Buying Attention

Campaign Advertisements and Candidate Salience

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Abstract

What effect does exposure to political television advertisements have on self directed information-seeking behavior? Of the $2.6 billion spent on political advertisements during the 2008 election, $2 billion was spent on local TV ads. Previous work shows that these TV spots have a direct effect on turnout, candidate evaluation, and political engagement, but we argue that they also have the indirect effect of spurring online information seeking about candidates. In this paper, we add to our understanding of what money spent on TV ads actually buys candidates. Generating attention and establishing name recognition is an essential component of a successful campaign, especially for lesser known candidates for whom "any news is good news." Combining data collected by the Wisconsin Ad Project with Google search data for 199 media markets spanning all 50 U.S. States in the year leading up to the 2008 election, we gauge the effects of local TV advertisements on information-seeking. We find that dollars spent on a TV ad translates to a significant increase in search volume for the candidate running an ad. Strikingly, the increase in searches for the target of attack ads is eight times greater than the increase in searches for the subject of ads promoting a candidate. In addition, ads about candidates' personal characteristics significantly increase searches while ads about policy issues have no significant effect.

The question of how political advertising campaigns affects citizen mobilization has long been of interest to scholars. Specifically, previous work pays great attention to the effect of political ads on watchers' propensity to seek further information about candidates. This self directed information-seeking behavior can indicate greater citizen engagement and candidate salience/viability.

While the importance of information-seeking behavior is well established, the way in which it is measured is highly contentious. Neither self-reported media exposure nor experimental process tracing fully capture the type of theoretical behavior associated with real-world information-seeking. In this paper, we test the effect of exposure to political advertising on information-seeking using a measure of self-directed internet searches (Google Trends). We argue that this measure of actual internet searches better captures the type of behavior individuals take to learn more about candidates and actively engage in politics.

We show that greater overall exposure to political advertising drives citizens to seek more information about candidates. We also find that the effect of ads on information seeking is strongly mediated by the *content* and *tone* of those ads. Strikingly, the increase in searches for the target of attack ads is eight times greater than the increase in searches for the subject of ads promoting a candidate. Meanwhile, ads focusing on candidates' personal characteristics drive a significant increase in internet searches

while ads focusing on policy issues have no effect.

While these results are intuitive, they contradict the findings of important previous work arguing that the information received from television ads *replaces* costlier, self-directed information-seeking behavior (Valentino, Hutchings & Williams 2004, Shah, Cho, Nah, Gotlieb, Hwang, Lee, Scholl & McLeod 2007). Additionally, our findings add to the literature finding that negative advertisements and personal characteristics can inspire increased political engagement (Geer 2006, Martin 2004, K & Freedman 2002) rather than apathy and cynicism (Ansolabehere & Iyengar 1995, Ansolabehere, Iyengar & Simon 1999).

This paper is organized into five main sections. First, we discuss previous work on the effect of exposure to political advertising on citizen mobilization, attitudes, and information-seeking. This section begins with a general discussion of what ads do and how they work before turning to the differential effects based on ad tone and content. Second, we lay out our theoretical expectations for how political advertising affects internet search behavior about candidates. Third, we discuss our data and argue that self-directed internet searches are a better measure of information-seeking than those used in previous studies. Fourth, we test our hypotheses using data from 199 US media markets in the year leading up to the 2008 presidential election. Finally, we discuss the implications and limitations of our findings and discuss future work we plan to conduct focusing on information-*sharing*.

I. Previous Work

A large body of literature in political science focuses on the effects of political advertising on citizen perceptions and behavior. One line of this literature focuses on the direct effect of advertising on citizens' impressions of candidates (Garramone, Atkin, Pinkleton & Cole 1990, Kaid & Boydston 1987) and voter choice (Franz & Ridout 2007, Chang 2001, Kahn & Geer 1994, Pinkleton 1997, Valentino, Hutchings & Williams 2004, Huber & Arceneaux 2007). Other works show that political ads affect overall views of the political system (Banducci & Karp 2003, De Vreese & Semetko 2002) and political engagement, with a special focus on turnout (Ansolabehere & Iyengar 1995, Wattenberg & Brians 1999, Martin 2004). An important part of this second strand of literature focuses specifically on political engagement as information-seeking. The self-directed behavior of learning more about candidates implies a more active form of political engagement than being a passive information receiver. Information-seeking may also indirectly affect candidate impression, candidate salience, voter choice, and other forms of political behavior.

In the following three subsections, we identify three theoretical debates on the effect of political advertising on information seeking. The first debate focuses on the effect of overall political advertising on information seeking. The second and third debates focus on the effect of ads based on their tone (negative vs. advocacy ads) and content (personal vs. policy ads). We argue that our measure of information seeking based on internet searches better operationalizes the theoretical concepts that characterize these debates.

I. Political Advertising and Information Seeking

When it comes to the overall effect of exposure to political advertisements on information seeking, there is a divide in the literature between those who argue that exposure *spurs* information seeking and those who argue that it *suppresses* information seeking. Those who argue that exposure to ads increases information-seeking point to the complementary nature of communication: when people learn about a topic, they are inspired to find out more about that topic (Chaffee 1982). Cho argues that political ads inspire information seeking by induc-

ing feelings of ambivalence among undecided voters and leading candidates' core supporters to seek information on who is winning the race (Cho 2011). In addition to this direct effect on citizen information seeking, political advertising might lead people to talk about political issues or candidates with members of their social network. This could lead to an indirect effect on information seeking by the friends of the people who actually saw the ad (Cho 2011, Huckfeldt & Sprague 1987).

Exposure to political ads might also suggest to citizens that the race is close or that the candidate mentioned in the ad is politically viable. Both of these realizations might make the watcher feel as if their vote matters more, inspiring them to research the candidates in order to make an informed decision. Recent research shows that a candidate gaining political viability (as measured by poll numbers) leads to greater Google searches for that candidate (Utych & Kam 2013). Viewing a political advertisement signals viability by showing that the candidate can afford to spend money on a campaign. In addition, viewing political ads can signal that the race is close, as candidates usually spend most of their advertising dollars in regions where they believe those dollars could tip the election in their favor.

Finally, political advertising can spur online information seeking by triggering emotional reactions in watchers. Brader (2005) finds that ads cuing enthusiasm led to greater recall of news articles unrelated to the content of the ad, while ads cuing fear led to greater recall of articles both related and unrelated to the ad. The role of emotion is generally underconsidered by those who argue that political advertisements suppress information-seeking.

On the other side of this debate, authors argue that exposure to political ads suppresses information seeking. The main hypothesized mechanism is that the information in political ads *replaces* the type of information that people would otherwise seek out (Valentino, Hutchings & Williams 2004). This argument follows a Downsian logic, where potential vot-

ers seek out only the necessary amount of information to bring them to a satisfactory decision (Downs 1957). Self-directed information seeking is costly behavior for accumulating the information necessary to make an informed decision. By providing information on candidates, political ads reduce the need for individuals to take this costly action in their free time. In a lab experimental setting, Valentino et al find that the effect of advertising on an individual's information-seeking behavior is strongly mediated by the political knowledge of the viewer. The most informed viewers are most likely to replace information-seeking with the information in political ads, while the least informed viewers do not act any differently.

There are two main ways in which previous studies operationalize information seeking. In observational survey studies and survey experiments, information seeking is most commonly measured as self-reported exposure to mass media (Atkin 1972, Shah et al. 2007), recall of related news articles (Brader 2005), and self-reported discussion partners (Huckfeldt & Sprague 1987, Cho 2013, Cho 2008, Shah et al. 2007). Meanwhile, lab experiments mainly use experimental process tracing techniques in which participants click on informational links organized in rectangular matrices (Lau 1995, Huang 2000, Redlawsk 2004) or on fake candidate websites (Valentino, Hutchings & Williams 2004).

Both of the above operationalizations do not fully capture self-directed information seeking. Self-reported data on information seeking suffer two main problems. First, none of these data capture information seeking as we would intuitively define it. Instead, these measures are crude proxies for actual information seeking. Exposure to mass media includes activities in which the viewer does not actively seek out the information. Recall of related and unrelated news articles may be capturing the fact that ads reinforce information that would have been received anyway. Self-reported discussion with other individuals is a measure that seems to better capture an individual's propensity

to share already received information than to seek new information. None of these measures intuitively capture the kind of behavior most people would associate with self-directed information seeking behavior. While these measures may be decent proxies for the kind of theoretical behavior the authors are most interested in, the varying results based on these different measures suggests that they are capturing different behavior.

Second, self-reported survey responses suffer from problems of desirability bias. It is plausible that respondents feel pressure to say they researched candidates or issues due to norms of civic involvement. Moreover, different demographics or respondent characteristics might have different norms and thus produce measurement error that is correlated with the dependent variable. As further discussed in the following sections, we believe that measuring actual internet searches better captures the theoretical concept of information seeking while being immune to social desirability bias.

In contrast to the self-reported behavior found in survey studies, experimental studies avoid problems of desirability bias and observe actual behavior as opposed to self-reported recall. However, the lab setting still has important differences from real-world information seeking. Studies that ask lab participants to engage in abstract search tasks based on rectangular matrices of links do not really capture the real-world information seeking environment (Valentino, Hutchings & Williams 2004). Meanwhile, studies that sit participants behind a computer screen with fake candidate websites act under the assumption that individuals in the real world would somehow get to the candidate websites. First, real-world information seeking often involves news articles that are not linked to candidates' websites. Second, simply getting to a candidate's website seems to be a more important indicator of information seeking than the number of links clicked once individuals have reached that site. We argue that a measure capturing actual internet searches would better represent the informa-

tion seeking behavior that individuals take in real-world scenarios.

II. Negative vs. Advocacy Ads

The majority of work on political advertising focuses specifically on the effects of negative ads. The major debate surrounds whether negative advertising leads to cynical and apathetic citizens who are less likely to turnout and engage in politics or whether it spurs stronger emotional connection to the election, provides more useful information, and leads to greater political engagement.

On one side of this debate, Ansolabehere and colleagues conducted lab experiments showing that exposure to political ads decreases citizens' likelihood of turning out to vote (Ansolabehere, Iyengar, Simon & Valentino 1994, Ansolabehere & Iyengar 1995, Ansolabehere, Iyengar & Simon 1999). The argument is that exposure to negative ads elicits strong negative emotions about candidates and the political system in general. In addition to eliciting this emotional response, viewers retain less information when it is delivered through negative ads than when it is delivered through advocacy ads (Geer & Geer 2003).

On the other side of the debate, authors argue that negative ads increase the propensity to turnout, generate interest in the election, and strengthen ties to specific candidates (Geer 2006, Wattenberg & Brians 1999, Martin 2004, K & Freedman 2002, Freedman & K 1999, Mayer 1996). Negative ads are theorized to increase political engagement by signaling a close and competitive election, increase feelings of candidate threat, and cuing individuals' "republican duty" (Martin 2004). In addition, negative ads are more likely to cue emotions of fear that inspire political engagement (Brader 2005).

In response to this debate on negative advertising, a slew of authors argue either that there is no discernible effect of negative ads on political engagement or that the effect is

highly contingent on other factors. In a series of meta-analytic articles, Lau and colleagues show that taken together, the results of work on negative advertising shows that there is no discernible effect on turnout or other forms of political engagement (Lau, Sigelman, Heldman & Babbitt 1999, Lau & pomper 2004, Lau, Sigelman & Rovner 2007). Others find that while there may be no overall effect of negative advertising, there are contingent effects based on the intensity of the negative campaign (Lau & pomper 2001), whether the ads are considered to be fair criticism (Kahn & Kenney 1999), the political orientation of the viewer (Finkel & Geer 1998), and the specific election cycle (Wattenberg & Brians 1999). Additionally, some authors point to differences in the ways that negative ads affect different forms of political engagement. Negative ads seem to increase cynicism about the political system as a whole but do not suppress voting intent (Yoon, Pinkleton & Ko 2005).

The relationship between negative political ads and information seeking has received less attention in the literature than the effect on turnout. However, just as with the rest of the literature on the effect of negative advertisements, authors find results for both sides of the debate. Using experimental methods, Cho (2013) finds that negative ads are more likely to inspire strong emotions such as fear, which then leads to more political discussion and information seeking. On the other hand, Shah et al (2007) find that exposure to negative ads results in people self-reporting lower levels of information seeking in television and print media forums. They find no effect of negative ads on self-reported online information seeking.

III. Personal vs. Policy Ads

Somewhat related to the literature on the *tone* of advertising, some scholars focus on ad *content*. The amount of advertising focusing on candidates' personal characteristics as opposed to policy positions has been on the rise in the last several decades (Geer 2006, West 2014).

The debate in this literature has a similar theoretical backing as the debate over the effects of negative advertisements. Some studies find that focus on personal characteristics is bad for democratic politics and has negative effects on citizen engagement (Carter 1998, Patterson 2009, Ansolabehere & Iyengar 1995). In contrast to these results, other studies find that there is no statistically significant relationship between ads focusing on personal characteristics and political engagement (Lau & pomper 2001) and that these ads might actually lead to increased mobilization despite the fact that citizens often view these ads as "unfair" (Brooks & Geer 2007).

II. Our Contribution

This paper aims to advance the three debates outlined above by proposing a novel measure of information seeking based on observational internet search data. The main contribution of this paper is empirical; we argue that data measuring actual self-directed internet searches is a better operationalization of the type of information seeking indicating political engagement. We outline how we use Google Trends to capture information seeking in the following section.

We also argue that this measure has important theoretical implications for how we think about information seeking and political engagement in the modern age. Political engagement is increasingly an online activity, and new data sources allow us to capture intricacies of how traditional advertising affects this newer form of political communication. We believe that this paper is a first step in moving towards more work that highlights this relationship between traditional media and newer forms of political engagement online.

Additionally, this paper makes an important distinction between information seeking about the *targets* and *purchasers* of attack ads. The causal mechanisms that would lead to

increased or suppressed information seeking about the targets and purchasers of attack ads are very different. The logic behind the specific hypotheses on these effects is discussed further in the next subsection. We test previous theories against each other from the three main debates outlined above.

I.   Hypotheses

The first major question that we aim to answer is: what is the effect of overall political advertising on self-directed information seeking behavior? The null hypotheses is that there is no relationship between exposure to political advertising and information seeking. Based on the two sides of the debate, we propose two alternate hypotheses:

H1a: *Exposure to political ads spurs an increase in online information-seeking behavior about candidates who run the ads*

H1b: *Exposure to political ads suppresses online information-seeking behavior about candidates who run the ads*

H1a follows the logic of Chaffee (1982), Cho (2008, 2011, 2013), and Brader (2005) among others. Exposure to political ads might result in a desire to seek additional information due to increased ambivalence among undecided voters, rallying the party base, increased emotional responses, and through a social network effect. Meanwhile, H1b follows the logic of Valentino et al (2004) and Shah et al (2007), who argue that information received in political ads replaces the need to seek information on one's own.

The second question we address is: what is the effect of negative advertising on information-seeking behavior? We break down this analysis into information seeking about both the target of negative advertising and information seeking about the candidate who ran the negative ad.

H2a: *Exposure to negative political ads suppresses*

information seeking about both the targets and purchasers of ads

H2b: *Exposure to negative political ads increases information seeking about both the targets and purchasers of ads*

H2c: *Exposure to negative political ads increases information seeking about the targets of attack ads while having little effect on information seeking about the purchaser of attack ads*

H2a follows the logic of Ansolabehere et al (1995, 1999) and others who argue that exposure to negative ads results in overall cynicism and apathy towards the election and candidates. According to these authors, increased cynicism should be connected with less political engagement in general (though they focus on turnout), which includes information seeking behavior about the targets and purchasers of attack ads.

H2b follows the logic of Geer (2006), Goldstein and Freedman (1999, 2002) and Martin (2004), who argue that exposure to negative ads results in an overall increase in political engagement. These authors argue that an increase in negative ad exposure cues viewers that the election is closer, spurs general interest in candidates and increases a sense of "republican duty." If this is the case, we should expect that viewers should increase information seeking about *both* candidates in the race in order for citizens to make an informed decision.

H2c tests a different mechanism that might lead to increased information seeking. According to Brader (2005) and Cho (2013), increased information seeking results from negative ads due to emotional responses to threat. The theoretical expectation is that information seeking will only increase about the *target* of the attack ad, as that is the candidate being threatened.

The third question we address relates to information seeking contingent on the *content* of political ads.

H3a: *Exposure to political ads focusing on candidates' personal characteristics and ads focus-*

ing on policy issues both spur a comparable increase in online information-seeking

H3c: *Exposure to political ads focusing on candidates' personal characteristics suppress online information-seeking*

H3d: *Exposure to political ads focusing on candidates' personal characteristics spur an increase in online information-seeking while exposure to ads focusing on policy positions has no effect*

H3a follows a similar logic to H1a, in which exposure to political ads increases overall information seeking. However, it adds the condition that there is no significant difference between the effects of personal and policy ads, which is consistent with the findings of Lau and Pomper (2001). H3b is in line with the expectations of Carter (1998), Patterson (2009) and others who argue that advertising that focuses on personal characteristics increases cynicism and suppresses political engagement.

Support for H3c would suggest that emotional responses spur information seeking (Brader 2005). This result would be consistent with the ideas of Brooks and Geer (2007), who show that ads about personal characteristics that individuals consider uncivil actually increase political engagement.

III.   Data and Methods

In this section, we discuss the data used in this study as well as the methods we use to test the hypotheses presented above.

I.   Data

We combine two sources of data to understand the relationship between campaign advertising and information seeking behavior: a dataset compiled by the University of Wisconsin Advertising Project and Google Trends data on internet web searches.

Measuring Exposure to Campaign Advertisements. The Wisconsin Advertising dataset is constructed by first using the CMAG automated system to pull down story boards of every political advertisement run in election years. The ads are then coded for further information using human coders who watch every unique political advertisement aired on the major national television networks and many national cable networks (Ridout, Franz & Goldstein 2008). This data has several advantages over respondent recall or archival data. Moreover, the data has been shown to have high accuracy when compared with the most highly regarded, but difficult to obtain source of data on advertising: tv station records. These data are the standard for most observational studies on political advertising.

The Wisconsin ad project codes a large number of characteristics of each advertisement. Of special interest to this project, the data includes coding for who purchased each ad, whether the ad listed a favored candidate, whether the ad mentioned an opponent, when and where the ad aired, and an estimated cost of the ad. Additionally, each advertisement is coded as either an attack, contrast, or promote ad (tone) and as focusing on personal characteristics or policy issues (content).

The unit of analysis in the advertising data is the Nielsen Designated Media Area (DMA). In this project, we use data from 199 DMAs in all 50 states for the 2008 Presidential election. Due to search volume limitations on Google Trends Data (only search terms with a sufficiently high search volume register), and problems with other candidates' names being more common (e.g. searches for "Clinton" might include searches for Bill *and* Hillary), we look specifically at ads run by and mentioning candidates Obama and McCain.

We sum the cost of ads placed in each media market by week two different ways to test our different hypotheses about the effect of purchasing ads vs being mentioned in an ad (as in the case of an attack ad). First, we sum up all advertisements in a given week *purchased* by

candidate i, in market j, during week T. This yields ad_{ijT}^{pay}. To construct another measure, ad_{ijT}^{ment}, we sum the cost of ads placed *mentioning* a candidate in each media market in each week. Equation 1 formalizes the general process of constructing these variables from the Wisconsin Advertising Data[1].

$$ad_{ijT} = \sum_{T}^{ij} ad_{ijt} \qquad (1)$$

In subsequent analyses we disaggregate by the type of ad by multiplying the cost of each ad by its binary tone or content coding. For example, an add costing $\$100,000$ that is coded as a personal ad enters our data set as that amount of personal ad spending and as $\$0$ of policy ad spending.

Measuring Information Seeking. We capture self-directed information seeking behavior with data from Google Trends. Google Trends records and makes available data on the relative volume of many search terms across time and space as far back as 2004[2]. Data can be downloaded at the state or Designated Media Area (DMA) levels for terms that have significantly high search volumes[3]. Before exploring the particulars of this measure, we need to justify the use of online searches as a measure of information seeking behavior.

Online searches represent an excellent measure of information seeking in the digital age. In 2008, more than 10 billion web searches a month were being made. A Pew report from the same year found that approximately 50% of people surveyed used internet searches on the average day and more than 60% used email (**?**). Google searches in particular made up approximately 60% of the search engine market (**?**). By 2012, these numbers had increased significantly, with 91% of adults using search engines and 83% preferring Google (Purcell, Brenner & Rainie 2012).

Google Trends data are becoming increasingly popular in a variety of fields, including the social sciences. The most prominent use of Google Trends data is "predicting the present" (Choi & Varian 2012). This includes epidemiological studies, which use data on searches for flu related terms to predict actual flu levels much quicker than conventional physician reporting methods (Ginsberg, Mohebbi, Patel, Brammer, Smolinski & Brilliant 2009). In political science, scholars are beginning to use Google Trends to measure issue salience (Mellon 2013, Pelc 2013). A recent article by Utych and Kam uses Google Trends to measure information seeking about candidates in presidential campaigns (Utych & Kam 2013). They find that information seeking about candidates increases as a result of gains in political viability (as measured by poll numbers). Along with this study, the work by Utych and Kam is the first to use Google Trends as a measure of information seeking.

We argue that Google Trends data on internet searches more accurately operationalizes the concept of information seeking than self-reported news recall and process tracing in an experimental setting. A person deciding to Google a candidate's name is an extremely direct measure of whether that person sought information about that candidate. This avoids capturing all the other factors that could play a role in a person's ability to recall news articles. Unlike survey measures of information seeking, internet search data is not susceptible to social desirability biases. It is very plausible that respondents feel pressure to say they researched candidates or issues given norms of civic involvement. Moreover, different demographics or respondent characteristics might have different norms and thus produce measurement error that is correlated with the dependent variable. Anonymous, aggregated search data is immune to this sort of error. Additionally, observational data on

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[1]Note that capital-case T denotes weeks and lower-case t represents days

[2]See `www.google.com/trends` to explore Google Trends' features.

[3]Google has set a search volume threshold that must be reached in order for search data to be accessible in Google Trends. Google has not made public the exact search volume.

Google searches captures the decision to seek additional political information in a person's everyday schedule. In an experimental setting, participants are not in an environment where they have the option to go about their daily business instead of taking the costly action of seeking political information.

While Google trends provides highly accurate aggregate measures, unlike NSA records, it does not link individual users to placed searches. The prevents us from including covariates on the searchers' characteristics (such as political knowledge, ideology, gender, etc.). Nevertheless, we find substantial temporal and geographic variation in our independent variable, exposure to ads, and in our dependent variable, searches for the candidates names.

As shown in Figure 1, the values produced by Google Trends for each media market are scaled such that the raw number of searches in each week is scaled to the highest point on the graph, which is always 100 at the highest level of searches within the specified time period. Anticipating the use of candidate fixed effects in our regression analyses, the data is downloaded separately for each candidate to maximize variation. Searches for each candidate's name (McCain or Obama[4]) in each media market invariably peak at 100 on the week of the election. This provides face validity for the claim that these particular search terms are predominantly in reference to the candidates as opposed to other places, people or things with the same name[5]. This peak likely represents individuals looking for information on election returns.

We download data on each candidate for each media market for every week in 2008 and combine this with data on ad type and approximate ad cost from the Wisconsin ad project. Because both data sets use the same unit of analysis, very little data is lost in the process of combining our two sources of data. Our final

data set has approximately 14,800 observations.

II. Methods

To test the hypotheses we lay out in section III, subsection I, we conduct ordinary least squared regressions with candidate fixed effects. We do not explicitly add media market fixed effects because Google rescale the search volume in each area. This results in a each area having very similar mean values[6] We interpret this as evidence that market fixed effect are unnecessary. Neverthless, the main findings hold when employing market fixed effects. For example, the coefficients in table 1 shrink, but retain sign and significance.. This strategy isolates the effect of campaign advertising apart from the general dynamic of increasing interest across time and on predictable occasions like the democratic and republican nominating conventions and election days.

In order to test our hypotheses that differentiate between the purchasers and targets of ads, we aggregate the advertising data two different ways before merging it with the search data. First, we include all ads with the candidate who paid for them. In these analyses an ad paid for by Obama that mentions McCain is still attached to Obama. This allows us to test whether ads increase, decrease or have no effect on information seeking about the candidate who purchased the ad. A second way of organizing the data sums up all ads in each media market-week based on the target of each ad (which candidate is mentioned).

IV. Results

In this section, we lay out the results of the regression analysis. First, we focus on the hypotheses relating to the effect of political ads

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[4]These search volumes include diverse capitalizations, but only the correct spelling for each candidate.

[5]There is a small chance this sort of problem could have arisen if data from 2004 was used. Bush was the name of a once a popular band or might have been searched by people looking to purchase shrubbery online.

[6]The standard deviation of the media market mean Google Trend values is only 3.38 on a 1-100 scale.

Figure 1: *Google search volumes for the candidate's names for two media markets in 2008.*
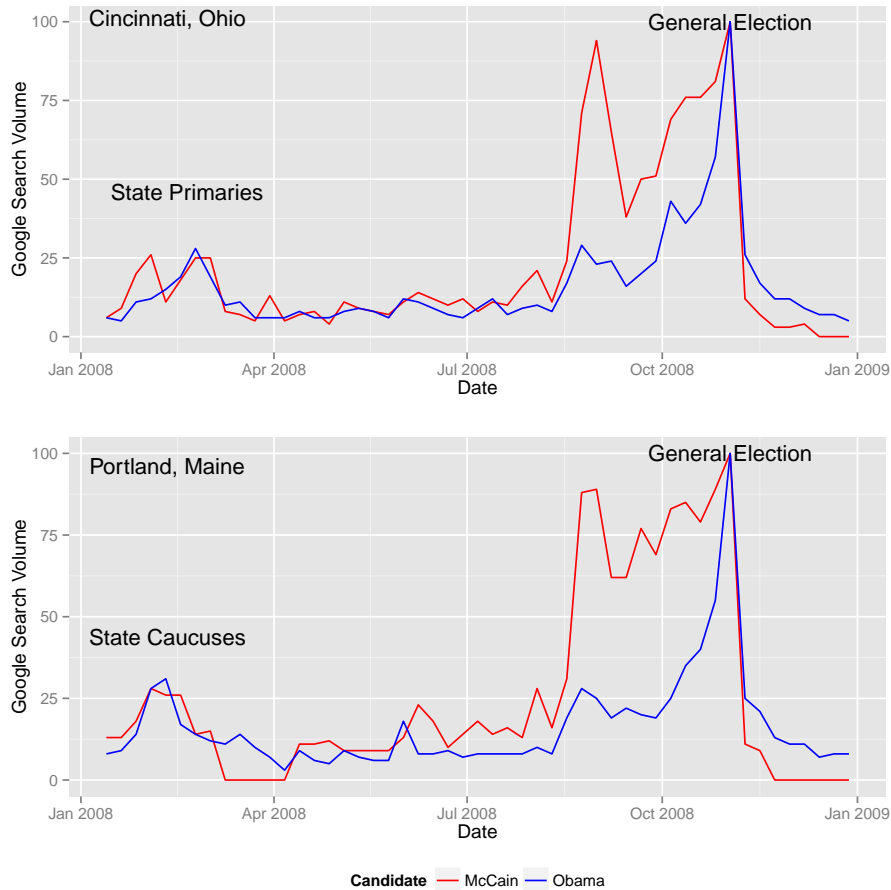
on overall information searching about candidates. Next, we turn to the differential effects based on ad tone and content.
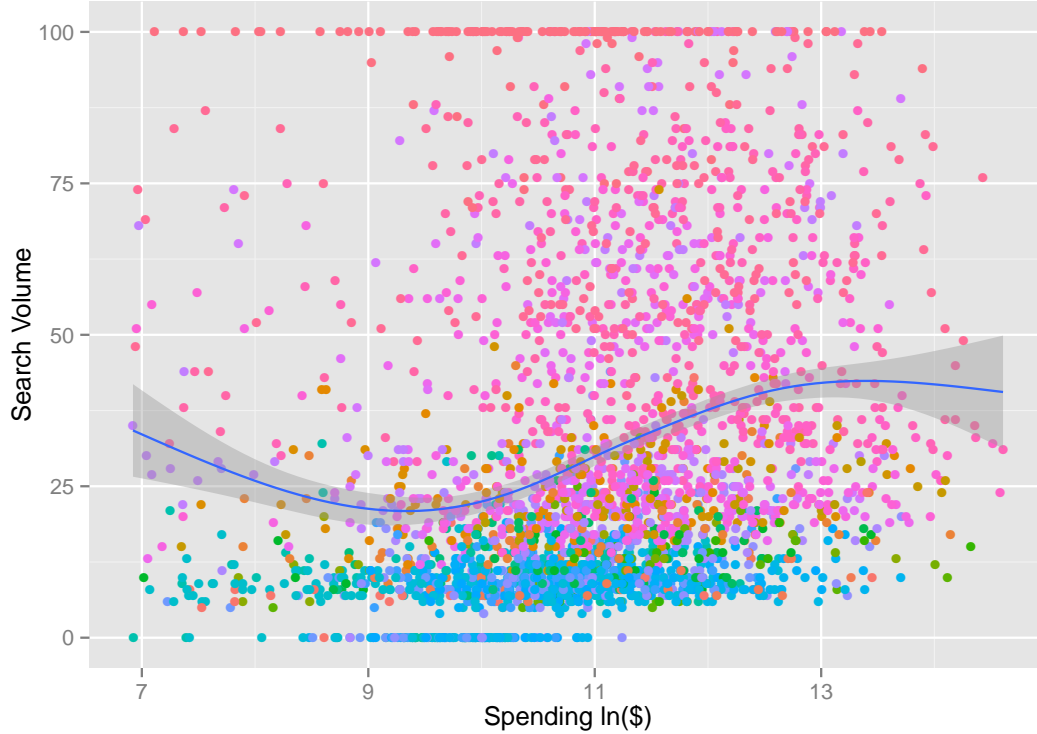
I. Overall Searches

We find strong support for H1a: increased spending on political advertisements predicts higher levels of information seeking about the candidate running an ad. This suggests that political ads inspire increased searches for additional information rather than replacing self-directed information seeking. Figure 2 shows a strong relationship between dollars spent by a candidate and searches for that candidate's name.

This basic bivariate relationship is not enough to show that ad dollars drive searches, however. From figure **??**, it is apparent that this relationship is, in part, driven by time remaining until the election. As election day approaches, candidates are more likely to spend money on advertising and citizens are more likely to seek information on candidates. Additionally, candidate Obama spent significantly more on advertising and saw higher overall search volume for his name. Finally, one might be concerned that other omitted factors specific to certain regions (such as closeness of the election) are driving the apparent relationship between our variables of interest.

In order to control for these factors, we in-

Figure 2: *All ad spending exceeding $1000 and search volume. Each circle represents one candidate-media market-week, our unit of analysis. Redder data points represent weeks that are closer to the election. Bluer data points represent dates further from the election.*

clude week fixed effects to account for time until the election. Additionally, we include a dummy for Obama to account for overall differences between searches for the two candidates. Results based on these specifications are seen in Table 1. The effect of ad spending on information seeking is positive and statistically significant at the .001 level across all models and remains regardless of whether the natural log is taken of the key independent variable, the dependent variable or both[7].

II.   Positive vs. Negative

Figure 3 shows the main results of the models focusing on ad tone. The differential effects of political ads on information seeking based on ad tone provide striking support for hypothesis H2c. Figure 3 shows the coefficients and 95% confidence intervals on attack, contrast, and promote ads. The models that produced these coefficients included time and candidate fixed effect. The turquoise bars of figure 3 shows the effects of ad dollars spent in these three categories on searches for the candidate who purchased the ad. The coefficient on attack ads is slightly positive, but not statistically signifi-

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[7]Zeros values exist in all of the the spending variables so we add 1 before taking the natural log. Some have noted that the value added can have substantial effects on the resulting estimates. Increasing or decreasing the magnitude of the added value (1 in the presented models) by a factor of 10 (.1 or 10) only changes the coefficient estimate on Advertising Spending .02, less than 30% of the coefficient estimate. We also estimate the models with a logged dependent variable, without substantial changes to the main models present in table 1.

Table 1: *The effect of ad spending on Google searches for the purchasing candidate.*

| | Google Trend (0-100) | | |
| | OLS | | |
	(1)	(2)	(3)
Ad Spending ln($)	1.524***	1.590***	0.260***
	(0.037)	(0.037)	(0.021)
Obama		−7.326***	−6.313***
		(0.335)	(0.173)
Week FE			Yes
Constant	15.288***	19.272***	11.520***
	(0.190)	(0.261)	(0.617)
N	14,713	14,713	14,713
R²	0.103	0.131	0.771
Adjusted R²	0.103	0.131	0.770

*p < .1; **p < .05; ***p < .01

Figure 3: *Left (Pink) Bars: Coefficient on spending (ln $) when advertisements are assigned to the candidate who purchased them, regardless of whether the purchaser or the opposition were mentioned in the ad.*
Right (Turquoise) Bars: Coefficient on spending (ln $) when advertisements are assigned to target of the advertisement, regardless of who purchased the ad.
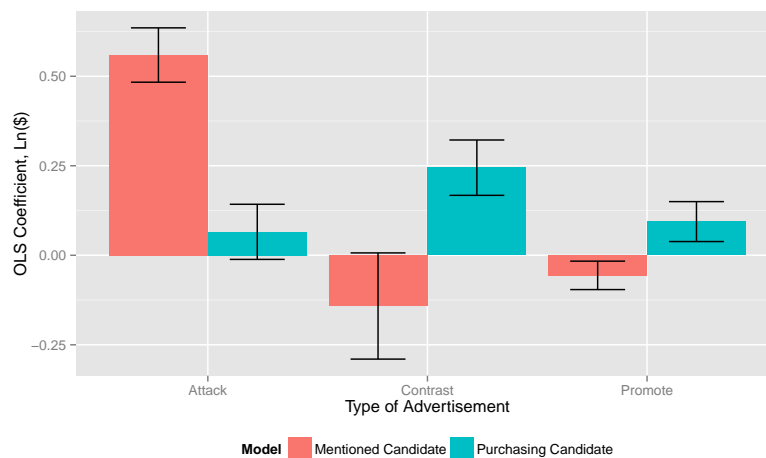
cant. This implies that money spent on attack ads results in little or no increased information seeking for the purchaser of that ad. On the other hand, ad dollars spent on contrast and promote ads result in increased searches for the purchasing candidate. Tables 2 and 3 contain the full results for the models that generated these figures. The plotted coefficients are from the full models (number 3 in both tables).

The right panel of Figure 3 shows the results for searches for the *targets* of political ads (candidates who were mentioned in the ad). In this specification of the model, attack ads result in increased searches for the target candidate at levels that are both statistically and substantively significant. Note the y-axis on this panel. The coefficient and confidence interval on promote ads is almost identical in both panels. This makes sense, as the "target" (mentioned candidate) of a promote ad should be the same as the purchaser of that ad. The striking result is that information seeking for the target of attack ads is eight times greater than information seeking for the purchasers of promote ads.

These results contradict the theoretical expectations of Ansolabehere et al (1995, 1999) and other authors that argue negative advertisements suppress political engagement (H2a). Negative ads have either a null effect or strong positive effect on information seeking depending on whether the target of searches is the purchaser or target of the ad. Additionally, these results contradict the logic of Geer (2006), Goldstein & Freedman (1999, 2002) and Martin (2004), which suggests that negative political ads should increase information seeking about both the target and purchaser of attack ads (because they cue closeness of the election and "republican duty" – H2b).

The results of this analysis suggest strong support for H2c, which suggests that people search specifically for the targets of attack ads due to emotions elicited by threat and fear (Brader 2005, Cho 2013).

III. Personal vs. Policy

Analysis of the effect of political ads on information seeking based on ad content support hypothesis H3c: exposure to political ads focusing on candidates' personal characteristics spurs an increase in online information-seeking while exposure to ads focusing on policy positions do not (Figure 4 table 4). Again, the model used to produce the results in Figure 4 include week and candidate fixed effects. Individuals are driven to increased political engagement by ads that focus on candidates' personal characteristics as opposed to ads that focus on policy issues. This provides evidence for the same theoretical mechanisms that are driving support for hypothesis H1a and H2c. Namely, political ads seem to drive increased information seeking when the ads are more likely to trigger an emotional response.

V. Discussion

I. Implications

The results in this paper have important theoretical implications and show the promise of using measures of internet searches to capture information seeking. Different lines of literature on the effects of political advertising suggest very different effects on information seeking. The results in the paper also take an important step in deciphering the causal mechanisms at play. By using what we argue is a better operationalized measure of self-directed information seeking behavior, we find strong support for a consistent line of conclusions that cross three main debates in the literature. Exposure to political advertisements increases a viewer's overall propensity to seek further information, and this effect is particularly strong when a candidate is the target of an attack ad or the ad focuses on a candidate's personal characteristics.

While this study is an important first step in

Table 2: *The effect of ad spending by type. Ad spending by type is attached to the candidate who purchases the ad.*

	Google Trends (0-100)		
	OLS		
	(1)	(2)	(3)
Attack Spending ln($)	3.208***	3.131***	0.065*
	(0.059)	(0.058)	(0.038)
Contrast Spending ln($)	−0.095	−0.137**	0.245***
	(0.065)	(0.064)	(0.039)
Promote Spending ln($)	−0.214***	−0.064	0.094***
	(0.047)	(0.047)	(0.028)
Obama		−5.586***	−6.207***
		(0.317)	(0.175)
Week FE			Yes
Constant	15.612***	18.644***	11.611***
	(0.173)	(0.243)	(0.618)
N	14,713	14,713	14,713
R^2	0.227	0.243	0.770
Adjusted R^2	0.227	0.243	0.770

$^*p < .1; {}^{**}p < .05; {}^{***}p < .01$

capturing the actual effects of political ads on political engagement and information seeking, the study still has important limitations. First, using observational data does not allow for the kind of causal inference found in experimental studies. Second, some might claim that we are primarily capturing effects on young voters, as they make up a disproportionately large number of Google users. Previous studies have shown that young voters respond to ads differently than older voters (Kaid, McKinney & Tedesco 2007). Third, because we are unable to control for types of political advertising other than television ads, perhaps the information seeking is actually driven by these other types of advertising. This includes advertising by email (Krueger 2006), the internet (Kaid 2002), and social media (Metaxas & Mustafaraj 2012).

II.   Future Work

We view this paper to be a first step in a larger research program that uses "big data" sources to test the effects of political advertising on political engagement. Because the units of analysis in Google Trends and Wisconsin Ad Project

data match up perfectly, a large number of other hypotheses might be tested.

In addition to other work using Google Trends, we are currently in the process of acquiring Alexa data on candidate websites to see whether Google searches for candidate names actually result in more clicks on their websites. This might allow us to better connect our results to experimental studies that track participant actions on candidate websites. Additionally, this analysis might produce a counter-intuitive result: in this paper, we find that the strongest effect of political ads on internet searches is for the *target* of attack ads. If this results in more website visits for the searched candidate, negative political ads might have a counterproductive effect for the purchaser of an ad by driving traffic to their opponent's website.

Finally, we are currently in the process of pulling down social network data from Facebook and Twitter to test the effect of political advertising on a different type of political engagement: information *sharing*. Following a similar logic to the theories supported in this paper, we expect that people will not only seek

Table 3: *The effect of being mentioned in an ad by type. Ad spending by type is attached to the candidate who is mentioned in the ad, regardless of who paid for it. This means that, for example, an ad by Obama attacking McCain would be attached to McCain.*

|	Google Trend (0-100)		
	OLS		
	(1)	(2)	(3)
Attack Spending ln($)	2.947***	2.810***	0.559***
	(0.070)	(0.069)	(0.038)
Contrast Spending ln($)	−0.849***	−1.014***	−0.142*
	(0.143)	(0.141)	(0.074)
Promote Spending ln($)	0.933***	1.099***	−0.056***
	(0.034)	(0.035)	(0.020)
Obama		−6.805***	−6.453***
		(0.321)	(0.163)
Week FE			Yes
Constant	15.970***	19.930***	12.151***
	(0.175)	(0.254)	(0.567)
N	17,693	17,693	17,693
R^2	0.148	0.169	0.789
Adjusted R^2	0.148	0.169	0.788

*p < .1; **p < .05; ***p < .01

more information about candidates based on ad exposure, but will also be more likely to share information or opinions of candidates with their friends. This might have large, snowballing effects, as one's friends' online behavior can strongly affect one's own political engagement (Bond, Fariss, Jones, Kramer, Marlow, Settle & Fowler 2012).

References

Ansolabehere, Stephen D, Shanto Iyengar & Adam Simon. 1999. "Replicating Experiments Using Aggregate and Survey Data: The Case of Negative Advertising and Turnout." *American Political Science Review* 93(4):901–909.

Ansolabehere, Stephen D, Shanto Iyengar, Adam Simon & Nicholas Valentino. 1994. "Does Attack Advertising Demobilize the Electorate." *American Political Science Review* 88(4):829–838.

Ansolabehere, Stephen & Shanto Iyengar. 1995. *Going Negative: How Political Advertisements Shrink & Polarize the Electorate*. New York: Simon and Schuster.

Atkin, Charles K. 1972. "Anticipated Communication and Mass Media Information-Seeking." *Public Opinion Quarterly* 36(2):188–199.

Banducci, Susan A & Jeffrey A Karp. 2003. "How Elections Change the Way Citizens View the Political System: Campaigns, Media Effects and Electoral Outcomes in Comparative Perspective ." *British Journal of Political Science* 33(3):443–467.

Bond, Robert M, Christopher J Fariss, Jason J Jones, Adam D I Kramer, Cameron Marlow, Jaime E Settle & James H Fowler. 2012. "A 61-Million Person Experiment in Social Influence and Political Mobilization." *Nature* 489:295–298.

Brader, Ted. 2005. "Striking a Responsive Chord: How Political Ads Motivate and Persuade Voters by Appealing to Emotions." *American Journal of Political Science* 49(2):388–405.

Brooks, Deborah Jordan & John G Geer. 2007. "Beyond Negativity: The Effects of Incivility on the Electorate." *American Journal of Political Science* 51(1):1–16.

Carter, Stephen L. 1998. *Civility: Manners, Morals, and the Etiquette of Democracy*. New York: Basic Books.

Figure 4: *Coefficient on personal or policy ad type dummy variables.*
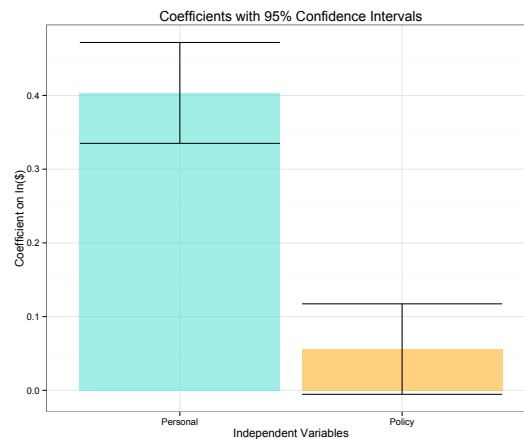
Chaffee, S H. 1982. Mass media and interpersonal channels: Competitive, convergent, or complementary? . In *Inter/media: Interpersonal communication in a media world*, ed. G Gumpert & R Cathart. New York: Oxford University Press pp. 57–77.

Chang, Chingching. 2001. "The Impacts of Emotion Elicited By Print Political Advertising on Candidate Evaluation ." *Media Psychology* 3(2).

Cho, Jaeho. 2008. "Political Ads and Citizen Communication." *Communication Research* 35(4):423–451.

Cho, Jaeho. 2011. "The Geography of Political Communication: Effects of Regional Variations in Campaign Advertising on Citizen Communication." *Human Communication Research* 37(3):434–462.

Cho, Jaeho. 2013. "Campaign Tone, Political Affect, and Communicative Engagement." *Journal of Communication* .

Choi, Hyunyoung & Hal Varian. 2012. "Predicting the Present with Google Trends." *The Economic Record* 88:2–9.

De Vreese, Claes H & Holli A Semetko. 2002. "Cynical and Engaged: Strategic Campaign Coverage, Public Opinion, and Mobilization in a Referendum." *Communication Research* 29(6):615–641.

Downs, Anthony. 1957. "An Economic Theory of Political Action in a Democracy ." *Journal of Political Economy* 65(2):135–150.

Finkel, Steven E & John G Geer. 1998. "A Spot Check: Casting Doubt on the Demobilizing Effect of Attack Advertising." *American Journal of Political Science* 42(2):573–595.

Franz, Michael M & Travis N Ridout. 2007. "Does Political Advertising Persuade?" *Political Behavior* 29:465–491.

Freedman, Paul & Goldstein K. 1999. "Measuring Media Exposure and the Effects of Negative Campaign Ads." *American Journal of Political Science* 43(4):1189–1208.

Garramone, Gina M, Charles K Atkin, Bruce E Pinkleton & Richard T Cole. 1990. "Effects of Negative Political Advertising on the Political Process." *Journal of Broadcasting & Electronic Media* 34(3):299–311.

Geer, John G. 2006. *In Defense of Negativity: Attack Ads in Presidential Campaigns*. Chicaco: The University of Chicago Press.

Geer, John G & James H Geer. 2003. "Remembering Attack Ads: An Experimental Investigation of Radio." *Political Behavior* 25(1):69–95.

Ginsberg, Jeremy, Matthew H Mohebbi, Rajan S Patel, Lynnette Brammer, Mark S Smolinski & Larry Brilliant. 2009. "Detecting Influenza Epidemics Using Search Engine Query Data." *Nature* 457:1012–1014.

Huang, Li-Ning. 2000. "Examining Candidate Information Search Processes: the Impact of Processing Goals and Sophistication." *Journal of Communication* 50(1):93–114.

Huber, Gregory A & Kevin Arceneaux. 2007. "Identifying the Persuasive Effects of Presidential Advertising." *American Journal of Political Science* 51(4):957–977.

Huckfeldt, Robert & John Sprague. 1987. "Networks in Context: The Social Flow of Political Information." *The American Political Science Review* 81(4):1197–1216.

K, Goldstein & Paul Freedman. 2002. "Campaign Advertising and Voter Turnout: New Evidence for a Stimulation Effect." *The Journal of Politics* 64(03):721–740.

Kahn, Kim Fridkin & John G Geer. 1994. "Creating Impressions: An Experimental Investigation of Political Advertising on Television." *Political Behavior* 16(1):93–116.

Kahn, Kim Fridkin & Patrick J Kenney. 1999. "Do Negative Campaigns Mobilize or Suppress Turnout? Clarifying the Relationship between Negativity and Participation." *The American Political Science Review* 93(4):877–889.

Kaid, Lynda Lee. 2002. "Political Advertising and Information Seeking: Comparing Exposure via Traditional and Internet Channels ." *Journal of Advertising* 31(1):27–35.

Kaid, Lynda Lee & John Boydston. 1987. "An Experimental Study of the Effectiveness of Negative Political Advertisements." *Communication Quarterly* 35(2):193–201.

Kaid, Lynda Lee, Mitchell S McKinney & John C Tedesco. 2007. "Introduction: Political Information Efficacy and Young Voters." *American Behavioral Scientist* 50(9):1093–1111.

Krueger, Brian S. 2006. "A Comparison of Conventional and Internet Political Mobilization." *American Politics Research* 34(6):759–776.

Lau, Richard R. 1995. Information Search During an Election Campaign: Introducing a Processing-Tracing Methodology for Political Scientists. In *Political Judgment: Structure and Process*, ed. Milton Lodge & Kathleen M McGraw. Ann Arbor: University of Michigan Press pp. 179–206.

Lau, Richard R & Gerald M pomper. 2001. "Effects of Negative Campaigning on Turnout in U.S. Senate Elections, 1988–1998." *The Journal of Politics* 63(03):804–819.

Lau, Richard R & Gerald M pomper. 2004. *Negative Campaigning*. Lanham: Rowman & Littlefield Publishers, Inc.

Lau, Richard R, Lee Sigelman, Caroline Heldman & Paul Babbitt. 1999. "The Effects of Negative Political Advertisements: A Meta-Analytic Assessment." *American Political Science Review* 93(4):851–875.

Lau, Richard R, Lee Sigelman & Ivy Brown Rovner. 2007. "The Effects of Negative Political Campaigns: A Meta-Analytic Reassessment ." *Journal of Politics* 69(4):1176–1209.

Martin, Paul S. 2004. "Inside the Black Box of Negative Campaign Effects: Three Reasons Why Negative Campaigns Mobilize." *Political Psychology* 25(4):545–562.

Mayer, William G. 1996. "In Defense of Negative Campaigning." *Political Science Quarterly* 111(3):437–455.

Mellon, Jonathan. 2013. "Where and When Can We Use Google Trends to Measure Issue Salience?" *PS: Political Science & Politics* 46(02):280–290.

Metaxas, Panagiotis T & Eni Mustafaraj. 2012. "Social Media and the Elections." *Science* 338:472–473.

Patterson, Thomas E. 2009. *The Vanishing Voter: Public Involvement in an Age of Uncertainty* . New York: Vintage.

Pelc, Krzysztof J. 2013. "Googling the WTO: What Search-Engine Data Tell Us About the Political Economy of Institutions." *International Organization* 67(03):629–655.

Pinkleton, Bruce E. 1997. "The Effects of Negative Comparative Political Advertising on Candidate Evaluations and Adversiting Evaluations: An Exploration." *Journal of Advertising* 26(1):19–29.

Purcell, Kristen, Joanna Brenner & Lee Rainie. 2012. "Search Engine Use 2012.".
URL: *http://www.pewinternet.org/Reports/2012/Search-Engine-Use- 2012/Summary-of-findings.aspx.*

Redlawsk, David P. 2004. "What Voters Do: Information Search During Election Campaigns." *Political Psychology* 25(4):595–610.

Ridout, T N, M Franz & K Goldstein. 2008. "Measuring Exposure to Campaign Advertising." *University of Wisconsin-Madison Advertising Project* .

Shah, Dhavan V, Jaeho Cho, Seungahn Nah, Melissa R Gotlieb, Hyunseo Hwang, Nam-Jin Lee, Rosanne M Scholl & Douglas M McLeod. 2007. "Campaign Ads, Online Messaging, and

Participation: Extending the Communication Mediation Model." *Journal of Communication* 57(4):676–703.

Utych, Stephen M & Cindy D Kam. 2013. "Viability, Information Seeking, and Vote Choice." *The Journal of Politics* .

Valentino, Nicholas, Vincent L Hutchings & Dmitri Williams. 2004. "The Impact of Political Advertising on Knowledge, Internet Information Seeking, and Candidate Preference." *Journal of Communication* 54(2):337–354.

Wattenberg, Martin P & Craig L Brians. 1999. "Negative Campaign Advertising: Demobilizer or Mobilizer?" *American Political Science Review* 93(4):891–899.

West, Darrell M. 2014. *Air Wars: Television Advertising and Social Media in Election Campaigns 1952-2012.* 6 ed. Thousand Oaks: SAGE.

Yoon, Kak, Bruce E Pinkleton & Wonjun Ko. 2005. "Effects of Negative Political Advertising on Voting Intention: An Exploration of the Roles of Involvement and Source Credibility in the Development of Voter Cynicism." *Journal of Marketing Communications* 11(2):95–112.

VI. Appendix

Table 4: *The effect of being mentioned in an ad by type. Ad spending by type is attached to the candidate who is mentioned in the ad, regardless of who paid for it. This means that, for example, an ad by Obama attacking McCain would be attached to McCain. Personal vs policy ads are highlighted here.*

| | Google Trend (0-100) | | |
| | OLS | | |
	(1)	(2)	(3)
Personal Spending ln($)	0.606***	0.551***	0.204***
	(0.054)	(0.053)	(0.027)
Policy ln($)	0.851***	0.973***	−0.015
	(0.047)	(0.046)	(0.025)
Obama		−6.602***	−6.753***
		(0.332)	(0.160)
Week FE			Yes
N	17,693	17,693	17,693
R^2	0.063	0.083	0.787
Adjusted R^2	0.063	0.083	0.787

*p < .1; **p < .05; ***p < .01

Figure 5: *Ad Spending by McCain and Obama by type in 2008.*