Instructor: P. E.

Student: P. H.

Summative Assignment 2 – Twitter API

Contents

Figures

Introduction

The Trump presidency is famous for using Twitter as its main means of communication. Donald Trump has used his personal Twitter account to "announce policy, move markets, attack the press, dispute reports, insult enemies and energize his base"[1], all while being able to circumvent the scrutiny of traditional media. Now, that Joe Biden has become the president-elect of the United States, it is interesting to see, how the Twitter activity of the two compare. Can we see indications that Biden will live up to his "pledge to be a president who seeks not to divide, but to unify"[2]?

To answer this question, the following approach combines a natural language processing-enabled sentiment analysis with more in-depth topical analyses of both the Twitter activity of Trump and Biden. The data for this was downloaded from the Twitter API on 03/12/2020 and covers tweets made by

[1] Andrews, "Commander in Tweets: The Dispatches That Define the Trump Presidency."
[2] Biden, "'We Must Make the Promise Real for Everybody': Joe Biden's Speech in Full."

Biden and Trump between the 23/11 and 02/12 (GMT-5), excluding retweets. The number of tweets is for Biden n=44 and for Trump n=93.

Although we can assume that the Twitter activity of Trump, as well as of Biden is in part the result of the efforts of campaign teams, for the sake of simplicity, in the following these will be addressed as the Twitter activity of “Trump” and “Biden” only.

Analysis and Results

As the first means of analysis, a word cloud can give an impression of the topics covered in the twitter feeds. For better comparability, the same set of common words were excluded from both these word clouds.

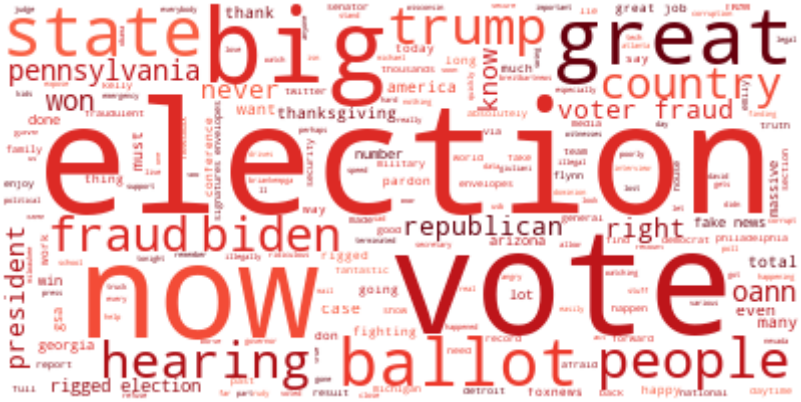

Figure 1 Word cloud Donald Trump

Figure 2 Word cloud Joe Biden

When looking at the Trump word cloud, we can see how the words “election”, “vote” and “ballot” are among the most frequently used ones. Less frequently used words like “fraud”, “hearing” and “Pennsylvania” give hints that in his recent Tweets, Trump was making claims regarding the results of the presidential election.

Meanwhile, in the Biden word cloud the words “build”, “team”, “together” and “one” predominate, signalling his call for unity and solidarity among the US population.

Using natural language processing, each tweet can be assigned a sentiment score, that is an average of individual scores for how positively or negatively the words used in the tweet are.[3] So, while the word clouds suggest that Trump’s tweets carry mainly negative sentiments, and Biden’s tweets carry mainly positive sentiments, natural language processing enables us to easily test this. The results can be visualized using a histogram of sentiments.

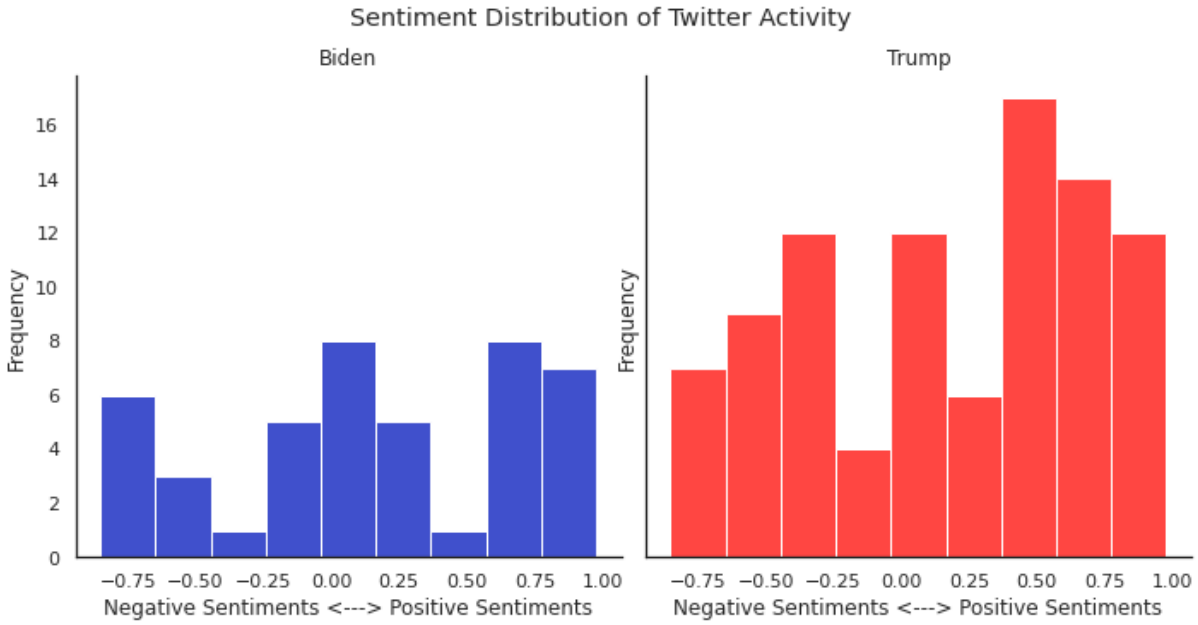

Figure 3 Histogram of sentiments in Joe Biden and Donald Trump's tweets

Here we can see that both politicians cover the entire range of sentiments in their tweets. Neither of them is tweeting in exclusively negative or exclusively positive tones. However, we can also see that Trump’s tweets are more often conveying extreme sentiments than this is the case with Biden, who tends to address neutral sentiments more often.

Given the fact that Trump has a much bigger Twitter following than Biden, this raises the question, whether tweets that convey more extreme sentiments are also shared and liked more often. A possible relationship that is explored in the following two graphs.

[3] Out of the tweets assessed, 6 Biden-tweets and 10 Trump-tweets have been graded with 0.0 on the sentiment scale. While some of these tweets are very short, others employ neutral language. Thus, I decided to keep the complete set of Tweets in the analysis.

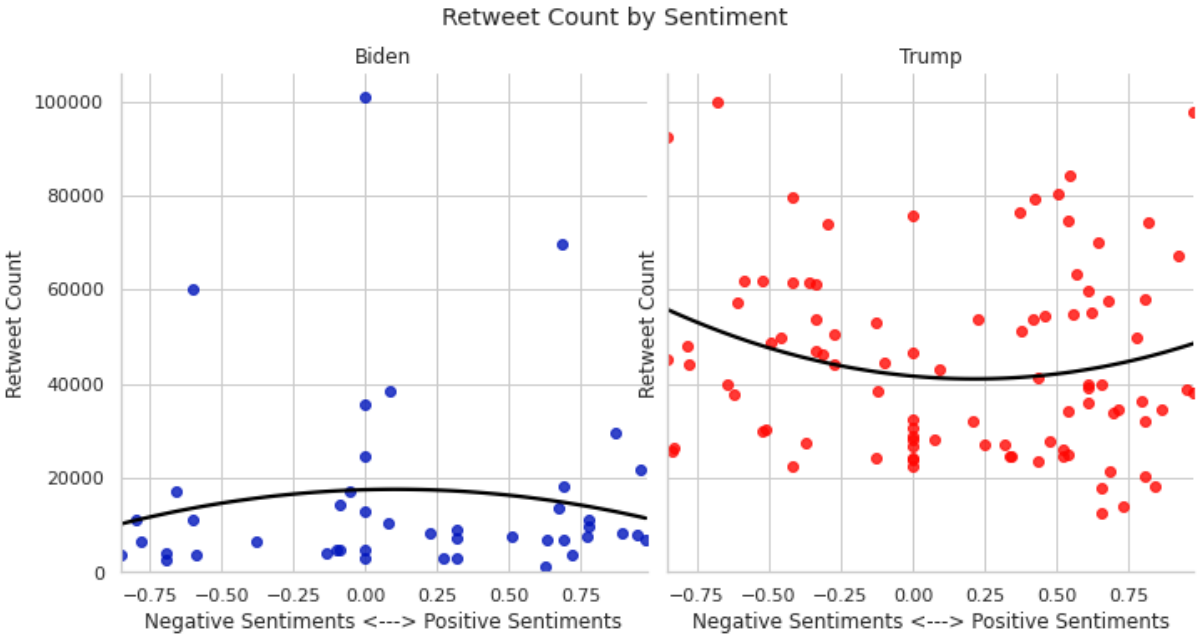

Figure 4 Regression plot showing retweet count by sentiment

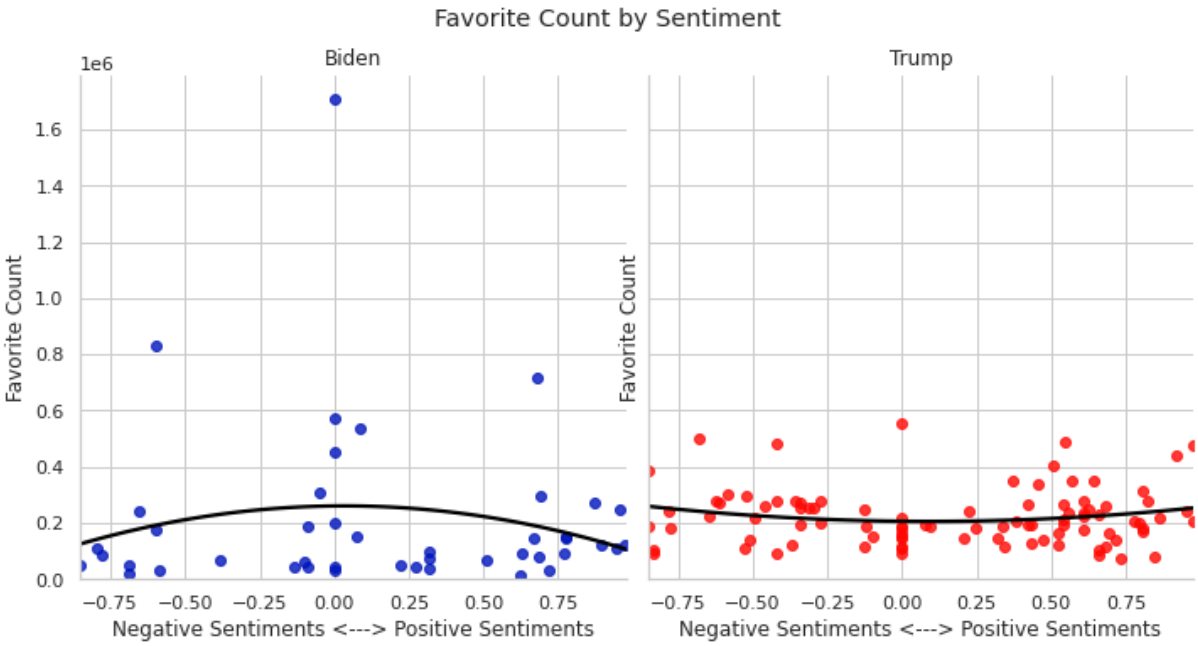

Figure 5 Regression plot showing favourite count by sentiment

Indeed, subsetting the graphs for Biden and Trump and fitting a quadratic regression line to the data[4] shows us, that Biden followers tend to retweet and favourite his posts much less when they carry extreme sentiments. Trump followers on the other hand seem to share his tweets more often when

[4] Confidence intervals are turned off, as the underlying sample was not randomized. Thus, confidence intervals would have been misleading.

the tweet carries more extreme sentiments. Thus, whether more extreme sentiments have a wider reach likely depends in large parts on the audience.

Finally, we can look at how the average sentiments are developing over time.

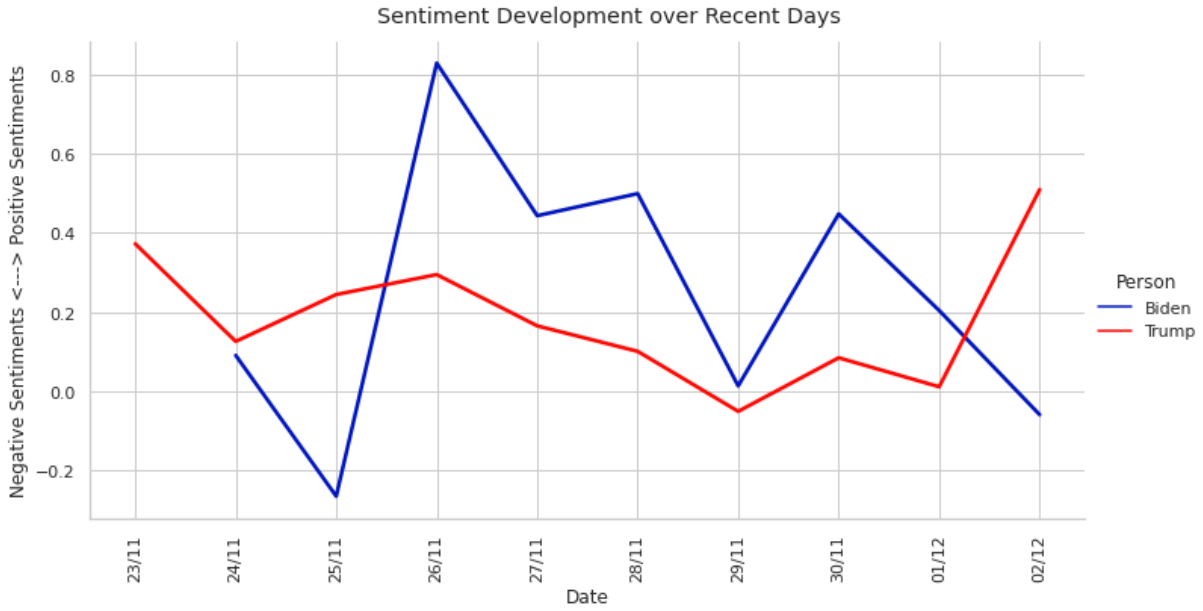

Figure 6 Time series of average sentiment per day

While the larger variance in the daily average sentiment scores for Biden can be explained in part by the smaller number of overall tweets per day, no clear trend can be found in the development of the average sentiments of Trump and Biden. Interestingly however, daily average sentiments seem to be correlated between the twitter activity of Trump and Biden. Further research could show, why that is.

Conclusion

While this brief analysis is based on only a short glimpse of the Twitter activity of the outgoing US president and the president-elect, some interesting findings could be made. Among these are that more extreme sentiments do not necessarily spread more widely on Twitter. Instead, this seems to depend on the audience. The fact that Biden conveys more neutral sentiments in his tweets than Trump may mean that his messages are also less polarizing. The finding that his followers accredit neutral messages with higher retweet- and favourite-counts gives hope that these messages are also well-received. Furthermore, we can see that the results of the natural language processing-enabled sentiment analysis are coherent with our intuition, thus underlining its potential as an aid in the analysis of larger sets of text data.

Bibliography

Andrews, Travis M. “Commander in Tweets: The Dispatches That Define the Trump Presidency.” *Washington Post*, October 14, 2020. https://www.washingtonpost.com/graphics/2020/technology/trump-twitter-tweets-president/.

Biden, Joe. “‘We Must Make the Promise Real for Everybody’: Joe Biden’s Speech in Full.” *The Guardian*, November 8, 2020. https://www.theguardian.com/us-news/2020/nov/08/we-must-make-the-promise-real-for-everybody-joe-bidens-speech-in-full.