Political Advertising Online and Offline

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Over the past 15 years, dramatic technological developments have changed how individuals consume media. The mass adoption of the Internet, smartphones, and social media have seen consumers reallocate their media consumption from television and print media toward online platforms. Political campaigns have taken advantage of this changing media landscape by increasingly deploying candidate advertisements on online platforms. Just as the introduction of television resulted in the wide deployment of the thirty-second political ad, online advertising has become a staple of contemporary political campaigns.

Two of the most important differences in online media relative to traditional television advertising are the low entry cost of running an advertisement and the ability to target advertisements to more precise demographics. Because online ads can be displayed to individual users instead of the entire local audience for a television program, online advertisements can be purchased in fine increments of impressions. Moreover, the cost of creating an online advertisement is dramatically lower than a television advertisement and online ads can be deployed more rapidly in response to a chang-

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ing campaign environment. While advertisers can select television programs with particular demographic profiles for their advertisements (Lovett and Peress 2015), television programs do not perfectly partition the ideological or partisan spectrum.[1] Online advertising platforms offer more precise targeting capabilities. In particular, social media firms have an unusually rich set of individual-specific information, including self-identified interests, demographics, and media consumption choices, that can be used to target advertisements to precise audiences.

In this research project, we take the first steps toward understanding how the opportunity to use online advertising platforms affects the intensity of campaign advertising, the content of campaign messages received by voters, and election outcomes. We outline a series of analyses motivated by theories of campaign advertising.

Most of the theoretical and empirical work on campaign advertising to date has focused on television. The emergence of online platforms offers an opportunity to test these theories because there are substantial differences between advertising online and advertising on TV. Many of these differences across the two communication technologies can be expected to have differential effects across candidate and message types, generating variation useful for understanding the causes and consequences of campaign advertising. We discuss the most important differences between television and online advertising, and the implications of these differences for the expected characteristics of ad content and sponsors across platforms. We are particularly

[1]In the left panel of Figure 1, Lovett and Peress (2015) show that the vast majority of television programs have net conservative identifiers between -0.1 and 0.3 and the most liberal show has a net conservative identifier level of -0.285 and the most conservative show has a net conservative identifier of 0.692, implying that all television programs in their sample have both nontrivial liberal and conservative audience sizes.

interested in how candidates allocate resources and messages across online and offline outlets and the extent of substitution from one medium to the other. We then discuss how we will estimate these relationships using data from the 2018 election cycle.

As Ballard, Hillygus and Konitzner (2016) discuss, there are serious barriers that limit scholarly attempts to study online political communication. In particular, many advertisements only appear briefly and are targeted to specific users in a way that is not visible to third-parties. These limitations have prevented scholars from seeing the complete universe of campaign advertisements. Facebook will make a database of information on political advertisements run on its platform publicly available in June 2018 (Nicas 2018). Facebook has released preliminary information on the content of this database. The database will include any images in the ad, the sponsor who financed the ad, the dates of the ad, the approximate number of impressions that the ad received, the cost of the ad, and basic aggregate demographic information on the age range, gender, and state of residence of the ad audience. Facebook intends to include both candidate and issue advertisements in this database. We will use information from this database to offer a comprehensive analysis of advertising on the Facebook platform.

Our main interest is in how features of the communication technologies available to campaigns shape how they operate: who advertises, and how much? What issues or candidate attributes do campaigns emphasize? Which subset(s) of the electorate do campaigns target? What is the tone of campaign messages that voters receive?

The implications of these analyses go beyond an understanding of online advertising platforms. Television stations and cable operators are pursuing new technological standards to more precisely target advertisements to individual viewers (Fung 2017, Bruell 2018). The results of this research proposal are important for understanding how these technological and regulatory developments will affect candidates, citizens, and the quality of democracy as targeting technologies enter into television and other media platforms. In the remainder of this document, we outline a series of analyses that use information about political candidates' advertising on both Facebook and television to understand how communication technologies shape campaign behavior.

Research Design

We will collect data on all federal, gubernatorial, and state legislative candidates. We will use the Facebook advertising archive to match candidates to their sponsored advertisements. In analyses that examine within-candidate variation in campaign advertisements online and offline, we will use data from the Wesleyan Media Project (Fowler, Franz and Ridout 2016) to identify candidates' television advertisements. We will collect information on the partisanship, incumbency status, and campaign resources of federal and gubernatorial candidates. If feasible, we will also collect this information for state legislative candidates.

Descriptive Statistics

The first contribution of our study is to document simple descriptive statistics on how political candidates use the Facebook platform. We report average Facebook spending levels for congressional, gubernatorial, and state legislative candidates. To estimate the total spending level for each candidate, we will aggregate the midpoint of the reported spending level[2] for a given advertisement across all advertisement that the candidate sponsors. We further disaggregate these averages by incumbents, major party challengers who qualified for the general election, major party challengers who did not qualify for the general election, and minor party candidates. We will also report average advertising spending by third-party organizations that sponsor issue advertisements included in the Facebook data set.

We then examine the timing of advertising on Facebook. In the event that the Facebook database includes a range of dates for the advertising campaign, we will uniformly allocate the advertising expenditures across each day included in the date range. We will examine both the timing in terms of the calendar date of advertisements and the number of days relative to the date of the relevant primary and general election. We will report time series of plots of the average advertising expenditures for each of the candidate and third-party types discussed above.

We then examine the spatial distribution of Facebook political advertisements, specifically the proportion of each candidate's ads that are viewed by out-of-state residents. We use two alternative approaches to aggregate individual advertisements to a candidate-level observation. First, we weight each advertisement by its proportion of total candidate advertising expenditures. Second, we weight each advertisement by its proportion of total candidate advertising impressions.

We will also classify the proportion of negative advertisements and advertisements by issue area on the Facebook platform. To classify the Facebook advertisements, we

[2] According to Facebook's publicly released demonstration of the ad database, spending levels are reported in bins rather than exact amounts.

will have research assistants classify a training sample of the Facebook advertisements and then use these classifications as the basis for a supervised learning classification procedure - e.g., a random forest classifier using word frequencies as features - for the remaining advertisements. We will again calculate expenditure- and impression-weighted measures of candidate message contents.

In the regression analyses below, we use the dependent variables defined in this section and analogous measures of candidate behavior in television advertising to examine within-candidate variation in advertising strategies across Facebook and television.

We expect that one challenge will be comparability of the measurement of ad tone and issue content between the Facebook sample and TV ads (coded by the Wesleyan Media Project). One way to increase comparability is to include a subsample of classifications produced by WMP for TV ads as part of the training data used to train our classifier. Features input to the classifier would be generated from transcripts of the ads, in order to match as closely as possible the features available for text-based Facebook ads. We would then use the predicted classifications - rather than the actual classification given by WMP - as the input to the models described below. This process would limit the degree to which systematic differences between TV and Facebook ads are the result of differences in measurement quality rather than actual differences in content as perceived by viewers.

Which Campaigns Advertise Online and Offline?

Our first set of analyses examines whether and how online advertising broadens the set of candidates who advertise. We first examine how the intensity of Facebook and television advertising varies within candidates. We then examine whether there are differences across different types of candidates in their use of the different advertising platforms. Of particular interest is the ability of challengers to level the electoral playing field by using Facebook advertisements in electoral environments where television advertising is feasible for incumbents, but too costly for challengers. We are also interested in whether the much lower entry cost of Facebook advertising enables candidates in downballot races who are priced out of the market for TV ads to reach voters.

In our baseline specification, we use the the total advertising spending on Facebook variable that we defined above. We use two separate measures to estimate television advertising expenditures. We will use the estimates from Kantar Media and data from Nielsen.[3] We estimate the following regression with candidate fixed effects:

$$AdSpending_{ik} = \alpha_i + \gamma Facebook_k$$
$$+ Facebook_k CandCovar_i \delta + \epsilon_{ik}$$

[3]As Martin and Peskowitz (2018) show candidate expenditures are almost never made directly to television stations, but are instead mediated by political consultants. Our primary interest in this study lies s in the intensity and use of advertising after this intermediation occurs so we estimate our models with the direct cost of television and online advertising instead of adding the markup that political consultants extract from their clients.

The dataset for this regression contains one observation for each candidate's spending on television advertisements and one observation for each candidate's spending on Facebook advertisements. The α_i are candidate-specific fixed effects, $Facebook_k$ is an indicator for whether the particular observation corresponds to Facebook advertising expenditures, and ϵ_{ik} is an idiosyncratic error term. $CandCovar_i$ is the row vector of candidate covariates: an indicator for whether the candidate is a challenger, indicators for whether the candidate is running for governor or state legislature, an indicator for whether the candidate qualified for the general election, and the interactions of the challenger, seat type, and general election qualification indicators. We also include additional indicators for whether the candidate is a Republican or third-party candidate. These candidate covariates cannot be directly included in the regression specification because none of these characteristics vary within candidates and we include the candidate-specific fixed effects α_i, in the equation. We can, however, interact these covariates with the $Facebook_k$ indicator to determine how these covariates are associated with the intensity of using Facebook advertisements relative to television advertisements.

We are primarily interested in how the relative intensity of online advertising usage differs across federal, gubernatorial, and state legislative contests and incumbents and challengers. The coefficients on the office type indicators and the challenger indicator and the interactions of these indicators will provide our estimates of these quantities.

We also examine how the level of congruence between a candidate's electoral constituency and Designated Market Area influences the allocation of advertising across television and Facebook. Candidates who run in low congruence districts waste a larger portion of their television advertising to audience members who cannot vote in the election than candidates who run in high congruence districts. As a result, we expect that low congruence candidates will allocate more of their advertising expenditures to Facebook. We define congruence as the share of the DMA's population that is located in the relevant congressional district or state. In cases where the electoral district includes multiple DMAs, we will define this variable as the maximum value of congruence across all of the DMAs. [4] To examine this possibility, we add the interaction the congruence variable with the Facebook indicator to our spending regression. Because of the difficulty of calculating congruence at the state legislative district level, we restrict the analyses that include the media congruence variable to the sample congressional and gubernatorial candidates.

Advertisement Timing and Geographic Targeting

The low-cost and more precise targeting ability of online advertisements opens up the possibility that campaigns can use Facebook advertisements to solicit campaign resources in a way that is infeasible with television advertisements. While television advertisements may incidentally increase campaign contributions[5], online advertising

[4] This definition of congruence is slightly different from the definition used by Snyder and Strömberg (2010) in their analysis of the effects of newspaper circulation congruence with congressional districts.Snyder and Strömberg (2010) weight market share by reader share to arrive at their measure of congruence. Lacking information on the spatial distribution of the television audience, we instead opt for a less refined measure.

[5] As one example, Urban and Niebler (2014) show that advertising that spills over from media markets in competitive states into uncompetitive states increases the probability of receiving campaign contributions from residents of the uncompetitive state who reside in the media market relative to other residents of the uncompetitive state who are not exposed to the advertisements.

is better suited to solicit campaign resources. Political campaigns often link their advertisements to landing pages where users can sign up for a mailing list, register to volunteer, or make campaign contributions. Online advertisements allow users to immediately follow through by performing an action at the request of the campaign.

Gerber et al. (2011) employ a field experiment in the Texas 2006 gubernatorial campaign to show that television advertising has a persuasive effect on citizens' political preferences, but that the effects are short-lived, typically lasting no longer than a week or two. This research suggests that advertisements that attempt to persuade will have higher electoral returns as the election date approaches. If online advertisements are more oriented toward generating campaign resources we would expect campaigns' timing of advertisements across online and offline platforms to differ. Our first set of analyses examine this possibility. We now estimate a regression of weekly campaign spending on candidate characteristics. We include the complete set of covariates from our analysis above in the specification. We first estimate a regression using the sample of advertisements before the candidate's primary election date.

$$AdvSpending_{iwk} = \alpha_i + Facebook_k \eta_w^{FB} + (1 - Facebook_k)\eta_w^{TV} + Facebook_k CandCovar_i \delta + \epsilon_{iwk}$$

For primary election data, we construct a transformed week index w that measures the number of weeks until the election date (calendar primary election dates will vary by candidate). The two sets of week fixed effects η^{FB} and η^{TV} correspond to advertising on Facebook and television respectively, and allow for general time-patterns that flexibly differ between the two platforms. We apply the same specification separately to general election data. These specifications will allow us to determine how online advertising's relative intensity varies as the election date approaches.

Campaigns can narrowly target online advertisements to potential supporters who are likely to make campaign contributions or serve as campaign volunteers. One dimension in which this difference may manifest itself is the deployment of online advertisements to users who are ineligible to vote in the candidate's election, but may be willing to contribute campaign resources to the candidate. The best data to examine this issue would include information for whether the audience member resides outside the electoral constituency of the candidate. However, the public Facebook database will only include the state of the advertising audience so we can only conduct the analysis using information of the state of residence of the users. We will calculate the proportion of the advertisement audience that resides outside the candidate's state and then aggregate to the candidate level. While the different motivations of online and offline advertising would lead to the prediction that a higher proportion of online advertisements are sent to out-of-state residents, a countervailing factor that increases the relative proportion of television advertisements outside of the state is the spatial structure of Designated Market Areas, with many DMAs crossing state lines. We will use both the expenditure- and impression-weighted measures of out-of-state Facebook advertising described above. To estimate the proportion of television advertisements that reach out-of-state residents, we will use the relative audience size outside of the candidate's state in the DMA of purchase.

Our estimating equation is:

$$PropOutState_{ik} = \alpha_i + \gamma Facebook_k + Facebook_k CandCovar_i \delta + \epsilon_{ik}$$

The timing and spatial targeting effects might interact with one another. Campaigns may deploy their advertisements early and outside of their electoral constituencies in order to generate campaign resources. To investigate this possibility we estimate the following regression and its analogue with days until the primary:

$$PropOutState_{itk} = \alpha_i + \beta_1 DaysUntilGeneralElection_t$$
$$+\beta_2 DaysUntilGeneralElection_t Facebook_k + \gamma Facebook_k + Facebook_k CandCovar_i \delta + \epsilon_{itk}$$

Advertisement Content

Scholars have noted the potential of negative television advertisements to backlash and harm the sponsor of the advertisement (Roese and Sande 1993). In their meta-analysis of 40 studies of negative campaigning Lau, Sigelman and Rovner (2007) find that respondents negatively evaluate the sponsor of the advertisement in 33 of the studies and this effect is substantively large and statistically significant.[6] One reason why this might be the case is that the negative advertisements are viewed by citizens who are favorably disposed toward the candidate who is attacked in the advertise-

[6] The magnitude of the backlash effect may be contingent upon advertising characteristics. Dowling and Wichowsky (2015) employ survey experiments to show that the sponsor of the advertisement conditions how respondents punish candidates for negative advertisements. When negative advertisements are sponsored by independent groups, opposing partisan voter do not punish the candidate as much as when the advertisement is directly sponsored by the candidate.

ment. As a result, these citizens may negatively assess the sponsoring candidate. The probability of turning out may also increase among these citizens. The inability to target the negative advertising message to the citizens who will be most receptive to it increases the magnitude of the backlash effect. The differential ability to target online and offline advertisements raises the possibility that candidates may prefer to allocate their negative messaging to online platforms where they can more precisely control the audience for their messages.

We will use both the expenditure- and impression-weighted measures of candidate negative advertising on Facebook. We will use the Wesleyan Media Project content classification as the basis for our coding of television advertisements as negative advertisements. We will estimate the following regression:

$$PropNegAd_{ik} = \alpha_i + \gamma Facebook_k + Facebook_k CandCovar_i \delta + \epsilon_{ik}$$

We are primarily interested in how the relative intensity of negative advertising differs across Facebook and television advertisements, which is captured by the γ coefficient. We are also interested in how the intensity of negative advertising varies across office types and challenger and incumbents. The coefficients on the office type indicators and the challenger indicator and the interactions of these indicators will provide our estimates of these quantities.

We apply the same specifications to analyze the proportion of issue-related advertising across platforms. We expect that the ability to target ads to a narrower group of viewers than television allows may induce campaigns to message on more niche issue areas that would go unmentioned in a broad-audience ad. For example, according to the WMP data, only about 5% of Senate candidates who advertised on TV made any mention of climate change or global warming in any of their advertisements in 2014. We focus on the same issue areas defined by the WMP and estimate regressions of the form:

$$PropIssueAd_{ik}^{j} = \alpha_i^j + \gamma^j Facebook_k + Facebook_k CandCovar_i \delta^j + \epsilon_{ik}^j$$

where j indexes issue areas.

In addition to the issue-specific regressions described above, we also construct summary measures of the "issue diversity" of a candidate's advertising, and the total share of advertising that references any policy issue (as opposed to advertising focused purely on candidate characteristics or experience). To measure issue diversity, we construct the Herfindahl-Hirschman index of a candidate's advertising, which is the sum of squared shares of a candidate's advertising devoted to each issue.

$$\begin{aligned} AnyIssue_{ik} &= \frac{\sum_l \left(\max_j Issue_{ijkl}\right) Impressions_{ikl}}{\sum_l Impressions_{ikl}} \\ IssueHHI_{ik} &= \sum_j \left(\frac{\sum_l Issue_{ijkl} Impressions_{ikl}}{\sum_l Impressions_{ikl}} \right)^2 \end{aligned}$$

We regress these measures on the same right-hand side variables described in the issue-specific regressions.

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