Microtargeting's Implications for Campaign Strategy and Democracy

Aaron Strauss
Princeton University

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Much of this dissertation has been focused on providing support for the Personal Experience Model. This chapter examines the implications of this model, both for campaign strategy and democracy as an institution. First, I assume that campaigns are able to leverage the Personal Experience Hypothesis by microtargeting voters. A game theoretic model demonstrates under what circumstances campaigns should microtarget, rather than attempting to elevate the status of an issue across the electorate. Regarding the normative implications for democracy, I conclude that microtargeting is neither inherently good nor bad, rather, it is a tool that can be used to achieve positive or negative results.

1 Campaign Microtargeting

Campaign microtargeting, in the broad sense, is a campaign identifying a subset of voters to deliver a tailored message to. The advent of electronic voter files and commercial databases has made this strategy more efficient and applicable to more groups of voters (Malchow, 2003). One theoretical connection between specific voters and issues is the Personal Experience Model. 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).

Microtargeting is a powerful tool because if voter-issue linkages are identified correctly, campaigns can have a powerful effect on how voters judge candidates in an election. Chapters 3, 4, and

5 have provided the empirical evidence to support this claim and demonstrated how campaigns can leverage personal experience to garner support from voters who would otherwise vote for the opposing candidate. In this chapter, I discuss situations when campaigns would prefer *not* to microtarget, even given its positive effects. In the broad sense, campaigns who need to change the landscape of a race dramatically would do best not to microtarget. On the other hand, in many situations, campaigns would do well to focus on voters who will be most responsive to their issue appeals.

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 targeted 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 groups such as hunters or those with low incomes. The third, and most complex, method is to survey a group of voters, ask a question (e.g., "Do you have children under the age of 18?", "What is the most important issue to you") the answer to which is no available in any data base. After a sufficient large number of voters (perhaps on the order of 2,000) have responded to a question, a campaign analyzes the data using either parameter (e.g., logit) or non-parametric (e.g., CHAID) method to correlation measures available for the entire electorate the survey response of interest (Malchow, 2003). The campaigns 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. The example in Figure 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%).

None of these methods perfectly identify a list of voters who will change their vote (or even shift their vote) if targeted with an appeal. In an attempt to maximize the probability of a targeted voter changing their vote choice, campaigns often also use the survey/CHAID method (third method above) 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 the classification

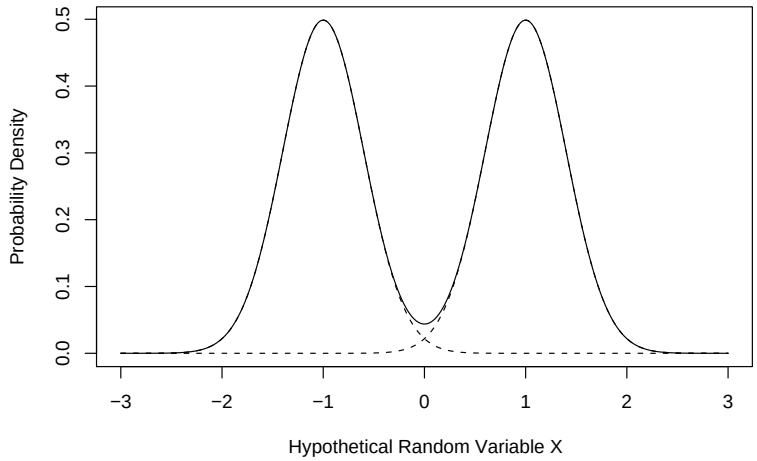

Figure 1: Example distribution of a variable that is guassian, but the mean and variance of the guassian depends on a Bernoulli process.

rate of the ensuing analysis may be low. 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 candidate's stances and shift in voter's candidate preferences. If a voter is experienced with an issue, belong's to an issue public, or has self-interest in an issue (all microtargetable subgroups), the voter is likely to more readily pay attention to campaign appeals on that issue. In all of these cases, the voter more easily processes political arguments on the issue (due to their experience, appetite, or self-interest) and thus are 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 increases 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 voters to judge the politician on the issue, unlike in other cases, in which the voter cue-takes from the politicians' positions. Since cue-taking polarizes of the electorate, and does not affect vote preferences, an increase in microtargeting (and hence a reduction in cue-taking) strengthens the relationship of voter attitudes affecting candidate evaluation.

2 Implications for Campaign Strategy

2.1 Microtargeting and Message Control

If a campaign can identify a subgroup of voters with experience on an issue, they have the ability to deliver target issue-specific messages to these voters. If the voter's opinions are congruent with the candidate's platform then the campaigns appeal with increase the voters' evaluations of the candidate (on average). This result appears to be strictly a new positive for the campaign, but of course, microtargeting and message delivery costs money. Below I explore the situations when microtargeting is not the optimal choice for a campaign.

First, independent of other options for resource allocation, microtargeting need not be 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 there are some microtargetable voters who *do* side with the candidate on the issue, then for the sake of simplicity, I assume that the campaign can identify these like-minded voters and only deliver messages to them.

Even if microtargetable, like-minded voters exist, sending these voters tailored messages is only useful if these individuals will not vote for the candidate in the absence of the appeal. Most likely, some of these individuals will have predispositions such that they would abstain or vote for the opponent if the campaign did not target them, but the proportion of voters in this circumstance can be small in high-salience, polarized elections where the dimension of opinions of the issue in question is similar to the overall ideological dimension of the campaign.[1] While potential small

[1] A high salience elections means few registered voters are abstaining, so not much get-out-the-vote effect is possible. A polarized electorate means that few voters are undecided or potential defectors. And similar issue

in number, for this chapter I assume some proportion of the electorate would shift their vote choice only if microtargeted, a proposition supported by the empirical chapters of this dissertation (Chapters 3,4, and 5).

In addition to microtargeting, campaigns can spend resources attempting to control the overall message agenda of the campaign. 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 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 choosing to spend resources to "broadcast" a message on a single issue and that issue resolves in their favor, then the electoral payoff can be large.

2.2 Translating the Personal Experience Model into a Formal Game

To further 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 has: (1) decided to run for office, (2) chosen a platform on which to run, and (3) must decide to spend the campaign's limited resources (i.e., money). There are two methods of campaigning the candidate must chose between. First, the campaign can microtarget voter-issue pairs for which the voters have stable opinions that are congruent with the candidate's platform. Or, the campaign can broadcast to all voters the candidate's stance on an issue for which the voters have unstable opinions, but which may resolve in the candidate's favor.

dimensions means that few voters current supporting the opponent are likely to be congruent with the candidate for the issue in question.

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

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

To guide their decisions, I assume that the campaign has a wealth of knowledge about the electorate. Through public opinion polls (or other means), campaign know the general predispositions of the electorate. The campaign also has knowledge about what percent of the electorate is microtargetable (i.e., has stable opinions) on each potential campaign issue. Also, the campaign has accurate beliefs about the probability that certain issues will resolve in their favor by Election Day (i.e., 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. In the model in this chapter, I assume that campaigns have the ability to identify these voters to some extent (i.e., 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. Also, I assume that the more money a campaign invests in microtargeting, the more voters they can reach in this targeted manner.

For the model below, I label all voter-issue pairs in which the voter has a stable opinion as 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.[4] However, the campaign does *not* wish to emphasize the issue among voters who have stable opinions that are incongruous with the campaign's platform. Hence, even if wide swaths of the electorate have stable opinion on issues, campaigns could maximize their efficiency by microtargeting 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 no votes are changed. This polarization mechanism requires two streams of considerations (i.e., one appeal from each ideological side)—a criterion non always present. 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.

[4]Female pronouns are used for voters; male pronouns for candidates.

Message streams can become one-sided when an issue resolves. For instance, when the economy tanked in the Fall of 2008, only 5% of the public rated the economic situation of the country as "excellent" or "good".[5] Voters can then use the single-stream of information from the media to "ground-truth" politicians performance. The evidence that resolved issues effect 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 game developed in this chapter, 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 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 of Chapter 2, the theory of issue ownership stipulates that wide swaths of the electorate favor one side of an issue. If a party "owns" and issue, the issue can be considered an "easy issue" (Carmines and Stimson, 1990) in that voters are capable of having 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 who has this majority of voters on their 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 2.5 usually consider cases in which a small percent of the electorate is microtargetable.

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

[5] "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.

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,

$$V_i \sim \mathcal{N}(\mu_i, \sigma^2). \tag{1}$$

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

$$U_i = \Pr(i \text{ wins}) = \Pr(V_i > 0.5) = \Phi(\frac{\mu_i - 0.5}{\sigma}). \tag{2}$$

Since I assume only two candidates in the race, $\mu_D = 1 - \mu_R$. To simplify the analysis, I assume 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 broke 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., $sigma^2 \to 0$). 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 $\frac{\partial U_i}{\partial \mu_i} > 0$. The 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 potion of the electorate has experience, though 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 microtargeting 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 the issue resolves in candidates 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; in this case, the issue resolves in candidate R's favor. Let $p_D = p_R$.

The campaigns do not have the resource to fully utilize the advantages offered by both issues. 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 the entire budget to gain the maximum votes from the strategy-issues combinations above.[6] The resulting distribution of the percentage of votes for candidate D, given both campaigns disbursements is

$$V_D(\delta_D, \delta_R) \sim \mathcal{N}(\mu_i, \sigma^2) + \delta_D m_D - \delta_R m_R + (2 - \delta_D - \delta_R) BS(p_D, p_R) \quad (3)$$

$$V_D(\delta_D, \delta_R) \sim \mathcal{N}(\mu_i, \sigma^2) + m(\delta_D - \delta_R) + (2 - \delta_D - \delta_R) BS(p, p) \quad (4)$$

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

$$\text{mean}(V_i(\delta_i, \delta_{\sim i})) = \bar{V_i}(\delta_i, \delta_{\sim i}) = \mu + m(\delta_i - \delta_{\sim i}) \quad (5)$$

$$\text{var}(V_i(\delta_i, \delta_{\sim i})) = \sigma^2 + 2pq^2(2 - \delta_i - \delta_{\sim i})^2 \quad (6)$$

If either campaign does not spend any resources broadcasting (i.e., $\delta_i = 1$) then that candidate's contribution to the variance (Equation 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,

$$\begin{aligned} U_D = {} & (1 - 2p)\Phi((\mu + m(\delta_D - \delta_R) - 0.5)/\sigma) \\ & + p\Phi((\mu + m(\delta_D - \delta_R) + q(2 - \delta_D - \delta_R) - 0.5)/\sigma) \\ & + p\Phi((\mu + m(\delta_D - \delta_R) - q(2 - \delta_D - \delta_R) - 0.5)/\sigma) \end{aligned} \quad (7)$$

This model includes two assumes which are rough approximations of the real world and not

[6] If one campaign spends all its resources on broadcasting then, q percent of voters switch. If both campaigns only broadcasted, then $2q$ voters would switch.

likely to hold in actual campaigns. First, the proportion of voters who would 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 so no matter if a candidate become 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, I ignore 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.

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.

$$\delta_i^*(\delta_{\sim i}) = \underset{\delta_i}{\operatorname{argmax}}\, U_i(\delta_i, \delta_{\sim i}) \tag{8}$$

To determine the best response to the opponent's strategy, $\delta_{\sim i}$, I take the partial derivative of candidate i's utility with respect to their strategy:

$$\begin{aligned} \frac{\partial U_i}{\partial \delta_i}(\delta_i, \delta_{\sim i}) &= (1-2p)\frac{m}{\sigma}\phi((\mu + m(\delta_i - \delta_{\sim i}) - 0.5)/\sigma) \\ &\quad + p\frac{m-q}{\sigma}\phi((\mu + m(\delta_i - \delta_{\sim i}) + q(2 - \delta_i - \delta_{\sim i}) - 0.5)/\sigma) \\ &\quad + p\frac{m+q}{\sigma}\phi((\mu + m(\delta_i - \delta_{\sim_i}) - q(2 - \delta_i - \delta_{\sim i}) - 0.5)/\sigma) \end{aligned} \tag{9}$$

Under some circumstances, the resource allocation decision is trivial. If the amount of votes one can shift with microtargeting (m) is greater than the proportion of votes possibly shifted if the issue resolves (q), then the campaign should throw all its money into microtargeting. Formally,

$m > q \rightarrow \frac{\partial U_i}{\partial \delta_i} > 0$ (see Equation 4) and the candidate's utility is increasing in δ.

As an intuition for the whether campaign have an incentive to microtarget or broadcast, consider the effect of broadcasting on the variance of V_i. Pouring more resources into broadcasting increases the percent of the population that would switch under a resolved issues, and since issue B resolves stochastically, increased broadcasting increase the variance of V_i. For a mathematical intuition of this result, see equation 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 in Chapter 5, campaigns want to increase the variance of the election result if they are losing (i.e., the expected vote percent is below 50%) and decrease the variance if they are winning (Carraway *et al.*, 1993). Applying this principal 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 a subtracting a value to the point on a Gaussian probability distribution has the property: $x < 0 \leftrightarrow \phi(x + c) > \phi(x - c)$. Next, I re-write Equation 9 to combine the terms influenced by the potential for microtargeting, m, and broadcasting, q,

$$\begin{aligned} \frac{\partial U_i}{\partial \delta_i}(\delta_i, \delta_{\sim i}) &= \frac{m}{\sigma}[(1-2p)\phi((\mu + m(\delta_i - \delta_{\sim i}) - 0.5)/\sigma) \\ &\quad + p\phi((\mu + m(\delta_i - \delta_{\sim i}) + q(2 - \delta_i - \delta_{\sim i}) - 0.5)/\sigma) \\ &\quad + p\phi((\mu + m(\delta_i - \delta_{\sim i}) - q(2 - \delta_i - \delta_{\sim i}) - 0.5)/\sigma)] \\ &- \frac{q}{\sigma}[p\phi((\mu + m(\delta_i - \delta_{\sim i}) + q(2 - \delta_i - \delta_{\sim i}) - 0.5)/\sigma) \\ &\quad - p\phi((\mu + m(\delta_i - \delta_{\sim i}) - q(2 - \delta_i - \delta_{\sim i}) - 0.5)/\sigma)]. \end{aligned} \tag{10}$$

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 it up with microtargeting along: $\mu + m(\delta_i - \delta_{\sim i}) < 0.5$. 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 ($q >> m$) so that Equation 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. The reasoning is as follows: if campaign i spends all 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 of 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 resources on microtargeting, then candidate i can take advantage of that error and win over half the time by following the above logic and spending all money on microtargeting.

Thus, in the case of a campaign in a marginal district with symmetric properties, microtargeting is weakly dominating strategy. The strategy is not strictly dominant because of the case where issue B always resolves ($p = 0.5$). Figure 2 illustrates the relationship between the probability of issue B resolving and the usefulness of broadcasting relative to microtargeting. The utilities of candidate D 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 pure microtargeting and pure broadcasting strategy approach the same value: 50%.

2.5 Edge Equilibria

Following from the logic of the previous section, in the case where candidates are on equal footing, only corner equilibria exist. In nearly all circumstances, these equilibria occur when both campaigns microtarget. In this section, restrictions on symmetry are relaxed; three scenarios are considered and depicted in Figure 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

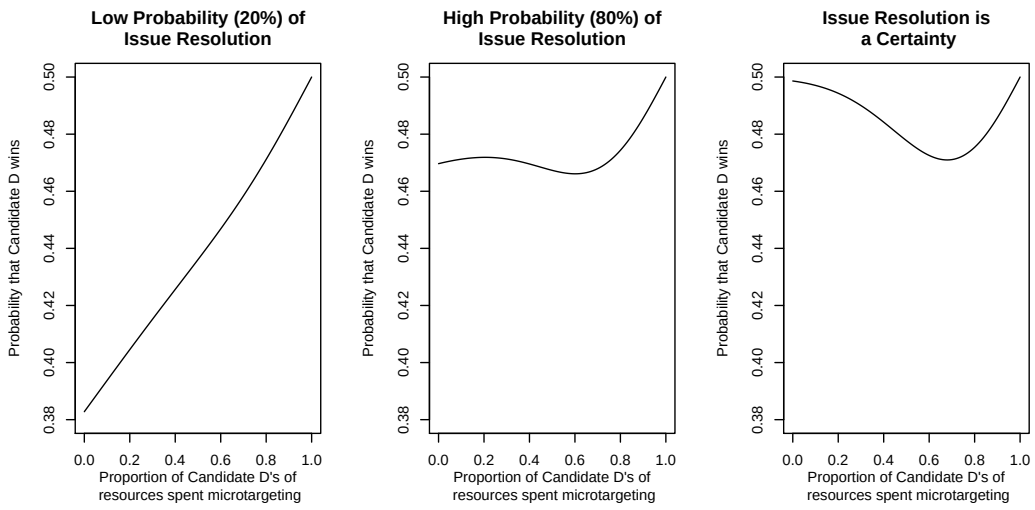

Figure 2: Candidate D's Utility Under Increasing Probabilities of Issue B resolving. In the examples depicted, 5% of the electorate is microtargetable by each campaign ($m = 0.05$) and 25% of the electorate shifts if the issue resolved ($q = 0.25$). The campaigns start on equal footing ($\mu = 0.5$) though 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).

resolve in candidate D's favor ($p_D = 0.7$, $p_R = 0.3$) and more voters switch to candidate D in 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" in panel (a) of Figure 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 only microtarget. The microtargeting strategy is often optimal since it lowers the variance of the election result as compared to broadcasting. The disadvantaged campaign's best response is often a combination of microtargeting and broadcast; the exact mix depends on the relative effectiveness of those two strategies.

An edge equilibrium of this type is depicted in Figure 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 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 divides his dollar by spending 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 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. However, in the middle of these two regimes, the need for candidate D to raise the mean is smaller enough to encourage broadcasting. However, candidate D cannot free-ride off of 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 issue resolution. This circumstance is interesting because *both* campaigns may have an incentive to broadcast. Candidate R may broadcast because that tactic increases the mean of his vote distribution. Candidate D might broadcast because broadcasting increases the variance of his vote share–helpful to candidate D's mean of vote share 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 broadcasts, 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 an equilibrium, a result I prove more formally in the next section.

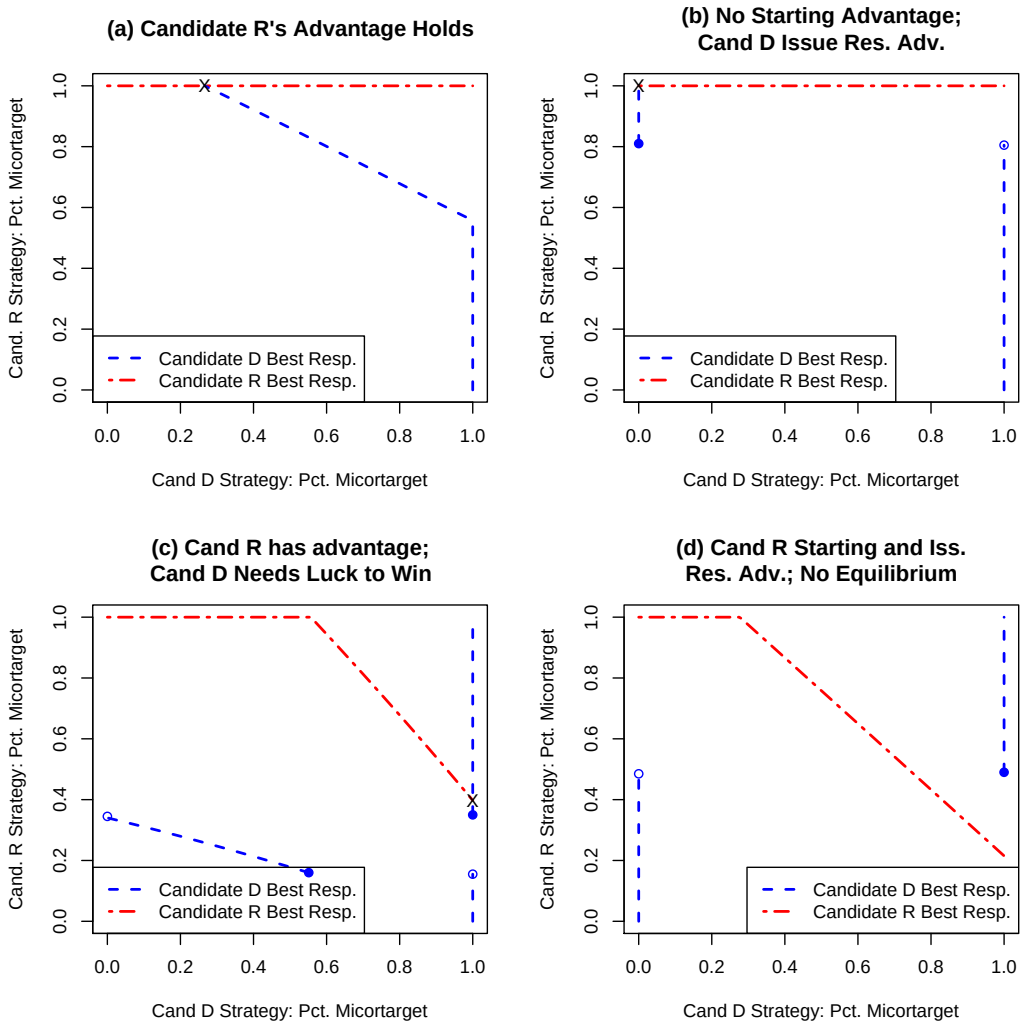

Figure 3: Best Response Plots of Four Scenarios. See Text for specifics.

2.6 No Internal Equilibria

In the microtargeting-broadcasting game, there are no internal equilibrium. Nor are there edge equilibrium 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.

$$
\begin{aligned}
U_i(\delta_i, \delta_{\sim i}) &= (1 - p_i - p_{\sim i})\Phi((\mu + m_i\delta_i - m_{\sim i}\delta_{\sim i} - 0.5)/\sigma) \qquad (11)\\
&\quad + p_i\Phi((\mu_i + m_i\delta_i - m_{\sim i}\delta_{\sim i} + q_i(2 - \delta_i - \delta_{\sim i}) - 0.5)/\sigma)\\
&\quad + p_{\sim i}\Phi((\mu + m_i\delta_i - m_{\sim i}\delta_{\sim i} - q_{\sim i}(2 - \delta_i - \delta_{\sim i}) - 0.5)/\sigma)\\
\frac{\partial U_i}{\partial \delta_i}(\delta_i, \delta_{\sim i}) &= \frac{m_i}{\sigma}(1 - p_i - p_{\sim i})\phi((\mu + m_i\delta_i - m_{\sim i}\delta_{\sim i} - 0.5)/\sigma) \qquad (12)\\
&\quad + \frac{m_i - q_i}{\sigma} p_i\phi((\mu_i + m_i\delta_i - m_{\sim i}\delta_{\sim i} + q_i(2 - \delta_i - \delta_{\sim i}) - 0.5)/\sigma)\\
&\quad + \frac{m_i + q_{\sim i}}{\sigma} p_{\sim i}\Phi((\mu + m_i\delta_i - m_{\sim i}\delta_{\sim i} - q_{\sim i}(2 - \delta_i - \delta_{\sim i}) - 0.5)/\sigma)
\end{aligned}
$$

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

$$
\begin{aligned}
0 \;>\; & -\frac{q_i}{\sigma} p_i\phi((\mu_i + m_i\delta_i - m_{\sim i}\delta_{\sim i} + q_i(2 - \delta_i - \delta_{\sim i}) - 0.5)/\sigma) \qquad (13)\\
& + \frac{q_{\sim i}}{\sigma} p_{\sim i}\Phi((\mu + m_i\delta_i - m_{\sim i}\delta_{\sim i} - q_{\sim i}(2 - \delta_i - \delta_{\sim i}) - 0.5)/\sigma)
\end{aligned}
$$

But analogous logic for candidate $\sim\ i$ yields the result that negation of the right-hand side of Equation 13 must be negative. The negation of a negative can not be negative. Contradiction.

2.7 Model Extensions: Multiple Issues and Platform Decisions

If more than two issues were at play in the election, the discussions above would also inform a candidate's decision about which issues to focus his efforts on. Candidates who are advantaged against the opponent's optimal strategy desired to increase the mean of their vote share and decrease the variance. Candidates who, on average, cannot win a majority of the vote wish to increase both their vote share and the variance of the outcome. One could extend the model with

multiple issues in a straightforward manner, though the strategy space would increase to $k-1$ dimensions, where k is the number of issues considered. The logic of Section 2.6 would hold within issue: no two candidates would broadcast on the same issue. Though candidates might optimally broadcast on two different issues.

Incorporating multiple issues would then enable the model extension of platform choice. Similar to the model of Groseclose (2001), candidates would have exogenous policy preferences and weights they places on winning the election vs. policy outcome. The choice of which issues to emphasize (either with microtargeting or broadcasting) would not only be a function of whether these issues help the candidate win, but whether the side of the issue the candidate takes is consistent with his policy preferences.

2.8 Discussion

The model above has three major substantive 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 just want to microtarget to increase their vote share, but also to prevent defection. The interaction between microtargeting and broadcasting is unmodeled in this chapter, but a natural extension of the theory in Chapter 2 would indicate that delivering microtargeted appeals before issue resolution would inoculate some voters from defection. 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 is must lower its expected vote share in order 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 than would be seen otherwise.

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

[7] As told by A.B. Culvahouse, recounting his conversation with John McCain.

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 bears out this prediction that opposing campaigns attempt to emphasize distinct sets of issues (Sellers, 1998), though current events often foil these plans and force campaigns to talk about the same issue (Sigelman and Buell, 2004).

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) can be used for positive or negative purposes. In this part of the chapter I examine the ways in which microtargeting has both positive and negative implications for democracy.

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), are generally incapable of forming coherent opinions (Converse, 1964), and that this lack of information is crucial to voters' decisions (Lau and Redlawsk, 2001; Bartels, 2005). In the other camp are scholars who believe that shortcuts are available (Popkin, 1994), voters seek the information that interest them (Krosnick, 1990), and any errors cancel 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 became more knowledgable they would process this

information similar to their high-information counterparts–an assumption 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 to among political alternatives on citizens. A safer standard by which to judge 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 to this standard is that the outcome of governments (democratic or otherwise) are policy decisions and citizen's issue opinions are farther from that final outcome than their vote decisions.

To resolve this balancing act, I use two standards by which to judge 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) there can be much disagreement about how to achieve those outcomes. Thus, with this first criterion, the analysis is constrained to only the set of information which is verifiable. Included in this set are: candidate positions (which the candidate him/herself defines), and observable facts.

Secondarily, I examine the more subjective arena 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.

3.2 Positives for Democracy

Microtargeting increases the efficiency of learning the candidates' position. If campaigns micro-target, a voter with experience on a political issue is both more likely to receive messages about that issue. These messages are more likely to be received because the voter knows that she can judge the candidates on the issue. This learning of candidate stances increases the amount of

information at voters' disposal and is thus a positive for democracy under the first criterion.

An example of this is seniors learning about where Bush and Gore stood on Social Security (see Chapter 3 for details). At the beginning of the campaign (through May 2000), 42 percent of seniors (60-year-old and older) could correctly identify both candidates on Social Security, compared to 36 percent of younger voters: a difference of 6 percentage points. In August, this difference was 8 percentage points; 10 points in September; 12 points in October. 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 is due to the Bush and Gore campaigns microtargeting, but clearly seniors were more actively engaging in the Social Security debate. If the campaigns had been able use the techniques available just two cycles later, perhaps more seniors would have learned about the candidates positions. Even by the end of the camapaign, a small majority of seniors could not accurately identify both candidates' positions on Social Security.

Transitioning to the second criterion–correct policy opinion–if experienced voters have more knowledge of 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, take for example an challenger facing an incumbent who is so incompetent that the office-holder is wrong on every issue. If the challenger does not microtarget and instead broadcasts one issue to every voter, then only the small subset of voters with experience on that issue would be effected (unless that issue resolves).

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

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

The resources afforded to the incumbent (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 used modern technology to match voters to the issues they have experience with, several subsets of voters would judge the incumbent poorly, potentially increasing the challengers probability of success to greater than 50%. As demonstrated in Section 3, the challenger would want to microtarget in this case—having these technology available would prevent the wrong-headed policies from being implemented by the incumbent.

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 through cue-taking. As shown in the survey experiments of Chapter 4, delivering congruent cues to partisans increases their attachment to their party's candidates. This attachment leads to cue-taking by the individuals (Chapters 2 and 4), which means that individuals uncritically accept the position of their preferred elite. Thus, individuals may be more prone to believe false information (Bartels, 2002).

As an example of individuals believing verifiably incorrect information, the 2008 CCES asked potential voters whether they knew what Barack Obama's religion was. Despite several statements by Obama that he was Christian and a large 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 were peddling these falsehoods (e.g., Fox News) and the individuals who believed them were nearly all conservative.[10] The direction of causation cannot be determined from this cross-sectional observation but other studies and chapters of this dissertation clearly indicate the power of cue-taking.

Another reason why microtargeting might be detrimental to democracy is that people might have experience with issues that effect only a small part of their life. For instance, an environmen-

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

talist might be microtargeted on global warming and vote for the pro-environment candidate even though that candidate's economic policies would be catastrophic. Since global warming works over a decade- or century-long scale, the economy is probably more relevant to the voter. But since the voter cannot judge on economic policies, they vote for the suboptimal candidate based on the issue for which they have experience.

Undoubtedly voters sometimes have policy opinions that are incorrect, even by the voters' standards applied to the benefit of hindsight. For instance, a third public went from believing the Iraq War was justified to a mistake from 2003 to 2006. The question is whether a more informed electorate would have had a different view of 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 obvious 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 great party or elite affiliation 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 the probability of cue-taking from elites and choosing policies which lead to negative outcomes.

3.4 Further Discussion: Party Structure

The cue-taking effect that produces large segments of the population to believe falsehoods also leads to closer party affiliation in broad parties. Parties, in the general sense, often include different "types" of voters (e.g., social conservative and economic conservatives). Microtargeting on the issue a voter has a stable opinion about (e.g., social issues) increase her evaluation of her party and lead the voter to more easily accept the party's platform on other issues (e.g., economic issues).[12] This artifact of microtargeting has both positive and negative implications

[11] This 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 decreased percent of the public would have supported the war.

[12] Partisanship has increased recently (Bartels, 2000), though I would not attribute much of this change to increased microtargeting as other more powerful forces are at work (McCarty *et al.*, 2008).

for democratic participation. On one hand, voters polarize when affiliating with parties, thus increasing political participation (Dalton, 2008). The number of parties is kept 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 parties abuse the voter's affiliation by pursuing rent-seeking or ideologically-extreme policies that are detrimental to the state of the nation (Sartori, 1976).

4 Conclusion

Microtargeting is a powerful tool that can help campaigns 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 which makes the decision of whom to vote for easier. However, that easier decision does not necessarily lead to positive outcomes and can lead the voter to be too trusting of elites. Whether microtargeting is good for democracy on the whole depends on one's perspective, such as one's beliefs about how much more knowledgeable voters are about the state of the world vis-a-vis the issues they have experience with.

A Analytical Solution for Variance of Vote Share

In the appendix, I derive 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. For an example, Figure 4 shows the distribution with $p = 0.5$ and sub-distributions of $\mathcal{N}(1, 0.16)$ and $\mathcal{N}(-1, 0.16)$.

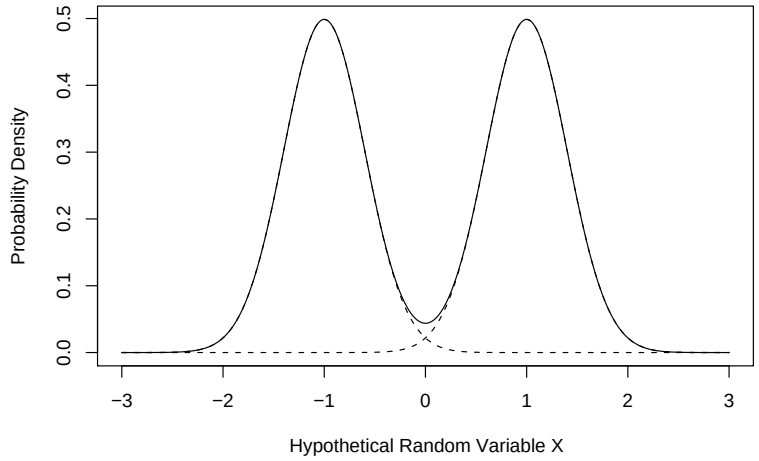

Figure 4: Example distribution of a variable that is guassian, but the mean and variance of the guassian depends on a Bernoulli process.

To determine the variance of X, let Y be a Bernoulli random variable that determines which guassian produces x. If the two normal distributions that make-up X are $\mathcal{N}(\mu_1, \sigma_1^2)$ and $\mathcal{N}(\mu_2, \sigma_s^2)$, then

$$\begin{aligned}
\text{Var}(X) &= \text{Var}(E[X|Y]) + E[\text{Var}(X|Y)] && (14)\\
\text{Var}(E[X|Y]) &= p(\mu_1 - \bar{X})^2 + (1-p)(\mu_2 - \bar{X})^2 && (15)\\
E[\text{Var}(X|Y)] &= p\sigma_1^2 + (1-p)\sigma_2^2 && (16)\\
\text{Var}(X) &= p[(\mu_1 - \bar{X})^2 + \sigma_1^2] + (1-p)[(\mu_2 - \bar{X})^2 + \sigma_2^2], && (17)
\end{aligned}$$

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 occur with a certain probability. There are four distributions because there are four possible outcomes when both the Democratic and Republican broadcasted issue 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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