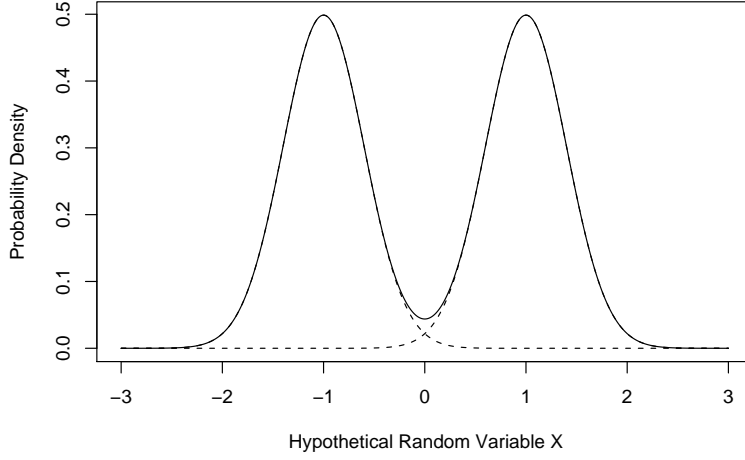


Figure E.1: Hypothetical distribution of a variable that is Gaussian, but the mean and variance of the Gaussian depend on a Bernoulli process.

X are $\mathcal{N}(\mu_1, \sigma_1^2)$ and $\mathcal{N}(\mu_2, \sigma_s^2)$, then

$$\text{Var}(X) = \text{Var}(E[X|Y]) + E[\text{Var}(X|Y)] \quad (\text{E.1})$$

$$\text{Var}(E[X|Y]) = p(\mu_1 - \bar{X})^2 + (1 - p)(\mu_2 - \bar{X})^2 \quad (\text{E.2})$$

$$E[\text{Var}(X|Y)] = p\sigma_1^2 + (1 - p)\sigma_2^2 \quad (\text{E.3})$$

$$\text{Var}(X) = p[(\mu_1 - \bar{X})^2 + \sigma_1^2] + (1 - p)[(\mu_2 - \bar{X})^2 + \sigma_2^2], \quad (\text{E.4})$$

where $\bar{X} = p\mu_1 + (1 - p)\mu_2$. Each sub-distribution contributes its own variance and the squared distance to the mean to the overall variance, in proportion to the probability that the distribution is activated by the Bernoulli probability.

This derivation is important because the distribution of the vote function is the

superposition of four normal curves, each of which occurs with a certain probability. There are four distributions because there are four possible outcomes when both the Democratic and Republican broadcasted issues have independent probabilities of either resolving or not resolving.

The mean of the distribution is,

$$\bar{V}_D(\delta_D, \delta_R) = \mu + m(\delta_D - \delta_R)$$

The variance of V_i is a weighted average of the squared distance of the four normal distributions that constitute V_i to \bar{V}_i . Using the derivation above, the variance is,

$$\begin{aligned} \text{Var}(V_D(\delta_D, \delta_R)) &= p_D(\sigma^2 + (q(2 - \delta_D - \delta_R))^2) \\ &\quad + p_R(\sigma^2 + (q(2 - \delta_D - \delta_R))^2) \\ &\quad + (1 - p_D - p_R)(\sigma^2) \\ &\quad \text{combining terms and assuming } p_D = p_R = p \\ &= \sigma^2 + 2pq^2(2 - \delta_D - \delta_R)^2 \end{aligned}$$

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