LLM As Presidential Candidate: Analyzing Shifts in Political Rhetoric Over Time

Niki Ekstrom, Michelle Hewson, Sydney Levy, Soline Boussard

Motivation

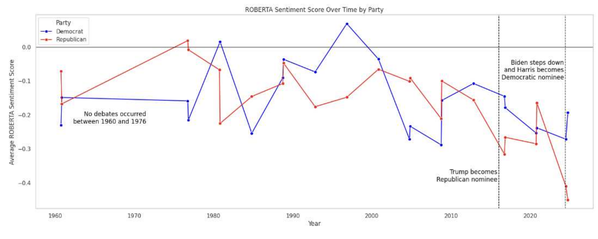
- **Understanding Political Influence:** Presidential debates are pivotal moments in shaping voter opinions and influencing election outcomes.
- **Tracking Historical Shifts:** Examining every debate from 1960 to 2024 provides a unique opportunity to understand how political rhetoric has evolved over time, reflecting shifts in societal values and party ideologies.

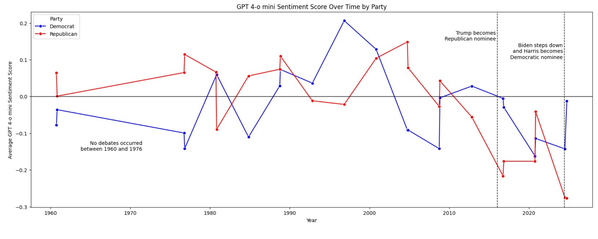
Research Questions

1. **Sentiment Evolution:** How has sentiment in U.S. presidential debates evolved over time across parties and election cycles?
2. **Refining LLMs for Political Debate Insights:** How does fine-tuning large language models on debate transcripts from different eras influence the sentiment and content of generated responses, and what insights can simulated debates between models provide?
3. **Rhetorical Differences:** How does the rhetoric of debates vary when comparing different political parties and historical periods?

1. Political Rhetoric Sentiment Over Time

- **Methodology:** Using RoBERTa and GPT-4o Mini, we generated sentiment scores based on each candidate's rhetoric in the presidential and vice-presidential debates from 1960-2024.
- **Results:**

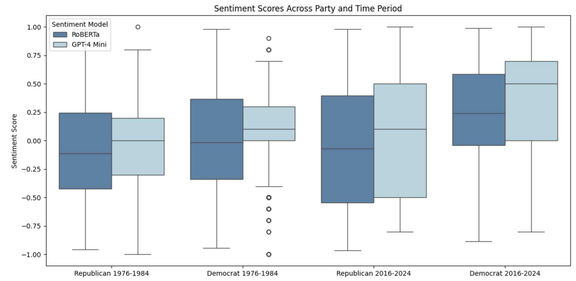




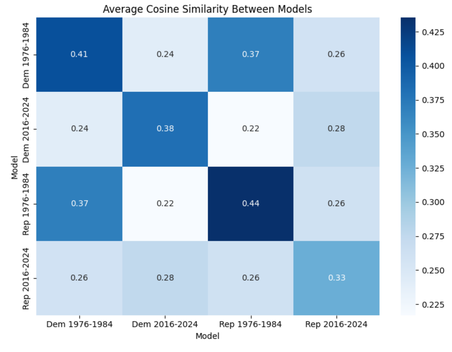
Both models agree that there has been a slight negative trend in overall sentiment over time. We see a positive sentiment increase when Harris becomes the Democratic nominee while sentiment decreases when Trump takes office.

2. Simulating Debates with GPT-4o Mini

- **Methodology:** We fine-tuned four GPT-4o mini models on debate transcripts from 1976-1984 and 2016-2024 (Republican and Democratic) to simulate a candidate from each party in each time period. Each model was prompted 10 times with 14 debate questions. Sentiment analysis, cosine similarity, and TF-IDF were used to analyze rhetorical alignment and common phrases across time and parties.
- **Results:**



There is a greater disparity in sentiment between the generated rhetoric from parties today (2016-2024) compared to before (1976-1984). We also see that the simulated Democratic sentiment has become more positive while the simulated Republican sentiment has remained mostly unchanged.

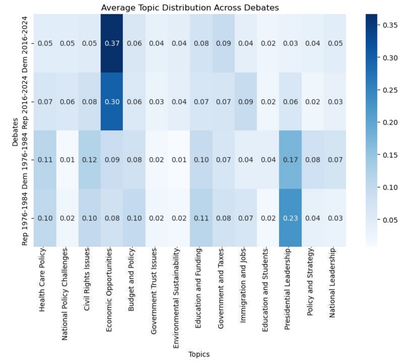


The most similar models are Republican and Democrats from 1976-1984. However, it is important to note that when the same model is asked a question multiple times, it does not always provide similar responses (see cosine similarity less than 0.5 along diagonals).

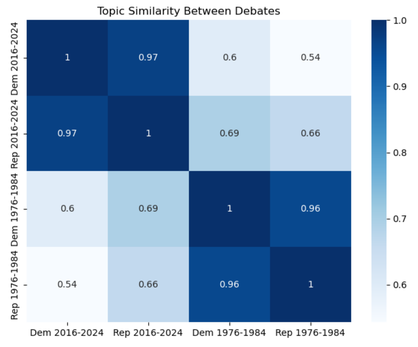
The most common phrases are more similar for the 1976-1984 models, with four of the most common expression being the same for Republicans and Democrats. These phrases reflect themes of nationalism and social issues.

3. Topic Modeling & Similarity Analysis Using LDA

- **Methodology:** We conducted Latent Dirichlet Allocation (LDA) analysis to uncover key topics in each simulated debate and explore the similarities between them.
- **Results:**



Topic distribution shows shifts in priorities: 2016-2024 Republicans and Democrats focused on economic opportunities (37%, 30%), while 1976-1984 debates exhibit more varied topics.



Topic similarity heatmap shows strong alignment within the same era and party (e.g., 0.97 for recent Democratic and Republican debates), with reduced similarity across parties and eras, highlighting evolving priorities.

Key Takeaways

- **Increasingly Negative Landscape:** Sentiment within debates has gotten more negative over time in both parties, highlighting a lack of optimism in American politics.
- **Polarization Trends:** We see a greater disparity temporally than we do between parties from the same time period. This illustrates how U.S. political discourse has become more divided over time.
- **Objective Analytical Power:** Unsupervised methods like RoBERTa, LDA, and LLM fine-tuning offer a more neutral lens for analyzing shifts in political rhetoric, as they tend to exhibit less political bias compared to human analysis.