

Estimating the Persuasive Effects of Advertising in Presidential Primary Elections *

Robert Bird[†]
Michael Peress[‡]

July 2020

Abstract

Presidential primary elections arguably represent the most dynamic campaigns in American politics. Television advertising is a key aspect of strategy that candidates can marshal throughout the campaign. We develop a methodology for measuring the impact of advertising in primary elections that accounts for endogeneity and apply it to the 2000 through 2016 elections. We find that running ads—both positive and negative—improve the favorability of the candidate running the ads, and in the case of negative advertising, lower the favorability of the attacked candidate. We find that negative advertising is more effective than positive advertising in changing intended vote, but that attacked candidates generally do not lose support when attacked. This suggests that the loss in favorability for attacked candidates is partially compensated by increased perceived viability.

*We would like to thank Joe Sandor for excellent research assistance.

[†]University of South Carolina, bird2@mailbox.sc.edu

[‡]SUNY-Stony Brook, michael.peress@stonybrook.edu

1 Introduction

Presidential primary elections arguably represent the most dynamic campaigns in American politics. Recent campaigns have involved large numbers of candidates, with candidates rising from nowhere only to fall back to earth a short time later. To take an extreme example, the 2012 Republican primary saw 9 separate candidates appear as a polling leader, with another 4 appearing in the top-3 candidates.¹ Many campaign events remain outside of the control of the candidates—a scandal from the past may be brought to light, or despite intense efforts, candidates may suffer poor performance in a televised debate. Advertising, however, remains a key aspect of campaign strategy that candidates can marshal throughout the campaign.

Indeed, advertising in general and television advertising in particular has seen a great deal of attention among scholars of American elections. Scholars have studied the persuasive effects of advertising (Franz and Ridout, 2007; Huber and Arceneaux, 2007; Gerber et al., 2011; Gordon and Hartmann, 2013; Lovett and Peress, 2015), the effect of advertising on turnout (Freedman, Franz and Goldstein, 2004; Krasno and Green, 2008), the effects of advertising on campaign donations (Urban and Niebler, 2014), and the effect of negative campaigns (Freedman and Goldstein, 1999; Krupnikov, 2014). While touching on both presidential and House elections, this literature overwhelmingly focuses on general election campaigns which see voters choose between two major party candidates.

Presidential primary elections differ from the elections considered in the literature in two important ways. They lack one of the most important factors in general elections—the party cue. Research has shown that party identification is an important heuristic people use to make general election voting decisions (Markus and Converse, 1979; Brody and Page, 1972; Jackson, 1975; Rahn, 1993). Because of this, the persuasive effect of ads may be to a degree drowned out by the overpowering effect of party identification in general elections. Moreover, as partisan sorting has been steadily increasing (Abramowitz and Saunders, 2008; Levendusky, 2009), an increasing effect of party on voting decisions may act to limit the magnitude of advertising effects. Lacking the party cue, primary elections may allow for more effective political advertising.

Presidential primary election exhibit a second important difference from the elections considered in advertising literature—they often feature more than two candidates who have a serious chance of winning. The presence of more than two candidates introduces strategic elements not present in two candidate elections. In two candidate elections, assuming no changes in turnout, votes lost by one candidate must flow to the other candidate, suggesting a degree of strategic symmetry between positive and negative advertising. In multi-candidate elections, votes lost by one candidate need not flow to the candidate who is attacking, and a negative campaigner faces the additional decision of who to attack. This, in turn, may lead to a weakened effect of negative campaigning relative to

¹Cain, Christie, Gingrich, Huckabee, Palin, Perry, Romney, Santorum, and Trump led at least one poll, with Bachmann, Giuliani, McCain, and Paul placing in the top-3 of at least one poll.

positive campaigning in primary elections.

Beyond the lack of symmetry between positive and negative campaigning, [Duverger's \(1963\)](#) Law suggests that multi-candidate races feature a pressure toward strategic voting. Candidates seen as not being serious contenders may experience an erosion of their support. Advertising by the candidate may alter not just the voters favorability towards the candidates, but also their beliefs about who has a realistic chance of winning. A negative ad could depress a voters favorability towards the attacked candidate, while at the same time increasing that voter's belief that the candidate is a serious competitor. In the extreme, negative campaigning in multi-candidate elections may backfire if the depressing effect on the attacked candidate is overwhelmed by an increased belief that the candidate is viable.

The preceding discussion suggests the following questions that we seek to answer in this paper. First, is television advertising effective in presidential primary elections? Second, is advertising more effective in primary elections than in general elections? Third, what form of advertising—positive or negative—is most effective in primary elections? Fourth, what are the mechanisms behind the effectiveness of advertising in presidential primary elections?

Estimating of the causal effect of campaign contacts involves dealing with potential endogeneity. Candidates may strategically target states where they are weak (in order to counteract this weakness) or states where they are strong (in order to build momentum by winning a state). Candidates who are strong may be strategically attacked by other candidates. We introduce a design to handle endogeneity that builds on the work of [Huber and Arceneaux \(2007\)](#), [Krasno and Green \(2008\)](#), and [Urban and Niebler \(2014\)](#). Their work avoids the problem of purposeful targeting of ads in general elections by relying on the fact that media markets overlapping multiple states leads to the un-purposeful targeting of non-battleground states. By relying on the timing of primary elections, we are able to adapt this methodology to isolate advertising that was un-purposely targeting during primary elections. We are able to apply this methodology by employing a large data set of over 800,000 respondents for the 2000 through 2016 elections by combining the National Annenberg Election Study and the Gallup Poll.

We find that running ads—both positive and negative—improve the favorability of the candidate running the ads, and in the case of negative advertising, lower the favorability of the attacked candidate. The former effect is most pronounced among partisan identifiers and the later effect is more pronounced among independent voters. Looking at the effect of advertising on candidate choice, we find that effect sizes are similar to what literature has found for general elections ([Huber and Arceneaux, 2007](#); [Gerber et al., 2011](#); [Gordon and Hartmann, 2013](#); [Lovett and Peress, 2015](#)). We find that negative advertising is more effective than positive advertising, but that attacked candidates are generally not hurt much by negative ads. Presumably, this occurs because the loss in favorability for attacked candidates is partially compensated by the increased attention that the ads provide. Supporting this, we find that being the subject of an ad—both as the candidate

running the ad and as an attacked candidate—raises the name recognition of candidate. The effect of being attacked on name recognition is concentrated among independent voters.

2 Theory

2.1 Positive and Negative Advertising in Multi-candidate Races

Consider the decision calculus of a presidential primary candidate who has chosen to target a particular state for advertising. The candidate must decide whether to run a positive ad or a negative ad, and in the later case, must decide which candidate to attack. The efficacy of the choice will depend on the relative effectiveness of positive and negative ads in changing opinions about the candidates, as well as any second order effects that the advertising has on the strategic calculus of the voter.

The calculus of the voter is similarly complicated. The voter must decide not only which candidate he prefers to win, but also how likely each candidate is to win the primary election, and if that candidate wins the primary election, how likely each candidate is to win the general election. Presidential primaries can be very fluid as recent contests illustrate. The logic of [Duverger's \(1963\)](#) Law suggests that voters will eschew low-polling candidates to avoid wasting their vote. [Bartels \(1987, 1988\)](#) demonstrates that candidate choice depends on perceptions of viability. [Knight and Schiff \(2010\)](#) similarly find momentum effects in the 2004 Democratic presidential primary, with early wins by Kerry leading to later success due to perceptions of his viability. Voters may form their impressions of a candidate's viability from a variety of sources—recognition of the candidate's name provides one signal. Favorable polling provides a second. Advertising by the candidates may provide a third such signal. Seeing a candidate in an advertisement, even if that candidate is begin attacked, may increase name recognition. Seeing a candidate run an advertisement may signal to the voter that the candidate has been able to raise funds. Seeing a candidate attacked may signal that he is seen by the other candidates as serious competition.

The above framework suggests that positive advertising should increase the vote share of the candidate who is advertising. The effects of negative advertising are more ambiguous because they depend on the balance of two effects. When a candidate attacks—the attack may increase how favorably voters see that candidate. It may also signal that the candidate is viable. When a candidate is attacked, it may decrease how favorably voters see the candidate. It may also *increase* how viable voters view that candidate. If the effect on favorability dominates, being attacked will hurt a candidate. If the effect of viability dominates, being attacked may help that candidate. In an extreme case, a candidate may actually lose vote share by attacking another candidate, if the benefit of the advertising is overwhelmed by the increase in perceived viability of the attacked candidate.

In understanding the underlying mechanisms, it is useful to have a measure that is free from

strategic considerations related to viability. A respondent's intended vote does not satisfy this requirement because it involves a comparison between the candidates. Instead, we consider a non-comparative measure—a respondent's favorability towards a particular candidate. In this case, the theory provides clear predictions:

- Positive advertising should increase a candidate's favorability
- Negative advertising should increase the favorability of the candidate running the ad
- Negative advertising should decrease the favorability of the candidate being attacked

Inherent in the mechanisms described above is that seeing an ad increases the perceived viability of candidate:

- Positive advertising should increase the perceived viability of the candidate running the ad
- Negative advertising should increase the perceived viability of the candidate running the ad
- Negative advertising should increase the perceived viability of the candidate being attacked

The predicted effect of positive advertising on candidate choice is unambiguous. In our theoretical framework, the sign of the effect of negative advertising allows us to gauge the relative sizes of two competing effects.

- Positive advertising should increase a candidate's vote share
- Observing negative advertising decreasing the vote share of the candidate running the ad is possible if the effect of negative advertising on the attacked candidate's perceived viability is particularly large
- Observing negative advertising increasing the vote share of the attacked candidate is possible if negative advertising increases the attacked candidate's perceived viability

2.2 Endogeneity

Estimating the effect of modes of campaign spending (such as television advertising) is complicated by problems of endogeneity. Concerns about such endogeneity go back at least to the work of [Jacobson \(1978\)](#). To illustrate the potential problems, consider the choice of which state a candidate targets in the primary election. A candidate may choose to advertise in a state where he or she is weak, in order to make up for the weakness. A candidate may desire to achieve momentum, and as such may advertise in states where they are strong, in order to turn somewhat favorable conditions into an overwhelming win. A candidate who is strong in a state may be viewed as a promising

prospect for negative advertising. Each of these could lead the correlation between advertising and vote share to depart from the causal effect of advertising on vote share.

In the literature on television advertising in general elections, a number of designs have been suggested to deal with endogeneity. Endogeneity arises because of the purposeful targeting of advertising. [Huber and Arceneaux \(2007\)](#) and [Krasno and Green \(2008\)](#) rely on advertising that was not purposely targeted to address the endogeneity problem. Specifically, television ads are targeted towards media markets, which are geographies that overlap state boundaries. Consistent with the nature of the electoral collage and a desire to maximize the probability of winning the election, Presidential candidates target their ads to states expected to be close. In the process of purposely targeting swing states, candidates will (un-purposely) target safe states when they advertise in media markets that overlap both safe states and swing states. Both [Huber and Arceneaux](#) and [Krasno and Green](#) estimated the effect of advertising by considering the subset of non-competitive states. [Urban and Niebler \(2014\)](#) used a similar design to deal with endogeneity in estimating the effect of television advertising on campaign donations. [Gordon and Hartmann \(2013\)](#) dealt with endogeneity by including county fixed effects and using advertising cost as an instrument. [Lovett and Peress \(2015\)](#) used media market fixed effects and relied on variation of advertising exposure within a media market to estimate the effect of advertising.

Like [Huber and Arceneaux \(2007\)](#), [Krasno and Green \(2008\)](#), and [Urban and Niebler \(2014\)](#), our design relies on advertising that was not purposely targeted. Research has shown that television advertising has a decaying effect ([Gerber et al., 2011](#); [Hill et al., 2013](#)). Given this effect and how presidential primary contests are stratified over time, candidates have an incentive to target states at different times. In particular, candidates can marshal their resources most effectively by targeting states with an imminent contest. Candidates however face the same constraint in primaries as they do in the general election—they must target geographies that potentially overlap multiple states. Because of this, we arguably observe candidates (un-purposely) targeting advertising to states with no imminent primary election. It is this that forms the basis of our identification strategy.

3 Data

Our main independent variables measure exposure to television ads. Most television ads target geographies called media markets. Our measure of advertising exposure is built upon ads shown in each media market. For the years 2000 through 2012, the source of this data is the Wesleyan Media Project (WMP). This dataset consists of advertisements that aired in various media markets throughout the entirety of the presidential campaign.² The dataset generally included variables such as the date the ad aired, the type of ad (positive or negative), which candidate was promoted in the ad, and which candidate was attacked in the ad. For certain years, some necessary information

²The 2000 data includes the 75 most populated media markets. The 2004 data includes the 100 most populated media markets. The 2008 and 2012 data include all media markets.

was missing (in particular, which candidate was being attacked). In these cases, we directly coded the information from the storyboards of the ads. For 2016, the source of advertising data was the Political Ad Archive. This dataset consisted of similar variables, though was more limited in the number of media markets.³

A common measure of advertising exposure is the gross ratings point (GRP). 100 GRPs could indicate that 100 percent of the population saw 1 ad, that 1 percent of the population saw 100 ads, or that 10 percent of the population saw 10 ads. We constructed our measure of GRPs in two different ways. The Wesleyan Media Project data reports a cost estimate for each advertisement. The cost of an advertisement is negotiated on a case by case basis, but a starting point of these negotiations are cost estimates provided by SQAD, Inc. These estimates provide a suggested cost per GRP within a day part. A day part is a unit of time within the day—for example—the early morning day part runs from 5am to 9am. The day part is the most important source of variation for the cost of reaching a household, and advertising in the most expensive daypart typically costs 3 to 4 times as much as advertising during the cheapest daypart. This difference in cost is driven largely by the relative difficulty of targeting men due to the fact that men tend to watch less television and there are fewer television programs with heavily male audiences than heavily female audiences. We estimate the number of GRPs for an advertisement by dividing the WMP cost estimate by the SQAD cost estimate per GRP. A similar approach is used in [Gordon and Hartmann \(2013\)](#). For the 2016 data, cost estimates were not available. To estimate the number of GRPs, we instead relied on the television shows the advertisements appeared on. We used the Simmons National Consumer Survey to estimate the viewership of each program, and use the viewership of the program to determine the share of the population that was exposed to the advertisement. A similar approach was used by [Lovett and Peress \(2015\)](#).

Our research design required us to measure primary voting intent. Most primary advertising occurs between January and March of the election year. Because we ultimately are subsetting the data in various ways, we would need to start with relatively large sample sizes. We make use of rolling cross-sections from two different sources—the National Annenberg Election Study (NAES) data and the Gallup Poll. The NAES is a rolling cross section survey administered during the 2000 and 2004 election campaigns. The Gallup Poll interviewed a random sample of approximately 500 voting age Americans every day for dates between 2008 and 2016. Taken together, our data spans 2000 through 2016 and contains over 800,000 observations.

We used the NAES and the Gallup Poll to construct 3 dependent variables. The first was a measure of primary voting intention, which was available in all years except 2016. The measure asked respondents who intended to vote in a particular primary (Democratic or Republican) which candidate they intended to vote for. The primary voting decision is a particularly complex one, due to the (frequent) presence of multi-candidate races. In this context, voters may fear wasting

³The data included 25 media markets—mostly media markets that overlapped states with early primary contests and battleground states.

their vote by voting for a candidate that has no chance of winning the primary. We sought to construct a measure of an individual candidate’s favorability that was free from strategic thinking relating to the candidate’s viability. Variables we found in the NAES and Gallup Poll datasets met this criteria reasonably well. We used thermometers for the candidate (for the NAES data) and favorability scales (for the Gallup Poll data), with a measure available for all years analyzed except 2008. Given the way the questions were asked, we are reasonably confident they would be free from such strategic considerations. Respondents were asked to rate candidates from multiple parties, as well as third party candidates, and non-candidates (e.g. the incumbent President). Given the fact that the candidates from a respondent’s primary were mixed in with many other candidates, the respondents were unlikely to view the task as asking them to report their preferences net of viability concerns. Similar variables are in fact used in the literature on strategic voting, which is similarly interested in measuring preference in a way that is free of strategic considerations ([Abramson et al., 1992](#); [Peress, 2008](#)). There are inconsistencies in our dataset in terms of how these questions were asked. In the 2000 NAES, respondents were asked to report a score between 1 and 100. In the 2004 NAES and the 2008 Gallup Poll, respondents were asked to report a score between 1 and 10. In the 2012 Gallup Poll, respondents were asked to report on a 4 point scale. In the 2016 Gallup Poll, respondents were asked to report a binary measure of favorability. We converted each of these scores to range between zero and one.

The third dependent variable was a proxy for perceived viability of the candidates. An ideal measure would directly ask respondents to rate the probability that each candidate would win the primary. After searching multiple data sources, we were unable to find such a variable with a large enough sample size that would allow us to apply our design. To get at this concept indirectly, we used a measure of the respondent’s recognition of the candidate’s name, where lack of familiarity was coded as zero and familiarity was coded as 1. Familiarity with the candidate is necessary condition for a belief that the candidate is likely to win the election.

4 Results

4.1 Checking the Design

As a first step, we evaluate the design we apply to handle endogeneity. An assumption of our design is that during the primary election campaign, the candidates purposely target only states with imminent primary elections. We used 3 different windows to delineate whether a primary election was imminent—two weeks, four weeks, and eight weeks. The first window is motivated by the work [Gerber et al. \(2011\)](#) and [Hill et al. \(2013\)](#), who emphasize advertising effects mostly decaying over a period of two weeks. Relatively quick decay is largely consistent with research on

other types of advertising.⁴ The four week and eight week windows are more conservative with respect to over how long Presidential candidates may believe their advertisements are effective. If our basic assumption is correct, we should observe few advertisements in days in which we are far from an election in any of the states that overlap the media market. We performed such a test in Figure 1. We indeed see that the vast majority of ads are run when a media market overlaps a state with an election coming within two weeks. When an election is more than 8 weeks away, virtually no ads are run. The ads drop to zero immediately after the election.

In only one instance does the figure depart from these patterns. In 2016, advertising extended outside of the two weeks prior to an election, though even in this case, the vast majority of advertisements ran in the 8 weeks before an election. In addition, we see a temporary surge in the weeks following the primary election. There are two factors that cause these differences. First, our 2016 data considered a limited number of media markets and was more skewed towards the early contests in Iowa, New Hampshire, and South Carolina. Second, The 2016 election campaign was particularly long, so though ads dropped off after the primary election was over, they picked up briefly in a number of swing states (which were over-represented in our sample) as candidates switched to general election campaigns. To deal with these limitations of the 2016 data, our tests only used observations before the primary election, so that our analysis could not be affected by early general election advertising, as was the case in 2016. We also considered a number of robustness checks later in the paper—we report analyses excluding 2016 and excluding Iowa, New Hampshire, and South Carolina—which did not alter our main conclusions.

4.2 Favorability

In the first set of models, the dependent variable is favorability. We estimate the model using OLS. We include a variable for whether the respondent and the candidate are of the same party, anticipating that respondents will rate their identified party’s candidates more favorably. We include respondent fixed effects to allow respondents to differ in how generously they grade the candidates. We include candidate fixed effects to allow the favorability of the candidates to vary with their characteristics (e.g. political experience), without needing to explicitly control for such characteristics.⁵ Here (and throughout the paper), the three ads variables are scaled by 1/10000, so that a 1-unit increase in these independent variables would correspond to a 10000 GRP increase in the number of ads, which in turn corresponds to the entire population seeing an additional 100 ads. We report results using three different windows for when an election is imminent. We also report results separately for co-partisans and independents.⁶

⁴To take one extreme example, [Tellis et al. \(2005\)](#) found that advertising effects, while detectable, large vanished 8 hours after the advertisement was run.

⁵We note that here and throughout, if a candidate ran in two different primaries (e.g. Hillary Clinton or Mitt Romney), a separate fixed effect is estimated for each primary.

⁶Some respondents fall into a third group who we may call anti-partisans, but we omit these results since they are less theoretically relevant as very few voters will vote in the opposite party’s primary.

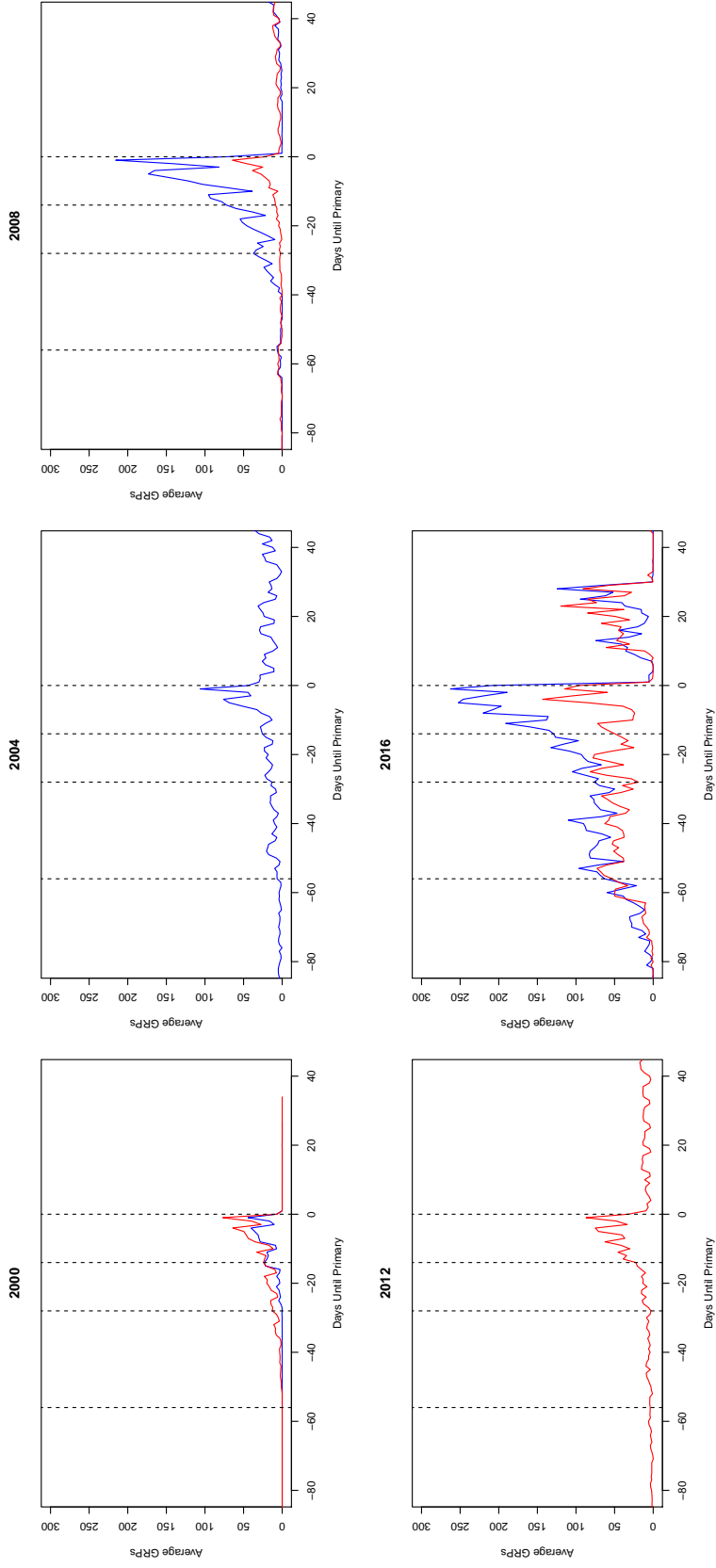


Figure 1: Temporal Patterns of Advertising – Each line denotes the average number of GRPs across media markets, relative to the closest primary election in the media market. Blue lines denote the sum across all Democratic candidates and red lines denote the sum across all Republican candidates. The dotted vertical lines denote the primary election, two weeks before the primary election, four weeks before the primary election, and eight weeks before the primary election.

Sample:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	2 weeks out	All Respondents 4 weeks out	8 weeks out	2 weeks out	Co-partisans 4 weeks out	8 weeks out	2 weeks out	Independents 4 weeks out	8 weeks out
Independent Variables:									
Party Match	0.445*** (0.003)	0.453*** (0.003)	0.481*** (0.003)		0.217+ (0.128)	0.147 (0.170)	0.085 (0.065)	0.094 (0.073)	-0.152 (0.134)
Run Positive Ads	0.145*** (0.040)	0.145*** (0.045)	-0.026 (0.083)	0.236* (0.101)					
Run Negative Ads	0.496* (0.223)	0.546+ (0.287)	0.226 (0.458)	0.309 (0.385)	0.361 (0.468)	0.395 (0.681)	0.310 (0.382)	0.309 (0.496)	-1.278 (0.854)
Attacked	-0.378*** (0.115)	-0.221 (0.161)	-0.709** (0.257)	0.055 (0.226)	0.474 (0.292)	-0.155 (0.368)	-0.427* (0.200)	-0.461+ (0.264)	-1.809*** (0.485)
<i>N</i>	313041	300418	271794	149505	145350	136066	108207	103415	92841

Table 1: The Effects of Ads on Favorability. Analyses include respondent and candidate fixed effects. Standard errors double-clustered by respondent and candidate are in parentheses. One star indicates statistical significance at the 5% level. Two stars indicates statistical significance at the 1% level. Three stars indicates statistical significance at the 0.1% level. A plus sign indicates statistical significance at the 10% level.

Sample:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	2 weeks out	All Respondents 4 weeks out	8 weeks out	2 weeks out	Co-partisans 4 weeks out	8 weeks out	2 weeks out	Independents 4 weeks out	8 weeks out
Independent Variables:									
Party Match	0.009*** (0.002)	0.008** (0.003)	0.005+ (0.003)						
Run Positive Ads	0.104** (0.037)	0.095* (0.042)	0.093 (0.079)	0.158 (0.110)	0.030 (0.141)	0.012 (0.190)	0.117* (0.055)	0.135* (0.063)	0.085 (0.119)
Run Negative Ads	0.309 (0.204)	0.267 (0.270)	0.442 (0.405)	0.468 (0.421)	0.608 (0.503)	0.820 (0.678)	0.418 (0.317)	0.178 (0.439)	0.378 (0.718)
Attacked	0.091 (0.105)	0.085 (0.148)	0.252 (0.231)	0.509* (0.247)	0.384 (0.317)	0.676+ (0.404)	-0.033 (0.162)	-0.106 (0.232)	-0.171 (0.422)
<i>N</i>	462996	447099	409582	216419	211531	200096	167952	161582	146768

Table 2: The Effects of Ads on Recognition. Analyses include respondent and candidate fixed effects. Standard errors double-clustered by respondent and candidate are in parentheses. One star indicates statistical significance at the 5% level. Two stars indicates statistical significance at the 1% level. Three stars indicates statistical significance at the 0.1% level. A plus sign indicates statistical significance at the 10% level.

Sample:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	2 weeks out	All Respondents 4 weeks out	8 weeks out	2 weeks out	Co-partisans 4 weeks out	8 weeks out	2 weeks out	Independents 4 weeks out	8 weeks out
Independent Variables:									
Run Positive Ads	2.204*** (0.208)	2.083*** (0.370)	1.264** (0.450)	2.377*** (0.244)	2.263*** (0.432)	1.614** (0.536)	1.928*** (0.400)	1.732* (0.702)	0.460 (0.822)
Run Negative Ads	4.385*** (0.781)	3.004*** (0.905)	2.346* (1.009)	4.117*** (0.983)	2.988* (1.166)	2.026 (1.327)	4.855*** (1.369)	2.827+ (1.453)	2.644 (1.621)
Attacked	1.389** (0.537)	0.972+ (0.566)	1.426+ (0.754)	1.698** (0.605)	1.042 (0.641)	1.725+ (0.899)	0.915 (1.023)	0.845 (1.065)	1.235 (1.214)
<i>N</i>	54160	42732	28740	38021	29983	20259	15958	12595	8381

Table 3: The Effects of Ads on Candidate Choice. Analyses include candidate fixed effects. Standard errors clustered by media market are in parentheses. One star indicates statistical significance at the 5% level. Two stars indicates statistical significance at the 1% level. Three stars indicates statistical significance at the 0.1% level. A plus sign indicates statistical significance at the 10% level.

The results are given in Table 1. Focusing first on the pooled results of columns (1)-(3), we find that positive and negative ads both increase the favorability of the candidates running the ads. Negative ads appear to have an effect which is larger in magnitude, though some caution should be applied to this interpretation as the difference in effect sizes is not statistically significant. Negative ads depress the favorability of the candidate being attacked. For co-partisans, we find that positive ads are effective. The point estimates for the effect of negative ads on the candidate running the ads is positive, but never statistically significant. We don't see any evidence that favorability drops among co-partisans when a candidate is attacked. For independent voters, we find consistent negative effects for attacked candidates. We don't see statistically significant effects for the candidate who is advertising, regardless of the tone of the ad.

Overall, our results are consistent with theoretical expectations and suggest that advertising is effective in primary elections. The particular finding that positive ads are more effective among co-partisans and negative ads depress the support of the attacked candidate among independents potentially suggest that multiple mechanisms are at play. One possibility is that positive ads boost name recognition, which is more likely to lead to a boost in support among co-partisans as they are more likely to assume favorable things about the candidates. Negative ads may be more effective among those with only weak attachments to the party (e.g. independents). Fully exploring if this is the case is probably not possible given the data we have.

To get a sense of the effect sizes, we considered the marginal effect of a change in advertising of 1000 GRPs. Based on the 4 week window, running 1000 GRPs of positive ads will increase the candidate's favorability by 0.015 on the 0-1 scale. Running 1000 GRPs of negative ads will increase that candidate's favorability by 0.055 on the 0-1 scale. Being attacked by 1000 GRPs of negative ads will decrease the attacked candidate's favorability by 0.022 on the 0-1 scale. In the time period we study, Romney purchased more exposure in the 2012 primary than any other candidate—he averaged 13000 GRPs across media markets. His closest opponent, Rick Santorum, purchased around 1000 GRPs. Obama's 2008 primary campaign purchased only slightly less exposure than Romney did in 2012. Hillary Clinton purchased about a quarter as many GRPs as Obama in 2008. In the 2000 Republican primary, George W. Bush purchased less than 900 GRPs. Given these numbers, for most candidates and most time periods, 1000 GRPs would entail a very substantial increase in their advertising, though for a few very well financed candidates, it would correspond to a small fraction of their advertising. As such a campaign moves candidate favorability between 0.015 to 0.055, we could conclude that in most cases, advertising has limited effects on favorability, but for a handful of high spending candidates, very large effects are plausible.

4.3 Name Recognition

We next examine whether advertising effects recognition of the primary candidates. The models we estimate are linear probability models for the probability of recognizing the candidate. As in

the previous subsection, we include respondent fixed effects and candidate fixed effects. We again consider three different windows for an imminent contest and we report result for all respondents, co-partisans, and independents. The results are given in Table 2. In the pooled results from columns (1) through (3), we find that co-partisans are about one percentage point more likely to recognize the candidate. Running 1000 GRPs of positive ads increase the probability that a respondent recognizes the candidate by one percentage point. The effects of running negative ads and of being attack are not statistical significant in the pooled analysis.

Considering co-partisans, we find that being attacked by 1000 GRPs increases the probability that a respondent recognizes that candidate by between 4 and 7 percentage points (with the results statistically distinguishable from zero when 2-week and 8-week windows were used). This corresponds to a sizable effect which in theory could allow a candidate to benefit electorally from being attacked, if that recognition translated into increased votes due to increased perceived viability.

4.4 Candidate Choice

We next analyzed the effect of advertising on candidate choice. In each case, the dependent variable was multinomial in nature, indicating the respondent’s preferred candidate in either the Democratic or Republican presidential primaries. Each model reported below is a conditional logit model. Each model also includes candidate-year fixed effects, to allow the vote share of candidates to vary with their characteristics (e.g. political experience), without needing to explicitly control for such characteristics. The results are given in Table 3.

Focussing first on the pooled results of columns (1) through (3), running ads—both positive and negative—increases the latent tendency for a voter to choose that candidate. Negative ads appear to have an effect that is greater in magnitude.⁷ Perhaps surprisingly, being attacked increases the latent tendency for a voter to choose that candidate. Within our theoretical framework, this indicates that the increase in perceived viability the negative ad brings is able to overwhelm the loss of favorability. Advertising appears to have a similar effect on candidate choice among co-partisans and independents.

We once again consider the effect of a change in advertising of 1000 GRPs. We first report results for a hypothetical two candidate race where the candidates would be evenly matched if their advertng was balanced because this provides a more direct comparison to results reported in the literature for general elections. Increasing positive advertising by 1000 GRPs would lead to a candidate’s vote share increasing by 5.2% percentage points (relying on a 4-week window). Increasing negative advertising by 1000 GRPs would lead to a candidate’s vote share increasing by 5.1% percentage points. We can compare these results to those reported by [Huber and Arceneaux \(2007\)](#) and [Gordon and Hartmann \(2013\)](#) for Presidential elections. [Huber and Arceneaux’s](#) results imply that an increase of 1000 GRPs would lead to an increase of between 4.2% and 5.8% in a

⁷In column (1), the difference is statistically significant.

candidate's vote share. [Gordon and Hartmann's](#) results imply the same change would increase the candidate's vote share by 1.5%. Our results are thus in line with [Huber and Arceneaux's](#) and imply substantially larger effects than [Gordon and Hartmann's](#).

We next report results that are calibrated to the elections in our sample. We started with a baseline of zero ad spending where the estimated candidate fixed effects allowed the baseline vote share to vary across candidates. For each candidate, we considered the effect of increasing the amount of positive advertising by 1000 GRPs, while holding everything else constant. For each candidate and each of their opponents, we considered the effect of increasing the amount of negative advertising directed at that opponent by 1000 GRPs. In each case, we report the change in vote share for the candidate running the ads. Full results are reported in [Table 4](#) through [9](#)

Take the 2012 Republican primary. For every one of the candidates, running negative ads is more effective than running positive ads, regardless of which candidate is attacked by the negative ads. The largest effect comes from attacking low polling candidates, though the differences are typically small. This can be understood in the following way. Negative ads have a bigger effect on favorability. Pushing against this tendency is the fact that attacking a candidate may increase that candidate's perceived viability. However, the later effect, which diminishes the benefit of negative ads relative to positive ads, does not completely eliminate the benefit. Going one step further, attacking a weaker candidate seems to provide a greater benefit than attacking a strong candidate. This can be understood in the following way. Attacking a candidate decreases that candidate's favorability. This effect, however, is concentrated among independent voters, who are less likely to vote in the party's primary than their identifiers, so the effect is someone attenuated. The act of attacking that candidate increases his perceived viability to a large enough degree to overwhelm the loss of favorability. Because attacking a candidate helps that candidate, the attacker benefits most from attacking a weak candidate who is less likely to benefit for increased perceptions of viability. Similar patterns hold in other contests with one exception. In the 2000 Democratic primary—the only two candidate contest we studied—the benefits of positive and negative advertising are roughly equal for both Al Gore and Bill Bradley.

4.5 Robustness

Having established our main results, we would like to demonstrate that our results are robust to alternative specifications. We first consider replacing candidate fixed effects with candidate-month fixed effects. The results are presented in [Tables 10](#) through [12](#). We continue to find that running positive and negative ads increases the favorability of the candidate running the ads. We continue to find that candidates who are attacked suffer in terms of favorability. We continue to find candidates who run positive ads see increased name recognition. We continue to find that the latent tendency to support a candidate increases when the candidate runs both positive negative ads, with negative ads having a larger effect. Two results do not hold up in this robustness test. We no longer find

that being attacked increases name recognition and we no longer find that being attacked increases the latent tendency of voters to choose that candidate.

We next consider the possibility that advertising exhibits diminishing returns by considering a log-specification. Specifically, we consider $\log(1 + GRPS/10000)$, where the 1 is used to handle instances where a candidate ran zero ads of a given type in a media market. The results are given in Tables 13 through 15. Like the results for candidate-month fixed effects, the main results hold up with the exceptions that we no longer find evidence that being attacked increases name recognition and we no longer find that being attacked increases the latent tendency of voters to choose that candidate. We also compared the fit of various models using the log-likelihood. We found that the models had very similar fit, with the linear specification fitting slightly better. One could take this as evidence for non-diminishing returns, but we suspect the data we observe are not precise enough to detect non-linearity and there are strong theoretical reasons to expect diminishing returns.

The next set of results repeat the analyses omitting Iowa, New Hampshire, and South Carolina. We report these results in Tables 16 through 18. All of the main results hold up in this specification. The next set of analyses report the favorability and name recognition models omitting 2016 (the candidate choice models already omitted 2016). These results are given in Tables 19 and 20. Again we find substantially similar results.

Overall, most of our main conclusions hold up in the various robustness checks. Positive and negative advertising have the expected effect of favorability, with negative advertising being more effective. Positive advertising increases a candidate name recognition. Both positive and negative advertising increase the latent tendency to vote for that candidate, with negative advertising more effective. Two results should be treated with more skepticism because they fail to hold up in two of the robustness checks. Specifically, the finding that being attacked increases name recognition and that being attacked increases voter's latent tendency to choose that candidate do not hold up when candidate-month fixed effects are included and when a logged specification is used.

5 Conclusion

In this article, we sought to answer four questions. Is television advertising effective in presidential primary elections? How does the effectiveness of television advertising in primary elections compare to its effectiveness in general elections. Are positive and negative advertising differentially effective in primary elections? What are the mechanisms behind the effectiveness of advertising in presidential primary elections?

We find clear evidence that television advertising is effective. Advertising increases the favorability of candidates, it increases the name recognition of candidates, and it increases the likelihood that respondents intend to vote for those candidates. Moreover, advertising appears to be similarly effective as advertising in general elections. Being more certain of this conclusion is hindered by the differing estimates for the effectiveness of advertising in general elections. Our estimates of

effectiveness are however quite close to the estimates of the study with the most similar methodology. Beyond this, primaries feature far more variation in the strength of candidates than general elections—since 2000, presidential elections have been fairly close among the two major parties. Advertising appears to be more effective for otherwise strong candidates than for otherwise weak candidates.

Negative advertising appears to be more effective in increasing a candidate’s favorability and in increasing the likelihood that respondents intend to vote for that candidate. We find some support for the notion that being attacked increases a candidate’s name recognition and *increases* the likelihood that respondents intend to vote for that candidate. We have more consistent support that being attacked, while hurting a candidate’s favorability, does not ultimately decrease the likelihood that respondents intend to vote for that candidate. The last result speaks directly to the mechanisms underlying the effectiveness of advertising—negative advertising hurts a candidate’s favorability, while increasing a candidate’s perceived viability. The benefit of increased perceived viability is matched, or potentially outweighed, the loss from reduced favorability.

A limitation of our study is that we lack a direct measure of perceived viability. Future work could potentially address this, though we retain some skepticism that others will retrospectively uncover survey measures with large enough sample sizes to reliably measure the effect of advertising on perceived viability using our design. An equally challenging avenue for future work is in studying advertising in non-presidential primaries. Though the necessary dependent variables would be available from the Wesleyan Media Project, constructing the necessary independent variables would be challenging because intended vote in lower level primaries is very rarely polled. Future work may be able to proceed by developing alternative methods to deal with endogeneity, which may allow the researchers to use aggregate election results, bypassing the need for large sample sizes of survey respondents.

References

- Abramowitz, Alan I. and Kyle L. Saunders. 2008. “Is Polarization a Myth?” *Journal of Politics* 70:542–555.
- Abramson, Paul, John Aldrich, John H. Paolino and David Rohde. 1992. “‘Sophisticated’ Voting in the 1988 Presidential Primaries.” *American Political Science Review* 86:55–70.
- Bartels, Larry. 1987. “Candidate Choice and the Dynamics of the Presidential Nominating Process.” *American Journal of Political Science* 31:1–30.
- Bartels, Larry. 1988. *Presidential Primaries and the Dynamics of Public Choice*. Princeton, NJ: Princeton University Press.

- Brody, Richard A. and Benjamin I. Page. 1972. "Comment: The Assessment of Policy Voting." *American Political Science Review* 66:450–458.
- Duverger, Maurice. 1963. *Political Parties: Their Organization and Activity in the Modern State*. London, Methuen; New York: Wiley.
- Franz, Michael M. and Travis N. Ridout. 2007. "Does Political Advertising Persuade?" *Political Behavior* 29:465–491.
- Freedman, Paul and Kenneth Goldstein. 1999. "Measuring Media Exposure and the Effects of Negative Campaign Ads." *American Journal of Political Science* 4:1189–1208.
- Freedman, Paul, Michael Franz and Kenneth Goldstein. 2004. "Campaign Advertising and Democratic Citizenship." *American Journal of Political Science* 48:723–741.
- Gerber, Alan S., James G. Gimpel, Donald P. Green and Daron R. Shaw. 2011. "How Large and Long-Lasting Are the Persuasive Effects of Televised Campaign Ads? Results from a Randomized Field Experiment." *American Political Science Review* 105:135–150.
- Gordon, Brett R. and Wes Hartmann. 2013. "Advertising Effects in Presidential Elections." *Marketing Science* 32:19–35.
- Hill, Seth, James Lo, Lynn Vavreck and John Zaller. 2013. "How Quickly We Forget: The Duration of Persuasion Effects from Mass Communication." *Political Communication* 30:421–547.
- Huber, Gregory A. and Kevin Arceneaux. 2007. "Identifying the Persuasive Effects of Presidential Advertising." *American Journal of Political Science* 51:957–977.
- Jackson, John E. 1975. "Issues, Party Choices, and Presidential Votes." *American Journal of Political Science* 19:161–185.
- Jacobson, Gary. 1978. "The Effects of Campaign Spending in Congressional Elections." *American Political Science Review* 72:469–491.
- Knight, Brian and Nathan Schiff. 2010. "Momentum and Social Learning in Presidential Primaries." *Journal of Political Economy* 118:1110–1150.
- Krasno, Jonathan S. and Donald P. Green. 2008. "Do Televised Presidential Ads Increase Voter Turnout? Evidence from a Natural Experiment." *Journal of Politics* 70:245–261.
- Krupnikov, Yanna. 2014. "How Negativity Can Increase and Decrease Voter Turnout: The Effect of Timing." *Political Communication* 31:446–466.
- Levendusky, Matthew S. 2009. *The Partisan Sort: How Liberals Became Democrats and Conservatives Became Republicans*. Chicago: University of Chicago Press.

- Lovett, Michell and Michael Peress. 2015. "Targeting Political Advertising on Television."
- Markus, Gregory B. and Philip E. Converse. 1979. "A Dynamic Simultaneous Equation Model of Electoral Choice." *American Political Science Review* 73:1055–1070.
- Peress, Michael. 2008. "Strategic Voting in Multi-Office Elections." *Legislative Studies Quarterly* 33:619–642.
- Rahn, Wendy M. 1993. "The Role of Partisan Stereotypes in Information Processing about Political Candidates." *American Journal of Political Scienc* 37:472–496.
- Tellis, Gerard J., Rajesh Chandy, Deborah MacInnis and Pattana Thaivanich. 2005. "Modeling the Micro Effects of Television Advertising: Which Ad Works, When, Where, Why, and For How Long?" *Marketing Science* 24:359–366.
- Urban, Carly and Sarah Niebler. 2014. "Dollars on the Sidewalk: Should U.S. Presidential Candidates Advertise in Uncontested States?" *American Journal of Political Science* 58:322–336.

A Online Appendix — Additional Tables

	Gore	Bradley
Baseline	66.89%	33.11%
Positive Ads (+1000 GRPs)	4.44%	4.76%
Negative Ads (+1000 GRPs)		
Attack Gore		4.64%
Attack Bradley	4.34%	

Table 4: Effect Sizes for Advertising (2000 Democratic Primary) – Analyses report the change in predicted vote share from increasing positive or negative ad spending by 1000 GRPs, relative to a baseline of no ad spending by all candidates.

	Bush	McCain	Forbes	Keyes	Bauer
Baseline	63.83%	27.07%	4.26%	3.91%	0.93%
Positive Ads (+1000 GRPs)	4.66%	4.30%	0.93%	0.86%	0.21%
Negative Ads (+1000 GRPs)					
Attack Bush		4.44%	1.07%	0.98%	0.25%
Attack McCain	5.06%		1.26%	1.16%	0.29%
Attack Forbes	6.36%	6.18%		1.28%	0.32%
Attack Keyes	6.38%	6.20%	1.38%		0.32%
Attack Bauer	6.56%	6.29%	1.40%	1.29%	

Table 5: Effect Sizes for Advertising (2000 Republican Primary) – Analyses report the change in predicted vote share from increasing positive or negative ad spending by 1000 GRPs, relative to a baseline of no ad spending by all candidates.

	Kerry	Edwards	Clark	Dean	Gephardt	Lieberman	Kucinich	Moseley-Braun	Sharpton
Baseline	17.45%	7.34%	15.20%	26.15%	10.19%	15.50%	2.11%	2.44%	3.62%
Positive Ads (+1000 GRPs)	3.21%	1.55%	2.88%	4.22%	2.07%	2.93%	0.48%	0.55%	0.80%
Negative Ads (+1000 GRPs)									
Attack Kerry		2.16%	3.96%	5.68%	2.87%	4.02%	0.67%	0.77%	1.12%
Attack Edwards	4.60%		4.15%	5.98%	3.00%	4.21%	0.70%	0.80%	1.17%
Attack Clark	4.44%	2.18%		5.74%	2.90%	4.06%	0.67%	0.78%	1.13%
Attack Dean	4.21%	2.08%	3.81%		2.76%	3.86%	0.64%	0.74%	1.08%
Attack Gephardt	4.54%	2.23%	4.10%	5.89%		4.16%	0.69%	0.79%	1.16%
Attack Lieberman	4.43%	2.18%	4.00%	5.74%	2.89%		0.67%	0.78%	1.13%
Attack Kucinich	4.71%	2.30%	4.25%	6.13%	3.07%	4.31%		0.82%	1.20%
Attack Moseley-Braun	4.70%	2.30%	4.24%	6.12%	3.06%	4.31%	0.71%		1.20%
Attack Sharpton	4.68%	2.29%	4.22%	6.09%	3.05%	4.28%	0.71%	0.82%	

Table 6: Effect Sizes for Advertising (2004 Democratic Primary) – Analyses report the change in predicted vote share from increasing positive or negative ad spending by 1000 GRPs, relative to a baseline of no ad spending by all candidates.

	Obama	Clinton	Edwards	Gravel	Kucinich	Richardson
Baseline	38.71%	49.72%	9.61%	0.65%	0.86%	0.46%
Positive Ads (+1000 GRPs)	5.04%	5.19%	1.97%	0.15%	0.20%	0.11%
Negative Ads (+1000 GRPs)						
Attack Obama		5.60%	2.48%	0.19%	0.25%	0.14%
Attack Clinton	5.35%		2.36%	0.18%	0.24%	0.13%
Attack Edwards	6.93%	6.99%		0.22%	0.29%	0.15%
Attack Gravel	7.29%	7.43%	2.93%		0.30%	0.16%
Attack Kucinich	7.28%	7.42%	2.93%	0.22%		0.16%
Attack Richardson	7.30%	7.44%	2.94%	0.22%	0.30%	

Table 7: Effect Sizes for Advertising (2008 Democratic Primary) – Analyses report the change in predicted vote share from increasing positive or negative ad spending by 1000 GRPs, relative to a baseline of no ad spending by all candidates.

	McCain	Romney	Giuliani	Huckabee	Huntsman	Thompson	Ron Paul	Keyes
Baseline	41.58%	13.01%	10.00%	23.62%	0.67%	5.41%	4.08%	1.63%
Positive Ads (+1000 GRPs)	5.13%	2.54%	2.04%	3.96%	0.15%	1.17%	0.90%	0.37%
Negative Ads (+1000 GRPs)								
Attack McCain	6.87%	3.14%	2.53%	4.73%	0.19%	1.47%	1.13%	0.47%
Attack Romney	7.00%	3.63%	2.88%	5.48%	0.22%	1.67%	1.28%	0.53%
Attack Giuliani	6.42%	3.41%	2.75%	5.56%	0.22%	1.69%	1.30%	0.54%
Attack Huckabee	7.40%	3.78%	3.04%	5.82%	0.21%	1.59%	1.23%	0.51%
Attack Huntsman	7.19%	3.70%	2.98%	5.69%	0.23%	1.76%	1.35%	0.56%
Attack Thompson	7.25%	3.73%	2.99%	5.72%	0.23%	1.73%	1.32%	0.55%
Attack Ron Paul	7.36%	3.77%	3.03%	5.79%	0.23%	1.75%	1.34%	0.55%

Table 8: Effect Sizes for Advertising (2008 Republican Primary) – Analyses report the change in predicted vote share from increasing positive or negative ad spending by 1000 GRPs, relative to a baseline of no ad spending by all candidates.

	Romney	Gingrich	Paul	Perry	Huntsman	Santorum	Bachmann	Cain
Baseline	34.06%	24.80%	9.70%	7.25%	3.68%	15.69%	2.39%	2.42%
Positive Ads (+1000 GRPs)	4.82%	4.08%	1.98%	1.53%	0.81%	2.96%	0.54%	0.54%
Negative Ads (+1000 GRPs)								
Attack Romney	6.12%	5.06%	2.56%	1.99%	1.06%	3.75%	0.70%	0.71%
Attack Gingrich	6.67%	5.73%	2.67%	2.07%	1.11%	3.92%	0.73%	0.74%
Attack Paul	6.76%	5.80%	2.88%	2.21%	1.18%	4.21%	0.78%	0.79%
Attack Perry	6.89%	5.91%	2.92%	2.26%	1.19%	4.25%	0.79%	0.80%
Attack Huntsman	6.45%	5.56%	2.77%	2.15%	1.15%	4.32%	0.80%	0.81%
Attack Santorum	6.94%	5.94%	2.94%	2.28%	1.21%	4.35%	0.76%	0.77%
Attack Bachmann	6.94%	5.94%	2.94%	2.28%	1.21%	4.35%	0.80%	0.81%

Table 9: Effect Sizes for Advertising (2012 Republican Primary) – Analyses report the change in predicted vote share from increasing positive or negative ad spending by 1000 GRPs, relative to a baseline of no ad spending by all candidates.

Sample:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	2 weeks out	All Respondents 4 weeks out	8 weeks out	2 weeks out	Co-partisans 4 weeks out	8 weeks out	2 weeks out	Independents 4 weeks out	8 weeks out
Independent Variables:									
Party Match	0.444*** (0.003)	0.452*** (0.003)	0.480*** (0.003)						
Run Positive Ads	0.115** (0.040)	0.107* (0.046)	-0.012 (0.084)	0.215* (0.101)	0.222+ (0.129)	0.229 (0.174)	0.053 (0.066)	0.063 (0.074)	-0.151 (0.136)
Run Negative Ads	0.581** (0.223)	0.808** (0.288)	0.763+ (0.462)	0.460 (0.385)	0.647 (0.468)	0.612 (0.683)	0.337 (0.385)	0.470 (0.499)	-0.596 (0.865)
Attacked	-0.254* (0.115)	-0.085 (0.162)	-0.403 (0.260)	0.034 (0.227)	0.479 (0.292)	-0.091 (0.372)	-0.354+ (0.201)	-0.388 (0.265)	-1.532** (0.490)
<i>N</i>	313041	300418	271794	149505	145350	136066	108207	103415	92841

Table 10: The Effects of Ads on Favorability, Candidate-Month Fixed Effects. Analyses include respondent and candidate-month fixed effects. Standard errors double-clustered by respondent and candidate are in parentheses. One star indicates statistical significance at the 5% level. Two stars indicates statistical significance at the 1% level. Three stars indicates statistical significance at the 0.1% level. A plus sign indicates statistical significance at the 10% level.

Sample:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	2 weeks out	All Respondents 4 weeks out	8 weeks out	2 weeks out	Co-partisans 4 weeks out	8 weeks out	2 weeks out	Independents 4 weeks out	8 weeks out
Independent Variables:									
Party Match	0.009*** (0.002)	0.008*** (0.002)	0.005+ (0.003)						
Run Positive Ads	0.080* (0.037)	0.095* (0.043)	0.067 (0.079)	0.046 (0.110)	0.020 (0.140)	0.015 (0.192)	0.096+ (0.055)	0.127* (0.063)	0.053 (0.119)
Run Negative Ads	0.131 (0.204)	-0.122 (0.269)	-0.126 (0.406)	0.083 (0.419)	0.060 (0.501)	0.087 (0.678)	0.257 (0.318)	-0.115 (0.440)	-0.174 (0.725)
Attacked	-0.040 (0.105)	-0.011 (0.148)	0.029 (0.232)	0.130 (0.248)	0.168 (0.317)	0.383 (0.406)	-0.121 (0.163)	-0.167 (0.233)	-0.411 (0.427)
<i>N</i>	462996	447099	409582	216419	211531	200096	167952	161582	146768

Table 11: The Effects of Ads on Recognition, Candidate-Month Fixed Effects. Analyses include respondent and candidate-month fixed effects. Standard errors double-clustered by respondent and candidate are in parentheses. One star indicates statistical significance at the 5% level. Two stars indicates statistical significance at the 1% level. Three stars indicates statistical significance at the 0.1% level. A plus sign indicates statistical significance at the 10% level.

Sample:	(1)		(2)		(3)		(4)		(5)		(6)		(7)		(8)		(9)	
	2 weeks out	4 weeks out	4 weeks out	8 weeks out	8 weeks out	2 weeks out	2 weeks out	4 weeks out	4 weeks out	8 weeks out	8 weeks out	2 weeks out	2 weeks out	4 weeks out	4 weeks out	8 weeks out	8 weeks out	
Independent Variables:																		
Run Positive Ads	1.058*** (0.216)	1.240** (0.377)	1.240** (0.377)	0.591 (0.483)	0.591 (0.483)	1.297*** (0.252)	1.297*** (0.252)	1.392** (0.441)	1.392** (0.441)	0.913 (0.562)	0.913 (0.562)	0.829* (0.417)	0.829* (0.417)	1.053 (0.721)	1.053 (0.721)	0.045 (0.905)	0.045 (0.905)	
Run Negative Ads	3.998*** (0.805)	2.368* (1.011)	2.368* (1.011)	1.470 (1.214)	1.470 (1.214)	3.678*** (1.076)	3.678*** (1.076)	2.307+ (1.366)	2.307+ (1.366)	0.985 (1.662)	0.985 (1.662)	4.570*** (1.308)	4.570*** (1.308)	2.421 (1.513)	2.421 (1.513)	2.197 (1.700)	2.197 (1.700)	
Attacked	0.400 (0.537)	0.141 (0.583)	0.141 (0.583)	0.320 (0.761)	0.320 (0.761)	0.502 (0.639)	0.502 (0.639)	0.088 (0.704)	0.088 (0.704)	0.159 (0.969)	0.159 (0.969)	0.303 (0.948)	0.303 (0.948)	0.300 (1.005)	0.300 (1.005)	0.719 (1.126)	0.719 (1.126)	
<i>N</i>	54160	42732	42732	28740	28740	38021	38021	29983	29983	20259	20259	15958	15958	12595	12595	8381	8381	

Table 12: The Effects of Ads on Candidate Choice, Candidate-Month Fixed Effects. Analyses include candidate-month fixed effects. Standard errors clustered by media market are in parentheses. One star indicates statistical significance at the 5% level. Two stars indicates statistical significance at the 1% level. Three stars indicates statistical significance at the 0.1% level. A plus sign indicates statistical significance at the 10% level.

Sample:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	2 weeks out	All Respondents 4 weeks out	8 weeks out	2 weeks out	Co-partisans 4 weeks out	8 weeks out	2 weeks out	Independents 4 weeks out	8 weeks out
Independent Variables:									
Party Match	0.444*** (0.003)	0.452*** (0.003)	0.480*** (0.003)						
Run Positive Ads	0.161** (0.050)	0.156** (0.058)	0.033 (0.102)	0.287* (0.119)	0.294+ (0.155)	0.309 (0.207)	0.077 (0.083)	0.091 (0.094)	-0.140 (0.168)
Run Negative Ads	0.612* (0.243)	0.835*** (0.308)	0.768 (0.488)	0.486 (0.415)	0.676 (0.497)	0.618 (0.721)	0.334 (0.421)	0.463 (0.537)	-0.667 (0.917)
Attacked	-0.305* (0.131)	-0.127 (0.180)	-0.460 (0.285)	0.025 (0.252)	0.525 (0.325)	-0.091 (0.414)	-0.428+ (0.229)	-0.461 (0.296)	-1.673** (0.534)
<i>N</i>	313041	300418	271794	149505	145350	136066	108207	103415	92841

Table 13: The Effects of Ads on Favorability, Logged Ads. Analyses include respondent and candidate fixed effects. Standard errors double-clustered by respondent and candidate are in parentheses. One star indicates statistical significance at the 5% level. Two stars indicates statistical significance at the 1% level. Three stars indicates statistical significance at the 0.1% level. A plus sign indicates statistical significance at the 10% level.

Sample:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	2 weeks out	All Respondents 4 weeks out	8 weeks out	2 weeks out	Co-partisans 4 weeks out	8 weeks out	2 weeks out	Independents 4 weeks out	8 weeks out
Independent Variables:									
Party Match	0.009*** (0.002)	0.008*** (0.002)	0.005+ (0.003)						
Run Positive Ads	0.107* (0.046)	0.128* (0.054)	0.083 (0.096)	0.051 (0.129)	0.021 (0.167)	-0.004 (0.227)	0.123+ (0.070)	0.165* (0.080)	0.072 (0.146)
Run Negative Ads	0.132 (0.222)	-0.133 (0.288)	-0.142 (0.429)	0.080 (0.452)	0.057 (0.532)	0.086 (0.715)	0.275 (0.347)	-0.113 (0.472)	-0.187 (0.766)
Attacked	-0.049 (0.119)	-0.025 (0.165)	0.018 (0.255)	0.147 (0.275)	0.199 (0.353)	0.453 (0.452)	-0.147 (0.186)	-0.201 (0.259)	-0.461 (0.462)
<i>N</i>	462996	447099	409582	216419	211531	200096	167952	161582	146768

Table 14: The Effects of Ads on Recognition, Logged Ads. Analyses include respondent and candidate fixed effects. Standard errors double-clustered by respondent and candidate are in parentheses. One star indicates statistical significance at the 5% level. Two stars indicates statistical significance at the 1% level. Three stars indicates statistical significance at the 0.1% level. A plus sign indicates statistical significance at the 10% level.

Sample:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	2 weeks out	All Respondents 4 weeks out	8 weeks out	2 weeks out	Co-partisans 4 weeks out	8 weeks out	2 weeks out	Independents 4 weeks out	8 weeks out
Independent Variables:									
Run Positive Ads	1.476*** (0.263)	1.765*** (0.453)	1.021+ (0.617)	1.739*** (0.306)	1.912*** (0.527)	1.400* (0.709)	1.235* (0.509)	1.661+ (0.872)	0.410 (1.173)
Run Negative Ads	4.488*** (0.908)	2.749* (1.160)	1.804 (1.395)	4.007*** (1.205)	2.546+ (1.534)	1.132 (1.852)	5.444*** (1.457)	3.090+ (1.782)	2.916 (2.046)
Attacked	0.453 (0.648)	0.093 (0.715)	0.408 (0.957)	0.524 (0.772)	-0.052 (0.865)	0.106 (1.205)	0.427 (1.153)	0.441 (1.249)	1.035 (1.467)
<i>N</i>	54160	42732	28740	38021	29983	20259	15958	12595	8381

Table 15: The Effects of Ads on Candidate Choice, Logged Ads. Analyses include candidate fixed effects. Standard errors clustered by media market are in parentheses. One star indicates statistical significance at the 5% level. Two stars indicates statistical significance at the 1% level. Three stars indicates statistical significance at the 0.1% level. A plus sign indicates statistical significance at the 10% level.

Sample:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	2 weeks out	All Respondents 4 weeks out	8 weeks out	2 weeks out	Co-partisans 4 weeks out	8 weeks out	2 weeks out	Independents 4 weeks out	8 weeks out
Independent Variables:									
Party Match	0.444*** (0.003)	0.451*** (0.003)	0.480*** (0.003)						
Run Positive Ads	0.166*** (0.043)	0.138*** (0.048)	-0.049 (0.086)	0.218+ (0.111)	0.120 (0.137)	0.043 (0.182)	0.151* (0.072)	0.118 (0.080)	-0.161 (0.140)
Run Negative Ads	0.539* (0.231)	0.588+ (0.305)	0.242 (0.461)	0.332 (0.430)	0.361 (0.552)	0.443 (0.686)	0.344 (0.389)	0.303 (0.511)	-1.293 (0.865)
Attacked	-0.400** (0.124)	-0.212 (0.169)	-0.719** (0.258)	0.123 (0.265)	0.491 (0.300)	-0.154 (0.369)	-0.477* (0.214)	-0.538+ (0.286)	-1.830*** (0.488)
<i>N</i>	303792	291595	263862	144756	140762	131764	104800	100166	89936

Table 16: The Effects of Ads on Favorability, No NH, IA, or SC. Analyses include respondent and candidate fixed effects. Standard errors double-clustered by respondent and candidate are in parentheses. One star indicates statistical significance at the 5% level. Two stars indicates statistical significance at the 1% level. Three stars indicates statistical significance at the 0.1% level. A plus sign indicates statistical significance at the 10% level.

Sample:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	2 weeks out	All Respondents 4 weeks out	8 weeks out	2 weeks out	Co-partisans 4 weeks out	8 weeks out	2 weeks out	Independents 4 weeks out	8 weeks out
Independent Variables:									
Party Match	0.009*** (0.002)	0.008** (0.003)	0.005+ (0.003)						
Run Positive Ads	0.106** (0.040)	0.095* (0.045)	0.146+ (0.082)	0.149 (0.123)	0.090 (0.151)	0.189 (0.207)	0.154* (0.061)	0.154* (0.068)	0.130 (0.124)
Run Negative Ads	0.320 (0.211)	0.295 (0.285)	0.453 (0.408)	0.647 (0.467)	0.902 (0.582)	0.824 (0.689)	0.373 (0.322)	0.053 (0.453)	0.353 (0.723)
Attacked	0.083 (0.114)	0.073 (0.154)	0.258 (0.231)	0.564* (0.283)	0.402 (0.324)	0.679+ (0.405)	-0.038 (0.179)	-0.191 (0.251)	-0.189 (0.424)
<i>N</i>	449377	434066	397727	209482	204805	193750	162880	156743	142400

Table 17: The Effects of Ads on Recognition, No NH, IA, or SC. Analyses include respondent and candidate fixed effects. Standard errors double-clustered by respondent and candidate are in parentheses. One star indicates statistical significance at the 5% level. Two stars indicates statistical significance at the 1% level. Three stars indicates statistical significance at the 0.1% level. A plus sign indicates statistical significance at the 10% level.

Sample:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	2 weeks out	All Respondents 4 weeks out	8 weeks out	2 weeks out	Co-partisans 4 weeks out	8 weeks out	2 weeks out	Independents 4 weeks out	8 weeks out
Independent Variables:									
Run Positive Ads	2.241*** (0.215)	1.994*** (0.384)	1.076* (0.443)	2.400*** (0.253)	2.263*** (0.462)	1.512** (0.533)	1.984*** (0.411)	1.425* (0.684)	0.163 (0.796)
Run Negative Ads	4.341*** (0.839)	2.692*** (0.927)	2.284* (1.025)	3.945*** (1.042)	2.616* (1.185)	2.071 (1.338)	5.038*** (1.532)	2.521+ (1.517)	2.538 (1.634)
Attacked	1.546** (0.565)	1.026+ (0.567)	1.413+ (0.748)	1.640** (0.630)	1.021 (0.646)	1.707+ (0.897)	1.427 (1.098)	1.031 (1.054)	1.226 (1.193)
<i>N</i>	53665	42382	28552	37688	29749	20129	15798	12481	8325

Table 18: The Effects of Ads on Candidate Choice, No NH, IA, or SC. Analyses include candidate fixed effects. Standard errors clustered by media market are in parentheses. One star indicates statistical significance at the 5% level. Two stars indicates statistical significance at the 1% level. Three stars indicates statistical significance at the 0.1% level. A plus sign indicates statistical significance at the 10% level.

Sample:	(1)		(2)		(3)		(4)		(5)		(6)		(7)		(8)		(9)	
	2 weeks out	4 weeks out	4 weeks out	8 weeks out	8 weeks out	2 weeks out	2 weeks out	4 weeks out	4 weeks out	8 weeks out	8 weeks out	2 weeks out	2 weeks out	4 weeks out	4 weeks out	8 weeks out	8 weeks out	
Independent Variables:																		
Party Match	0.199*** (0.004)	0.197*** (0.004)	0.196*** (0.006)															
Run Positive Ads	0.238*** (0.057)	0.280*** (0.071)	0.245*** (0.094)	0.266*** (0.100)	0.216+ (0.127)	0.230 (0.148)	0.231* (0.095)	0.290* (0.116)	0.158 (0.162)									
Run Negative Ads	-0.055 (0.295)	0.041 (0.302)	-0.011 (0.388)	0.247 (0.439)	0.414 (0.449)	0.465 (0.605)	-0.453 (0.537)	-0.353 (0.550)	-0.776 (0.741)									
Attacked	-0.540*** (0.149)	-0.402* (0.196)	-0.810*** (0.238)	-0.339 (0.226)	-0.078 (0.337)	-0.463 (0.369)	-0.517+ (0.269)	-0.381 (0.299)	-1.262** (0.443)									
<i>N</i>	211821	204225	185014	115861	113350	107113	71105	68233	61193									

Table 19: The Effects of Ads on Favorability, No 2016. Analyses include respondent and candidate fixed effects. Standard errors double-clustered by respondent and candidate are in parentheses. One star indicates statistical significance at the 5% level. Two stars indicates statistical significance at the 1% level. Three stars indicates statistical significance at the 0.1% level. A plus sign indicates statistical significance at the 10% level.

Sample:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	2 weeks out	All Respondents 4 weeks out	8 weeks out	2 weeks out	Co-partisans 4 weeks out	8 weeks out	2 weeks out	Independents 4 weeks out	8 weeks out
Independent Variables:									
Party Match	0.037*** (0.005)	0.037*** (0.006)	0.036*** (0.008)						
Run Positive Ads	0.251*** (0.075)	0.226* (0.093)	0.167 (0.127)	0.230+ (0.137)	0.081 (0.175)	0.005 (0.212)	0.250* (0.117)	0.282* (0.144)	0.339+ (0.205)
Run Negative Ads	0.836* (0.381)	0.911* (0.390)	0.826+ (0.484)	0.658 (0.570)	0.700 (0.584)	0.920 (0.735)	1.023 (0.667)	1.082 (0.683)	0.508 (0.880)
Attacked	0.448* (0.183)	0.309 (0.248)	0.563+ (0.297)	0.829** (0.313)	0.779+ (0.445)	0.870+ (0.485)	-0.002 (0.303)	-0.247 (0.388)	-0.104 (0.552)
<i>N</i>	311754	301912	276164	170690	167663	159788	107439	103519	93480

Table 20: The Effects of Ads on Recognition, No 2016. Analyses include respondent and candidate fixed effects. Standard errors double-clustered by respondent and candidate are in parentheses. One star indicates statistical significance at the 5% level. Two stars indicates statistical significance at the 1% level. Three stars indicates statistical significance at the 0.1% level. A plus sign indicates statistical significance at the 10% level.