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Campaign Advertising and Electoral Outcomes: How can Campaign Advertising Focusing on Different Issues Affect Electoral Outcomes? A Case Study for the 2020 American Presidential Election

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Abstract

In this paper we examine the potential impact of campaign advertisements that emphasize different issues on the electoral outcomes of the 2020 American Presidential election. Using campaign ad data from the Wesleyan Media Project and election data from the Federal Election Commission (FEC) we employ an Instrumental Variable (IV) methodology using the cost of a political advertisement as an instrument for the intensity of advertising for 7 issue categories. From our analysis we determine that for Democratic vote shares and voter turnout there seems to be a small positive effect of higher intensity of advertising, while for Republican vote shares there's a small negative one, although there is little difference between the issue categories themselves when considering the effect on the average county.

The views stated in this thesis are those of the author and not necessarily those of the supervisor, second assessor, Erasmus School of Economics, or Erasmus University Rotterdam

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## Introduction

The 2020 American presidential election. In terms of global importance, this electoral contest between Republican incumbent, Donald Trump, and Democratic challenger, Joe Biden, had major implications for both the United States (US) and the world at large. Contested in the middle of global pandemic, economic recession, and after four years of the highly norm-breaking and turbulent Donald Trump presidency, this election was fought in unique circumstances unlike other presidential elections in the past. This led to the 2020 election having the highest electoral turnout by percentage since 1900, as well as both candidates receiving over 74 million votes, breaking the record for most votes received by a presidential candidate previously held by Barack Obama in 2008. From these facts, it is evident that the 2020 election was hotly contested and had high public participation, leading to a highly contentious political campaign as both candidates sought to persuade voters to their side and to mobilize their own voting bases.

Political campaigning is the primary method by which candidates try to influence the decision-making of a specific group of people. Usually, these campaigns are run on a message that communicates to people the ideas and positions of the candidate on specific issues that they want to share with voters. In American elections, political campaigns play an important role in helping candidates reach voters. The 2020 elections were the most expensive in US history, with total campaign spending from both candidates reaching over \$14 billion, more than doubling the previous record that was set during the 2016 election. This helps to highlight the importance of political campaigning, as well as the importance of this election. There are many different methods of political campaigning that have been employed in the past. These can include campaign stops by the candidate themselves, political debates between the candidates, door-to-door canvassing of the homes of potential voters by volunteers of the campaign, and importantly for the focus of this paper advertising. Political advertisements, particularly those that are on TV, play a crucial role in presenting the candidates' positions on different issues to voters across the country. They can help a candidate reach many people that may otherwise not be as feasible with the other methods of political campaigning. Additionally, it allows for a candidate to communicate their position on a wide variety of issues that may be salient during the campaign. In the context of this election, this is pertinent because of the salience of many

different issues. As will be discussed later in the paper, issues such as Covid-19, racism and police brutality, impeachment, climate change, the economy, etc. were very salient at the time. As the political climate in the US has become increasingly polarized in recent times, with the Democratic and Republican parties finding themselves on opposing ends of many issues, elections in the US have become more competitive. This raises the importance of political advertising, as they might play a role in determining the outcome of the election, particularly in close races such as the 2020 one.

The focus of this paper is on how the content of political advertisements may affect electoral outcomes, such as vote shares for both candidates and electoral turnout. While previous literature (which is more thoroughly explored in the literature review section) has determined that there may be possible effects of political advertising on electoral outcomes, these focused primarily on the number of ads broadcasted rather than on the content. We believe that that content of the ad is just as important, as voters often base their decision on who to vote for and whether they vote at all on how they feel the candidates represent their views on various issues. Consequently, the content of the ads may also be influencing the outcomes of elections, which has not been a topic of extensive research. This leads us to the primary research question of this paper: To what extent have campaign advertisements that emphasize specific issues affected voter turnout and outcomes in American presidential elections? This question is scientifically relevant as it deals with a topic that has not been extensively covered in past literature. As mentioned previously, most previous research on this topic has focused on the number and partisanship of the advertisements, and not on the content. Investigating this topic through the lens of the content of the ad can help to fill this gap in the literature, as well as provide insight into the effectiveness of campaign advertising overall. Future political campaigns may be able to use the results of this paper to better understand how to tailor their campaign advertisements to mention the issues that motivate people to vote for them. Additionally, we employ an Instrumental Variable (IV) approach, using the estimated cost of an advertisement as an instrument for the intensity of advertising for ads mentioning specific issues. While this approach is not necessarily novel, previous work done by other authors have employed the use of IVs and the cost of advertisements as instrument, its use in this specific context of the content of political advertising has not been done in previous

literature. This question is socially relevant as the US is regarded as being the cornerstone of global democracy, and its elections have wide-ranging implications for both the US and the world. Additionally, better understanding the impact that political advertisements can have on voting behaviour can aid in keeping the democratic process both fair and transparent, which is vital in ensuring the proper functioning of a democratic state. Also, as this question deals with voter turnout, which is an important measure of political participation and civic engagement in democracies worldwide, the findings of this paper may help policymakers and campaign strategists in developing strategies that increase voter participation in future elections. This is important as increased public participation in the electoral process is an indicator of healthy democracies and proper representation of the electorate in government.

This paper has the following structure. Firstly, we conduct a review of the relevant literature which determines what findings there have been on this topic by previous research. Secondly, we explain the data and empirical methodology that we use to analyse this question. This includes additional context on the circumstances of this election, a descriptive statistics analysis of the raw data, and an explanation as to what issues are being measured and which ones were salient at the time of the election. The methodology section also includes checks/explanations of the relevant assumptions that are made with the empirical strategy of the paper. Thirdly, we propose and explain our hypotheses regarding the potential findings of the paper. Fourthly, we present the empirical results of the paper, as well as an analysis of the results in the context of the research question. We also present the results of any robustness checks in this section. Finally, based on the results, we draw a conclusion to the research question and discuss the possible implications, as well as possible limitations.

## Literature Review

The topic of campaign advertising has been the focus of many works of previous academic literature. For this paper, we split the literature review into three branches. The first pertains to the effect of campaign advertising on voter turnout and the second focuses on the effect of campaign advertising on electoral outcomes. The third focuses on our IV

approach. Specifically, it deals with the different potential instruments that have been used in past papers, which helps to determine the instrument in our methodology.

### Voter Turnout

For the first branch there have been several different works which have both argued that campaign advertising has a positive effect on voter turnout and that it has little or even negative effects on turnout. It should be noted that most of the previous literature has not focused substantially on the actual issues being presented in the ad, instead opting for either the partisanship of the ad or on the negativity or positivity of the ad. For the view that campaign advertising increases voter turnout, Goldstein, and Freedman (2002) used a logistic model to examine the effect of negative campaign advertising on voter turnout in the 1996 American presidential election. In this case they found that negative campaign advertising had stimulating effects on voter turnout, meaning that voters were more likely to turnout when exposed to a greater amount of negative advertising. This result stands in contrast to other theories that negative campaign advertising acts as a demobilizing force on voter turnout. This finding is echoed in Franz et al. (2008) and Wattenberg and Brians (1999) which both dispute the demobilization hypothesis by other authors, notably Ansolabehere et al. (1999). This result is backed up in the later work of Freedman et al. (2004), which studied the 2000 Presidential election. Here, they estimate models of the information and engagement effects of campaign advertising on voter turnout and find that campaign advertisements, which are information-rich and often emotionally driven, can lead to more informed and politically engaged citizens, which increases turnout.

For campaign advertising acting as a negligible or even negative force on voter turnout, there has also been considerable academic literature. One such work comes from Ansolabehere et al. (1999). In this work, the authors use several instrumental variables to replicate the experiments of other authors that showed negative effects of campaign advertising on voter turnout using aggregate turnout data from the 1992 California Senate election. They conclude that negative advertising has a demobilization effect on voters, leading to lower turnout. This complements the findings of Lau et al. (1999) and Krupnikov (2011), who also find little effectiveness in negative political advertising, with Krupnikov (2011) finding that negative political advertising can only demobilize voters if it targets the voters' preferred candidate, and it is seen by the voter late in the campaign.

Another work comes from Ashworth & Clinton (2006), who exploit the exogenous variation in campaign advertising during the 2000 Presidential election, using residence in battleground states as an instrument for campaign exposure. Their specification finds that exposure to campaign advertising has little to no impact on voter turnout. Similar findings were documented by Krasno and Green (2008) who exploit the variation in the volume of TV campaign advertisements in different states during the 2000 Presidential election as a natural experiment. They find negligible effects on voter turnout based on the volume of advertising purchased by Presidential campaigns. A more contemporary study by Spenkuch and Toniatti (2018), which examined the influence of campaign advertisements on voter turnout and electoral outcomes in the 2004, 2008, and 2012 elections, found that there was little impact on aggregate voter turnout. Other studies, such as Clinton and Lapinski (2004) and Enos and Fowler (2018) similarly find little effects of political TV advertisements on voter turnout.

### Electoral Outcomes

Like the literature on voter turnout, the effect of campaign advertising on the actual results of the election has also been a topic of study. Several studies have highlighted the effect of political advertising on the vote shares of candidates. A study by Kendall et al. (2015) in an Italian mayoral election found that sending voters messages about the candidates' valence led voters to increasing their support by around 4.1%. For the American context, Spenkuch and Toniatti (2018), in contrast to their findings on voter turnout, found using a regression discontinuity design that advertising can increase a candidates vote share. This happens by changing the partisan composition of the electorate and persuading the "right" set of voters on election day. This is despite their findings minimal effects of political advertising on voter's opinions and beliefs. This is important as other studies, such as Gerber et al. (2011), have found that the effects of TV political advertisements on voter preferences are strong but short-lived, indicating that their persuasive effect could be limited. Another study by Kaid et al. (2011) which focused on the 2008 Presidential election, found that exposure to political advertisements led to changes in candidate evaluation and political informed-ness of young voters, which could lead to changes in electoral outcomes. This is complemented by the study of Franz and Ridout (2010) which found strong persuasive effects of political TV advertisements for the 2004 and 2008 Presidential elections. However, these effects were

much stronger in non-battleground states, likely due to there being more competition for voters' attention in battleground states.

On the topic of how issues are presented in political advertisements, the work of Tedesco and Dunn (2019) focused on the 2016 American Presidential election. They showed that most ads by the Hillary Clinton campaign were ad hominin attacks on the character of Donald Trump, rather than on contrasting her policies with his. This may have led to a missed opportunity, particularly among late-deciding voters in battleground states. This highlights the importance of focusing on issues in American elections, rather than on just attack ads. Another study by Kaid et al. (2007) also found that political advertising that focused on issues was crucial for younger voters to evaluate candidates. They found this in the context of the 2004 Presidential election, where voters surveyed responded that political advertisements by both the Democratic and Republican candidates helped to educate them on each candidates' stance on issues, as well as having an agenda-setting effect where respondents change what issues they feel are important. It should be noted that literature on the different effects of political advertising that emphasizes different issues is limited and is a gap that this paper will seek to fill.

### Instrumental Variable

This paper analyses the effects of campaign advertising that focuses on specific issues on voter turnout and electoral outcomes in the 2020 American Presidential election using an IV analysis. There have been several papers that have used IV analysis on the effects of political advertising. Ansolabehere et al. (1999) used volume of advertising as an instrument for ad exposure. Ashworth and Clinton (2006) used residence in a battleground state to also instrument for the same thing. Both instruments would likely be unsuitable for the purpose of this paper, as they would both affect the outcome variable. Volume of advertising would likely affect the vote shares of each party, as seeing more of one party's ads may influence a voter's decision on who to vote for. Residence in a battleground state may also influence the vote shares for a candidate as these states tend to be closer. This would violate the exclusion restriction assumption, which would undermine the validity of the instrument. The paper by Gordon et al. (2013) provides a more suitable instrument. In this paper, the authors use the prior year's market price for advertising as an instrument for the effect of market-level advertising on county-level vote shares. We use a similar instrument in



estimated cost of advertisement. The full justification of the instrument, as well as the regression equations can be found in the methodology section.

## Data

In this section we describe the raw data. This includes an explanation of the origin of the data, as well as a descriptive analysis of the data on the content of campaign advertising and the election data. The data consists of campaign advertisement data from the Wesleyan Media Project, which is an organization that collects data of political advertising in American elections. This contains information on the number of political advertisements, the media market that the advertisement aired in, the party/candidate that bought the advertisement, the estimated cost of the political advertisement, and most importantly the issues that the advertisement addresses. They do this by grouping several sub-issues to 7 broad categories of issues. These 7 categories are the economy, the environment, social issues (abortion, racism, gender equality, etc.), social welfare (healthcare, education, social security, etc.), law-and-order, foreign policy, and other issues (issues that do not fit into the other categories). The data was taken from the 2020 American presidential election between Democratic candidate Joe Biden and Republican candidate Donald Trump. Like the study by Spenkuch and Toniatti (2018) only ads from two months before the election day of November 3<sup>rd</sup>, 2020, were examined as these ads are the most likely to have the greatest impact on political outcomes in the election. This data is used to determine the intensity of political advertising for each issue category for the media market that the advertisement was aired in. The intensity is measured as the total number of advertisements belonging to a specific issue category in each of the 210 media markets.

For the data on the political outcomes, we collect county level data on Democratic vote shares, Republican vote shares, and voter turnout. This data comes from Harvard Dataverse, which is a database repository maintained by the Massachusetts Institute of Technology (MIT) Election Data and Science Lab (MEDSL). The database contains information of election outcomes for every county in the United States, including information on the number of votes cast for each candidate, as well as the total number of votes cast. This allows us to calculate values for the Democratic and Republican vote shares for each county.

Additionally, US census data is used to get the total over-18 population of each county,

which should be an estimation of the voting eligible population of each county. Dividing the number of votes cast by the voting eligible population gives the voter turnout. This dataset has been combined with the campaign advertisement dataset. For each media market, 8 measures of campaign advertisement intensity, comprising the 7 issue categories as well as the total intensity, were determined for both the Democratic and Republican campaign advertisements. These measures were then assigned to the counties that make up the relevant media market, leading to a total of 3155 observations.

### Descriptive Statistics: Advertising Intensity

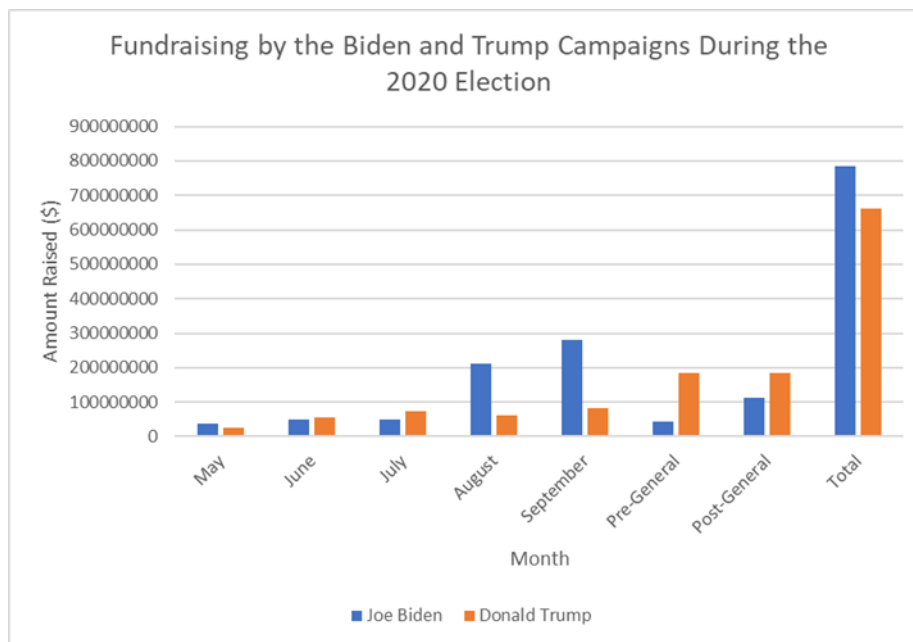
In this section we examine the descriptive statistics of the dataset. Firstly, we look at the data for the Democratic and Republican advertisements. This enables us to compare the two, which should give an indication into what issues each party was focusing on in the two months before the 2020 election. Hence, we should be able to see the differences in the issues that each party was prioritizing in their campaign advertisements. Firstly, we look at the absolute and relative number of campaign advertisements for each issue. The results of this can be found in Tables 1 of the Appendix.

From the table a few things are immediately evident. Importantly, we can see that there are several differences in the relative number of ads devoted to different issue categories by each party. The Democrats broadcasted relatively more advertisements mentioning issues related to social welfare and the other issues category, while the Republicans aired relatively more advertisements in the issue categories of the economy, law-and-order, foreign policy, and the environment. Both parties were relatively even in advertisements broadcasted about social issues. Additionally, it is also evident that the Democrats aired significantly more advertisements than the Republicans overall. In total, the Joe Biden campaign aired 497403 campaign advertisements in comparison to the Donald Trump campaign's 166534. The possible reasons for this disparity are important for analysing why each campaign made the advertising choices that they made.

Firstly, a reason for the disparity in advertising could be due to differences in fundraising between Joe Biden and Donald Trump. Fundraising is a very important indicator as to the viability and competitiveness of a political candidate and is an important source of revenue for political campaigns which allows for them to pay for things such as campaign advertising.

A visual summary of the campaign spending of both the Biden and Trump campaigns from the time where Joe Biden was confirmed as the Democratic nominee to the general election can be found in Figure 1 below.

Figure 1: Bar Graph Showing Evolution of Campaign Fundraising by the Biden and Trump Campaigns During the 2020 American Presidential Election



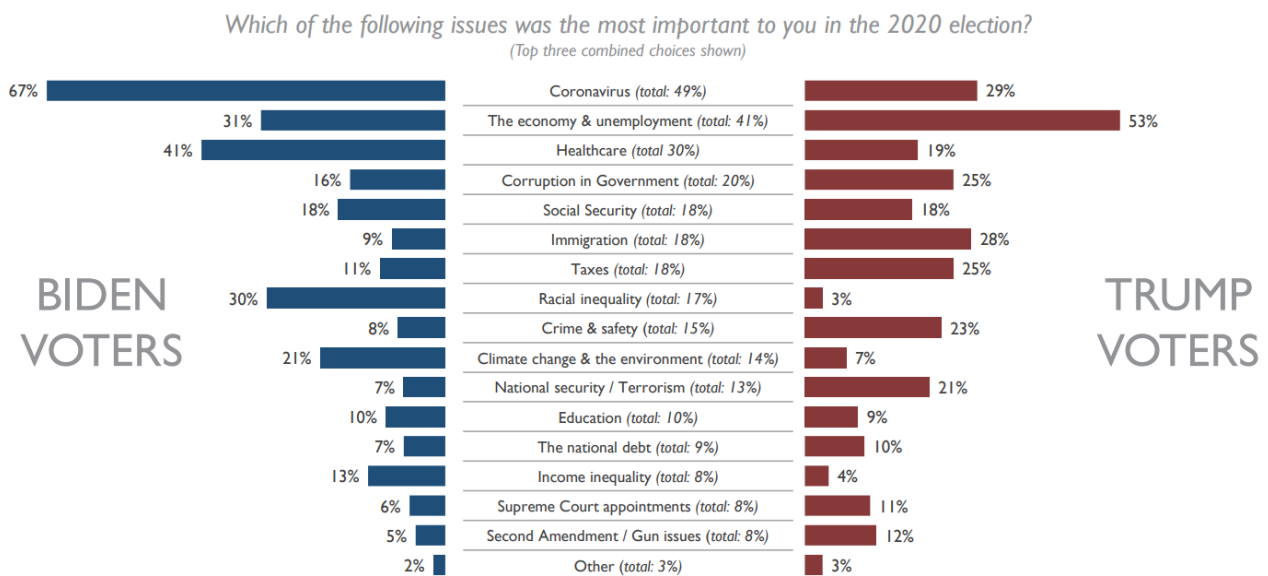
Notes: The term pre-general refers to the period October 1<sup>st</sup>, 2020 – October 14<sup>th</sup>, 2020, and the term post-general refers to the period October 15<sup>th</sup>, 2020 – November 23<sup>rd</sup>, 2020.

From Figure 1 we can see that while the Biden campaign fundraised more overall than the Trump campaign, including huge advantages in August and September, the Trump campaign had fundraising advantages in the immediate lead-up to the election. This can be seen in the pre-general and post-general periods, where the Trump campaign outraised the Biden campaign. This is important as it suggests that fundraising, while possibly a contributing factor, was not the main reason for the disparity in campaign advertisements, as both campaigns raised significant amounts of money. Consequently, we must look elsewhere.

Another possible reason could be the salience of issues during the 2020 Presidential election. Salience is a property in which certain things stand out more than others. In electoral terms, issues that are salient are more at the forefront of public discourse and in the minds of voters. Each election has different issues that are salient at the time, and this can affect how each party campaigns, and what they are campaigning about. This is

important as it connects to another factor, which is that the Democratic and Republican parties are trusted to handle certain issues to different degrees. If the salient issues of an election are ones that Democrats are more trusted with than it may be expected that Democrats would campaign more on those issues, which could be reflected here in the differences in the amount of campaign advertising. Similarly, there could also be a dampening effect on Republican campaign advertising, as this political environment may make it more difficult for the Trump campaign to advertise if the salient issues are ones that they are distrusted on by voters. A survey conducted by Politico (2020) after the election sought to provide insight into the priorities of voters during the election. In Figure 2 below, we can see their results for Democratic and Republican voters for what they cited as their top issues at the time.

Figure 2: Salient Issues for Biden and Trump Voters During the 2020 Presidential Election



Notes: Figure source Politico (2020)

Unsurprisingly, for both groups Covid-19 is one of the top issues of concern, although Biden voters at a significantly larger margin than Trump voters and is also largest issue for the entire sample at 49%. The 2020 Presidential election took place in the context of the Covid-19 Pandemic, which caused widespread disruption to everyday life, immense economic damage, and extensive weakening of public health. The economy is also highly prevalent for both groups and is the second largest issue in the entire sample at 41%. This was also the top issue for Trump voters at 53% which was less than the top issue for Biden voters, who had Covid-19 as their top issue at 67%. Other issues that figured prominently for both

groups were healthcare (although significantly more by Biden voters), corruption, and social security. Biden voters placed significantly more importance on racial inequality and climate change, while Trump voters put more importance on immigration, crime & safety, and national security.

These findings could help to explain the differences in campaign advertising between the Biden and Trump campaigns. As mentioned before, the issues of Covid-19 and healthcare were highly salient during the 2020 election. This is problematic for Trump, as his response to the Covid-19 pandemic as the incumbent was widely criticized at being mishandled. A survey by Gallup (2020) also found that Americans trusted Democrats over Republicans in handling the coronavirus pandemic by a 12-point margin (49%-37%) indicating that this was a losing issue for Trump. Additionally, his administration had earlier in his term tried to repeal the Affordable Care Act, which would have left millions of Americans without healthcare. Consequently, it is not surprising that the Trump campaign's advertising for social welfare (which includes healthcare and Covid-19 as sub-issues) was substantially less than the Biden campaign who was more trusted to adequately deal with the issue. This could also help to explain why the Trump campaign has less advertisements overall, as the Covid-19 pandemic was a dominating factor in the national environment at the time, which may have made it more difficult for him to campaign on the issues that he preferred. We can see that for the issues more emphasized by Trump voters, such as the economy and crime & safety, that the Trump campaign did air relatively more ads than the Biden campaign, which could indicate that these were the issues that Trump preferred to run on. As for the Biden campaign, we can see that there was a relatively greater amount of campaign advertising for social welfare than the Trump campaign. Perhaps surprisingly, the Trump campaign had relatively more advertisements on the environment than the Biden campaign, despite it being a more salient issue for Biden voters. This could be due to the dataset not distinguishing between positive and negative mentions of the issue, as the Trump campaign could have aired ads attacking climate-related policies of the Biden campaign.

#### Battleground States vs. Non-Battleground States

Another important consideration is the difference in advertising intensity between battleground and non-battleground states. American presidential elections are determined

through an electoral college, where each state and Washington DC have a certain number of electoral votes based on population. If a candidate wins a plurality of the vote in a state, then they get the electoral votes for that state. In total there are 538 electoral college votes, meaning that a candidate needs to get a majority of at least 270 electoral college votes to win. Most states are non-competitive in presidential elections and have voted for the same party for many consecutive elections. Several states, however, are substantially closer. These are the battleground, or swing, states, which have been known to having very close results in presidential elections. These can change from election to election, but for 2020 the 11 battleground states, according to multiple polling aggregators, were Arizona, Florida, Georgia, Iowa, Michigan, Nevada, North Carolina, Ohio, Pennsylvania, Texas, and Wisconsin. In the dataset these states are represented by a dummy variable which is equal to 1 if the state is battleground and 0 otherwise. As these states are seen as crucial to the outcome of the election, it is likely that more resources, and thus more campaign advertising, was put into these states. For this reason, we will also give a comparison in the descriptive statistics for battleground states as opposed to non-battleground states. The results of this can be found in Tables 2-4 in the Appendix.

From Table 3, which shows the descriptive statistics for advertising intensities in only the battleground states, we can see a marked difference when compared to the intensities for the full sample (Table 2) and the non-battleground states only (Table 4). Specifically, the mean intensities for every issue are higher in battleground states than in non-battleground states and in the full sample. This signifies that there were greater resources put into advertising in these states than in non-battleground states. This is not surprising due to these states being of relatively greater importance in the context of the election, meaning it is likelier that these states would have a higher overall number of ads, even though there are less battleground states than non-battleground states. Interestingly, there does not seem to be any change into which issue is the most campaigned about, regardless of whether the state is a battleground or not. For Democrats, social welfare remained the top issue in both sets of states, whereas for Republicans the economy remained top. This could be because the Biden and Trump campaigns simply implemented their campaign ad strategy for battleground states also to non-battleground states, just with less volume of ads. This also suggests that social welfare and the economy are the two issues that will have the most

important role in affecting election outcomes, as these two seemed to be the principal issues of the Biden and Trump campaigns respectively.

### Vote Shares and Turnout

In Table 5 below, we also compiled the descriptive statistics for the election data of the Democratic vote total, Republican vote total, Democratic vote share, the Republican vote share, and voter turnout for the 2020 Presidential election. All the data was taken at a county level for each state, except for Alaska which reports election results by district. For the vote shares, the most evident result is that the mean for Republican vote share was substantially higher than the Democratic vote share, with 0.65 as compared to 0.33. However, as most counties in the United States are less populated and rural this is not surprising, as these are the counties that the Republicans typically do best in. This means that there are simply more counties where the Republicans get high vote shares, however due to the low population density of these counties, this does not necessarily result in Republicans obtaining more votes overall. This can be seen in the means for the Democratic and Republican vote totals, where the Democratic votes were higher with a mean of 25736.43 as compared to the Republican mean of 23522.79. Regarding voter turnout, the mean was 0.64. This indicates high turnout for an American Presidential election, as no other previous election had total turnout at this level. While these statistics do not give an indication as to the effect of campaign advertisements, they do allow for us to get more information about the raw data, which can be useful in the final analysis.

Table 5: Descriptive Statistics for Democratic Vote Total, Republican Vote Total, Democratic Vote Share, Republican Vote Share, and Voter Turnout

	<b>DEMOCRAT VOTE TOTAL</b>	<b>REPUBLICAN VOTE TOTAL</b>	<b>DEMOCRATIC VOTE SHARE</b>	<b>REPUBLICAN VOTE SHARE</b>	<b>VOTER TURNOUT</b>
<b>MEAN</b>	25736.43	23522.79	0.33	0.65	0.64
<b>STANDARD DEVIATION</b>	96824.87	53994.40	0.16	0.16	0.10
<b>MINIMUM</b>	4	59	0.03	0.05	0.07
<b>MAXIMUM</b>	3028885	1145530	0.93	0.96	0.99

*Notes:* Table 5 shows descriptive statistics of the mean, standard deviation, minimum value, and maximum value for Democratic vote total, Republican vote total, Democratic vote share, Republican vote share, and voter turnout. All values have been rounded to two decimal places.

### Estimated Cost

In Table 6 below we have the descriptive statistics for the estimated cost of Democratic and Republican campaign advertisements. This will give more information on the raw data for the instrument, which is important in determining the possible effect of campaign advertisements on political outcomes. We can see that the mean for Republican ads is greater than the mean for Democratic ads. This is perhaps slightly surprising as Democratic voters are more concentrated in urban areas, which tend to be more expensive media markets. However, Republicans aired substantially less ads overall, as per Table 1, which may explain this. With less adverts, the mean may be more affected by outliers in the data, which could lead to the higher mean for Republican ads. Another reason could be that, as the incumbent party, Republicans had to spend more on ads in competitive states to defend their position, particularly in urban areas where the Republicans had substantial electoral weakness and are more expensive markets. Conversely, the Democrats may have tried to air ads in less populated rural areas to try and mitigate losses there, which are less expensive markets.



Table 6: Descriptive Statistics for Estimated Cost of Democratic and Republican Campaign Advertisements

	<b>ESTIMATED COST OF DEMOCRATIC ADS</b>	<b>ESTIMATED COST OF REPUBLICAN ADS</b>
<b>MEAN</b>	766.73	938.94
<b>STANDARD DEVIATION</b>	4683.86	5078.20
<b>MINIMUM</b>	0	0
<b>MAXIMUM</b>	911540	647730

*Notes:* Table 6 shows descriptive statistics of the mean, standard deviation, minimum value, and maximum value for the estimated cost of Democratic and Republican campaign advertisements. All values have been rounded to two decimal places.

## Methodology

For this paper we analyse the potential impact of differing levels of campaign advertising intensity for different issues on election outcomes of the 2020 American presidential election. To do this we are using an Instrumental Variable (IV) approach. The advantages of this method are that it allows for us to overcome endogeneity concerns that may arise due to the independent and outcome variables being confounded by unobserved factors. The use of the instrument that is correlated with the endogenous variable but not with the outcome variable is useful in overcoming this problem and establishing a possible causal relationship. Additionally, the IV method helps to mitigate omitted variable bias, as the use of the instrument helps to capture the omitted variable's effect on the endogenous variable. It is also particularly useful in this case, as random assignment of the intensity of campaign intensity is not feasible, so we are able to exploit the variation in instrument to enable identification of any treatment effects.

In our analysis we use two instruments based on the estimated cost of campaign advertising and whether the ad was aired in a battleground state. We also include a control variable of the number of eligible voters in a county. The estimated cost of an ad was selected as it would be expected to be correlated with the endogenous variable of the campaign advertising intensity for each issue. If ads are cheaper to buy, there would be a greater number of ads bought leading to higher intensity and vice versa. Additionally, it would also

be expected that it would not be correlated with the outcome variables of the Democratic vote share, Republican vote share, and voter turnout. Most voters are likely unaware of the cost of campaign advertisements, so it should not play a factor into whether a person decides to vote and who they decide to vote for. Similarly, for the battleground variable, battleground states are often more heavily targeted by political campaigns in the US due to their importance in determining the result of the election, so it would be expected that there would be higher advertising intensities in these states. With the number of eligible voters should also influence the advertising intensities, as campaigns may devote more resources to counties with higher voting populations, resulting in higher intensities. We will test and explain in further detail the IV assumptions in the Instrument Validity section of this paper.

For our IV analysis, we are using a 2 Stage Least Square Regression (2SLS) approach. We do this by estimating the following equations.

First Stage:

$$(1) \text{ Actual } INS_i = \alpha + \beta \times \text{Estimated Cost of Ad}_i + \gamma \times \text{Battleground} + \delta \times \text{Eligible Voters}_i + \epsilon_i$$

$$(2) \text{ Actual } \widehat{INS}_i = \hat{\alpha} + \hat{\beta} \times \text{Estimated Cost of Ad}_i + \hat{\gamma} \times \text{Battleground} + \hat{\delta} \times \text{Eligible Voters}_i + \epsilon_i$$

Second Stage:

$$(3) \text{ Electoral Outcome}_i = \alpha + \beta \times \text{Actual } \widehat{INS}_i + \gamma \times \text{Battleground} + \delta \times \text{Eligible Voters}_i + \epsilon_i$$

In the first stage we estimate the effect of the instruments, the estimated cost of each campaign advertisement and whether the ad was aired in a battleground state or not, on the actual intensity of the campaign ads. The variable Actual INS represents the actual number of campaign advertisements aired in a specific county pertaining to a specific issue category. The variable Estimated Cost of Ad is the cost of each ad, measured in USD. The variable Battleground is a binary variable that equals 1 when the ad aired in a battleground state and 0 otherwise. The variables with the hat symbol are the predicted values. The variable Eligible Voters is the total population of a county that is over 18, which is used as a proxy for

the voting eligible population of the county and serves as a control variable. This is included due to it being more likely for campaigns to target counties with higher voting populations, thus resulting in higher advertising intensities. The variable Electoral Outcome is either the Democratic vote share, the Republican vote share, or voter turnout. The subscript “*i*” represents the different counties in the data set. Using the coefficients estimated in equation (1), we calculate the predicted intensity of campaign advertising using equation (2). These predicted intensity measures are then used in the second stage in equation (3). From the results of this regression, we determine if there are any statistically and economically significant causal interpretations that can be drawn. This allows for us to conclude as to whether there is any meaningful impact of differing intensities of advertising on different issues on electoral outcomes. For each outcome, we run a set of 8 regressions for each party. Each of the regressions will cover a different issue category as well as for all ads in their entirety. This is done to allow for comparison between the two parties as well as for the different issue categories to see how emphasis on different issues may affect electoral outcomes differently. This allows for us to determine the extent, if any, that the different issue categories influence the vote shares of both parties. For voter turnout, instead of separate regressions for the advertisements for both parties, we follow the methodology of Spenkuch & Toniatti (2018) and just have one regression using the total advertising intensities. These are obtained by adding the Democratic and Republican intensities together.

## Instrument Validity

In this section we explain the validity of the instruments of the estimated cost of the ad and the battleground variable. This is done by checking whether the instrument satisfies the four IV assumptions. These are the assumptions of a meaningful first stage, the exclusion restriction, independence, and monotonicity. The validity of the instrument is important to the methodology, as without a valid instrument then it is impossible to draw any causal conclusions from the estimates of the regression.

### Meaningful First Stage

Firstly, we examine the assumption of a meaningful first stage. This is done by using an OLS regression of the variable of interest, in this case the campaign ad intensity for each issue

category, on the instrument variables, in this case the estimated cost of each ad and whether the state the ad was aired in was a battleground or not. We use the first stage specification as mentioned in the Methodology section, and we test each party separately as well as the total intensity, leading to 24 regressions (each party has 7 issue categories, plus the overall ad intensity). The results for this regression can be found in Tables 7 and 8 in the Appendix.

From Tables 7 and 8, we can see that for every issue category, the two instruments are highly statistically significant for the actual campaign ad intensity. For both Democratic and Republican ads, the instruments were found to be statistically significant at the 1% level. This is a good indication that the instruments satisfy the meaningful first stage assumption and that they are valid. As this is true across both parties and all the issue categories, this positively signals that the estimated cost of the advertisements and the battleground status of the states that the ads were aired in can be used as instruments in an IV specification. However, there is a potential issue in the economic significance of the estimated cost instrument. For both parties and for each issue category, the coefficients for the estimated cost of advertisement were very low, at less than 0.01. This signals that, while a statistically significant relationship between the cost and the ad intensity exists, that there may be a negligible practical effect of this. This would be detrimental to the use of this instrument. Conversely, the battleground instrument does show economic significance, as its coefficients are relatively large. For Democratic ads, the coefficient ranged from 29.71 to 1457.08, while for Republicans the coefficient ranged from 79.09 to 730.08, and from 108.64 to 2154.48 for total ads. This indicates that there is a large positive effect of a state being a battleground to the intensity of campaign advertising. This is not surprising as these states are crucial to the outcome of the election, so it makes sense that campaigns would invest more advertising into them. Overall, it seems that both instruments satisfy the meaningful first stage assumption. While there are concerns over the economic significance of the estimated cost of the advertisement, both the instruments displayed a high degree of statistical significance, showing that they do both have a statistical power in relation to the advertisement intensity and can be used in an IV specification.

## Independence

The independence assumption states that the error term in the regression analysis is independent of the explanatory variables. In the context of this IV analysis, this means that the instrument (the cost of an ad) is uncorrelated with the error term in both the first and second stage equations. This is important as if the independence assumption is violated this would lead to biased and inaccurate estimates. It is not possible to directly test for independence assumption as it relates to possible unobserved factors that may be affecting the endogenous variable and the instrument. However, we can determine that it is likely to hold due to ad costs being typically determined by factors outside the control of the outcome of interest. These factors may include media prices, production costs, market rates, etc., which are unlikely to be directly influenced by unobserved determinants of election outcomes, which helps to ensure independence.

## Exclusion Restriction

The exclusion restriction states that the instrument used should only affect the outcome variable through its impact on the endogenous variable and not through any other channel. In this case, the estimated cost of an ad should only affect the outcome variables (Democratic vote share, Republican vote share, and voter turnout) through actual advertising intensity. The exclusion restriction is difficult to test empirically due to the availability of data. However, it is unlikely that the estimated cost of political advertisements affects electoral outcomes other than through the vote shares for both parties and voter turnout. As mentioned before, the average voter is unlikely to even be aware of the cost of a campaign advertisement and will likely not base their decision to vote and who to vote for on that information. Higher costs of ad may reflect higher campaign intensity, which can then influence voter behaviour through the channels of information exposure, mobilization, and persuasion. Previous empirical studies, such as Gordon et al. (2013) have used cost of political advertisements as instruments and found that the relationship between cost of advertising and electoral outcomes is mediated by campaign advertising intensity, making it highly likely that the exclusion restriction is satisfied in this case. Similarly, for the battleground instrument, the fact that someone lives in a battleground state should not be a factor in their personal decision on who to vote for, but should influence the campaign advertising intensity, as these states are often focused more on by political campaigns.

## Monotonicity

The monotonicity assumption is that changes in the instrument only lead to changes in the endogenous variable (in this case campaign advertisement intensity) in one direction. In this context, this assumption is likely to hold as higher costs of ad will likely reflect campaigns allocating more resources to advertising, leading to higher intensity and greater exposure. It is unlikely that higher costs of advertising reflect lower intensity of advertising by campaigns, so there should not be any defiers. Additionally, campaigns are highly incentivized to invest in advertisements to try and shape electoral outcomes in their favour, which should lead higher cost of ads and higher intensity of advertising.

## Hypotheses

In this section, we present the hypotheses for the results of the empirical analysis. This consists of a hypothesis and a null hypothesis for the results on Democratic and Republican vote shares, as well as for voter turnout. For Democratic vote shares the hypothesis and the null hypothesis are:

Hypothesis: Higher campaign ad intensity on issues of importance to the Democratic voting base (healthcare, education, social issues, etc.) positively impact the Democratic vote share.

Null Hypothesis: There is no impact on Democratic vote share from higher campaign ad intensity on issues traditionally aligned with Democratic party priorities.

For Republican vote shares:

Hypothesis: Higher campaign ad intensity on issues of importance to the Republican voting base (the economy, law-and-order, foreign policy, etc.) positively impacts the Republican vote share.

Null hypothesis: There is no impact on Republican vote share from higher campaign ad intensity on issues traditionally aligned with Republican party priorities.

These hypotheses are based on the salience of issues that were reported in Figure 2 of the data section. The issues mentioned in the hypotheses were of high salience for the voting bases of the two candidates and would theoretically be expected to increase the vote shares of each candidate with higher intensity of advertising. If the results from the regressions

show a positive impact on the vote shares with higher advertising intensity of the issues mentioned in the hypotheses that enables us to not reject the hypotheses.

For voter turnout:

Hypothesis: Higher campaign ad intensity on issues salient during the 2020 election (social welfare, the economy, and social issues) positively impacts voter turnout

Null hypothesis: Campaign ad intensity for any issue does not have an impact on voter turnout.

Like the hypotheses for Democratic and Republican vote shares, the hypothesis for voter turnout has to do with the salience of certain issues during the 2020 election. Based on Figure 2, we can see those issues falling under social welfare (Covid-19, healthcare, etc.), social issues (racism, police brutality, etc.) and the economy were of high importance to both Biden and Trump voters. Theoretically, higher advertising intensities for these issues may have a mobilizing effect, which could increase total voter turnout. If this is reflected in the regression results, we do not reject this hypothesis.

## Results

In this section we present and analyse the results of the second stage regressions as shown in equation (3). This allows us to determine the potential effects of the content of campaign advertising, which should shed light on which issues, if any, are driving voters to vote and on who to vote for. The results of these regressions can be found in Tables 9, 10, and 11 in the Appendix.

In Table 9, we can see the results for the effect of different campaign advertising intensities of different issues on the vote shares of the Democratic party during the 2020 presidential election. What is immediately evident is that all the coefficients retain a high degree of statistical significance. This is good as it indicates that there is a meaningful relationship between the different campaign ad intensities and vote shares for the Democratic party. However, when looking at the coefficients themselves we can see that they are quite small. Reminder that the dependent variable is the Democratic vote share in 2020 election and that it is measured in percentage (vote shares were originally reported in decimals but were multiplied by 100 to obtain a percentage value). Hence, the coefficients represent changes

in the percentage of vote shares when there is an increase of one unit of the advertising intensity. As the advertising intensity is measured by the total number of ads, a one-unit increase is defined as one additional ad being broadcast. With that in mind, when analysing the coefficients, it appears that, while there is a statistically significant relationship between the instrument and the outcome variable, the economic significance is not substantial. The issue with the most impact for Democratic ads (Panel A) seems to be the environment, with the coefficient being 0.02. This implies that higher intensity of Democratic ads mentioning environmental issues, as captured by the instrument of cost of Democratic ads mentioning the environment, is positively associated with Democratic vote shares, and that a one-unit increase of cost of ads focused on the environment is, on average, associated with a 0.02% increase in the Democratic voting share in the average county. This makes sense as the environment and climate change were cited as being an important issue for Biden voters (see Figure 2). It should be noted that this result may also be driven by the fact that there were less ads focused on the environment overall when compared to the other issue categories, which may mean that the effect of a singular ad is less diluted. When considering that the average intensity of Democratic ads for environmental issues in all states only 45 (see Table 2), by far the lowest out of all the issues, this is still not a very large practical effect. This would mean, on average, 45 Democratic environmental ads being broadcast would lead to an increase of the Democratic vote share in the average county of 0.9%. In only battleground states, the average intensity is 100 (see Table 4), leading to an average increase of 2% in the average county. This could potentially be economically significant, as in close elections any increase in vote share could prove decisive, however it would depend on how this increase in vote share would impact the statewide margin.

When looking at the other issue categories, they all have coefficients that are less than 0.02, indicating that other issues have little effect on Democratic vote shares. The next largest coefficient is for law and order, at 0.01, while all the other issues have coefficients less than that. For law and order, the average intensity of Democratic advertising in all states is 160 and 376 for only battleground states. This would mean that, with a coefficient of 0.01, there would be an increase in the Democratic vote share in the average county of 0.16% and 0.38%, which are small increases. The issue with the smallest effect is social welfare with a coefficient of  $8.99e-04$ . This is surprising as social welfare is an issue that is typically



considered to be more of a Democratic one, and social welfare issues (particularly healthcare) were very salient for Biden voters at the time (see Figure 2). The average intensity for Democrat social welfare ads is 972 for all states and 2248 for battleground states. With this coefficient this would lead to an average increase of Democratic vote share in the average county of 0.87% in all states and 2.02% in only battleground states. It appears that for the issues where the Democrats aired a greater number of ads have lower coefficients overall, indicating a diluted effect for a single ad, however the greater volume of ads for a singular issue may still result in a non-negligible effect on Democratic vote shares.

In Panel A of Table 10, we can see the results for the effect of differing advertising intensities of Republican ads on Republican vote shares in the 2020 American Presidential election. As opposed to the Democratic vote shares, all the coefficients here are negative. This indicates that a greater intensity of Republican or Democratic ads leads to a decrease in the Republican vote share. This is interesting as it suggests that being exposed to a greater number of Republican ads is somehow demotivating voters from voting for the Republican candidate. This may be a possible reason for the overall lower number of ads that the Trump campaign aired when compared to the Biden campaign. If greater exposure to Trump's position on various issues leads to lower Republican vote share, then it would make sense to air less ads. It can also be indicative of the marginal effect of airing an additional ad becoming negative for Republicans. It is possible that campaign advertisements initially yielded a positive marginal effect on Republican vote share, but eventually this marginal effect turned negative. Hence, airing additional ads would decrease the Republican vote share. If the Trump campaign realized this, then they might have reduced their advertisements. If the marginal effect for Democratic ads on the Biden vote share remained positive for a larger amount of ads, then this might help explain the discrepancy between the number of Democratic and Republican ads. The issues with the largest negative effect were the environment, foreign policy, and social issues (as well as the other issue category) with coefficients of -0.01. Foreign policy has the highest average advertising intensity in all states with 124, which would result in a decrease in the Republican vote share in the average county of 1.24%. In battleground states only, social issues have the highest average advertising intensity with 331, which would imply a decrease in the Republican vote share of 3.31% in the average county. In a close election these values may be important, particularly

in the battleground states, which are often decided by only a few percentage points, but again it would depend on how this would translate to the statewide margin. The issue with smallest effect is social welfare, with a coefficient of  $-2.40e-03$ . The average intensity of Republican social welfare ads is 253 in all states and 608 for only battleground states, leading to decreases in the Republican vote share in the average county of 0.61% and 1.46%. Like the Democratic vote shares, it appears that the issues that have a greater number of ads broadcast have lower coefficients, however the greater number of ads may still lead to a notable effect on the vote shares. Overall, it seems that there is a not insignificant effect of different intensities on different issues, however the differences between the different issue categories are more connected with the overall number of ads rather than the effect of a singular ad.

In Table 11 (see Appendix), we find the results for the effects of the total advertising intensity on voter turnout. From the results we can see that ads on the environment seem to have the largest effect on voter turnout. The coefficient for this is  $4.30e-03$  indicating that a one unit increase in the total intensity of economic campaign ads leads to an increase in the percentage of voter turnout of 0.0043%. This was found to be statistically significant at the 1% level, as were the other coefficients. Like the previous results on Democratic and Republican vote share, it is possible that this coefficient is largest since the environment had the least number of ads broadcasted during this time. In the average county in all states, there were 137 (45 Democratic and 92 Republican) ads broadcasted about the environment. This would lead to an increase in turnout of about 0.59% when applied with this coefficient. In battleground states only, the average county had 325 (100 Democratic and 225 Republican) ads broadcasted about the environment, which would translate to an increase of turnout of about 1.40%. In close elections this may be important, however it is not a substantial increase. When looking at the other issues, we can see that the issue with the smallest coefficient was social welfare, with a coefficient of  $8.45e-04$ . This indicates that an additional ad about social welfare being broadcast only increases the turnout rate by 0.000845%. This is somewhat surprising as social welfare issues, particularly healthcare and the Covid-19 pandemic, were very salient during this election. When looking at the average county, which has 1225 (972 Democratic and 253 Republican) ads about social welfare broadcast, this would translate into an increase in turnout of about 1.04%. In only

battleground states, the average county would have 2856 (2248 Democratic and 608 Republican) ads about social welfare broadcasted, resulting in an increase in turnout of about 2.41%. Both values are greater than the values for environmental ads, indicating that the number of ads is playing a role in the size of the coefficients. The exact economic significance of this result depends on the closeness of the election. In battleground states, where the elections are usually decided by only a few percentage points, this increase in turnout can potentially prove decisive. In non-battleground states, this is less likely to be as significant as the result is likely not in doubt due to the higher margins by which these states are decided by in Presidential elections.

### Robustness Checks

In this section we conduct checks for the robustness of our results. This is done to ensure the validity and reliability of the main results. Specifically, they help to determine whether the conclusions from the main results hold under alternative specifications, assumptions, or variations in the data. This allows for us to assess the sensitivity of the results to different modelling choices and assumptions, which can help us to gauge the stability of the results under different approaches. Specifically, we conduct a check using the methodology of Spenkuch & Toniatti (2018) where they study the effect of advertising on Democratic and Republican vote shares by examining the relationship between differences in partisan advertising on differences in vote shares. This is done to see if using the methodology of the literature gives an alternative outcome which may conflict with the findings of this paper. To do this we run the same IV regression as in the main specification, however the outcome variable will be the difference between the Democratic and Republican vote share ( $\Delta Vote Share = DemVoteShare - RepVoteShare$ ), the instrument is the difference between the cost Democratic and Republican advertisements ( $\Delta Ad Cost = DemAdCost - RepAdCost$ ), and the variable that is being instrumented is the difference between Democratic and Republican intensities ( $\Delta Ad Intensity = DemAdIntensity - RepAdIntensity$ ). As it had the largest effect in the main results, we only conduct this check for ads mentioning the environment. With these variable specifications, coefficients that are more positive indicate a greater advantage for the Democratic candidate, Joe Biden, over the Republican candidate, Donald Trump. The results for this analysis can be found in Table 12 below.

Table 12: Regression Results for the Effect of the Difference in Partisan Advertising Mentioning the Environment on the Difference in Democratic and Republican Vote Shares

VARIABLE	ENVIRONMENT
<b>ΔAD INTENSITY ENVIRONMENT</b>	-0.01 (4.44e-03)
<b>BATTLEGROUND</b>	-2.67** (1.25)
<b>ELIGIBLE VOTERS</b>	4.38e-05*** (2.07e-06)
<b>CONSTANT</b>	-34.40*** (0.67)
<b>R<sup>2</sup></b>	0.13
<b>NUMBER OF OBSERVATIONS</b>	3150

Notes: Table 12 shows the effect of the difference in Democratic and Republican advertising intensities on issues mentioning the environment on the difference in Democratic and Republican vote shares. The values in the table represent the coefficient, with the values in parenthesis representing the standard errors. \* means that the coefficient is significant at 10% significance level, \*\* at 5%, and \*\*\* at 1%. All values have been rounded to two decimal places.

We can see from Table 12 that the coefficient for the main variable of interest, ΔAd Intensity Environment, is slightly different than from the main specification. Recall that for the original results, the effect on the Democratic vote share by Democratic ads was found to be 0.02 and the effect on the Republican vote share by Republican ads was found to be -0.01. Those results suggested that Democrats benefitted from airing ads on the environment, while Republicans were hurt by it. From this result, it appears that the reverse is true. The coefficient of -0.01 suggests that there is a slight advantage to Republicans with the increase in the difference between the ad intensities of Democratic and Republican ads on the environment. Specifically, an increase of one unit of the difference between the Democratic and Republican ad intensities leads to a decrease in the difference between the vote shares of the Democratic and Republican candidates by 0.01%. As the difference in vote shares was determined by  $\Delta Vote Share = DemVoteShare - RepVoteShare$ , this would suggest that either the Democratic vote share is decreasing or the Republican vote share is increasing, which is obviously advantageous to the Republicans. An increase in the difference between the Democratic and Republican ad intensities would suggest that either Democrats air more ads

or the Republicans air less. If it is true that the marginal effect of airing one additional ad has become negative for Republicans, as was suggested by the coefficient of -0.01 in the main specification, then this would make sense, as airing less ads bring them back to a point where the marginal effect was still positive. It should be noted that this coefficient was not found to statistically significant, which raises considerable doubt into the possible causal implications of the finding.

## Conclusion

The original research question of this paper was “To what extent have campaign advertisements that emphasize specific issues affected voter turnout and outcomes in American presidential elections?” From the findings of this paper, it appears that there is a relatively significant effect on Democratic and Republican vote shares, with Democrat vote share increasing and Republican vote shares decreasing, and a small increase in voter turnout. However, there did not seem to be a large difference between the different issues that were mentioned in the advertisements. While a singular advertisement for the different issues seemed to have different effects, with advertisements mentioning environmental issues having the largest effect of the vote shares and voter turnout, when taking into the account the average number of ads aired in a county, there were not significant differences in changes to vote shares or turnout. Hence, the answer to the research question appears to be that advertisements that emphasized specific issues did not affect vote shares and voter turnout to a large extent. While there were some differences between singular ads, these appeared to be driven more by the overall number of ads aired rather than the content of the ad, with issues with a lower number of ads registering larger effects for singular ads. This indicates that the marginal effect of airing an additional ad is smaller for issues with a greater number of advertisements than for issues with less advertisements, which may explain why the environment, which had the least number of ads, had the largest coefficient for all electoral outcomes. This may have broader implications for campaign strategies in American elections, as these findings suggest that campaign advertisements play a more substantial role in mobilization rather than persuasion. This is supported by the small increases in turnout. It also may highlight the importance of other advertising strategies, such as greater exposure, timing, political appeals, or candidate quality in swaying voters. It may also suggest that Republicans are

disadvantaged when compared to Democrats, as they seemed to reach a negative marginal effect of airing an additional ad far sooner than the Democrats. Additionally, these findings could have implication for campaign spending. If the content of ads is not as important, then campaign strategists may need a different resource allocation method, focusing on a combination of different campaign activities to persuade potential voters. As elections in America, and elsewhere, continue to be closely contested, these findings may be important in influencing exactly how campaigns allocate their resources and how they effectively reach voters. However, they do leave open further questions. How would these results differ for other methods of campaigning? Would there be a substantial difference if we examined more local races, such as congressional or gubernatorial elections? Would elections in other countries exhibit the same patterns, or are there circumstances unique to the US that make it an outlier? We leave these questions open to future research.

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## Appendix

Table 1: Comparison Between the Issues that Democratic and Republican Ads Focused On in the 2020 Presidential Election

	DEMOCRATIC	REPUBLICAN
<b>TOTAL NUMBER OF ADS</b>	497403	166534
<b>NUMBER OF ADS MENTIONING THE ECONOMY</b>	101054 (20.32%)	80758 (48.49%)
<b>NUMBER OF ADS MENTIONING SOCIAL ISSUES</b>	69674 (14.01%)	24612 (14.78%)
<b>NUMBER OF ADS MENTIONING LAW-AND-ORDER</b>	34338 (6.90%)	51666 (31.02%)
<b>NUMBER OF ADS MENTIONING SOCIAL WELFARE (HEALTH, EDUCATION, SOCIAL SECURITY)</b>	225749 (45.39%)	40574 (24.36%)
<b>NUMBER OF ADS MENTIONING THE ENVIRONMENT/ENERGY</b>	10379 (2.09%)	23448 (14.08%)
<b>NUMBER OF ADS MENTIONING FOREIGN POLICY</b>	40857 (8.21%)	29853 (17.92%)
<b>NUMBER OF ADS MENTIONING OTHER ISSUES</b>	107414 (21.59%)	26096 (15.67%)

*Notes:* Table 1 shows the total number of ads that mention a particular issue category as defined by the Wesleyan Media Project for both the Democratic and Republican parties in battleground and non-battleground states. The values in parentheses are the percentage share of the total number of ads for each party.

Table 2: Descriptive Statistics for Democratic and Republican Campaign Advertising Intensity on Each Issue Group (Battleground and Non-Battleground)

<b>PANEL A: DEM</b>	<b>TOTAL</b>	<b>ECONOMY</b>	<b>SOCIAL ISSUES</b>	<b>LAW AND ORDER</b>	<b>SOCIAL WELFARE</b>	<b>ENVIORNMENT</b>	<b>FOREIGN POLICY</b>	<b>OTHER</b>
<b>MEAN</b>	2111	554	317	160	972	45	201	456
<b>STD. DEV</b>	4303	1074	565	342	2014	103	590	974
<b>MAX</b>	20813	5899	2609	2355	9348	522	6465	4805
<b>MIN</b>	0	0	0	0	0	0	0	0
<b>PANEL B: REP</b>	<b>TOTAL</b>	<b>ECONOMY</b>	<b>SOCIAL ISSUES</b>	<b>LAW AND ORDER</b>	<b>SOCIAL WELFARE</b>	<b>ENVIRONMENT</b>	<b>FOREIGN POLICY</b>	<b>OTHER</b>
<b>MEAN</b>	762	362	120	255	253	92	142	154
<b>STD. DEV</b>	1547	753	258	522	489	227	291	315
<b>MAX</b>	8237	4737	1120	3002	2516	2267	1605	1450
<b>MIN</b>	0	0	0	0	0	0	0	0

Notes: Table 2 shows the descriptive statistics of Democratic and Republican campaign advertising intensity for each issue category in battleground and non-battleground states as well as the total advertising intensity. All values have been rounded to the nearest whole number.

Table 3: Descriptive Statistics for Democratic and Republican Campaign Advertising Intensity on Each Issue Group (Battleground)

<b>PANEL A: DEM</b>	<b>TOTAL</b>	<b>ECONOMY</b>	<b>SOCIAL ISSUES</b>	<b>LAW AND ORDER</b>	<b>SOCIAL WELFARE</b>	<b>ENVIORNMENT</b>	<b>FOREIGN POLICY</b>	<b>OTHER</b>
<b>MEAN</b>	4982	1313	733	376	2248	100	481	1044
<b>STD. DEV</b>	5499	1371	687	458	2493	141	881	1218
<b>MAX</b>	20813	5899	2609	2355	9348	522	6465	4805
<b>MIN</b>	0	0	0	0	0	0	0	0
<b>PANEL B: REP</b>	<b>TOTAL</b>	<b>ECONOMY</b>	<b>SOCIAL ISSUES</b>	<b>LAW AND ORDER</b>	<b>SOCIAL WELFARE</b>	<b>ENVIRONMENT</b>	<b>FOREIGN POLICY</b>	<b>OTHER</b>
<b>MEAN</b>	1924	888	331	649	608	225	324	335
<b>STD. DEV</b>	2080	998	352	711	622	327	349	359
<b>MAX</b>	8237	4737	1120	3002	2516	2267	1605	1450
<b>MIN</b>	0	0	0	0	0	0	0	0

Notes: Table 3 shows the descriptive statistics of Democratic and Republican campaign advertising intensity for each issue category in battleground states as well as the total advertising intensity. All values have been rounded to the nearest whole number.

Table 4: Descriptive Statistics for Democratic and Republican Campaign Advertising Intensity on Each Issue Group (Non-Battleground)

<b>PANEL A: DEM</b>	<b>TOTAL</b>	<b>ECONOMY</b>	<b>SOCIAL ISSUES</b>	<b>LAW AND ORDER</b>	<b>SOCIAL WELFARE</b>	<b>ENVIORNMENT</b>	<b>FOREIGN POLICY</b>	<b>OTHER</b>
<b>MEAN</b>	735	190	117	57	360	19	67	174
<b>STD. DEV</b>	2658	631	352	200	1368	64	296	669
<b>MAX</b>	20708	4680	2392	1475	9348	469	1759	4805
<b>MIN</b>	0	0	0	0	0	0	0	0
<b>PANEL B: REP</b>	<b>TOTAL</b>	<b>ECONOMY</b>	<b>SOCIAL ISSUES</b>	<b>LAW AND ORDER</b>	<b>SOCIAL WELFARE</b>	<b>ENVIRONMENT</b>	<b>FOREIGN POLICY</b>	<b>OTHER</b>
<b>MEAN</b>	205	110	19	66	83	28	55	67
<b>STD. DEV</b>	716	405	88	225	281	112	209	248
<b>MAX</b>	5771	2537	1087	2092	1858	1136	1200	1450
<b>MIN</b>	0	0	0	0	0	0	0	0

Notes: Table 4 shows the descriptive statistics of Democratic and Republican campaign advertising intensity for each issue category in non-battleground states as well as the total advertising intensity. All values have been rounded to the nearest whole number.

Table 7: First Stage Regression Results for Actual Intensity of Democratic and Republican Ads on the Instrument of Estimated Cost of Ad and the Variables of Whether the State the Ad was Aired in was a Battleground and the Eligible Voters in the County

PANEL A: DEM		TOTAL	ECONOMY	SOCIAL ISSUES	LAW AND ORDER	SOCIAL WELFARE	ENVIRONMENT	FOREIGN POLICY	OTHER
EST. COST OF AD	1.07e-03*** (8.63e-06)	5.09e-04*** (1.15e-05)	1.15e-03*** (1.41e-05)	1.25e-03*** (1.17e-05)	9.38e-04*** (7.48e-06)	9.20e-04*** (1.03e-05)	9.76e-04*** (8.78e-06)	1.05e-03*** (7.97e-06)	
BATTLEGROUND	1457.08*** (63.35)	745.51*** (29.03)	315.61*** (11.04)	110.54*** (5.67)	683.46*** (29.53)	29.71*** (2.01)	76.85*** (10.00)	302.80*** (13.97)	
ELIGIBLE VOTERS	-3.93e-04*** (1.08e-04)	-6.46e-05 (5.07e-05)	-4.47e-05** (1.90e-05)	1.37e-05 (9.79e-06)	-1.53e-04*** (5.10e-05)	-1.58e-05*** (3.55e-06)	-9.13e-05*** (1.73e-05)	-7.90e-05*** (2.37e-05)	
CONSTANT	235.30*** (34.82)	124.12*** (16.28)	56.40*** (6.12)	12.22*** (3.14)	110.69*** (16.42)	6.56*** (1.13)	9.76** (5.59)	46.31*** (7.66)	
R <sup>2</sup>	0.87	0.54	0.77	0.83	0.87	0.76	0.82	0.88	
F-STATISTIC	6958.73	1223.22	3418.84	5189.22	6849.57	3292.11	4771.52	7461.96	
NUMBER OF OBSERVATIONS	3151	3151	3151	3151	3151	3151	3151	3151	
PANEL B: REP		TOTAL	ECONOMY	SOCIAL ISSUES	LAW AND ORDER	SOCIAL WELFARE	ENVIRONMENT	FOREIGN POLICY	OTHER
EST. COST OF AD	7.08e-04*** (7.61e-06)	7.73e-04*** (8.17e-06)	5.91e-04*** (8.18e-06)	7.39e-04*** (9.18e-06)	6.98e-04*** (9.14e-06)	7.63e-04*** (7.59e-06)	7.98e-04*** (1.25e-05)	9.34e-04*** (1.40e-05)	
BATTLEGROUND	730.08*** (27.93)	320.51*** (13.61)	157.16*** (5.41)	256.10*** (10.46)	227.38*** (10.28)	79.09*** (3.99)	110.55*** (7.04)	90.96*** (7.54)	
ELIGIBLE VOTERS	-1.20e-04* (4.71e-05)	-7.46e-05 (2.32e-05)	-3.17e-05** (9.02e-06)	-1.79e-05 (1.75e-06)	-5.79e-05*** (1.73e-05)	-1.75e-05** (6.97e-06)	-5.05e-05*** (1.20e-05)	-6.78e-05*** (1.30e-05)	
CONSTANT	102.75*** (15.14)	47.52*** (7.46)	10.64*** (2.91)	41.46*** (5.65)	52.98*** (5.57)	10.10*** (2.24)	32.35** (3.87)	39.24*** (4.15)	
R <sup>2</sup>	0.81	0.80	0.74	0.76	0.74	0.80	0.65	0.65	
F-STATISTIC	4396.33	4269.61	3060.20	3398.77	2974.10	4320.60	1918.09	1976.82	
NUMBER OF OBSERVATIONS	3151	3151	3151	3151	3151	3151	3151	3151	

Notes: Table 7 shows the first stage regression results for actual intensity of campaign advertising for Democratic and Republican ads during the final two months of the 2020 American presidential election. The intensities of the 7 issue categories of the economy, social issues, law and order, social welfare, the environment, foreign policy, other issues, and the total intensity are represented. The values in the table represent the coefficient, with the values in parenthesis representing the standard errors. \* means that the coefficient is significant at 10% significance level, \*\* at 5%, and \*\*\* at 1%. All values have been rounded to two decimal places.

Table 8: First Stage Regression Results for Actual Intensity of All Ads on the Instrument of Estimated Cost of Ad and the Variables of Whether the State the Ad was Aired in was a Battleground and the Number of Eligible Voters in the County

VARIABLE	TOTAL	ECONOMY	SOCIAL ISSUES	LAW AND ORDER	SOCIAL WELFARE	ENVIRONMENT	FOREIGN POLICY	OTHER
<b>EST. COST OF AD</b>	9.53e-04*** (8.29e-06)	6.91e-04*** (1.01e-05)	8.59e-04*** (1.17e-05)	9.32e-04*** (9.00e-06)	5.47e-04*** (4.59e-06)	8.06e-04*** (7.63e-06)	9.02e-04*** (8.99e-06)	1.04e-03*** (8.92e-06)
<b>BATTLEGROUND</b>	2154.48*** (87.45)	981.68*** (38.09)	478.05*** (15.78)	335.03*** (10.46)	1009.26*** (36.20)	108.64*** (5.32)	192.46*** (14.41)	386.42*** (19.32)
<b>ELIGIBLE VOTERS</b>	-4.81e-04* (1.48e-04)	-1.02e-04 (6.52e-05)	-4.80e-05** (2.662e-05)	1.46e-06 (2.23e-05)	-2.16e-04*** (6.25e-05)	-3.18e-05** (9.29e-06)	-1.39e-04*** (2.47e-05)	-1.49e-04*** (3.36e-05)
<b>CONSTANT</b>	355.78*** (47.54)	164.05*** (20.92)	76.57*** (8.54)	57.61*** (7.16)	154.64*** (20.13)	17.06*** (2.97)	43.29*** (7.96)	85.23*** (10.74)
<b>R<sup>2</sup></b>	0.86	0.71	0.75	0.84	0.86	0.82	0.80	0.85
<b>F-STATISTIC</b>	6300.88	2543.35	3190.83	5478.59	6470.64	4803.28	4220.34	5857.81
<b>NUMBER OF OBSERVATIONS</b>	3151	3151	3151	3151	3151	3151	3151	3151

Notes: Table 8 shows the first stage regression results for actual intensity of campaign advertising for All ads during the final two months of the 2020 American presidential election. The intensities of the 7 issue categories of the economy, social issues, law and order, social welfare, the environment, foreign policy, other issues, and the total intensity are represented. The values in the table represent the coefficient, with the values in parenthesis representing the standard errors. \* means that the coefficient is significant at 10% significance level, \*\* at 5%, and \*\*\* at 1%. All values have been rounded to two decimal places.

Table 9: Regression Results for the Effect of Differing Campaign Advertising Intensities for Different Issues on Democratic Vote Shares for the 2020 American Presidential Election

PANEL A: 2SLS (DEM ADS)										
	TOTAL	ECONOMY	SOCIAL ISSUES	LAW AND ORDER	SOCIAL WELFARE	ENVIRONMENT	FOREIGN POLICY	OTHER		
<b>AD INTENSITY</b>	4.49e-04*** (7.66e-05)	1.39e-03*** (4.58e-4)	3.95e-03*** (6.60e-04)	0.01*** (9.83e-04)	8.99e-04*** (1.61e-04)	0.02*** (3.28e-03)	2.58e-03*** (5.35e-04)	1.91e-03*** (3.26e-04)		
<b>BATTLEGROUND</b>	-2.44*** (0.69)	-2.10*** (0.76)	-2.96*** (0.69)	-2.41*** (0.64)	-2.23*** (0.64)	-2.21*** (0.62)	-1.61*** (0.61)	-2.20*** (0.63)		
<b>ELIGIBLE VOTERS</b>	2.12e-05*** (1.03e-06)	2.14e-05*** (1.03e-06)	2.12e-05*** (1.02e-06)	2.08e-05*** (1.04e-06)	2.12e-05*** (1.03e-06)	2.10e-05*** (1.03e-06)	2.16e-05*** (1.02e-06)	2.12e-05*** (1.03e-06)		
<b>CONSTANT</b>	31.54*** (0.33)	31.59*** (0.34)	31.40*** (0.34)	31.56*** (0.33)	31.54*** (0.33)	31.49*** (0.33)	31.66*** (0.33)	31.53*** (0.33)		
<b>R<sup>2</sup></b>	0.14	0.14	0.15	0.14	0.14	0.14	0.14	0.14		
<b>NUMBER OF OBSERVATIONS</b>	3151	3151	3151	3151	3151	3151	3151	3151		
PANEL B: 2SLS (REP ADS)										
	TOTAL	ECONOMY	SOCIAL ISSUES	LAW AND ORDER	SOCIAL WELFARE	ENVIRONMENT	FOREIGN POLICY	OTHER		
<b>AD INTENSITY</b>	1.05e-03*** (2.35e-04)	2.14e-03*** (4.69e-04)	0.01*** (1.57e-03)	1.96e-03*** (7.30e-04)	2.45e-03*** (7.78e-04)	0.01*** (1.48e-03)	0.01*** (1.33e-03)	0.01*** (1.19e-03)		
<b>BATTLEGROUND</b>	-2.36*** (0.69)	-2.21*** (0.67)	-2.38*** (0.75)	-1.67*** (0.71)	-1.82*** (0.69)	-1.56** (0.64)	-2.49*** (0.67)	-1.78** (0.65)		
<b>ELIGIBLE VOTERS</b>	2.15e-05*** (1.02e-06)	2.15e-05*** (1.02e-06)	2.17e-05*** (1.02e-06)	2.17e-05*** (1.03e-06)	2.18e-05*** (1.02e-06)	2.15e-05*** (1.03e-06)	2.16e-05*** (1.02e-06)	2.13e-05*** (1.02e-06)		
<b>CONSTANT</b>	31.63*** (0.33)	31.60*** (0.33)	31.72*** (0.33)	31.68*** (0.33)	31.61*** (0.34)	31.68*** (0.33)	31.42*** (0.34)	31.38*** (0.34)		
<b>R<sup>2</sup></b>	0.14	0.14	0.14	0.14	0.14	0.13	0.15	0.14		
<b>NUMBER OF OBSERVATIONS</b>	3151	3151	3151	3151	3151	3151	3151	3151		

Notes: Table 9 shows the 2sls IV regression results for the effect of differing campaign advertising intensities on different issues on Democratic vote shares. Panel A shows the results for Democratic ads and Panel B shows the results for Republican ads. The values in the table represent the coefficient, with the values in parenthesis representing the standard errors. \* means that the coefficient is significant at 10% significance level, \*\* at 5%, and \*\*\* at 1%. All values have been rounded to two decimal places.

Table 10: Regression Results for the Effect of Differing Campaign Advertising Intensities for Different Issues on Republican Vote Shares for the 2020 American Presidential Election

PANEL A: 2SLS (REP ADS)										
	TOTAL	ECONOMY	SOCIAL ISSUES	LAW AND ORDER	SOCIAL WELFARE	ENVIRONMENT	FOREIGN POLICY	OTHER		
AD INTENSITY	-1.03e-03*** (2.38e-04)	-2.09e-03*** (4.76e-04)	-0.01*** (1.60e-03)	-1.90e-03** (7.40e-04)	-2.40e-03*** (7.89e-04)	-0.01*** (1.50e-03)	-0.01*** (1.35e-03)	-0.01*** (1.21e-03)		
BATTLEGROUND	3.09*** (0.70)	2.95*** (0.68)	3.13*** (0.76)	2.42*** (0.71)	2.57*** (0.71)	2.30*** (0.64)	3.24*** (0.68)	2.54*** (0.65)		
ELIGIBLE VOTERS	-2.16e-05*** (1.04e-06)	-2.17e-05*** (1.04e-06)	-2.19e-05*** (1.03e-06)	-2.19e-05*** (1.04e-06)	-2.19e-05*** (1.04e-06)	-2.17e-05*** (1.05e-06)	-2.17e-05*** (1.03e-06)	-2.14e-05*** (1.04e-06)		
CONSTANT	66.30*** (0.34)	66.32*** (0.34)	66.22*** (0.34)	66.25*** (0.34)	66.33*** (0.34)	66.25*** (0.34)	66.51*** (0.34)	66.56*** (0.34)		
R <sup>2</sup>	0.14	0.14	0.14	0.13	0.14	0.13	0.15	0.14		
NUMBER OF OBSERVATIONS	3151	3151	3151	3151	3151	3151	3151	3151		
PANEL B: 2SLS (DEM ADS)										
	TOTAL	ECONOMY	SOCIAL ISSUES	LAW AND ORDER	SOCIAL WELFARE	ENVIRONMENT	FOREIGN POLICY	OTHER		
AD INTENSITY	-4.46e-04*** (7.76e-05)	-1.39e-03*** (4.65e-04)	-3.92e-03*** (6.70e-04)	-0.01*** (9.98e-04)	-8.96e-04*** (1.64e-04)	-0.02*** (3.32e-03)	-2.62e-03*** (5.42e-04)	-1.91e-03*** (3.31e-04)		
BATTLEGROUND	3.21*** (0.66)	2.88*** (0.77)	3.73*** (0.70)	3.14*** (0.65)	3.01*** (0.65)	2.97*** (0.63)	2.41*** (0.62)	2.98*** (0.64)		
ELIGIBLE VOTERS	-2.13e-05*** (1.04e-06)	-2.16e-05*** (1.05e-06)	-2.14e-05*** (1.03e-06)	-2.10e-05*** (1.05e-06)	-2.14e-05*** (1.04e-06)	-2.12e-05*** (1.04e-06)	-2.18e-05*** (1.04e-06)	-2.14e-05*** (1.04e-06)		
CONSTANT	66.39*** (0.34)	66.35*** (0.34)	66.53*** (0.34)	66.37*** (0.34)	66.39*** (0.34)	66.44*** (0.34)	66.28*** (0.34)	66.40*** (0.33)		
R <sup>2</sup>	0.14	0.14	0.15	0.14	0.14	0.14	0.14	0.14		
NUMBER OF OBSERVATIONS	3151	3151	3151	3151	3151	3151	3151	3151		

Notes: Table 10 shows the 2sls IV regression results for the effect of differing campaign advertising intensities on different issues on Republican vote totals. Panel A shows the results for Republican ads and Panel B shows the results for Democratic ads. The values in the table represent the coefficient, with the values in parenthesis representing the standard errors. \* means that the coefficient is significant at 10% significance level, \*\* at 5%, and \*\*\* at 1%. All values have been rounded to two decimal places.



Table 11: Regression Results for the Effect of Differing Campaign Advertising Intensities for Different Issues on Voter Turnout

	<b>TOTAL</b>	<b>ECONOMY</b>	<b>SOCIAL ISSUES</b>	<b>LAW AND ORDER</b>	<b>SOCIAL WELFARE</b>	<b>ENVIRONMENT</b>	<b>FOREIGN POLICY</b>	<b>OTHER</b>
<b>AD INTENSITY</b>	3.38e-04*** (3.38e-05)	1.48e-03*** (1.48e-04)	2.40e-03*** (3.35e-4)	1.94e-03*** (2.88e-04)	8.45e-04*** (8.82e-05)	4.30e-03*** (6.80e-04)	2.37e-03*** (2.66e-04)	1.77e-03*** (1.69e-04)
<b>BATTLEGROUND</b>	-1.84*** (0.43)	-1.78*** (0.46)	-2.06*** (0.47)	-1.57*** (0.45)	-1.86*** (0.42)	-1.02*** (0.41)	-1.44*** (0.41)	-1.85*** (0.41)
<b>ELIGIBLE VOTERS</b>	-3.38e-06*** (6.59e-07)	-3.25e-06*** (6.59e-07)	-3.19e-06*** (6.54e-07)	-3.27e-06*** (6.64e-07)	-3.38e-06*** (6.54e-07)	-3.20e-06*** (6.64e-07)	-3.06e-06*** (6.55e-07)	-3.34e-06*** (6.57e-07)
<b>CONSTANT</b>	63.57*** (0.21)	63.57*** (0.21)	63.55*** (0.21)	63.64*** (0.21)	63.52*** (0.21)	63.67*** (0.21)	63.57*** (0.21)	63.47*** (0.21)
<b>R<sup>2</sup></b>	0.04	0.04	0.05	0.03	0.05	0.02	0.04	0.06
<b>NUMBER OF OBSERVATIONS</b>	3151	3151	3151	3151	3151	3151	3151	3151

Notes: Table 11 shows the 2sls IV regression results for the effect of differing campaign advertising intensities on different issues on voter turnout. \* means that the coefficient is significant at 10% significance level, \*\* at 5%, and \*\*\* at 1%. All values have been rounded to two decimal places.