

Understanding Trump's 2016 Victory Through TV Ad Data

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INTRODUCTION

Political campaigns are tactical battlegrounds similar to the game of chess, where a minor oversight in strategy could snowball into an inescapable loss. The 2016 United States presidential election was a historic, contentious game of chess in many regards. The election resulted in the nomination of the only president in U.S. history - Donald Trump - that had [no previous political or military experience](#). Trump earned a total of 304 electoral votes; 34 more than the 270 electoral votes needed to secure his victory, and 77 more than his general election opponent Hillary Clinton. However, Trump lost the popular vote to Hillary Clinton [by nearly 2.9 million votes](#).

This report will attempt to uncover some of the political ad strategies used by these two presidential candidates in the 2016 presidential election, with a particular focus on how these candidates considered the electoral college system, time of day, and messaging in their political TV ad strategy.

RESEARCH QUESTION

In our Exploratory Data Analysis, our group was guided by the following overarching question: What political TV ad strategies appeared to be most effective in helping Donald Trump secure his victory in the 2016 presidential election?

In our pursuit to answer this question cohesively, we considered the following supporting questions:

1. Geography
 - a. Question: What role did broadcast location and volume of presidential campaign ads play in the outcome of the election?
 - i. What was the difference in geography and volume of ads aired between the two campaigns?
 - ii. Did the geography and volume of ads correlate with victory in those states?
2. Time of Day
 - a. Question: What strategies did campaigners take when they took into account the when the ads were shown at a specific time of day?
 - i. Does time of day have an affect on what type of program these ads were played on?

- ii. When taking into account the different political climate of each state how does the strategy differ between each state?

3. TV Ads subjects - Focus on Swing States

Question: What kind of TV Ads subjects did the leading candidates of both major political parties focus on?

- Does the volume of TV ads by leading candidates in the swing states have a direct correlation to the election results?
- Does the TV Ads subject play any role in the determination of the election winner?
- How did the political candidates strategize about the distribution of the TV Ads across the swing states?

DATASET

The dataset we have focused our exploratory data analysis on what is called “Airings on TV”, which provides specific details about the nature and timing of presidential campaign ads pertaining to this election. This dataset is *not* comprehensive of all ads aired for this election; instead, it is a collection point for ten broadcast markets in ten battleground states: Arizona, Colorado, Iowa, Nevada, New Hampshire, North Carolina, Florida, Ohio, Pennsylvania and Wisconsin.

The dataset covers ads airing in these markets from 9/1/2014 to 11/29/16 - well before the end of the primary elections (2/1/16 to 6/7/16) until shortly after the presidential election (11/8/16). Within our exploratory data analysis, we place a particular focus on the following battleground states: Florida, Arizona, Iowa, Colorado, North Carolina, Pennsylvania, Nevada, Ohio, Wisconsin, Virginia, and New Hampshire. One battleground state from this election - Michigan - is not covered, as it fell outside of the broadcast markets where this data was collected. Of the 11 battleground states included in this dataset, Trump would flip seven of them (FL, AZ, IA, NC, PA, OH, WI). From Ballotpedia:

“With the battlegrounds, Clinton ended up winning four states—32 electoral votes—while Trump won eight states and the second congressional districts of Maine and Nebraska, a total of 127 electoral votes. In other words, he won about 70 percent of the electoral votes available in battleground states. Trump's battleground states were Arizona, Iowa, Michigan, Wisconsin, Ohio, Pennsylvania, North Carolina, and Florida. Clinton's were Colorado, Nevada, New Hampshire, and Virginia. Crucial to Trump's victory were Wisconsin, Michigan, and Pennsylvania. All three of these states

were part of Clinton's so-called "firewall," a group of six states also including Colorado, Virginia, and New Hampshire that were thought to guarantee her a path to 270." -Ballotpedia

CLEANING

Dataset for ad airing contained 375,350 rows and 19 columns. Each row in this data was a data point and was a specific instance that an ad was aired. 19 columns described data of this specific instance.

```
RangeIndex: 375350 entries, 0 to 375349
Data columns (total 19 columns):
#   Column                Non-Null Count  Dtype
---  -
0   id                     375350 non-null  int64
1   wp_identifier          375350 non-null  int64
2   network               375350 non-null  object
3   location              375325 non-null  object
4   program               375335 non-null  object
5   program_type          375350 non-null  object
6   start_time            375350 non-null  object
7   end_time              375350 non-null  object
8   archive_id            375350 non-null  object
9   embed_url             375350 non-null  object
10  sponsors               374188 non-null  object
11  sponsor_types         374188 non-null  object
12  race                  345478 non-null  object
13  cycle                 346249 non-null  float64
14  subjects              352788 non-null  object
15  candidates            350223 non-null  object
16  type                  375350 non-null  object
17  message               375350 non-null  object
18  date_created          375350 non-null  object
```

Initial Dataset Column

Column Description

wp_identifier = Unique numerical id from WP organization

network = TV channel that the ad was aired

location = city and state where the the ad was aired

program = name of the TV program in which the ad aired

program_type = represented if ad was aired during the "news" or "not news"

start_time = start date time of aired ad

end_time = end date time of aired ad

archive_id = unique alphanumeric id used by PoliticalAdArchive.org
embeded_url = url for ad
sponsor = Organization sponsoring political ads as it appears in the ad
sponsor_type = candidate committee
race = federal race the ad is targeted towards
cycle = election cycle
subjects = subjects covered in ad
candidates = candidates named in ads
type = Input by archive researcher ads that are targeted towards a particular candidate
message = pro, con, or mix messages in ad
date_created = date time of when row was inserted

Cleaning Process

Dates Conversion

“start_date” and “end_date” columns included UTC as a prefix and panda read this as an object. Since the time zone was not important to any of our analysis, the group made the decision to remove the time zone in each date time field. This process first involved converting the column to a string type removing the 3 characters and converting the remaining numbers into datetime data type.

New “state” Column

Most of our analysis centered around the states and “location” columns had the format of “city state” with some values having two different states. Also with this column some of the states were not in its two letter format. An example of which was the state of Iowa, Our process in creating a state column is first convert all states into its two letter abbreviation then from there extrapolate a new column using the two letter abbreviation. For the locations that had two states we defaulted to the swing state an example of which was choosing between Massachusetts and New Hampshire. Since our analysis centered around the swing states during the 2016 presidential election the default state was to the swing state.

Reduce Dataset

This is centered around the presidential election and more particularly how Donald Trump won his presidential election. It is appropriate to reduce the data set and only grab the dates between the first full day after the primary (July 27, 2016) to the last day before election day (November 7, 2016). Also only look at ads that were targeted towards the 2016 presidential election and not any other race as this is data that is irrelevant to our data questions.

STRATEGY ANALYSIS FINDINGS

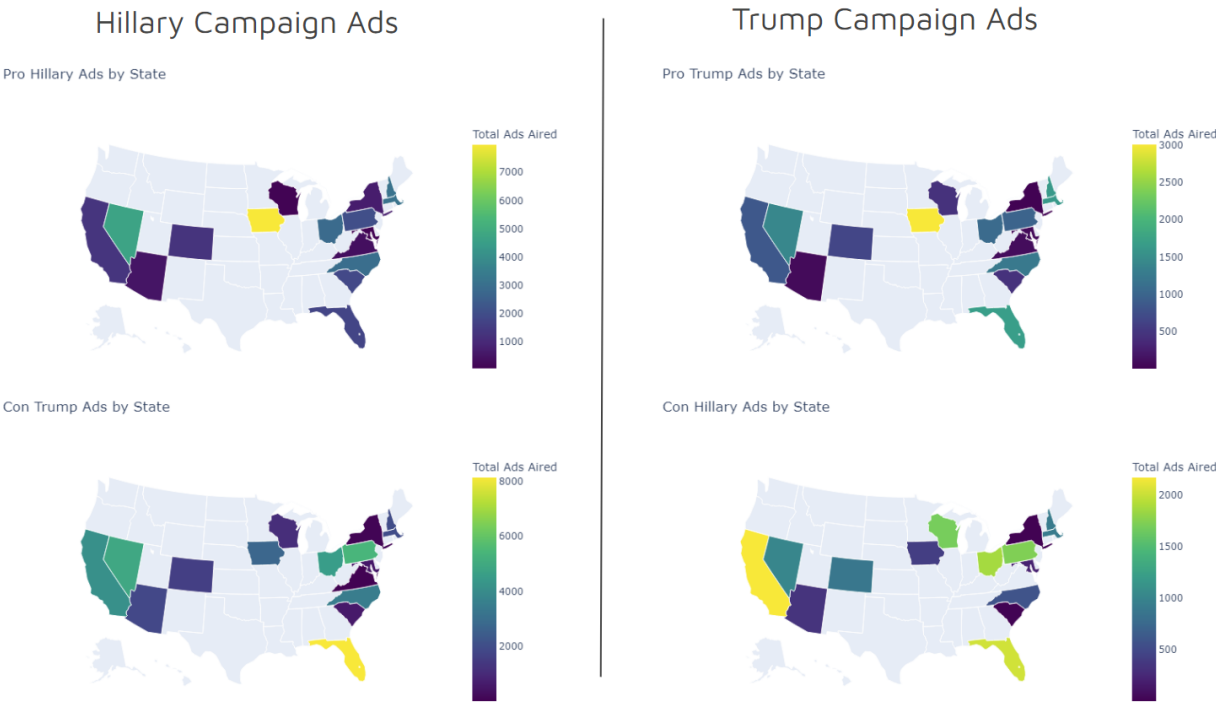
Geography

Question 1

What was the difference in geography and volume of ads aired between the two campaigns?

Below are four visualizations generated using pandas and the graph_objects module from the plotly package, used to compare how the Hillary and Trump campaigns prioritized ad volume by message type and state. “Campaign” was determined by two criteria: first, the featured subject of the ad (either Hillary or Trump), and second, the message type: for instance, Pro Hillary and Con Trump ads are grouped on the left under Hillary campaigns. The message type refers to whether the ad was in support of the featured subject: pro being in favor, con being against.

Sum of Ads Aired by Campaign, Message Type and State



Both campaigns chose to air the highest number of self-promoting pro ads in the battleground state of Iowa: 7,974 aired by the Hillary campaign and 3,005 aired by the Trump campaign. For opponent con ads, the Clinton campaign focused on airing more con ads in Florida (8,139), while the Trump campaign focused on airing more con ads in California (2,166). The Clinton campaign's decision to focus on Florida makes sense because it's a hotly contested battleground state, but it's unclear why the Trump campaign chose to designate such a high proportion of its TV ad budget on airing con Hillary ads California, a state that hasn't nominated a republican presidential candidate since 1988. Although this decision didn't cost Trump his eventual victory, it appears to have been a strategic mistake on the part of his campaign.

Finally, the Trump campaign appeared to place more importance on pro type ads in Massachusetts and New Hampshire (both at 1,628 due to both states belonging to the same broadcast market), as well as con type ads in Ohio (1,866), Pennsylvania (1,722), and Wisconsin (1,686).

Question 2

Did the volume of ads aired in each state correlate with victory?

No, the volume of ads did not show a correlation with victory in most states (with the exception of Wisconsin). In fact, the data suggests that the volume and location of ads had little to no impact on the election results, as evidenced in the summary table below:

	state	pro_trump	pro_hillary	pro_trump_to_hillary_delta	con_trump	con_hillary	con_trump_to_hillary_delta	winning_cand	result_type
0	AZ	71	484	-0.853306	1803	331	4.447130	Trump	Win
1	CA	843	1282	-0.342434	4113	2166	0.898892	Hillary	Win
2	CO	652	1247	-0.477145	1573	875	0.797714	Hillary	Win
3	DC	62	56	0.107143	518	204	1.539216	Hillary	Win
4	FL	1679	1734	-0.031719	8139	2023	3.023233	Trump	Flip
5	IA	3005	7974	-0.623150	2728	408	5.686275	Trump	Flip
6	MA	1628	3102	-0.475177	1961	907	1.162073	Hillary	Win
7	MD	62	56	0.107143	518	204	1.539216	Hillary	Win
8	NC	1240	2949	-0.579518	3484	577	5.038128	Trump	Win
9	NH	1628	3102	-0.475177	1961	907	1.162073	Hillary	Win
10	NV	1414	4657	-0.696371	4888	1010	3.839604	Hillary	Win
11	NY	5	687	-0.992722	46	1	45.000000	Hillary	Win
12	OH	1050	2824	-0.628187	4532	1866	1.428725	Trump	Flip
13	PA	969	2014	-0.518868	5395	1722	2.132985	Trump	Flip
14	SC	436	1842	-0.763301	591	5	117.200000	Trump	Win
15	WI	443	83	4.337349	1061	1686	-0.370700	Trump	Flip

In this table, we can see a print out of a filtered and transformed data frame that uses `style.background_gradient` to conditionally highlight the values of two columns of interest. These calculated columns were inserted to show the delta between the sum of ads by state, message type, and candidate. The “pro_trump_to_hillary_delta” column shows the delta between pro trump and pro hillary ad volumes, while the “con_trump_to_hillary_delt” column shows the delta between con trump and con hillary ad volume. Also included are scores pulled from the New York Times’ election results data set used to generate the last two columns on the right. “winning_cand” specifies the winning candidate for each state, and “result_type” indicates whether the state was flipped from one party to another.

Here were some key findings from this summary table:

- The Hillary campaign aired considerably more ads for the New York market than Donald Trump (99% higher volume of pro Hillary ads, 4500% higher volume of con Trump ads), and the reasons are unclear. Realistically, she probably didn’t need to air such a high volume of ads in New York in order to win the state; New York is a historically blue state that hasn’t nominated a republican presidential candidate since 1924. Although she did win in this state, it wasn’t a flip, so it doesn’t suggest that the volume of ads had an effect on the result. This decision appears to have been a strategic mistake on the part of the Hillary campaign.
- The Hillary campaign aired more ads in South Carolina (76% higher pro Hillary ads, 11720% higher con Trump ads) than the Trump campaign, but they were not able to successfully flip that state.
- The Trump campaign aired more ads than the Hillary campaign in Wisconsin (433% higher pro Trump ads, 37% higher con Hillary ads) and they were able to successfully flip that state. This suggests that Trump’s ads may have reached and resonated with Wisconsin voters at a higher rate than in other states. Ultimately, the Trump campaign’s decision to air a higher volume of ads in Wisconsin may have contributed to his win in this state.
- Within this sample, Trump was the only candidate to flip any states, and he flipped 5 of them successfully: Florida, Iowa, Ohio, Pennsylvania, and Wisconsin. However, correlation between ad volume and the result could only be established in the state of Wisconsin, as it is the only state where 1) Trump campaign aired more ads than the Hillary campaign, and 2) it was flipped from blue to red.

- Totals for all states show that in this sample, the Hillary campaign aired 61% more ads than the Trump campaign: 77,404 ads aired by the Hillary campaign, compared to only 30,079 aired by the Trump campaign.

Question 3 (Final Thoughts on Geography + Ad Volume)
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What role did broadcast location and volume of presidential campaign ads play in the outcome of the election?

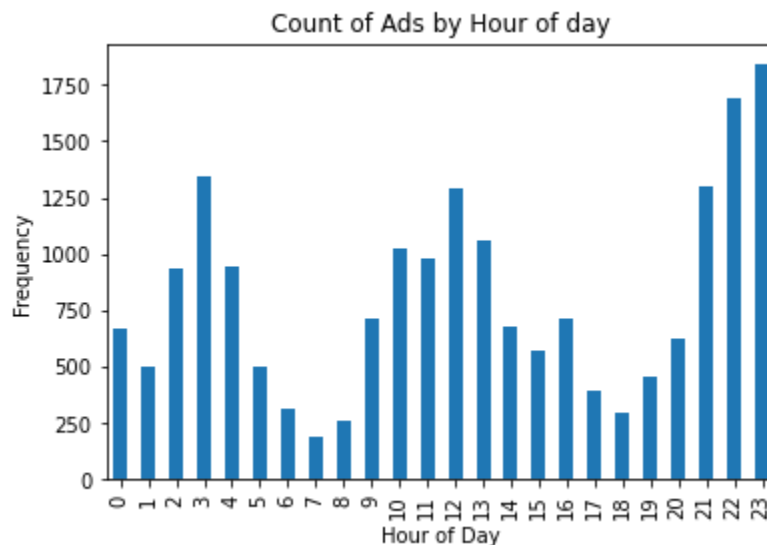
If this sample is representative of the overall political TV ad strategy from both campaigns throughout all 50 states in the 2016 presidential election, then it suggests that the Trump campaign placed much lower significance than the Hillary campaign did on investing into TV ads. This makes sense because, as many of us have heard, the Trump campaign is reported to have invested a considerable amount of funds into other channels, such as social media. The website opensecrets.org has additional data to help quantify the amount that each campaign spent on Facebook and Google in the 2016 election, however this data was not integrated into this analysis. Ultimately, this data suggests that Trump's 2016 victory was earned not through the number of ads his campaign aired in battleground states (Wisconsin being one potential exception), but through another, or some combination of other strategies, such as investing more into advertising channels outside of TV, or through tone and messaging.

Time of Day

Question 1

What strategies did campaigners take when they took into account the when the ads were shown at a specific time of day?

Maximizing the amount of people seeing the ads is crucial in reaching voters and also helps in the amount of money spent on airing ads. The name of the game is targeting the most people with one ad. Since the dataset includes the times of when it was aired we can extrapolate the time of day.



From this table we can clearly see ads aired throughout the day that there are clear peaks and troughs. The first peak occurred around 0300 hr and then a second peak occurred around 1200 hr . Lastly we can see the least peak occurring at around the last hour of the day.

Key finding in this graph

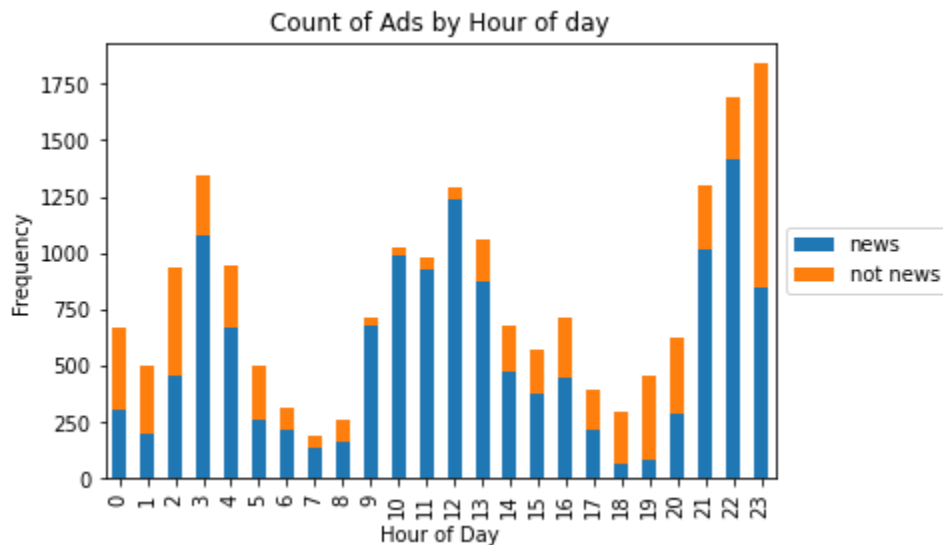
- There is a strategy when combining all the states and looking into when ads were airedd. From this we can see that there are peak hours in order to gain maximum visibility with each ad. The Trump team in this case has chosen to air political ads at 0300 hr , 1200 hr, and Midnight around. With prime airing time being between 2100 hr and 23:59 hr.

- In order to reduce the amount of airing they did not prioritize the 0700hr and 1800hr as I would assume most people would not be watching tv and this would be reserved for most of the population getting ready to go to work and traveling.

Question 2

Does time of day have an affect on what type of program these ads were played on?

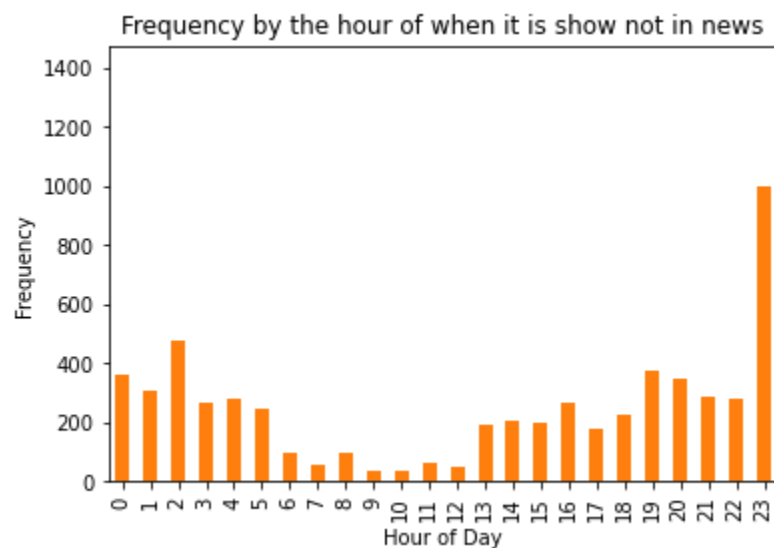
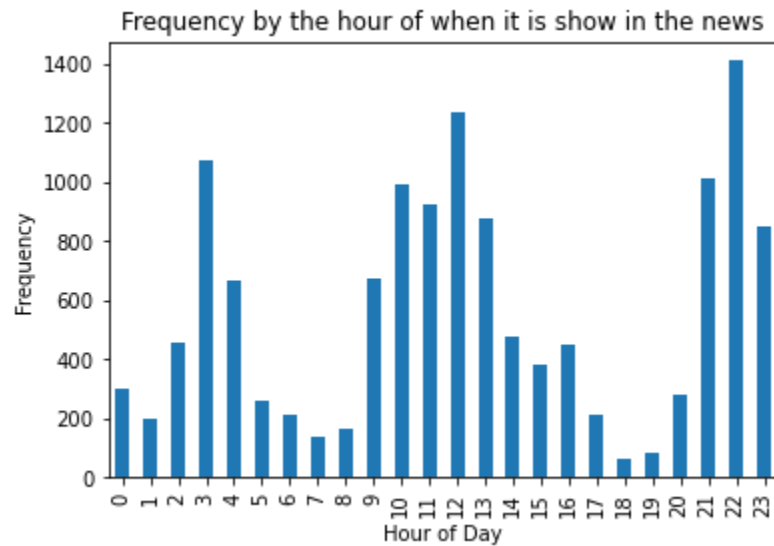
To answer this particular question we can have a higher level of understand by superimposing the ratio of when it was aired during the news and not news



Key finding in this graph

- There is a difference in the ratio of when it is aired during the “news” and “not news” program as compared to each hour of the day.

Since both of these data values are stacked on top of each other there isn't a clear way that we can see that each data value has their own different peaks as displayed in the graphs below



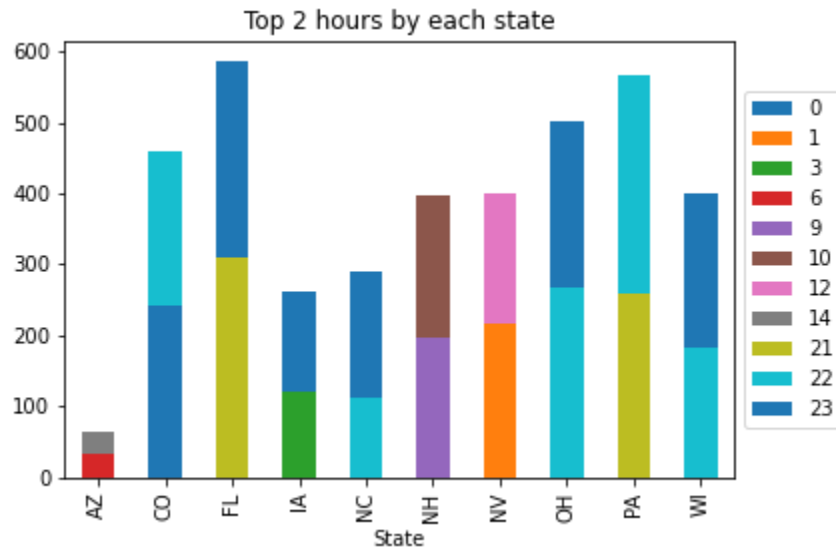
Key finding in this graph

- Depending on the type of program the Trump team has a clear understanding when to target the most people. For programs that are not news they tend to air more ads in the late afternoon to the late night hour. Which would makes sense as this is when most people watch TV for entertainment.

Question 3

When taking into account the different political climate of each state how does the strategy differ between each state?

When looking at the cycles between each state, there is no variability as most people in the US have relatively the same schedule but when comparing the top 2 hours that air the most ads on a couple of states standout.



Key finding in this graph

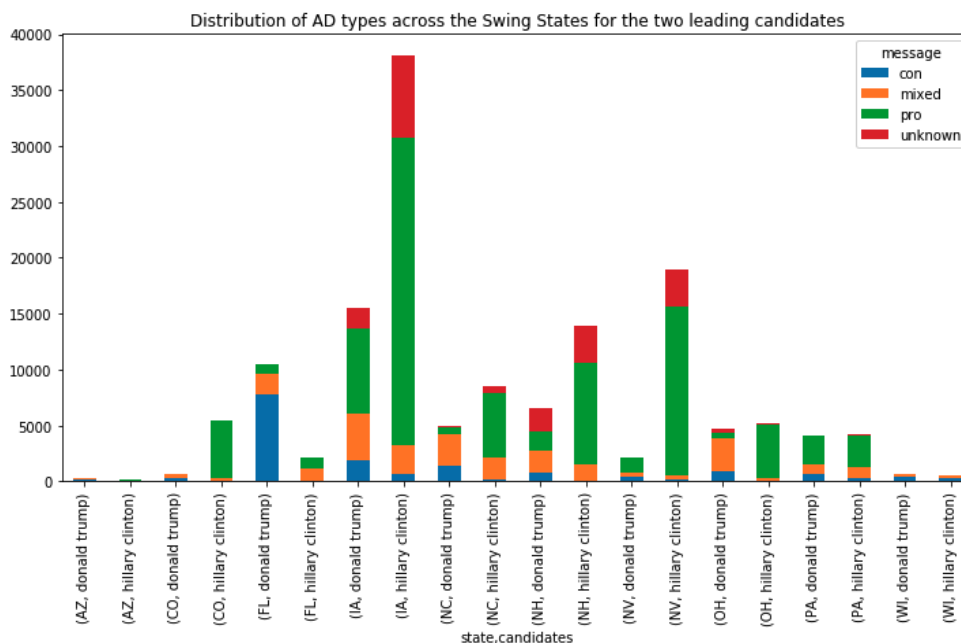
- This clearly shows that a majority of the top 2 hours lie between 2200 and 2300
- Three states that stand out from this graph are Arizona, New Hampshire, and Nevada. These states differ in the top 2 most hours occurring during the day as opposed to the end of the day. Out of these three anomalies it seems that Trump only won Arizona
- Their strategy might have been different as they thought that people that were in these states tend to watch more TV during the day as opposed to watching in the evening.

TV Ads Subjects

Question 1

Does the volume of TV ads by leading candidates in the swing states have a direct correlation to the election results?

Based on the data, the candidates focused more on the pro ads. This means that each candidate tried to convince the voters why their policies are much better than the other candidates instead of focusing on the cons of other candidates. In this scenario, the two major candidates of the leading political parties, Hillary Clinton and Donald Trump had fair distributions when it comes to pro Ads.



From the chart, both candidates had the highest number of TV ads in Iowa. This actually agrees with the political campaign trend in the country. Iowa matters because of the primary because it is the first state in the primary election cycle for both campaigns. It is believed that candidates who fare well in Iowa will gain momentum to eventually become the nominee. Before the 2016 election, every democratic candidate that won Iowa from the year 2000 became the democratic party's nominee for president.

In FL, Donald Trump had the most percentage of con ads across the swing states. This also agrees with the trend of the elections because FL has 30 electoral votes in the

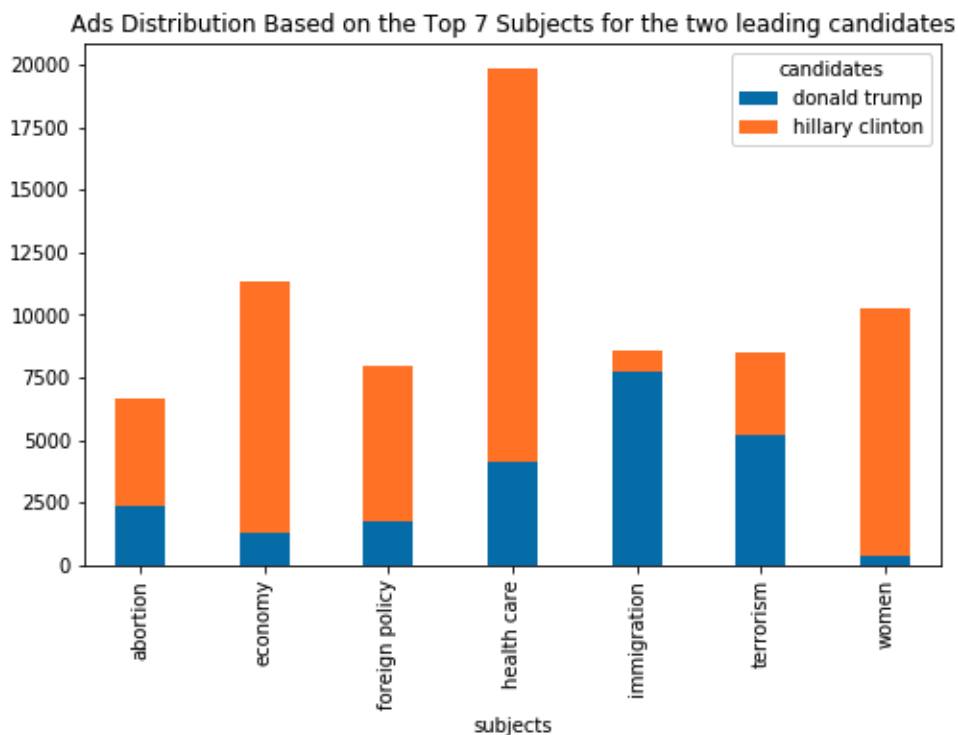
electoral college and since Trump also resides majorly in FI, it will be the best approach for the Hillary Clinton campaign to run more negative ads against Donald Trump.

So, from this chart, it is obvious that Hillary Clinton spent vastly more on Ads compared to Donald Trump. So, as anyone would have expected that the candidate who spent more on the ads should win the election, but the reverse was the case in the 2016 presidential election as Donald Trump ended up winning most of the swing states. So, it is obvious that the volume of TV ads in the 2016 presidential campaign did not have a direct relationship with the chances of winning the election. Also, the kind of ads (pro, con, mixed, unknown) would not have single handedly given any of the candidates the win.

Question 2

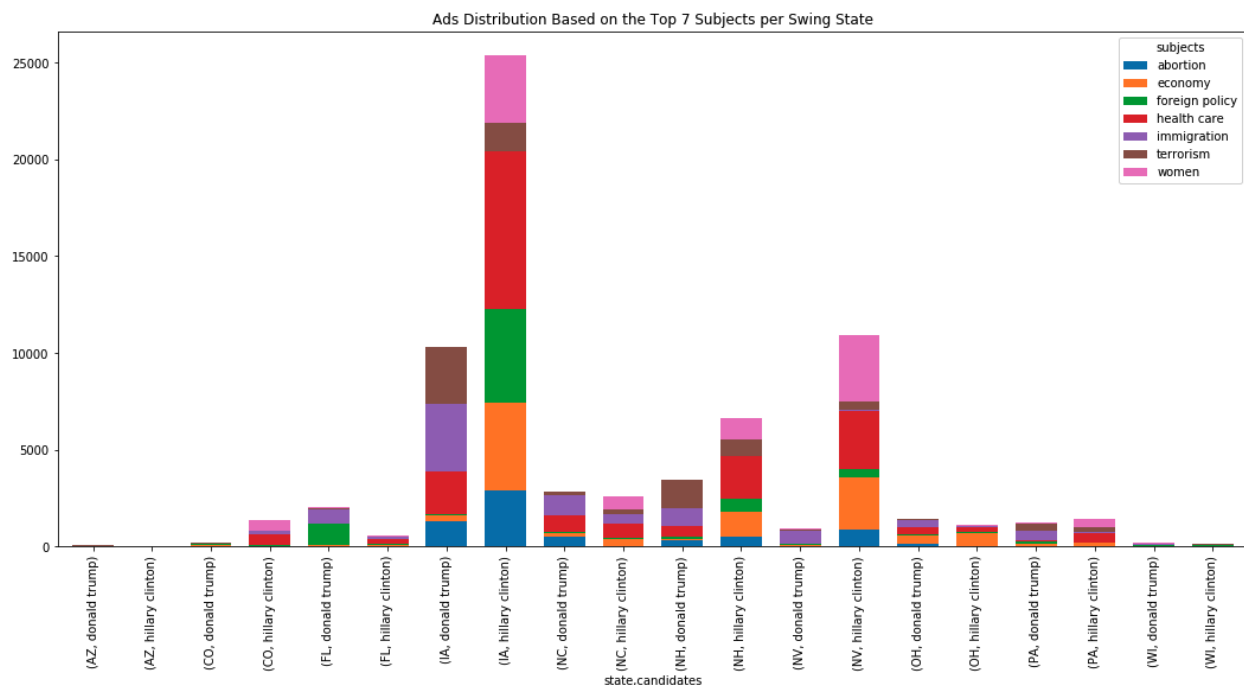
Does the Ads subjects play any role in the determination of the 2016 presidential election winner?

From the data, both candidates (Donald Trump and Hillary Clinton) focused on different subjects for their TV Ads. In this report, we focused on the top seven (7) of those subjects. The top seven (7) of those subjects are Healthcare, Economy, Women, Immigration, Terrorism, foreign policy, and abortion.



Clearly from the chart above, the volume of TV ads from Hillary Clinton is way more than Donald Trump which also supports the outcome of the analysis in question 1 above. For the two candidates, it is also obvious that Hillary Clinton focused more on Health care, women, economy, foreign policy, and abortion. Although Donald Trump also had shares in these subjects where Clinton focused more, Trump was more on the immigration and Terrorism. Some of the popular Trump campaign lines during the election include, “I will build the wall and Mexico will pay for it” which is about immigration, “we will repeal and replace Obamacare” which is for healthcare, and some rhetoric about terrorism.

The next focus of this analysis is to check how the candidates prioritized the top seven (7) TV ad subjects across the swing states.



Although the two candidates prioritized Iowa for the most number of ads, Trump focused more on terrorism and immigration messages in Iowa, terrorism as major message in NH and foreign policy in FL. From the outcome of elections, it seems Donald Trump messages about immigration and terrorism resonated more at that time based on the immigration situation in the US and the increased terrorism in the world. Also, the price of healthcare at that time was increasing and his message about bringing something new to healthcare may have resonated with more voters.

CONCLUSION

Donald Trump won the 2016 election with 304 electoral votes compared to Clinton with 227 electoral college votes. The analysis in the report focused on understanding the strategies that helped Trump become the US president after the 2016 general elections. In this report, we focused on how the candidates viewed and prioritized the electoral college votes across the swing states based on their TV ads distribution across those states, the time of day that the candidates decided to air their ads, and the messages in their political TV ads.

In terms of TV Ads volume, Clinton had more TV ads than Donald Trump in virtually all the swing states and both campaigns chose to focus more of their TV ads on self-promoting pro ads. In terms of volume, both campaigns had the highest number of ads in Iowa. This is because Iowa is the first state in the primary election cycle for both campaigns and the belief is that any candidate who wins Iowa in the political parties will gain momentum to eventually become the party's nominee. In terms of message distribution of the ads, Clinton campaign focused on airing con ads against Trump in FL, a swing state with 30 electoral college votes.

The two candidates also had some strategic mistakes in the distribution of some of their ads. Trump campaign had some con ads against Clinton in California, a democratic party state. Clinton campaign also aired some ads in the state of New York which is not needed as NY is a reliably democratic state and some ads in SC which is a reliably republican state. Trump had more ads in Wisconsin compared to Clinton and maybe that contributed to his win in the swing state of Wisconsin.

Also, another strategy is the times those TV ads were aired. Both candidates focused on the peak hours to gain more visibility. The prime airing was between 2100 hr and 23:59 hr. There was a reduction in the ads volume during the times of the day that candidates assumed there would be less viewers. Also, Trump team seemed to have a better understanding when targeting more potential voters as they tend to air more ads in the late afternoon / evening for non-news ads.

The other strategy that might have also contributed to Trump winning the 2016 election is the subject of the TV ads. Both candidates focused Healthcare, Economy, Women, Immigration, Terrorism, foreign policy, and abortion as the top seven (7) subjects but with different priorities. Donald Trump focused more immigration. Terrorism, and healthcare. During the 2016 election cycle, it seems these subjects resonated more with voters than other subjects focused on by Clinton as Trump ended up winning most of the swing states.

So, strategic use of TV ads was one of the weapons that Trump used in winning the 2016 elections. He seemed to understand the right volume of ads, strategic times to air those ads, and distribution of ad subjects across the swing states. Although Trump was successful in the use of the TV ads, the data is still not sufficient to conclude that strategic use of the TV ads was the only strategy that won him the presidential election.

References:

<https://www.degruyter.com/>

<https://www.economist.com/>