



Politician Twitter Sentiment Analysis

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Introduction

- Twitter = “go-to” place to follow influential and affluent people including **politicians**
- Goal of this research: to gauge Twitter sentiment towards Democrats vs. Republicans
- Secondary goal: to use Twitter sentiment to predict election results

Data

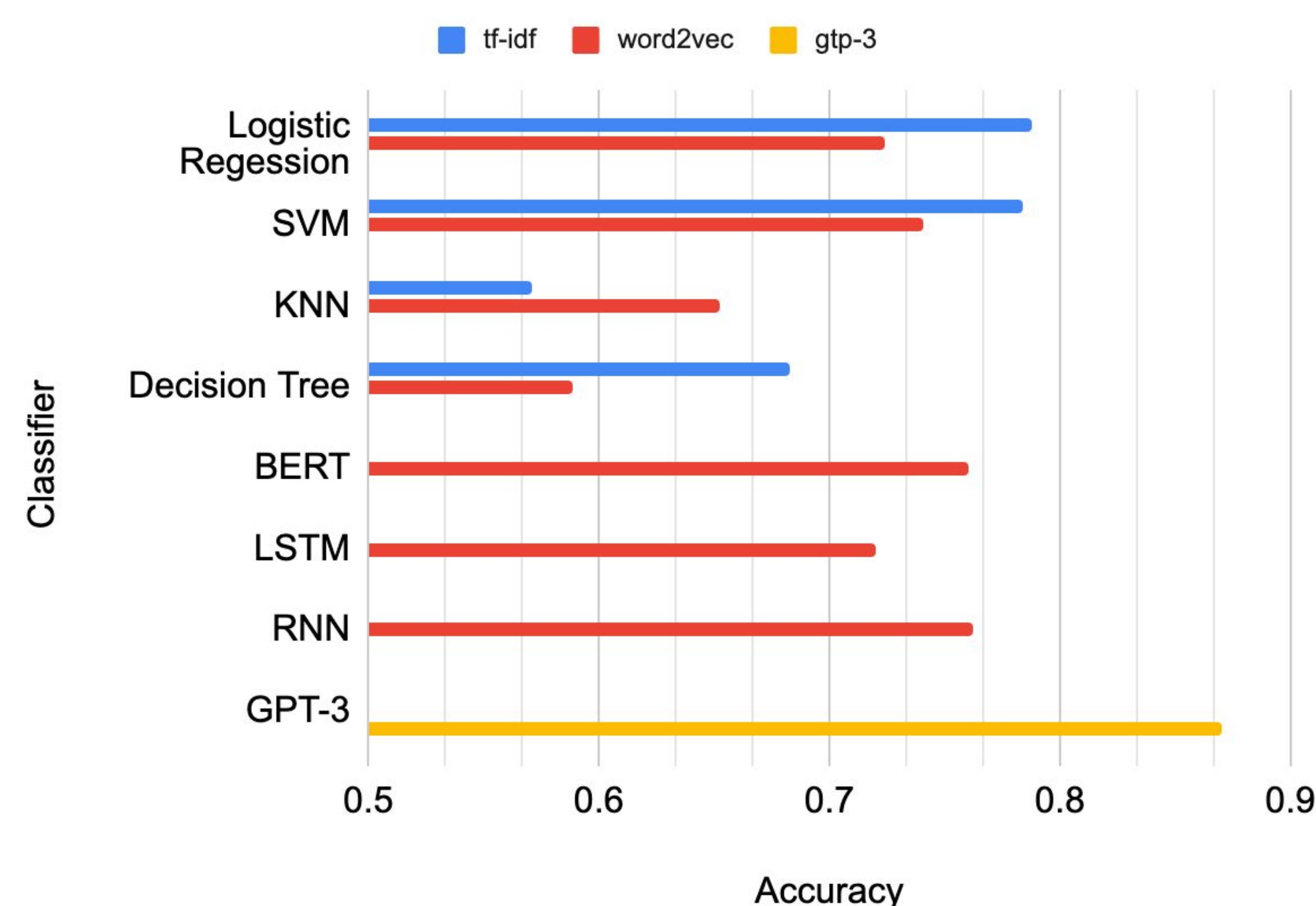


- Libraries, software, tools: Gensim, Keras, Pandas, NumPy, TensorFlow, PyTorch, Sklearn, nltk, re, Bert, google colab, word2vec, Python
- Randomly sampled 25,000 positive tweets and 25,000 negative tweets from a dataset of 1.6 million tweets
- Train-test split of 40,000 and 10,000 for training & testing respectively
- Processed text using **tf-idf**, **word2vec**, or **SSWE**

Methods

- Train a sentiment classifier using randomly sampled tweets
- Use this sentiment classifier on a set of politician tweets

Classifier Accuracies



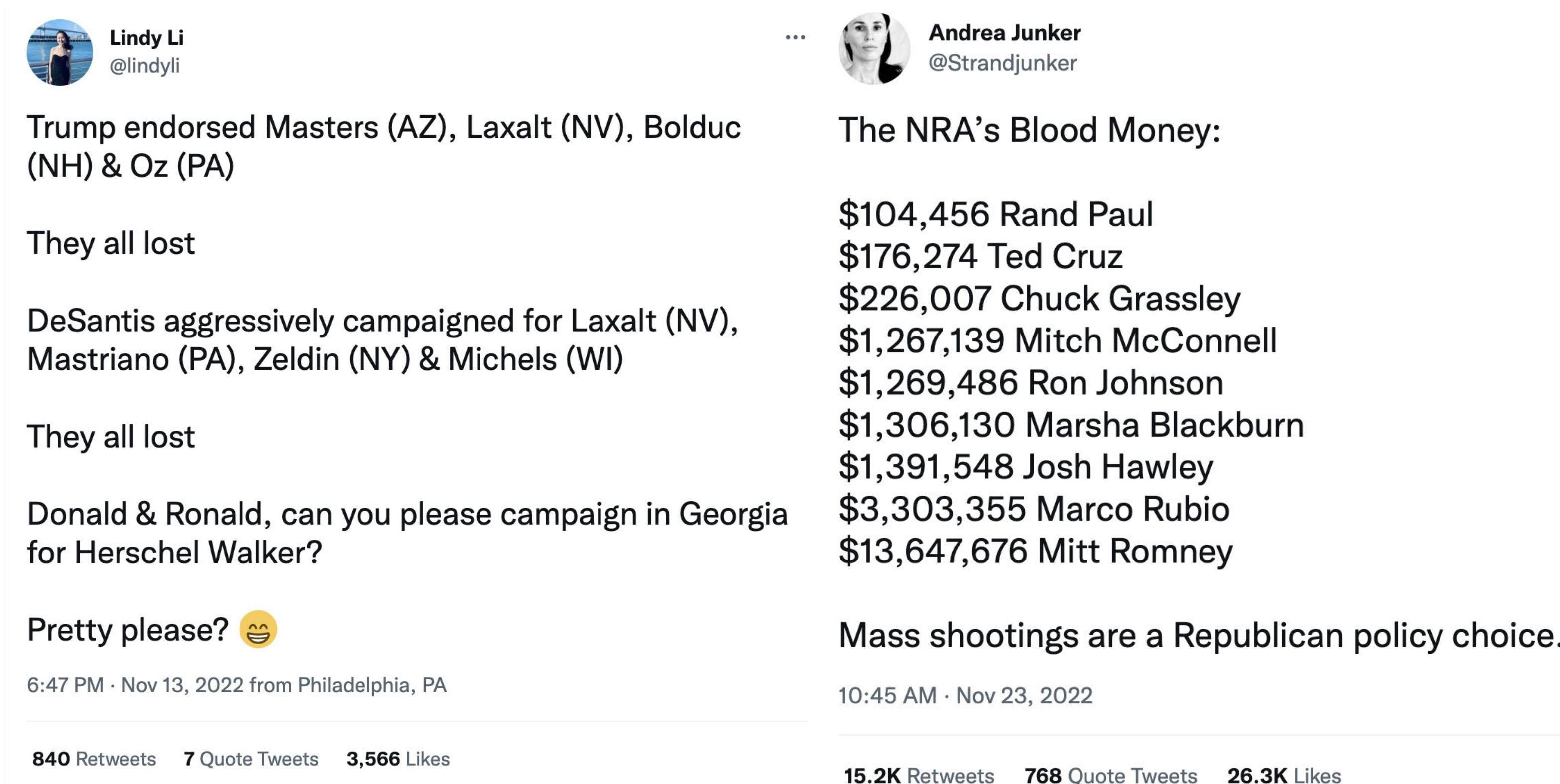
Politician Sentiment

- Chose popular Democrat vs. Republican opponents from most recent US Senate election
- Extracted ~300 tweets **about** each politician using Twitter Search API
- All tweets are from November 23, 2022

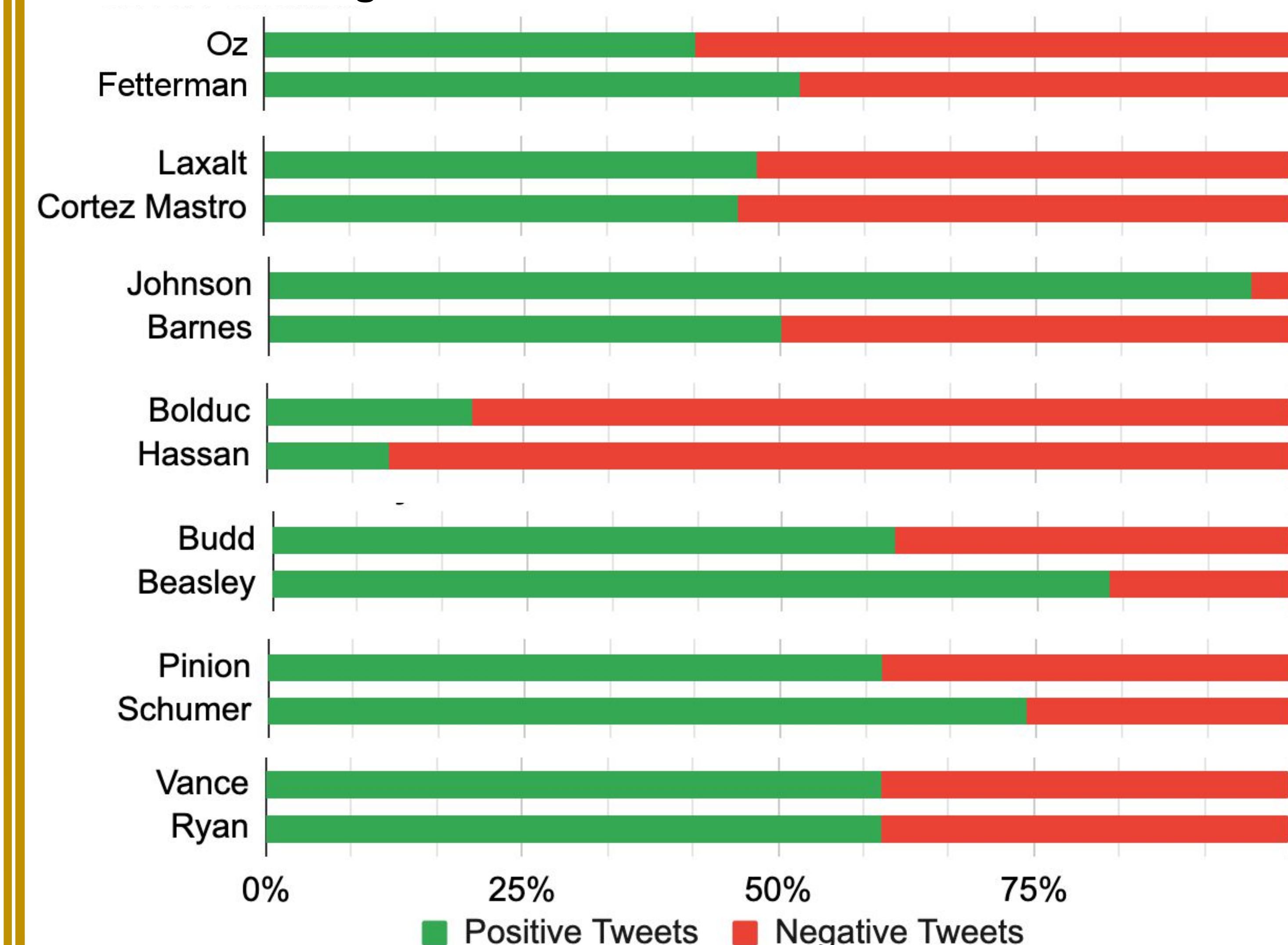
State	Republican	Democrat
PA	Mehmet Oz	John Fetterman
NV	Adam Laxalt	Catherine Cortez Masto
WI	Ron Johnson	Mandela Barnes
NH	Donald Bolduc	Maggie Hassan
NC	Ted Budd	Cheri Beasley
NY	Joe Pinion	Charles Schumer
OH	JD Vance	Tim Ryan

Green = won election

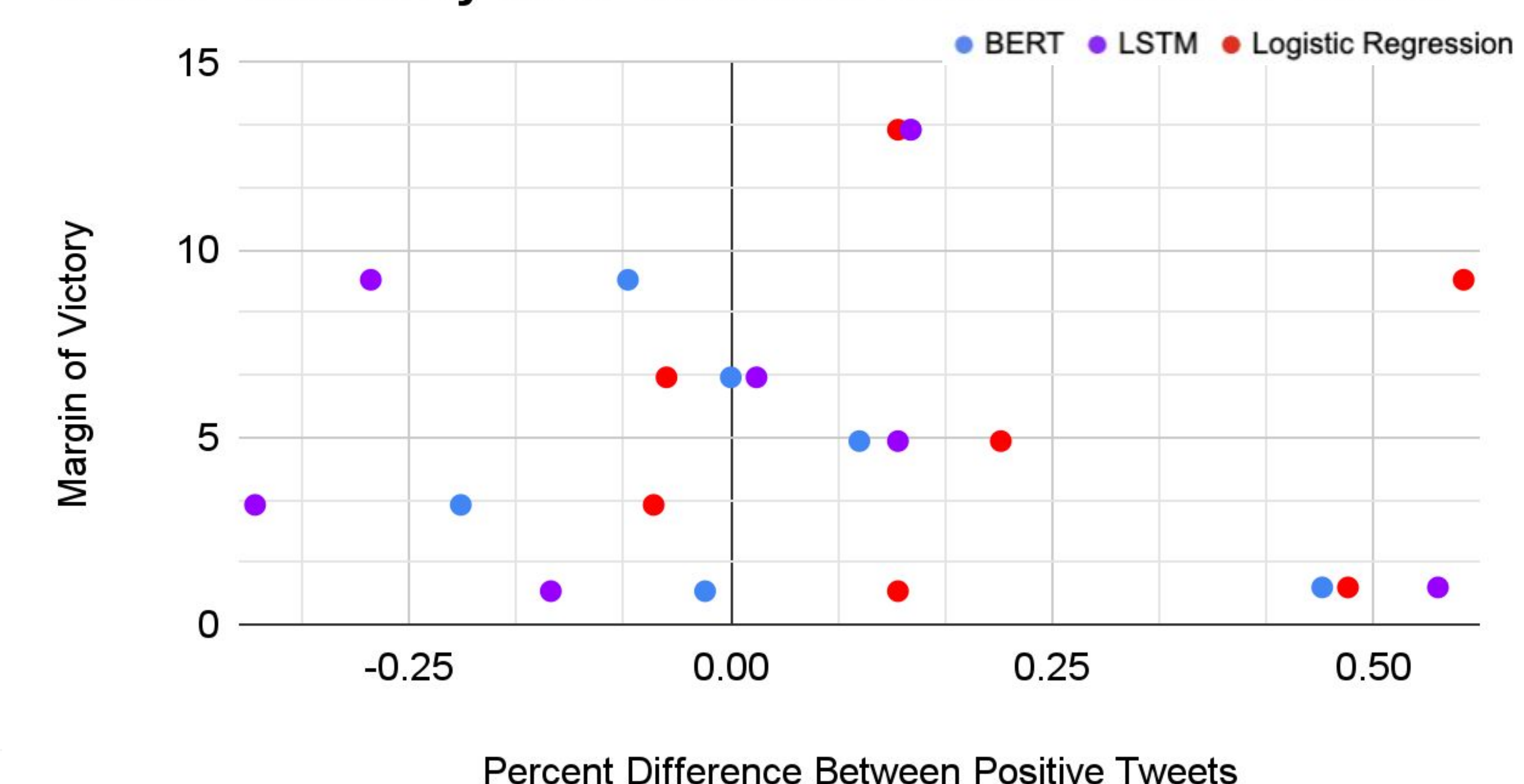
Red = lost election



Positive vs. Negative Twitter Sentiment for Each Political Race



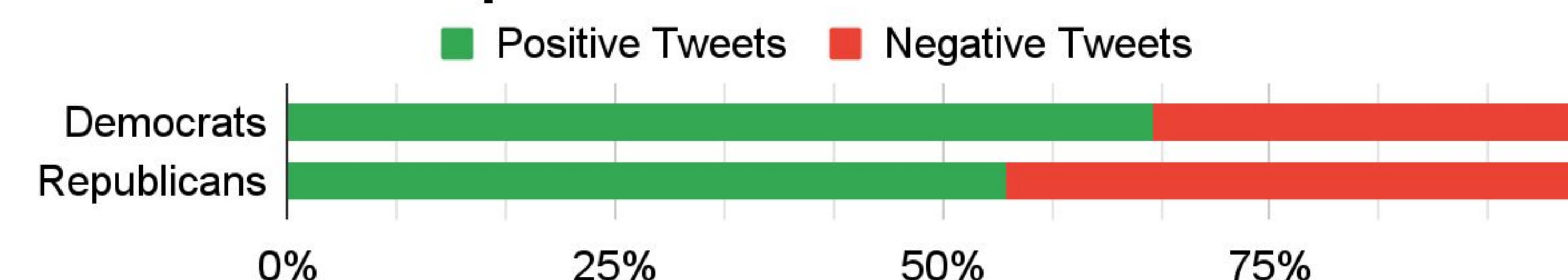
% Won Election By vs. % Difference Between Positive Tweets



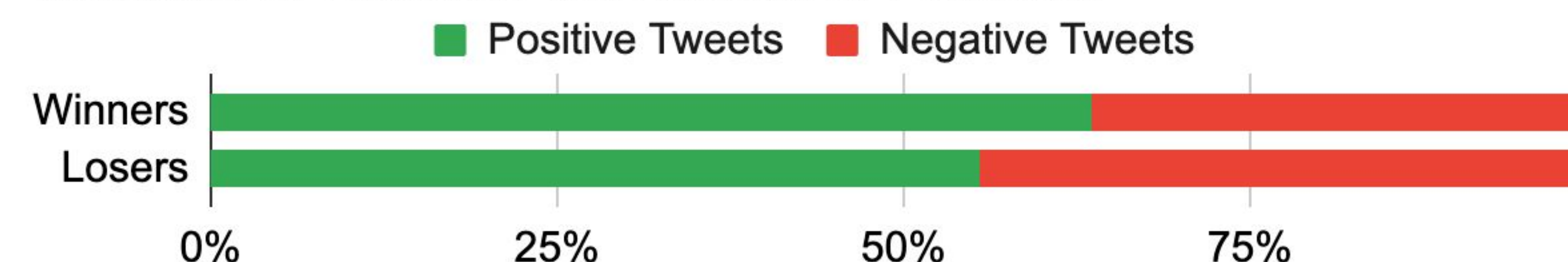
Results

Used average of LSTM, BERT, LogReg to predict politician tweets

Democrats vs. Republicans



Winners of Election vs. Losers of Election



Conclusions

- Findings:**
 - 1) **Democrats** had **more** positive tweets than **Republicans**
 - 2) **Winners** had **more** positive tweets than the **Losers**
 - 3) Our models **could** somewhat reliably **predict election results** based on Twitter sentiment
- Limitations:**
 - 1) Twitter users do **not** make up a **representative sample**
 - 2) **Twitter expressions of emotion** are far **different** from **interpersonal expressions of emotion**
 - 3) **Full API**: see how sentiment changes over time
 - 4) Train more **complex Neural Network** models
- Future**: dataset of political tweets, non-binary classification, and analyze the number of retweets/likes