Messaging the Bases: Tailoring Political Ads to Audiences*

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Abstract

Advertising is a crucial instrument in political campaigns. A correctly-placed and designed ad energizes a politician's base and depresses the opponent's. I theoretically and empirically examine how politicians strategically vary ad content and placement to reflect the political makeup of audiences to invoke desired electoral reactions. Politicians can select ads that increase the salience of policy positions or highlight valence (non-policy) attributes via positive ads about themselves or negative ads about opponents. In turn, ads affect voters' choices of candidates and whether to abstain due to alienation or indifference. I characterize theoretically how the optimal composition of ads varies with audience demographics and candidate characteristics. I then use the texts of different ads in states with competitive gubernatorial or presidential contests in 2008 and 2012 to identify the types of ads used on different tv shows. I combine these data with viewer demographic and polling data, uncovering empirical findings consistent with the theory (e.g., opposing candidates target different (and more polarized) audiences with policy ads, positive valence ads are mostly targeted to a candidate's alienated base).

Keywords: Political advertising, strategic communication, abstention, mobilization.
JEL Classification: D72, D83

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1 Introduction

How do politicians advertise? Advertising is an indispensable tool for every political campaign. Although politicians use various means to reach voters, political ads are the main instrument of such communication (p.4, Fowler et al. (2018)). Their importance is attested to by the effort exerted to create an ad: scripting, actor hiring and focus group testing are just few of the many stages of creating a single ad (Fowler et al. (2018)). Political ads take many different forms, but local television (tv) ads are the predominant way to speak to voters (Martin and Peskowitz, 2017; Liberini et al., 2018).[1] Even today, local tv remains a primary source of news and entertainment for the electorate.[2] Thus, it is unsurprising that regular programming is flooded with political ads in every election cycle. For example, the presidential and gubernatorial election cycles of 2008 and 2012 each saw over two million local ad plays with over a billion dollars spent.[3]

Tv ads vary in content and tone: some ads highlight policy issues and positions, while others focus on candidates non-policy traits (valence) — either emphasize the positive personal traits of the preferred candidate or attack the negative attributes of the opponent. Classifying ads based on their content and tone, one realizes that politicians simultaneously employ these different types of ads. Furthermore, ad placement and the mix of types of ads vary across different shows and networks. Table 1 emphasizes the two patterns. Presidential candidates in 2008 and 2012 simultaneously used policy ads (highlighting policy), positive valence ads (emphasizing their positive traits) and negative valence ads (attacking the opponents negative traits). Also, they varied ad placement and content ad placement and ad content across and within networks. The variation is especially evident in the shares of policy and positive valence ads, where the two parties target different outlets.

My paper then asks: what function does each type of ad serve in a campaign, given that politicians are strategic? And, how does ad placement, content and tone vary based on the makeup of the expected audience? To address these questions, I develop a theory of targeted political advertising, which I find to be consistent with empirical findings from the political advertising of gubernatorial and presidential candidates in states with competitive contests in 2008 and 2012.

I consider an electoral competition model with two candidates who can place ads in

[1] See: Statista, Ad Age, Tech for Campaigns, Forbes. Liberini et al. (2018); Hendricks and Schill (2014) argue that targeting on social media is based on observable characteristics, however, they note that microtargeting is still hard.

[2] Pew Research, Owen (2014); Hendricks and Schill (2014); Hillygus and Shields (2008)

[3] See Wesleyan Media Project Report for 2010 for more details.

[4] Gen Enter refers to general entertainment programs.

Table 1: Presidential Ads Post Labor Day 2008 and 2012

Democrat	Share of No Ads	Share of Negative Valence Ads	Share of Policy Ads	Share of Positive Valence Ads
CNN - Gen Enter[4]	0.31	0.17	0.27	0.25
CNN - News	0.16	0.21	0.20	0.44
FOX/FOX News Channel - Gen Enter	0.37	0.08	0.22	0.33
FOX/FOX News Channel - News	0.74	0.07	0.03	0.16
MSNBC - Gen Enter	0.12	0.30	0.09	0.48
MSNBC - News	0.13	0.20	0.10	0.56
OTHER - Gen Enter	0.21	0.12	0.21	0.46
OTHER - News	0.46	0.07	0.16	0.31
Republican	**Share of No Ads**	**Share of Negative Valence Ads**	**Share of Policy Ads**	**Share of Positive Valence Ads**
CNN - Gen Enter	0.55	0.22	0.04	0.18
CNN - News	0.46	0.26	0.05	0.23
FOX/FOX News Channel - Gen Enter	0.63	0.26	0.11	0.00
FOX/FOX News Channel - News	0.25	0.33	0.33	0.10
MSNBC - Gen Enter	0.88	0.12	0.00	0.00
MSNBC - News	0.79	0.20	0.01	0.00
OTHER - Gen Enter	0.77	0.16	0.05	0.02
OTHER - News	0.42	0.36	0.09	0.13

different tv shows in order to reach voters. Tv shows vary in the ideological makeup of their viewers; this assumption is consistent with evidence in Ridout et al. (2012). Voters care both about candidate policy positions and valence (non-policy candidate traits). Policy is a horizontal dimension of differentiation in the sense that voters disagree about its optimal level (Downs, 1957). Following Groseclose (2001), valence is orthogonal to policy and it is a vertical dimension of differentiation; ceteris paribus higher valence candidates are preferred. Voters can cast a ballot for a candidate or abstain from voting, and they differ in their voting costs. In the spirit of the seminal work by Adams and Merill III (2003), voters derive utility from the act of voting, but abstain if they are alienated (i.e., if the favored candidate is not sufficiently attractive to a voter) or indifferent between the two candidates (i.e., the preferred candidate is not sufficiently different from the opponent relative to the cost of voting).[5] Candidates choose the bundle of ads to place in a tv show — the level and mix of

[5]The two sources of abstention create some tension in the interpretation consistency of voter utility. I discuss this and possible solutions in more detail in the discussion after the model is formally set up. Briefly, alienation as defined implies that the utility is derived from the process of voting. In contrast, indifference can naturally be interpreted as outcome orientated; the utility difference between the two candidates should not matter to a voter who only cares about voting. However, my model is equivalent to assuming equal proportions of two sub-populations: one that cares about voting and one that cares about outcomes.

policy, positive and negative valence ads to use. Ads affect the political attitudes of voters who see them and thus affect turnout by altering the margins of abstention (alienation and indifference). Candidate positions are fixed, but the salience of the policy in the voter's utility is affected by the policy ads consumed. Ideally, a candidate's policy ads serve dual purpose: (i) they decrease the salience of the policy divergence between the candidate and an aligned voter, and (ii) they increase the salience of the policy divergence with the opponent, but they risk doing the opposite with non-aligned voters. Positive valence ads boost the candidate's valence, while negative valence ads lessen the opponent's valence.

The theoretical predictions of my model are sharp. First, candidates tailor ads to tv shows based on the ideological composition of the audience and their margins of abstention. And, even though a candidate's optimal mix of ads within a tv show is not directly dependent to the on an opponent's ads, systematic correlations of the different types of ads between the opponents are induced due to the tailoring of ads designed to target the underlying viewer demographics. Opposing candidates target policy ads to different and more polarized audiences. Specifically, each candidate talks about policy in tv shows watched mostly by their base, but attacks the opponent in shows watched by the opponent's base. Positive valence ads are used with the alienated, and perhaps heavily ideological, base. Moderate voters are targeted with a mix of policy, negative valence and positive valence ads. The opponent's base is mostly targeted with negative valence ads attacking the opponent. The moderate bases can receive some positive valence ads if they are effective enough at affecting indifference. Finally, I find that as the ideological gap between candidates widens, it becomes easier to motivate both the ideological and moderate base on the policy dimension. In contrast, candidates with higher initial valence increase their positive advertising.

The intuition underlying the results is keen. A correctly-placed ad mobilizes the base and demobilizes the opposing one. Given the horizontal policy differences, a single type of ad cannot achieve the desired reaction from the various voting bases. Each type of ads activates a different part of a voter's utility, and it is targeted to a different type of voter and designed to elicit a specific reaction. A candidate's own alienated base is energized by ads highlighting their preferred candidate, whereas their indifferent base is mobilized by a mix of ads that together increase the distance between the two candidates. Similarly, the opponent's base is mobilized by policy ads and thus candidates avoid emphasizing policy in tv shows watched by the opponent's base. Instead, they focus on reducing the opponent's valence through negative valence attack ads.

Voters at the fringe of support of a candidate are heavily ideological, and abstain only due to alienation. The candidate must then increase the utility that these voters derive

from voting for them. Thus, fringe voters are targeted with the most positive valence ads emphasizing the positive traits of the preferred candidate. Moderate voters abstain mostly due to indifference, and as a result a mix of policy, positive and negative ads are employed to separate the candidate from the opponent; increase own utility and decrease utility from voting for the opponent. If policy ads are persuasive for the base, then ceteris paribus more policy ads are targeted towards the fringe than the more aligned voters. To see why, realize that the marginal gain from persuading a fringe voter on the policy dimension is higher than the marginal gain with a moderate voter.

Shows that are watched overwhelmingly by the opponent's base are not targeted with policy ads since this will mobilize them to vote. The fringe supporters of the opponent abstain because the prospect of voting for their candidate is not appealing enough. Thus, candidates optimally reinforce this sentiment by targeting only negative valence ads to them. Conversely, the opponent's moderate base is targeted with a combination of negative valence and some positive valence ads, if the latter are sufficiently effective at making voters indifferent.

In other words, tv shows act as aggregators of political preferences that enable politicians to (probabilistically) match message to audience. Ads are strategically matched to a receptive audience to minimize undesirable reactions. Concretely, highlighting a divisive issue, such as abortion or gun control, can energize a candidate's base if it receives the ad; more viewers of "Fox and Friends" are receptive to an "anti-abortion" ad than viewers of "The Price is Right". Table 1 is consistent with this logic. Democrats are 3 times more likely to talk about their positive traits on MSNBC than on Fox-related news shows. Conversely, Republicans are 33 times more likely to highlight policy on Fox news than MSNBC. CNN is targeted by Democratic policy and Republican positive valence, which would suggest that they are mostly moderate Democratic voters.

To test if the theoretical predictions are consistent with the empirical evidence more generally, I analyze the ads by the gubernatorial and presidential candidates in 2008 and 2012. I use polling data to focus on states with competitive contests, which eliminates concerns about the exact goal of an ad — for example, advertising to boost down-ballot candidates when the top-ticket candidate is a heavy favorite or a heavy underdog. Additionally, I only consider ads played in local tv shows since over 99% of political ads in each cycle were in local stations.

I use the texts of the different ads to identify the mix of policy, positive valence and negative valence ads used on different tv shows. I combine these data with viewer demographic and polling data to examine the extent of ad tailoring based on show characteristics. First, I document that all three types of ads (policy, positive valence and negative valence) are

simultaneously used by candidates, and that the mix of ads by a candidate varies across tv shows. This is consistent with the hypothesis that each type of ad has a function to play in a political campaign. Furthermore, I show that tv shows vary in the demographic composition of their audiences, which along with the findings in Ridout et al. (2012), is evidence of viewer sorting into tv shows.

I begin examining tailoring of ads by asking whether individual viewer demographics are differentially targeted with each type of ad by presidential candidates. Specifically, I test if the probability of reaching a specific a demographic with a given type of ad differs between the two opposing presidential candidates. Consistent with the model, I find statistically significant differences for certain demographics such as race, age, education and wealth. Certain demographics are targeted with policy or positive valence ads by one party and with negative valence ads by the opposing party. For example, black and middle-aged viewers are systematically targeted with Democratic policy and positive valence ads, and Republican negative valence.

Next I examine the relationship between the shares of each type of ad and the average ideology (i.e., conservative, middle of the road or liberal) of viewers. It should be noted that ideology does not perfectly capture the voter bases of the different candidates; for example, conservative Democrats are an important constituency of the Democratic party. Even so, I find evidence of tailoring ads based on ideology. Democrats decrease their share of policy and positive valence ads by up to 3 percentage points as a show becomes more conservative. That translates to about 10 percent decrease relative to the unconditional average for each type of ad. In turn, Democratic candidates increase their negative valence ads by up to 4 percentage points in more conservative shows. In contrast, Republicans increase their positive valence ads by up to 7 percentage points and decrease their negative valence ads by 7 percentage points as shows become more conservative Put differently, Republicans advertise about 50 percent more about their positive valence attributes on more conservative shows.

I conclude the analysis of the presidential ads by examining how opponents *differentially* target the *bundle* of demographics in each tv show. Specifically, I implement a two-stage process to analyze whether opposing candidates target the same audience with different types of ads. In the first stage, I instrument the share of each type of ad for each candidate on the set of viewer demographic variables and polling variables. This achieves two goals, an intuitive one and a technical one. First, it captures how candidates tailor ads based on the *expected* audience, and second it circumvents endogeneity and bias concerns. In the second stage, I estimate the correlation coefficients between the expected shares of the different type of ads for the two candidates. I repeat the analysis using weekly data as

well as aggregated data from the whole period after Labor Day. The theory provides sharp predictions. Candidates target the majority of their policy and positive valence ads to a different audiences. And, for a given audience, opposing candidates want to activate different parts of the utility of the voter. Thus, they avoid using policy or positive valence in front of the same audience, and a higher share of negative valence ads are targeted to the audiences the opponent targets with mostly policy and positive valence.

Consistent with the model predictions, I find significant negative correlations between (1) the shares of policy ads by opposing candidates, and (2) their shares of positive valence ads. This suggests that presidential opposing candidates speak to different audiences about policy and positive valence. I also find that opponent's policy and positive valence ads are negatively correlated. This further validates the predictions, since it implies that candidates switch away from policy (positive valence) when the opponent talks about positive valence (policy). Instead, the share of policy and positive ads are positively correlated with negative valence ads and the probability of the opponent not advertising in a show. That is, candidates increase policy and positive valence in those shows where the opponent does not advertise or attacks the candidate.

Finally, I complete the analysis by examining the gubernatorial elections. I again investigate how opposing ad strategies of opposing candidates correlate, albeit using raw correlations due to the lack of consistent demographic data on viewers. The correlations are again consistent with the model predictions in a similar manner to the discussion above.

Using the multitude of gubernatorial candidates, I test the effect of varying the ideological distance between the candidates on ad strategies. I demonstrate that as the ideological distance between opposing candidates increases (1) the probability of advertising policy or positive valence in the same show decreases, whereas (2) the probability of both using negative valence ads increases. Moreover, consistent with model predictions, I find that candidates increase the share of their policy ads with their base, since it becomes easier to motivate them on that dimension.

Finally, I examine the effects of initial candidate valence. I find evidence that higher own valence increases positive advertising, and decreases negative. Higher opponent valence has the opposite effects: it decreases positive advertising and increases negative. Both observations are predicted by my model.

Contribution. Ad targeting is a well-known phenomenon. Fowler et al. (2018) document four generations of ad targeting. First, targeting took the form of advertising in certain times of the day in an effort to reach broad demographic groups (e.g., daytime for women). Since 2004, consumer surveys have been used to relate consumer demographics to tv shows.

The third generation, starting around 2012, entailed using additional demographic data from cable boxes and satellite subscriptions to match voter types to tv-shows. The final generation saw the rise of addressable ads. Using data from satellite subscriptions, politicians now target specific households in addition to tv shows.

The theory and empirical results of the current paper apply to all generations of targeting even though I use data from the second and third generations. I allow politicians to exploit voter behavior (i.e., sorting of voters in tv shows based on ideology) to target different parts of the voter's utility depending on their ideological preferences, and thus margin of abstention, by tailoring messages. This is a novel mechanism of political behavior to the literature and an important innovation. Previous work on targeting and campaign advertising focused on broader objectives, such as the effect on turnout (Spenkuch and Toniatti, 2018; Krupnikov, 2011). Fowler et al. (2018) state "while Democratic campaigns may be more likely to target Democrats, a lot of Republicans are still being exposed to Democratic ads, and a lot of Democrats are being exposed to Republican ads." (p.p.96-97). I argue that this is no accident. This a deliberate strategic decision by politicians wishing to evoke specific responses. I build on the work of Adams and Merill III (2003) to study how different forms of abstention inform the advertising strategies of politicians. Specifically, I characterize the incentives to use vertical and horizontal ads based on the margin of abstention to elicit different responses.

Literature Review

The theory and empirical results in this paper speak to several strands of the literature, which I summarize below.

Political advertising, targeting and messaging tailoring

Earlier work on targeting has established that Democrats and Republicans have diverging viewing habits that leads opposing candidates to advertise in different outlets (Ridout et al., 2012). In the election cycles of 2008 and 2012, while some shows are targeted by a single party, there is also significant overlap in the targeted shows.[6] Targeting certain populations

[6]In Table 7, I record the probability a candidate ever advertises in a show regardless of the volume of ads. I find that 47% of the tv-shows in 2008 and 57% of the tv-shows in 2012 saw ads by both Democrats and Republicans. If I adjust for the volume ads, Democrats and Republicans advertise in the same show 79% of the time in 2008 and 86% of the time in 2012, see Table 8. Thus, there exists a significant overlap in the shows in which both parties advertise. There is also a substantial number of shows in which only one party advertises. According to my model, I should observe candidates adopt different types of ads when they both advertise. Further, in the shows when only one candidate advertises, I should expect to see more

with issue-specific messages does not raise their turnout (Sides and Karch, 2008; Clinton and Lapinski, 2004). Sides and Karch (2008) argue that seeing ads mentioning a policy issue of interest does not differentially increase a voter's turnout relative to other voters. This is a distinct observation from the main thesis of current paper. My theory predicts that messaging depends on the relevant margin of abstention, i.e., indifference vs alienation (candidates address different parts of a voter's utility through their ads).

Le Pennec (2019) demonstrates that politicians vary their messaging based on the audience. In particular, French parliamentary candidates emphasize non-policy issues when the national party's position is unpopular in their district. Adams et al. (2016) provide theoretical and empirical analyses of Japanese House of Representative candidates who can advertise policy positions or highlight valence. Unlike my paper, which examines the differential messaging based on margin of abstention, Adams et al. (2016) and Le Pennec (2019) examine the binary choice to emphasize policy or valence stemming from the comparative advantage between the candidates.

My paper contributes to the extensive literature on the effects of advertising on voting turnout and choices. Ansolabehere and Iyengar (1997) argue that negative campaigning shrinks turnout. Goldstein and Freedman (2002) dispute this claim and instead find that voters are stimulated to vote when exposed to negative advertising. Krupnikov (2011) claims that the discrepancy is resolved when timing is taken into account. Voters exposed to negative advertising closer to the election are demobilized, which causes turnout to decrease. Souberyan (2009) argues that the effect of positive and negative campaigning depends on the sensitivity of voters watching the ads. Others show that ads have no impact on aggregate turnout, but affect voter composition and vote shares (Spenkuch and Toniatti, 2018). Da Silveira and De Mello (2011) show that campaign spending has meaningful effects on outcomes in Brazil. However, Gerber et al. (2011) and Durante and Gutierrez (2014) claim that ad effects, though strong, are short-term.[7] Sides et al. (2020) use two different research designs using the boundary of media markets as treatment. They show that ads broadcast after Labor Day affect outcomes, while ads played in the summer have no effect. Experimental evidence by Tomz and Houweling (2008); Kendall et al. (2015); Hager (2019) suggests that factual or informative ads about candidate platforms have a positive impact on a candidate's vote share.

policy and positive valence ads as discussed in my theoretical analysis.

[7] Pons (2018) demonstrates that other forms of communication, such as in-person visits to voters, also have short-term effects on vote choice.

Platform and valence competition: vote buying (persuasion) and endogenous valence

My paper also speaks to literature on vote buying and endogenous valence (Snyder, 1989; Klumpp and Polborn, 2006; Ashworth and Bueno de Mesquita, 2009; Boyer et al., 2017; Serra, 2010) Harrington and Hess (1996) consider a spatial electoral competition model with candidate valence. Candidates can spend resources on positive or negative advertising, but not on valence ads. Positive ads move candidate closer to marginal voter, negative ads move opponent away from the marginal voter. They find that candidates with high initial valence run a positive campaign, whereas candidates with low initial valence run negative campaign. Chakrabarti (2007) extends this work to allow for valence ads. Higher valence candidates run a personal campaign. A lower valence candidates runs an ideological (policy) campaign. Bernhardt and Ghosh (2020) study the effects of positive and negative ads on primary and general elections. Polborn and Yi (2006) predict that low quality candidates tend to highlight their opponent's valence.

However, the above work only considers persuasion; that is, there is no margin of abstention in these models. Moreover, a voter is either reached or not, but not which part of their utility is activated. Voters can abstain in Adams and Merill III (2003) but candidates do not have immutable policy positions. Instead they decide their policy positions based on how it changes their indifferent and alienated bases.

Herrera et al. (2008) consider a reduced form of abstention. Specifically, a reduced form parameter captures the effectiveness of targeting by campaigns. Voters that are not effectively reached to abstain from voting. In contrast, I model the source of abstention and its interplay with the ideological position of the voter. Importantly, the underlying observation is that candidates adapt their messaging and communication strategy based on the margin of abstention and ideology position.

The paper is organized as follows. In Section 2, I set up and solve the theoretical model. In Section 3, I discuss data sources and present the empirical analysis of presidential and gubernatorial ads from 2008 and 2012. Section 4 concludes. Proofs are contained in Appendix A. Tables with the empirical results are omitted from main text and are included in Appendix B. Additional data details are in Appendix C. Appendix D considers extensions of the theoretical model.

2 Theoretical Model

2.1 Setup

I consider a political contest with advertising, a discrete policy issue x and two candidates, D and R.[8] Candidate positions are immutable and common knowledge, and satisfy $x_D \leq 0 \leq x_R$. Voters care about ideology (policy) and candidate valence. Valence is orthogonal to ideology (Groseclose, 2001), and, ceteris paribus, higher valence candidates are preferred.[9] Voters are divided into T tv shows with each voter h watching only one tv show t. Equation (1) describes the utility that voter h — with ideology x_h watching tv show t — derives by voting for candidate k.

$$U_{h,t}(k; x_h) = -a^k_{h,t}|x_h - x_k| + V^k_{h,t} + \epsilon^k_h. \tag{1}$$

Here $a^k_{h,t} \geq 0$ measures the salience of ideology difference between candidate k and voter h in the voter h's utility. Notice that $a^k_{h,t}$ varies across opposing candidates. One can think of the policy issue x as a composite of different issues that each candidate wishes to implement — citizen candidates who cannot commit to a different policy. That is, there exists a status quo that each candidates tries to change. As a result, different voters might perceive the changes differently. $V^k_{h,t}$ reflects the valence that voter h attaches to candidate k. Finally, ϵ^R_h is a stochastic preference shift that is uniformly distributed on $(\underline{\epsilon}, \bar{\epsilon})$, where $\underline{\epsilon} < 0 < \bar{\epsilon}$. I normalize ϵ^D_h to zero.

Policy salience $a^k_{h,t}$ and valence $V^k_{h,t}$ are not intrinsic and they are influenced by the ads the candidates place on tv show t. Denote the policy, positive valence and negative valence ads by q^k_t, p^k_t and n^k_t, respectively, used by candidate k on tv show t. Policy ads affect the policy salience according to

$$a^k_{h,t} = a^k_1(q^k_t; x_h) + a^k_2(q^{k'}_t; x_h),$$

for $k \neq k'$ and $k, k' = \{D, R\}$. I consider a framework where a candidate's policy ads increase policy salience with the opponent's base. Conversely, policy ads decrease the salience with ideologically aligned voters. In the analysis section, I discuss an alternative specification in which policy ads increase the salience of policy for all candidates and voters. Policy ad effects are assumed to be characterized by diminishing marginal returns.

The valence index for candidate D increases in p^D_t and initial valence stock V_D, and

[8] The terms policy and ideology are used interchangeably.

[9] Valence is not an indicator of ability about the policy issue.

decreases in n_t^R according to

$$V_{h,t}^D = V_1(p_t^D; V_D) + V_2(n_t^R; V_D),$$

The valence index for candidate R, $V_{h,t}^R$, is defined analogously. In the analysis that follows I assume that positive ads have diminishing marginal returns, whereas negative ads have constant effects. I also allow for the possibility that positive ads have less impact than negative ads.

Voting is costly and it varies across voters so some voters might abstain from voting — abstention is cost free. Specifically, voter h incurs cost c_h in order to vote, where c_h is uniformly distributed on $(\underline{c}, \bar{c})$ and distributed independently of voter ideology. I assume that $\underline{c} < 0$ to capture the positive payoff some voters enjoy from exercising their civic duty. Following Adams and Merill III (2003), I consider two margins of abstention: alienation and indifference. Alienation occurs when the utility from the preferred candidate is less than the cost of voting; that is, $\max\{U_{h,t}(D; x), U_{ht}(R; x)\} < c_h$. Indifference arises when the utility difference between the two candidates does not justify incurring c_h, that is $|U_{h,t}(D; x) - U_{h,t}(R; x)| < c_h$.

Candidates can affect the margins of abstention among the viewers of show t through the mix of ads they place in show t, which in turn affect policy salience and candidate valence indexes. Given the ideological makeup of the audience, each candidate chooses a bundle of ads in order to mobilize their own base and demobilize the opposing one. That is, within tv-show t candidate D chooses a bundle of ads (q_t^D, p_t^D, n_t^D) to maximize the votes they receive $s_t(D)$ and minimize the votes that R receives $s_t(R)$. Thus, D's solves

$$\max_{q_t^D, p_t^D, n_t^D} s_t(D) - s_t(R), \text{ subject to } q_t^D + p_t^D + n_t^D \leq B_t^D, \tag{2}$$

where B_t^D are the total ads by candidate D in show t. The maximization problem of candidate R within show t is defined analogously. Taking B_t^D and B_t^R as given, the solutions to (2), and the analogous problem for R, define a Nash equilibrium for the bundle of ads within show t.

I show that the additive separability of opposing candidate ads in $a_{h,t}^k$ and $V_{h,t}^k$ implies that each candidate has a dominant strategy. As a result, within show t, I define a *dominant strategy equilibrium*. That is, each candidate's best response depends solely on the tv show characteristics, i.e., expected viewer average ideology, and not on opponent's strategy. The model is set up so that candidates target audiences and any correlation between the ads of opposing candidates derives solely from the differential targeting of the audience by the

candidates.

My model is concerned with the targeting of voters and the mix of ads within a show by opposing candidates. In other words, I do not explicitly solve for the distribution of ads B_t^k across shows. Solving for B_t^k requires assumptions about both the distribution of voter ideologies within and across shows, and the size of the audience in each show. Moreover, the main mechanism of my theory is the tailoring of ads in order to manipulate the margins of abstention given the ideological makeup of the audience. While the intensity of ads is also a form a targeting, it is a secondary mechanism in the present model. However, one should expect candidates to not advertise on shows with small audience sizes, and on shows populated by voters that are very closely ideologically aligned with the opponent. Such voters are harder to demobilize as they require significant investment in advertising.

Parametric Assumptions

In the current section, I impose parametric assumptions that I use to derive predictions for my empirical analysis. First, I assume that the ideal policy (or ideology) of a voter h can take one of five possible values: $-1, x_D, 0, x_R, 1$. The aggregate distribution of ideology is characterized by function $F_0(x)$. Within tv show t, $\pi_{-1,t}$ of t's viewers have preferred policy position -1, $\pi_{x_D,t}$ prefer position x_D, $\pi_{0,t}$ prefer position 0, $\pi_{x_R,t}$ prefer position x_R, and $\pi_{1,t}$ prefer position 1. Note that all voters watch a tv show. Thus, if $\zeta_t = \pi_{-1,t} + \pi_{x_D,t} + \pi_{0,t} + \pi_{x_R,t} + \pi_{1,t}$, the within show voter distribution $F_t(x)$ must satisfy the following aggregation condition[10]

$$\sum_t^T \zeta_t F_t(x) = F_0(x) \text{ for all } x. \tag{3}$$

I assume that advertising has a quadratic impact on the salience of policy for voter h in tv show t

$$\begin{aligned} a_{h,t}^D &= \begin{cases} A(\alpha - \sigma_1 q_t^D(1 - \frac{\beta_q}{2} q_t^D)), & \text{if } x_h = -1 \text{ or } x_h = x_D \text{ or } x_h = 0, \\ A(\alpha + \sigma_2 q_t^D(1 - \frac{\beta_q}{2} q_t^D) + \sigma_1 q_t^R(1 - \frac{\beta_q}{2} q_t^R)), & \text{if } x_h = x_R \text{ or } x_h = 1, \end{cases} \\ a_{h,t}^R &= \begin{cases} A(\alpha + \sigma_2 q_t^R(1 - \frac{\beta_q}{2} q_t^R) + \sigma_1 q_t^D(1 - \frac{\beta_q}{2} q_t^D)), & \text{if } x_h = 0 \text{ or } x_h = x_D, \\ A(\alpha - \sigma_1 q_t^R(1 - \frac{\beta_q}{2} q_t^R)), & \text{if } x_h = 0 \text{ or } x_h = x_R \text{ or } x_h = 1. \end{cases} \end{aligned} \tag{4}$$

Here q_t^k reflects the policy ads by candidate $k \in \{D, R\}$ on tv show t. The value $A \cdot \alpha$ captures the initial importance of ideology/policy, while weights σ_1 and σ_2 capture the potency of ads in affecting how voters perceive policy differences between them and the candidates. Policy

[10] Let $\underline{\zeta} = \min_t \zeta_t$, then we must have $T \leq 2\kappa/\underline{\zeta}$ since $1 \geq \sum_t^T \zeta_t/(2\kappa) \geq T\underline{\zeta}/(2\kappa)$.

ads are assumed to have diminishing marginal returns, so that $\beta_q > 0$.

In the analysis that follows, I set $\sigma_1 = 1$ and $0 < \sigma_2 \leq 1$. Assuming $\sigma_1 = 1$ proxies for a form of persuasion from the candidate's base; for example, candidate D's policy ads q_t^D decrease $a_{h,t}^D$ and increase $a_{h,t}^R$ with D's base. Conversely, $\sigma_2 > 0$ implies that k's policy ads increase k's distance with the opponent's base. After I characterize the optimal number of policy ads, I briefly discuss how the results change if instead $\sigma_1 = -1$, and/or $\sigma_2 < 0$.

Note that k's policy ads do *not* affect how the opponent's base perceives the opponent's policy positions. However, the main theoretical results presented below are robust to this assumption.

I assume that positive and negative advertising affect candidate valence according to

$$V_{h,t}^D = V_D(v + p_t^D(1 - \frac{\beta_p}{2} p_t^D) - \delta \cdot n_t^R),$$
$$V_{h,t}^R = V_R(v + p_t^R(1 - \frac{\beta_p}{2} p_t^R) - \delta \cdot n_t^D),$$

where $p_{k,t}, n_{k,t}$ refer to positive valence and negative valence (attack) ads by candidate $k \in \{D, R\}$ in tv show t. Value $V_k \cdot v$ is the initial valence index (i.e., endowment) of candidate k, and δ reflects the potency of negative advertising. I assume that $\delta < 1$. The effects of positive valence ads are characterized by diminishing marginal returns, so that $\beta_p > 0$. Negative ads have constant effects. Note that assuming constant returns to negative ads allows for simpler expressions of the optimal mix of ads within shows. However, if negative ads have diminishing marginal returns, the explicit solutions about the distribution of expenditures across shows can be derived.

2.2 Discussion: Interpretation of utility

Adams and Merill III (2003) examine U.S. elections and document the existence of different groups of voters (or partisans). Some voters have sharp policy preference and they strongly favor one candidate. Others have weaker policy preferences and smaller utility differences between opposing candidates. Both groups have members that abstain from voting, and it is important to account for this empirical fact and to understand how politicians target their advertising to these different groups of voters.

To address this, I consider a model in the spirit of Adams and Merill III (2003) that features abstention by alienation as well as indifference. As described above, alienation arises if the *utility from the favored candidate* is below a voter-specific threshold, and indifference occurs when the *utility difference between the candidates* is below the same threshold. Heavily

ideological voters abstain due to alienation, while moderate voters are more likely to abstain due to indifference.

As defined, the two margins of abstention create a tension in the consistency of the interpretation of voter utility. In my model, I assume voters derive utility from the process of voting rather than the potential election outcomes. Abstaining from alienation is consistent with this interpretation. However, labeling voters, who abstain because they weakly prefer a candidate, as indifferent implies that they are outcome-orientated voters. If a voter cares only about voting, then the utility difference is irrelevant.

This discrepancy can be resolved in multiple ways that are consistent with my model. First, I can assume two different sub-populations: one group cares about the process of voting, and the other cares about election outcomes. The former group abstains from alienation, and the latter group abstains from indifference. As I show in Appendix D, the model in the main text is a special case of this version with equal proportions of each type of voter. If the proportions are not equal, the model remains qualitatively the same but becomes significantly less analytically tractable and only numerical solutions are obtained. These numerical solutions yield the same testable predictions. In addition, testable predictions emerge by varying the relatives shares of the two sub-populations. However, these predictions can not be tested because I have no way to measure the shares of each population in the data.

Second, I can extend the definition of alienation to consider both the utility from the preferred candidate as well as the disutility from the opponent. This would make alienation consistent with outcome based voting, and it would impact fringe voters. If the magnitude of disutility from the opponent exceeds the utility from the preferred candidate, candidates would target more negative advertising to the fringe base. The last possibility entails re-interpreting voting costs as stochastic preference shifters capturing mental agony from voting for the wrong candidate. Thus, moderate voters abstain because they are "indifferent" in the sense that their assessment of the two candidates is very similar.

2.3 Analysis

Within tv-show t, voters who prefer candidate D over R are considered to be D's base. Voter h with ideology x_h prefers D over R if

$$\epsilon_{h,R} \leq \tilde{\epsilon}_t(x_h) = a^R_{h,t}|x_h - x_R| - a^D_{h,t}|x_h - x_D| + V^D_{h,t} - V^R_{h,t}. \tag{5}$$

Voter h is an alienated member of D's base if $U_{h,t}(R;x_h) < U_{h,t}(D;x_h) < c_h$. Thus, the share of D's base with ideology x watching show t that is alienated is

$$A_t(D;x) = \frac{\bar{c} - U_{h,t}(D;x)}{\bar{c} - \underline{c}}.$$

In contrast, a voter is indifferent about voting if the utility difference between two candidates is small relative to their cost of voting. That is, voter h prefers D but is indifferent about voting if $U_{h,t}(D;x_h) - U_h(R;x_h) < c_h < U_{h,t}(D)$. Thus, the share of D's base in tv show t who have ideology x that abstain due to indifference is (assuming $U_{h,t}(R;x) > 0$ for all h at x, see below),

$$I_t(D;x) = E\left[\frac{U_{h,t}(R;x)}{\bar{c} - \underline{c}}\right] = \frac{\mathcal{U}_t(R;x)}{(\bar{c} - \underline{c})} + \frac{\bar{\epsilon} + \underline{\epsilon}}{2(\bar{c} - \underline{c})}.$$

Here $\mathcal{U}_t(R;x) = -a_t^R|x_R - x| + V_t^R$ is the direct utility from voting for R. Implicit in the derivation of $A_t(D;x)$ and $I_t(D;x)$ is the assumption that viewers of show t who have the same ideology x also have the same values for a_t^k and V_t^k. Analogously, the alienation and indifference shares for candidate R with the viewers of t are

$$A_t(R;x) = E\left[\frac{\bar{c} - U_{h,t}(R;x)}{\bar{c} - \underline{c}}\right] = \frac{\bar{c} - \mathcal{U}_t(R;x)}{(\bar{c} - \underline{c})} - \frac{\bar{\epsilon} + \underline{\epsilon}}{2(\bar{c} - \underline{c})},$$
$$I_t(R;x) = \frac{U_{h,t}(D;x)}{\bar{c} - \underline{c}},$$

for all x.

Alienation among k's base decreases in the utility $U_{h,t}(k;x_h)$ that they derive from voting for k. Conversely, indifference among k's base increases in the utility the base derives from voting for the opponent. Thus, by increasing the utility voters get from voting for them, k reduces own alienation, and increases opponent indifference. Given the ideological differences in these two groups, a different mix of ads is needed to achieve both two goals. Similarly, candidate k can minimize own indifference and increase opponent alienation by reducing the utility voters derive from voting for the opponent. As I show below, the ideological differences between the two groups inform how the candidate varies the ads between the two groups.

From equation (4), viewers of show t with ideologies $x \leq x_D$ have the same policy salience parameters a_t^k and the same valence indexes V_t^k. Similarly, viewers of t with ideologies x_R also share a_t^k and V_t^k. Thus,it follows that $U_t(D;-1) < U_t(D;x_D)$ and $E[U_t(R;-1)] < E[U_t(R;x_D)]$. That is, voters located at $x = -1$ and $x = 1$ are relatively more likely to abstain due to alienation than indifference. In contrast, voters with ideology $x = x_D$ and

$x = x_R$ are relatively more likely to abstain because they are indifferent.

Assumption 1. *$A(1 + x_R) > (\bar{\epsilon} + V_R \cdot v)/\alpha$ and $A(1 - x_D) > V_D \cdot v/\alpha$.*

Assumption 2. *(i) $A(x_R - x_D) < (\underline{\epsilon} + V_R \cdot v)/(\alpha + 1/\beta_q)$; and,*

(ii) $A(x_R - x_D) > \max\{(-\underline{\epsilon} + (V_D - V_R)v + \delta V_R \bar{B})/\alpha,\ (\bar{\epsilon} + (V_R - V_D)v + \delta V_D \bar{B})/\alpha\}$ with $V_R(v - \delta\bar{B}(1 + \alpha\beta_q)) + \underline{\epsilon} > 0$, and $\bar{B} = 1/\beta_q + 1/\beta_p$.

Assumption 3. *$A(x_R - x_D) > \delta V_R$ and $A(x_R - x_D) > \delta V_D$.*

Assumptions 1 and 2 add more structure and reduce the number of cases to consider streamlining the analysis. Under Assumption 1, fringe voters — $x_D = -1$ and $x_R = 1$ — can abstain due to alienation, but not due to indifference. Similarly, Assumption 2 implies that voters with ideology $x \leq x_D$ either abstain or vote for D, and voters at $x \geq x_R$ either abstain or vote for R. Thus, only voters with ideology $x = 0$ switch their candidate choice based on the ads they consume and the idiosyncratic shock ϵ_h^R (i.e., marginal voters).[11] Together, Assumptions 1 and 2 are consistent with a structure derived with a continuous x: a marginal voter located between the two candidates, moderate voters who can be indifferent about voting, and heavily ideological voters who can be alienated. Moreover, $U_{h,t}(R; x_D)$ and $U_{h,t}(D; x_R)$ are positive under Assumption 2. Assumption 3 ensures that candidates do not use only negative advertising by imposing enough ideological difference between the candidates such that policy ads motivate some voters.

Among the viewers of show t, candidate D receives

$$\begin{aligned} s_t(D) = {} & \pi_{-1,t}\left(1 - A_t(D; -1)\right) + \pi_{x_D,t}\left(1 - A_t(D; x_D) - I_t(D; x_D)\right) \\ & + \pi_{0,t}\frac{\tilde{\epsilon}(0) - \underline{\epsilon}}{\bar{\epsilon} - \underline{\epsilon}}\left(1 - A_t(D; 0) - I_t(D; 0)\right) + (\pi_{x_R,t} + \pi_{1,t}) \cdot 0, \end{aligned} \tag{6}$$

votes. Viewers with ideology $x = -1$ either vote for D or they are alienated. Voters at $x = x_D$ vote for D if they vote, but they can be indifferent or alienated. From equation (18), share $\tilde{\epsilon}(0)$ of centrists (i.e., $x = 0$) prefer D over R. Of those, share $A_t(D; 0)$ have high voting costs, and share $I_t(D; 0)$ consider the candidates too similar.

Analogously, the number votes R receives from show t is

$$\begin{aligned} s_t(R) = {} & (\pi_{-1,t} + \pi_{x_D,t}) \cdot 0 + \pi_{0,t}\frac{\bar{\epsilon} - \tilde{\epsilon}(0)}{\bar{\epsilon} - \underline{\epsilon}}\left(1 - A_t(R; 0) - I_t(R; 0)\right) \\ & + \pi_{x_R,t}\left(1 - A_t(R; x_R) - I_t(R; x_R)\right) + \pi_{1,t}\left(1 - A_t(R; 1)\right). \end{aligned}$$

[11] Equivalently, I can assume that only voters with ideology $x = 0$ experience an idiosyncratic shock ϵ_h^R. Under this framework, ϵ_h^R can be interpreted as uncertainty about the preferences of centrist voters.

Within tv-show t candidate D chooses a bundle of ads (q_t^D, p_t^D, n_t^D) to maximize the votes they receive and minimize the votes R receives; that is, solve equation (2) reflecting the dominant strategy nature of the equilibrium.

Proposition 1. *A unique solution exists within show t. Denote $\zeta_t = \pi_{-1,t} + \pi_{x_D,t} + \pi_{0,t} + \pi_{x_R,t} + \pi_{1,t}$.*

If $\pi_{-1,t}/\zeta_t$ or $\pi_{x_D,t}/\zeta_t$ is sufficiently large, then $q_t^D > 0$. Similarly, if $-A \cdot x_D > \delta \cdot V_R$ and $\pi_{0,t}/\zeta_t$ is sufficiently large, then again $q_t^D > 0$. If $\pi_{x_R,t}$ or $\pi_{1,t}$ are sufficiently large, then $q_t^D = 0$.

If $\pi_{-1,t}/\zeta_t$ is sufficiently large then $p_t^D > 0$. Similarly, if $\delta < V_D/V_R$ then $p_t^D > 0$ if either of $\pi_{x_D,t}/\zeta_t, \pi_{0,t}/\zeta_t$ or $\pi_{x_R,t}/\zeta_t$ is sufficiently large. Conversely, $q_t^D = 0$ if $\pi_{1,t}/\zeta_t$ is sufficiently large.

Policy and positive valence ads by R, q_t^R and p_t^R, are defined analogously.

The number of negative valence ads by candidate k in show t is given by $B_t^k - q_t^k - p_t^k$. Proposition 1 suggests that opposing candidates target policy ads to their respective bases, and thus different audiences. Centrists are targeted with *some* policy ads if they are sufficiently effective at persuading marginal voters to switch choice of candidate relative to negative valence ads. No policy ads are targeted to shows watched mostly by the opponent's base. If $\sigma_2 < 0$ in a_t^k (equation (4)), then policy ads persuade the opposing base, and some policy ads are targeted to the opponent's moderate base in order to increase indifference.

Heavily ideological (fringe) voters are targeted with positive valence ads by their preferred candidate. Candidate k targets positive valence ads to moderate voters of all bases if they are sufficiently effective relative to negative valence ads. Emphasizing positive traits with moderate voters shrinks the indifference margin of the base (since they are more likely to be indifferent), and expands opponent's indifference margin. Again no positive valence ads are directed towards shows seen mostly by the opponent's fringe base.

Tv shows that are overwhelmingly watched by the opponent's base, especially the fringe one, are targeted with ads underscoring the negative attributes of the opponent. Among moderate voters this increases indifference, and among the fringe votes it increases alienation.

Proposition 2. *Denote $\zeta_t = \pi_{-1,t} + \pi_{x_D,t} + \pi_{0,t} + \pi_{x_R,t} + \pi_{1,t}$.*

Then, policy ads q_t^D: (i) always increase in $\pi_{-1,t}$; (ii) increase in $\pi_{x_D,t}$ if $\pi_{x-1,t}/\zeta_t$ is not too large; (iii) increase in $\pi_{0,t}$ if either $\pi_{-1,t}/\zeta_t$ and $\pi_{x_D,t}/\zeta_t$ are small, or if either of $\pi_{x_R,t}/\zeta_t$ and $\pi_{1,t}/\zeta_t$ is sufficiently large; (iv) always decrease in $\pi_{x_R,t}$ and $\pi_{1,t}$.

Moreover, q_t^D increases in $x_R - x_D$ if $\sigma_2 < \pi_{x_D,t}/\pi_{x_R,t}$; is independent of V_D but decreases in V_R. Finally, q_t^D is independent of B_t^D, but decreases in σ_2 and δ, and increases in A.

Proposition 3. *Positive valence ads p_t^D: (i) increases in $\pi_{-1,t}$; (ii) increase in $\pi_{x_D,t}$, $\pi_{0,t}$ and $\pi_{x_R,t}$ if $\pi_{-1,t} < \pi_{1,t}$; and, (iii) decrease in $\pi_{1,t}$. The effects are proportional to $\delta V_R/V_D$.*

Moreover, p_t^D is independent of $x_R - x_D$, A and B_t^D; increases in V_D, and decreases in V_R and δ.

Candidates target most policy and valence ads to their fringe base (Propositions 2 and 3). The former follows from $\sigma_1 = 1$ in the definition $a_{h,t}^k$ in equation (4). If instead $\sigma_1 \leq 0$, then policy ads fail to reduce the ideological concerns of fringe voters, and as a result, no policy ads are targeted to them. These fringe voters abstain only from alienation, and thus k combines policy and positive valence ads to boost the utility they derive from voting for them. In fact, if show t contains only fringe voters, candidate k targets $1/\beta_q$ policy ads, $1/\beta_p$ policy ads and zero negative valence ads.

Voters, who align ideologically with k (i.e., x_D for candidate D), are targeted with the next most policy ads. Policy ads decrease the salience of ideological differences between a candidate and their base, and increase it between their base and the opponent. For voters at x_D, the first channel is turned off. Hence, the marginal benefit from policy ads is higher with voters at $x = -1$ relative to voters at $x = x_D$. Accordingly as the share of viewers with ideology x_D increases, the number of policy ads increases only when the increase of their share is at the expense of more right-wing ideologies (i.e., $x \geq 0$). Similarly, the number of policy ads by D increase in the share of centrist voters, $x = 0$, if again this higher share reduces the share of more right-wing ideologies, $x \geq x_R$. In contrast, policy ads decrease in the share of voters with ideology $x \geq x_R$.

As discussed above, moderate voters of all bases are relatively more likely to abstain from indifference. This means that the utility voters get from both candidates matter. Positive valence are used if they are effective (Proposition 1), and they increase in the share of moderate voters if the ratio of $x = -1$ voters does not decrease relative to $x = 1$.

Overall, candidates mobilize their own base by targeting policy and positive valence ads in the shows watched by the base. However, as the ideological makeup of the audience tilts towards the opponent's base, candidates decrease their policy and positive valence advertising. Instead, they switching to negative advertising in an effort to increase abstention with the opponent's base.

Finally, if the ideological gap between opponents widens, candidates increase policy advertising in shows watched by their base, and decrease it otherwise.[12] Higher initial own valence implies more positive advertising, whereas higher initial opponent valence results to

[12]In a variation of the model with diminishing returns to negative advertising, I find that positive valence ads move in the opposite direction of policy ads when the ideological gap increases.

less policy and positive valence advertising.

Discussion: Ad intensity and testable predictions

My model as presented above is linear in the number of ads in a show. To see this, notice that constant effects for negative ads imply that the value function in (2) is linear in B_t^k. As a result, I cannot solve for an interior solution for B_t^k. Allowing for diminishing marginal returns to negative ads, yields an interior solution. However, as I mentioned above this requires strong assumptions about the distribution of voters within and across tv shows, and the size of the audiences. Since this is a secondary form of targeting, I avoid this analysis in the current paper.

Instead, I briefly describe a solution algorithm for B_t^k. Specifically, candidates rank tv shows based on their expected contribution to k's probability of winning. The expected contribution clearly depends on the ideological makeup of the audience and the size of the audience. Ads are then assigned to shows according to this ordering. Imposing that no tv show is watched by more than half of the electorate suffices for candidates to want to advertise in multiple shows. That is,

$$\max_t \zeta_t < \sum_t \zeta_t/2,$$

where $\zeta_t = \pi_{-1,t} + \pi_{x_D,t} + \pi_{0,t} + \pi_{x_R,t} + \pi_{1,t}$. Next, notice that the optimal number of policy and positive valence ads is independent of B_t^k (number of ads in show t) — Propositions 2 and 3. However, the number linear nature of negative valence ads is $B_t^k - q_t^k - p_t^k$, which can cause an indeterminacy when B_t^k is continuous. Either assuming diminishing marginal returns to negative ads or binary B_t^k addresses this concern. Proceeding in this fashion and imposing further distribution assumptions would characterize the distribution of ads across shows.

The above procedure may yield some boundary solutions in which candidates do not place ads on certain shows. As discussed above, these are most likely shows with small audience size or shows populated by voters that very closely ideologically aligned with the opponent.

Overall, the testable predictions of my model can be summarized as follows:

P1: Opposing candidates' ads of the same type —policy, positive valence, and negative valence— are negatively correlated.

P2: A candidate's policy ads are negatively correlated with the opponent's positive valence

ads.

P3: Certain viewer demographics should be targeted by different type of ads by opposing candidates.

P4: As ideological distance between opponents increases, the probability that candidates advertise policy in different shows increases.

P5: Candidates are more likely to target policy and positive valence ads in shows that the opponent does not advertise or uses negative valence ads.

3 Empirical Analysis

3.1 Data

I use multiple data sets to construct the database utilized to test for the theoretical predictions of my model: (i) the Wisconsin Advertising Project and the Wesleyan Media Project data on political advertising (Goldstein et al., 2011; Fowler et al., 2014, 2015, 2017); (ii) polling and voting data from Real Clear Politics; (iii) audience demographic data from the Gfk MRI "Survey of the American Consumer"; (iv) Sood (2016) and American Consumer Survey (Bureu, 2010, 2012) data on the county composition of Designated Market Areas (DMAs); (v) Adam Bonica's Database on Ideology, Money in Politics, and Elections (DIME) (Bonica, 2016). I summarize the different data sets in turn.

Advertising and Shows

The Wisconsin Advertising Project (WAP) and Wesleyan Media Projects (WMP) databases contain the universe of political advertising on television in the U.S. for 2008 and 2012, respectively. The variables of interest consist of the title of the ad played (i.e., name used to identify a unique ad), the sponsor of the ad, the name of the tv-show, the station, the network affiliate, the media market (DMA), and date and time the ad was played. Although, the state in which a tv station is located is available, I use the media market as the area variable. As I discuss below, viewers within a media market receive the same station offerings, and media markets can spread over multiple states. Thus, a station might be located in a battleground state but not in a battleground market.

Additionally, WAP and WMP provide storyboards and videos of each ad played in 2008 and 2012, which I transcribe to obtain the texts of the different ads.[13] I use these texts to

[13]The Wisconsin Advertising Project provided storyboards, while the Wesleyan Media Project made the

classify each ad as either policy, positive valence or negative valence. Determining the type of each ad is crucial for testing the theoretical predictions. In the model above, an ad has a single type: policy, positive valence or negative valence. In practice, a single ad can touch on multiple themes, which makes classification challenging.

One approach entails classifying ads directly based on their whole text. However, such an approach is prone to errors and inconsistencies. A direct classification does not provide a consistent and unambiguous quantitative measure of the percentage of the ad spent on different topics. Thus, ads that touch on both policy and non-policy issues, and/or contain both positive and negative statements, are likely to be erroneously classified. Similarly, a direct classification is likely to (i) inconsistently interpret statements that are repeated in multiple different ads, and (ii) obfuscate what is considered as a policy and non-policy issue. The latter also implies that direct classification is inflexible when one wants to vary what is considered a policy issue. An alternative approach utilizes resources that classify words into different themes (e.g., NRC Lexicon with positive and negative sentiment words), and counts the number of words in each theme. Ads are then classified based on the size of each theme. Two main issues make such an approach unsuitable for my analysis. First, the classification of words by external resources is not congruent with the policy and non-policy distinction required in the current analysis. Second, this approach misses the context of most statements. For example, ads often quote the opposing candidate in order to either highlight contradictory statements or a disagreement.

Instead, I develop a modular and rule based algorithm for classifying ads that resolves these issues. First, I split the text into individual statements/sentences. For each statement, I compute its size based its on the number of characters, and assign a subject category and tone category based on its content.[14, 15] I also associate statements based on their similarly — number of common words — such that similar statements are consistently classified. The subject categories include topics such as abortion, health-care, leadership, religion and so on — a complete list is given in Appendix C. The tone is either positive, negative or neutral. Next, I find the total size of each (subject and tone) category within each ad, and I designate subject categories as either policy or valence.[16] An ad is defined as a policy ad if the size of

videos available. The storyboards were transcribed using the *PyPDF2* python package, whereas I used the *VLC* and *ffmpeg* shell utilities to decode each video file to an audio file. Microsoft Azure is then utilized to transcribe each audio file.

[14]WAP and WMP provide a set of variables characterizing each ad. However, the default characterization does not achieve the systematic classification needed for my analysis and suffers from the issues discussed with direct classification.

[15]I use Python's NLTK package to break text into sentence tokens which serve as statements.

[16]Some statements are assigned multiple subject categories or tone categories. The size of the statement is split equally into each subject category and tone category.

the policy categories exceeds the size of the valence ones. Otherwise, the ad is classified as a valence ad. Similarly, the size of positive and negative categories determines whether the sentiment of the ad. This approach offers several advantages. First, I provide a quantitative measure of the different topics mentioned in the ad, which allows for consistent classification of ads. Second, it is transparent about what are the policy and non-policy issues. Also, it offers the opportunity to extend the current analysis in multiple ways. It is flexible in the definition of policy and valence categories, and thus, I can examine the differential ad placement of controversial vs non-controversial topics (e.g., abortion vs taxes). Similarly, it allows for a continuous measure of policy and valence within each ad, which can supplement the binary classification. Moreover, the individual statements constitute a rich training set that can be utilized to train machine and deep learning models to predict subject and tone categories for future elections.

In Table 2, I list the policy categories of the current analysis, and in Table 3, I provide examples of sorted statements: Statements 1, 2 and 3 highlight policy issues such as health-care, war and abortion, whereas statements 4 to 8 either emphasize positive character traits of a preferred candidate or negative traits of the opponent. Table 4 summarizes the share of each type of ad used in the presidential and gubernatorial elections of 2008 and 2012.

Next, I define the tv shows in my sample. A unique tv show is identified by the tv show name, affiliate, market (DMA), and time of day. For example, NBC local news in New York is considered a different tv show from NBC local news Chicago. This allows to account for unobserved voter distribution within the different markets.

I only consider political ads in local tv markets since over 99 percent of presidential and gubernatorial ads are in local tv stations.[17] Moreover, I discard ads played during movies or infomercials. The underlying mechanism of my theoretical postulates that regular television programming aggregates political preferences. Movies and infomercials are hard to justify as preference aggregators. Following the Gerber et al. (2011), who find summer ads to be insignificant, I only consider ad plays from September to Election day. For gubernatorial elections, I also require that the ad is played after the parties' primary elections.[18] Finally, I restrict attention to tv shows with a sufficient number of ad plays. Specifically, I require that a show has at least five ad plays per week or at least twenty ad plays when I examine the whole period from September to Election Day.

[17] According to Fowler et al. (2018) two reasons drive this phenomenon. First, local tv stations allow for better targeting of voters during the period under examination. Second, cable and national network ads are prohibitively expensive.

[18] Primaries dates are collected from Ballotpedia and Wikipedia.

DMA Boundaries, Census and American Consumer Survey

Viewers within a Designated Market Area (DMA) receive the same station offerings. Each US county falls within a single DMA in a given year, however a DMA can cross state boundaries. In order to derive the composition of each DMA, I use data from Sood (2016) and the American Consumer Survey from the US Census. Sood (2016) provides the shapefiles of the different DMAs. Building on the observation that each county belongs to only one DMA, I use Census county shapefiles to find if a county falls within a DMA for the given year. This allows me to characterize the composition of each DMA. Then, using American Consumer Survey Census data on county population, I find the percentage of the DMA contained in a state. Expressing DMAs in terms of state participation allows me to attribute polling and viewership data (see below).

Demographics and Viewership

Data on viewer demographics come from the Gfk MRI Survey of the American Consumer for the fall seasons of 2008 and 2012. Each wave is administrated to over 24,000 U.S. adults, and it includes an extensive list of respondent demographics as well as the state of residence. Furthermore, the respondents identify the tv shows they watch among a list of approximately 600 options. Using the mapping of states to DMAs, I use the state of residence of the respondent to assign viewer demographics for shows in the advertising database. Recall that a show is defined in terms of its name and DMA.

The Gfk MRI survey also asks respondents to place themselves in one of five ideological spaces: very liberal, somewhat liberal, middle of the road, somewhat conservative, and conservative. A show's audience's ideology is defined as a weighted average of the different ideological shares times the numeric value corresponding to that ideology: very liberal is mapped to -1, somewhat liberal to $-1/2$, middle of the road to 0, somewhat conservative to $1/2$, and very conservative to 1. Thus, the ideology of show t is defined as

$$\begin{aligned} Ideol_t = &-1 \cdot very\_liberal_t - 0.5 \cdot liberal_t \\ &+ 0 \cdot middle_t \\ &+ 0.5 \cdot conservative_t + 1 \cdot very\_conservative_t. \end{aligned} \tag{7}$$

A show with ideology close to zero could be inhabited by middle of the road viewers or equal number of conservative and liberals. I distinguish between these two cases by defining a binary variable activated when middle of the road viewers are the majority of the viewers.

Similarly, the 2012 Gfk MRI survey records respondents party identification. Using this information, I define a party identification for show t as follows

$$Party_t = -1 \cdot democrat_t + 1 \cdot republican_t. \tag{8}$$

I separately consider the share of independent viewers; that is, viewers who do not identify with either party.

Polling Data

Polling data is collected from the aggregator site Real Clear Politics. This includes all the state polls capturing the intent-to-vote for presidential and gubernatorial elections as well as the final vote for each election. Links to some detailed polls are available, which I follow to obtain favorability scores for gubernatorial candidates. If a link is not working, I use *www.web.archive.org* to reach a live version of the website. For presidential candidates, I use the mapping of states to DMAs to assign a polling score for each candidate in each DMA based on the latest available poll of each state within the DMA.

Using the polling data I focus the analysis of presidential ads to battleground markets. A market is defined as battleground if the weekly polling difference between the candidates is within ten percentage points. Taken together with the requirement of a minimum number of ad plays, I retain 40% of the ad plays in the 2008 presidential election, and 63% of the 2012 presidential ad plays. Similarly, I only consider competitive gubernatorial elections; that is, elections with final vote difference within margin within twenty points. For 2008, this means Indiana, Missouri, Montana, North Carolina, Vermont and Washington gubernatorial elections are considered. For 2012, Indiana, Missouri, Montana, North Carolina, New Hampshire, Utah, Washington and West Virginia are considered. The results presented below are robust to different cutoff definitions.

Candidate Ideological Scores (DIME)

Ideological scores for the gubernatorial candidates are derived from Bonica (2016) DIME database. Bonica leverages contributions to candidates to yield time-invariant ideological scores. Unlike DW-Nominate, the DIME scores are available for every candidate who run for any office in the US during the period between 1979-2014. I use DIME to examine whether ideological distance affects advertising.

3.2 Analysis

In this section, I analyze how politicians vary ad placement and ad content in the 2008 and 2012 election cycles, and present empirical findings consistent with the strategic variation predicted by the theoretical model.

The underlying theoretical mechanism rests on the assumption that tv shows differ in the political makeup of their audience, and that all types of ads — policy, positive and negative valence — are simultaneously being used by candidates. As discussed above, Table 4 summarizes the shares of the different type of ads used by presidential and gubernatorial candidates between September and Election Day. It is clear that all three types of ads are used by politicians during a campaign. Tables 5 and 6, on the other hand, present summary statistics for the average shares of viewer demographics for the tv shows in 2008 and 2012. The standard deviation and inter-quartile range suggest that there is substantial variation in the audience composition of the different shows. Along with Ridout et al. (2012), this serves as justification for assuming that tv shows (stochastically) aggregate political preferences.

In the analysis that follows, I examine presidential and gubernatorial elections separately. For the presidential elections, I consider how the mix of ads by Democratic and Republican candidates varies with audience characteristics. For gubernatorial races, I pool all elections and years, and exploit the variation in the set of candidates to examine the effects of ideological and valence differences on ad strategies. Focusing on these dimensions instead of party labels makes the analysis more interesting and tractable. Moreover, comparing gubernatorial ad strategies based on party labels can produce misleading correlations. Compared to federal candidates, party labels of gubernatorial candidates are less predictive of the ideological distance between them and the opponent's base. Thus, conditioning on party labels can conflate different relationships. Consider, for example, the Democratic gubernatorial candidates in West Virginia versus those in Washington. By a similar reasoning, I pool the 2008 and 2012 elections since I do not anticipate structural changes in the nature of ad strategies by gubernatorial candidates. The 2008 and 2012 presidential elections were analyzed separately since each party was mapped to a single candidate, and each year had a substantial volume of ads.

Presidential Elections

I rely on the intuition and predictions of my theory to guide the analysis. Candidates exploit the aggregation of voter ideologies (demographics) that tv shows induce to tailor ad content in order to target specific components of the voters' utility. The choice of ad content

depends on the audience composition and its margin of abstention. Opposing candidates can advertise in the same show but they should target different parts of the voter's utility. Thus, observable viewer characteristics should be informative about candidate strategies. I use this observation to first examine whether individual demographics, and average show ideology, are differentially being targeted by opposing candidates. Then, I extend the analysis to consider how combinations of demographics are being targeted.

Individual Demographics. In Tables 9, 10, 11 and 12, I estimate the difference in the probability of reaching a specific demographic — overall and with each type of ad — between Democrats and Republicans. A positive value suggests that on average Democrats target that demographic with a specific type of ad more than Republicans. If candidates strategically vary ad placement and ad content in the way my theory predicts, then I should find evidence of demographics being targeted with policy, or positive valence, by one candidate and negative valence by the other.

Tables 9 and 10 consider the presidential election of 2008. In the former, I consider differential targeting of demographics for all the tv shows in the sample, and in the latter I focus on tv shows in which both candidates advertise. Overall, candidates target different demographics with different ads in a way consistent with the predictions of my theory. Combining observations from both tables, I observe that Republicans target male voters with policy ads and female voters with negative valence ads. Equivalently, Democrats target female voters with policy ads and male voters with valence ads. Voter groups such as black voters, middle-aged voters, middle-class voters and non-college graduates (i.e., high school or less, and non college degree holders) are more likely to see ads emphasizing Democratic policy or positive candidate attributes. The same groups see Republican ads attacking the Democratic candidate's valence (i.e., negative valence ads). Conversely, younger voters, homeowners, and college graduates are targeted with more Republican policy and positive valence ads, while Democrats attack the Republican candidate with the same voters. Latino voters are targeted with Republican policy ads, and Democratic valence ads (both positive and negative). These are the unconditional probabilities, and thus could reflect the ideological variation among Latino voters in the U.S.; for example, Cuban-Americans lean Republican whereas Mexican-Americans lean Democratic. Hence, it is possible that Republican policy ads and Democratic negative valence ads are targeted to one sub-population, and the Democratic positive valence to another. In all, I find evidence consistent with the theoretical predictions: opposing candidates deliver different type of ads to the same population in the systematic way discussed above.

I repeat the analysis for the 2012 cycle in Tables 11 and 12. Again, I find evidence

consistent with my theory. White voters experience more Republican policy and positive valence ads, and although statistically insignificant white voters receive more negative Democratic ads. Black and Latino voters are targeted with Democratic policy and positive valence ads, and negative ads by Republicans. Male voters see Democratic positive valence ads and Republican negative valence ads. Equivalently, women voters see Republican positive valence ads and Democratic negative valence ads. The positive attributes of the Democratic candidate are highlighted to middle-aged voters, while Republicans attack the Democratic candidate with the same voters.

When I focus on the demographics that are equally targeted by the two candidates, the results are stronger. In 2008 this refers to Latino voters, male and female voters, younger voters and middle income voters. In 2012 this includes Latino voters, middle-aged voters and richer voters. For these demographics, I find the most consistent evidence with the theory — targeted with policy and positive valence ads by one candidate and negative valence by the other.

Audience Ideology Next I consider the relationship between a tv show's average viewer ideology (as defined in (7)) and candidate strategy. Specifically, I fit the regression equation

$$Y_{t,k} = \alpha + \beta_k^Y \cdot \text{Ideol}_t + \gamma_k^Y \cdot Poll\_RD_t + u_{t,k}, \tag{9}$$

where $Y_{t,k}$ is the share of ad type $Y = \{q, p, n\}$ (i.e., policy, positive valence, negative valence) played in show t by candidate $k = \{D, R\}$. $Poll\_RD_t$ is the polling difference between the Republican and Democratic candidates among the viewers of show t; defined at the market level.

Ideology does not perfectly capture the voting bases. For example, conservative Democrats form a significant part of the Democratic party. However, how voters identify ideologically should be correlated with how they view candidates' policy positions. Ex ante, ideologically liberal voters should be closer in terms of policy to Democrats and more conservative voters should be closer to the Republican policies. My theory then predicts that as the average ideology of a show's audience becomes more conservative, Democrats should be reducing their share of policy and positive valence ads, and increasing the negative valence ads. Republicans should follow the opposite strategy.

In Table 13, I find that in 2008 Democrats decrease their share of policy ads by 3 percentage points (i.e., $\beta_D^q = -0.0292$), or 8 percent less policy ads, as the average ideology of the show's viewers becomes more conservative. Moreover in Table 14, I uncover that as the audience tends more conservative, Democrats decrease their share of positive valence ads

by 3.7 percentage points, and Republicans increase theirs by 7.3 percentage points; that is, $\beta_D^p = -0.037$ and $\beta_R^p = 0.073$. Finally in Table 15, I find that Democrats target more negative valence ads in more conservative shows (i.e., $\beta_D^n = 0.067$), whereas Republicans reduce their negative ads as the audience becomes more conservative (i.e., $\beta_R^n = -0.073$). Overall, I uncover findings consistent with the prediction discussed above: as the average ideology of a show's audience becomes more conservative, Democrats switch from highlighting their policy positions and their positive valence traits to emphasizing their opponent's negative non-policy attributes.

Tailoring to a Bundle of Demographics. So far in the analysis I have tested for targeting of a single demographic characteristic at a time. I now proceed to examine the interplay of all viewer and market demographics, and how they affect candidate advertising. To achieve this, I follow a data driven methodology to classify shows that uses a two-stage process, and avoids a priori restrictions on the relationship between demographics and political preferences.

In the first stage, I estimate the systematic part of candidate's ad strategies given tv show and market characteristics. Specifically, I regress the share of each type of ad on a set of viewer and market demographics. This provide a measure for the tailoring of ads for the specific audience. In the second stage, I calculate the correlation between the ad strategies of opposing candidates.

In the theoretical model, correlations between the ad types of opposing candidates derive purely from the differential targeting of viewer demographics. Examining the correlation between the predicted shares of each type of ad captures the extent of differential targeting of the same audience by opposing candidates. Since the predicted shares depend only on the show characteristics, significant correlation statistics are due to the mechanism of my theory; candidates target demographics with tailored messages to elicit specific reactions. Thus, observed correlations of opposing candidate ad strategies provide a test of the theoretical predictions.

I repeat the analysis for two frequencies of data aggregation: weekly and whole period (i.e., aggregate from September to Election day). The first-stage results are available in the Online Appendix. The second-stage correlations for the weekly predicted shares are estimated in Tables 16 and 17, respectively. The correlations for the aggregated period are shown in Tables 18 and 19, respectively. Candidates have four possible actions in each tv show: no advertisement, negative valence advertisement, positive valence advertisement and policy advertisement. Weekly ad data is a higher frequency, which raises concerns of over-representation of no advertising as a response. Aggregating over the whole period helps ameliorate such concerns.

Consistent with the theory, I find significant negative correlation between the policy ads of opposing candidates with magnitudes between -0.05 and -0.13. Similarly, there is strong negative correlation between the positive valence ads ranging between -0.05 and -0.08. These findings suggest that Democratic and Republican candidates target policy and positive valence to different voters, a pattern consistent with the theoretical predictions presented above. Moreover, I find that a negative correlation exists between the weekly negative valence ads of the opposing candidates, which implies that candidates attack the opponent in different shows than the opponent does.

Policy ads are also negatively correlated with the opponent's positive valence ads. With weekly data, this ranges between -0.09 and -0.10 for 2008, and -0.03 and -0.10 for 2012. Over the whole period, the negative correlation between policy ads and positive valence ranges between -0.10 and -0.13 for 2012. This again is consistent with the theory which predicts that positive valence ads are mostly used to mobilize the alienated base, and policy ads are targeted towards aligned voters. As a result, opposing candidates promote their policy and positive valence ads in distinctly different shows than the opponent. Furthermore, I find that policy and positive valence ads are positively correlated with the opponent's (i) the weekly predicted probability of not advertising, and (ii) negative valence ads over the whole period. The latter ranges between 0.06 and 0.14 for 2008 and 2012, and it is consistent with the prediction that candidates highlight the opponent's negative attributes to demotivate the opponent's base. The former suggests that policy and positive valence is optimal in shows candidates expect the opponent to not advertise.

All in all, the main predictions of the model are consistent with the ad strategies followed by presidential candidates in 2008 and 2012. First, I show that certain demographics are differentially targeted by candidates in way that is consistent with the theory; one candidate favors policy or positive valence, and the opponent negative valence. I also consider how the average ideology of a show's viewers informs the ad strategies of candidates. As predicted by the theory, Democrats are more likely to use policy and positive valence ads in shows with more liberal voters, and negative valence in shows with more conservative viewers. Republicans increase their positive valence advertising in shows with more conservative viewers, and increase their negative valence ads in shows with more liberal viewers. Finally, I find that opposing candidates strategies are correlated in the directions predicted find that opposing candidates strategies are correlated in the directions predicted by the theory.

Gubernatorial Elections

Next, I analyze the ad strategies of gubernatorial candidates in 2008 and 2012. First, I consider how the shares of the different types of ads between opposing opponents correlate. This provides further evidence consistent with the correlations induced by the strategic variation of ad placement and content predicted by the model. Then, I test the theoretical predictions about the effect of valence and ideological distance between opponents on ad strategies.

Correlations. In Table 20, I calculate the correlation between the ad strategies of opposing candidates using, first, the weekly shares of the different ad types, and second, the aggregated shares for the whole period between September and Election day. Similar to the presidential analysis results, the share of policy and positive valence ads between opposing candidates are negatively correlated. Moreover, candidates increase policy and positive valence ads in the shows in which the opponent does not advertise. In other words, opposing candidates highlight their policy positions and emphasize their positive valence traits to different audiences. This is consistent with the theoretical prediction that each candidate targets policy and positive valence to their alienated and indifferent bases.

The correlation patterns of negative valence ads suggest that negative ads are targeted to the opponent's base. First, I find that opposing candidates' negative valence ads are negatively correlated. This implies that each candidate targets their negative ads to a different group of voters than their opponent. Second, a candidate's own share of negative ads is positively correlated with the opponent's share of positive ads and policy ads (for the whole period). This again is consistent with the prediction that candidates target the opponent's base with negative ads in an effort to demobilize them.

Ideology Distance. Next, I consider the effect of ideological difference between opposing candidates on advertising strategies. First, I test the theoretical prediction that candidates increase their share of policy ads and decrease their share of negative valence ads. To capture this, I estimate the regression equation

$$Y_{t,k,s} = \beta^Y \cdot Dime\_Diff_s + u_{t,k},$$

where $Y_{t,k,s}$ is the share of ads of type $Y = \{q, p, n\}$ by candidate k in show t and state s, and $Dime\_Diff_s$ measures the absolute difference between the DIME scores of the two candidates in state s. The results in Table 21 are in line with the theory. As the ideological distance between the opponents widens, candidates increase their share of policy ads and

decrease their share of negative ads; the effect is approximately one for one, $\beta^q = 0.008$ and $\beta^n = -0.012$. No significant effect on positive valence ads exists, which is again consistent with the theory.

Then, I proceed to examine how the probability that opposing candidates use the same type of ad in the same show varies with ideological distance. Specifically, I estimate the regression equation

$$P^Y_{t,s} = \alpha^Y + \beta^Y \cdot Dime\_Diff_s + u_{t,s},$$

where $P^Y_{t,s}$ reflects the probability that opposing candidates in state s both target tv show t with ads of type $Y = \{q, p, n\}$; $Dime\_Diff_s$ again measures the absolute difference between the DIME scores of the two candidates in state s. The results are shown in Table 22.

The probability that both candidates highlight policy or positive traits in the same show decreases by 5 ($\beta^q = -0.052$) and 0.5 ($\beta^p = -0.005$) percentage points, respectively, as the distance between opponents increases. In contrast, it becomes more likely that both candidates use negative ads in the same show, $\beta^n = 0.037$. In terms of the theoretical model, the results in Tables 21 and 22 suggest that candidates mobilize their bases with policy and positive valence ads, and target negative valence ads to the indifferent voters in the middle. As the ideological gap between opponents increases, it becomes easier to motivate the base on the policy dimension. Thus, candidates target even more of their policy ads to their base.

For the last part of the analysis of ideological differences, I estimate the regression equation (10). Specifically, I follow a two-step process analogous to the presidential ads analysis. I instrument the opponent strategies on show, market and election characteristics. Similar to above, this captures how candidates tailor ads to audiences based on their demographics. Thus, the only source of correlation between the ad types of opposing candidates is the targeting of demographics and not the opponent's strategy.

$$\begin{aligned} Y_{t,k,s} = \beta_0 &+ \beta^Y_1 \cdot Opp\_No\_Ads_{t,k,s} + \beta^Y_2 \cdot Opp\_Policy\_Share_{t,k,s} + \beta^Y_3 \cdot Opp\_PosVal\_Share_{t,k,s} \\ &+ \gamma^Y_1 \cdot High\_Ideol\_Dif_{k,s} \cdot Opp\_No\_Ads_{t,k,s} \\ &+ \gamma^Y_2 \cdot High\_Ideol\_Dif_{k,s} \cdot Opp\_Policy\_Share_{t,k,s} \\ &+ \gamma^Y_3 \cdot High\_Ideol\_Dif_{k,s} \cdot Opp\_PosVal\_Share_{t,k,s} \\ &+ u_{t,k,s}. \end{aligned} \tag{10}$$

$Y_{t,k,s}$ again reflects the share of ads of type $Y = \{q, p, n\}$ by candidate k in show t and state s; $High\_Ideol\_Dif_{k,s}$ is an indicator variable equal to one when the absolute difference

in ideology between opposing candidates exceeds two.[19] $Opp\_No\_Ads_{t,k,s}$ captures the probability k's opponent in state s does not advertise in show t, and $Opp\_Policy\_Share_{t,k,s}$ and $Opp\_PosVal\_Share_{t,k,s}$ are the expected share of policy and positive valence ads, respectively, by k's opponent in show t and state s. Coefficients β_1^Y, β_2^Y and β_3^Y capture the effect of the corresponding opponent ad type relative to the opponent's negative valence ads. The results of regression (10) are shown in Table 23. Ideologically distant candidates switch away from policy and positive valence to negative valence when the opponent talks about policy or their positive valence. Specifically, I find that $\beta_2^n + \gamma_2^n = 0.307$ and $\beta_3^n + \gamma_3^n = 0.503$ which suggest that negative ads increase in opponent's policy and positive valence ads. Similarly, $\beta_2^q + \gamma_2^q = -0.373$ and $\beta_3^q + \gamma_3^q = -0.232$, and $\beta_2^p + \gamma_2^p = -0.125$ and $\beta_3^p + \gamma_3^p = -0.065$ imply that a candidate's policy and positive valence ads decrease in the opponent's policy and positive valence ads. Moreover, ideologically distant opponent's are more likely to use more policy and less negative valence ads, in the shows the opponent is least likely to advertise; $\beta_1^n + \gamma_1^n = -0.442$ and $\beta_1^q + \gamma_1^q = 0.419$. In contrast, opposing candidates with small ideological differences both target moderate voters with policy and positive valence ads ($\beta_2^p, \beta_3^q > 0$). However, I also find evidence that even ideologically similar candidates target their extreme base with positive valence ads. To see this, notice that $\beta_1^p > 0$ which suggests that a candidate advertises positive valence in shows where the opponent does not advertise.

Valence Effect Finally, I consider the effect of valence on ad strategies. Specifically, I measure the effect of initial valence stock on how candidates advertise by estimating the regression

$$\begin{aligned} Y_{t,k,s} = \beta_0^Y + \beta_1^Y \cdot Own\_Fav\_Unfav_{t,k,s} + \beta_2^Y \cdot Opp\_Fav\_Unfav_{t,k,s} \quad (11) \\ + \gamma_1^Y \cdot Favored_{t,k,s} \cdot Own\_Fav\_Unfav_{t,k,s} \\ + \gamma_2^Y \cdot Favored_{t,k,s} \cdot Opp\_Fav\_Unfav_{t,k,s} \\ + \theta_k + u_{t,k,s} \quad (12) \end{aligned}$$

where again $Y_{t,k,s}$ reflects the share of ads of type $Y = \{q, p, n\}$ by candidate k in show t and θ_k are candidate fixed effects; $Own\_Fav\_Unfav_{t,k,s}$ measures the difference between the favorables and unfavorables of candidate k in state s; $Opp\_Fav\_Unfav_{t,k,s}$ reflects the same difference for k's opponent. The former proxies for own candidate valence, and the latter for the opponent's valence. Both are lagged by a week to avoid simultaneity. $Favored_{t,k,s}$

[19] The DIME score can take any value on the real line. Setting the cutoff value equal to 2 splits the sample into equal sub-samples. The results are robust to alternative cutoff values.

indicates whether candidate k has higher favorables-unfavorables than their opponent, and it is defined at the state level. The results are presented in Table 24. Consistent with the model predictions, higher own valence increases positive valence ads and decreases negative ones; that is, $\beta_1^n < 0 < \beta_1^p$. In contrast, candidates increases their negative ads and decrease their positive ones as the opponent's valence increases, i.e., $\beta_2^n > 0 > \beta_2^p$. Policy ads are independent of initial valence as the theory suggests.

4 Conclusion

In this paper, I theoretically and empirically examine strategic variation of ad placement and ad content by politicians competing for the same office. I develop a theory of political competition with political advertising and voter abstention, where voters abstain from voting either due to alienation or indifference. For alienated voters the utility of voting for than their preferred candidate is smaller than their cost of voting, whereas for indifferent voters the cost of voting exceeds the utility difference between the two candidates. I show theoretically that politicians use ads to mobilize their base and demobilize the opponent's base. To achieve this, they vary the content of ads in tv shows based on the ideological makeup of the show's viewers and their margin of abstention.

I combine data on political advertising and tv show characteristics to uncover empirical findings consistent with the theoretical predictions. First, I classify each ad used by presidential and gubernatorial candidates in the 2008 and 2012 U.S. election cycles based on its content into one of three types: policy ad (i.e., highlight policy positions), positive valence ad (i.e., emphasize a candidate's positive non-policy traits), and negative valence ad (i.e., attacks on opponent's negative non-policy attributes). I then document that candidates in competitive contests employ all three types of ads simultaneously. Consistent with the theory, I find evidence that candidates target policy and positive valence ads to their base in an effort to mobilize them. In particular, positive valence ads are shown to the alienated base to boost the utility that base derives from voting for their preferred candidate. Negative valence ads are targeted towards indifferent voters and the opponent's alienated base. The former type of voters compares the two candidates, and thus negative ads improve that comparison for the candidate. The latter are skeptical about voting for the opponent, and negative ads reinforce that skepticism.

Finally, consistent with the model I find evidence that as the ideological distance between opposing candidates increases, candidates find it easier to motivate their base with policy ads. As a result, each candidate increases policy advertising with their base but decrease it with everyone else. Also, higher valence candidates switch to a more positive campaign.

The findings in this paper provide a novel mechanism of strategic communication between politicians and voters. Politicians exploit the probabilistic aggregation of political preferences that tv shows induce in order to tailor messages to the different political bases. These messages target specific parts of a voter's utility based on their most likely margin of abstention. By employing this strategy, candidates aim to maximize the turnout of their own political base, and minimize the turnout of the opposing one. This is an important new source of strategic variation of ad placement and ad content that helps to explain the distribution of different types of ads. Moreover, it highlights that when examining the relationship between political advertising and turnout, the type of advertising viewers consume needs to be taken into account.

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5 Appendix

5.1 Appendix A - Proofs

Proof of Proposition 1: Substitute out n_t^D from (2) by using $n_t^D = \bar{B}_t^D - q_t^D - p_t^D$. Since negative ads have constant marginal effects and policy is additively separable from valence, the optimization problem with respect to policy ads q_t^D and p_t^D can be solved separately. Consider first the second-order conditions. Define $S\tilde{O}C_x^q$ and $S\tilde{O}C_x^p$ the second order derivatives for policy and positive valence, respectively, if a show's viewers are exclusive comprised of voters with ideology x. For any show t, we can express the second-order derivative with respect to q_t^D and p_t^D as

$$SOC_t^q = \pi_{-1,t} \cdot S\tilde{O}C_{-1}^q + \pi_{x_D,t} \cdot S\tilde{O}C_{x_D}^q + \pi_{0,t} \cdot S\tilde{O}C_0^q + \pi_{x_R,t} \cdot S\tilde{O}C_{x_R}^q + \pi_{1,t} \cdot S\tilde{O}C_1^q,$$
$$SOC_t^p = \pi_{-1,t} \cdot S\tilde{O}C_{-1}^p + \pi_{x_D,t} \cdot S\tilde{O}C_{x_D}^p + \pi_{0,t} \cdot S\tilde{O}C_0^p + \pi_{x_R,t} \cdot S\tilde{O}C_{x_R}^p + \pi_{1,t} \cdot S\tilde{O}C_1^p,$$

where

$$S\tilde{O}C_{-1}^q = -\frac{(1+x_D)\beta_q}{\bar{c}-\underline{c}}, \qquad S\tilde{O}C_{-1}^p = -\frac{V_D\beta_p}{\bar{c}-\underline{c}},$$
$$S\tilde{O}C_{x_D}^q = -\frac{(x_R-x_D)\beta_q}{\bar{c}-\underline{c}}, \qquad S\tilde{O}C_{x_D}^p = -\frac{V_D\beta_p}{\bar{c}-\underline{c}},$$
$$S\tilde{O}C_0^q = -\frac{x_D(2\underline{c}-\bar{\epsilon}+\underline{\epsilon})\beta_q}{(\bar{c}-\underline{c})(\bar{\epsilon}-\underline{\epsilon})}, \quad S\tilde{O}C_0^p = \frac{V_D(2\underline{c}-\bar{\epsilon}+\underline{\epsilon})\beta_p}{(\bar{c}-\underline{c})(\bar{\epsilon}-\underline{\epsilon})},$$
$$S\tilde{O}C_{x_R}^q = \frac{(x_R-x_D)\sigma_2\beta_q}{\bar{c}-\underline{c}}, \qquad S\tilde{O}C_{x_R}^p = -\frac{V_D\beta_p}{\bar{c}-\underline{c}},$$
$$S\tilde{O}C_1^q = 0 \qquad\qquad S\tilde{O}C_1^p = 0.$$

It follows then that the second-order conditions with respect to q_t^D fails if $\pi_{x_R,t}$ or $\pi_{1,t}$ are sufficiently high. Similarly, the second-order conditions with respect to p_t^D fails if $\pi_{1,t}$ is sufficiently high. Moreover, it is immediate from SOC_t^q and SOC_t^p that a unique solution q_t^D, q_t^D for any show t.

Next, denote $\tilde{q}_x$ and $\tilde{p}_x$ the solution to the first order condition of (2) with respect to q_t^D

and p_t^D, respectively, if a show's viewers are exclusive comprised of voters with ideology x.

$$\begin{aligned}
\tilde{q}_{-1} &= \frac{n^q_{-1}}{d^q_{-1}} = \frac{A(1+x_D)}{A(1+x_D)\beta_q}, & \tilde{p}_{-1} &= \frac{n^p_{-1}}{d^p_{-1}} = \frac{V_D}{V_D\beta_p},\\
\tilde{q}_{x_D} &= \frac{n^q_{x_D}}{d^q_{x_D}} = \frac{A(x_R-x_D)-\delta V_R}{A(x_R-x_D)\beta_q}, & \tilde{p}_{x_D} &= \frac{n^p_{x_D}}{d^p_{x_D}} = \frac{V_D-\delta V_R}{V_D\beta_p},\\
\tilde{q}_0 &= \frac{n^q_0}{d^q_0} = \frac{-Ax_D-\delta V_R}{A(-x_D)\beta_q}, & \tilde{p}_0 &= \frac{n^p_0}{d^p_0} = \frac{V_D-\delta V_R}{V_D\beta_p},\\
\tilde{q}_{x_R} &= \frac{n^q_{x_R}}{d^q_{x_R}} = \frac{-(A(x_R-x_D)\sigma_2+\delta V_R)}{-A(x_R-x_D)\beta_q\sigma_2}, & \tilde{p}_{x_R} &= \frac{n^p_{x_R}}{d^p_{x_R}} = \frac{V_D-\delta V_R}{V_D\beta_p},\\
\tilde{q}_1 &= 0, & \tilde{p}_1 &= 0.
\end{aligned}$$

Then, in show t the generic solutions to the first-order conditions are

$$\tilde{q}^D_t = \frac{(\bar{\epsilon}-\underline{\epsilon})(\pi_{-1,t}\cdot n^q_{-1}+\pi_{x_D,t}\cdot n^q_{x_D}+\pi_{x_R,t}\cdot n^q_{x_R}-\pi_{1,t}\delta V_R)+((\bar{\epsilon}-\underline{\epsilon})-2\underline{c})\pi_{0,t}\cdot n^q_0}{(\bar{\epsilon}-\underline{\epsilon})(\pi_{-1,t}\cdot d^q_{-1}+\pi_{x_D,t}\cdot d^q_{x_D}+\pi_{x_R,t}\cdot d^q_{x_R})+((\bar{\epsilon}-\underline{\epsilon})-2\underline{c})\pi_{0,t}\cdot d^q_0}, \quad (13)$$

$$\tilde{p}^D_t = \frac{(\bar{\epsilon}-\underline{\epsilon})(\pi_{-1,t}\cdot n^p_{-1}+\pi_{x_D,t}\cdot n^p_{x_D}+\pi_{x_R,t}\cdot n^p_{x_R}-\pi_{1,t}\delta V_R)+((\bar{\epsilon}-\underline{\epsilon})-2\underline{c})\pi_{0,t}\cdot n^p_0}{(\bar{\epsilon}-\underline{\epsilon})(\pi_{-1,t}\cdot d^p_{-1}+\pi_{x_D,t}\cdot d^p_{x_D}+\pi_{x_R,t}\cdot d^p_{x_R})+((\bar{\epsilon}-\underline{\epsilon})-2\underline{c})\pi_{0,t}\cdot d^p_0}, \quad (14)$$

Let $\zeta_t = \pi_{-1,t}+\pi_{x_D,t}+\pi_{0,t}+\pi_{x_R,t}+\pi_{1,t}$ denote the number of viewers of show t. If $SOC^q_t < 0$ — $\pi_{x_R,t}/\zeta_t$ and $\pi_{1,t}/\zeta_t$ are sufficiently small — candidate D targets $q^D_t = \max\{\tilde{q}^D_t, 0\}$ policy ads to show t. Similarly, if $SOC^p_t < 0$ — $\pi_{1,t}/\zeta_t$ is sufficiently small — candidate D targets $p^D_t = \max\{\tilde{p}^D_t, 0\}$ policy ads to show t.

The rest of the results follow immediately from definitions (13) and (14) by letting the corresponding ratio $\pi_{x,t}/\zeta_t$ grow. □

Proof of Proposition 2: Suppose $q^D_t > 0$. From (13),

$$\begin{aligned}
\frac{\partial q^D_t}{\partial \pi_{-1,t}} &= \frac{\delta V_R(1+x_D)(\bar{\epsilon}-\underline{\epsilon})}{A\beta_q\cdot K^2}\left[(\bar{\epsilon}-\underline{\epsilon})(\pi_{x_D,t}+\pi_{0,t}+\pi_{x_R,t}+\pi_{1,t})-2\underline{c}\pi_{0,t}\right]\\
\frac{\partial q^D_t}{\partial \pi_{x_D,t}} &= \frac{\delta V_R(\bar{\epsilon}-\underline{\epsilon})}{A\beta_q\cdot K^2}\left[(\bar{\epsilon}-\underline{\epsilon}-2\underline{c})x_R\pi_{0,t}+(\bar{\epsilon}-\underline{\epsilon})\left((x_R-x_D)(\pi_{x_R,t}+\pi_{x_R,t}\sigma_2+\pi_{1,t})-(1+x_D)\pi_{-1,t}\right)\right]\\
\frac{\partial q^D_t}{\partial \pi_{0,t}} &= -\frac{\delta V_R(\bar{\epsilon}-\underline{\epsilon})}{A\beta_q\cdot K^2}(\bar{\epsilon}-\underline{\epsilon}-2\underline{c})\left[(1+x_D)\pi_{-1,t}+x_R\pi_{x_D,t}-((x_R-x_D)\sigma_2-x_D)\pi_{x_R,t}-(-x_D)\pi_{1,t}\right]\\
\frac{\partial q^D_t}{\partial \pi_{x_R,t}} &= -\frac{\delta V_R(\bar{\epsilon}-\underline{\epsilon})}{A\beta_q\cdot K^2}\left[(\bar{\epsilon}-\underline{\epsilon})\left((1+x_D)\pi_{-1,t}+(x_R-x_D)(1+\sigma_2)\pi_{x_D,t}+(x_R-x_D)\sigma_2\pi_{1,t}\right)\right.\\
&\qquad \left.+(\bar{\epsilon}-\underline{\epsilon}-2\underline{c})((x_R-x_D)\sigma_2-x_D)\pi_{0,t}\right]\\
\frac{\partial q^D_t}{\partial \pi_{-1,t}} &= -\frac{\delta V_R(\bar{\epsilon}-\underline{\epsilon})}{A\beta_q\cdot K},
\end{aligned}$$

where

$$K = (\bar{\epsilon} - \underline{\epsilon})((1 + x_D)\pi_{-1,t} + x_R(\pi_{x_D,t} - \sigma_2\pi_{x_R,t}) - x_D(\pi_{x_D,t} + \pi_{0,t} - \sigma_2\pi_{x_R,t})) - 2\underline{c}x_D\pi_{0,t} > 0.$$

Since $\underline{c}, \underline{\epsilon}, x_D < 0$ and $\bar{c}, \bar{\epsilon}, x_R > 0$, the observations in Proposition 2 regarding the effects of $\pi_{-1,t}, \pi_{x_D,t}, \pi_{0,t}, \pi_{x_R,t}$ and $\pi_{1,t}$ follow immediately. Next, consider the effects of varying $\Delta x = x_R - x_D$. Again suppose $q_t^D > 0$, then we can express q_t^D as

$$q_t^D = \frac{1}{\beta_q}\left(1 - \frac{\delta V_R(\bar{\epsilon} - \underline{\epsilon} - 2\underline{c})\pi_{0,t} + (\bar{\epsilon} - \underline{\epsilon})(\pi_{x_D,t} + \pi_{x_R,t} + \pi_{1,t})}{A\left(-(\bar{\epsilon} - \underline{\epsilon} - 2\underline{c})x_D\pi_{0,t} + (\bar{\epsilon} - \underline{\epsilon})((1 + x_D)\pi_{-1,t} + (x_R - x_D)(\pi_{x_D,t} - \sigma_2\pi_{x_R,t}))\right)}\right)$$

Then,

$$\frac{\partial q_t^D}{\partial(x_R - x_D)} = \frac{(\pi_{x_D,t} - \sigma_2\pi_{x_R,t})\delta V_R(\bar{\epsilon} - \underline{\epsilon})\left[(\bar{\epsilon} - \underline{\epsilon})(\pi_{x_D,t} + \pi_{x_R,t} + \pi_{1,t}) + (\bar{\epsilon} - \underline{\epsilon} - 2\underline{c})\pi_{0,t}\right]}{A\beta_q\left(-x_D(\bar{\epsilon} - \underline{\epsilon} - 2\underline{c})\pi_{0,t} + (\bar{\epsilon} - \underline{\epsilon})((1 - x_D)\pi_{-1,t} + (x_R - x_D)(\pi_{x_D,t} - \sigma_2\pi_{x_R,t}))\right)^2}.$$

Thus, $\partial q_t^D/\partial(x_R - x_D) > 0$ if $\pi_{x_D,t} > \sigma_2\pi_{x_R,t}$. The rest of the effects are trivial to derive from (13). If $q_t^D = 0$ then each derivative is zero, hence the claim of increasing, but not strictly increasing. □

Proof of Proposition 3: Suppose $q_t^D > 0$. From (14),

$$\begin{aligned}
\frac{\partial p_t^D}{\partial \pi_{-1,t}} &= \frac{\delta V_R(\bar{\epsilon} - \underline{\epsilon})}{V_D\beta_p \cdot K^2}\left[(\bar{\epsilon} - \underline{\epsilon})(\pi_{x_D,t} + \pi_{0,t} + \pi_{x_R,t} + \pi_{1,t}) - 2\underline{c}\pi_{0,t}\right] \\
\frac{\partial p_t^D}{\partial \pi_{x_D,t}} &= \frac{\delta V_R(\bar{\epsilon} - \underline{\epsilon})^2}{V_D\beta_p \cdot K^2}(\pi_{1,t} - \pi_{-1,t}) \\
\frac{\partial q_t^D}{\partial \pi_{0,t}} &= \frac{\delta V_R(\bar{\epsilon} - \underline{\epsilon})}{A\beta_q \cdot K^2}(\bar{\epsilon} - \underline{\epsilon} - 2\underline{c})(\pi_{1,t} - \pi_{-1,t}) \\
\frac{\partial p_t^D}{\partial \pi_{x_R,t}} &= \frac{\delta V_R(\bar{\epsilon} - \underline{\epsilon})^2}{V_D\beta_p \cdot K^2}(\pi_{1,t} - \pi_{-1,t}) \\
\frac{\partial p_t^D}{\partial \pi_{x_R,t}} &= -\frac{\delta V_R(\bar{\epsilon} - \underline{\epsilon})}{V_D\beta_p \cdot K}
\end{aligned} \tag{15}$$

where

$$K = (\bar{\epsilon} - \underline{\epsilon})(\pi_{-1,t} + \pi_{x_D,t} + \pi_{0,t} + \pi_{x_R,t}) - 2\underline{c}\pi_{0,t} > 0 \tag{16}$$

Since $\underline{c}, \underline{\epsilon}, x_D < 0$ and $\bar{c}, \bar{\epsilon}, x_R > 0$, the observations in Proposition 3 regarding the effects of $\pi_{-1,t}, \pi_{x_D,t}, \pi_{0,t}, \pi_{x_R,t}$ and $\pi_{1,t}$ follow immediately. Similarly, the rest of the effects can be trivially derived. If $p_t^D = 0$ then each derivative is zero, hence the claim of increasing, but not strictly increasing. □

5.2 Appendix B - Empirical Results

Table 2: Policy Categories

Abortion	Bailout
Drilling	Education
Energy/Environment	Government (Budget/Debt/Deficit)
Gun Rights	Healthcare
Immigration	Jobs (Outsourcing)
Nuclear	Regulation
Social Security	Taxes
War	Women Issues

Table 3: Statement Examples

Policy
1. *the biggest problem with american health-care system is that it costs too much*
2. *he wants us to keep spending $10 billion a month in iraq, just like bush.*
3. *senator obama support born-alive infant protections*
Positive Valence
4. *senator mccain, we are a frightened nation. times are tough, and you have the judgment we can believe in.*
5. *he understands the pressures families are under and what it takes to help families thrive*
Negative Valence
6. *"our economy, i think, the fundamentals of our economy are strong", so, so what senator mccain is saying is that the recession is not real.*
7. *on record, for and against*
8. *flip-floppers only hold one position at a time*

Table 4: Share of Types of Ads

Election	Party	Neg Valence	Policy	Pos Valence
Pres 2008	Democrat	0.37	0.38	0.25
	Republican	0.54	0.41	0.05
Pres 2012	Democrat	0.55	0.30	0.16
	Republican	0.67	0.18	0.14
Gub IN 2008	Democrat	0.8	0.00	0.20
	Republican	0.0	0.34	0.66
Gub MO 2008	Democrat	0.46	0.29	0.25
	Republican	0.32	0.26	0.42
Gub MT 2008	Democrat	0.00	0.55	0.45
	Republican	0.87	0.13	0.00
Gub NC 2008	Democrat	0.53	0.09	0.38
	Republican	0.57	0.06	0.37
Gub VT 2008	Democrat	0.55	0.18	0.27
	Republican	0.44	0.00	0.56
Gub WA 2008	Democrat	0.42	0.26	0.32
	Republican	0.63	0.09	0.29
Gub IN 2012	Democrat	0.65	0.08	0.27
	Republican	0.00	0.08	0.92
Gub MO 2012	Democrat	0.39	0.0	0.61
	Republican	0.67	0.2	0.13
Gub MT 2012	Democrat	0.19	0.54	0.27
	Republican	0.63	0.14	0.24
Gub NC 2012	Democrat	0.28	0.43	0.28
	Republican	0.10	0.53	0.37
Gub NH 2012	Democrat	0.40	0.54	0.05
	Republican	0.18	0.55	0.26
Gub UT 2012	Democrat	0.37	0.09	0.54
	Republican	0.00	0.80	0.20
Gub WA 2012	Democrat	0.64	0.14	0.22
	Republican	0.32	0.35	0.33
Gub WV 2012	Democrat	0.48	0.33	0.19
	Republican	0.46	0.14	0.40

5.2.1 Show Demographics

Table 5: Tv Show Demographics 2008

Demographics 2008	N	Mean	St. Dev.	Min	Pctl(25)	Pctl(75)	Max
Ideology: Cons - Liberal	14,530	0.173	0.213	-1.000	0.051	0.278	1.000
Ideology: Majority Middle of Road	14,530	0.074	0.262	0	0	0	1
Party: Republican - Democrat							
Party: Independent							
Very Conservative	14,530	0.116	0.095	0.000	0.054	0.155	1.000
Somewhat Conservative	14,530	0.218	0.136	0.000	0.143	0.266	1.000
Middle of the Road	14,530	0.325	0.144	0.000	0.250	0.391	1.000
Somewhat Liberal	14,530	0.122	0.093	0.000	0.064	0.161	1.000
Very Liberal	14,530	0.039	0.048	0.000	0.002	0.056	0.754
Republican							
Democrat							
Independent							
Male	14,530	0.465	0.194	0.000	0.345	0.590	1.000
Female	14,530	0.535	0.194	0.000	0.410	0.655	1.000
White	14,530	0.777	0.196	0.000	0.706	0.906	1.000
Black	14,530	0.139	0.145	0.000	0.036	0.190	1.000
Latino	14,530	0.075	0.117	0.000	0.002	0.104	1.000
Age 18 34	14,530	0.253	0.169	0.000	0.140	0.328	1.000
Age 35 54	14,530	0.379	0.147	0.000	0.308	0.458	1.000
Age over 55	14,530	0.353	0.182	0.000	0.239	0.458	1.000
Education Less High School	14,530	0.133	0.108	0.000	0.065	0.174	1.000
Education High School	14,530	0.341	0.146	0.000	0.270	0.408	1.000
Education No Degree College	14,530	0.276	0.130	0.000	0.215	0.328	1.000
Education College Graduate	14,530	0.236	0.137	0.000	0.151	0.306	1.000
Household Income less 20k	14,530	0.170	0.133	0.000	0.083	0.224	1.000
Household Income 20-40k	14,530	0.204	0.124	0.000	0.136	0.255	1.000
Household Income 40-60k	14,530	0.185	0.122	0.000	0.116	0.233	1.000
Household Income 60-75k	14,530	0.105	0.084	0.000	0.059	0.138	1.000
Household Income 75-150K	14,530	0.240	0.135	0.000	0.157	0.321	1.000
Household Income Over 150K	14,530	0.081	0.084	0.000	0.022	0.114	1.000
Home ownership	14,530	0.681	0.182	0.000	0.599	0.793	1.000
Home Value Less 50k	14,530	0.033	0.058	0.000	0.000	0.043	1.000
Home Value 50-100k	14,530	0.058	0.065	0.000	0.007	0.086	0.679
Home Value 100-200k	14,530	0.229	0.162	0.000	0.103	0.321	1.000
Home Value Over 200k	14,530	0.334	0.190	0.000	0.204	0.442	1.000

[20]Although fewer shows have matched demographics in 2012, the number of observations in 2012 with matched demographics is almost twice as many as in 2008.

Table 6: Tv Show Demographics 2012

Demographics 2012[20]	N	Mean	St. Dev.	Min	Pctl(25)	Pctl(75)	Max
Ideology: Cons - Liberal	14,354	0.151	0.195	-1.000	0.050	0.255	1.000
Ideology: Majority Middle of Road	14,354	0.032	0.176	0	0	0	1
Party: Republican - Democrat	14,354	-0.042	0.205	-1.000	-0.144	0.070	1.000
Party: Independent	14,354	0.200	0.120	0.000	0.125	0.265	1.000
Very Conservative	14,354	0.105	0.080	0.000	0.052	0.145	0.985
Somewhat Conservative	14,354	0.195	0.115	0.000	0.126	0.253	1.000
Middle of the Road	14,354	0.248	0.126	0.000	0.180	0.310	1.000
Somewhat Liberal	14,354	0.102	0.090	0.000	0.046	0.135	1.000
Very Liberal	14,354	0.048	0.068	0.000	0.004	0.064	1.000
Republican	14,354	0.215	0.130	0.000	0.132	0.291	1.000
Democrat	14,354	0.257	0.134	0.000	0.178	0.321	1.000
Independent	14,354	0.200	0.120	0.000	0.125	0.265	1.000
Male	14,354	0.455	0.194	0.000	0.328	0.607	1.000
Female	14,354	0.545	0.194	-0.000	0.393	0.672	1.000
White	14,354	0.765	0.208	0.000	0.696	0.902	1.000
Black	14,354	0.149	0.158	0.000	0.040	0.204	1.000
Latino	14,354	0.076	0.136	0.000	0.0001	0.089	1.000
Age 18 34	14,354	0.216	0.151	0.000	0.109	0.284	1.000
Age 35 54	14,354	0.347	0.146	0.000	0.275	0.420	1.000
Age over 55	14,354	0.413	0.190	0.000	0.303	0.532	1.000
Education Less High School	14,354	0.104	0.102	0.000	0.041	0.141	1.000
Education High School	14,354	0.334	0.148	0.000	0.248	0.421	1.000
Education No Degree College	14,354	0.287	0.128	0.000	0.220	0.348	1.000
Education College Graduate	14,354	0.252	0.138	0.000	0.163	0.336	1.000
Household Income less 20k	14,354	0.159	0.131	0.000	0.078	0.211	1.000
Household Income 20-40k	14,354	0.206	0.123	0.000	0.135	0.262	1.000
Household Income 40-60k	14,354	0.175	0.108	0.000	0.117	0.221	1.000
Household Income 60-75k	14,354	0.107	0.086	0.000	0.054	0.143	1.000
Household Income 75-150K	14,354	0.253	0.139	0.000	0.162	0.336	1.000
Household Income Over 150K	14,354	0.077	0.084	0.000	0.018	0.102	1.000
Home ownership	14,354	0.712	0.177	0.000	0.661	0.809	1.000
Home Value Less 50k	14,354	0.037	0.052	0.000	0.000	0.055	0.985
Home Value 50-100k	14,354	0.030	0.040	0.000	0.000	0.048	0.647
Home Value 100-200k	14,354	0.303	0.144	0.000	0.219	0.388	1.000
Home Value Over 200k	14,354	0.271	0.172	0.000	0.153	0.361	1.000

5.2.2 Presidential

Table 7: Advertise in same show

Pres 2008	Show without Republican ads	Show with Republican Ads
Show without Democratic ads	0.00	0.13
Show with Democratic ads	0.40	0.47
Pres 2012		
Show without Democratic ads	0.00	0.17
Show with Democratic ads	0.29	0.53

Table 8: Advertise in same show adjusting for volume of ads

Pres 2012	Show without Republican ads	Show with Republican ads
Show without Democratic ads	0.00	0.04
Show with Democratic ads	0.17	0.79
Pres 2012		
Show without Democratic ads	0.00	0.04
Show with Democratic ads	0.09	0.86

Table 9: Difference in Demographic Reach Presidential 2008

Democrat-Republican	Overall	Policy	Positive Valence	Negative Valence
White	$-0.023^{***}(0)$	$-0.024^{***}(0)$	$-0.032^{***}(0)$	$-0.016^{***}(0)$
Black	$0.028^{***}(0)$	$0.043^{***}(0)$	$0.025^{***}(0)$	$0.013^{***}(0)$
Latino	$0.001(1)$	$-0.01^{***}(0)$	$0.021^{***}(0)$	$0.005^{***}(0)$
Male	$0.002(1)$	$0.001(1)$	$0.004(1)$	$0.005 * *(0.013)$
Female	$-0.002(1)$	$-0.001(1)$	$-0.004(1)$	$-0.005 * *(0.013)$
Age 18 34	$0.002(1)$	$-0.008^{***}(0)$	$0.013^{***}(0.002)$	$0.005^{***}(0)$
Age 35 54	$0.007^{***}(0)$	$0.015^{***}(0)$	$0.01^{**}(0.021)$	$0(1)$
Age over 55	$-0.007^{***}(0)$	$-0.004(0.585)$	$-0.02^{***}(0)$	$-0.004^{*}(0.099)$
Education Less High School	$0.004^{***}(0)$	$0.005^{***}(0)$	$0.004(1)$	$0.004^{***}(0)$
Education High School	$0.002^{**}(0.038)$	$0.002(1)$	$-0.009^{*}(0.087)$	$0.004^{***}(0.006)$
Education No Degree College	$0.004^{***}(0)$	$0.003(0.135)$	$0.014^{***}(0)$	$0.002(0.336)$
Education College Graduate	$-0.008^{***}(0)$	$-0.007^{***}(0)$	$-0.006(0.522)$	$-0.008^{***}(0)$
Household Income less 20k	$0.014^{***}(0)$	$0.019^{***}(0)$	$0.016^{***}(0)$	$0.012^{***}(0)$
Household Income 20-40k	$-0.001(1)$	$-0.006^{***}(0)$	$-0.005(1)$	$0.004^{***}(0)$
Household Income 40-60k	$0.003^{***}(0)$	$0.002(1)$	$0.003(1)$	$0.004^{***}(0)$
Household Income 60-75k	$-0.004^{***}(0)$	$-0.002(0.137)$	$-0.004(0.676)$	$-0.004^{***}(0)$
Household Income 75-150K	$-0.005^{***}(0)$	$-0.002(1)$	$-0.006(0.378)$	$-0.007^{***}(0)$
Household Income Over 150K	$-0.005^{***}(0)$	$-0.007^{***}(0)$	$-0.003(1)$	$-0.006^{***}(0)$
Home ownership	$-0.017^{***}(0)$	$-0.014^{***}(0)$	$-0.037^{***}(0)$	$-0.014^{***}(0)$
Home Value Less 50k	$-0.001^{***}(0.004)$	$-0.003^{***}(0)$	$-0.003(0.318)$	$0.001(1)$
Home Value 50-100k	$-0.003^{***}(0)$	$-0.002^{***}(0)$	$0(1)$	$-0.003^{***}(0)$
Home Value 100-200k	$-0.017^{***}(0)$	$-0.018^{***}(0)$	$-0.027^{***}(0)$	$-0.016^{***}(0)$
Home Value Over 200k	$0.003^{**}(0.033)$	$0.008^{***}(0)$	$-0.001(1)$	$0.001(1)$

Table 10: Difference in Demographic Reach When Both Advertise Presidential 2008

Democrat-Republican	Overall	Policy	Positive Valence	Negative Valence
White	$-0.023^{***}(0)$	$0.009^{***}(0)$	$0(1)$	$0.003(1)$
Black	$0.028^{***}(0)$	$0.014^{***}(0)$	$-0.004(1)$	$-0.006^{***}(0)$
Latino	$0.001(1)$	$-0.015^{***}(0)$	$0.014^{***}(0)$	$0.004^{***}(0.008)$
Male	$0.002(1)$	$-0.006 * (0.073)$	$-0.004(1)$	$-0.002(1)$
Female	$-0.002(1)$	$0.006 * (0.073)$	$0.004(1)$	$0.002(1)$
Age 18 34	$0.002(1)$	$-0.014^{***}(0)$	$0.008(1)$	$0.004^{*}(0.096)$
Age 35 54	$0.007^{***}(0)$	$0.012^{***}(0)$	$0(1)$	$-0.003(0.536)$
Age over 55	$-0.007^{***}(0)$	$0.006^{*}(0.088)$	$-0.003(1)$	$0(1)$
Education Less High School	$0.004^{***}(0)$	$-0.005^{***}(0)$	$-0.005(0.948)$	$-0.002(0.649)$
Education High School	$0.002^{**}(0.038)$	$0(1)$	$-0.008(0.944)$	$-0.002(1)$
Education No Degree College	$0.004^{***}(0)$	$0.007^{***}(0)$	$0.014^{***}(0.001)$	$0.001(1)$
Education College Graduate	$-0.008^{***}(0)$	$0.002(1)$	$0.003(1)$	$0.004^{**}(0.034)$
Household Income less 20k	$0.014^{***}(0)$	$0.003(0.695)$	$0.004(1)$	$-0.002(1)$
Household Income 20-40k	$-0.001(1)$	$-0.011^{***}(0)$	$-0.004(1)$	$-0.003(0.351)$
Household Income 40-60k	$0.003^{***}(0)$	$0.007^{***}(0)$	$0.005(1)$	$0.003(0.174)$
Household Income 60-75k	$-0.004^{***}(0)$	$-0.002(1)$	$-0.001(1)$	$-0.002^{**}(0.04)$
Household Income 75-150K	$-0.005^{***}(0)$	$0.007^{***}(0)$	$0.001(1)$	$0.004^{***}(0.002)$
Household Income Over 150K	$-0.005^{***}(0)$	$0(1)$	$-0.002(1)$	$0.001(1)$
Home ownership	$-0.017^{***}(0)$	$0.005(0.116)$	$-0.009(0.84)$	$0(1)$
Home Value Less 50k	$-0.001^{***}(0.004)$	$-0.003^{***}(0)$	$-0.003(1)$	$0.001(1)$
Home Value 50-100k	$-0.003^{***}(0)$	$0.002^{*}(0.081)$	$0.001(1)$	$0.002^{*}(0.084)$
Home Value 100-200k	$-0.017^{***}(0)$	$-0.006^{**}(0.014)$	$-0.007(1)$	$-0.007^{***}(0)$
Home Value Over 200k	$0.003^{**}(0.033)$	$0.019^{***}(0)$	$0.005(1)$	$0.009^{***}(0)$

Table 11: Difference in Demographic Reach Presidential 2012

Democrat-Republican	Overall	Policy	Positive Valence	Negative Valence
White	$-0.016^{***}(0)$	$-0.021^{***}(0)$	$-0.028^{***}(0)$	$-0.013^{***}(0)$
Black	$0.01^{***}(0)$	$0.014^{***}(0)$	$0.007^{***}(0)$	$0.012^{***}(0)$
Latino	0.001(1)	$0.009^{***}(0)$	$0.022^{***}(0)$	$-0.007^{***}(0)$
Male	$-0.004***(0)$	$-0.003(1)$	$0.009***(0)$	$-0.007***(0)$
Female	$0.004***(0)$	0.003(1)	$-0.009***(0)$	$0.007***(0)$
Age 18 34	$0.019^{***}(0)$	$0.022^{***}(0)$	$0.02^{***}(0)$	$0.018^{***}(0)$
Age 35 54	0(1)	0.002(1)	$0.012^{***}(0)$	$-0.004^{***}(0)$
Age over 55	$-0.024^{***}(0)$	$-0.025^{***}(0)$	$-0.037^{***}(0)$	$-0.02^{***}(0)$
Education Less High School	$0.007^{***}(0)$	$0.012^{***}(0)$	$0.011^{***}(0)$	$0.005^{***}(0)$
Education High School	$-0.002^{***}(0.001)$	0.001(1)	$-0.021^{***}(0)$	0.002(0.834)
Education No Degree College	$0.004^{***}(0)$	$0.003^{**}(0.018)$	$0.004^{*}(0.06)$	$0.005^{***}(0)$
Education College Graduate	$-0.014^{***}(0)$	$-0.017^{***}(0)$	0.002(1)	$-0.018^{***}(0)$
Household Income less 20k	$0.012^{***}(0)$	$0.016^{***}(0)$	0(1)	$0.015^{***}(0)$
Household Income 20-40k	$-0.002^{**}(0.021)$	$0.009^{***}(0)$	$-0.003(0.488)$	$-0.004^{***}(0)$
Household Income 40-60k	$-0.003^{***}(0)$	$-0.008^{***}(0)$	$-0.003^{*}(0.052)$	$-0.001(0.742)$
Household Income 60-75k	0(1)	$-0.001(1)$	0.002(0.145)	0(1)
Household Income 75-150K	$-0.014^{***}(0)$	$-0.017^{***}(0)$	$-0.005^{***}(0.006)$	$-0.015^{***}(0)$
Household Income Over 150K	0(1)	0(1)	$0.005^{***}(0)$	$-0.001^{***}(0.009)$
Home ownership	$-0.025^{***}(0)$	$-0.022^{***}(0)$	$-0.026^{***}(0)$	$-0.026^{***}(0)$
Home Value Less 50k	$-0.002^{***}(0)$	$0.001^{**}(0.015)$	$-0.001(1)$	$-0.002^{***}(0)$
Home Value 50-100k	$-0.003^{***}(0)$	$-0.001^{***}(0.001)$	$0.003^{***}(0)$	$-0.004^{***}(0)$
Home Value 100-200k	$-0.005^{***}(0)$	$-0.013^{***}(0)$	$-0.018^{***}(0)$	0.001(1)
Home Value Over 200k	$-0.019^{***}(0)$	$-0.013^{***}(0)$	$0.005^{**}(0.018)$	$-0.027^{***}(0)$

Table 12: Difference in Demographic Reach When Both Advertise Presidential 2012

Democrat-Republican	Overall	Policy	Positive Valence	Negative Valence
White	$-0.016^{***}(0)$	$-0.011^{***}(0)$	$-0.019^{***}(0)$	$0.002(1)$
Black	$0.01^{***}(0)$	$0.005^{**}(0.019)$	$0.001(1)$	$-0.002(0.425)$
Latino	$0.001(1)$	$0.011^{***}(0)$	$0.021^{***}(0)$	$-0.007^{***}(0)$
Male	$-0.004***(0)$	$0.003(1)$	$0.009***(0)$	$-0.003***(0.003)$
Female	$0.004***(0)$	$-0.003(1)$	$-0.009***(0)$	$0.003***(0.003)$
Age 18 34	$0.019^{***}(0)$	$0.012^{***}(0)$	$0.01^{***}(0)$	$0.006^{***}(0)$
Age 35 54	$0(1)$	$0.002(1)$	$0.012^{***}(0)$	$-0.003^{***}(0)$
Age over 55	$-0.024^{***}(0)$	$-0.013^{***}(0)$	$-0.022^{***}(0)$	$-0.008^{***}(0)$
Education Less High School	$0.007^{***}(0)$	$0.009^{***}(0)$	$0.011^{***}(0)$	$-0.001(1)$
Education High School	$-0.002^{***}(0.001)$	$-0.003(1)$	$-0.02^{***}(0)$	$0.002(0.321)$
Education No Degree College	$0.004^{***}(0)$	$0.005^{***}(0)$	$0.005^{***}(0.003)$	$0.007^{***}(0)$
Education College Graduate	$-0.014^{***}(0)$	$-0.011^{***}(0)$	$0.004(0.104)$	$-0.014^{***}(0)$
Household Income less 20k	$0.012^{***}(0)$	$0.008^{***}(0)$	$-0.004^{**}(0.024)$	$0.006^{***}(0)$
Household Income 20-40k	$-0.002^{**}(0.021)$	$0.011^{***}(0)$	$0.003(0.77)$	$-0.004^{***}(0)$
Household Income 40-60k	$-0.003^{***}(0)$	$-0.007^{***}(0)$	$-0.003(0.432)$	$0.002^{**}(0.027)$
Household Income 60-75k	$0(1)$	$-0.002(0.302)$	$0(1)$	$0(1)$
Household Income 75-150K	$-0.014^{***}(0)$	$-0.012^{***}(0)$	$-0.002(1)$	$-0.01^{***}(0)$
Household Income Over 150K	$0(1)$	$0.002(0.154)$	$0.006^{***}(0)$	$0(1)$
Home ownership	$-0.025^{***}(0)$	$-0.009^{***}(0)$	$-0.014^{***}(0)$	$-0.013^{***}(0)$
Home Value Less 50k	$-0.002^{***}(0)$	$0.001(0.11)$	$0(1)$	$-0.003^{***}(0)$
Home Value 50-100k	$-0.003^{***}(0)$	$0(1)$	$0.004^{***}(0)$	$-0.003^{***}(0)$
Home Value 100-200k	$-0.005^{***}(0)$	$-0.008^{***}(0)$	$-0.014^{***}(0)$	$0.007^{***}(0)$
Home Value Over 200k	$-0.019^{***}(0)$	$-0.002(1)$	$0.012^{***}(0)$	$-0.019^{***}(0)$

Table 13: Ideology and Policy

Dependent Variables: Year:	Dem Policy Share (2008)	Rep Policy Share (2008)	Dem Policy Share (2012)	Rep Policy Share (2012)
Variables				
(Intercept)	2.273***	1.324***	0.1768*	-1.723***
	(0.1173)	(0.1825)	(0.0990)	(0.1142)
Ideol	-0.0295*	-0.0223	-0.0090	-0.0004
	(0.0169)	(0.0223)	(0.0115)	(0.0189)
Poll Margin R - D	-1.945***	-0.9457***	0.1298	1.936***
	(0.1188)	(0.1853)	(0.0996)	(0.1162)
Fit statistics				
Observations	19,430	14,064	29,997	23,852
R^2	0.01790	0.00285	0.00014	0.01946
Adjusted R^2	0.01780	0.00270	7.61×10^{-5}	0.01938

Heteroskedasticity-robust standard-errors in parentheses
*Signif. Codes: ***: 0.01, **: 0.05, *: 0.1*

Table 14: Ideology and Positive Valence

Dependent Variables:	Dem Pos Valence Share	Rep Pos Valence Share	Dem Pos Valence Share	Rep Pos Valence Share
Year:	(2008)	(2008)	(2012)	(2012)
Variables				
(Intercept)	0.6386***	-0.2323***	-0.3648***	1.620***
	(0.1090)	(0.0728)	(0.0833)	(0.0966)
Ideol	-0.0371***	0.0079	0.0028	0.0730***
	(0.0142)	(0.0109)	(0.0104)	(0.0119)
Poll Margin R - D	-0.3887***	0.2869***	0.5244***	-1.502***
	(0.1101)	(0.0739)	(0.0839)	(0.0971)
Fit statistics				
Observations	19,430	14,064	29,997	23,852
R^2	0.00136	0.00144	0.00217	0.02565
Adjusted R^2	0.00126	0.00129	0.00210	0.02557

Heteroskedasticity-robust standard-errors in parentheses
*Signif. Codes: ***: 0.01, **: 0.05, *: 0.1*

Table 15: Ideology and Negative Valence

Dependent Variables:	Dem Neg Valence Share	Rep Neg Valence Share	Dem Neg Valence Share	Rep Neg Valence Share
Year:	(2008)	(2008)	(2012)	(2012)
Variables				
(Intercept)	-1.911***	-0.0913	1.188***	1.103***
	(0.1243)	(0.2058)	(0.1249)	(0.1370)
Ideol	0.0666***	0.0144	0.0062	-0.0725***
	(0.0177)	(0.0263)	(0.0142)	(0.0205)
Poll Margin R - D	2.334***	0.6589***	-0.6542***	-0.4343***
	(0.1260)	(0.2090)	(0.1254)	(0.1381)
Fit statistics				
Observations	19,430	14,064	29,997	23,852
R^2	0.02309	0.00114	0.00181	0.00248
Adjusted R^2	0.02299	0.00100	0.00174	0.00240

Heteroskedasticity-robust standard-errors in parentheses
*Signif. Codes: ***: 0.01, **: 0.05, *: 0.1*

Table 16: Second Stage Ad Correlations Presidential 2008

Dem/Rep	Rep No Ads	Rep Neg Valence	Rep Policy	Rep Pos Valence
Dem No Ads	-0.24^{***}	0.16^{***}	0.12^{***}	0.10^{***}
Dem Neg Valence	0.19^{***}	-0.14^{***}	-0.10^{***}	-0.08^{***}
Dem Policy	0.26^{***}	-0.16^{***}	-0.13^{***}	-0.11^{***}
Dem Pos Valence	0.18^{***}	-0.13^{***}	-0.09^{***}	-0.08^{***}

Table 17: Second Stage Ad Correlations Presidential 2012

Dem/Rep	Rep No Ads	Rep Neg Valence	Rep Policy	Rep Pos Valence
Dem No Ads	-0.16^{***}	0.15^{***}	0.06^{***}	0.10^{***}
Dem Neg Valence	0.17^{***}	-0.16^{***}	-0.07^{***}	-0.10^{***}
Dem Policy	0.16^{***}	-0.15^{***}	-0.05^{***}	-0.10^{***}
Dem Pos Valence	0.12^{***}	-0.11^{***}	-0.03^{***}	-0.07^{***}

Table 18: Second Stage Ad Correlations Presidential 2008 (Aggregated Fall)

Dem/Rep	Rep No Ads	Rep Neg Valence	Rep Policy	Rep Pos Valence
Dem No Ads	0.03	-0.06^{**}	-0.05^{**}	0.09^{***}
Dem Neg Valence	-0.03	0.05^{**}	0.06^{***}	-0.10^{***}
Dem Policy	-0.03	0.04	0.01	0.00
Dem Pos Valence	-0.06^{**}	0.09^{***}	0.01	-0.05^{**}

Table 19: Second Stage Ad Correlations Presidential 2012 (Aggregated Fall)

Dem/Rep	Rep No Ads	Rep Neg Valence	Rep Policy	Rep Pos Valence
Dem No Ads	0.03	-0.09^{***}	0.05^{***}	0.10^{***}
Dem Neg Valence	-0.03	0.07^{***}	-0.01	-0.11^{***}
Dem Policy	-0.03	0.10^{***}	-0.05^{**}	-0.10^{***}
Dem Pos Valence	-0.05^{**}	0.14^{***}	-0.13^{***}	-0.05^{*}

5.2.3 Gubernatorial

Table 20: Gubernatorial Ad Correlations

Weekly	Opp No Ads	Opp Neg Valence	Opp Policy	Opp Pos Valence
Own No Ads	-0.395***	0.186***	0.215***	0.231***
Own Neg Valence	0.012***	-0.053***	-0.008***	0.045***
Own Policy	0.150**	-0.062	-0.069***	-0.108***
Own Pos Valence	0.237***	-0.072***	-0.139***	-0.173***
Fall	**Opp No Ads**	**Opp Neg Valence**	**Opp Policy**	**Opp Pos Valence**
Own No Ads	-0.180***	0.094***	0.106***	0.102***
Own Neg Valence	-0.086***	-0.068***	0.110***	0.129***
Own Policy	0.070***	0.046***	-0.068***	-0.114***
Own Pos Valence	0.147***	-0.028***	-0.126***	-0.105***

Table 21: Gubernatorial Effect of Ideological Difference on Own Strategy

Dependent Variables:	Negative Valence Share (1)	Policy Share (2)	Positive Valence Share (3)
Variables			
Dime Diff	−0.012***	0.008***	0.001
	(0.002)	(0.002)	(0.003)
Fit statistics			
Observations	55,448	51,308	51,494
R^2	0.001	0.0003	0.00000
Adjusted R^2	0.0005	0.0002	−0.00005

Heteroskedasticity-robust standard-errors in parentheses
*Signif. Codes: ***: 0.01, **: 0.05, *: 0.1*

Table 22: Gubernatorial Ideological Difference and Probability Same Ad Type

Dependent Variables: Probability On Same Show	Negative Valence (1)	Policy (2)	Positive Valence (3)
Variables			
Dime Diff	0.037***	−0.052***	−0.005***
	(0.001)	(0.001)	(0.0004)
Fit statistics			
Observations	44,706	44,706	44,706
R^2	0.005	0.009	0.0005
Adjusted R^2	0.005	0.008	0.0002

Heteroskedasticity-robust standard-errors in parentheses
*Signif. Codes: ***: 0.01, **: 0.05, *: 0.1*

Table 23: Gubernatorial Ideological Differences (DIME)

Dependent Variables:	No Ad (1)	Negative Valence (2)	Policy (3)	Positive Valence (4)
Variables				
High Dime Diff	−0.290***	0.071***	−0.005	−0.008
	(0.017)	(0.014)	(0.014)	(0.011)
Opp No Ads	−0.231***	−0.552***	0.259***	0.377***
	(0.031)	(0.026)	(0.025)	(0.021)
Opp Policy	0.154***	−0.121***	0.357***	−0.379***
	(0.039)	(0.033)	(0.034)	(0.028)
Opp Pos Val	0.274***	0.335***	−0.447***	0.066***
	(0.030)	(0.028)	(0.020)	(0.022)
High Dime Diff x Opp No Ads	0.641***	0.112***	0.207***	−0.450***
	(0.044)	(0.041)	(0.038)	(0.032)
High Dime Diff x Opp Policy	0.189***	0.409***	−0.709***	0.250***
	(0.055)	(0.048)	(0.043)	(0.038)
High Dime Diff x Opp Pos Val	−0.785***	0.203***	0.181***	−0.114***
	(0.050)	(0.050)	(0.035)	(0.038)
Constant	0.658***	0.505***	0.134***	0.266***
	(0.015)	(0.012)	(0.012)	(0.010)
Fit statistics				
Observations	43,564	43,564	43,564	43,564
R^2	−0.076	−0.632	−0.572	−0.074
Adjusted R^2	−0.076	−0.632	−0.572	−0.074

Standard errors adjusted for IV estimation
*Signif. Codes: ***: 0.01, **: 0.05, *: 0.1*

Table 24: Gubernatorial Effect Own and Opponent Valence

Dependent Variables:	Negative Valence	Policy	Positive Valence
Model:	(1)	(2)	(3)
Variables			
Own valence	-1.115***	-0.3142	1.429*
	(0.3718)	(0.6521)	(0.7624)
Opp valence	1.668***	-0.2783	-1.390**
	(0.2222)	(0.5363)	(0.5759)
Favored	0.2738***	-0.0468	-0.2271**
	(0.0640)	(0.0826)	(0.1010)
Favored × Own valence	0.7568*	0.2585	-1.015
	(0.4144)	(0.7917)	(0.8977)
Favored × Opp valence	-2.115**	1.431	0.6845
	(0.8016)	(0.9279)	(0.9453)
Fixed-effects			
Candidate FE	Yes	Yes	Yes
Fit statistics			
Observations	35,752	35,752	35,752
R^2	0.32013	0.25704	0.22189
Within R^2	0.03699	0.01794	0.03820

Clustered (Candidate FE) standard-errors in parentheses
*Signif. Codes: ***: 0.01, **: 0.05, *: 0.1*

5.3 Appendix C - Additional Data Details

5.3.1 Statement Categories

Table 25: Categories of Statements

Statement Categories		
911/Al Qaeda	Abortion	America
Animal Cruelty	Bailout	Children
Conservative Values	Corruption	Death Penalty
Defense Spending	Drilling	Economic Crisis
Education	Energy/Environment	Equal Opportunity
Extremist	Flip Flopping	Government
Gun Rights	Healthcare	Hunting/Fishing
Immigration	Iran	Islam
Israel	Jobs	LGBT
Latinos	Leadership	Liberal Values
Lying	Middle Class	Other
Race	Racist	Reform/Regulation
Relatable	Religion	Safety
Security	Sensitive	Small Business
Small BusinessVal	Social Security	Taxes
Terrorism	Trade	Troops/Veterans
Vote	War	Welfare
Women	WomenVal	Workers

5.3.2 MRI Demographics

Table 26 lists all the demographics included in the Gfk MRI Survey of the America Consumer. All variables are indicator variables equal to 1 if the respondent satisfies that demographics. Additionally, the population weight variable *wgtpop* provided which I use to weight the demographic variables. Variables related to frequency of voting and party identification are only available in the 2012 survey.

Table 26: Demographics in Gfk MRI Survey of the American Consumer

General Demographics		
Men	State: Delaware/Maryland/Washington, D.C./West Virginia	Ideology: Very Conservative
Women	State: Alabama/Mississippi	Ideology: Somewhat Conservative
Educ: did not graduate HS	State: Arkansas/Louisiana/Oklahoma	Ideology: Middle of the Road
Educ: attended college	State: California	Ideology: Somewhat Liberal
Educ: no college	State: Florida	Ideology: Very Liberal
Educ: graduated high school	State: Georgia	How Often Vote: National Elections: Always
Educ: post graduate	State: Illinois	How Often Vote: National Elections: Sometimes
Educ: graduated college plus	State: Indiana	How Often Vote: National Elections: Never
Age 18-24	State: Kentucky	How Often Vote: Statewide Elections: Always
Age 25-34	State: Maine/New Hampshire/Vermont	How Often Vote: Statewide Elections: Sometimes
Age 35-44	State: Massachusetts	How Often Vote: Statewide Elections: Never
Age 45-54	State: Michigan	How Often Vote: Local Elections: Always
Age 55-64	State: Minnesota/Iowa	How Often Vote: Local Elections: Sometimes
Age 65+	State: Missouri	How Often Vote: Local Elections: Never
Employment: working full time	State: Montana/Idaho/Wyoming/Colorado	Political Party, If Any, Affiliated With: Democratic
Employment: working part time	State: Nebraska/Kansas	Political Party, If Any, Affiliated With: Republican
Employment: not working	State: New Jersey	Political Party, If Any, Affiliated With: Other party
HHI <$20,000	State: New Mexico/Arizona/Utah/Nevada	Political Party, If Any, Affiliated With: Independent
HHI $20-29,999	State: New York	
HHI $30-39,999	State: North Carolina/South Carolina	
HHI $40-49,999	State: North Dakota/South Dakota	
HHI $50-59,999	State: Ohio	
HHI $60-74,999	State: Pennsylvania	
HHI $75-149,999	State: Rhode Island/Connecticut	
HHI $150,000+	State: Tennessee	
HH size: 1	State: Texas	
HH size: 2	State: Virginia	
HH size: 3-4	State: Washington/Oregon	
HH size: 5+	State: Wisconsin	
Home owned		
Home value: <$50,000		
Home value: $50-99,999		
Home value: $100,000-199,999		
Home value: $200-499,000		
Home value: $500,000+		
Race: White		
Race: Black/African American		
Race: American Indian or Alaska Native		
Race: Asian		
Race: Other		
Spanish spoken in home		

5.4 Appendix D - Alternative Theoretical Models

5.4.1 Two Populations of Voters

In this section, I briefly discuss an extension of the basic model that allows for two types of voters. The two groups differ in their source of utility. Share γ of voters are outcome orientated voters, and share $1-\gamma$ derive utility from the process of voting. The former abstain from indifference, whereas the latter abstain from alienation. The voter type is independent of ideology.

The two groups have the same utility functional form given in equation (1) in the main text. Imposing Assumptions 1-3 means that candidate D's receives

$$\begin{aligned} s_t(D) = \pi_{-1,t}\left(1-(1-\gamma)A_t(D;-1)\right) \\ + \pi_{x_D,t}\left(1-(1-\gamma)A_t(D;x_D)-\gamma I_t(D;x_D)\right) \\ + \pi_{0,t}\frac{\tilde{\epsilon}(0)-\underline{\epsilon}}{\bar{\epsilon}-\underline{\epsilon}}\left(1-(1-\gamma)A_t(D;0)-\gamma I_t(D;0)\right) \end{aligned}$$

votes from the viewers of show t. Similarly, R receives

$$\begin{aligned} s_t(R) = \pi_{0,t}\frac{\bar{\epsilon}-\tilde{\epsilon}(0)}{\bar{\epsilon}-\underline{\epsilon}}\left(1-(1-\gamma)A_t(R;0)-\gamma I_t(R;0)\right) \\ + \pi_{x_R,t}\left(1-(1-\gamma)A_t(R;x_R)-\gamma I_t(R;x_R)\right) \\ + \pi_{1,t}\left(1-(1-\gamma)A_t(R;1)\right). \end{aligned}$$

Abstention margins are defined in the main text. Denote $F=(\bar{\epsilon}-\tilde{\epsilon}(0))/(\bar{\epsilon}-\underline{\epsilon})$. Then, D candidate maximizes

$$\begin{aligned} s_t(D)-s_t(R) \propto \pi_{-1,t}(1-\gamma)U_t(D;-1) \\ + \pi_{x_D,t}\left((1-\gamma)U_t(D;x_D)-\gamma U_t(R;x_D)\right) \\ + \pi_{0,t}F(1-2\gamma)(U_t(D;0)-U_t(R;0)) \\ + \pi_{0,t}\left(\gamma U_t(D;0)-(1-\gamma)U_t(R;0)\right) \\ + \pi_{0,t}(2F-1)(\gamma\bar{c}-\underline{c}) \\ + \pi_{0,t}F(1-2\gamma)(\bar{\epsilon}+\underline{\epsilon}) \\ + \pi_{x_R,t}\left(\gamma U_t(D;x_D)-(1-\gamma)U_t(R;x_D)\right) \\ - \pi_{1,t}\gamma U_t(R;1)+K_1, \end{aligned}$$

where K is constant. The corresponding objective function in the main text can be expressed as

$$\begin{aligned} s_t(D) - s_t(R) \propto \pi_{-1,t} U_t(D;-1) \\ &+ \pi_{x_D,t}\left(U_t(D;x_D) - U_t(R;x_D)\right) \\ &+ \pi_{0,t}\left(U_t(D;0) - U_t(R;0)\right) \\ &+ \pi_{0,t}(2F-1)(\bar{c}-\underline{c}) \\ &+ \pi_{x_R,t}\left(U_t(D;x_D) - U_t(R;x_D)\right) \\ &- \pi_{1,t} U_t(R;1) \end{aligned}$$

The two are equivalent when $\gamma = 1/2$ and c_h, c_l are re-normalized.

5.4.2 Negative Voting

My model can readily be extended to allow for a form of negative voting. Specifically, the voter utility in equation (1) can be extended to

$$U_{h,t}(D;x_h) = \mathcal{U}_{h,t}(D;x_h) - \nu \cdot \mathcal{U}_{h,t}(R;x_h) \;\&\; U_{h,t}(R;x_h) = \mathcal{U}_{h,t}(R;x_h) - \nu \cdot \mathcal{U}_{h,t}(D;x_h) + \epsilon_h, \quad (17)$$

where $\mathcal{U}_{h,t}(k;x)$ is the direct utility voter h receives from voting for candidate k. The magnitude of negative voting is captured by $\nu \geq 0$ The direct utility is accordingly.

$$\mathcal{U}_{h,t}(k;x_h) = -a_{h,t,k}|x_h - x_k| + V_{h,t,k},$$

where the components are defined as in the main text.

At ideology x, equation (17) suggests these are voters with realized $\epsilon_{h,R}$ such that

$$\begin{aligned} \epsilon_h \leq \tilde{\epsilon}_t &= U_{h,t}(D;x_h) - U_{h,t}(R;x_h) \\ &= (1+\nu)(\mathcal{U}_{h,t}(D;x_h) - \mathcal{U}_{h,t}(R;x_h)). \end{aligned} \quad (18)$$

Assumptions 1 and 2 can be extended as follows.

Assumption 4. *$\sigma_2 > 0$ and $\bar{\epsilon} = -\underline{\epsilon} = \epsilon$ and*

Assumption 5. $\bar{\epsilon}/(1+v) - aA|x_R - x_D| < v(V_R - V_D) + (\delta V_D - V_R)/2\beta_q - \delta V_D \bar{B}$

Assumption 6. $\underline{\epsilon}/(1+v) + aA|x_R - x_D| > v(V_R - V_D) + (\delta V_D - V_R)/2\beta_p - \delta V_R \bar{B}$

Assumption 7. $\bar{\epsilon} < aA(1 + x_R - \nu(1 + x_D)) - vV_R + \nu(v - \delta B)V_D$ *and* $0 < aA(1 + x_D - \nu(1 + x_R)) - vV_D + \nu(v - \delta B)V_R$

Then, among the viewers of show t, candidate D receives

$$\begin{aligned} s_t(D) = {} & \pi_{-1,t}\left(1 - A_t(D;-1)\right) + \pi_{x_D,t}\left(1 - A_t(D;x_D) - I_t(D;x_D)\right) \\ & + \pi_{0,t}\frac{1+\nu+\epsilon}{2\epsilon}(\mathcal{U}_{h,t}(D;0) - \mathcal{U}_{h,t}(R;0))\left(1 - A_t(D;0) - I_t(D;0)\right) \\ & + (\pi_{x_R,t} + \pi_{1,t}) \cdot 0. \end{aligned} \tag{19}$$

Analogously, the number votes receives from show t is

$$\begin{aligned} s_t(R) = {} & (\pi_{-1,t} + \pi_{x_D,t}) \cdot 0 \\ & + \pi_{0,t}\left(1 - \frac{1+\nu+\epsilon}{2\epsilon}(\mathcal{U}_{h,t}(D;0) - \mathcal{U}_{h,t}(R;0))\right)\left(1 - A_t(R;0) - I_t(R;0)\right) \\ & + \pi_{x_R,t}\left(1 - A_t(R;x_R) - I_t(R;x_R)\right) + \pi_{1,t}\left(1 - A_t(R;1)\right). \end{aligned} \tag{20}$$

Within tv-show t candidate D chooses a bundle of ads $(q_{D,t}, p_{D,t}, n_{D,t})$ to maximize the votes they receive and minimize the votes R receives. Thus, D's solves

$$\max_{q_{D,t},p_{D,t},n_{D,t}} s_t(D) - s_t(R), \text{ subject to } q_{D,t} + p_{D,t} + n_{D,t} \leq \bar{B}_{D,t}. \tag{21}$$

The definitions of utility in equation (17) and abstention areas suggest that $s_t(D) - s_t(R)$ can be expressed as

$$\begin{aligned} s_t(D) - s_t(R) = {} & \pi_{-1,t}\left(\frac{\mathcal{U}_{h,t}(D;-1) - \nu \cdot \mathcal{U}_{h,t}(R;-1)}{\bar{c} - \underline{c}}\right) \\ & + \pi_{x_D,t}\left(\frac{1+\nu}{\bar{c} - \underline{c}}\right)\left(\frac{\mathcal{U}_{h,t}(D;x_D) - \mathcal{U}_{h,t}(R;x_D)}{\bar{c} - \underline{c}}\right) \\ & + \pi_{0,t}\left(\frac{\epsilon - \underline{c}(1+\nu+\epsilon)}{\epsilon}\right)\left(\frac{\mathcal{U}_{h,t}(D;0) - \mathcal{U}_{h,t}(R;0)}{\bar{c} - \underline{c}}\right) \\ & + \pi_{x_R,t}\left(\frac{1+\nu}{\bar{c} - \underline{c}}\right)\left(\frac{\mathcal{U}_{h,t}(D;x_R) - \mathcal{U}_{h,t}(R;x_R)}{\bar{c} - \underline{c}}\right) \\ & + \pi_{1,t}\left(\frac{\mathcal{U}_{h,t}(D;1) - \nu \cdot \mathcal{U}_{h,t}(R;1)}{\bar{c} - \underline{c}}\right) + K, \end{aligned}$$

where K is a constant independent of the candidates ads. It becomes clear that in order to maximize the probability of winning, candidate D must increase the voters' direct utility from voting for them and minimize the direct utility voters derive by voting for the opponent.

The results from the main text extend. I omit the proofs since they are similar in nature with the proofs of the results in the main text.

Proposition 4. *A unique solution exists within show t.*

If $\pi_{-1,t}$ or $\pi_{x_D,t}$ are sufficiently high, then $q_t^D > 0$. Similarly, if $-A \cdot x_D > \delta \cdot V_R$ and $\pi_{0,t}$ is sufficiently high, then again $q_t^D > 0$. If $\pi_{x_R,t}$ or $\pi_{1,t}$ are sufficiently high, then $q_t^D = 0$.

If $\nu\delta < V_D/V_R$, then candidate D always uses positive valence ads, $p_t^D > 0$, in shows with sufficiently high $\pi_{-1,t}$. If $\delta < V_D/V_R$ then D also uses positive valence ads in shows with sufficiently high $\pi_{x_D,t}, \pi_{0,t}$ or π_{xR_t}. If $\nu\delta > V_R/V_D$ then candidate D use positive valence ads with sufficiently high $\pi_{1,t}$.

The number of negative valence ads is given by $B_t^D - q_t^D - p_t^D$.

Allowing for negative voting means that voters care about the utility from both candidates. Thus, candidate D can increase alienation among R's fringe base by using positive valence ads. In this way, D reduces the incentive to vote *against* D and thus increases R's abstention.

Proposition 5. *Suppose $0 < \sigma_2 \leq 1$ and ν is small enough. $q_{D,t}$ increases in $\pi_{-1,t}$ $q_{D,t}$ increases in $\pi_{x_D,t}$ if $\pi_{x\_1,t}$ is not too large. $q_{D,t}$ increases in $\pi_{0,t}$ if $\pi_{-1,t}$ and $\pi_{x_D,t}$ are small enough or if $\pi_{x_R,t}$ and $\pi_{1,t}$ are large enough. $q_{D,t}$ decreases in $\pi_{x_R,t}$ and $\pi_{1,t}$ unless $\pi_{x_R,t}$ is large enough.*

$q_{D,t}$ increase in $x_R - x_D$ if $\sigma 2 < \pi_{x_D,t}/\pi_{x_R,t}$ is. Moreover, $q_{D,t}$ it is unaffected by V_D, but decreases in V_R if positive number of ads. Moreover, $q_{D,t}$ decreases in $_2$ and δ, and increases in A when ads are already positive.

Optimal $q_{D,t}$ are independent of $B_{D,t}$.

Proposition 6. *Suppose $0 < \sigma_2 \leq 1$ and ν is small enough. $p_{D,t}$ increases in $\pi_{-1,t}$. $p_{D,t}$ increases in $\pi_{x_D,t}$, $\pi_{0,t}$ and $\pi_{x_R,t}$ if $\pi_{-1,t} < \pi_{1,t}$. $p_{D,t}$ decreases in $\pi_{1,t}$. The effect are proportional to $\delta V_R/V_D$.*

Positive valence ads $p_{D,t}$ are independent of $x_R - x_D$. They increase in V_D and decrease in V_R. Higher ν increases positive valence ads if $\pi_{-1,t} < \pi_{1,t}$. They also decrease in δ and they are independent of A and $B_{D,t}$.