

## Results Appendix

### I. Figures from Sentiment Analysis

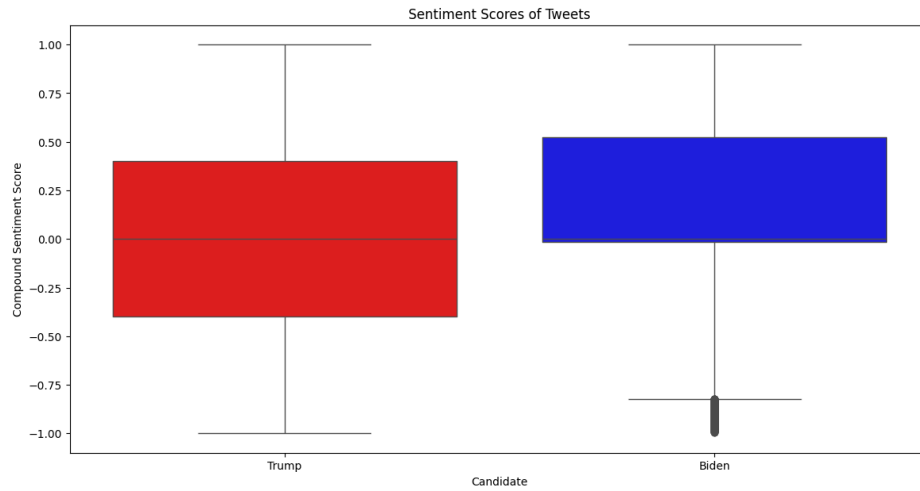


Figure 1. Sentiment Scores of Tweets

Figure 1 highlights how Biden's overall compound sentiment score is more positive than Trump. The minimum sentiment score and the lower quartile is also higher for Biden than for Trump. The median rests at 0.00 for the box plot for Trump which underscores how his tweets are, on average, more neutral. Meanwhile, the box plot for Biden has a smaller interquartile range.

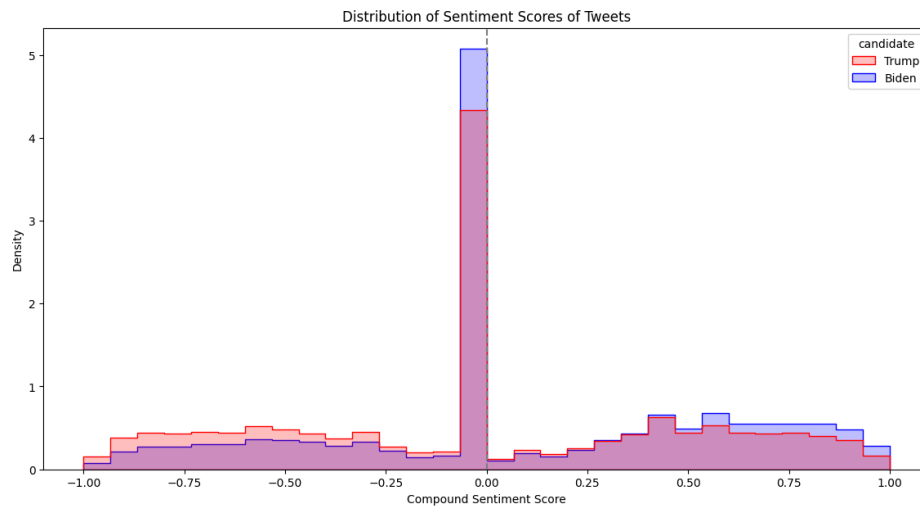


Figure 2. Distribution of Sentiment Scores of Tweets

Figure 2 captures the distribution of compound (average) sentiment scores for Trump and Biden. On the right side of the graph, there is more blue, representing Biden, with positive scores. Meanwhile, there is a higher density of negative compound scores for Trump, as seen on the left

side of the graph. This figure demonstrates that Biden had more neutral and positive sentiment scores overall than Trump.

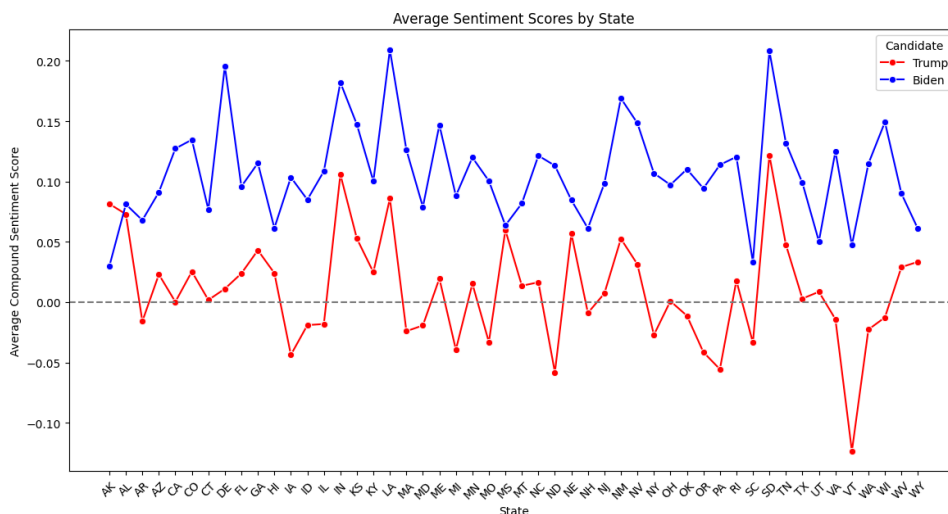


Figure 3. Average Sentiment Scores by State

Figure 3 draws attention to the average sentiment scores separated by State. The average sentiment scores for each state varied but Biden overall had higher, more positive sentiment scores than Trump did in each state except for Arkansas. The states with the highest positive sentiment scores for Biden were DE, LA, and SD. The states with the most positive sentiment scores for Trump were IN and SD. Notably, the state with the lowest sentiment score for Trump was VT.

## II. Statistical Significance Calculations

	Candidate	Average Compound Sentiment Score
0	Biden	0.111159
1	Trump	-0.003819

	candidate	mean	std_dev	sample_size
0	Biden	0.111159	0.479481	154344
1	Trump	-0.003819	0.500793	167876

Using z-score,  $z = (x - \mu) / \sigma$ , the calculations are done in a notebook in github. Using the p-value level of 0.05 to be the criteria, the p-value of 0.0 is indeed statistically significant. Since 0.0 is less than the threshold of 0.05, the compound sentiment analysis values from tweets during the 2020 presidential election between Trump and Biden are found to have a significant difference—the mean sentiment scores vary notably among candidates.

### III. Figures from Frequent Words Analysis

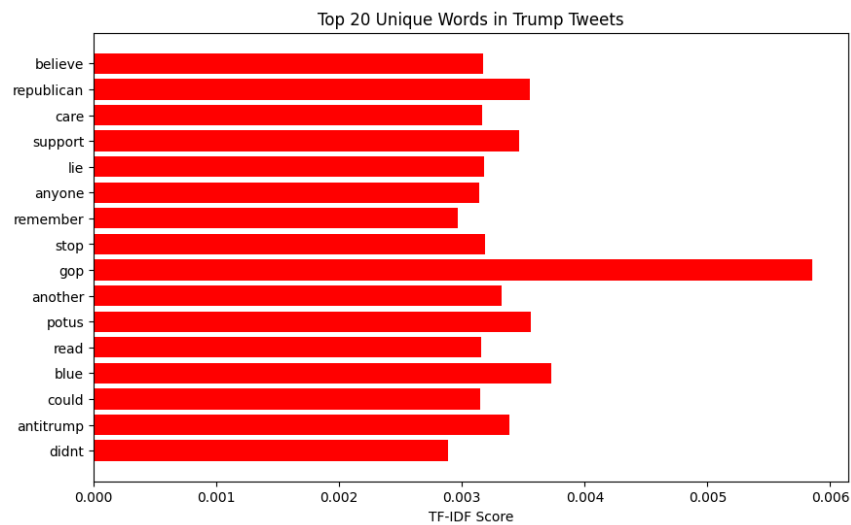


Figure 4. Top 20 Unique Words in Trump Tweets

After getting rid of the common words in the Trump and Biden tweets, the most common unique words directed towards Trump was “gop.” It is unsurprising that “gop”, grand old party, ranked as the top frequent word as it is another name for the republican party. Some other unique words in tweets towards Trump include “blue”, “republican”, “support” and “potus.” The words “lie”, “stop”, “antitrump”, and “didn’t” certainly give a negative connotation.

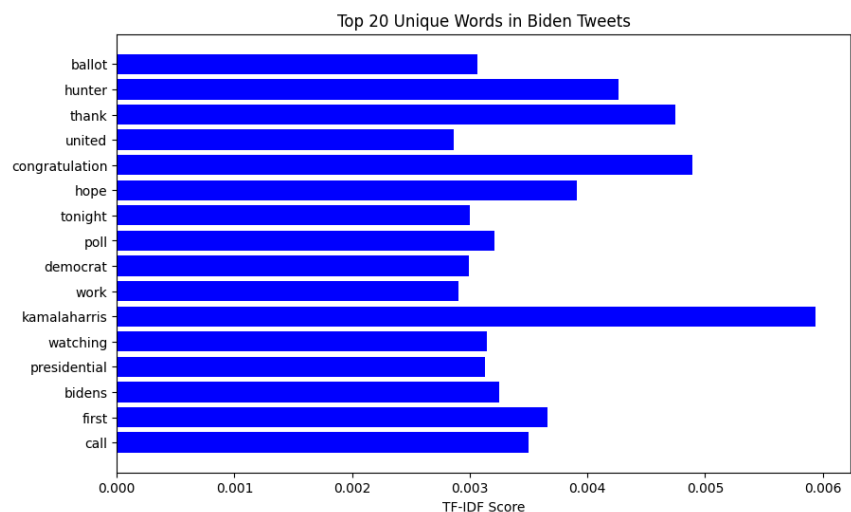


Figure 5. Top 20 Unique Words in Biden Tweets

Overwhelmingly, the word “kamalaharris” is the most common, unique word for Biden. It makes sense why Kamala Harris would be mentioned the most as she was Biden’s running mate. Some other top unique words include “congratulation”, “thank”, “hunter” “hope” and “first.” The words “united”, “hope”, and “congratulation” are associated with a more positive connotation.