

An Analysis of U.S. Presidents' Inaugural and State of the Union Addresses From 1789 to 2019

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Computational Methods for American
Politics, Autumn 2019



Presentation Outline

I. Research Questions

II. Data

III. Analysis I (General Overview)

IV. Analysis II (Question 1)

V. Analysis III (Question 2)

VI. Conclusion and Q&A

Research Questions (1)

1. Do presidential speeches become *less positive* compared to the beginning of an administration?
 - a. **Hypothesis:** Presidential speeches become *less positive* as a presidential administration ages
 - b. **Method of comparison:** Compare inaugural addresses to State of the Union addresses
 - i. Level of formality comparability
 - ii. Delivery consistency
 - iii. Audience comparability
 - c. **Analytical method:** sentiment analysis via dictionary approach

Research Questions (2)

1. Do we see major differences in topics/words in SOTU addresses *before and after* Woodrow Wilson's presidency (1913 - 1921)?
 - a. **Background:** Jeffrey Tulis (1987) claims that Woodrow Wilson shifted the trend in presidential speeches from constitutional to popular, inspirational rhetoric. Wilson was the first president to orally deliver SOTU to Congress.
 - b. **Method of comparison:** Compare topics/words among State of the Union addresses
 - c. **Analytical method:** topic modeling (Latent Dirichlet Allocation)

Data Sources

1. US presidents' inaugural speeches (1789 - 2017)

- a. <https://www.kaggle.com/adhok93/presidentialaddress/data>
- b. 58 speeches

2. State of the Union Addresses (1790 - 2019)

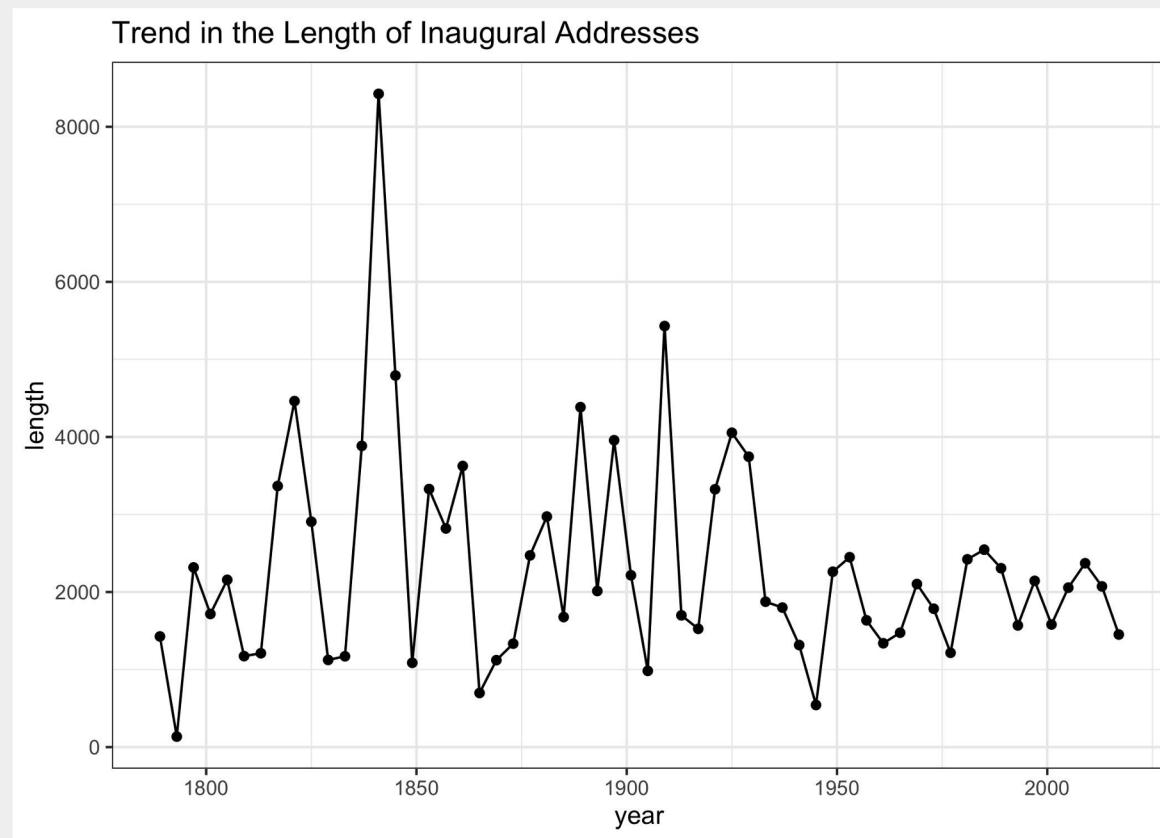
- a. United States Presidential State of the Union Addresses (SOTU) package in R (only speeches up to 2016)
- b. Trump's State of the Union Addresses (2018 - 2019) were added manually
- c. 238 speeches

name	inaug_party	elected	term	inaugural_address	day_of_week	month_day	speech_yea	text	
George Washington	nonaffiliated	1	1		1 Thursday		April 30	1789	Fellow-Citizens of the
George Washington	nonaffiliated	1	2		2 Monday		March 4	1793	Fellow Citizens: I /
John Adams	Federalist	1	1		1 Saturday		March 4	1797	WHEN it was first p
Thomas Jefferson	Democratic-Republic	1	1		1 Wednesday		March 4	1801	Friends and Fellow-
Thomas Jefferson	Democratic-Republic	1	2		2 Monday		March 4	1805	PROCEEDING, fel

Inaugural address data

Analysis I (General Overview) – Speech Length

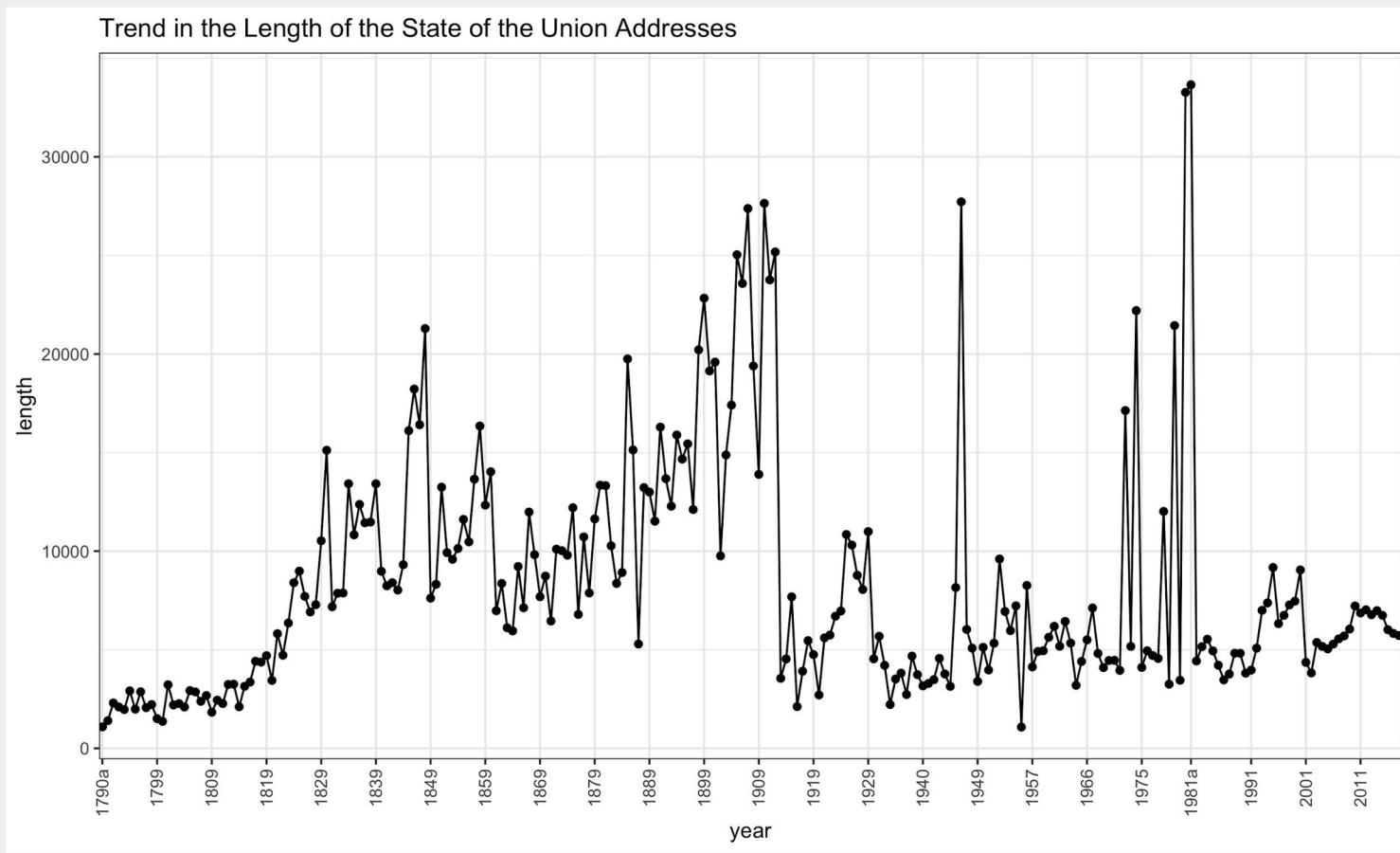
In general, the speeches tend to become shorter



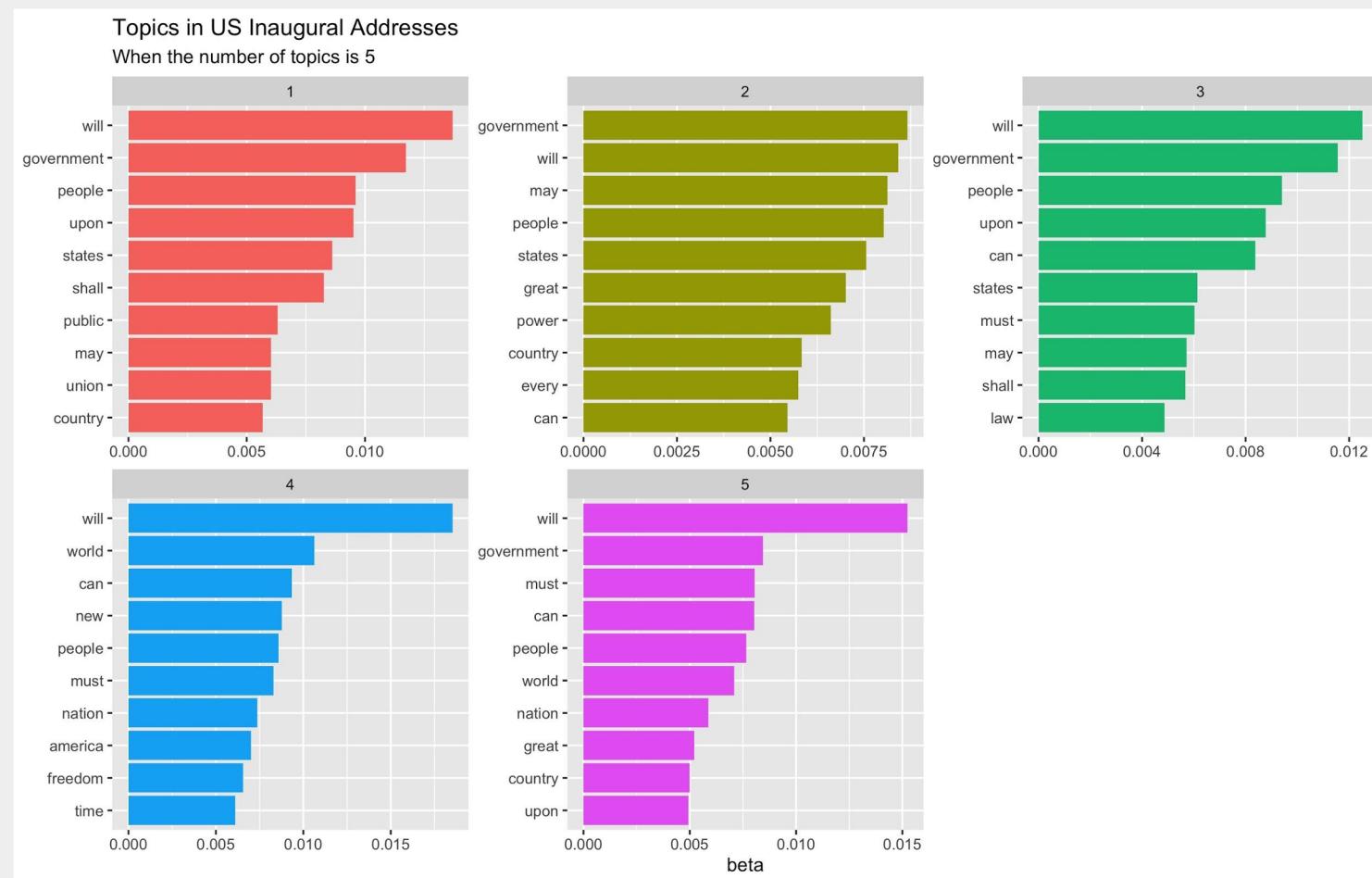
- Top 3 longest inaugural addresses
- William Henry Harrison (1841)
 - William Howard Taft (1909)
 - James K. Polk (1845)

Analysis I (General Overview) – Speech Length

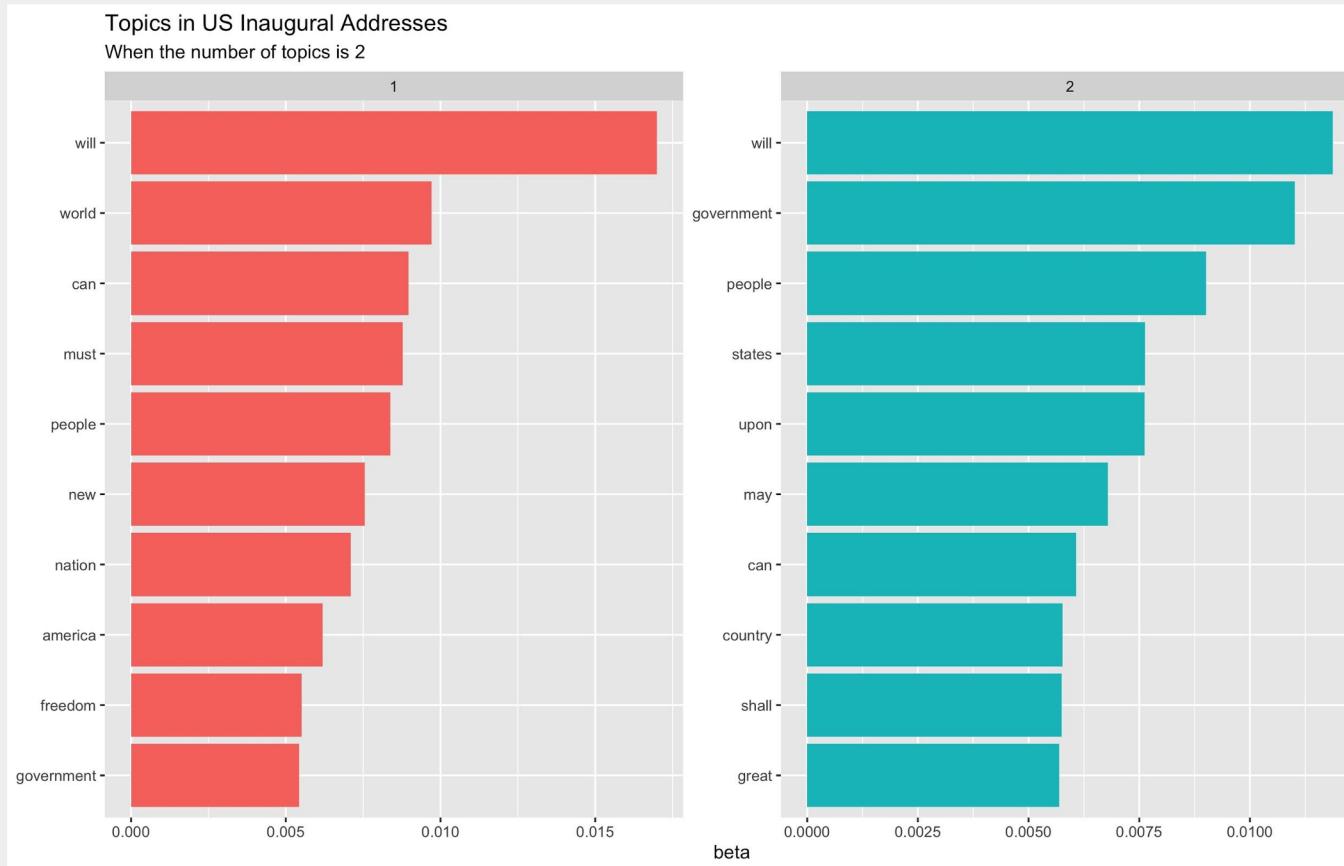
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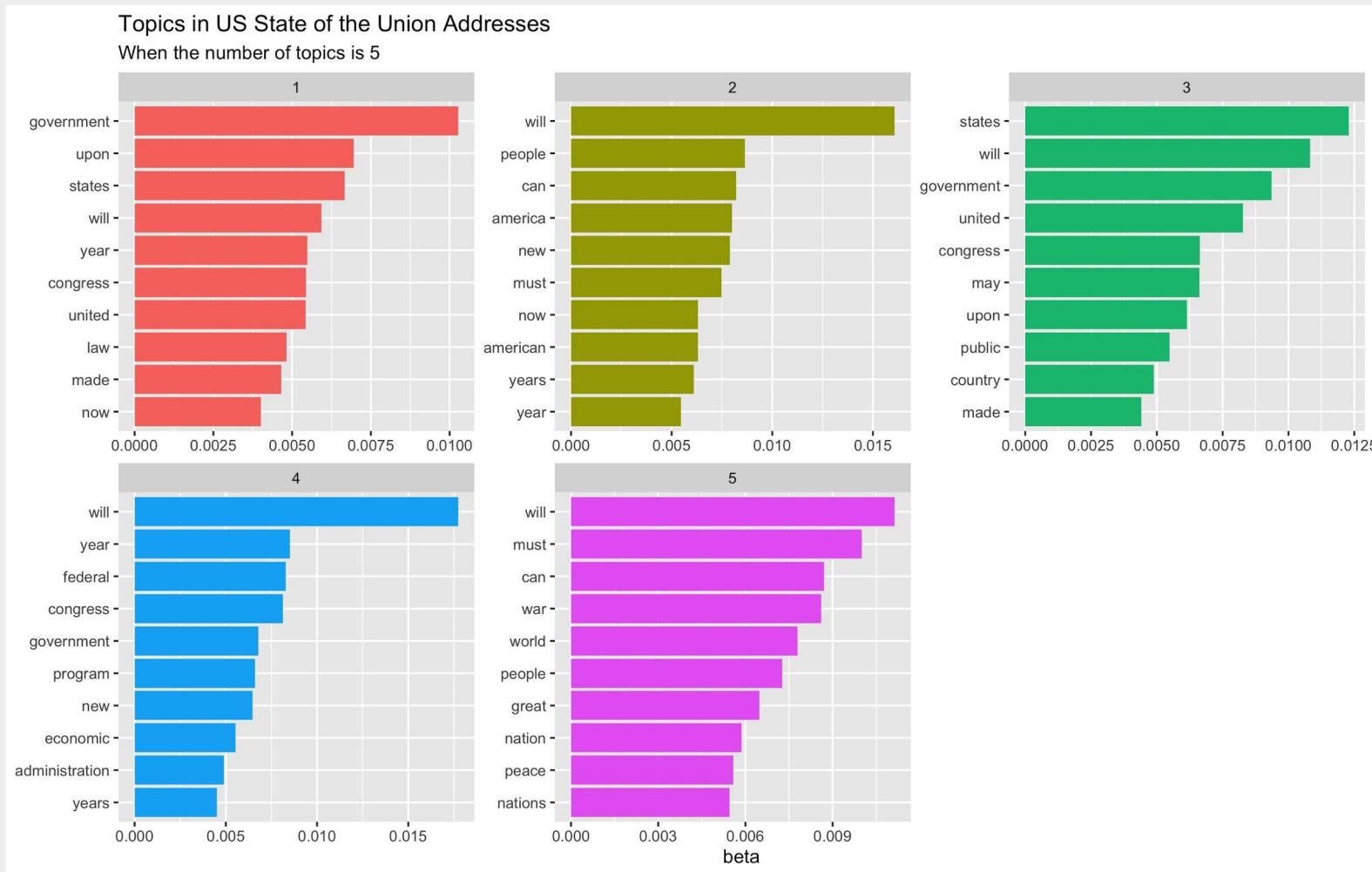
Analysis I (General Overview) – Common Topics



Analysis I (General Overview) – Common Topics



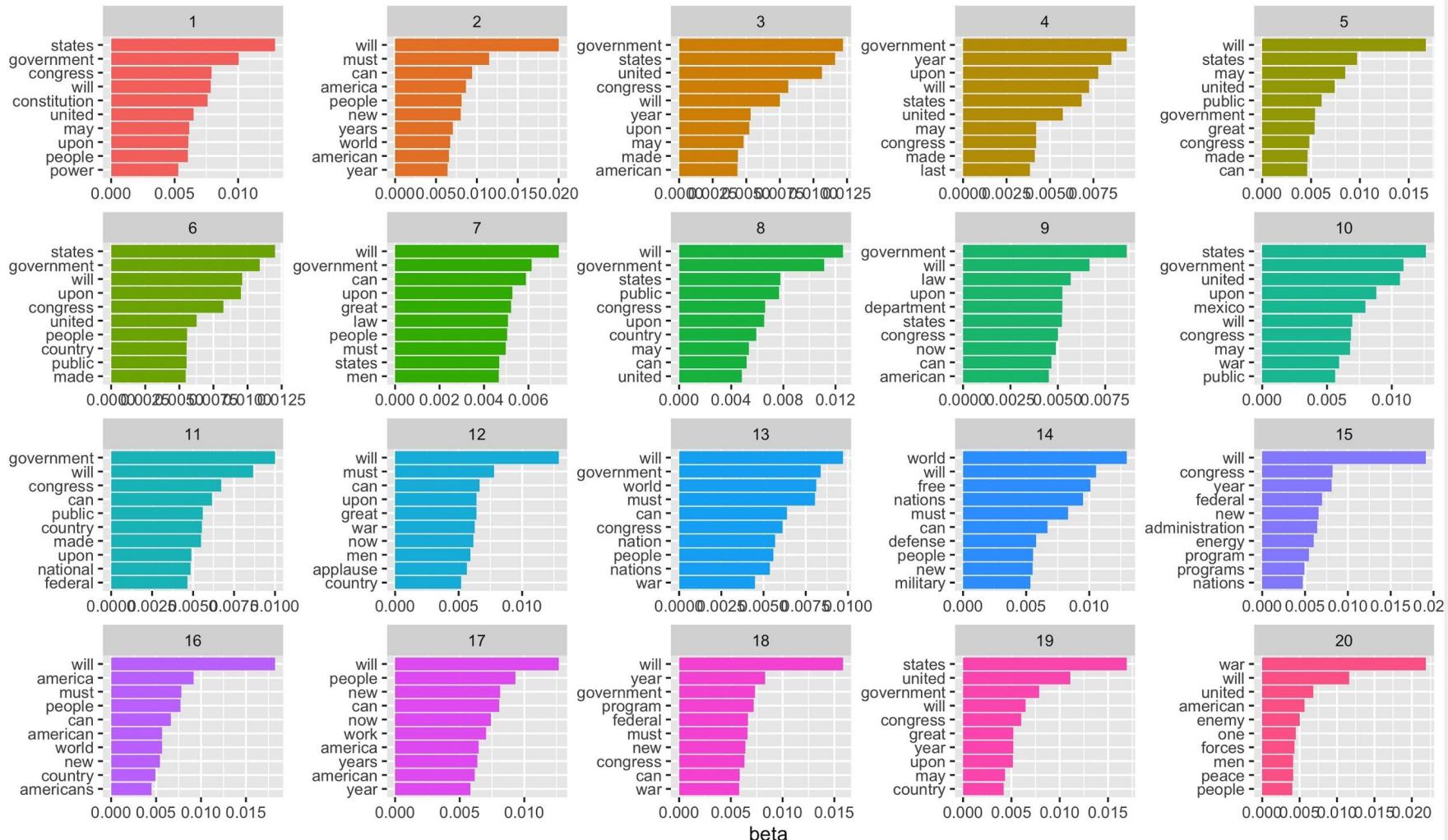
Analysis I (General Overview) – Common Topics



Analysis I (General Overview) – Common Topics

Topics in US State of the Union Addresses

When the number of topics is 20

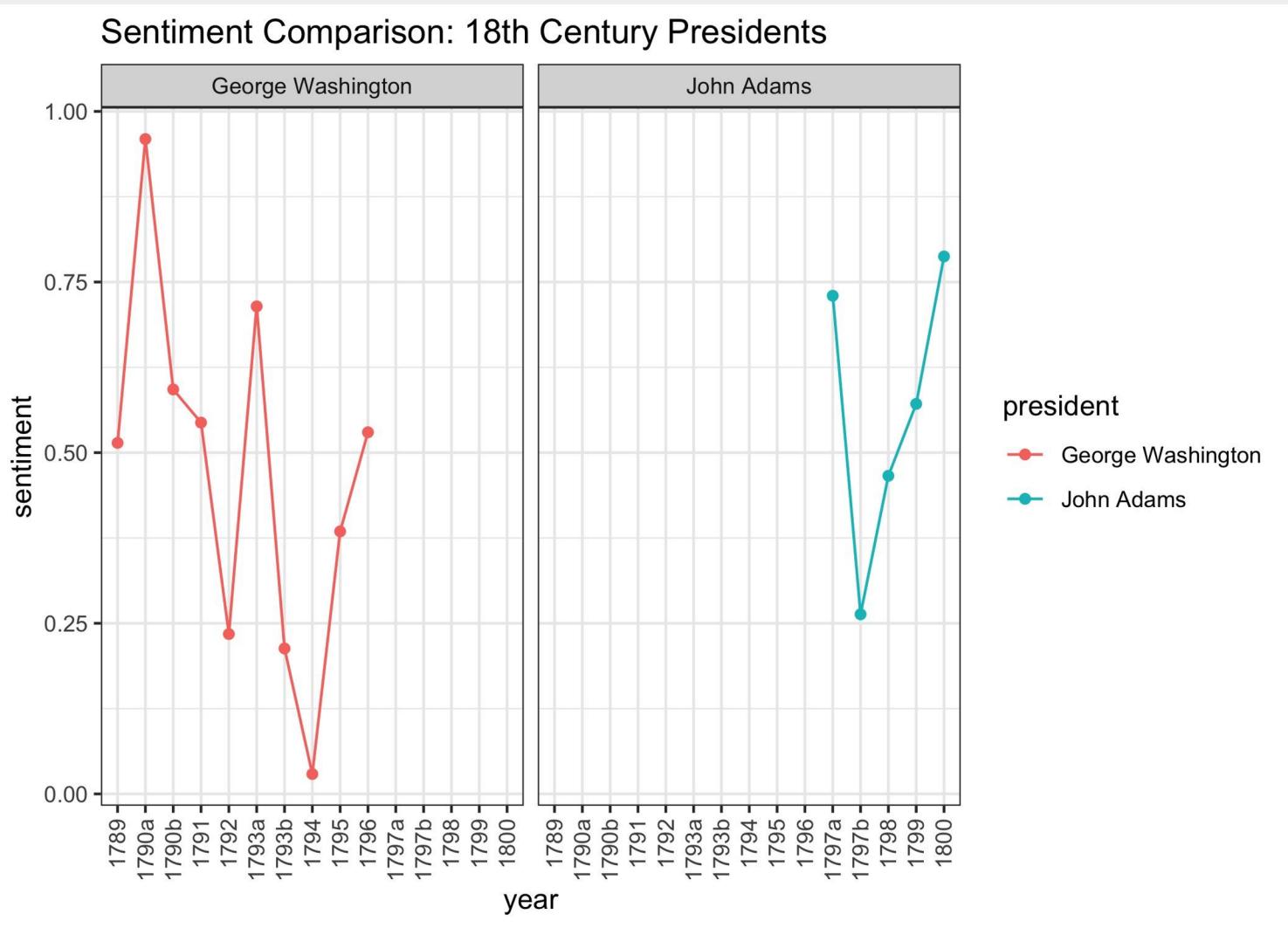


Recap - Research Questions (1)

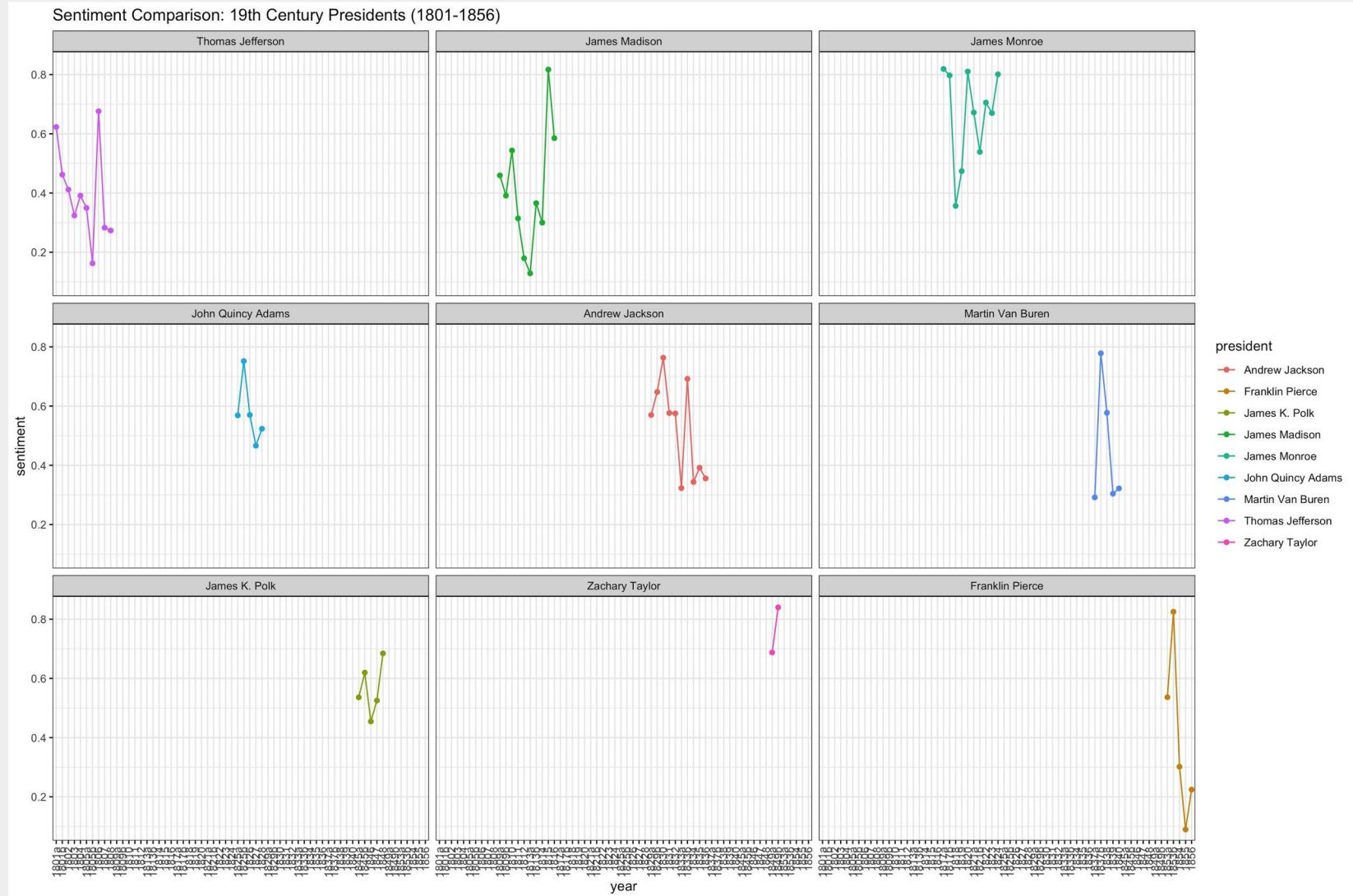
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Remark: 7 presidents have been dropped before further analysis: William Henry Harrison, John Tyler, Andrew Johnson, Chester A. Arthur, Gerald R. Ford, Millard Fillmore, James A. Garfield (no inaugural addresses or no State of the Union Address)

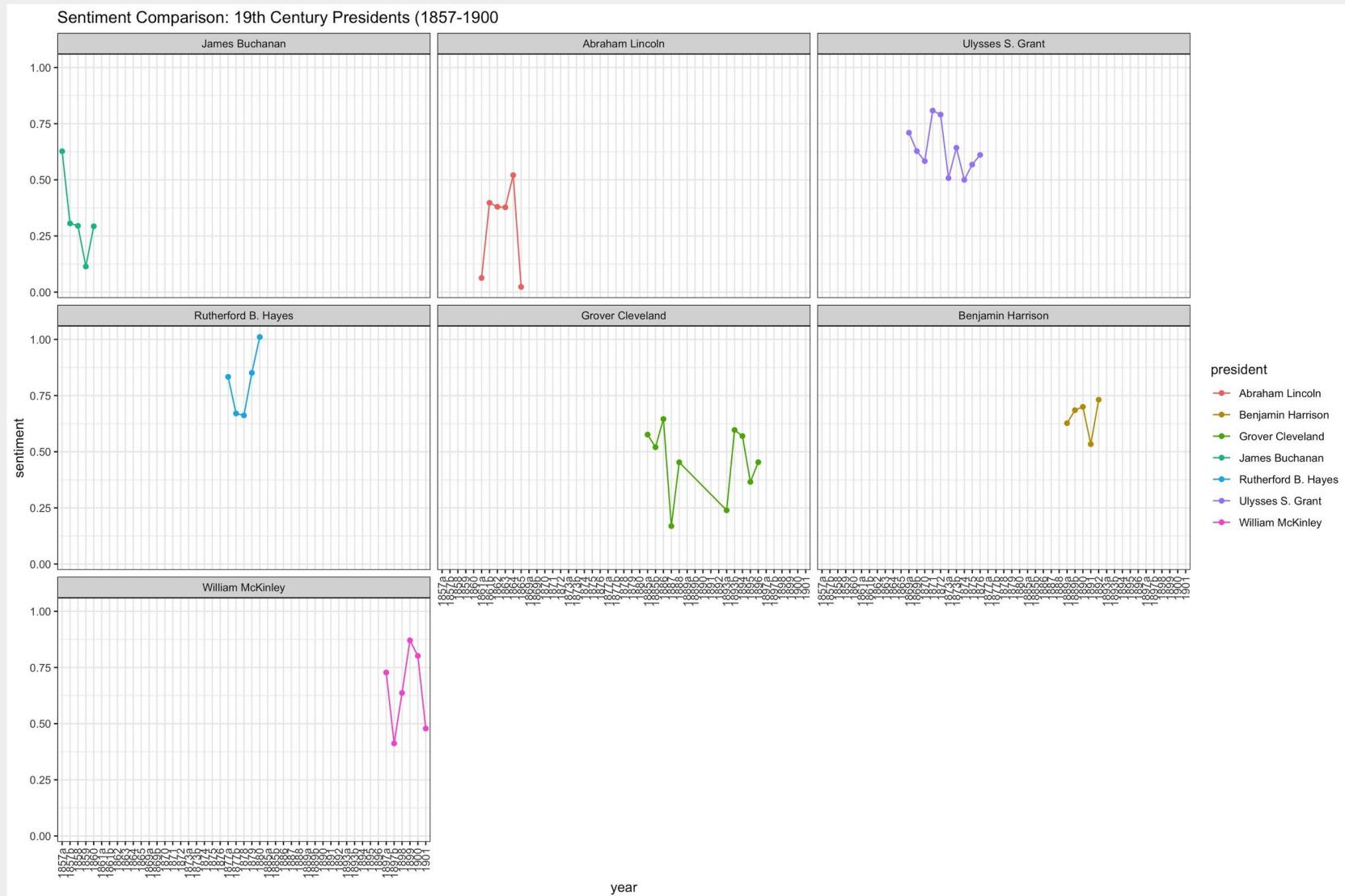
Analysis II (Main Findings) – Sentiment Evolution



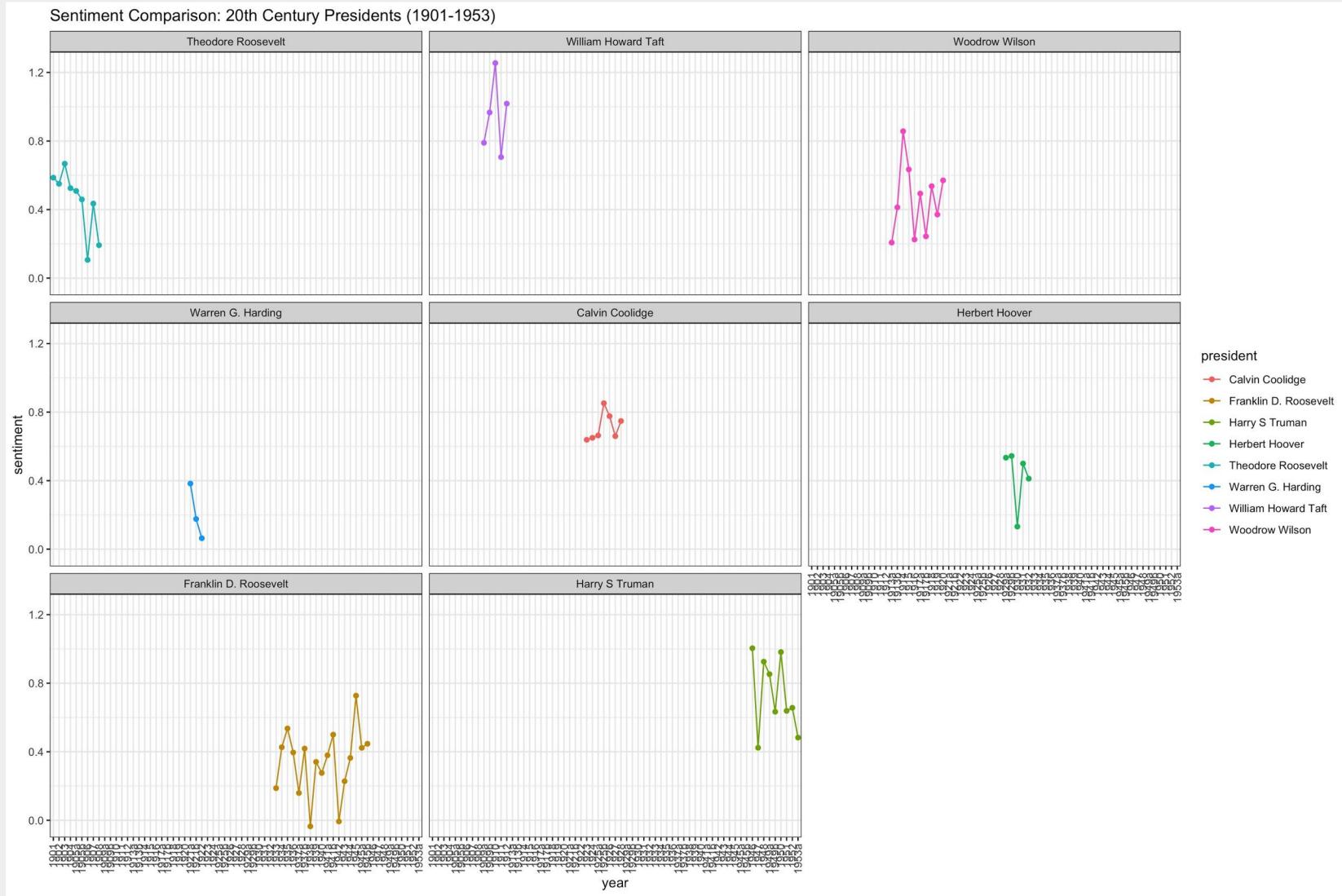
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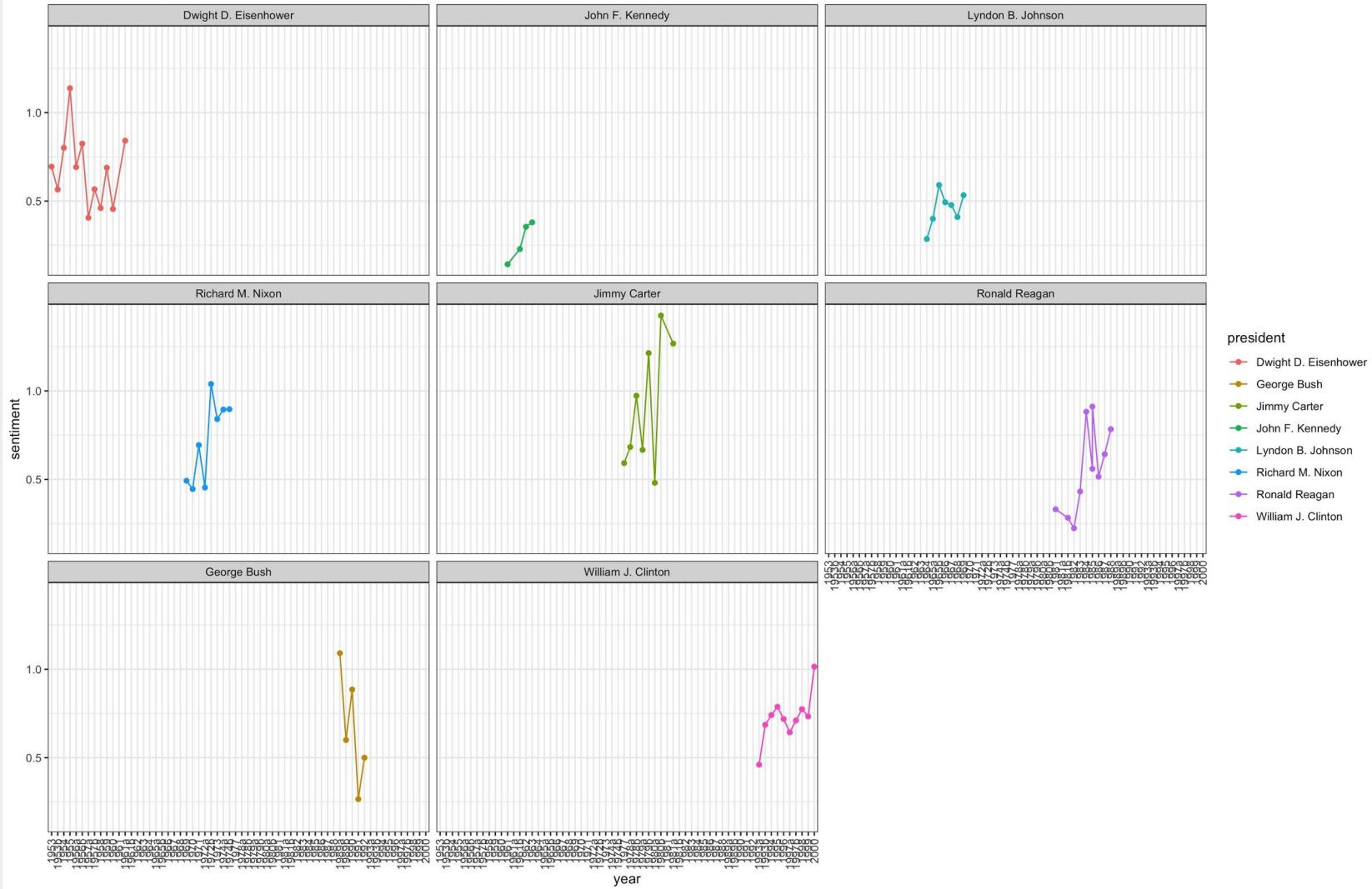


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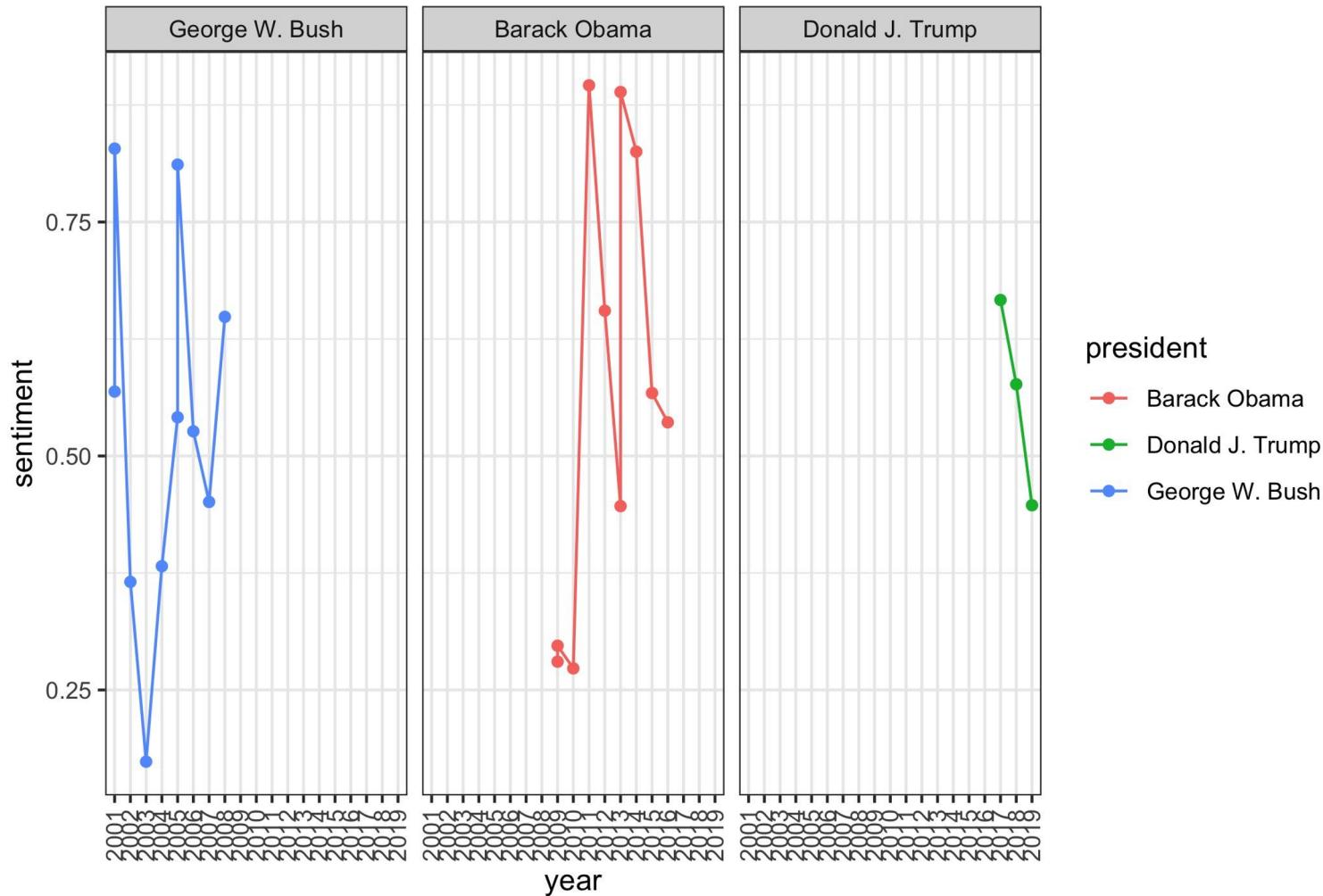
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Sentiment Comparison: 20th Century Presidents (1953-2000)



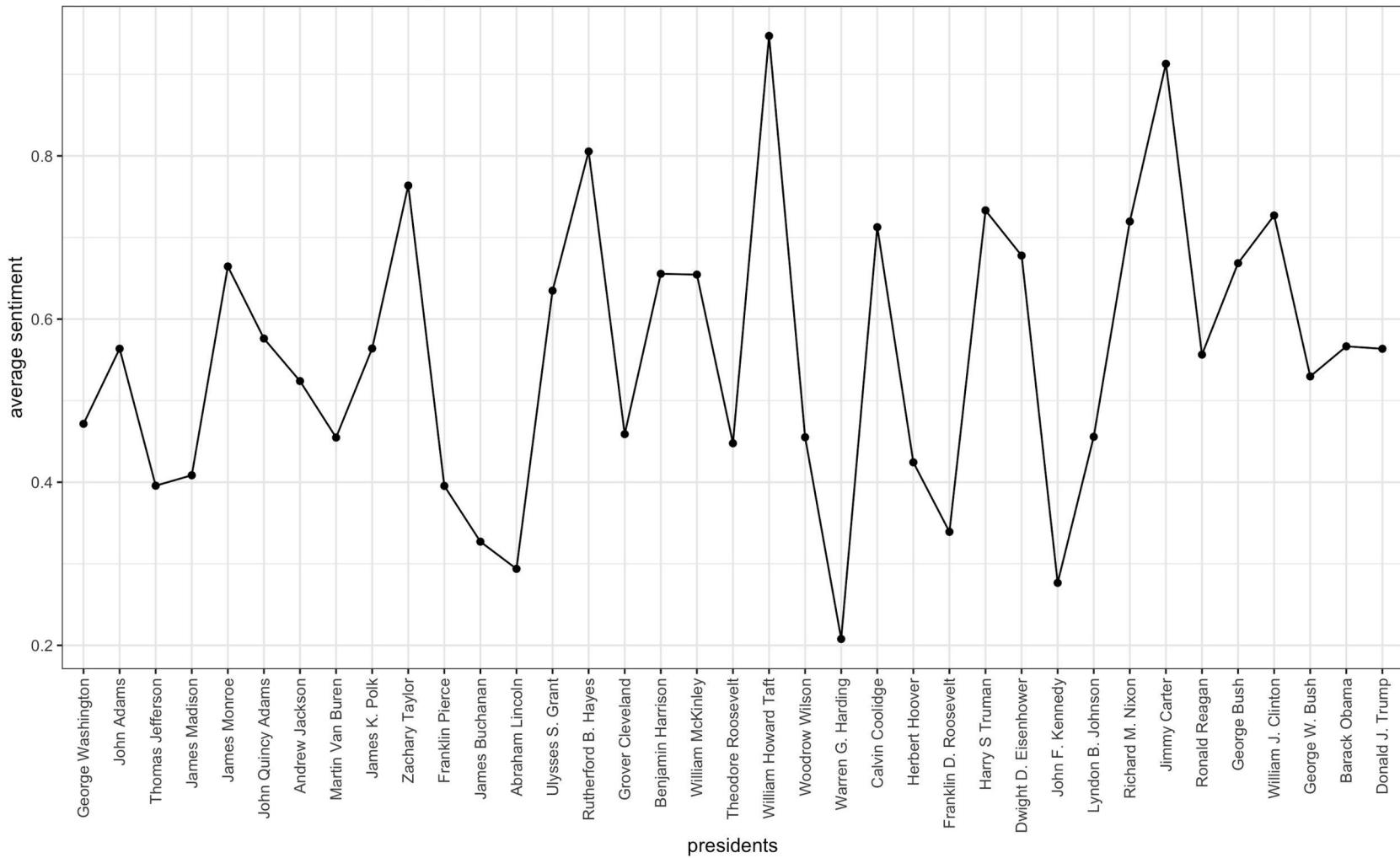
Analysis II (Main Findings) – Sentiment Evolution

Sentiment Comparison: 21th Century Presidents



Analysis II (Main Findings) – Sentiment Evolution

Trend in the Average Sentiments by Presidents



Analysis II (Main Findings) – Sentiment Evolution

Became less positive (overall)	Became more positive (overall)
<ol style="list-style-type: none">1. George Washington2. Andrew Johnson3. Franklin Pierce4. John Quincy Adams5. Martin Van Buren6. Thomas Jefferson7. Abraham Lincoln*8. Grover Cleveland9. James Buchanan10. Harry S. Truman*11. Herbert Hoover12. Theodore Roosevelt13. Warren G. Harding14. Woodrow Wilson*15. George Bush*16. Barack Obama17. Donald Trump	<ol style="list-style-type: none">1. John Adams2. James K. Polk*3. James Madison*4. James Monroe5. Zachary Taylor6. Benjamin Harrison7. Rutherford B. Hayes8. Ulysses S. Grant9. William McKinley*10. Calvin Coolidge11. Franklin D. Roosevelt*12. William Howard Taft13. Dwight D. Eisenhower*14. Jimmy Carter15. John F. Kennedy*16. Lyndon B. Johnson*17. Richard M. Nixon*18. Ronald Reagan19. Bill Clinton20. George H. W. Bush*

* denotes wartime presidents; (in order) War of 1812, Mexican-American War, Civil War, Spanish American War, WW1, WW2, Korean War, Vietnam War, Persian Gulf War, Iraq War
Colors denote the era

Discussion and Future Analysis

- ♦ There does not seem to be an across-the-board trend in sentiments
- ♦ Specific issues with dictionary methods
 - Limited number of labeled words
 - Way to improve: create a customized dictionary
- ♦ Grouping presidents by inaugural and SOTU addresses
 - Guessing where the differences between 2 groups are may not be most efficient
 - Way to improve: use unsupervised methods such as k-means to group presidents by their speeches

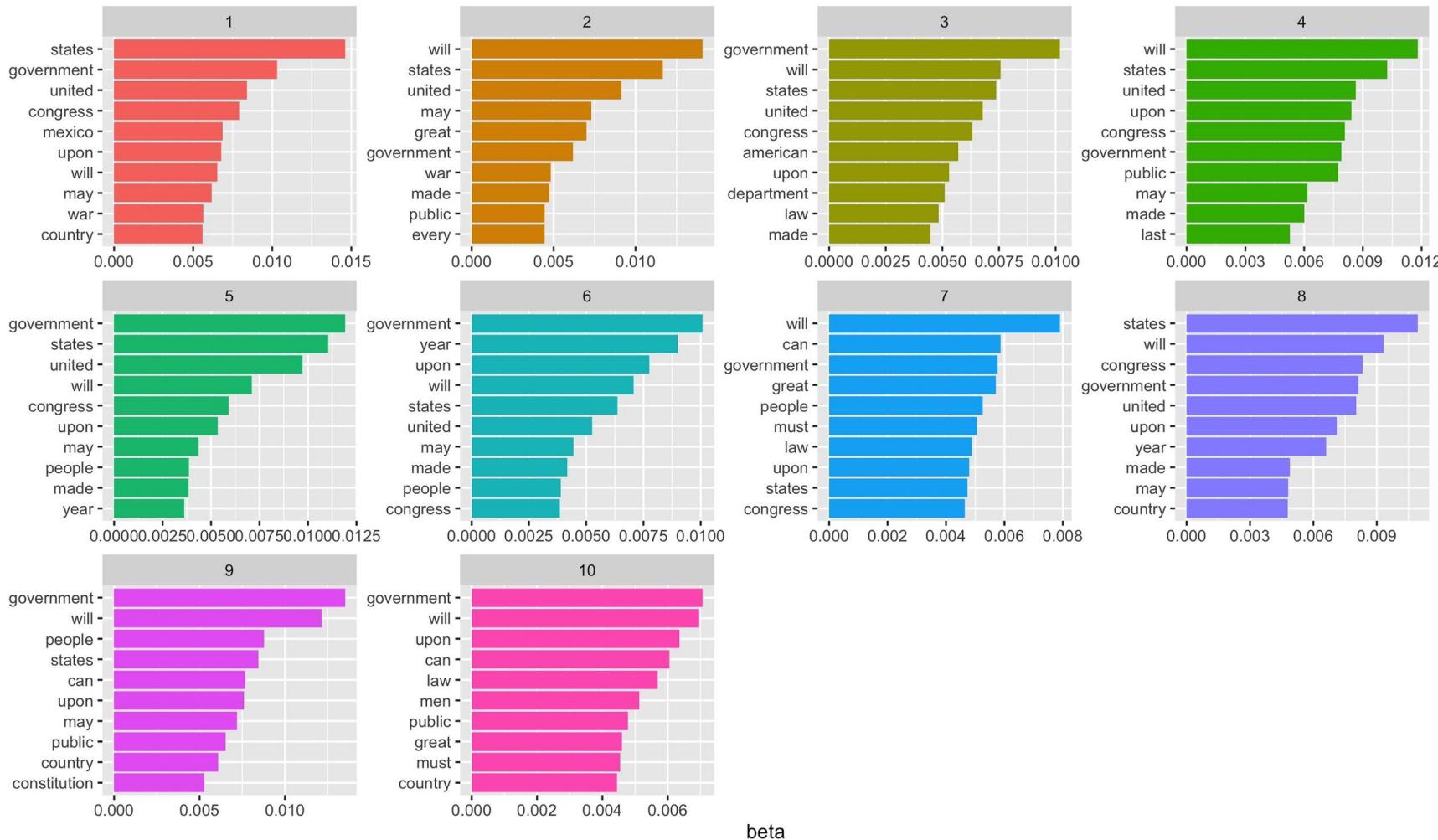
Recap - Research Questions (2)

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Analysis III - Topics Before vs. After Wilson

Topics Before Wilson

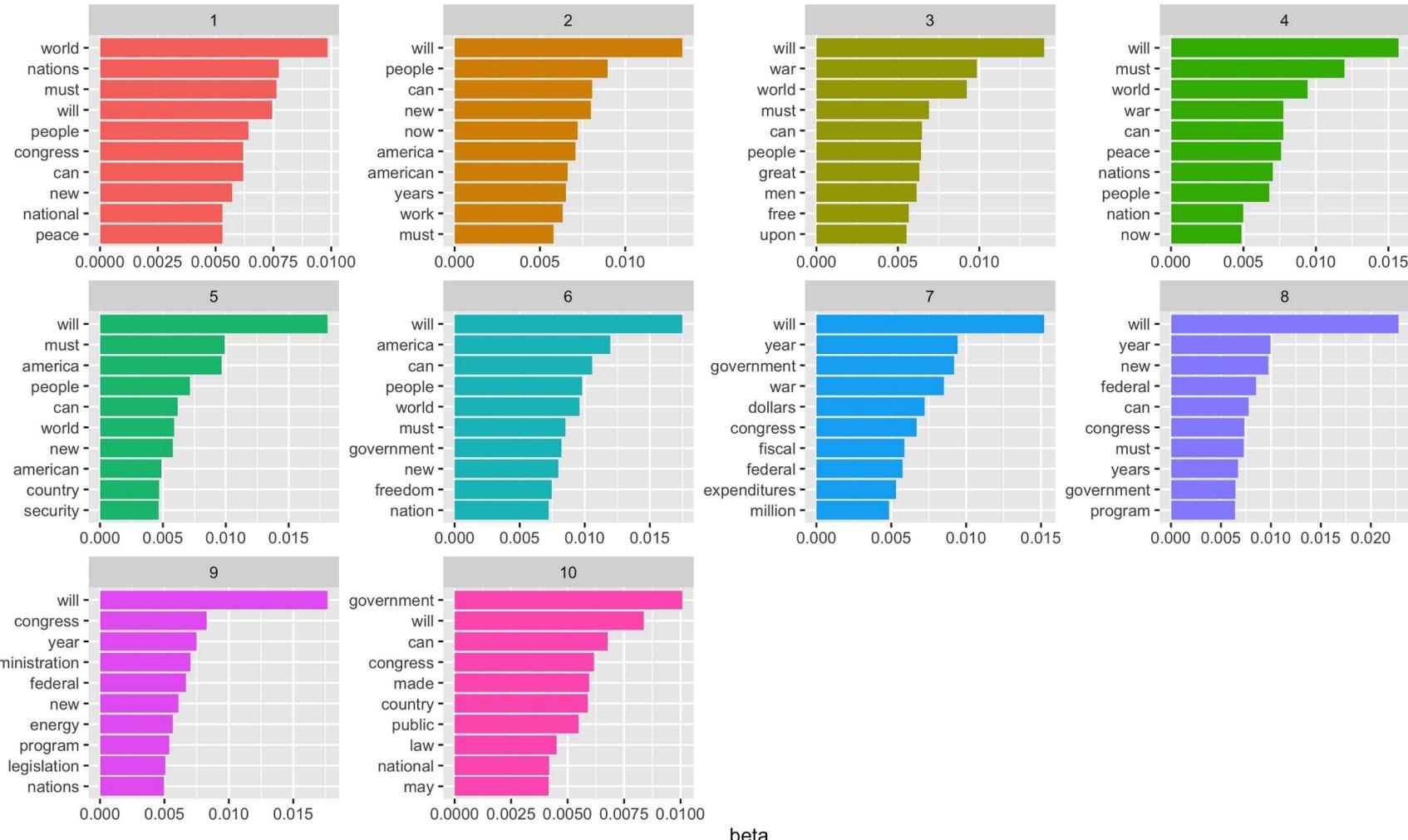
When the number of topics is 10



Analysis III - Topics Before vs. After Wilson

Topics After Wilson

When the number of topics is 10



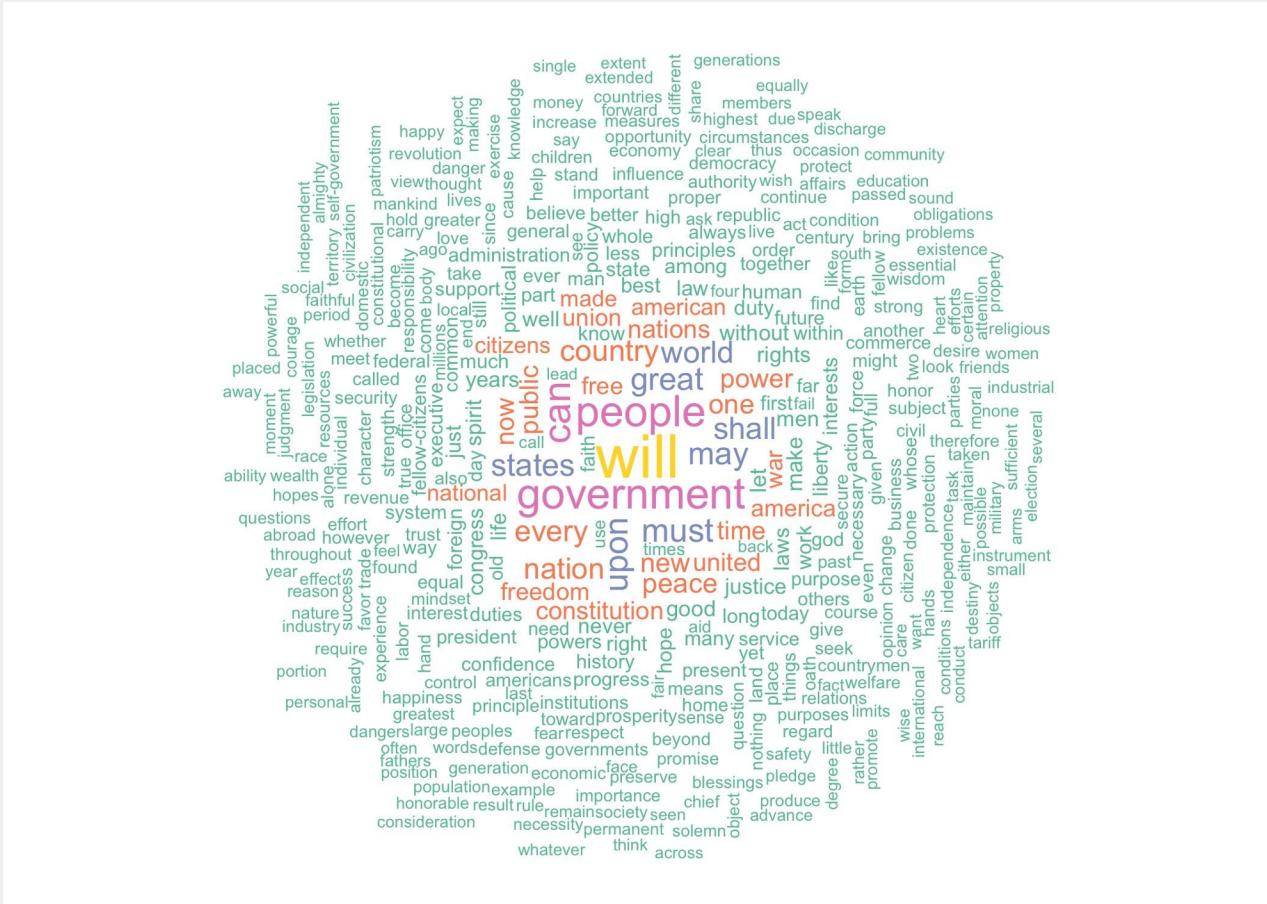
Conclusion and Q & A

- ♦ **Overall sentiments** » positive as expected
- ♦ **Topics** » inaugural addresses focus on narrower issues than SOTU
- ♦ **Individual Sentiments** » no clear trend for presidents. We cannot conclude that overall U.S. presidents become less positive in their speeches by the presidency years
- ♦ **Topics before and after Wilson** » Definitely different. But, it was not able to pick up the differences that Tulis claims

Appendix

Analysis I (General Overview) – Common Words

Inaugural Addresses (1789 - 2017)



Analysis I (General Overview) – Common Words

State of the Union Addresses (1970 - 2019)

