Electoral Campaign Intensity and Policy Learning

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Abstract

This paper uses the National Annenberg Election Survey data from the 2004 US election to empirically test how campaign intensity modifies the relationship between political interest and policy learning. This research furthers our understanding on the effects of campaigns on policy learning, testing the conditions in which individuals demonstrate greater learning. The analysis utilises a two-step OLS regression to analyse whether advertising spending interacts with political interest to influence policy learning. It is theorised that campaign intensity conditions the relationship between political interest and policy learning and provide an explanation to why recent studies have observed a negative relationship between political interest and policy learning. Those less politically interested are expected to demonstrate stronger policy learning than those more politically interested when campaign intensity is high. This expectation is premised on the idea that, in the context of greater campaign intensity, the less politically interested become relatively more exposed to political information than the most politically interested. The findings corroborate recent work that illustrates a negative relationship between political interest and policy learning during campaigns even when reducing the role of ceiling effects. The expected interaction between campaign intensity and political interest on policy learning is, however, not supported by the data. From this it is discerned that campaign spending seems to have limited influence on policy learning through political interest, and also that campaigns do not produce much policy learning generally.

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Chapter 1

Introduction

In the 2020 US presidential election, campaign spending reached a record high estimated spend of $6.6bn. That number is more than twice the previous record in 2008 estimated at $2.8bn (Opensecrets.org, 2020). These eye-watering sums reflect the ever-increasing expenditure invested into political campaigns in the US. By comparison, total spending in the 2017 British election totalled around £13.7m (The Electoral Commission, 2017). This is evidently a significant gulf in comparative spending, and demonstrative of the relaxed spending limits placed on American campaigns. But what does this significant additional spending achieve for American democracy? Are there tangible benefits to the democratic system that justify such enormous quantities of election spending?

One critical point to note is that campaign money is not spent equitably in the US. The Electoral College (EC) system means that each state carries a different quantity of EC votes based on population size. Furthermore, only a handful of states tend to be competitive come election time. Campaigns therefore focus their attention on the states with the highest EC votes that are the most competitive. This has produced huge inequalities in spending across respective states, with most of the resources being concentrated in the key battleground states. More problematically, it provides greater weight to the votes of those residing in battleground states relative to those living in less competitive areas as these votes are more decisive for the result.

However, this paper does not intend to directly weigh in on arguments surrounding

equality in American democracy. This research rather focuses on the implications of the variation of campaign spending across the US states on policy learning. Campaigns are vital components of democracy designed to inform the electorate about the parties and candidates so that they can make an informed decision at the election. Previous work has empirically demonstrated that campaigns do indeed stimulate voter learning (Lipsitz, 2011; Ferrín, Fraile and García-Albacete, 2019; Wolak, 2006; Arceneaux, 2006; Nadeau et al., 2008; Benoit, Hansen and Holbert, 2004). Furthermore, theoretical literature has emphasised the importance of promoting an educated electorate as a key quality for a healthy democracy. However, this is only the broad picture. If campaigns do stimulate learning, then how significant is the effect of campaign intensity on the observable learning effect? Put differently, to what extent do individuals exposed to more political information in a high intensity campaign environment learn relative to those exposed to less campaign intensity?

These are extremely relevant questions and have important implications on our understanding of how campaigns function in democracy. If increasing campaign intensity stimulates strong learning, we can infer that the additional intensity produced in this context positively impacts democracy. Consequently, one may conclude that restrictions on campaign spending serve to limit the amount of information distributed to the electorate and would therefore negatively impact voter knowledge. This would thus provide some empirical support for important theoretical arguments regarding the role of campaigns.

But there is another important dimension of focus for this thesis. As has been shown, political interest is a key factor in determining voter knowledge (Graber, 2012; Eveland Jr, Shah and Kwak, 2003; Lipsitz, 2011). Those more interested in politics tend to be more engaged and more knowledgeable. It may well be that campaigns have heterogeneous effects on policy learning depending on an individual's political interest, especially when considering the potential implications of campaign intensity. For example, individuals who express lower levels of political interest may be induced to learn more about policy in higher intensity environments as they are exposed to political information they would

otherwise avoid through their lack of interest. As a result, examining the learning effects of less interested individuals is a particular interest for this research paper, and something largely omitted from extant work. To what extent does campaign intensity modify the relationship between political interest and policy learning? If, as expected, the politically uninterested learn significantly more when the campaign intensity is greater, this may provide further support to earlier findings that less politically interested individuals learn more in the campaign environment.

This paper therefore offers an empirical analysis of the relationship between campaign intensity and voter learning using the US context and the 2004 National Annenberg Election Survey (NAES). The variation in spending across states is used as a proxy for campaign intensity, with the learning effects of the electorate measured to provide insight into how campaign intensity influences learning. In utilising this distinction, this study intends to understand how voters of varying political interest learn about policy during elections. Recent work has suggested that uninterested individuals demonstrate the strongest learning effects during campaigns, but this is likely to depend on the intensity of campaigning they are exposed to. Perhaps voters exposed to significantly more political information are also considerably more likely to learn about politics regardless of their political interest level. Whereas, in less competitive areas, political interest is expected to remain an important predictor of learning as exposure to political information remains relatively low for these individuals. Regardless, this paper intends to further understanding on how political campaigns condition policy learning amongst the electorate.

Campaign intensity is therefore defined here as the quantity of information distributed to the electorate. This may be measured in several ways, but the primary indicator used in this analysis is television advertising. In the US, given the limited campaign finance laws, television advertising remains a powerful tool for conveying political information to the electorate. As such, advertising spending by the political parties acts as the primary indicator for campaign intensity in this study. Learning is measured through the knowledge scores of individuals on pre-election and post-election survey knowledge

questions. These are used to gauge how voters improve their scores over the course of the election campaign, with the difference between their pre-election and post-election scores representing their policy learning. Political interest is also a critical variable since it likely has a significant impact on the extent to which one learns about policy, especially in less intense campaign areas.

To provide an analytical framework, this research paper is divided into several chapters. The first chapter provides a comprehensive examination of relevant extant literature, outlining the contribution and significance of this study in the context of previous work. One of the primary mechanisms investigated here is that of exposure to political information and policy learning in the high-choice environment of modern media. Understanding the relationship between exposure to political information, political interest and subsequent policy learning is critical to gauge how campaigns may stimulate learning amongst the electorate. This discussion provides the primary assumptions to build a testable theory about how campaigns may impact individuals of different interest levels disproportionately.

The second chapter builds on the literature review to formulate the theoretical expectations and hypotheses to be tested within the empirical analysis. This includes how campaign intensity is expected to influence learning at varying levels of political interest, and justifies why uninterested individuals are of particular interest to this research paper. This section therefore provides the primary hypotheses to be tested and discussed in the latter sections, formulating expectations about the relationship between political interest and learning with and without the modifying effect of campaign intensity.

The third section elaborates the methods and design of the study, explaining how the relevant concepts are measured and operationalised in the empirical model. There are several key methodological decisions and justifications for formulating the independent and dependent variables, as well as the statistical models used. One of the primary issues is formulating a model that can effectively handle the problems of nested data with predictors at different levels. These important considerations are discussed in detail

to emphasise the contribution of this paper.

This is followed by the results section which outlines and discusses the main empirical findings. Ultimately, it is demonstrated that there seems to be very little effect of campaigns and campaign intensity on voter learning. There is some evidence of a negative correlation between political interest and policy learning during campaigns. However, there is no evidence that campaign intensity has the expected modifying effect on the relationship between political interest and policy learning. The results show that campaign intensity has little influence on policy learning in the 2004 election. These findings thus raise questions for the impact of campaign spending on policy learning since we would expect campaign intensity to significantly improve learning due to increased exposure to information.

Chapter 2

Literature Review

To develop a testable theory on how campaign intensity stimulates policy learning depending on political interest, this study draws on several connected areas of research in political science. First, this paper relates to work discussing exposure to political information in the modern media environment. The main impact of greater campaign intensity is a significant increase in information distributed to the electorate. More information being circulated increases the exposure of individuals to political information. As such, it is important to understand how modern media influences exposure to political information based on political interest. It is demonstrated that greater campaign intensity predominantly increases exposure to political information for individuals uninterested in politics. This is because their lack of political interest is mitigated by the quantity of information provided through the campaign. Thus, in campaign periods, the politically uninterested experience significantly increased exposure to political information. Conversely, campaign intensity will only marginally increase exposure for the most politically interested because these individuals are already deeply engaged in political matters. The additional information provided by the campaign has little increase on their exposure to political information. In short, campaign intensity considerably boosts exposure of political information for those least interested in politics, but only marginally for those more interested.

However, since this paper studies policy learning, the link between exposure to

political information and policy learning also needs to be demonstrated. Increased exposure for the politically uninterested is irrelevant if this does not translate into policy learning. Thus, literature that illustrates the link between exposure to political information and policy learning is used to bridge these two parts of the theoretical framework. Most relevant is recent work that empirically demonstrates campaigns generate the strongest learning effects for the least interested. This encapsulates the assumption that mere exposure to political information is sufficient to produce learning even amongst the politically uninterested. It also indicates that those less politically interested also experience comparatively greater exposure to political information in higher intensity campaigns.

The main contribution of this paper is to test the assumption that the impact of campaign intensity on policy learning depends on political interest. This is something omitted from current literature on campaign effects. Extant work studies the effect of campaigns and political interest on policy learning independently, but little effort has been made to investigate the interaction between the two. This is all the more important given the findings that less politically interested individuals learn during campaigns. The interaction between political interest and campaign intensity may partly explain these counter-intuitive findings. Furthermore, there are significant shortcomings in work exploring the extent to which campaigns stimulate policy learning. These are discussed to demonstrate how the current study extends current knowledge and improves on the methods deployed in previous work on the impact of campaigns.

2.1 Political Exposure through Modern Media

Over recent decades, we have observed a transformational shift in the media and the way individuals consume political information. Historically, political scientists conceptualised the "trapping effect". The trapping effect described the process whereby individuals were inadvertently exposed to political information in a low-choice media environment (Wonneberger, Schoenbach and van Meurs, 2012; Prior, 2007; Shehata et al., 2015). The

limited range of television and radio channels, in the absence of modern internet and social media, meant individuals were "trapped" into political information. One could not simply switch between a multitude of alternative channels offering a vast array of content. In such contexts, it was theorised that individuals would improve their political knowledge regardless of political interest due to frequent inadvertent exposure. It was premised on the assumption that mere exposure to political information is sufficient to stimulate learning effects.

However, with the advent of new media, the mechanism behind the concept of the trapping effect has become rather redundant. The proliferation of social media, streaming services, on-demand TV and the digitalisation of radio has revolutionised media consumption. In consequence, the modern media environment is more accurately described as one of high-choice. Individuals have an abundance of media available to them, and preference more strongly determines information to which one is exposed. Those with a strong preference for entertainment shows or sports events can find material to indulge in around the clock. In contrast, those with a keen interest in politics can immerse themselves in round the clock news and an abundance of political information. This type of selective exposure has a theoretically critical consequence on political knowledge: a reduction in exposure to political information for those uninterested in politics (Aalberg, Blekesaune and Elvestad, 2013). Individuals can readily avoid political information through their habitual media consumption.

These concerns triggered several studies on the matter to better comprehend the implications of modern media on exposure to political information. In a comprehensive study, Prior (2007) indeed found that one's Relative Entertainment Preference (REP) strongly conditions exposure to political information. Individuals with a high REP have significantly reduced exposure to political information (Prior, 2007). Such findings are problematic if we perceive political learning a desirable outcome. Those uninterested in politics can, intentionally or unintentionally, effectively insulate themselves from political information. Such avoidance may have significant ramifications on political learning for those expressing a high REP. Without exposure to political information,

individuals cannot improve their political knowledge. Whereas, those more interested in politics continue to be exposed to political information because they actively seek out the information. As such, the knowledge gap between the politically interested and uninterested is expected to broaden.

However, more recent work has raised doubt over this theory. Such work conversely finds that, despite the advancement of a high-choice media environment, politically uninterested citizens are nevertheless exposed to political information (Shehata et al., 2015, p. 380; Wonneberger, Schoenbach and van Meurs, 2012, p. 68). From this perspective, it may indeed be the case that exposure to political information for the politically uninterested is lower than in the traditional low-choice media environment, but they continue to be exposed to some extent. This raises the question as to how those with a high REP in a high-choice environment continue to be exposed to political information despite a lack of interest. One potential explanation is that, despite the proliferation of media, individuals continue to be inadvertently exposed to political information. Infotainment, for example, may produce passive learning effects despite occurring in the context of entertainment shows (Ferrín, Fraile and García-Albacete, 2019). The appearance of politicians on talk shows is one such example. Their appearance brings with it an opportunity to discuss politics and try to engage those ordinarily uninterested in such issues.

Another possible explanation is the distribution between public and commercial television channels. The presence of strong public broadcast services has been found to contribute to political learning amongst those least interested in politics (Shehata et al., 2015). Public broadcasts often run news and other shows that provide individuals with more balanced, non-partisan information, and it seems less interested individuals are still exposed to this content. Public news broadcasts still appear to command a strong audience, even in the modern high-choice environment. The evidence thus suggests public broadcasting seems to be an important source of political information for individuals generally uninterested in politics (Wonneberger, Schoenbach and van Meurs, 2012). It may consequently be the case that modern media continues to reach the

uninterested, especially in countries with strong public broadcasting services. This seems somewhat contrary to the theoretical arguments that these individuals are now able to almost entirely avoid exposure to political information.

Trying to understand learning in the modern media context is evidently complicated. But it seems that contextual factors strongly condition the extent of exposure to political information, and therefore policy learning, particularly for those uninterested in politics. Take, for example, the influence of the political cycle. In non-election years, it is likely that self selection strongly controls one's exposure to political information. The uninterested, due to their high REP, predominantly avoid political information. In contrast, individuals with a strong political interest will continue to expose themselves to political information through their media consumption. However, as an important election approaches, the abundance of political information produced by the campaign penetrates the effects of self selection. Even those watching entertainment shows are exposed to campaign-related appearances and adverts. In addition, other campaign related activities are likely to reach the uninterested. Rallies and canvassing are two such examples that and may also contribute to exposure of political information at campaign times. In consequence, the imbalance of exposure to political information between the politically interested and uninterested subsequently shrinks. Put more succinctly, the intensity of the campaign reduces the disproportionate exposure to political information between the least and most politically interested individuals. This is not to say that intense campaigns render political interest immaterial, but the increased quantity of political information during campaigns comparatively increases the exposure of the least interested to political information.

2.2 Policy Learning in High Intensity Contests

The previous section demonstrated how exposure to political information in the modern media environment strongly depends on political interest. However, this paper focuses on policy learning rather than exposure to political policy. Though it is likely that exposure

to political information has important implications for policy learning, this link must be demonstrated to theorise about how increased campaign intensity conditions policy learning.

To do so, it is necessary to explore the function of political interest in policy learning in a campaign context. If one expects high-intensity campaigns to stimulate policy learning even amongst the politically uninterested, there is an implicit assumption that mere exposure to political information is sufficient to learn. It would suggest political interest is not decisive on the tendency for individuals to learn about politics. If we can determine an empirical link between political interest and policy learning, we can theorise about how campaign intensity may modify this relationship. To assess the accuracy of this assumption and examine the empirical context, it is necessary to consult the extant literature on policy learning.

There is ample work that examines the relationship between political interest and learning in campaign contexts. One recent study by Ferrín et al (2019) discovered that, in the context of Spanish campaigns, the politically uninterested are substantively more likely to improve their knowledge compared to more interested groups over the campaign period (Ferrín, Fraile and García-Albacete, 2019, p. 326). This finding clearly implies that exposure to political information, regardless of political interest, is critical for policy learning. If the least politically interested are showing evidence of strong policy learning in a campaign context, it suggests that political interest alone cannot explain political learning. It may instead be the case that additional exposure to political information through the campaign environment is behind these findings. This alludes to the idea that exposure to political information mitigates, to some extent, the political interest of an individual in their tendency to learn about politics. As a result, we can infer that more intense campaigns, which increases exposure to political information, will further improve policy learning for the uninterested. To support their study, Ferrín et al (2019) attribute their findings to the passive learning effects of infotainment (Ferrín, Fraile and García-Albacete, 2019, p. 317). They theorise that the appearance of political actors on certain television programmes produces passive learning effects for those watching. Consequently,

this assists in reaching those with a higher REP, and emphasises the link between exposure to political information and policy learning. If being exposed to political information is producing policy learning, more intense campaigns will further improve policy learning as they generate even greater exposure to political information through the these passive effects.

However, it is worth noting that ceiling effects are a significant limitation of their research. Though they suggest their methodology sidesteps this issue, their measurement of learning involves measuring scores from one point in time to a later date. The most politically knowledgeable are thus unable to improve their knowledge scores from the first to the second measurement. Without accounting for ceiling effects, their results may overstate the relative effect for the less interested since they are more likely to be less knowledgeable about politics. As such, ceiling effects may explain why they find the counter-intuitive result that less interested individuals learned more during the 2015 Spanish election campaign (Ferrín, Fraile and García-Albacete, 2019). To be able to reasonably compare learning effects by political interest, one needs to take some care in reducing how ceiling effects may be constraining certain individuals. This is a critical consideration when comparing across political interest groups, and the method for reducing these limitations for this analysis are discussed in more detail in the methodology section.

However, if the least interested do learn more during electoral campaigns, it suggests political interest is less relevant to policy learning in the context of campaigns. Instead, the amount of exposure to political information may, for the least interested, be mitigating their lack of political interest. As such, this would support why Ferrin et al (2019) observe that the least interested learn most in electoral campaigns. The vast amounts of political information that accompany an electoral campaign stimulate learning most strongly in those who would not, in a non-campaign context, be exposed to this political information. These ideas are reinforced by Shehata et al (2015) who study the same effects in Sweden. The study identifies a politically strong learning effect amongst those expressing lower political interest, a phenomenon they label inadvertent learning (Shehata

et al., 2015, p. 308). Inadvertent learning posits that, in the high-choice information-rich media environment, exposure to political information stimulates learning effects even when an individual lacks interest in the information. Since those already politically interested experience no significant increase in their exposure to political information, we see much stronger policy learning for those less interested. Such a conclusion seems significant, since intuitively one would expect that a lack of political interest may mean individuals would not retain information to which they are exposed.

Prior's (2007) work presented in the previous section may appear to contrast these findings. His work concludes that those with a higher REP, in a high-choice media environment, express significantly lower levels of political knowledge (Prior, 2007, p. 115). The mechanism to which he attributes this relationship is the considerably reduced exposure for those with a high REP. If we assume one's REP is a relatively sound indicator for political interest, this seems to conflict with the findings that individuals with a lower interest learn more during campaigns.

However, there are two key differences between the work of Prior (2007) and that of Ferrín et al (2019) and Shehata et al (2015). The first is that Prior is analysing political knowledge in a non-campaign context. As already discussed, there are theoretical reasons to expect significant differences in individual policy learning in a campaign and non-campaign context. In non-campaign contexts, exposure to political information is driven mostly by political interest. The lack of exposure for the less politically interest translates into a lack of policy learning and therefore low political knowledge. In contrast, the politically interested are still strongly exposed to political information through their media consumption. Electoral campaigns, however, significantly alter this relationship. The vast quantity of political information distributed comparatively increases the exposure of the politically uninterested to political information. This additional exposure during campaigns produces more policy learning for the less politically interested. This effect becomes stronger in line with the intensity of the campaign itself. This mechanism may offer insight into why we observe the counter-intuitive results that less interested individuals learn more during campaigns.

The second difference is that Prior is measuring knowledge rather than learning. It seems reasonable, and unsurprising, to expect that those most uninterested in politics express the lowest political knowledge levels. But knowledge and learning are not synonymous. A substantial relative increase in an individual's knowledge may still leave them, in absolute terms, relatively uninformed about politics. It is therefore expected that the politically uninterested learn considerably through the passive effects of inadvertent learning during campaigns. The additional quantity of campaign information increases their exposure to political information and drives their policy learning. Thus the size and direction of the learning effect is an integral focus of this research paper. Previous studies demonstrated that exposure during periods of pervasive information, i.e. electoral campaigns, are conducive for the politically uninterested to improve their political knowledge. They reinforce the idea that, in a high-intensity campaign environment, interest in politics becomes significantly less relevant for policy learning. This does not necessarily imply that they become more knowledgeable about politics, only that their relative learning effect is higher than that of more politically interested individuals.

This discussion questions the application of findings that argue political interest and a concern in specific issues are the primary components that explain policy learning (Graber, 2012; Eveland Jr, Shah and Kwak, 2003; Lipsitz, 2011). It seems that, during electoral campaigns, exposure to political information, alongside political interest, have important implications on policy learning. Relatively speaking, exposure to political information produced by greater campaign intensity is more important for policy learning amongst the politically uninterested since those with higher interest levels experience little change in their exposure. That is not to say that these papers are inherently contradictory, but rather that it is important to recognise the context being examined. For example, whether we are examining policy learning in a campaign or non-campaign context. This paper seeks to link the work outlined on exposure and knowledge in a general context to work analysing the impact of campaigns on voter learning. Political interest is likely to remain a key predictor of policy learning outside campaign periods, but

the information environment of campaigns may have disproportional effects on learning for those of different political interest. The less interested see a significant increase in their exposure to political information due to campaigns, while the more politically interested see little change in their exposure to political information.

2.3 Why Study Political Learning?

Political knowledge is a crucial aspect of democracy. An ignorant electorate is likely an unengaged electorate. Improving the political knowledge of citizens is therefore an intrinsic prerequisite for a healthy democratic system. A knowledgeable electorate is more inclined to engage in an informed and enlightened manner, helping to produce good governance in the long term (Toka, 2008). Furthermore, educating the electorate is inherently desirable even without the consequences on participation. Citizens ought to be informed about the significant decisions that determine their way of life, regardless of the instrumental benefits to democracy. Thus creating conditions conducive for learning is an important component of democracy.

For the electorate to make informed decisions, they must first understand the issues and implications of their political involvement (Berelson, 1952, p. 317). The more citizens are informed, the better information they then possess to reach decisions. Campaigns naturally serve a critical role in informing the electorate about relevant candidates and their respective platforms. Though scholarly debate continues on the degree to which electorates need to be informed to produce effective policy, it is generally agreed that improving the knowledge of the electorate is an objectively positive outcome (Blais and Kilibarda, 2016; Althaus, 1996; Galston, 2001; Bartels, 1996).

Even without considering the implications on decision-making, it has been demonstrated that political knowledge positively correlates with participation (Larcinese, 2007; Shehata et al., 2015). The least informed citizens are also the least likely to participate in political decision-making. This does not only entail casting a vote, but engaging in political discussion (Berelson, 1952, p. 321). If educating the

electorate on political issues can improve participation, this is another intrinsically positive outcome. Thus the contribution of political campaigns to informing electorates ought to be considered as an indispensable aspect of modern democracy. If citizens demonstrate clear learning effects from intense campaigns, this would be an important finding to better understand how we can improve democratic performance.

One riposte to these ideas is that, for democracy to function effectively, citizens do not necessarily require effective factual knowledge. On the contrary, party cues and other information shortcuts enable voters to nevertheless reach reasonably competent decisions (Elkin and Soltan, 2010). Voters themselves are suggested to be far more competent than factual knowledge would indicate, and does not necessarily hinder their capacity to make rational political decisions (Elkin and Soltan, 2010).

While this may be partially accurate, such a critique on the importance of an informed electorate is less convincing when considering the type and method of measuring knowledge operationalised in this paper. If voters cannot identify the primary policy positions of major candidates, one can subsequently question the rationality on which they base their decisions(Blais and Kilibarda, 2016). It may be the case that party cues on other issues are consistent with the candidates on the issues on which they are not informed, but this is a significant assumption. If a voter cannot identify candidate positions during a campaign, and still cannot correctly respond following the election, they are evidently lacking important information that may alter their intention to participate and even vote choice.

This is particularly problematic when one considers that candidates and parties may intentionally conceal less popular commitments from the public eye, requiring opposition advertising or media involvement to supply this information to voters. There is evidence that, while individuals need not be policy experts, a minimum baseline is required to make a rational judgement on political matters (Galston, 2001). If voters are not learning about the issues measured in this paper, there may be questions about their capacity to reach a reasoned judgement. For example, a voter unaware of the party which supports an increase in the minimum wage may vote against their rational

self-interest in the absence of this relevant knowledge. This does not by any means suggest voting without full information is inherently wrong, merely that voters may choose differently with more complete information (Althaus, 1996; Andersen, Tilley and Heath, 2005; Bartels, 1996). In combination with the demonstrated positive relationship between knowledge and engagement, these points highlight the importance of creating an informed electorate.

There is also a rich literature of political theory discussing the normative and empirical importance of campaign regulations. Such work is very relevant here since campaign restrictions by definition have implications for the duration and intensity of political campaigns. There is considerable debate amongst scholars on this subject. Some contend that freedom to spend creates an information-rich environment that is normatively beneficial to improving political knowledge. This position is premised on the idea that more information is better than less as it provides voters with more political information on which to decide their vote (Pevnick, 2016; Smith, 2009). From this perspective, restricting spending will only reduce the quantity of political information provided through the campaign, and therefore negatively impact the political knowledge of voters. Consequently, these restrictions are detrimental to democracy.

Others contend that the restrictions are necessary for many reasons, but primarily for equality of opportunity. Limitless spending benefits those with more money, creating an unfair platform for competition. It may be that those spending more money dominate the information to which individuals are exposed, meaning voters only learn the information the parties want them to (Rowbottom, 2010). This is without considering the type of information distributed, such as negative adverts or misleading information that has little or even negative impacts on policy learning. From this perspective, campaign regulations, including those on how and where information is distributed, are important factors in helping voters learn and make informed decisions. For example, the limits on television advertising for political parties is restricted in the UK to party political broadcasts on terrestrial TV. This form of limitation may be important to ensure the information is

more balanced for the electorate, and this may be more important for learning than the absolute quantity of political information circulated.

Although this paper does not seek to weigh in on these theoretical arguments, the empirical analysis does have important implications for these ideas. If the former theory is correct, and more information inherently produces more learning, we would expect to see a clear impact of campaign intensity on policy learning. This may be especially true for those who tend to be uninterested in politics as these voters, due to their lack of political interest, tend to receive little exposure to political information. In consequence, their increased exposure to political information during campaigns may produce a significant policy learning effect.

However, if there is no effect of campaign intensity on policy learning, it will provide some empirical insight into whether campaign restrictions should be viewed as desirable. Why permit parties and groups to spend so heavily during campaigns if there is no evidence of improvement on knowledge? Though campaign spending may remain important for other reasons, such as participation and voting decision, the literature opposing campaign regulations for the benefits on political knowledge will carry considerably less weight. Conversely, if there are the expected strong effects of campaign intensity on policy learning, it can be argued that restrictions will harmfully impact political learning. Assuming this is normatively desirable, this is negative for both the individuals and democracy.

2.4 Learning Effects in the Context of Political Campaigns

Thus far this paper has examined the theoretical link between exposure to political information and policy learning. It was suggested that high-intensity campaigns can offset a lack of political interest and generate increases in political knowledge, but this depends on an individual's political interest. Electoral campaigns may therefore have heterogeneous effects on policy learning due to an interaction with political interest.

Furthermore, it was shown that political knowledge is a critical component of democracy. Increasing political knowledge increases participation, helps voters reach informed decisions and produces good governance in the long term. But how does this theory sit within the context of empirical analysis in extant scholarly work? This section highlights that the potential interaction between political interest and campaign intensity has not been addressed in previous work. Additionally, it is shown that there is scope to improve the methods that have been used to examine policy learning during electoral campaigns more generally.

There is a rich body of empirical research that examines the impact of political campaigns on political learning. Generally, most of this work finds clear evidence of a positive relationship between political campaigns and learning effects (Lipsitz, 2011, p. 102; Ferrín, Fraile and García-Albacete, 2019, p. 320; Wolak, 2006, p. 360; Benoit, Hansen and Holbert, 2004, p. 183; Arceneaux, 2006, p. 172; Shehata et al., 2015, p. 391; Nadeau et al., 2008, p. 238; Claassen, 2011, p. 216). These results are to be expected given the vast quantity of political information circulated during these periods. Based on intuitive reasoning and the phenomenon of selective exposure, one would expect policy learning to be most evident amongst those that are more politically interested. These are individuals that actively seek out political information and are more engaged in political campaigns. Though an important caveat is that this depends on the reduction of ceiling effects. Without this, the most politically knowledgeable individuals have less scope to learn about politics. If ceiling effects are accounted for, we would expect a generally positive relationship between political interest and policy learning.

Yet the previous sections complicate this picture somewhat; it seems that, in certain conditions, the least politically interested show considerably greater increases in political knowledge over the course of a campaign. Perhaps the intensity of campaign information conditions the relationship between political interest and policy learning. It may be that intense campaigns reduce the importance of political interest on policy learning amongst the least politically interested. Increased intensity may be reducing the imbalance of exposure to political information between individuals of different

political interest. This mechanism therefore stimulates learning more strongly amongst those generally less interested in politics. This brings us to the primary research question for this paper: how does campaign intensity condition the relationship between political interest and learning?

Unlike the field examining campaign effects on overall political learning, there is less research that examines the heterogeneity of these effects based on political interest. This is somewhat unexpected given the importance of understanding how campaigns inform electorates. If less politically interested citizens express higher learning effects during campaigns, this strongly contributes to literature that argues campaigns are important for informing citizens, even if they are not expressly interested in politics.

For the research that has been conducted, there is a distinct lack of consensus on who learns most in a campaign context. On the one hand, several studies have concluded that learning effects are strongest amongst those with strong interests and motivations in politics (Eveland Jr, Shah and Kwak, 2003, p. 374; Nadeau et al., 2008, p. 238; Lipsitz, 2011, p. 104). Conversely, others attribute the highest knowledge gains to those with the lowest interest (Ferrín, Fraile and García-Albacete, 2019, p. 326; Arceneaux, 2006, p. 172; Shehata et al., 2015, p. 388). To complicate matters further, a study by Claassen (2010) finds that learning effects are unaffected by individual interest (Claassen, 2011, p.216). On the surface, it certainly appears that more research is required to understand the intricate relationship between campaigns and political learning. The present study can therefore be understood as an effort to improve our understanding of the impact of campaigns on voter learning and rectify some of the inherent conflicts within the current literature.

Before discussing specific applications, it is important to outline why this empirical body of work fails to identify clear answers. One initial explanation may be cross-national variation in learning effects. There is no reason to believe that the learning effects of political campaigns will be proportional across countries. There are several country-level variables, such as media regulation and campaign spending rules, that may condition the impact of campaigns on policy learning. This country-level

heterogeneity may assist in explaining why studies find differing relationships between political interest and policy learning during campaigns. The relationship may depend greatly on restrictions to campaign information and how the media operates. Since most work takes a case-specific focus, this may well help to explain why we observe differing results.

Additionally, while research has examined the general relationship between campaigns and policy learning, such studies have not been designed to analyse how within-country variation in campaign intensity conditions policy learning depending on political interest. The work of Ferrin et al (2019), for example, studies the effects of the 2015 Spanish election campaign on voter learning throughout the country (Ferrín, Fraile and García-Albacete, 2019). While they identify differential effects on political knowledge based on individual interest in politics, it does not address the extent to which the intensity of the campaign, and the subsequent learning effects, may modify this relationship. It may well be that the relationship between political interest and policy learning depends on the intensity of the campaign. Individuals residing in less targeted regions of Spain may experience considerably less exposure to political information, and it would therefore be expected that the uninterested individuals would not show improvement in their policy learning. Whereas, the uninterested more heavily exposed to campaign information due to greater campaign intensity may demonstrate considerably greater policy learning. These more nuanced findings may be masked by failing to recognise the variability of campaign information through campaign intensity. To quantify this effect, it is necessary to analyse changes in political knowledge amongst those with varying levels of political interest when exposed to differing levels of campaign intensity. To be able to attribute the effect to campaign intensity, it is also necessary to limit the number of additional factors that may confound this relationship.

These requirements return us to the American case. In US politics, due to the design of the electoral college, there is considerable variation in campaign intensity across the constituent states. This has resulted in the conceptualisation of battleground and non-battleground states. Political parties concentrate resources on the so-called battleground

states as they are more competitive and more decisive for the election outcome. Due to this design, there is ample opportunity to empirically test how campaign spending correlates with learning across the US states, while remaining within the context of a single national election. Remaining with the context of national politics is important since it limits many context-specific confounders that would appear if the analysis compared different states.

Three studies are particularly relevant here, and all utilise the American context to conduct their analyses. Wolak (2006) and Lipsitz (2011) studied the differences in learning effects present in battleground and non-battleground states (Wolak, 2006; Lipsitz, 2011). Their studies attempted to discover whether residency in battleground states significantly altered one's engagement and learning, with the papers finding rather inconsistent results. Wolak found that individuals residing in battleground states expressed stronger learning effects, while Lipsitz found only a very marginal effect of living in a battleground state and learning (Wolak, 2006, p. 37; Lipsitz, 2011, p. 107). Such a contradiction is intriguing and warrants further examination of the design and analysis of these respective studies. If voters in battleground states are less likely to learn, it questions the effectiveness of campaign spending in terms of educating voters. Of course, one may contend the primary function of campaigns is to convince voters to vote for a specific party or candidate, but it would nevertheless highlight that campaigns are relatively poor at informing individuals about key policy pledges from leading candidates.

In the work by Lipsitz (2011), there are several potential issues that may significantly impact the outcome of the analysis. Firstly, to measure political interest, the study utilises only direct indicators asking respondents to place themselves on a categorical scale based on how much they follow politics. Measuring political interest in this way is a significant issue given that the differences between the scale are entirely subjective. It is difficult for a voter to place themselves accurately without any means to gauge their level of political interest. Furthermore, this type of indicator may suffer from social desirability bias as respondents could be less inclined to openly admit they are entirely uninterested in politics. When using political interest as a predictor variable, it is important to take

care in constructing the measurement. For this study, only indirect measures of political interest are used to limit the effects of social desirability bias and protect against the problems stemming from arbitrary categories. Since the answers are more meaningful, indirect measures provide an improved measure of a respondents political interest.

Second, and more fundamentally, Lipsitz examines individual effects on voter learning using state-level measures as predictors. In consequence, the standard errors of the coefficients will be underestimated, creating problems for inference and statistical significance. Since Lipsitz is utilising nested data, it is critical to recognise that a significant portion of the variation may be at the second level of the state, and thus drawing inference from a multivariate regression is statistically unsuitable.

To measure policy learning in battleground states, Wolak constructs a measurement by adding up the number of positive and negative mentions about the presidential candidates. The idea is that more mentions is reflective of a greater knowledge about the candidate. Such a measure problematic for several reasons. Firstly, using only a measure that relates to candidates may not be reflective of political knowledge. Questions relating to policy and election pledges are equally important components to accurately measure a respondents knowledge. Second, there is no reason to expect the number of total mentions to correlate with knowledge. Individuals may express opinions about candidates that have little factual grounding, and this presents problems with the internal validity of the measure. Mentions are likely more related to favourability and opinion than concrete political knowledge. Premising the findings on this measure is severely problematic for the conclusions of the study. Creating a measure that is both reliable and internally valid is crucial for accurately drawing conclusions on policy learning. In this research, knowledge of candidate background and policy issues is used to measure policy learning. These indicators are more reflective of knowledge as they have determinable answers.

Another study by Claassen (2010) studied the extent to which learning, persuasion and priming are influenced by political awareness. The results demonstrate that policy learning is indeed mediated by political awareness, but it is mostly equal across groups

(Claassen, 2011, p. 206). As such, the paper suggests there are no demonstrable differences in learning across political interest groups. However, the study focuses on the national context without consideration of the potential heterogeneous effects across states. These findings may conceal differential effects between states and the variation of campaign intensity.

Based on these critiques, there is plenty of scope to improve the methodology used to study policy learning in the American context. Using more reflective indicators of knowledge and adopting a statistical model that can handle the complexities of independent variables at different levels will provide a more robust analysis of the relationship between political interest and policy learning. Furthermore, incorporating the potentially modifying effect of campaign intensity on this relationship promises to provide further insight into our understanding of policy learning during campaigns. In this manner, we can not only improve our inference on how political interest predicts policy learning, we can also assess what causes this to vary. This assists in advancing research on the overall effects of political campaigns, especially with regard to how spending and regulations may impact the quality of democracy.

2.5 Contribution

This thesis can be considered as part of the broader literature discussing the extent to which campaigns matter. To what extent do electoral campaigns have implications for electorates? Undoubtedly, campaign effects are largely dependent on the national context. The intensity and length of campaigning is often predetermined by electoral rules and campaign finance restrictions. But this paper studies one particular outcome of campaigns: policy learning. Do campaigns stimulate significant learning effects amongst the electorate? What conditions these effects? Are particular groups of voters more inclined to learn over the course of the campaign? These are all salient questions for political science, and this paper is best contextualised as contributing to this body of work.

Previous literature is chiefly concerned with general learning effects and whether this is influenced by residency in battleground states. A significant omission is how the intensity of the campaign mediates policy learning amongst those with varying interest in politics. This is fertile ground to understand the extent to which campaign intensity mitigates the role of low interest in politics on policy learning. If we observe significant increases in political knowledge amongst the politically uninterested specifically in a high intensity context, we can be confident in attributing a significant share of this effect to the intensity of campaign. The US is particularly suited to this given the vast differential in resources used to campaign in different states. This study intends to produce insight into whether campaign intensity generates learning amongst those uninterested in politics due to the pervasiveness of political information in those states.

More specifically, this thesis analyses the extent to which the intensity of campaigns influences the relationship between political interest and policy learning. One would intuitively expect more intense campaigns to produce stronger learning effects since more individuals are likely to be exposed to political information, however one can also assume that this would be strongly dependent on an individual's interest in politics. Exposure to campaign information may be irrelevant if one is uninterested in politics. Or perhaps the intensity and pervasiveness of campaign information generates learning even amongst the uninterested. This relationship has been overlooked in the current literature, and campaign intensity may significantly change the extent to which individual's learn about policy depending on their interest. Furthermore, extant work has some methodological flaws that are improved in this analysis. Most obviously, this involves a more complex statistical model to cope with the different levels of independent variables and also improving the operationalisation of the variables themselves. In doing so, this research both fills a knowledge gap and improves on previous work that explores how campaigns contribute to policy learning.

This study therefore has several empirical implications for our understanding of political campaigns and policy learning. First, it furthers our knowledge on the relationship between political interest and policy learning in the context of electoral

campaigns. The nature of this research design provides insight into the heterogeneous effects of campaign intensity on policy learning by distinguishing between political interest levels. Second, it demonstrates how the modern media environment may be a factor in exposure of voters to political information. Based on previous work, it is expected that respondents uninterested in politics do not actively seek political information. Thus, if we observe evidence of learning amongst the politically uninterested, these effects may provide credence to the literature identifying the phenomenon of inadvertent learning. Finally, and most saliently, the study promises to strengthen our knowledge on the consequences of campaign intensity on policy learning. Do intense political campaigns stimulate strong learning effects? Are these effects spread disproportionately amongst individuals based on their interest? To what extent does campaign intensity effect the degree to which respondents of different political interest learn during the campaign period? These are all important questions to be assessed by this study.

Chapter 3

Theory and Hypotheses

Based on the discussion presented in the literature review, this chapter outlines the specific theories and hypotheses to be tested in this analysis. The aim of this research is to better understand policy learning in a campaign context. The two primary contributions of this analysis are to improve the methodological techniques used to analyse policy learning and to include how campaign intensity affects political learning based on political interest. Before outlining the specific hypotheses to be tested, this section formulates the theoretical chain driving the expectations of the research. In doing so, it explains how campaign intensity affects the policy learning of individuals with varying political interest differently.

Before introducing campaign intensity to the equation, it is worth outlining the theoretical framework between political interest and policy learning. When it comes to policy learning, political interest has a critical role in controlling the extent of policy learning for individuals. Those who are most interested in politics tend to learn more because their greater interest means they expose themselves to more political information than those less interested in politics. The politically interested are inclined to engage more heavily in politics through various activities including watching the news, reading newspapers, following campaign material, attending political events, making contributions and so forth. Such activities produce greater exposure to political information. This greater exposure to political information stimulates stronger learning

effects since they are obtaining relevant political information. In contrast, those less politically interested are considerably less engaged in such political activities. Their lower engagement in political activities significantly lowers their exposure to political information. In consequence these individuals learn less about policy matters relative to individuals more interested in politics.

Despite this expectation, some empirical work contradicts this theoretical chain. The work of Ferrin et al (2019) and Shehata et al (2015) both found that less interested individuals learn more during electoral campaigns. However, there is a significant caveat to their analyses. Both fail to adequately avoid the constraining role of ceiling effects. Because the most politically interested tend to also be the most knowledgeable (Prior, 2007), ceiling effects limit the extent to which they can learn further about politics. Without reducing the role of ceiling effects, it is difficult to compare the relative policy learning of individuals based on their political interest. However, this study does reduce the limitations of ceiling effects by removing individuals who have no scope to learn more about policy from the analysis. In their absence, it is expected that those more interested in politics will demonstrate stronger policy learning than those less interested in politics. This functions through their greater exposure to political information due to their habitual media consumption. This expectation is outlined in the first hypothesis:

Hypothesis 1 (H1): *Individuals more interested in politics will demonstrate stronger policy learning relative to those less interested in politics*

This hypothesis therefore provides further analysis as to how political interest influences policy learning in a campaign context. Once the problems associated with ceiling effects have been reduced, it is expected that the most interested in politics will demonstrate the strongest policy learning.

The more theoretically salient part of this paper examines how campaign intensity further conditions this relationship between political interest and policy learning. Introducing campaign intensity to the theoretical framework complicates the expectations informing the first hypothesis. Firstly, it is expected that campaign intensity influences the extent to which individuals learn about policy differently based

on their interest in politics. For the most interested, campaign intensity is predicted to increase their policy learning, but only very marginally. This is because these are individuals who are already saturated with political information and the increased intensity of the campaign only slightly increases their exposure to political information. Since their exposure to political information is unlikely to change substantially, the politically interested are not expected to improve their policy learning to any great extent. These individuals expose themselves to political information even in the absence of electoral campaigns, and their exposure remains high in a campaign and non-campaign context.

However, this is not the case for the politically uninterested. These are individuals who, due to their lack of interest, are exposed to a limited amount of political information. Their lack of interest means they do not seek out political information and their media habits insulate them from political matters in the absence of campaigns. In contrast to the more interested, campaign intensity is expected to substantially increase the exposure of less politically interested individuals to campaign information. This is due to the reasons noted previously, that high intensity campaigns produce an environment of pervasive political information that becomes more difficult to avoid via selective exposure. Whether this avoidance is intentional or unintentional through their media habits is irrelevant. As Ferrin et al (2019) theorised, in an intense campaign environment individuals may learn passively through infotainment and unexpected exposure to political information. In consequence, less interested individuals see a far greater increase in their exposure to political information and therefore demonstrate far greater policy learning than the most interested. This learning may not be linear to the quantity of information exposed due to their lack of interest meaning they may retain less of the information to which they are exposed. Nevertheless, their relative increase in exposure to political information is far greater than those more interested and this is expected to translate into greater policy learning. In other words, campaign intensity becomes a strong predictor of policy learning for the politically uninterested, but not for the politically interested.

Another reason to expect stronger relative policy learning for the least politically

interested is because those most interested may be more sceptical of new information. The politically interested tend to be most exposed and engaged in political matters. These are also individuals who tend to be more informed on politics in general. One implication of this is that they may be more sceptical of new political information to which they are exposed. This may be especially true if it contradicts their extant understanding of politics. For example, if a knowledgeable voter is informed that the Republican candidate at the 2004 election, George Bush, is in favour of banning assault weapons, they may be sceptical given their knowledge about the Republican Party and their support of the right to bear arms. Though this is factually true, politically interested individuals may be less inclined to trust this information. Even more so in the knowledge that most American media outlets have some degree of partisan bias. In contrast, a less politically interested individual may take this information at face value if their knowledge of partisan politics is weak. Therefore, we observe policy learning for the less interested individual rather than the politically interested individual. This argument tends to be deployed more for partisan information, but this example highlights that it may also have implications for how individuals of different political interest learn about policy.

This expectation is encapsulated in the second hypothesis:

Hypothesis 2 (H2): *The impact of campaign intensity on learning is expected to be stronger for those politically uninterested compared to those politically interested.*

If H2 holds, then it would strongly suggest that intense campaigns are particularly conducive for policy learning amongst individuals lacking political interest. If both H1 and H2 find empirical support, it would suggest that campaign intensity is indeed critical to improving voter knowledge alongside other desirable outcomes from campaigning. If we assume increased political knowledge within the electorate is desirable, then this has clear implications for the literature on why political campaigns matter in political science. If H1 does not hold, H2 may provide the reasoning as to why the more interested do not show stronger learning effects. It may be the case that campaign intensity is most relevant to boosting the learning effect for the uninterested and helps to explain why previous work has identified these individuals as more prone to learning during campaigns.

It would also, to some extent, support increases in spending to provide additional campaign information for the objective benefits to democracy. Although this would likely also require some additional research on the diminishing returns of campaign intensity on learning. It may be that the overall effect is only small, but this is beyond the scope of this current research paper

Chapter 4

Measurement and Data

To conduct the analysis, this paper utilises the 2004 National Annenberg Election Survey (NAES) dataset. The NAES is a comprehensive survey conducted on individuals across the US over the course of the presidential election. The dataset includes all the necessary questions to measure individual policy learning effects along with the political interest of respondents. This dataset is particularly suitable for this analysis as the survey is administered in several waves: some taking place before election day, with one final post-election survey. The pre-election surveys took place from 15th July until 1st November 2004, and the post-election survey was run from 4th November until 28th December 2004. This rolling cross-section design permits measurement of respondents knowledge early in the campaign and soon after the election on the same set of questions. It is subsequently possible to determine the knowledge increase for each question put to respondents to gauge the learning effects. The 2004 election year was selected as it contains all the necessary indicators to conduct the analysis, and also features the rolling-cross section design absent in other available years. The number of respondents subjected to both a pre-election and post-election interview is 8664. This paper therefore applies the analysis to these specific individuals. The data also includes information on the state residency of respondents, providing the means to compare learning across different US states.

4.1 Campaign Intensity

There are several key independent variables relevant to this analysis. Since this study is primarily interested in how campaign intensity conditions learning, it must first address how campaign intensity is conceptualised. Campaign intensity is regarded as the quantity of information distributed to influence the electorate. Greater intensity encompasses greater quantity of information provided to citizens. To operationalise the intensity variable, this paper incorporates a second dataset, the TNSMI/CMAG political advertising dataset produced by the University of Wisconsin, which includes data on the estimated advertising spending by the parties in the 94 largest media markets. Advertising spending is expected to be a reflective indicator of how much attention is being concentrated in certain areas. Furthermore, campaign adverts contain key political information which is conveyed to the residents of that market.

Since the NAES cannot identify the specific media market to which respondents belong, the total estimated spending for all media markets within state boundaries are collated to provide a state-level estimate. For each state, this estimated advertising spending acts as a proxy for the intensity of the political campaign. In line with the theory, it is expected that learning effects should be, on balance, greater in states with higher estimated advertising spending. The relative advertising spending within each state is displayed in Figure 4.1. The barplot visually demonstrates the significant spending inequality for each state during the campaign. The most competitive states for 2004 (Florida, Ohio, Pennsylvania, Wisconsin) receive considerably more advertising spending than less competitive states. This inequality strengthens the theory that respondents residing in more competitive states, such as Florida or Ohio, will be exposed to a substantially greater quantity of political information during the campaign than respondents residing in Maryland or Arkansas.

There are however a few issues regarding the construction of the campaign intensity variable. Firstly, the total number of media markets included in the dataset (94) represents only around half of total media markets. Thus, the intensity variable may be missing a considerable amount of data on the total estimated spending and suffer from

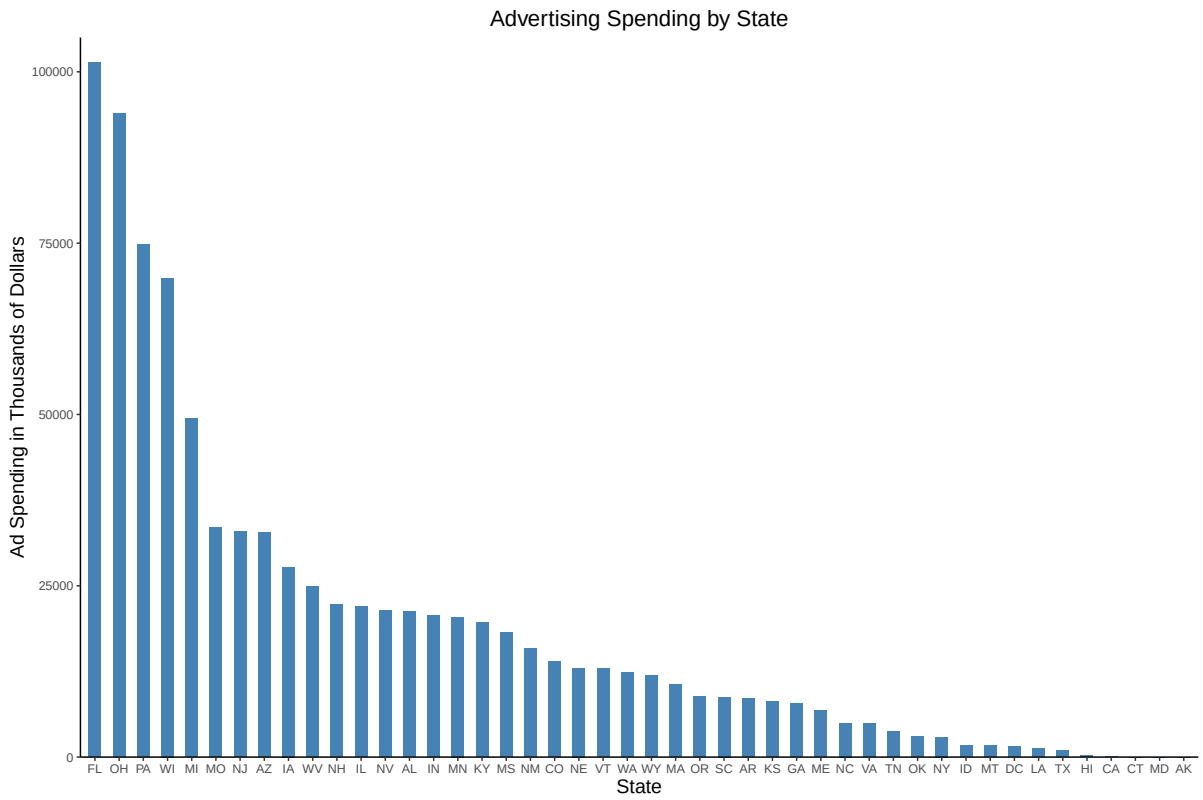

Figure 4.1: Estimated advertising spending by state in 2004

some degree of measurement error. It is worth noting, however, that the media markets included in the data are the largest (in terms of spending) and most influential in the country. The markets not included in the dataset are those present in less competitive states, and likely comprise only a minor amount of estimated spending. The expenditure totals derived from this method also correspond with expenditure calculated for states in the 2004 election in other sources. Thus we can be reasonably confident this measure is a reliable indicator of advertising spending. More details of the media markets included from the data as well as a breakdown of the findings produced in other sources can be viewed in the Appendix.

A second issue is that media markets transcend state boundaries, and collating the estimated total of all media markets within a state may therefore not truly reflect the amount spent within that state. Such a measure may inflate the spending estimate in states situated next to key battleground states with media markets that cross into their borders. Since there is no possibility to better identify which respondents live in which media market, these state level estimates are the best method given the data provided.

Again, since we observe similarities between the estimates created here and produced elsewhere, this is not a significant concern.

Perhaps most importantly, using a state-level estimate is problematic since the primary aspect of interest here is individual-level learning. This presents problems for the statistical model used to conduct the analysis with independent variables at different levels. Applying a normal OLS regression using state-level spending as a predictor will lead to inference problems and biased standard errors. As is explained in more detail when discussing the model, a two-step least squares regression design is employed to prevent the problems associated with nested data.

To strengthen the internal validity of the campaign intensity measure, a second indicator measuring the number of campaign visits from candidates in states is run in the models. The data for the indicator is retrieved from FairVote, a non-partisan organisation which records campaign and election data in the US. FairVote tracked all presidential related campaign visits during the election, and these were used as an alternative dependent variable in the statistical models as robustness checks (FairVote, 2005). Candidate visits are another important indicator of intensity and campaign attention since these visits predominantly occur in the most competitive states with the highest EC votes. The second indicator is used to further protect against any potential measurement error in the advertising spending measure, and ensure internal validity of the dependent variable of this study.

4.2 Political Interest

The second independent variable for the analysis is political interest. Due to the complexity of measuring interest, it can be difficult to operationalise variables that accurately reflect the concept. Fortunately, the NAES dataset provides several indicators which cover both campaign and political interest. These include direct questions asking respondents how interested they are in the campaign and politics more generally, alongside indirect measures asking about their frequency in discussing and

reading about politics.

After examining each of the potential interest indicator variables, it became clear that the indirect measures asking respondents if they had discussed politics in the last week were most appropriate for several reasons. First, the direct measurements asking respondents to self-report their own interest level featured a high proportion of missing values. Depending on the interest measure, the percentage of missing values ranged from 37% to 65%. This would therefore considerably reduce the number of observations present in the analysis and pose problems for generalisability.

Second, opting for the indirect measures is methodologically preferable as the measurement scale is more meaningful. For example, the question asking respondents how many days they have discussed politics with friends or family in the last week ranges from 0-7 days. The difference between each point on the scale has a quantifiable meaning and therefore is preferable to the Likert measures of the direct indicators. Additionally this provides a continuous scale which is better suited for the models than the categorical measures asking respondents to self-report their own interest levels.

Since this study utilises a two-step OLS regression, it is important to identify any possible multicollinearity between predictor variables. Given these various predictors are all an attempt to measure the same concept, it is expected these will strongly correlate with one another. To test this, indirect measures of political interest were converted into numeric variables and their similarity was measured using a correlation test. The results can be observed in the correlation matrix presented in Table 4.1. From this it is clear there is relatively limited correlation between the different political interest variables. This is an indication that the variables are measuring political interest in slightly different ways, suggesting multicollinearity is not a significant concern for the models. The indicator asking respondents how many days over the previous week they had discussed politics with friends and family is used as the primary measure for political interest in the models. This was selected as it did not contain any missing values and discussing politics seems a reliable measure for quantifying political interest. To be sure, sensitivity checks were also run by changing the indicator used in the model to measure an individuals interest

to ensure the results did not depend on this methodological decision. Doing so had no effects on either the statistical or substantive significance of the results. These results are observable in the Appendix.

	discussed family	discussed work	network news	cable news
discussed family	1			
discussed work	0.36	1		
network news	0.12	-0.03	1	
cable news	0.28	0.12	0.14	1

Table 4.1: Interest variable correlation

4.3 Policy Learning

The dependent variable of this analysis is policy learning. The NAES is particularly well-suited for this since it poses the same political knowledge questions to the same group of respondents both before and after the election. As such, it is possible to measure the improvement in pre-election and post-election knowledge of respondents. The first step in creating the dependent variable was deciding which questions to include in the measure. The questions to be included were determined by their relevance to the type of learning being measured in this study. Thus, the knowledge questions relating to institutional and electoral rules included in the survey are mostly irrelevant since one would not expect respondents to learn about these during a political campaign. More relevant are important policy pledges and candidate positions heavily advertised during campaign periods. Questions on these matters will be more reflective of knowledge derived from the campaign. The data provides ample questions asking respondents which candidate supports a particular policy, both before and after election day. The questions included to produce the dependent variable are outlined in the Appendix.

The second step in selecting the knowledge questions to be included was determining questions which both had a definitive answer and were asked throughout the pre-election waves. The latter is particularly problematic since, although the NAES contains many potential knowledge questions on policy issues, few were asked across all the pre-election and post-election waves. Including questions that were asked in only

certain waves considerably lowered the number of total respondents included in the analysis as not all of the respondents were asked the same questions. Some respondents were never asked knowledge questions included in only one particular wave, and such questions were therefore discarded from the analysis. Ultimately, only questions which had a definitive answer and were asked across all election and post-election waves were included in the analysis to retain sufficient observations.

It is equally important to consider that this study intends to measure, to the maximum extent possible, knowledge obtained through the campaign rather than improvements through other processes, such as party cues. To achieve this, the questions incorporated as indicators vary from relatively straightforward to more complex questions with specific answers, across a range of issues. By incorporating this variation in difficulty and subject, this paper ensures that voters are not merely improving through shortcuts like party cues, or sheer luck.

Additionally, this paper is also only interested in those who initially answered these knowledge questions incorrectly since the paper is studying the learning effects. Those who demonstrated negative learning effects are not relevant in understanding the composition of the electorate who learn during the campaign. A significant benefit of measuring the dependent variable in this way is a reduction in ceiling effects constraining those most politically interested. Individuals expressing high interest in politics also have an opportunity to learn the information, meaning the effect across political interest is more comparable. The number of respondents with a perfect pre-election knowledge score comprised less than 1% (25 of 4553) of those included which seemed an acceptably small compromise to limit ceiling effects. Discounting those who initially answered at least one question incorrectly also means party cues are not as problematic since, even if party cues remain partly responsible for improvements, the respondent initially answered certain questions incorrectly. It may therefore be the campaign itself that activates party cues and indirectly assists respondents in answering questions correctly. But the mechanism that drives the improvements in scores does not particularly matter, as long as it is connected to the campaign.

These pre-requisites resulted in eight knowledge questions put to all respondents, the distribution of which is presented in Figure 4.2. From this it is observable that there is a slight negative skew towards a greater number of correct answers given to the knowledge questions. Once missing values and those with perfect scores in the pre-election index were removed, this left 3450 respondents who participated in the relevant knowledge questions both before and after election day. Only 4% of respondents scored zero on the pre-election knowledge score, with 13% achieving 7 correct answers. The overall negative skew may suggest that the knowledge questions were not particularly difficult for the majority of respondents. Nevertheless, it demonstrates that many respondents had several questions of which they could improve their knowledge score through the campaign.

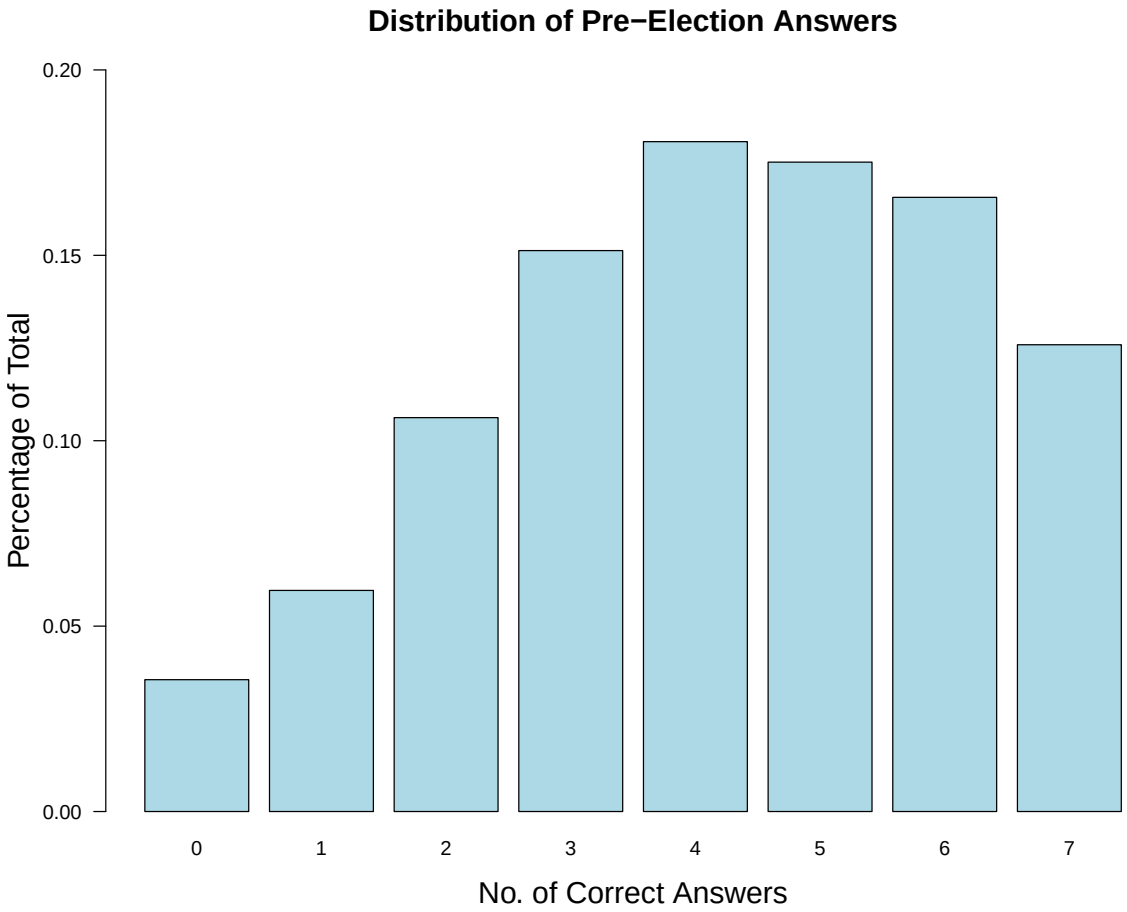

Figure 4.2: Pre-election knowledge answer distribution

To create the measure itself, an individual measure was created by coding "1" if an

individual answered correctly, and "0" if they answered either incorrectly, "don't know" or "refused". This was conducted on the waves taking place before election day and also for the post-election wave. This provided an individual knowledge score ranging from 0-8 for both pre and post-election. The scores achieved were then divided by the number of knowledge questions answered to provide a comparable learning percentage across individuals for both pre-election and post-election waves. The percentage difference from the pre-election to post-election wave represents the individual learning effect. Since the design attempts to reduce the constraints of ceiling effects, this makes the individual learning effect measure more comparable across interest levels than in extant work.

To isolate the treatment effect analysed here, it is necessary to incorporate several control variables into the model. Those included are demographic control variables including education, gender, age, income and race. Such demographic variables are known to be important predictors of policy learning, and therefore it is important to ensure these are accounted for when running the individual level models. Age is a continuous variable across the age range of those included in the dataset. Education has 9 categories of substantive interest, ranging from education at grade 8 or lower to a graduate or professional degree. The indicator for gender in the dataset is a binary variable, taking only male and female values. Income features 9 categories ranging from less than $10,000 to an income of over $150,000. Race is a categorical variable with 4 levels, namely "White", "Black", "Asian", "Other". A descriptive summary of all the variables used in the analysis is presented in table 4.2.

These individual level controls serve to improve the internal validity of the learning effect measurement by reducing the influence of these factors that may otherwise significantly confound the relationship being studied. Since this paper is not interested in the substantive effects of these variables, the only coding change was to relevel the variables to ensure that they use the same reference category in the regression outputs. Furthermore, since models examining state-level variation are also conducted in the analysis, there is nothing additional added to the model. It is expected that the majority of variance studied across states will be mostly due to the impact of the

Table 4.2: Summary statistics

Statistic	N	Mean	Min	Pctl(25)	Median	Pctl(75)	Max	St. Dev.
Learning	3,450	0.152	0.000	0.000	0.125	0.250	0.875	0.150
Advertising	4,528	25.425	0.000	2.935	10.617	32.888	101.387	31.552
Visits	4,528	10.044	0.000	0.000	1.000	10.000	61.000	17.273
Interest	4,528	4.778	1.000	3.000	5.000	8.000	10.000	2.553
Interest2	4,528	2.826	1.000	1.000	1.000	4.000	10.000	2.329
Age	4,528	34.295	1.000	22.000	34.000	45.000	81.000	16.359
Sex	4,528	1.548	1.000	1.000	2.000	2.000	2.000	0.498
Edu	4,528	5.759	1.000	3.000	6.000	7.000	11.000	2.310
Income	4,528	5.877	1.000	4.000	6.000	7.000	11.000	2.452
Race	4,528	1.788	1.000	1.000	1.000	2.000	4.000	1.067

campaign. Controlling for the election-specific variables, such as the number of adverts run or the EC weight, would limit the affect of intensity as a key explanatory variable.

4.4 Model

The statistical model selected for this analysis is a two-step OLS regression. This model is particularly important since the independent variables are at different levels. The individual learning effect is being predicted by individual political interest and state-level campaign spending. Utilising a two-step OLS regression model therefore ensures that any observed variance on the learning of the electorate is accounted for by the potential different levels of the data. This also assists in avoiding any assumptions about the generalisation of the relationship for individuals.

It may well be the case that state-level factors result in similar effects for residents of the same state. This seems particularly likely given our knowledge of battleground state tendencies in American election campaigns. Competitive states are heavily targeted because they are more decisive in the final outcome. Applying a standard multivariate regression would be problematic as the observations within the data are not independent; individuals from within the same state are more similar than those across different states. In consequence, their standard errors will be correlated, and these issues violate a fundamental principle of multivariate regression. Implementing a

two-step procedure is necessary to avoid these pitfalls and improve the inference of the findings.

Furthermore, extant work has failed to address this potential variance in their analysis. Much of this work applies findings at the individual level to state-level findings between battleground and non-battleground states. Such a generalisation is a form of atomistic fallacy (Luke, 2004). This is particularly evident in the work of Lipsitz (2011) whose study aggregates the effects of individual knowledge scores to the state level (Lipsitz, 2011). Overlooking important contextual factors, which may be particularly strong in the case of American political campaigns, may produce misleading findings that fail to accurately measure the conditioning of state-level factors on the relationship between political interest and policy learning. Consequently, discerning a better understanding of the effect of political campaigns on policy learning requires more work that accounts for the nuances of individual context. Given the EC system in the US, state-level contextual factors plausibly influence how voters learn about policy during the campaign. The significant variation between each state means that the effects studied here amongst individuals may be strongly linked to their respective states campaign effects, justifying the need for a model that can handle the independent variables being at different levels.

The two-step OLS analysis was conducted as follows. First the learning effects for all individuals within the dataset were calculated based on the knowledge questions described above. These individual policy learning effects were then regressed on the political interest predictors across all states. This produced several coefficients for the effects of each predictor at the state level. The second stage of the analysis involved regressing the state level coefficients on the second-level predictor of campaign intensity. The consequent coefficients highlight the effects of the state level predictors on the individual-level relationship between political interest and policy learning. Conducting the analysis this way ensures the inference of the relationships being analysed reflect the effect of the individuals environment. Achen (2005) has demonstrated that the results of the two-step procedure is not only computationally more simplistic, but it also brings with it several substantive advantages. Mostly these include easier interpretation of the

estimations which are remarkably similar to those produced by multilevel models (Achen, 2005).

Chapter 5

Results

Before exploring the substantive results, some descriptive statistics are first presented. The learning effect across all states included in the analysis is provided in Figure 5.1. Here one can observe the number of respondents included in each state-level regression, alongside the distribution and mean learning effect (red lines) for each state. For clarity, the states are reordered according to the intensity variable determined by advertising spending. Perhaps the most striking aspect here is the notable lack of variation across states. Given the vast inequality in campaign attention between states, one would expect to observe a far greater variance in policy learning based on where resources are concentrated. Despite Florida, Wisconsin and Ohio being the three largest recipients of advertising spending in the 2004 election, they show no observable evidence of improved policy learning compared to other states. Even before examining the statistical results, this already seems a rather interesting and counter-intuitive aspect of the data.

Not only is the lack of variance across states notable, but the effect of campaign intensity on policy learning is also consistently small. Figure 5.1 suggests that, on average, voters across the US learn very little about policy throughout the campaign. If increasing the amount of political information disseminated is expected to stimulate learning, one would expect to observe significantly greater variance in policy learning across the US. In most states, the campaign effect on learning is negligible and near zero. This suggests that the 2004 election, and American campaigns more generally, appear to only produce an

incredibly small positive effect on political knowledge. Perhaps the relationship between exposure to political information and policy learning is weaker than theorised, or that the types of information being circulated are not conducive for policy learning. Regardless, it seems that American voters do not improve their knowledge much over the course of an electoral campaign.

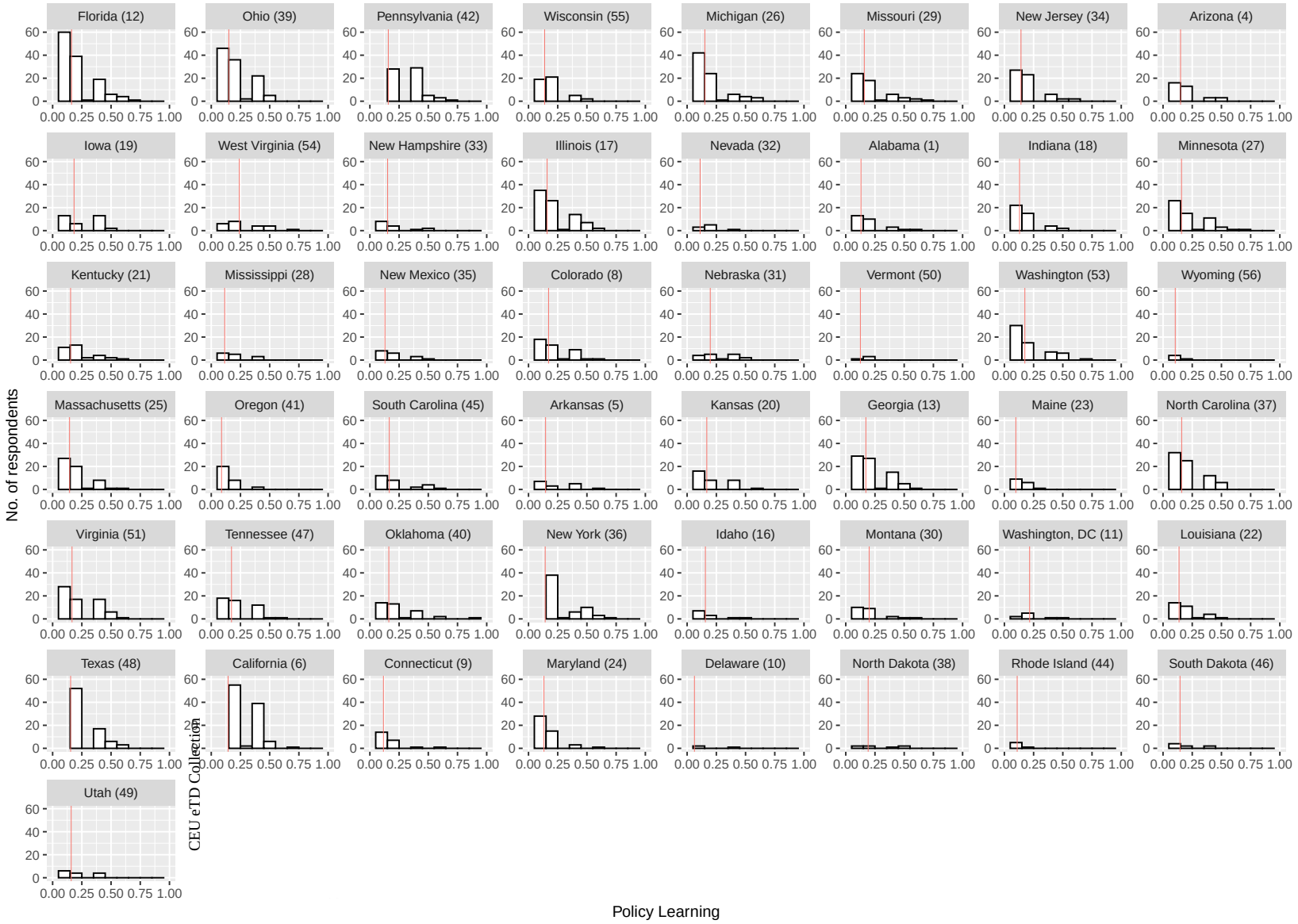

Figure 5.1: Learning effect across states

Note: Ordered by advertising spending, mean indicated by vertical red lines

To provide a better idea of the overall effects, 5.2 presents boxplots demonstrating the policy learning for respondents based on their political interest. Political interest ranges from 1 (least politically interested) to 7 (most politically interested). Remarkably, political interest appears to have virtually no effect on policy learning for individuals at the 2004 election. On average, a small positive policy learning effect is evident across all political interest values, similar to the small effects illustrated in Figure 5.1. Figure 5.2 also highlights a slightly lower maximum value in policy learning for the most politically interested. This is unexpected given one would anticipate the most politically interested to learn the most about politics during elections, showing that no respondent classified as strongly politically interested secured a high policy learning score. Nevertheless, the lack of variation across political interest is striking. This also furthers the evidence from Figure 5.1 that relatively little learning seems to take place during the election campaign, and also that political interest has little impact on the degree to which individuals learn about policy.

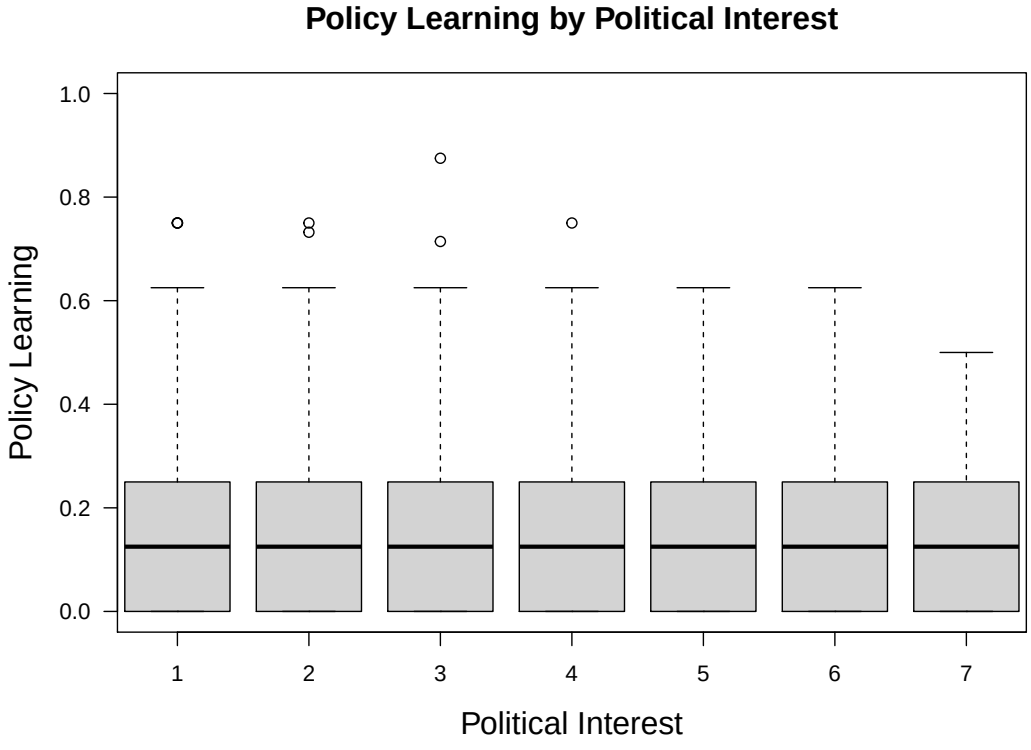

Figure 5.2: Policy learning based on political interest

Figure 5.3 presents boxplots highlighting the relationship between policy learning for each state. It further illustrates a lack of variation in policy learning across the states included in the analysis. West Virginia appears to show a higher average policy learning effect relative to other states, but there seems to be limited evidence that campaign intensity is producing stronger policy learning in specific states. If this was the case, we would expect to see evidence of significantly greater policy learning in states such as Florida, Ohio and Pennsylvania that received the highest advertising spending in 2004.

Figure 5.3: Policy learning by state

5.1 Findings

Of course, this is only a brief insight into the data. Before introducing the interactive effects of campaign intensity by state, we can address the first hypothesis by statistically examining the effect of political interest on voter learning during the 2004 campaign for all respondents. Doing so is relatively straightforward; the model is a standard multivariate regression for all respondents including the same control variables used in the main part of the analysis. This model demonstrates the general relationship between policy learning and political interest for all respondents without incorporating the influence of campaign intensity. H1 theorised that there would be a positive relationship between political interest and policy learning over the course of the election. The main premise for this is that the more politically interested would actively seek out political information and therefore experience greater exposure to political information which would generate learning about policies. It may also be that the more politically interested retain more political information as a consequence of their interest in the information itself. The less politically interested may be exposed to political information but their lack of interest leaves them more prone to forgetting this information. Furthermore, since only respondents with something to learn from the initial waves are included in the analysis, ceiling effects should be limited in their constraints on the capacity for the most interested to improve.

Surprisingly, Table 5.1 reveals a negative and statistically significant relationship between political interest and the policy learning effect for the 2004 election. As such, it suggests that the less politically interested were more inclined to learn over the course of the campaign. This corroborates the work referenced earlier such as that by Ferrín et al (2019) and Shehata et al (2015) that indicate it is the least politically interested that learn most during campaigns. Although such work had forecast these results, those studies did not account for the limitations of ceiling effects on the most interested. Here, ceiling effects are a vastly reduced problem, and yet we can observe a similar outcome. This outcome therefore strongly supports the notion that less interested individuals indeed learn most during campaigns, even if we reduce the limitations on

Table 5.1: General relationship between political interest and policy learning
Note: state dummies included but not reported

	DV: Learning Effect for All Respondents
	Learning Effect
Political Interest	-0.005^{***} (0.001)
Age	-0.0004^{**} (0.0002)
Gender	0.011^{**} (0.005)
Education	-0.003^{**} (0.001)
Income	0.001 (0.001)
Race	0.001 (0.002)
Constant	0.155^{***} (0.025)
Observations	3,450
R^2	0.030
Adjusted R^2	0.015
Residual Std. Error	0.149 (df = 3395)
F Statistic	1.956^{***} (df = 54; 3395)
Significance levels	*p<0.1; **p<0.05; ***p<0.01

how much one can learn.

However, it is also worth noting that the coefficient is incredibly small and therefore the substantive effect is rather limited. This may well be a product of the limited variation that was evident in the descriptive figures. Even though it seems those with lower political interest tend to learn more, the margin of the effect is remarkably small, at least in the election studied here. However, even if one recognises the only marginal effect on policy learning, we would intuitively expect campaigns to have a strong positive impact on policy learning through the mechanism of increasing exposure to political information. Hence the findings of the first model are quite insightful into how campaigns relate to voter learning.

The adjusted R^2 is also very low, at only 0.01, suggesting that the current model is a relatively poor fit for the dependent variable. Given that we would expect political interest to be an important predictor of political knowledge and learning, this is also a relatively interesting aspect in itself. It seems that there is more to the relationship than theorised here, and more work ought to be conducted to understand policy learning in the context of campaigns. Why is it the case that less politically interested individuals

learn more, and why are political interest and individual controls such weak predictors for policy learning with regard to model fit? Ultimately, based on the results presented in Table 5.1, we can confidently reject H1 as, somewhat paradoxically, lower political interest seems to produce stronger individual policy learning, even when accounting for ceiling effects.

We can also visualise these results using predicted values to provide additional clarity on these effects. Figure 5.4 presents the predicted values for individual policy learning using political interest as the independent variable. All controls present in the previous model are also included to be able to observe the effect of interest on learning in relative isolation. For the graph, the learning effect variable was multiplied by 100 for easier interpretation, with the possible scores ranging from -100 to 100.

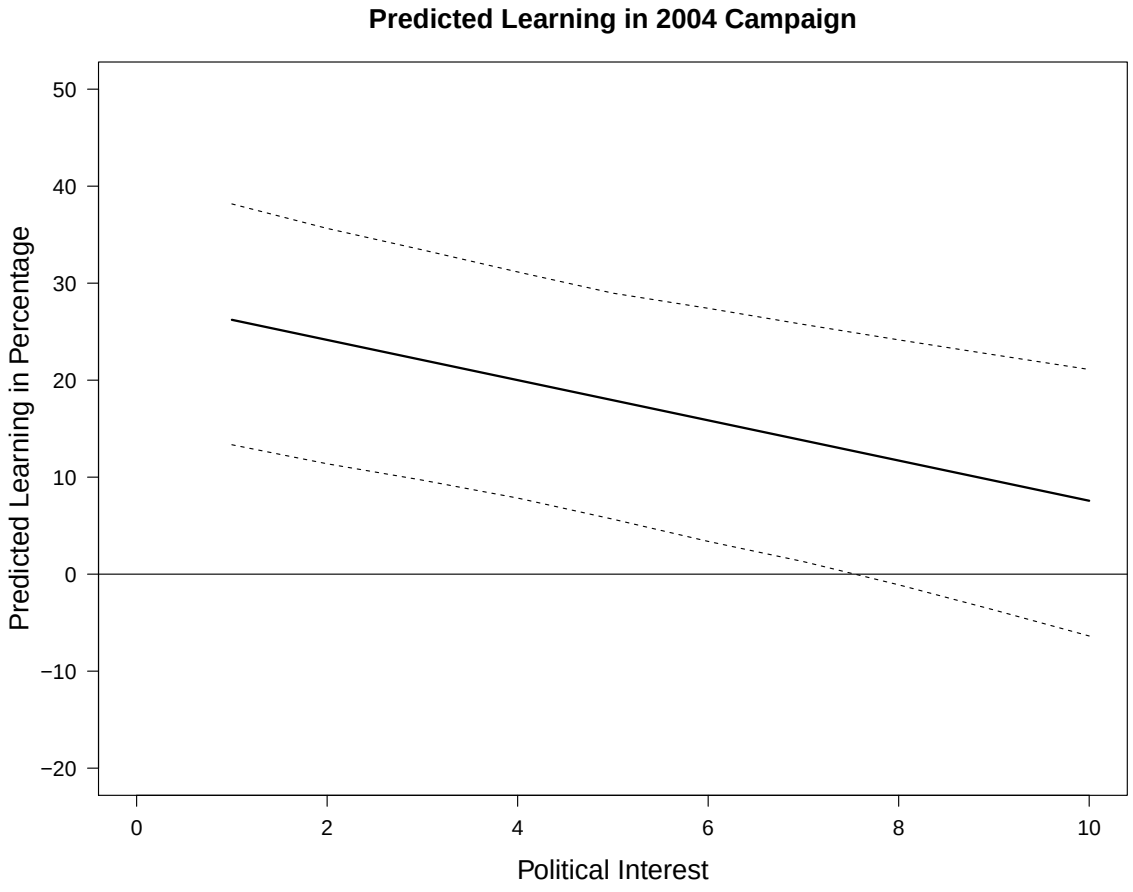

Figure 5.4: Predicted policy learning based on political interest

5.4 clearly illustrates the negative relationship between political interest and policy learning over the course of the 2004 election campaign. The solid line represents the mean

from the simulated predicted values, with the upper and lower confidence intervals, set at 95 percent, represented by the dotted lines. As political interest increases, we observe a marginal decrease in predicted learning along the line. It is important to again emphasise that this effect is only small, and the confidence intervals indicate there is some degree of variance in this finding. Nevertheless, one would expect to observe a strong, positive relationship between interest and learning based on the discussion about self-selection and exposure to political information. Especially considering that ceiling effects, which should theoretically constrain the potential for the most politically interested individuals to learn about policy, are less problematic due to the design of this study. If we assume the most interested are the most knowledgeable, as Prior found, this seems quite perplexing.

One potential answer to this negative relationship is that the intensity of a campaign modifies this relationship. It may be that the less politically interested become significantly more exposed to political information during campaigns, relative to those who are more politically interested. If we assume that some political information may be easier to pick up, it may be that less politically interested individuals improve their answers on questions already answered correctly by those more politically interested. As a result, we observe relatively stronger learning effects for those less politically interested relative to those more interested. This theory suggests ceiling effects remain a constraint on the more politically interested, albeit generally reduced. As such, it would empirically highlight that additional amounts of spending are generally most beneficial for less interested individuals, and that the intensity of campaigns does indeed mitigate (a lack of) political interest to some degree.

5.2 Substantive Effects

Examining the learning effect for all individuals across the US is only one part of the analysis of this paper. Of greater interest is how intensity conditions the relationship between political interest and policy learning. It was theorised earlier that, in the context of lower campaign intensity, political interest would remain a strong predictor of

knowledge since individuals are exposed to political information primarily through selective exposure. As campaign intensity increases however, political interest becomes less central to determining exposure to political exposure. In consequence, the politically uninterested experience significantly greater exposure to political information than in a non-campaign context, meaning they demonstrate a relatively greater policy learning effect compared to those more politically interested. If true, it may partly explain why we observe the negative relationship between political interest and policy learning; the uninterested living in competitive states are driving the results in Table 5.1. It may also be that including the intensity of the election into the analysis improves the model fit observed for political learning.

To test this idea, expressed in H2, a two-step OLS regression analysis was employed. Firstly, individual-level regressions were run for all available states using policy learning as the dependent variable alongside the same predictors and control variables included in the models used to test H1. This resulted in 41 state-level coefficients based on the relationship between political interest and policy learning. These state-level coefficients were then used as the dependent variable in the second-step regression which used campaign intensity as the predictor variable. Utilising a two-step procedure avoids the problems associated with explanatory variables at different levels in nested data, and ensures improved inference of the outcome. The state-level coefficients produce a dependent variable that is on the same level as the intensity predictor variable. This is also important as respondents from within the same states are likely to be less independent from one another than those in different states due to the campaign context. These problems are accounted for by creating a state-level analysis through the two-step procedure. Furthermore, any additional state-level context variables that influence individual learning are therefore incorporated in the state-level regression coefficients. The state-level coefficients are presented in Table 5.2, and visualised in Figure 5.5. The full regression tables by state can be viewed in the Appendix.

Since using a single indicator for the campaign intensity may pose problems for internal validity, a second intensity measure, the total number of campaign visits by the

Table 5.2: First-step state coefficients

	State	Coefficient
1	Alabama	-0.0030288
2	Arizona	-0.0156830
3	California	-0.0033623
4	Connecticut	-0.0147426
5	Florida	-0.0038458
6	Georgia	-0.0033373
7	Iowa	-0.0222801
8	Idaho	-0.0171719
9	Illinois	-0.0082178
10	Indiana	-0.0070862
11	Kansas	0.0248759
12	Kentucky	0.0092104
13	Louisiana	0.0056170
14	Massachusetts	-0.0071041
15	Maryland	-0.0034979
16	Maine	0.0061063
17	Michigan	-0.0030779
18	Minnesota	-0.0034379
19	Missouri	-0.0013991
20	Mississippi	0.0053360
21	Montana	0.0045009
22	North Carolina	0.0074696
23	Nebraska	0.0042506
24	New Hampshire	0.0122635
25	New Jersey	-0.0009569
26	New Mexico	-0.0006713
27	Nevada	-0.0100213
28	New York	-0.0082611
29	Ohio	-0.0083470
30	Oklahoma	-0.0184397
31	Oregon	-0.0045610
32	Pennsylvania	-0.0069109
33	Rhode Island	-0.0343342
34	South Carolina	-0.0071638
35	South Dakota	0.0295657
36	Tennessee	0.0037511
37	Texas	-0.0085577
38	Virginia	-0.0129430
39	Vermont	0.1118822
40	Washington	-0.0035130
41	Wisconsin	-0.0043254

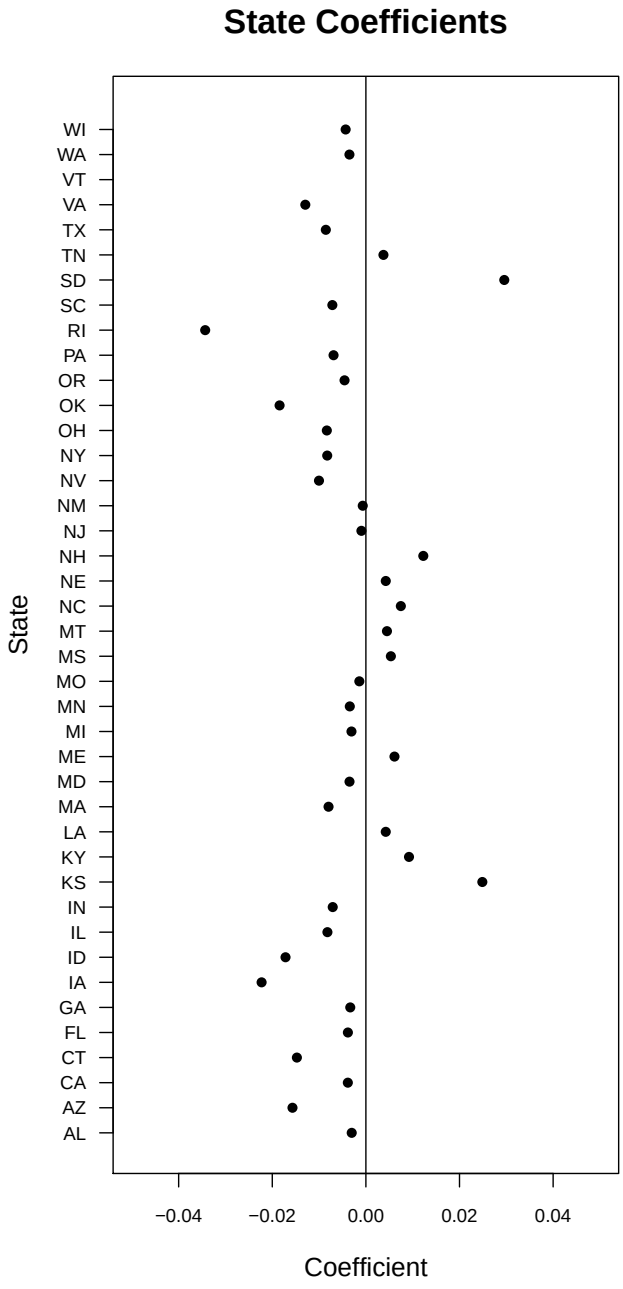

Figure 5.5: Learning effect across states

two parties, was also run as the dependent variable in the second-stage regression. Effectively this provides a form of robustness check to ensure the results were not dependent on the type of indicator used to measure intensity. It may be that advertising spending is a poor indicator for intensity as defined here, or that it only reflects a single dimension of a more complex concept. Including the additional measure for intensity improves the reliability of the findings by removing the dependency of the outcome on a single measure. The results for the second-step regression models using both dependent variables are presented in table 5.3. The first model provides the effect of advertising spending, the second provides the alternative dependent variable of campaign visits. No additional controls are necessary since these were included in the first-stage regression models.

Table 5.3: Second-step OLS regression

	DV: Learning Effect for All Respondents	
	Learning effect	
	Model 1	Model 2
	(1)	(2)
Ad Spending	−0.0001	
	(0.0001)	
Visits		−0.0002
		(0.0002)
Constant	0.001	0.001
	(0.004)	(0.004)
Observations	41	41
R^2	0.006	0.024
Adjusted R^2	-0.019	-0.001
Residual Std. Error (df = 39)	0.021	0.021
F Statistic (df = 1; 39)	0.249	0.950
Significance levels	*p<0.1; **p<0.05; ***p<0.01	

The first thing to note from the outputs of model 1 and 2 is that they are extremely similar. Both display a small, negative coefficient which suggests that the indicators used as the predictor variables are relatively similar in their measurement of intensity. If a

significant difference was observable, it may suggest that the indicators are measuring different dimensions of campaign intensity. In terms of model fit, we can see from the R^2 the second model using campaign visits is a marginally better model fit for the data relative to model 1, yet both are incredibly poor fitting overall. This is consistent with the poor fit found in the first part of the analysis, but still seems intriguing given that one would expect political interest and campaign intensity to explain a considerable amount of variation in policy learning. Furthermore, the magnitude of the coefficient is extremely small suggesting intensity has only a very marginal effect on learning. Again, this may reference back to the limited amount of variance observed in the dependent variables in the descriptive figures.

The null hypotheses of these regressions is that state-level campaign intensity has no conditioning effect on the relationship between political interest and policy learning during campaigns. The respective p-values of 0.6205 and 0.3358 demonstrate a lack of statistical significance, meaning we cannot reject these null hypotheses. Consequently, the models suggest that campaign intensity has no conditioning effect on policy learning, which is a surprising outcome to complement to those found in the first part of the analysis. Given how much additional spending and attention is concentrated in battleground states, it seems remarkable that this has no effect on how much voters of different political interest levels learn about policy during the campaign. One would at least expect that this has some influence on policy learning as voters learn more about issues, election pledges and specific candidates. Perhaps this speaks to the type of content that is used for advertising during political campaigns. Negative advertising, for example, may be uninformative or even stimulate confusion for voters on key issues. However, if anything, the output suggests a negative, albeit minuscule, effect of spending on learning. If we previously believed campaigns were important sources of political information for voters, it seems we may have to readjust our understanding.

To confirm these counter-intuitive findings, a second statistical model was used to analyse how intensity conditions the relationship between political interest and policy learning. Rather than utilise the two-step procedure, the models presented in Table 5.4

use an interaction between political interest and campaign intensity to explore how these interact to influence policy learning. Again, both measures of campaign intensity are used to improve internal validity and reliability of the results. The campaign intensity variable is only introduced in the interaction term, using state dummy variables to control for the state of an individual. In this way, the model also attempts to avoid the problems of independence and correlated standard errors associated with the independent variables being at different levels.

Table 5.4: Interaction model including state dummies
Note: State dummies included but not reported

	DV: Learning Effect for All Respondents	
	Learning effect	
	(1)	(2)
Political Interest	−0.004*** (0.001)	−0.004*** (0.001)
Advertising*Interest	−0.00002 (0.00003)	
Visits*Interest		−0.0001 (0.0001)
Age	−0.0004** (0.0002)	−0.0004** (0.0002)
Gender	0.011** (0.005)	0.011** (0.005)
Education	−0.003** (0.001)	−0.003** (0.001)
Income	0.001 (0.001)	0.001 (0.001)
Race	0.001 (0.002)	0.001 (0.002)
Constant	0.154*** (0.025)	0.151*** (0.026)
Observations	3,450	3,450
R^2	0.030	0.031
Adjusted R^2	0.015	0.015
Residual Std. Error (df = 3394)	0.149	0.149
F Statistic (df = 55; 3394)	1.931***	1.944***
Significance levels		*p<0.1; **p<0.05; ***p<0.01

This model confirms the findings from the previous models, with political interest showing a statistically negative effect on individual learning, and no evidence for a interaction between political interest and campaign intensity in affecting policy learning. Similarly, a low adjusted R^2 is observed for these models also indicating that the predictors included weakly explain the variation in the dependent variable. The outputs also demonstrate a strong similarity between the two models, reinforcing the notion that advertising spending and campaign visits are similar in their measurement of campaign intensity.

To further test the relationship campaign intensity and policy learning, an additional model was run creating an interaction between exposure to political information and campaign intensity. The output is presented in Table 5.5. This model examines whether there is any interaction between the amount of political information respondents are exposed to during the campaign with their interest in politics. This variable remains at the individual level and uses exposure to political information, rather than campaign intensity, to observe how campaigns influence policy learning depending on political interest. Once again, there is no evidence of any substantive effects of this interaction on policy learning.

Based on the results presented here, we can confidently reject H1 and H2. The first part of the analysis empirically demonstrated a statistically significant negative relationship between political interest and policy learning, albeit limited in substantiveness. This second part of the analysis illustrated that there is no evidence that campaign intensity interacts with political interest to influence policy learning. These are rather counter-intuitive conclusions, but they corroborate other work highlighting that less politically interested individuals learn during campaigns. Though the finding that less politically interested learn more about policy during campaigns, the coefficient is incredibly small and suggests the substantive effect is very marginal. Moreover, the evidence has consistently indicated that relatively little overall policy learning is taking place between the first and second wave of questions. As such, political campaigns seem to have little effect on policy learning for the electorate.

Table 5.5: Exposure and intensity interaction model
Note: state dummies included but not reported

	DV: Learning Effect for All Respondents
	gainsal
Political Interest	-0.005^{***} (0.001)
Exposure*Intensity	-0.0001^{**} (0.00002)
Age	-0.0003^{*} (0.0002)
Gender	0.011^{**} (0.005)
Education	-0.002^{**} (0.001)
Income	0.002 (0.001)
Race	0.001 (0.002)
Constant	0.155^{***} (0.025)
Observations	3,450
R^2	0.032
Adjusted R^2	0.016
Residual Std. Error	0.149 (df = 3394)
F Statistic	2.028^{***} (df = 55; 3394)
Significance levels	*p<0.1; **p<0.05; ***p<0.01

Such findings are concerning if we previously assumed that campaigns are critical periods in which voters are exposed to important political information and seek to make an informed decision at the election. Moreover, the results are intriguing in the knowledge that the US is an extreme example in terms of campaign spending. The parties spend an extortionate amount of money on their campaigns, creating an environment saturated with political information. Despite this, it seems that all of this effort has a very limited effect on how much voters can learn about policy from campaigns. It is worth reiterating at this point that campaigns are not necessarily designed to inform electorates, but rather to secure votes. Parties are seeking re-election and thus attempt to convince the electorate they are the best option. Nevertheless, it is concerning that policy learning seems to be almost entirely absent in such an environment, even if the politically uninterested do display a slight improvement in overall knowledge.

5.3 Robustness Checks

Before theorising in more detail why campaign intensity does not have the expected effects on policy learning, it is useful to analyse the results without the added conditions for the dependent variable. Rather than removing those who score negatively on their knowledge scores from the pre-election to post-election wave, it is worth exploring the results when retaining these individuals. These are individuals who, for whatever reason, actually displayed a negative learning effect across the campaign. Presumably these include those who mostly guessed the answers initially and could not provide the same answers in the post-election survey. In model 1, those with a perfect score on their first wave are still removed to prevent the limitations of ceiling effects, but model 2 also includes those with perfect scores to be able to examine the difference across these empirical conditions. In terms of model construction, they are otherwise identical to the models presented previously.

Introducing these individuals into the analysis may have several implications. Firstly, including those scoring negatively removes the constraints that campaigns only improve individual knowledge. It may be that campaigns produce negative learning through misinformation and campaign material designed to deflect attention for specific matters. A party may stand to gain electorally from misleading the electorate about a particular candidate or policy. In consequence, individuals actually become less clear on the political information to which they are exposed, driving negative scores from the pre-election to post-election wave. Second, including those with a perfect initial score will introduce the limitations of ceiling effects, and we would therefore expect to see a stronger negative impact of political interest on policy learning as the most politically interested cannot improve their already perfect knowledge scores. This follows the assumption that the most politically interested are more likely to be those with the better initial knowledge scores. Though these individuals could receive a negative learning score, it is unexpected given their stronger interest in politics.

Figure 5.6: Learning effect across states including non-learners

Before looking at the statistical models, we can descriptively observe how including these individuals changes the composition of the dependent variable. In 5.6 we can see the same breakdown of the learning effect across states as previously, this time with the possibility to score negatively. Quite surprisingly, we can see that a significant proportion of respondents across states demonstrated negative policy learning. This proportion is perhaps far higher than one may initially expect and suggests campaigns seem to also negatively impact political learning. It also emphasises a distinct lack of variation across all states, even when allowing individuals to score negatively on the dependent variable. Moreover, it emphasises that the overall learning effects across states is close to 0. This backs up the previous findings that campaigns, despite huge spending, are poor at generating the type of political learning we would expect to observe. 24% of respondents actually perform worse in the post-election survey than they did before being exposed to political information through the campaign.

Table 5.6: Multivariate regression including non-learners
Note: state dummies included but not reported

	DV: Learning Effect for All Respondents	
	Learning Effect	
	(1)	(2)
Political Interest	−0.001 (0.001)	−0.001 (0.001)
Age	−0.0003* (0.0002)	−0.0004* (0.0002)
Gender	0.004 (0.006)	0.005 (0.006)
Education	0.001 (0.001)	0.001 (0.001)
Income	0.004*** (0.001)	0.004*** (0.001)
Race	−0.001 (0.003)	−0.001 (0.003)
Constant	0.026 (0.029)	0.025 (0.029)
Observations	4,528	4,553
R^2	0.017	0.017
Adjusted R^2	0.005	0.006
Residual Std. Error	0.200 (df = 4473)	0.200 (df = 4498)
F Statistic	1.457** (df = 54; 4473)	1.480** (df = 54; 4498)
Significance levels		*p<0.1; **p<0.05; ***p<0.01

The first model in Table 5.6 for the overall individual effects across the US demonstrates that including those with negative scores removes the statistically

significant negative effect of interest on learning. Though the coefficient remains negatively correlated, the p-value of 0.289 suggests this is not of statistical significance. Thus it indicates that, when including those with negative policy learning, the negative relationship between political interest and policy learning is not so evident. Interestingly, model 2 produces a similar coefficient also without any statistical significance. This may be expected given those with a perfect initial score were only a fraction of the respondents, as otherwise one would expect introducing ceiling effects into the analysis would strengthen the initial findings that less interested respondents tend to learn more during elections. The adjusted R^2 remains rather low, still indicating that the construction of the models poorly fits the data. The analyses for the second-step regressions were also run with the inclusion of the individuals added here, but, as expected, this had no effect on the outcome. The results are presented in the Appendix.

5.4 Discussion

The lack of evidence supporting H1 and H2 leaves us to ponder why we observe no impact of campaign intensity on the relationship between political interest and policy learning, and why there seems to be almost no relationship between political interest and policy learning generally. First and foremost, it is possible that the construction of the dependent variable in this study was problematic for measuring policy learning. It could be the case that the questions were too challenging or poor indicators to gauge knowledge improvements. However, this study included all knowledge questions posed by the NAES to respondents that met two basic criteria, (i) they were asked to all respondents throughout the waves, (ii) they had a definitive correct answer. This criteria is necessary to ensure there are sufficient respondents for the analysis and that the knowledge questions provide a concrete measure of learning. The questions span a range of topics, and there is no discernible reason to expect them to be problematic as a representation of policy learning. Furthermore, the inclusion of all knowledge indicators

that met this criteria ensures that the results are not dependent on the selection of knowledge indicators. Thus there is no reason to expect the results to be dependent on the decisions made for the operationalisation of variables.

Though the results are counter-intuitive and oppose what was theorised earlier in this paper, there is some extant work that reports similar findings (Ferrín, Fraile and García-Albacete, 2019; Lipsitz, 2011; Shehata et al., 2015). However, these papers had focused on national campaigns without considering the potential implications of campaign intensity on policy learning. Additionally, though they found less interested respondents displayed the strongest learning effects, they did not factor in the role of ceiling effects. Consequently, a critique of such work centres on the fact that the more politically interested citizens are likely to have little or no scope to learn more about politics relative to the less politically interested. In this case, it would not be surprising to find a negative relationship between political interest and policy learning. As has been emphasised throughout this paper, ceiling effects are less of an issue here due to the design of the dependent variable. Those with perfect political knowledge scores were removed from the main analysis, and yet the negative relationship between political interest and policy learning remained. Re-introducing those excluded from the main part of the analysis had little impact on the overall outcome, except to show no general effect between political interest and policy learning.

There are several important points to note. Firstly, although ceiling effects are less of a problem in this analysis, they are not entirely removed. It may well be the case that, despite removing those with perfect initial scores, the questions the more politically interested answered wrong initially were particularly difficult to learn during the campaign. In this sense, there is still greater scope for the less politically interested to learn since they may not have initially answered even the most simple knowledge question correctly. Yet, given that we are analysing proportional increases, this should not be such a significant issue. Regardless, there is little evidence presented here that changing the ceiling effects threshold would fundamentally change the results.

A key design decision for future consideration regards whether to include those who

score negatively in the measure of learning. Here, those displaying a negative policy learning score are perceived as less relevant for consideration since this paper studies voter learning. Those who answered correctly in the pre-election wave but incorrectly in the post-election wave are likely those who did not know and therefore guessed the answers, or provided an answer even when they were uncertain. Perhaps disregarding those therefore biases the results in favour of those who guessed correctly and were retained in the analysis. This imbalance may be influencing the results we observed above. In all likelihood, it is those who are less politically interested who may need to guess due to lower overall knowledge. But there is no obvious reason to expect this given the opportunity to refuse a knowledge question or provide a don't know response. In fact, it may conversely be that those reporting higher interest will be subjected to stronger social desirability bias and feel additional pressure to provide an answer. Following these considerations, it is unlikely these decisions strongly drove the results, and there is little evidence to suggest changing those included in the dependent variable significantly altered the findings. Whether or not we include those scoring negatively and with perfect initial scores, the outcome is largely the same. The only observable difference is moving from a statistically significant but substantively small negative relationship between interest and learning, to no relationship for all individuals regardless of state residency.

It is also important to theorise why campaign intensity seems to have little effect on the relationship between political interest and policy learning. One suggestion is that campaign information is not particularly informative. Parties are predominantly focused on winning the election, informing the electorate may only be beneficial if it serves to secure support at the election. From this perspective, parties are solely focused on their self-interest. If true, it may be that parties only distribute information to voters that serves their own electoral ambitions. For example, a party may invest heavily into a negative advertising campaign that seeks to undermine credibility of an opposition candidate, but contains little factual or relevant political information. Voters, including those relatively uninterested in politics, may be frequently exposed to political information from the campaign, but it will have little effect on policy learning

scores. It may also be that parties emphasise only certain election promises and candidate information, while directing attention away from other areas. This may be a consequence of an electorally unpopular policy or ideological standpoint. Effectively, such campaign information is designed to confuse and misinform the electorate about the true intentions of candidates. Again, voters, especially those less politically interested, may struggle to obtain sufficient political information to educate themselves for the forthcoming election. Despite the abundance of exposure to political information, voters will only pick up on information the parties want to convey.

Another factor may be related to how media operates within the country being studied. The US is a rather different model from most European states, lacking any public broadcasting station to provide the electorate with a source of reliable, informative and non-partisan political information. As (Wonneberger, Schoenbach and van Meurs, 2012) have highlighted, having a public broadcasting network seems to stimulate learning for voters of all political interest levels, and may partly explain why we observe little effect in the US. Public broadcasting acts as a source of impartial political information for the electorate to inform themselves about their vote choice. It seems unlikely the absence of public broadcasting is entirely responsible, but it is certainly worth exploring further in future research. Measuring the political interest and exposure of individuals to political information in various states may indeed be very insightful to better understand how media conditions exposure to campaign information. Perhaps the relative lack of public broadcasting in the US has a far more significant effect on policy learning than one may anticipate, assuming public broadcasting is secure from government influence. Voters may consequently self-select into media which provides only limited political information on specific topics and issues the party is willing to discuss.

Aside from the main effects, another consistent and interesting finding is that all the models conducted for the analysis of this study showed incredibly low R^2 values. When theorising about what may be relevant for policy learning, political interest is expected to be one of the strongest explanations for any variation observed in the data. Yet the

models above suggest that political interest, in the 2004 American election, seems to be a very weak explanation for the variation we observe. Introducing campaign intensity did not seem to improve the model fit, indicating that there are other additional factors which influence policy learning. This is all the more surprising since the models control for a range of individual level controls that would also be expected to strongly influence policy learning. Lipsitz (2011) also found a similarly low R^2 when studying policy learning in the US, suggesting this may be a feature of American campaigns (Lipsitz, 2011).

Ultimately, the findings question the efficacy of campaign spending when it comes to prodcuing policy learning. The US is extremely relaxed in terms of campaign spending regulations, which means the Democrats and Republicans spend huge sums to generate support at election time. A defender of such a system may well suggest that the spending generates an abundance of political information that serves to inform voters, and improves the quality of democracy. Limiting spending, one may contend, would be detrimental to the knowledge of American voters, and American democracy more generally.

On the contrary, this study empirically suggests that the amount of spending seems to not matter when it comes to policy learning. That is not to say that spending is irrelevant, since it may well improve participation rates and encourage those sympathetic to a certain party to cast a vote. But suggesting campaign intensity is important for voters to improve their political knowledge finds little support in this analysis. Perhaps the quantity of information is less relevant than the type and source of information for policy learning. An abundance of negative adverts or mixed messages designed to obscure certain issues or misinform the electorate may actually have negative implications for policy learning. Whereas, the presence of unbiased media sources and regulations on spending and messaging are justified on the grounds of informing voters and therefore improving the quality of democracy.

Another alternative explanation may relate to how voters absorb and retain political information. Based on what has been shown, there seems to be no evidence that campaign intensity modifies the relationship between political interest and policy learning. It therefore suggests the politically uninterested, regardless of the campaign

intensity to which they are exposed, learn no differently to individuals of greter political interest. Perhaps the problem is the basic assumption that exposure to political information stimulates policy learning regardless of political interest. The notion here is that voters inadvertently learn from the political information to which they are exposed, at least to some degree, even if they are uninterested in the content. Perhaps this analysis highlights that the relationship between exposure to political information and policy learning is more complex. However, extant research on inadvertent learning has indicated this is an empirical reality, and the individual analysis here that shows a negative relationship between interest and learning also makes such a theory implausible. If the politically uninterested do indeed learn more during campaigns, the idea that exposure produces learning seems accurate, at least to some extent.

Again, this raises further questions of whether campaigns are of particular value to democracy, especially those which permit almost limitless spending. Authors such Pevnick (2016) have theoretically argued that there is significant learning effects associated with exposure to political information, and consequently argues that there should not be limits placed on campaign spending (Pevnick, 2016). Based on the empirical findings from this paper, the quantity of political information seems to have little value in terms of educating voters. It may be that the type and source of political information is far more important for individual learning than sheer quantity. Regulating campaign advertising to prevent adverts that are negative or misleading may be more effective at generating policy learning. Similarly, instituting a public broadcast service that can provide impartial political information to the electorate may be more valuable than permitting parties to spend without constraints during campaigns. Furthermore, for less interested individuals, their exposure to correct or useful political information during campaigns may be more important since this may be the period in which they learn about politics the most. The presence of a public broadcasting service may therefore be invaluable in providing a good source of information to the electorate as a whole.

These findings may not only be relevant for American campaigns, but campaigns

internationally. Campaign spending may have limited benefits for policy learning without additional campaign regulations on the type and source of information. There is no reason to theoretically expect these findings to be substantively different in the US context without considering these additional factors. However, in European states with stronger restrictions on campaign spending and advertising, we may observe a significantly different relationship between campaign spending and policy learning, particularly with regard to how campaign spending interacts with political interest. Furthermore, it may also have important implications for understanding how other types of campaign serve to inform the electorate. It seems that considerably more work needs to be invested into understanding how campaigns impact policy learning.

Chapter 6

Conclusion

This paper set out to empirically test the implications of campaign intensity on policy learning in the 2004 US presidential election. It was theorised that, by reducing ceiling effects, we would observe a positive relationship between political interest and policy learning. This was premised on the assumption that those more interested in politics are more likely to be exposed to political information through the campaign, and therefore demonstrate stronger learning effects. The empirical findings of the paper suggest the opposite; policy learning is stronger amongst those less politically interested. Although this corroborates extant literature that found similar results (Ferrín, Fraile and García-Albacete, 2019), such work had not sufficiently reduced the constraints of ceiling effects. As such, this paper strengthens the evidence that less politically interested individuals learn more during campaign periods. However, the substantiveness of the effect is rather small and depends, to a limited extent, on whether individuals that demonstrate negative policy learning are included in the analysis.

The second part of the theory posited that campaign intensity may strongly condition the relationship between political interest and policy learning. It was suggested that as campaign intensity increases, exposure to political information increases differentially based on political interest. For the politically interested, campaign intensity produces little change in their exposure to political information. This is because politically interested individuals actively seek out political information

in the absence of an electoral campaign. Their habitual media consumption means they are frequently exposed to political information and this hardly changes with campaign intensity. In contrast, campaign intensity was expected to generate significantly more exposure to political information for the politically uninterested. These are individuals who, outside of a campaign context, are exposed to a limited amount of political information. In more intense campaigns, the abundance of campaign material significantly increases the exposure of the politically uninterested to political information. As such, the politically uninterested were expected to display significantly greater increases in policy learning relative to those more politically interested. However, based on the results of this research, there is little evidence that campaign intensity has any interaction effect with political interest on policy learning. Neither of the measures used to reflect campaign intensity indicated it is an important factor in this broader relationship.

Consequently, there are several important implications for extant work in the field. Firstly, this paper provides more compelling evidence that there is a negative relationship between political interest and policy learning in a campaign environment. Such findings seem surprising given that one would expect that more politically interested individuals would display stronger policy learning, especially when reducing the constraints of ceiling effects. It appears that less politically interested individuals actually improve their political knowledge the most in a campaign context. It is also worth noting that this analysis was conducted on the US election in 2004. Though many modern media platforms were around, the media environment has considerably changed since then with the proliferation of social media and online streaming services. Perhaps the small positive effect of campaigns on policy learning for the politically uninterested found here is even more evident in more recent elections. Additional work that covers such elections would further improve our understanding of this unintuitive finding.

The findings that the less politically interested learn more during campaigns is made all the more surprising given the lack of interaction between campaign intensity and

political interest. The fact that the less politically interested are learning more about policy during campaigns may be attributed to the considerable increase in political information to which they are exposed relative to those more politically interested. However, the two-step OLS regression used for the second hypothesis demonstrated this is not the case. This poses further questions as to why less politically interested individuals learn more during campaigns.

The analysis here thus provides some empirical insight into the theoretical arguments surrounding campaign restrictions. If campaign intensity has a limited impact on policy learning, it indicates that campaign restrictions would not be detrimental to voter knowledge. On the contrary, the discussion section forwarded the argument that limitations on advertising may prevent misleading information being provided to the electorate. Furthermore, limits to spending may provide voters with exposure to political information from additional viewpoints. Either way, more political information does not seem to translate directly into greater knowledge, and perhaps the balance of information is more important than the quantity for policy learning. The empirical findings of this research therefore question those defending unrestricted campaign spending on the grounds that it improves political knowledge. This research finds little evidence of a positive relationship between campaign spending and policy learning.

It should be noted this analysis took place in the US, which possesses significantly less restrictions on election campaigns than elsewhere in the world. Further work may conduct a similar analysis in other countries with restrictions designed to produce a greater balance of political information. Comparing the results found elsewhere with those presented in this study will provide additional insight into how campaign restrictions influence policy learning. From this it would be possible to understand if we observe the same negative relationship between political interest and policy learning found here. Similarly, accounting for other country-level variables, such as public broadcast services and rules on advertising, may further our knowledge on the relationship between campaign spending and policy learning.

Fundamentally, this study generates several important conclusions relating to the literature on campaign effects. Firstly, campaigns seem to have an incredibly small effect on overall learning. As shown descriptively in the effects across states, but also through the size of the coefficients presented in the results, there seems to be little evidence of voters improving their knowledge during the campaign period. Second, any measurable policy learning effects appear to be strongest amongst those expressing the least interest in politics. Thirdly, despite theoretical expectations, campaign intensity does not have an interaction effect with political interest on policy learning. If an increase in the total amount of exposure to political information at election time has no effect on policy learning, we may theorise that there are more important aspects that determine policy learning. The presence of public broadcasting and limits on expenditure, for example, may actually promote learning even though it restricts the total amount of political information. Consequently, there is ample scope to build on the surprising results found in this study.

Appendix A

Appendix

A.1 Media Markets and Advertising Data

In Figure A.1, one can view the estimated advertising spending by state produced by Fairvote. The similarity between the data produced by FairVote and that produced in this paper futhers confidence in the measures created for the analysis.

State	Bush	R Interest Groups	Kerry	D Interest Groups	Total
FL	$17,152,568	$9,527,823	$18,956,635	$18,566,221	$64,203,247
OH	$11,332,296	$12,161,125	$12,588,208	$12,693,436	$48,775,065
PA	$10,918,618	$6,061,903	$11,721,975	$7,904,781	$36,607,277
WI	$3,362,036	$2,778,751	$4,433,616	$3,840,534	$14,414,937
MI	$4,974,690	$972,574	$5,709,922	$1,841,380	$13,498,566
MN	$2,907,487	$1,094,978	$3,800,174	$2,711,443	$10,514,082
IA	$2,149,705	$1,408,438	$2,839,191	$2,704,134	$9,101,468
NV	$2,621,806	$1,318,624	$2,175,175	$2,446,152	$8,561,757
NM	$1,977,795	$1,265,509	$2,898,550	$1,626,620	$7,768,474
CO	$2,367,200	$1,527,083	$2,271,832	$906,578	$7,072,693
NH	$1,172,541	$1,345,258	$878,735	$1,178,736	$4,575,270
MO	$147,910	$1,360,468	$0	$1,965,989	$3,474,367
ME	$697,329	$0	$898,581	$650,251	$2,246,161
OR	$994,157	$22,041	$1,180,927	$44,987	$2,242,112
WV	$736,370	$104,234	$738,162	$572,141	$2,150,907
WA	$148,134	$0	$556,946	$472,760	$1,177,840
AR	$58,668	$82,256	$0	$306,653	$447,577
NC	$0	$19,274	$0	$412,623	$431,897
HI	$0	$90,567	$27,198	$270,218	$387,983
TN	$0	$0	$0	$336,554	$336,554
OK	$0	$0	$0	$285,985	$285,985
LA	$0	$41,671	$0	$161,422	$203,093
AL	$0	$0	$0	$89,141	$89,141
SC	$0	$0	$0	$38,852	$38,852
DC	$0	$1,549	$2,886	$8,272	$12,707
TX	$127	$0	$0	$0	$127
Total	**$63,719,437**	**$41,184,126**	**$71,678,713**	**$62,035,863**	**$238,618,139**

NJ, KS, MA, MD, CA, WY, DE, VT, ND, AK, SD, MT, RI, ID, NE, UT, MI, CT, KT, IN, VA, GA, IL are not listed because they had no ads aired during the peak campaign season.

Figure A.1: Advertising spending calculated by FairVote

The media markets used to create the advertising spending variable are presented in Table A.1

Table A.1: Media markets included for ad spending

	Media Market		Media Market
1	Mobile	48	Charleston
2	Ft. Myers	49	Cincinnati
3	Jacksonville	50	Columbus
4	Miami	51	Dayton
5	Orlando	52	Kansas City
6	Tampa	53	Toledo
7	West Palm Beach	54	Knoxville
8	Wilkes Barre	55	Memphis
9	Omaha	56	Nashville
10	Cedar Rapids	57	Washington DC
11	Davenport	58	Portland, ME
12	Des Moines	59	Charlotte
13	Boston	60	Savannah
14	Manchester, NH	61	Springfield
15	New York	62	Atlanta
16	Minneapolis	63	Buffalo
17	Madison	64	Youngstown
18	Burlington	65	Albany
19	Oklahoma City	66	Rochester
20	Tulsa	67	Syracuse
21	Albuquerque	68	Houston
22	Columbia	69	Portland, OR
23	Phoenix	70	Colorado Spring
24	Seattle	71	San Francisco
25	Cable	72	Johnstown
26	Greenville	73	Little Rock
27	Detroit	74	Paducah
28	Flint	75	Spokane
29	Grand Rapids	76	Harrisburg
30	Waco	77	San Diego
31	St Louis	78	Shreveport
32	Cleveland	79	Baton Rouge
33	Austin	80	New Orleans
34	Las Vegas	81	Greensboro
35	Milwaukee	82	Raleigh
36	Philadelphia	83	El Paso
37	Pittsburgh	84	Baltimore
38	Los Angeles	85	Fresno
39	Norfolk	86	Hartford
40	Roanoke	87	Louisville
41	Tri-Cities	88	Sacramento
42	Richmond	89	Honolulu
43	Chattanooga	90	Champaign
44	Green Bay	91	Huntsville
45	Denver	92	Wichita
46	Chicago	93	Birmingham
47	Tucson	94	San Antonio

A.2 State-level Regressions

All state level regressions produced in the process of the two-stage OLS procedure are presented in the following tables. From this one can observe the relationship between political interest and policy learning for each individual state included in the analysis

	DV: Policy Learning						
	Learning Effect						
	AL	AZ	CA	CT	DL	DC	FL
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Political Interest	−0.003 (0.009)	−0.016* (0.008)	−0.003 (0.003)	−0.015* (0.008)	0.002 (0.041)	0.021 (0.034)	−0.004 (0.004)
Age	0.002* (0.001)	0.001 (0.001)	0.0001 (0.001)	−0.001 (0.001)	0.0002 (0.008)	−0.002 (0.008)	0.0004 (0.001)
Gender	0.003 (0.047)	−0.075* (0.044)	0.039** (0.016)	0.019 (0.043)	0.038 (0.217)	−0.102 (0.205)	−0.058** (0.023)
Education	−0.002 (0.011)	−0.015 (0.010)	0.001 (0.004)	−0.008 (0.010)	0.005 (0.036)	0.029 (0.060)	−0.005 (0.006)
Income	−0.002 (0.010)	0.003 (0.009)	0.003 (0.004)	0.019** (0.007)	0.034 (0.040)	−0.016 (0.059)	−0.008 (0.005)
Race	0.006 (0.019)	−0.031* (0.018)	0.012 (0.008)	−0.015 (0.021)	0.036 (0.072)	−0.004 (0.138)	0.002 (0.010)
Constant	0.072 (0.121)	0.411*** (0.122)	0.050 (0.046)	0.162 (0.111)	−0.307 (0.870)	0.240 (0.395)	0.326*** (0.065)
Observations	49	52	304	38	10	11	190
R^2	0.074	0.219	0.030	0.280	0.245	0.238	0.066
Adjusted R^2	−0.058	0.115	0.011	0.141	−1.266	−0.905	0.035
Residual Std. Error	0.153 (df = 42)	0.134 (df = 45)	0.142 (df = 297)	0.124 (df = 31)	0.183 (df = 3)	0.205 (df = 4)	0.154 (df = 183)
F Statistic	0.563 (df = 6; 42)	2.101* (df = 6; 45)	1.557 (df = 6; 297)	2.013* (df = 6; 31)	0.162 (df = 6; 3)	0.208 (df = 6; 4)	2.140* (df = 6; 183)
Significance levels							*p<0.1; **p<0.05; ***p<0.01

	DV: Policy Learning						
	Learning Effect						
	GA	ID	IL	IN	IA	KS	KY
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Political Interest	−0.003 (0.006)	−0.017 (0.023)	−0.008 (0.006)	−0.007 (0.006)	−0.022* (0.011)	0.025** (0.010)	0.009 (0.009)
Age	−0.00002 (0.001)	−0.001 (0.003)	−0.001 (0.001)	0.001 (0.001)	−0.001 (0.002)	0.001 (0.002)	−0.001 (0.001)
Gender	0.034 (0.030)	−0.015 (0.126)	0.004 (0.028)	−0.027 (0.033)	0.097* (0.048)	−0.013 (0.048)	−0.017 (0.049)
Education	0.001 (0.007)	0.002 (0.031)	−0.004 (0.007)	0.008 (0.007)	−0.012 (0.014)	0.001 (0.010)	−0.0001 (0.010)
Income	0.006 (0.007)	−0.009 (0.021)	0.005 (0.006)	−0.001 (0.007)	0.016 (0.014)	−0.004 (0.009)	0.007 (0.009)
Race	0.003 (0.013)	0.022 (0.052)	−0.009 (0.013)	−0.021 (0.018)	0.012 (0.023)	−0.0003 (0.021)	0.026 (0.020)
Constant	0.092 (0.084)	0.285 (0.265)	0.235*** (0.079)	0.184** (0.073)	0.124 (0.145)	0.038 (0.141)	0.086 (0.126)
Observations	111	16	133	69	49	45	54
R^2	0.022	0.119	0.029	0.067	0.162	0.178	0.087
Adjusted R^2	−0.034	−0.469	−0.018	−0.023	0.042	0.049	−0.029
Residual Std. Error	0.155 (df = 104)	0.170 (df = 9)	0.161 (df = 126)	0.132 (df = 62)	0.158 (df = 42)	0.145 (df = 38)	0.162 (df = 47)
F Statistic	0.390 (df = 6; 104)	0.202 (df = 6; 9)	0.618 (df = 6; 126)	0.741 (df = 6; 62)	1.353 (df = 6; 42)	1.376 (df = 6; 38)	0.748 (df = 6; 47)
Significance levels							*p<0.1; **p<0.05; ***p<0.01

	DV: Policy Learning						
	Learning Effect						
	LA	ME	MD	MA	MI	MN	MO
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Political Interest	0.006 (0.008)	0.006 (0.008)	−0.003 (0.006)	−0.007 (0.006)	−0.003 (0.006)	−0.003 (0.007)	−0.001 (0.007)
Age	−0.002 (0.001)	−0.0002 (0.001)	−0.003*** (0.001)	−0.001 (0.001)	−0.001 (0.001)	−0.001 (0.001)	0.002 (0.001)
Gender	−0.042 (0.039)	0.104** (0.037)	0.065** (0.028)	0.010 (0.032)	−0.020 (0.030)	0.019 (0.037)	−0.055 (0.038)
Education	−0.009 (0.010)	−0.010 (0.008)	−0.005 (0.007)	−0.014* (0.008)	0.0001 (0.007)	0.004 (0.008)	−0.0003 (0.009)
Income	−0.003 (0.009)	0.008 (0.007)	−0.00005 (0.008)	−0.002 (0.008)	−0.003 (0.008)	−0.001 (0.009)	0.0001 (0.009)
Race	0.012 (0.024)	−0.046 (0.029)	−0.011 (0.014)	−0.025 (0.015)	0.007 (0.013)	0.018 (0.017)	0.011 (0.018)
Constant	0.294** (0.112)	0.012 (0.113)	0.191** (0.083)	0.353*** (0.094)	0.236*** (0.088)	0.121 (0.106)	0.172 (0.108)
Observations	50	29	67	88	115	90	85
R^2	0.108	0.401	0.205	0.109	0.020	0.037	0.044
Adjusted R^2	−0.016	0.238	0.125	0.043	−0.034	−0.032	−0.029
Residual Std. Error	0.135 (df = 43)	0.093 (df = 22)	0.114 (df = 60)	0.134 (df = 81)	0.151 (df = 108)	0.166 (df = 83)	0.171 (df = 78)
F Statistic	0.870 (df = 6; 43)	2.456* (df = 6; 22)	2.571** (df = 6; 60)	1.654 (df = 6; 81)	0.377 (df = 6; 108)	0.533 (df = 6; 83)	0.605 (df = 6; 78)

Significance levels *p<0.1; **p<0.05; ***p<0.01

	DV: Policy Learning						
	Learning Effect						
	MT	MS	NE	NV	NH	NJ	NM
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Political Interest	0.005 (0.013)	0.005 (0.012)	0.004 (0.020)	−0.010 (0.014)	0.012 (0.017)	−0.001 (0.007)	−0.001 (0.012)
Age	−0.006** (0.002)	−0.004 (0.002)	0.0002 (0.003)	−0.001 (0.002)	−0.004 (0.002)	−0.001 (0.001)	0.002 (0.002)
Gender	0.077 (0.058)	0.019 (0.074)	−0.021 (0.082)	0.094 (0.073)	0.024 (0.068)	−0.033 (0.031)	−0.007 (0.056)
Education	−0.004 (0.012)	−0.009 (0.014)	−0.001 (0.026)	−0.021 (0.015)	−0.019 (0.013)	−0.001 (0.007)	−0.012 (0.013)
Income	−0.013 (0.011)	0.020 (0.012)	0.014 (0.019)	0.002 (0.013)	−0.007 (0.017)	−0.010 (0.008)	−0.009 (0.013)
Race	0.001 (0.025)	0.005 (0.023)	−0.009 (0.045)	−0.036 (0.051)	0.034 (0.029)	0.003 (0.015)	−0.007 (0.025)
Constant	0.377** (0.153)	0.106 (0.234)	0.160 (0.247)	0.218 (0.193)	0.315 (0.185)	0.299*** (0.094)	0.199 (0.148)
Observations	26	27	25	18	22	95	31
R^2	0.339	0.217	0.035	0.288	0.315	0.050	0.149
Adjusted R^2	0.131	−0.018	−0.287	−0.100	0.040	−0.015	−0.064
Residual Std. Error	0.135 (df = 19)	0.134 (df = 20)	0.194 (df = 18)	0.134 (df = 11)	0.147 (df = 15)	0.146 (df = 88)	0.146 (df = 24)
F Statistic	1.626 (df = 6; 19)	0.925 (df = 6; 20)	0.108 (df = 6; 18)	0.742 (df = 6; 11)	1.148 (df = 6; 15)	0.768 (df = 6; 88)	0.700 (df = 6; 24)
Significance levels							*p<0.1; **p<0.05; ***p<0.01

	DV: Policy Learning						
	Learning Effect						
	NY	NC	OH	OK	OR	PA	RI
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Political Interest	−0.008* (0.004)	0.007 (0.006)	−0.008* (0.004)	−0.018* (0.011)	−0.005 (0.006)	−0.007 (0.005)	−0.034 (0.011)
Age	0.0003 (0.001)	−0.001 (0.001)	−0.0003 (0.001)	0.002 (0.002)	−0.00001 (0.001)	−0.001 (0.001)	−0.001 (0.002)
Gender	0.032 (0.023)	0.026 (0.030)	0.034 (0.023)	0.106** (0.046)	0.005 (0.029)	0.049** (0.022)	0.030 (0.076)
Education	−0.003 (0.005)	−0.005 (0.007)	0.005 (0.006)	0.018 (0.011)	0.006 (0.007)	−0.009* (0.005)	0.007 (0.007)
Income	−0.009* (0.005)	0.0003 (0.006)	0.002 (0.005)	0.002 (0.012)	−0.003 (0.006)	0.014*** (0.005)	−0.024 (0.010)
Race	−0.014 (0.011)	0.006 (0.013)	−0.005 (0.011)	−0.002 (0.019)	0.017 (0.016)	0.001 (0.011)	−0.020 (0.040)
Constant	0.219*** (0.061)	0.115 (0.070)	0.118* (0.070)	−0.073 (0.137)	0.058 (0.094)	0.111* (0.058)	0.467 (0.183)
Observations	192	111	172	62	59	196	8
R^2	0.080	0.030	0.043	0.165	0.043	0.092	0.982
Adjusted R^2	0.050	−0.026	0.009	0.074	−0.068	0.063	0.874
Residual Std. Error	0.152 (df = 185)	0.150 (df = 104)	0.143 (df = 165)	0.175 (df = 55)	0.107 (df = 52)	0.154 (df = 189)	0.028 (df = 1)
F Statistic	2.676** (df = 6; 185)	0.531 (df = 6; 104)	1.250 (df = 6; 165)	1.815 (df = 6; 55)	0.385 (df = 6; 52)	3.190*** (df = 6; 189)	9.096 (df = 6; 1)
Significance levels							*p<0.1; **p<0.05; ***p<0.01

	DV: Policy Learning						
	Learning Effect						
	SC	SD	TN	TX	VA	WA	WI
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Political Interest	−0.007 (0.013)	0.030 (0.028)	0.004 (0.007)	−0.009** (0.004)	−0.013* (0.007)	−0.004 (0.008)	−0.004 (0.006)
Age	0.001 (0.002)	0.001 (0.006)	−0.001 (0.001)	−0.0003 (0.001)	−0.002 (0.001)	−0.002* (0.001)	−0.0001 (0.001)
Gender	0.045 (0.057)	−0.084 (0.147)	0.042 (0.040)	0.004 (0.021)	−0.002 (0.033)	−0.002 (0.039)	−0.044 (0.032)
Education	−0.007 (0.015)	−0.014 (0.036)	−0.011 (0.009)	−0.005 (0.005)	−0.012 (0.008)	0.008 (0.009)	−0.009 (0.008)
Income	0.016 (0.010)	−0.014 (0.034)	0.012 (0.007)	0.002 (0.004)	0.006 (0.008)	−0.011 (0.008)	0.002 (0.007)
Race	0.020 (0.028)	0.052 (0.058)	0.019 (0.016)	0.002 (0.009)	−0.026* (0.015)	0.026 (0.018)	−0.003 (0.016)
Constant	−0.005 (0.156)	0.188 (0.286)	0.058 (0.108)	0.215*** (0.054)	0.366*** (0.090)	0.240** (0.100)	0.279*** (0.079)
Observations	41	12	68	207	107	79	75
R^2	0.126	0.244	0.084	0.035	0.121	0.125	0.069
Adjusted R^2	−0.028	−0.662	−0.006	0.006	0.068	0.052	−0.013
Residual Std. Error	0.176 (df = 34)	0.180 (df = 5)	0.149 (df = 61)	0.143 (df = 200)	0.158 (df = 100)	0.157 (df = 72)	0.134 (df = 68)
F Statistic	0.817 (df = 6; 34)	0.270 (df = 6; 5)	0.931 (df = 6; 61)	1.217 (df = 6; 200)	2.289** (df = 6; 100)	1.720 (df = 6; 72)	0.839 (df = 6; 68)
Significance levels							*p<0.1; **p<0.05; ***p<0.01

A.3 Second-step OLS Including Non-Learners

Table A.2 presents the results from the second-step OLS when including those who also score negatively. As can be seen, there is no substantive change from those presented in the main paper which included only those with positive policy learning scores.

Table A.2: Second-step OLS regression including non-learners

	DV: Learning Effect for All Respondents	
	Learning effect	
	Model 1	Model 2
	(1)	(2)
Ad Spending	−0.00002 (0.0001)	
Visits		−0.00004 (0.0002)
Constant	0.001 (0.003)	0.001 (0.002)
Observations	41	41
R^2	0.002	0.002
Adjusted R^2	-0.024	-0.024
Residual Std. Error (df = 39)	0.014	0.014
F Statistic (df = 1; 39)	0.069	0.070
Significance levels		*p<0.1; **p<0.05; ***p<0.01

Table A.3 presents the eight knowledge questions used to construct the dependent variable. These were questions asked to all individuals in both the pre-election and post-election survey waves.

No.	DV Questions
1	To the best of your knowledge, who is a former prosecutor—George W. Bush, John Kerry, both, or neither?
2	To the best of your knowledge, who favors making the recent tax cuts permanent—George W. Bush, John Kerry, both, or neither?
3	To the best of your knowledge, who urges Congress to extend the federal law banning assault weapons—George W. Bush, John Kerry, both, or neither?
4	To the best of your knowledge, who favors allowing workers to invest some of their Social Security contributions in the stock market—George W. Bush, John Kerry, both, or neither?
5	John Kerry says that he would eliminate George W. Bush's tax cuts on those making how much money—over $50,000 a year; over $100,000 a year; over $200,000 a year; or over $500,000 a year?
6	To the best of your knowledge, who favors the federal government helping to pay for health insurance for all children and helping employers pay the cost of the workers' health insurance— George W. Bush, John Kerry, both, or neither?
7	To the best of your knowledge, who favors changing the recently passed Medicare prescription drug law to allow reimporting drugs from Canada—George W. Bush, John Kerry, both, or neither?
8	To the best of your knowledge, who favors eliminating tax breaks for overseas profits of American corporations and using the money to cut taxes for businesses that create jobs in the United States—George W. Bush, John Kerry, both, or neither?

Table A.3: Questions comprising the DV

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