I Think What I Hear, The Influence of Social Media on Political Ideologies

Richard Matovu and Zakery Fyke
Texas Tech University, Lubbock, TX, US

I. Introduction

Echo Chambers are the metaphorical description given to the situation in which beliefs, information, and ideas are reinforced or cemented inside a defined system. A common example is an individual exclusively associating themselves with those who agree with or share their ideals and their point of view. The Echo Chamber then reinforces ones own present world view because of the lack of exchange of dialogue with those who hold a different point of view. The advent of Social Media has allowed Echo Chambers to be formed more easily than ever, and with over 60% of Americans getting their news from Social Media according to a study by Pew Research Center, this problem could be getting worse. Analysis of the data found on Twitter may allow us to locate these Echo Chambers present based on the political party divide.

II. Motivation

Social Echo Chambers have become a hot topic as, especially in public media, as many believe that the formation of Echo Chambers is leading to a radicalization of political views on both sides of the party divide, making it more and more difficult for both sides to find a common ground, and leading to social unrest. This inability to find common ground between the two parties makes it more and more difficult for the two to find compromises that both sides will accept, leading to events like the 2013 Shutdown of the Federal Government when both sides were unable to find a compromise on the Federal Debt Ceiling.

We are interested in seeing if we can find and visualize the formation of these Echo Chambers by utilizing the information available on social media, namely by analyzing tweets and followers found on Twitter. Twitter is one of the largest Social Media platforms in the world, and with the politically charged atmosphere currently present in the United States, we believe we will be able to find lots of data which will help us identify these Echo Chambers. Is it possible to visualize the formation of these Echo Chambers on Twitter by analyzing the data we gather? If so, can we find what factors lead to the formation of these Echo Chambers and possibly identify some common ground between the two parties that might be used to break them?

III. Related Work

The effects of conversations happening in cyberspace have a very real and measurable impact in the real world. Hamton et al found in 2016 that Twitter users who felt their audience on Twitter agreed with their opinion were more willing to speak out on that issue in the workplace. There have been numerous methodologies used to locate and visualize the Echo Chambers that become present online and on social media, including analyzing blog posts and the comments on those posts and analyzing the messages and connections found on Twitter and Facebook. .

The topic of whether or not ideological polarization is exhibited in online exchanges is still an open debate among researchers. Conover et al found that political ideology could be predicted with a high level of accuracy by analyzing tweets of the users. By contrast, Bakshy et al found that there was very little online ideological segregation in absolute terms, with open exchanges and exposure to ideological differences being fairly common. Variations like these are common between studies, and one reason for them might be that some studies use a self-selected sample of partisan individuals, while other studies have not.

With some similarity to the topic of whether ideological polarization even exists in online exchanges, which side of the political spectrum would be more likely to engage in selective exposure to information – information which confirms the opinions which they already hold – is still an open topic with a variety of answers from different researchers. While not the direct focus of our studies, it should be noted in the peripheral that different studies have found different results. The ones performed by Bakshy et al found that liberals are much more likely than conservatives to engage in cross-ideological dissemination of political and nonpolitical information, which stands in contrast to the rising belief of many that liberals, especially those on college campuses, have formed their own echo chambers.

In the past, previous work has analyzed the presence of Echo Chambers forming around online blogs. Gilbert et al found in their study that blogs frequently created what they defined to be an Echo Chamber, with certain genres of blogs being more likely to meet these conditions. However, their metric for deciding if a blog could be categorized as an Echo Chamber was based on the ratio of comments left on posts which agreed with the writer of the blog. As they mention, there is no agreed upon metric which designates something as an Echo Chamber. Adamic and Glance analyzed the differences in behavior of liberal and conservative blogs and how frequently one referred to another. They chose 1000 political blogs, and analyzed the top 20 conservative and top 20 liberal blogs, ranking them based on the number of citations each blog received from October and November of 2004, the period of the George W.

Bush vs John Kerry Presidential election. From these 40 blogs, they collected roughly 23,000 posts from 8/29/04 - 11/15/04, with a slight bias in the count towards the left leaning blogs. During analysis, they found that conservative blogs link to one another more frequently than liberal blogs, but that particular liberal blogs are more likely to be linked to by other left leaning blogs. Their analysis also showed that only 15 percent of all links were bipartisan.

More recent work has begun to focus on the influence of Social Media on the public sphere and on the formation of Echo Chambers. Twitter has been the focus of most of these studies, due to the ease of access for information on users and their corresponding tweets.

Barber et al analyzed a collection of 3.8 million Twitter users in the United States. They pointed out that existing methods, which focus on analyzing the content of Twitter messages in order to draw conclusions was not scalable, bringing up questions about the validity of any conclusions made by these techniques. Instead, they focused on Latent Space Modeling, focusing on the connections between different Twitter users in order to draw their conclusions. They also chose 12 significant, political and nonpolitical, events from the period of 2012 to 2014, including the United States Federal Budget, Marriage Equality, the Winter Olympics, and the Academy Awards, and used these in order to collect roughly 150 million tweets which mentioned any of these keywords. Using this collection of tweets, they found their 3.8 million active Twitter followers to analyze. By using known political pages, such as The Tea Party, Stephen Colbert, and others, they created a Latent Space Model of all these Twitter users. Barber et al concluded that while the Social Media sphere is not necessarily bounded by ideological contours, especially when it comes to nonpolitical issues like the Winter Olympics, when it comes to politicized issues, individuals are significantly more likely to pass on information to other users that they have received from sources which are similar to their existing network.

IV. Methodology

To complete this task, we have collected data from Twitter through web crawling techniques including, but not limited to, the Twitter API for R and Python. This data has been gathered from the top ten United States Senators which have the largest following on Twitter, as their political affiliation is already established, as are their Twitter handles. From these accounts, we collected data regarding their tweets and their Twitter followers. We then analyzed this data we collected by comparing the collections of each politician's followers to see if those who follow a particular influential member of Congress from one party are less likely to follow members of the other party.

Expanding upon this, we will then attempt to visualize who the followers of these politicians are following, so that we can get a total view of any sort of Echo Chamber that may have been formed between these groups. For example, might we find that those Twitter users who follow a particular party are very unlikely to follow particular celebrities or corporate leaders? With this, we can classify the followers of these politicians into different Echo Chambers.

Once this visualization has been done, we will then attempt to identify which topics are important to each of our groups and the sentiment which they have towards this topic. For example, both sides may frequently discuss issues like Gun Control, but one group may have a negative outlook on it, while the other may have a positive outlook on it. We will then use this analysis to attempt to predict which of our Echo Chambers a person falls into based on their tweets contained in our dataset from the Presidential Campaign.

A. Dataset

For our dataset, we have collected a subset of 500,000 followers from each of our ten US Senators twitter accounts and a subset of 3,200 tweets.The collection of followers were then compared with one another to find the shared followers between each of the senators in question. The set of tweets were analyzed using Latent Dirichlet Allocation as a topic modeling method in order to find which topics each senator has been discussing to their followers.

B. Implementation

First, we will analyze the lists of Twitter follows of the most influential US politicians. These may include, but are not limited to, President Donald J. Trump, Senators Bernie Sanders, Elizabeth Warren, and Ted Cruz, among others. We will compare these lists to find if followers of one group are less likely to follow the members of the other. Our assumption is that those who follow members of one party are unlikely to follow members of the other party. After, we will visualize who these followers are following, in a similar method. Again, we would expect to see a divide between who the groups are following, thus giving the symptoms of an Echo Chamber. This visualization will likely be performed utilizing Python or R, or even a mixture of the two.

Once this is complete, the next phase will be to analyze the Tweets sent out by these politicians to find the topics which they discuss most frequently and the sentiment given to these topics. For example, while both sides of the political spectrum are likely to discuss Gun Control, Immigration, and Taxes, they often discuss these with varying amounts of positivity or negativity. We assume that their followers, members of their Echo Chamber, are likely to hold these beliefs as well.

Forming a training and testing set from our original Echo Chamber model, based on who is following who, we can then use our analysis of the topics each side finds important to classify tweets based on their messages, without having to have knowledge of who the person is following.

V. Conclusion

It seems that with each passing year, American Politics is becoming more and more divided along party lines, and each year it is becoming harder for the two sides to find compromises between them that will make both parties happy. The formation of Echo Chambers, which reinforce ones own worldview and make it more difficult to consider the validity of another persons view, have largely contributed to this. By

utilizing the data collected from Twitter, we can identify what causes these Echo Chambers to form, and may be able to find what can break them.