

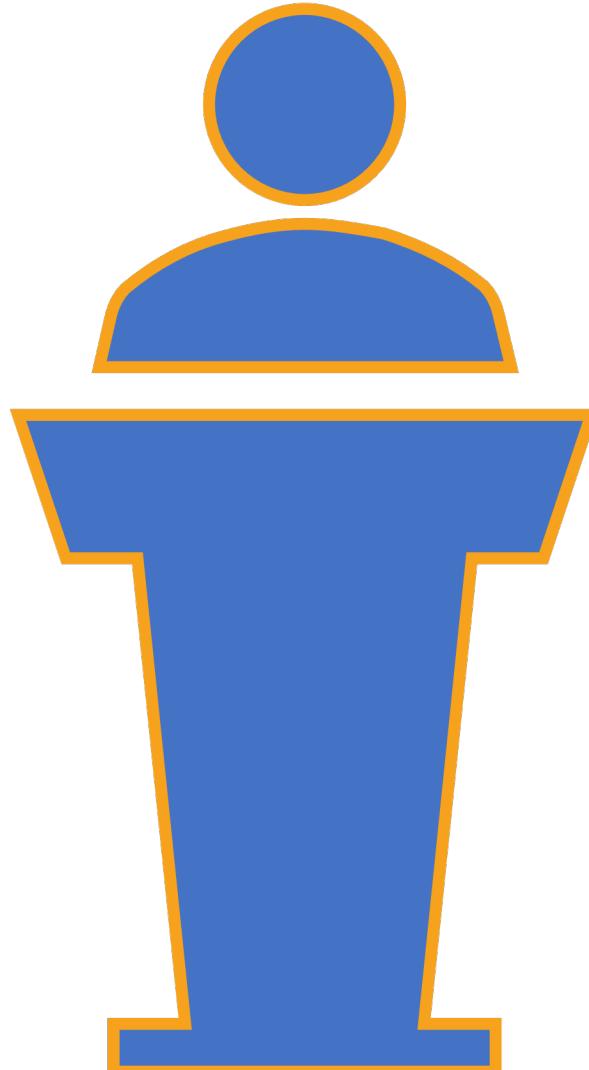


Analyzing Presidential Debates

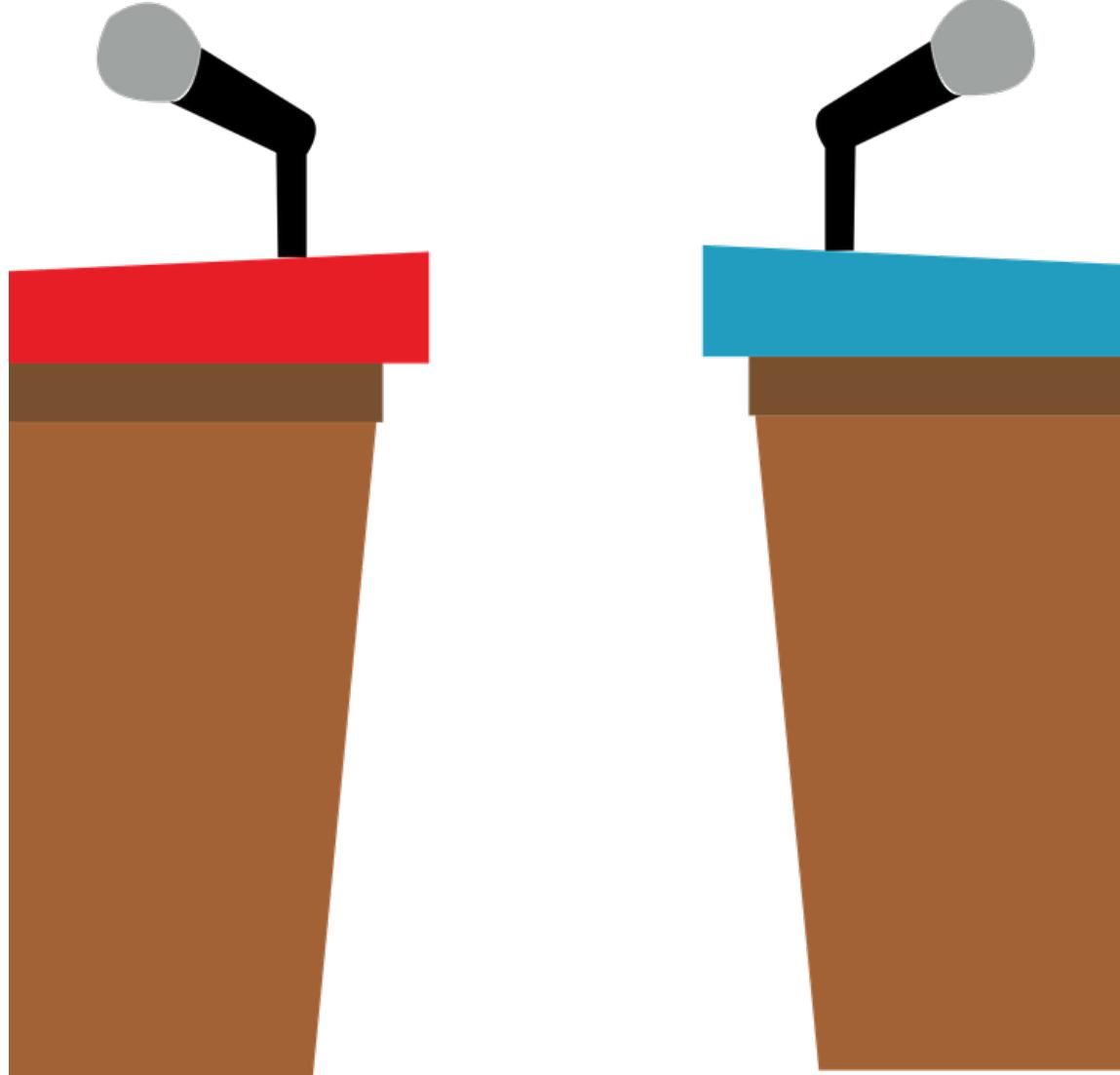
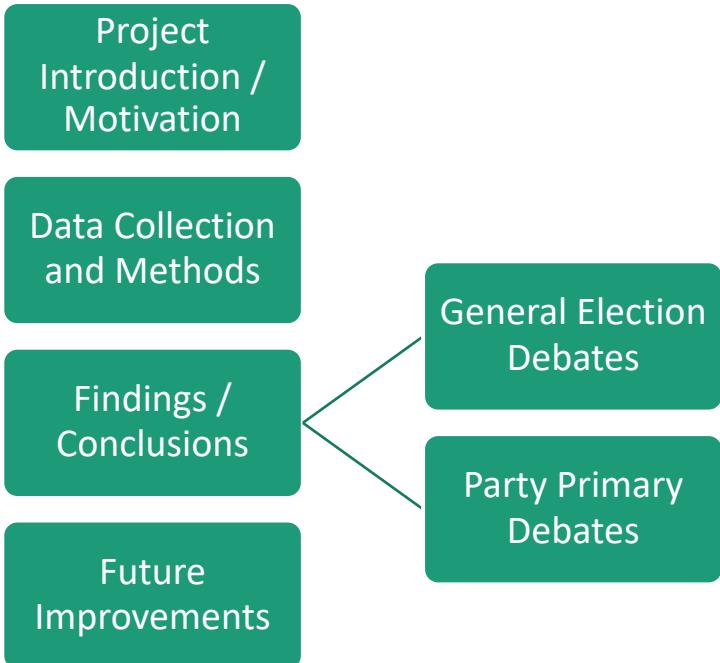
Metis Project 4

2/26/2021

By: Patrick Bovard

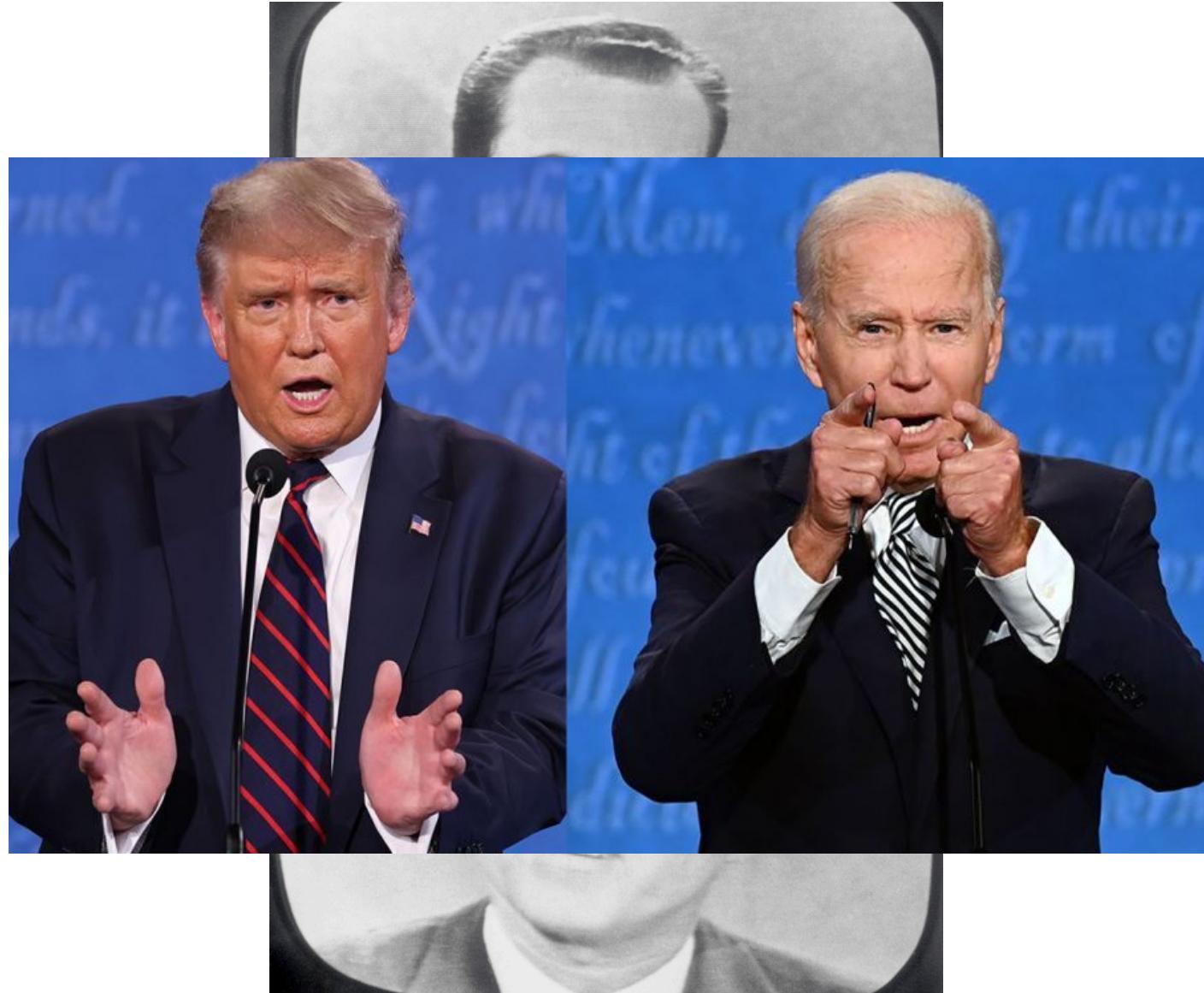


Agenda



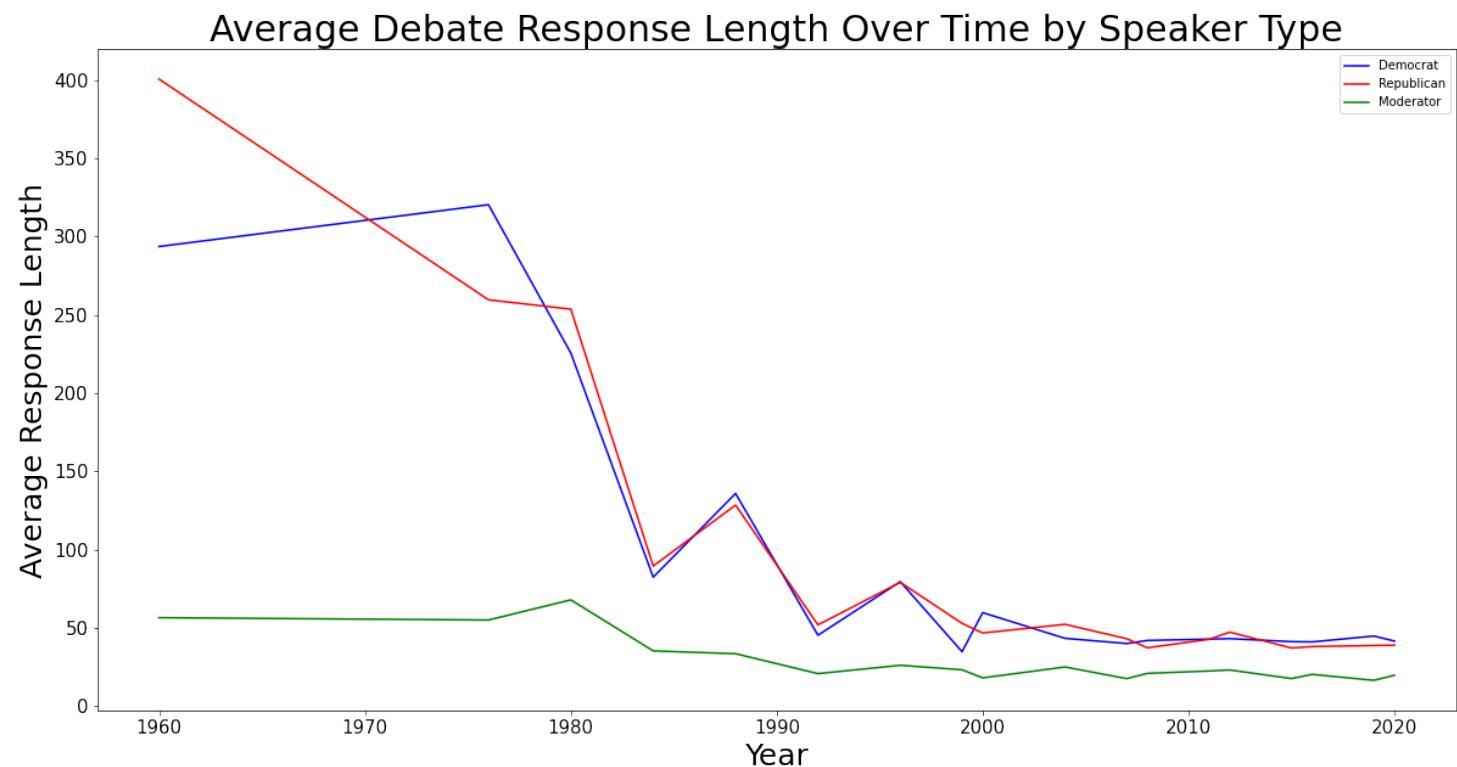
The televised Presidential Debate fundamentally changed the United States election process

- Began with Kennedy v. Nixon in 1960
 - Intimate, live view of candidates
- Now:
 - Large-scale television event
 - Years-long process: General election and primaries
- **Main Questions:**
 - How have debates changed in topic over time?
 - Do parties tend to focus on certain topics?
 - Do party nomination winners tend to have distinct focuses compared to losers?



Data was scraped from all available presidential debate transcripts for analysis

- General Elections: 1960-2020
- Party Primaries: 2000-2020
- Pre-processing
 - Lemmatization
 - TF-IDF Vectorization
- “Document” = one paragraph
 - Tagged by speaker, date, party, and election result of speaker



Topic modelling via NMF
revealed 8 major
categories



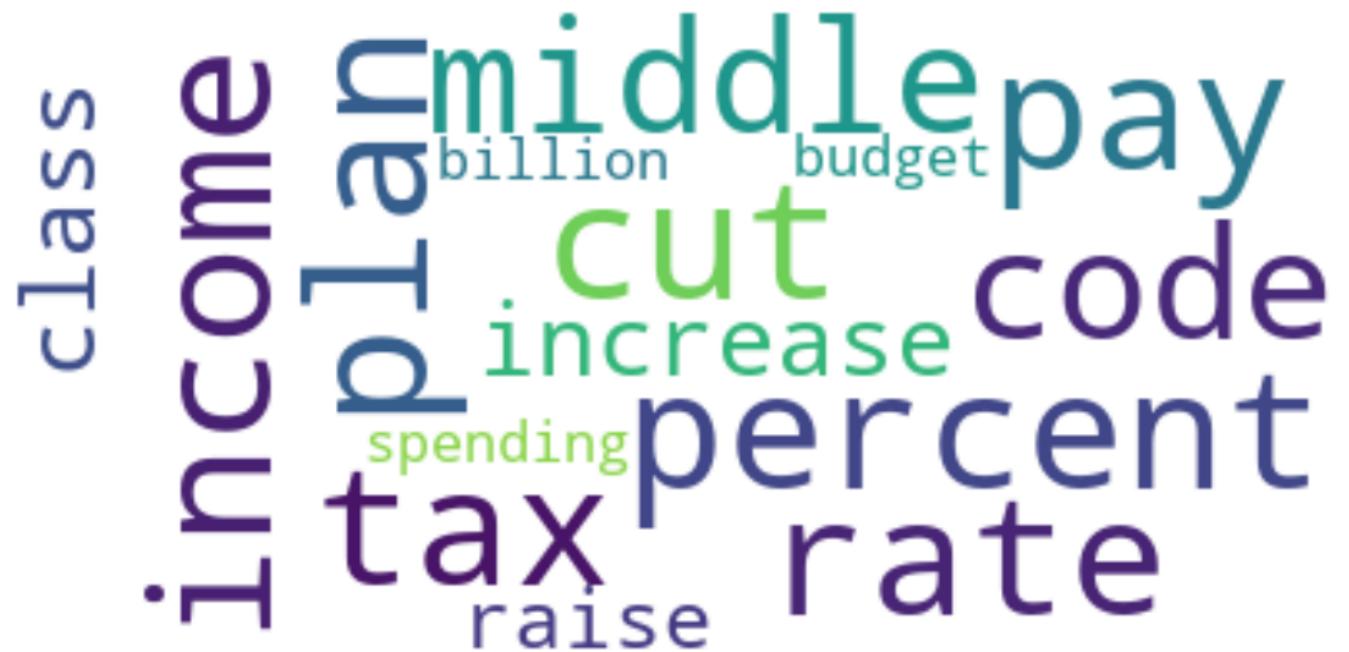
Topic modelling via NMF
revealed 8 major
categories

- Campaign Issues

believe one
right let issue time
life know first + people
thing lot well law

Topic modelling via NMF
revealed 8 major
categories

- Campaign Issues
- Taxes



Topic modelling via NMF
revealed 8 major
categories

- Campaign Issues
- Taxes
- Healthcare

A word cloud visualization showing the most common topics from topic modelling via NMF. The words are arranged in a cluster, with larger words indicating higher frequency. The colors of the words vary, suggesting different topics or categories.

The words in the cloud include:

- coverage (yellow)
- doctor (green)
- medicare (teal)
- every (light blue)
- insurance (blue)
- system (green)
- universal (green)
- million (purple)
- plan (purple)
- drug (blue)
- health (blue)
- american (green)
- company (green)
- cost (blue)
- care (green)
- people (purple)
- child (purple)
- affordable (blue)

Topic modelling via NMF
revealed 8 major
categories

- Campaign Issues
- Taxes
- Healthcare
- Education

A word cloud visualization where the size and color of words represent their frequency and importance in the topic. The most prominent words are 'education' (large green), 'school' (large blue), 'teacher' (large blue), 'child' (large green), and 'kid' (large purple). Other visible words include 'college' (yellow), 'need' (blue), 'parent' (teal), 'student' (purple), 'make' (yellow), 'choice' (yellow), 'public' (purple), 'money' (purple), 'every' (green), 'family' (green), 'federal' (green), 'help' (yellow), 'program' (purple), and 'go' (purple).

Topic modelling via NMF
revealed 8 major
categories

- Campaign Issues
- Taxes
- Healthcare
- Education
- Social Security

A word cloud visualization where the size and color of words represent their frequency and importance. The most prominent words are 'social' (green), 'medicare' (green), 'program' (purple), 'benefit' (teal), 'security' (green), 'trust' (purple), 'money' (purple), 'budget' (green), 'cut' (yellow), 'senior' (yellow), 'retirement' (teal), 'debt' (teal), 'fund' (green), and 'dollar' (green). Smaller words include 'national' (blue), 'system' (blue), 'spending' (blue), 'billions' (yellow), and 'trillions' (yellow).

Topic modelling via NMF
revealed 8 major
categories

- Campaign Issues
- Taxes
- Healthcare
- Education
- Social Security
- Foreign Policy/Military

A word cloud visualization showing topics from topic modelling via NMF. The words are colored in various shades of green, purple, and yellow, and some have small text annotations above them.

The words and their approximate bounding boxes are:

- ally (yellow)
- troop (green)
- iran (teal)
- force (light blue)
- make (purple)
- need (purple)
- nuclear (purple)
- iraq (purple)
- foreign (light green)
- nation (teal)
- state (green)
- policy (yellow)
- world (purple)
- military (green)
- country (green)
- deal (yellow)
- war (yellow)
- iran (teal)
- united (green)
- weapon (purple)

Topic modelling via NMF revealed 8 major categories

- Campaign Issues
- Taxes
- Healthcare
- Education
- Social Security
- Foreign Policy/Military
- Domestic Economy

A word cloud visualization showing topics related to small business, jobs, and economy. The words are colored in shades of blue, green, and yellow. The most prominent words are 'small business', 'million', 'job', 'work', 'new', 'economy', 'energy', and 'create'. Smaller words include 'good', 'people', 'company', 'percent', 'trade', 'got', 'manufacturing', and 'created'. The word 'create' is oriented vertically on the right side of the cloud.

Topic modelling via NMF
revealed 8 major
categories

- Campaign Issues
- Taxes
- Healthcare
- Education
- Social Security
- Foreign Policy/Military
- Domestic Economy
- Debate Speak

keep change know
economy got talk
able going pay go
bring money see
look take see
back make way
people



Focus on Foreign
Policy has drastically
decreased over
time

Change in Topics Over Time





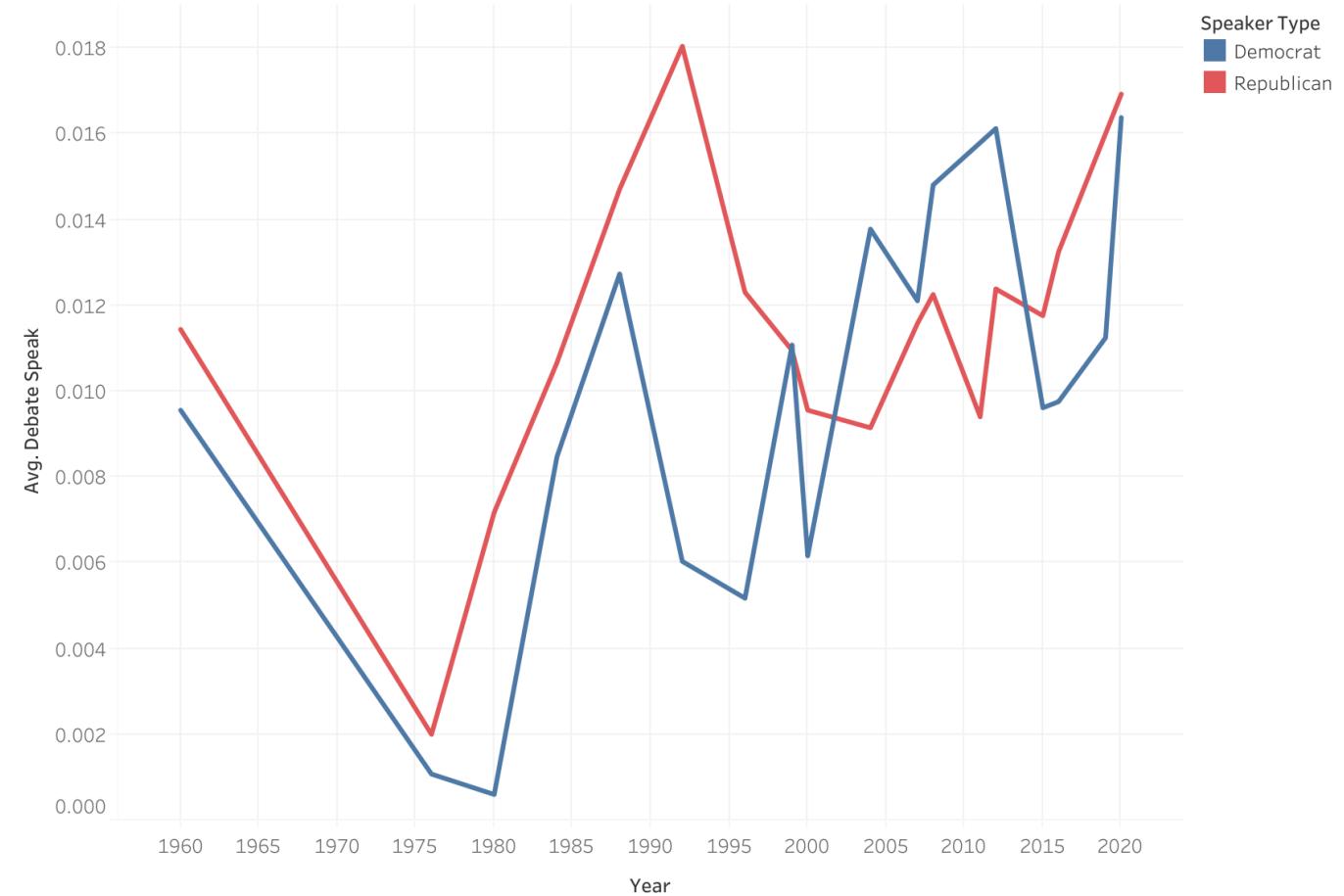
Healthcare has seen
a substantial
increase in
discussion

Change in Topics Over Time



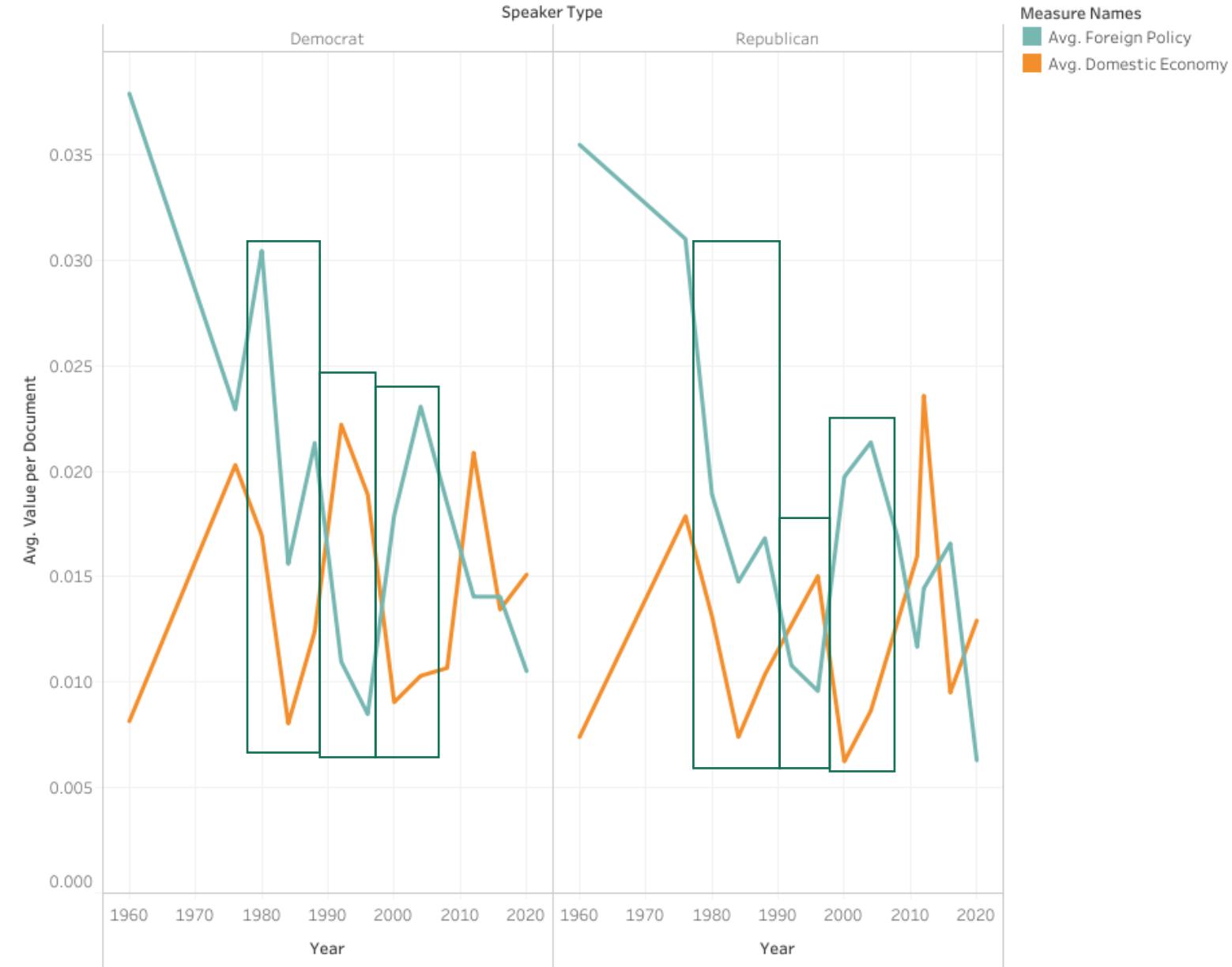
Generic “Debate Speak” has risen consistently over the last 30 years

Rise in Generic Debate Speak



Republicans tend
to win general
elections when
Foreign Policy is a
higher debate
focus

Relationship Between Foreign Policy and the Domestic Economy



Democratic and Republican Primaries had many similar topics with different key words.

Topic	Democrat Key Word Example	Republican Key Word Example

Democratic and Republican Primaries had many similar topics with different key words.

Topic	Democrat Key Word Example	Republican Key Word Example
Taxes	Pay	Cut
Healthcare	Universal, Access	Market
Foreign Policy / Military	End, Home	Take, Make



Additionally, unique topics emerged within each party

Democrat Unique Topics	Republican Unique Topics



Additionally, unique topics emerged within each party

Democrat Unique Topics	Republican Unique Topics
Progressive Ideas	Religion in Education
Big Pharma	Border Security / Immigration

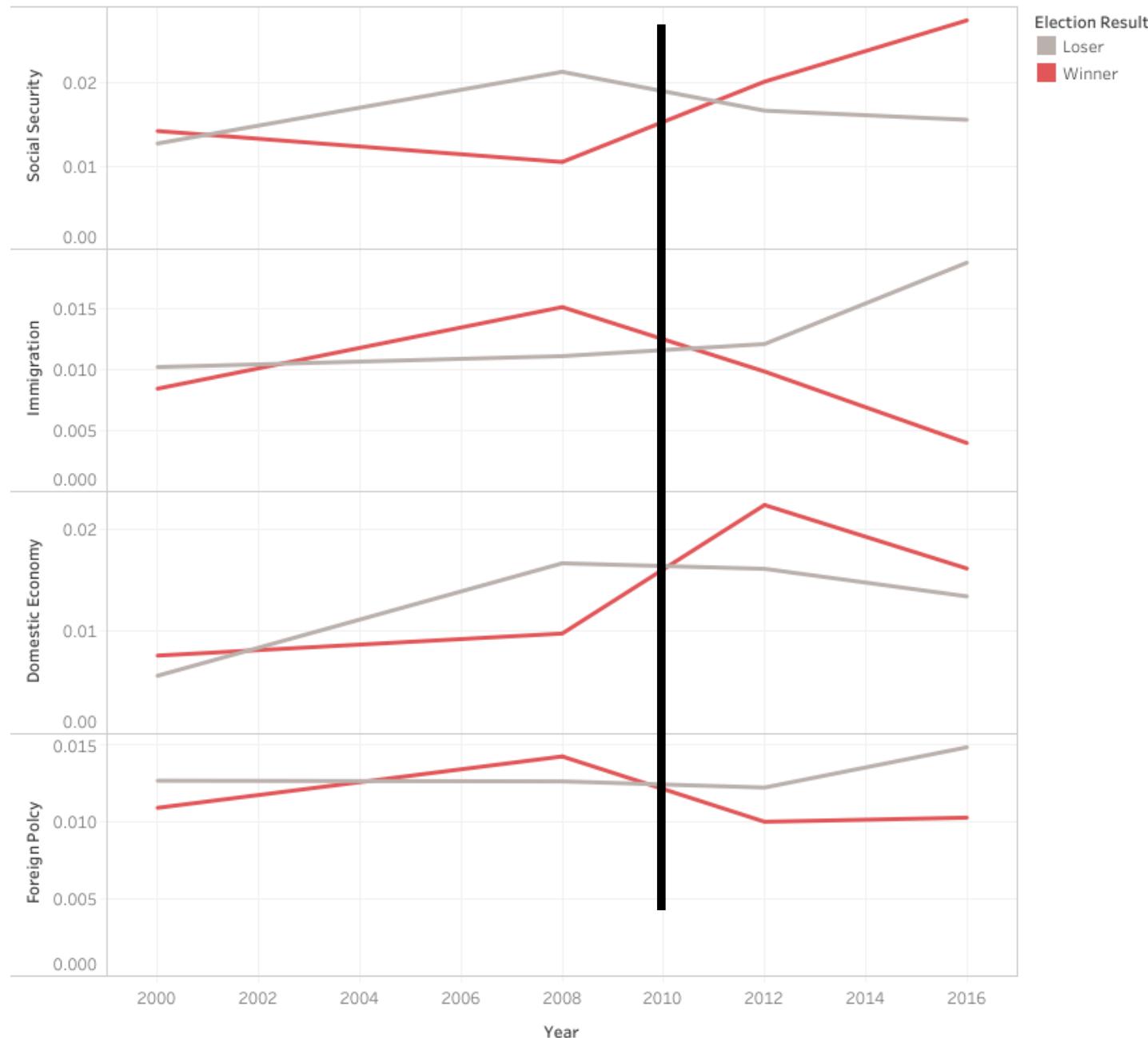


Successful Democratic candidates have tended to focus more on Progressive Ideas, and less on economic topics

Average Topic Value For Democratic Primaries



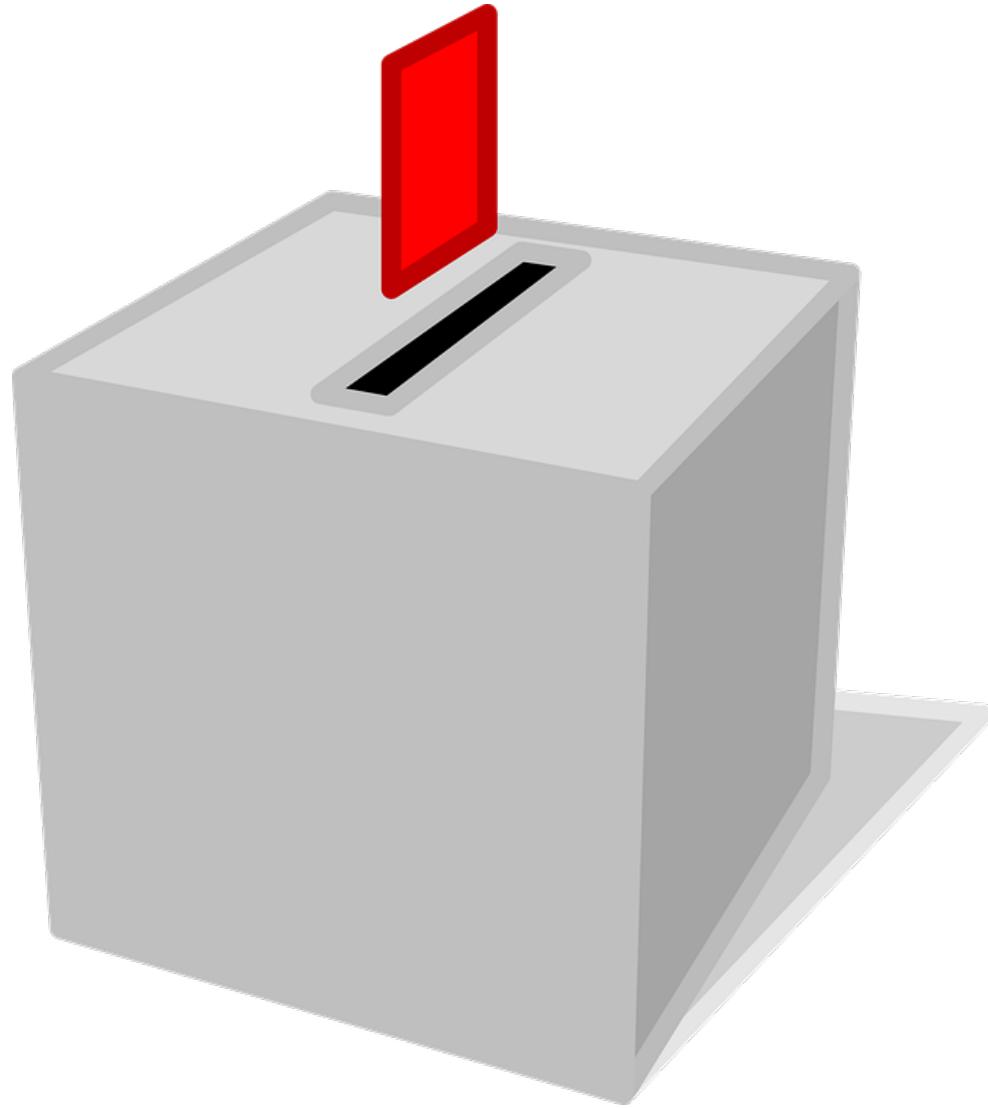
Average Topic Value For Republican Primaries



After McCain,
successful Republicans
have shifted more focus
to Social Security and
the Domestic Economy

Future Improvements

- Next election cycle:
 - Candidate Recommendation System
 - Predictive Modeling on Elections
- Training advanced word embeddings

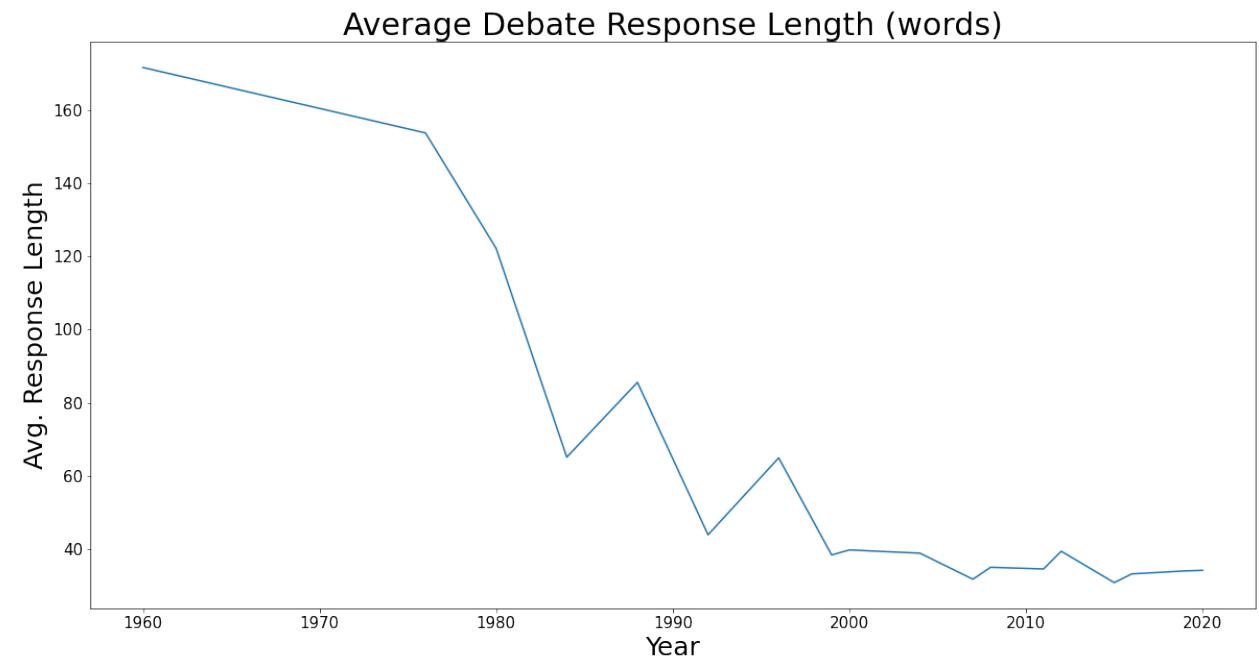


Thank you!

Any Questions?

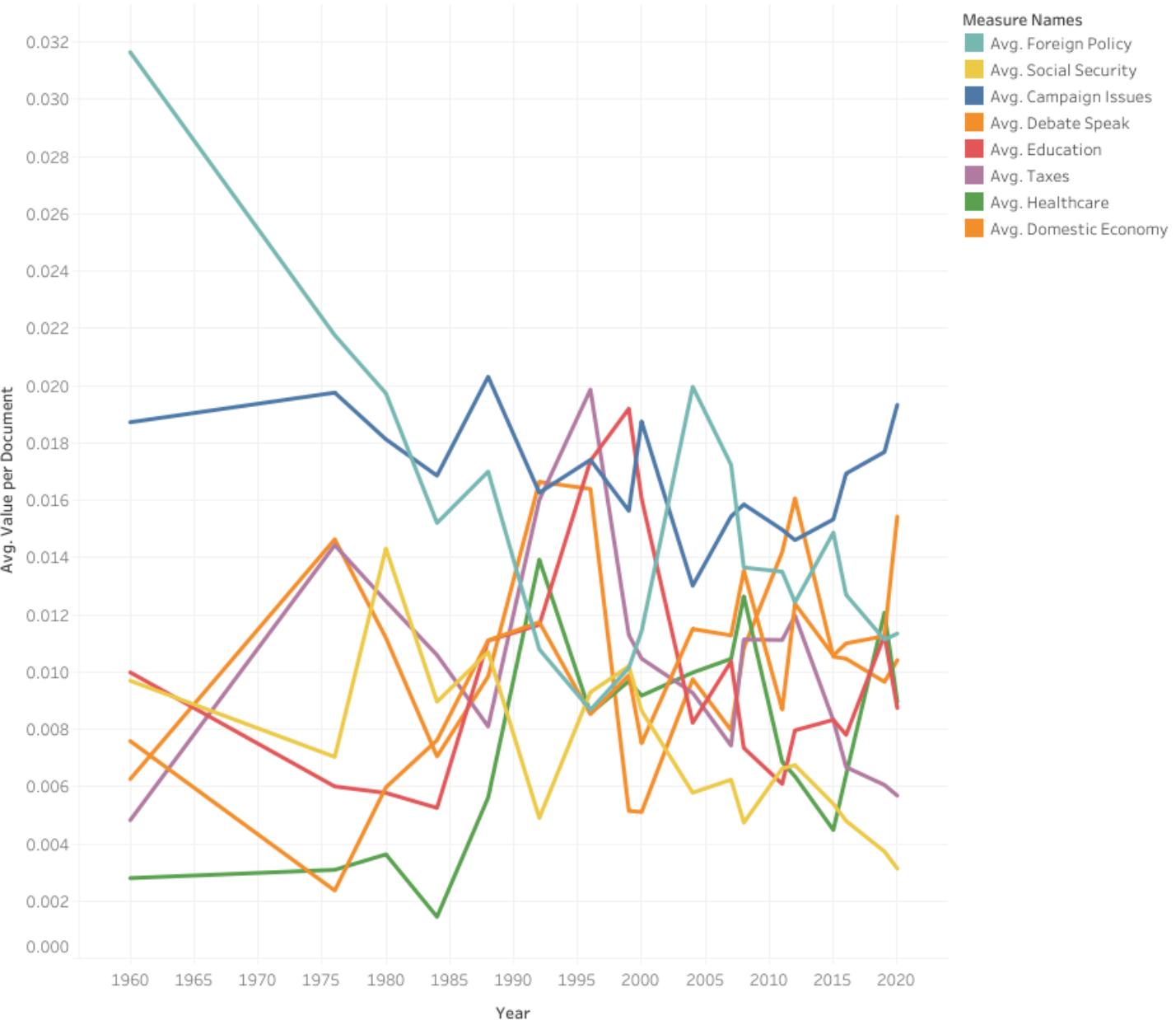
Appendix

The average debate response length has decreased substantially over time



Full Data Set Changes Over Time

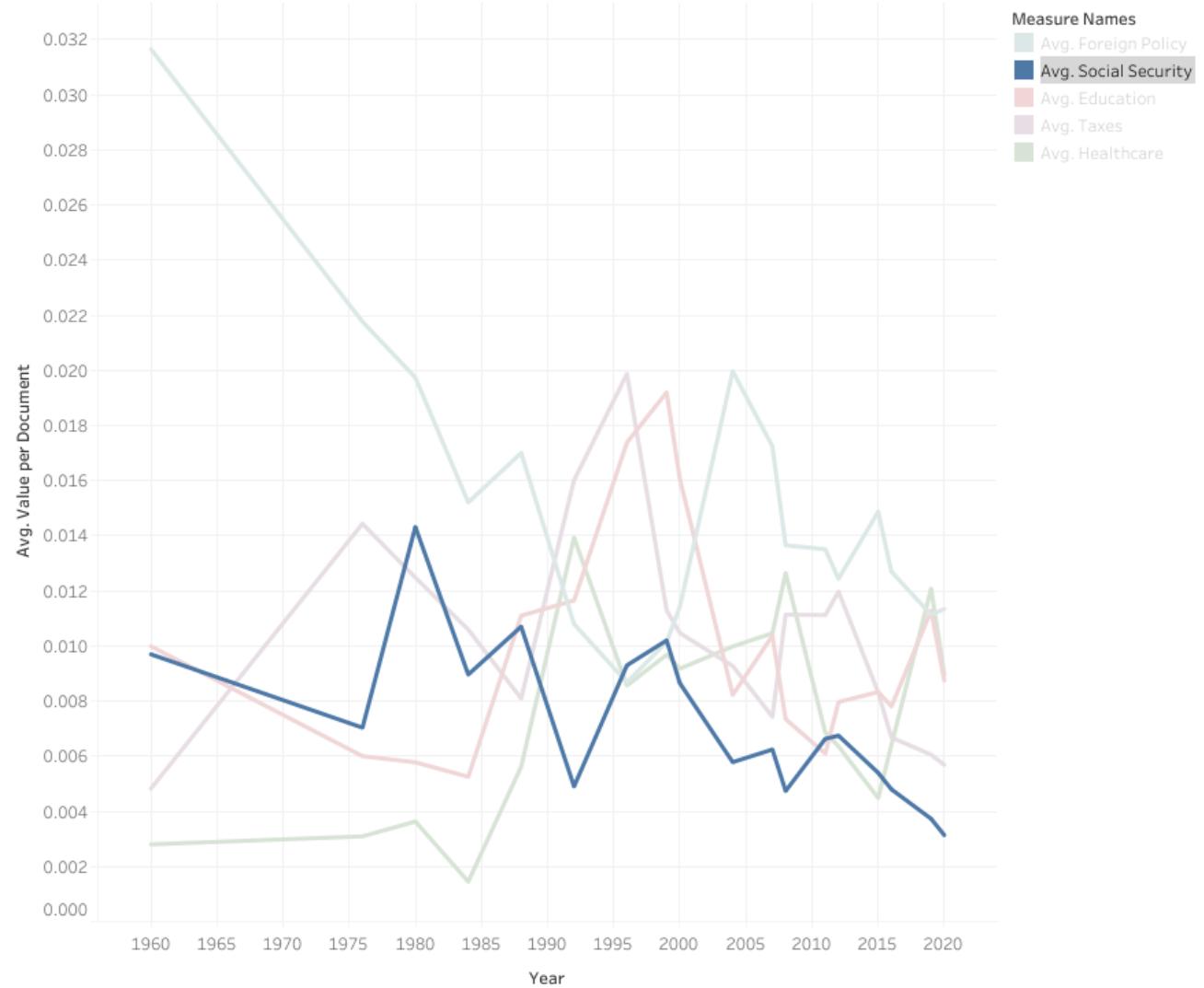
Change in Topics Over Time (Full Set)





Focus on Foreign
Policy and Social
Security have
steadily decreased
over time

Change in Topics Over Time





Education and taxes
have a more cyclical
nature

Change in Topics Over Time





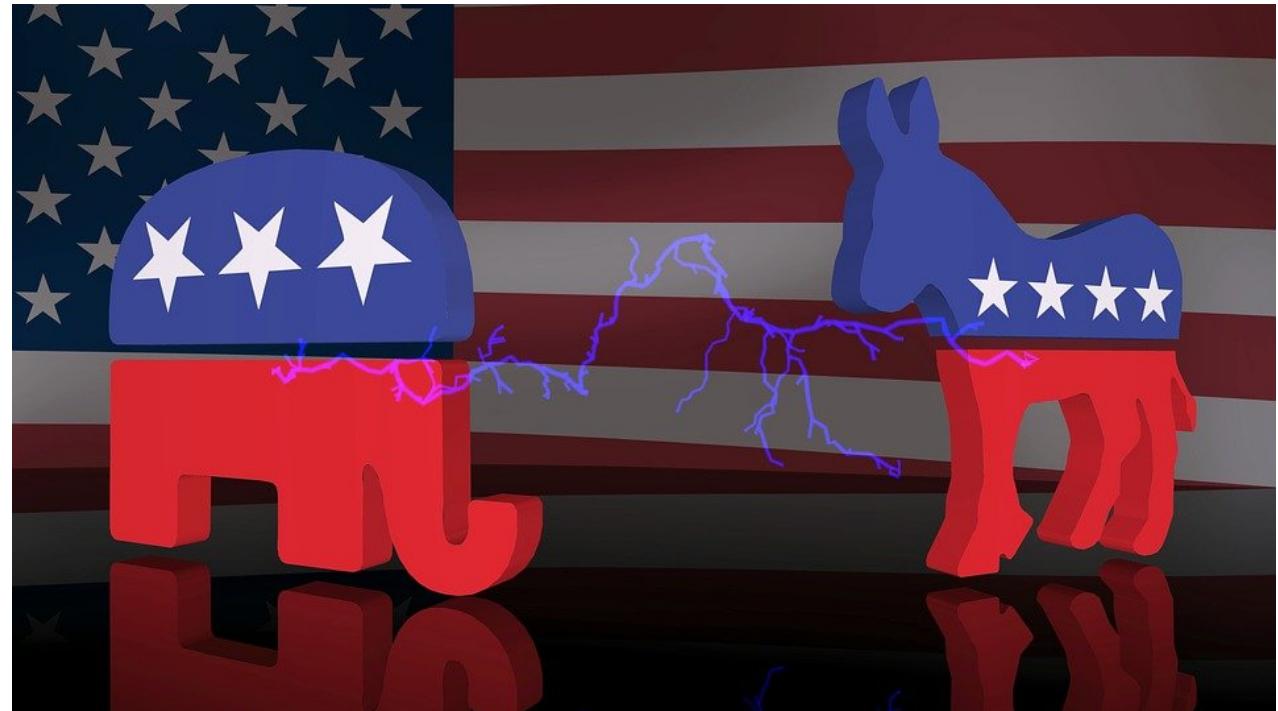
Education and taxes
have a more cyclical
nature

Change in Topics Over Time



Topic modelling was run individually on Democratic and Republican primaries

- Goal:
 - Do same topics emerge?
 - Are there any new topics?
 - New ways of describing same topics?



Full Corpus Final Topics and Key Words

- Topic 1: ['people', 'know', 'one', 'right', 'time', 'thing', 'issue', 'well', 'like', 'life', 'let', 'believe', 'law', 'come', 'first', 'lot', 'way', 'look', 'got']
- Topic 2: ['tax', 'cut', 'percent', 'income', 'pay', 'plan', 'rate', 'middle', 'code', 'increase', 'class', 'raise', 'spending', 'billion', 'budget', 'money', 'family', 'capital', 'fair']
- Topic 3: ['health', 'care', 'insurance', 'plan', 'cost', 'medicare', 'company', 'system', 'universal', 'people', 'affordable', 'coverage', 'drug', 'million', 'doctor', 'american', 'private', 'every', 'child']
- Topic 4: ['school', 'child', 'education', 'need', 'teacher', 'kid', 'parent', 'college', 'public', 'family', 'student', 'make', 'every', 'money', 'program', 'choice', 'go', 'help', 'federal']
- Topic 5: ['going', 'make', 'go', 'know', 'back', 'change', 'able', 'pay', 'take', 'economy', 'money', 'way', 'see', 'talk', 'got', 'bring', 'look', 'keep', 'people']
- Topic 6: ['security', 'social', 'medicare', 'money', 'program', 'benefit', 'cut', 'budget', 'national', 'fund', 'senior', 'retirement', 'trust', 'trillion', 'billion', 'system', 'debt', 'dollar', 'spending']
- Topic 7: ['state', 'united', 'war', 'world', 'need', 'iraq', 'military', 'nuclear', 'iran', 'weapon', 'policy', 'troop', 'nation', 'force', 'foreign', 'ally', 'make', 'country', 'deal']
- Topic 8: ['job', 'economy', 'business', 'million', 'work', 'create', 'new', 'energy', 'small', 'trade', 'people', 'percent', 'good', 'created', 'got', 'back', 'manufacturing', 'company', 'growth']

Democratic Primary Topics and Key Words:

- Topic 1: ['people', 'know', 'one', 'state', 'right', 'united', 'time', 'well', 'like', 'gun', 'thing', 'woman', 'done', 'bill', 'come', 'fact', 'got', 'look', 'number', 'let']
- Topic 2: ['health', 'care', 'plan', 'universal', 'insurance', 'affordable', 'coverage', 'system', 'medicare', 'child', 'people', 'cost', 'every', 'million', 'single', 'access', 'american', 'provide', 'cover', 'everyone']
- Topic 3: ['tax', 'pay', 'percent', 'class', 'middle', 'income', 'wealth', 'family', 'paying', 'dollar', 'cut', 'people', 'money', 'raise', 'million', 'top', 'wealthy', 'rate', 'street', 'working']
- Topic 4: ['school', 'education', 'child', 'college', 'kid', 'teacher', 'public', 'every', 'student', 'free', 'go', 'tuition', 'debt', 'make', 'program', 'family', 'community', 'university', 'high', 'young']
- Topic 5: ['war', 'iraq', 'troop', 'iran', 'military', 'end', 'voted', 'combat', 'afghanistan', 'world', 'security', 'vote', 'policy', 'nuclear', 'home', 'weapon', 'force', 'foreign', 'united', 'continue']
- Topic 6: ['going', 'know', 'make', 'change', 'together', 'people', 'able', 'take', 'run', 'got', 'cost', 'forward', 'economy', 'talk', 'everybody', 'tell', 'way', 'problem', 'bring', 'something']
- Topic 7: ['need', 'job', 'trade', 'world', 'make', 'change', 'climate', 'energy', 'worker', 'deal', 'right', 'new', 'work', 'also', 'china', 'way', 'policy', 'agreement', 'fuel', 'help']
- Topic 8: ['company', 'insurance', 'drug', 'money', 'medicare', 'prescription', 'cost', 'profit', 'big', 'industry', 'system', 'private', 'healthcare', 'price', 'doctor', 'lobbyist', 'people', 'pharmaceutical', 'million', 'billion']

Republican Primary Topics and Key Words:

- Topic 1: ['state', 'united', 'war', 'world', 'iran', 'military', 'nuclear', 'one', 'policy', 'take', 'weapon', 'iraq', 'foreign', 'nation', 'like', 'make', 'china', 'israel', 'trade', 'interest']
- Topic 2: ['tax', 'cut', 'percent', 'income', 'plan', 'rate', 'code', 'pay', 'flat', 'spending', 'corporate', 'money', 'capital', 'rid', 'gain', 'raise', 'budget', 'lower', 'middle', 'fair']
- Topic 3: ['health', 'care', 'insurance', 'cost', 'saving', 'plan', 'account', 'system', 'buy', 'medicare', 'market', 'medical', 'people', 'federal', 'patient', 'program', 'percent', 'take', 'money', 'medicaid']
- Topic 4: ['life', 'school', 'child', 'right', 'pro', 'believe', 'parent', 'education', 'choice', 'law', 'court', 'family', 'make', 'every', 'decision', 'respect', 'human', 'god', 'abortion', 'federal']
- Topic 5: ['job', 'economy', 'business', 'create', 'work', 'created', 'million', 'sector', 'energy', 'back', 'regulation', 'world', 'private', 'manufacturing', 'trade', 'make', 'small', 'china', 'creation', 'good']
- Topic 6: ['going', 'security', 'social', 'program', 'back', 'money', 'go', 'change', 'spending', 'economy', 'trillion', 'take', 'save', 'washington', 'way', 'medicare', 'pay', 'dollar', 'keep', 'see']
- Topic 7: ['need', 'border', 'law', 'system', 'military', 'immigration', 'secure', 'go', 'come', 'troop', 'ground', 'force', 'make', 'problem', 'isi', 'deal', 'way', 'enforcement', 'fence', 'also']
- Topic 8: ['people', 'know', 'got', 'time', 'thing', 'let', 'lot', 'one', 'well', 'come', 'like', 'work', 'problem', 'look', 'go', 'way', 'washington', 'tell', 'done', 'party']

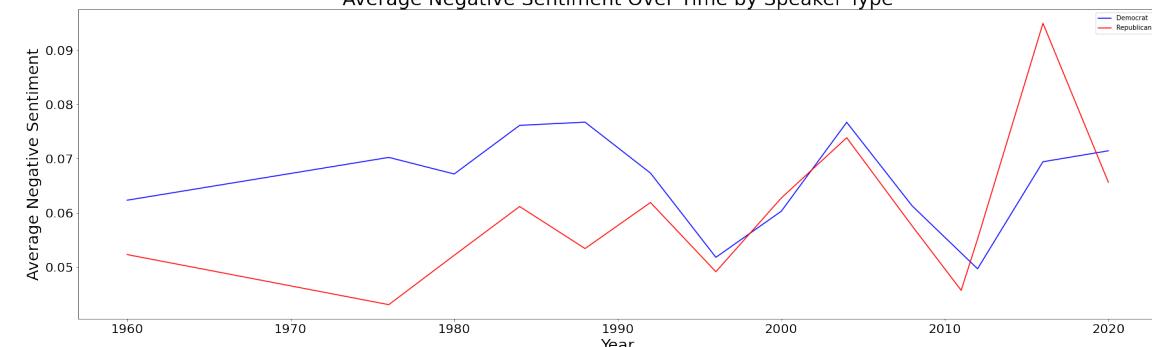
Large Discrepancies in Negative/Positive Sentiments indicate how certain campaigns were run.

Bush v. Kerry

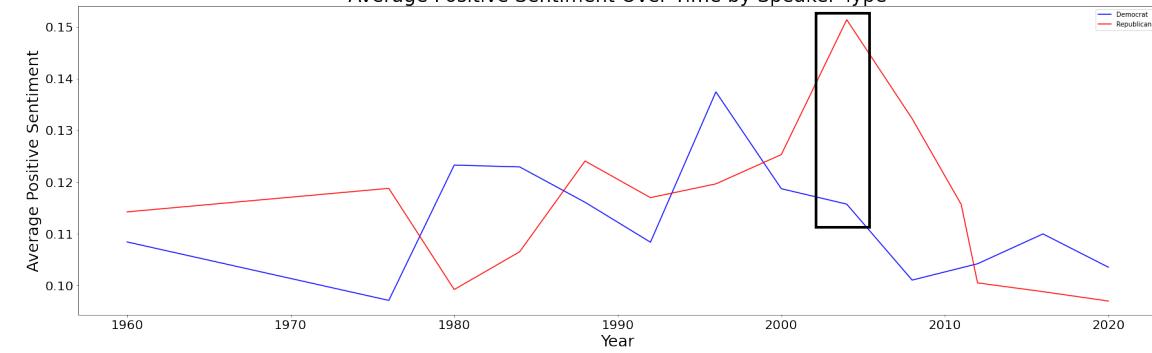
- Early Iraq War, Good Enough Economy
- Post-9/11

2004

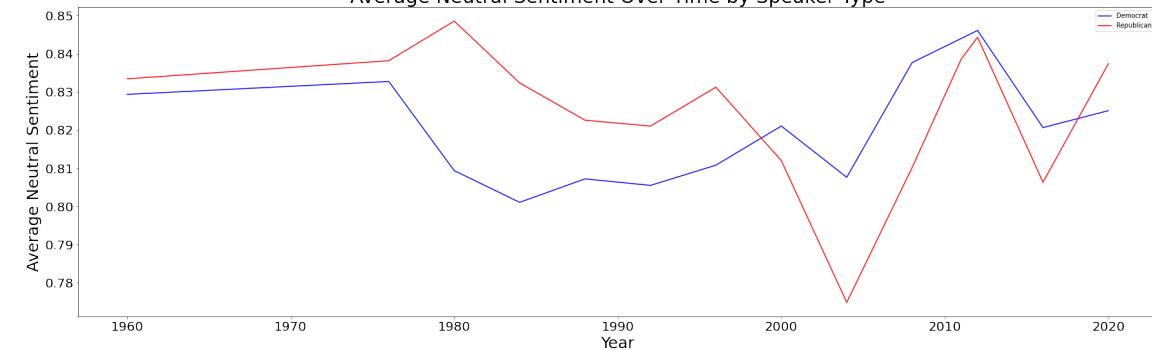
Average Negative Sentiment Over Time by Speaker Type



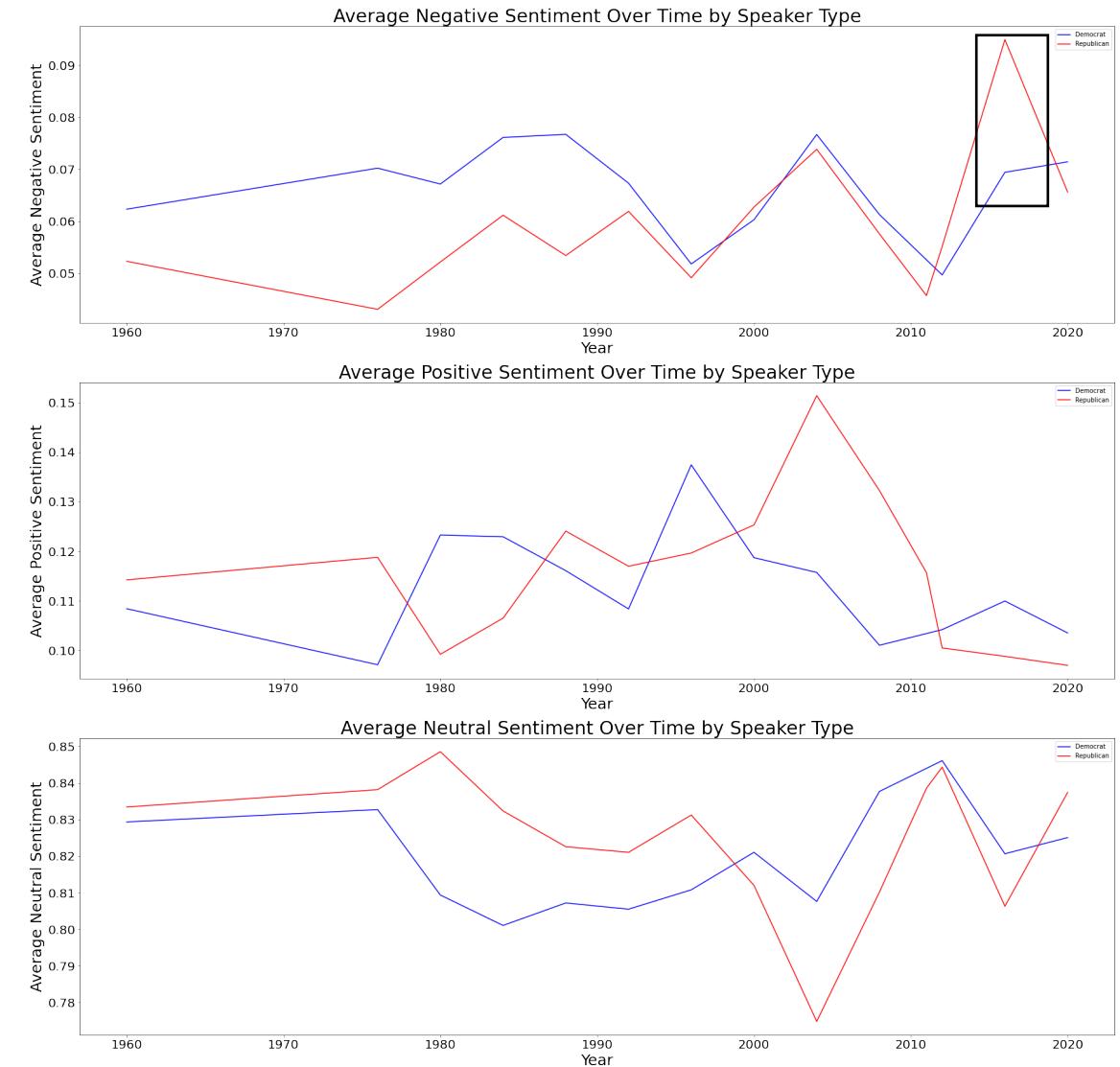
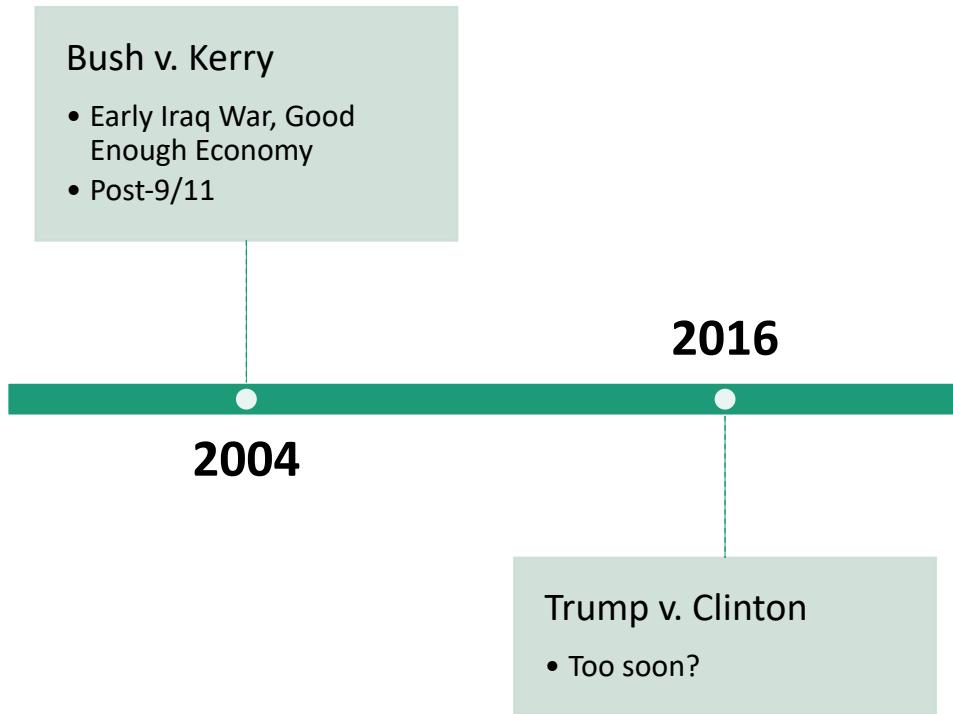
Average Positive Sentiment Over Time by Speaker Type



Average Neutral Sentiment Over Time by Speaker Type



Large Discrepancies in Negative/Positive Sentiments indicate how certain campaigns were run.



Sentiment Analysis: Election Winners and Losers

