PARTY TALK: SPEECH PATTERNS OF PRESIDENTIAL CANDIDATES

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INTRODUCTION

The purpose of our project is to investigate the relationship between politicians' political ideologies and their speech patterns, more specifically, speech rate and speech complexity. To do so, we analyzed the speech patterns of 2008 presidential candidates in primary debates and measure how their complexity and rate of speech correlate to their political ideology. When measuring political ideology, we placed candidates on a continuous scale ranging from liberal to conservative (rather than using Democrat vs. Republican). Through doing so, we were able to determine whether speech rate and/or complexity varies linearly from one end of the political spectrum to the other. Determining if there is a relationship could provide insight into whether the speech patterns of candidates mirror those of their typical supporters, as there are demographic differences in those who support liberal versus conservative candidates.

HYPOTHESIS

- We hypothesize that there will be a **small correlation between political ideology and speech rate, with more liberal candidates speaking faster.** We expect to this correlation based on our research that residents of Northern states speak faster than residents of Southern states, and because Northern states are disproportionately liberal. However, we believe such a correlation will be small since some Northern states are conservative, and there were no differences found between speech rates of individuals in urban vs. rural communities (a major factor in conservative vs. liberal values).
- We hypothesize that there will be a **correlation between political ideology and speech complexity, with more liberal candidates using greater complexity of speech**. The Democratic base is more educated than the Republican base, and we believe that to appeal to this demographic, Democratic candidates would purposefully include more complex language in their speech while Republican candidates might do the opposite.

METHODOLOGY

POLITICAL LEANING

Political leaning is represented on a scale from 0-100, with 0 being the most liberal and 100 being the most conservative. At ontheissues.org, every politician is rated a social score from 0-100 and financial score from 0-100 based on how often they vote along party lines, with 0 being the most liberal and 100 being the most conservative. For each candidate, we aveaged these scores to find their unique "leaning" score.

SPEECH RATE

Speech rate is represented in words/second. For each instance that a candidate spoke in a debate, we counted the number of words they spoke and the divided this value by the number of seconds they spoke. Then, we averaged all of the individual speech rates to find an overall speech rate for the candidate in the debate. We chose to exclude instances that the candidate spoke for less than 15 seconds because we believed that this was not representative of a typical speech and could be skewed by short questions and interjections. For each candidate, we calculated speech rate based on one debate.

SPEECH COMPLEXITY

Speech complexity is calculated by inverting the Flesch Reading Ease test through Microsoft Word. The Flesch Reading Ease test rates text on a 100-point scale. The higher the score, the easier it is to understand the document.

The formula for the Flesch Reading Ease score is:

$$206.835 - (1.015 \times ASL) - (84.6 \times ASW)$$

where **ASL** = average sentence length (the number of words divided by the number of sentences) and **ASW** = average number of syllables per word (the number of syllables divided by the number of words). For each candidate, we ran this test on three of their debates, then averaged the scores. In our data, we chose to invert the score using the formula **100 - score**, in order to represent more intuitively higher scores as more complex speech.

DATA

Candidate	Political Leaning	Speech Complexity	Inverse Complexity	Speech rate (w/s)
Gravel	12.5	74.100	25.900	3.080
Huckabee	76.0	71.967	28.033	3.379
Brownback	87.5	70.600	29.400	3.115
Biden	17.5	70.000	30.000	3.306
Romney	76.0	68.500	31.500	3.776
Giuliani	74.5	66.733	33.267	3.447
Tancredo	90.0	66.267	33.733	3.422
Hunter	92.5	65.500	34.500	3.113
Richardson	25.0	64.733	35.267	2.576
Edwards	22.5	63.467	36.533	3.354
Obama	21.5	62.767	37.233	3.083
Clinton	15.0	62.600	37.400	3.068
Dodd	11.0	61.933	38.067	3.740
Kucinich	2.5	61.400	38.600	3.368
McCain	66.0	31.500	31.500	2.935
Paul	57.5	29.800	29.800	3.141

RESULTS

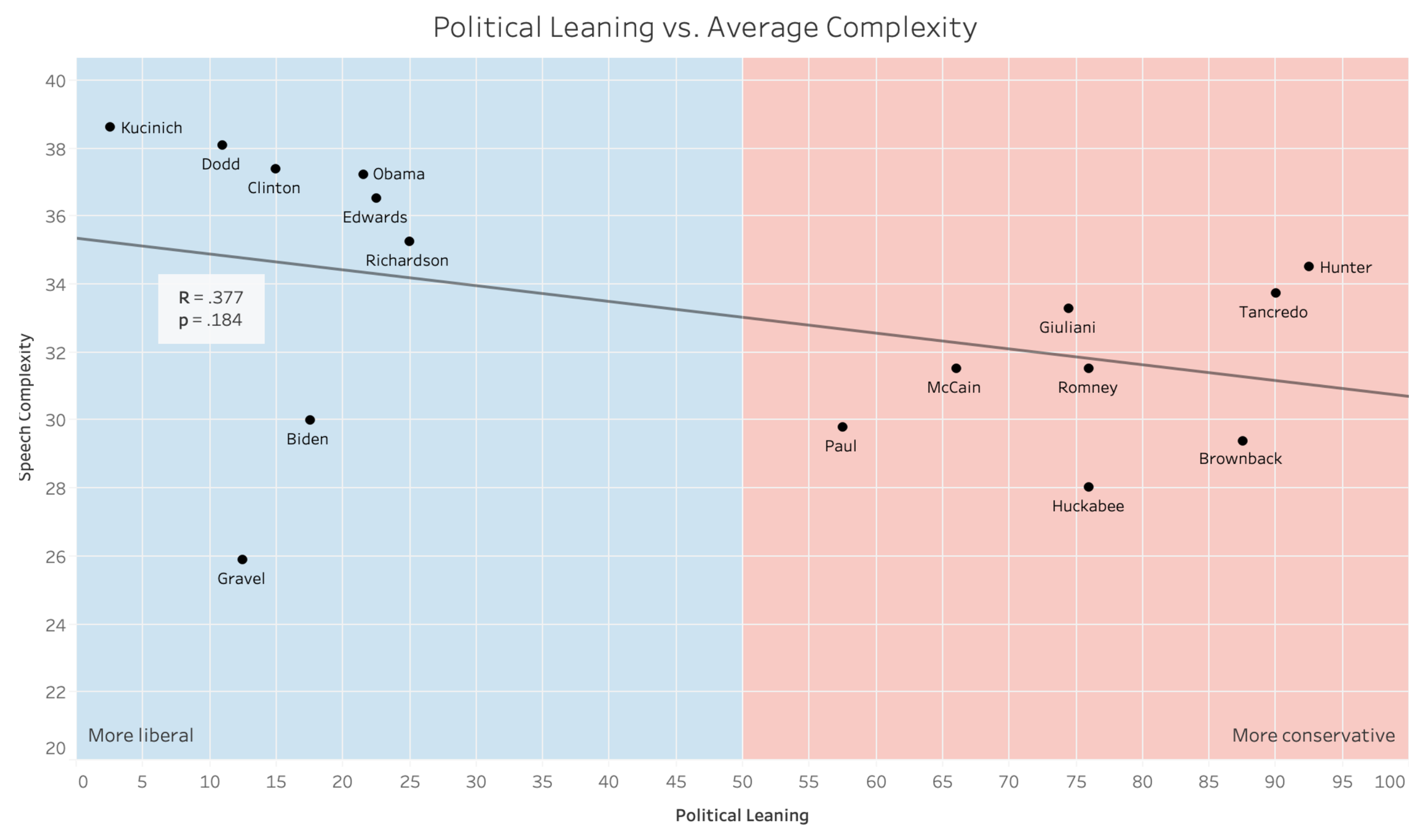

Figure 1.1 *Political Leaning vs. Speech Complexity*

R = .377 and p = .184
There is weak correlation between political leaning and speech complexity across parties.

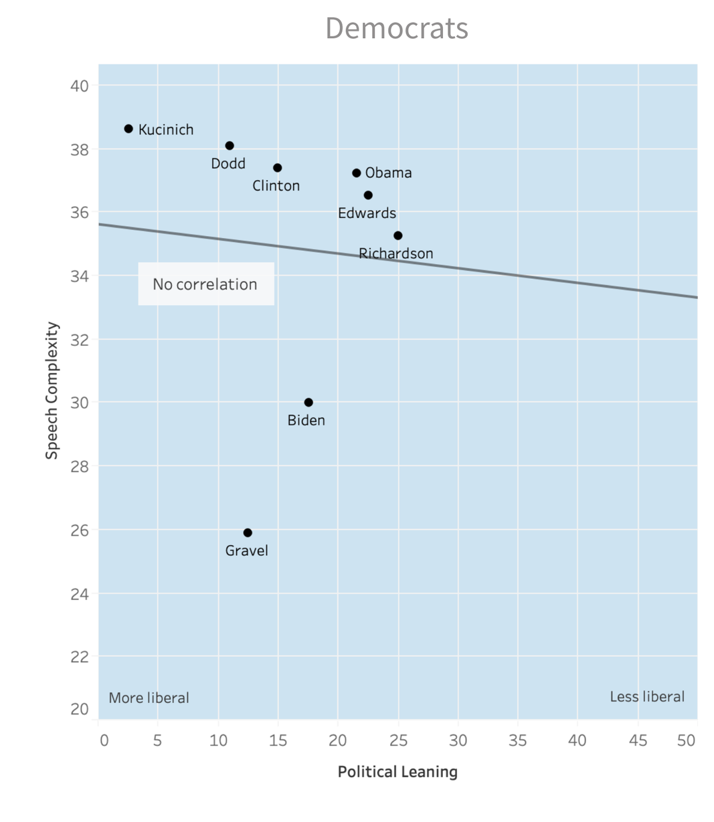

Figure 2.2 *Political Leaning vs. Speech Complexity within Democrats*

R = -.075 and p = .860
There is no correlation between political leaning and speech complexity within the Democratic candidates.

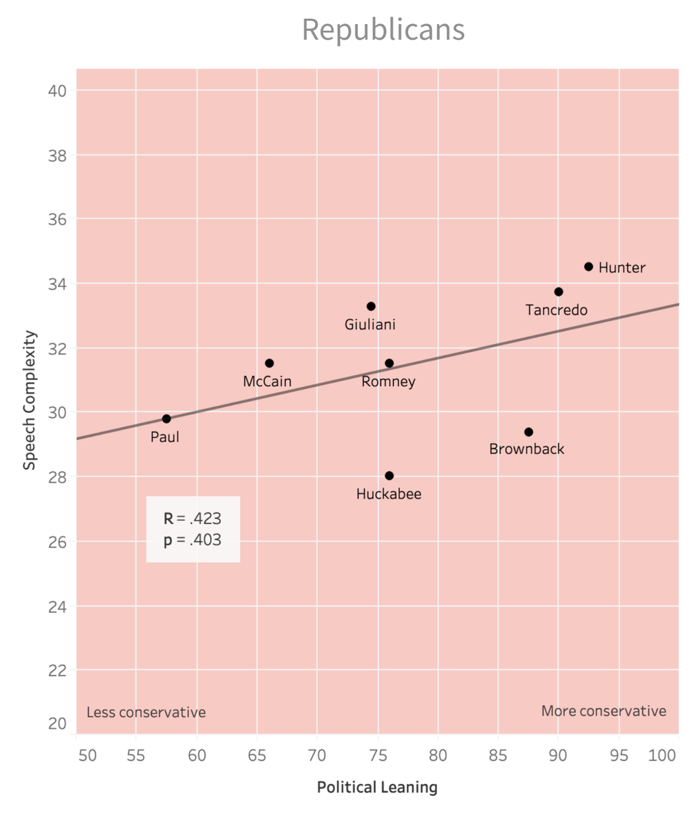

Figure 2.3 *Political Leaning vs. Speech Complexity within Republicans*

R = .423 and p = .403
There is very weak correlation between candidates being more conservative and using more complex speech within the Republican candidates.

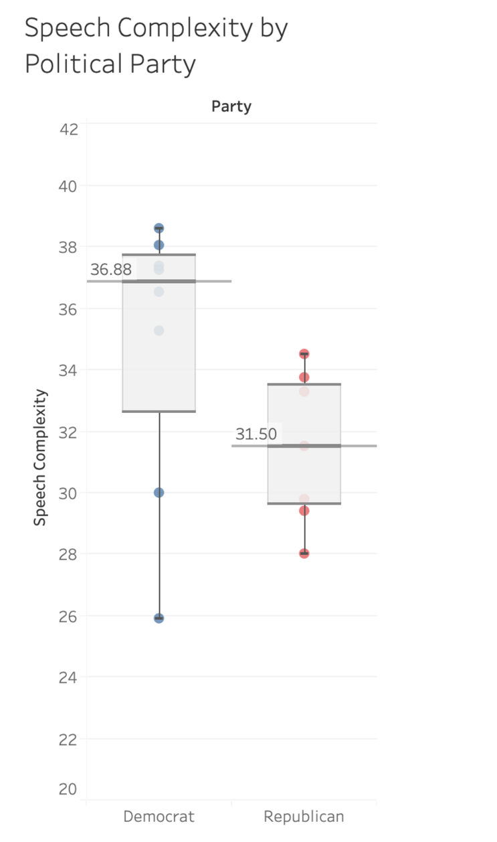

Figure 2.4 *Speech Complexity by Political Party*

p = .076
Based on a one-tailed p-test, there is statistical significance that Democratic candidates use more complex speech.

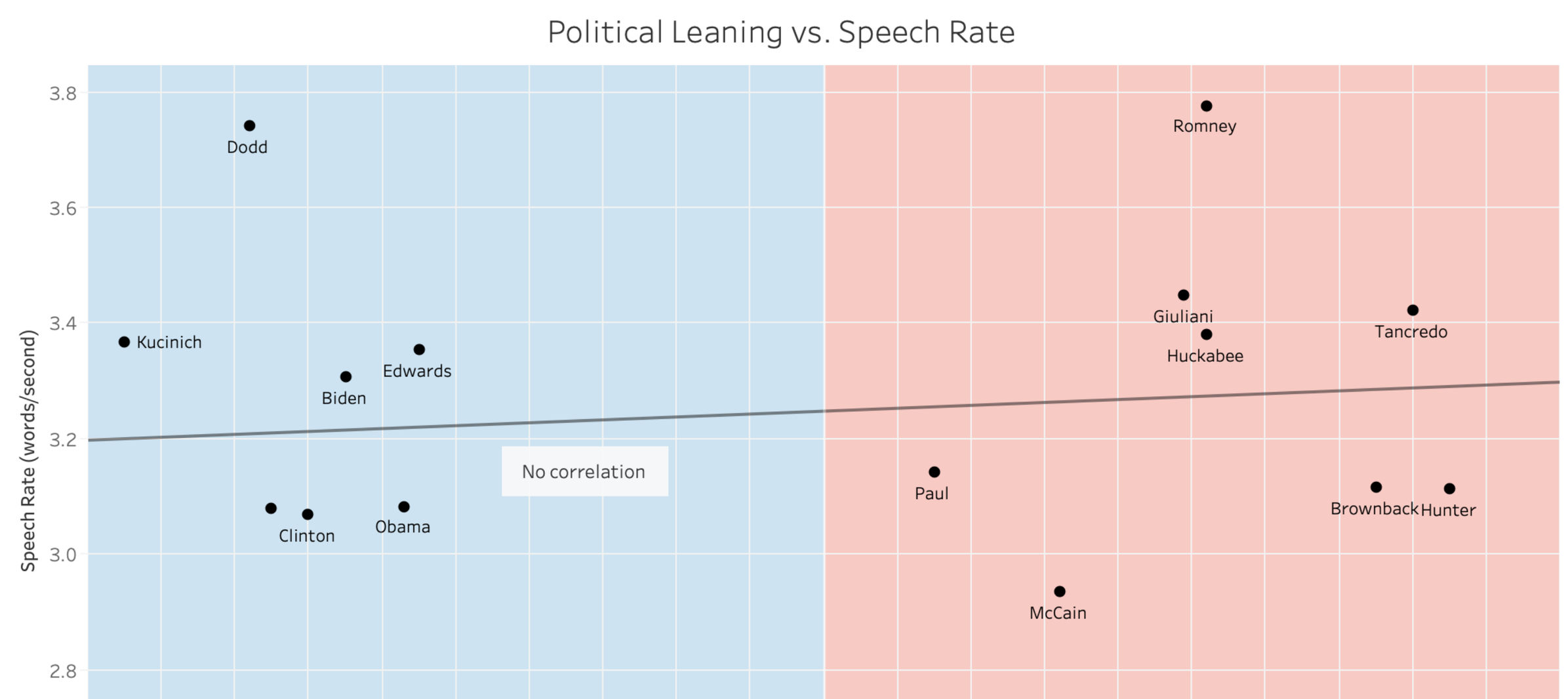

Figure 2.1 *Political Leaning vs. Speech Rate*

R = .114 and p = .678
There is no correlation between political leaning and speech rate across parties.

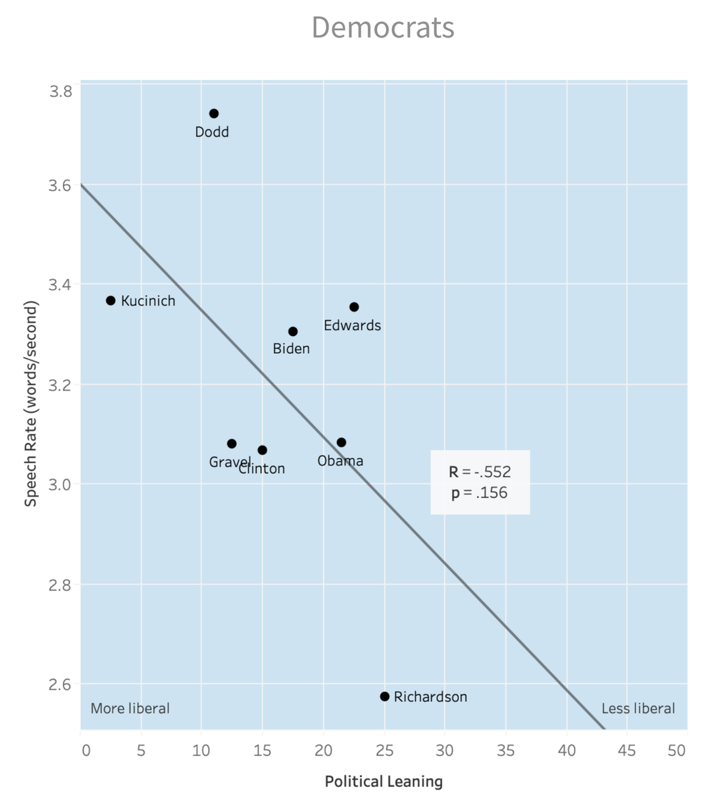

Figure 2.2 *Political Leaning vs. Speech Rate within Democrats*

R = -.552 and p = .156
There is weak positive correlation between candidates being more liberal and speaking more quickly.

Figure 2.3 *Political Leaning vs. Speech Rate within Republicans*

R = .132 and p = .756
There is no correlation between political leaning and speech rate within the Republican candidates.

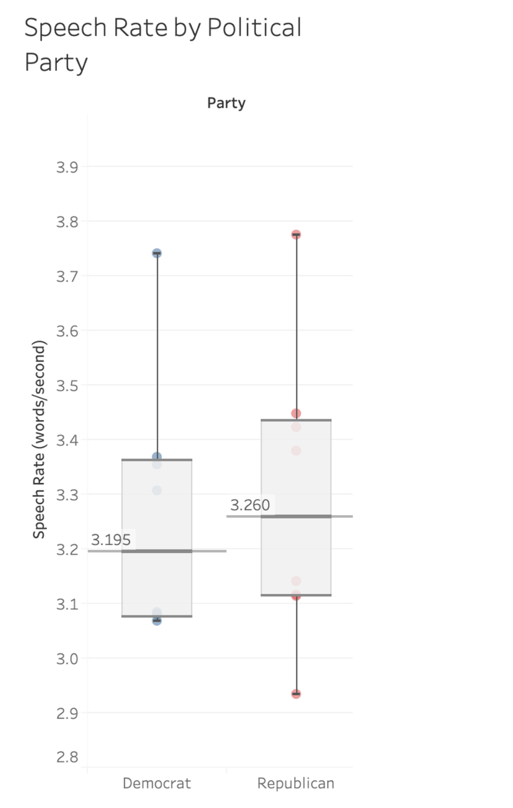

Figure 2.4 *Speech Rate by Political Party*

p = .273
Based on a one-tailed p-test, there is no statistically significant difference between the speech rate of Republican and Democratic candidates.

DISCUSSION

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- Thank you to [American History] Teacher.

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