

# **A Case Study in Political Rhetoric: Numerical Analysis of Joe Biden and Bernie Sanders' Climate Change Rhetoric**

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## **Abstract**

Although the cause is not certain, climate change is a highly politicized issue in American politics, largely along partisan and ideological lines. Previous research demonstrates that moral foundations may be helpful in reducing this divide, and that the economy is a much more popular political issue among conservatives than climate change. We apply these results to analyze the gap in popularity between the much more popular climate plan of now President-Elect Joe Biden and the Green New Deal, co-sponsored by Senator Bernie Sanders. We conduct two studies analyzing the rhetoric of Joe Biden and Bernie Sanders utilizing a word frequency distribution, which jointly demonstrate that Bidens' rhetoric appeals more to conservative moral foundations and political issues. This tentatively suggests that utilizing a diverse set of rhetoric may be effective in reducing politicization over climate change.

## **Introduction and Previous Research**

It is clear that political attitudes over climate change are highly politicized in the American public. In comparison to conservatives, liberals are more likely to see climate change as an important issue, and support initiatives that address this challenge (Need Source). That conservatives and liberals tend to be overwhelmingly more likely to self-identify as republicans and democrats respectively causes climate change to be a political issue largely split across party lines. In examining this

phenomenon, the author sought to analyze the factors that influence this divide during the 2020 presidential primaries and general election.

In this time period, two democratic candidates, Bernie Sanders and Joe Biden, each advocated for a climate change policy of very different popularities. On one hand, the more ambitious policy advocated by the more liberal Bernie Sanders known as the Green New Deal is highly controversial among the public, with an overall approval rating of 43% according to one poll by the National Green Advocacy Project (Green Advocacy Project, 2019). Critically, opinions on this initiative were highly partisan, with 81% and 6% of self-identified democrats and republicans indicating that they "strongly support" or "somewhat support" the Green New Deal. On the other hand, the more moderate Joe Biden's climate plan enjoys a 45% approval rating among self-identified republicans, as well as 89% of democrats according to one poll (New York Times, et.al, 2020). That both plans have roughly the same approval rating among democrats yet Joe Biden's proposal has a 39 point edge over Sanders' among republicans indicates a significant difference in how these two policies are received.

When juxtaposing the popular support for these two policies, there are a large number of possible factors influencing it, which include but are not limited to Biden's more moderate stances or Sanders' reputation as a more liberal politician. However, the political rhetoric used by each politician when appealing to the public with their climate change policies is

undoubtedly another factor to consider when explaining the large popularity gap.

When considering differences in political rhetoric, it has been clearly established by researchers utilizing a framework known as Moral Foundations Theory (MFT) that conservatives and liberals hold different moral foundations (Graham et al., 2009). These may be separated into five different moral intuitions, which are Harm/Care, Fairness/Reciprocity, Ingroup/Loyalty, Authority/Respect, and Purity/Sanctity. Of these, liberals tend to endorse the first two more, while conservatives tend to identify more strongly with the last three. Critically, when arguments generally associated with on one side of the political spectrum were presented to people of the opposite political leanings, those that were more aligned with the moral intuitions of the reader tended to be more compelling (Feinberg and Willer, 2015), demonstrating that reframing political arguments to appeal to a those with different political beliefs is effective. When applied to the political issue of climate change, this conclusion seems to still hold true for shifting attitudes among self-identified republicans. In one study, although opinions of liberals did not shift significantly no matter the arguments presented to them, reframing pro-environmental rhetoric in terms of the three previously-discussed moral intuitions that appeal more to conservatives was effective in increasing their support for protecting the environment (Wolsko et.al, 2016). Another study had similar findings, but also found that in particular, the Purity/Sanctity moral intuition was especially effective in increasing pro-environmental attitudes among conservatives (Feinberg and Willer, 2012).

Another aspect of rhetoric that may have different appeals to those of different political leanings is political issues. According to one poll, while 68% of Biden supporters (who tend to be more liberal) view climate change as “very important” to their vote in the 2020 election, only 11% of Trump supporters (who tend to be more conservative) share the same opinion. On the other hand, the Economy was also the single most important issue to Trump supporters, with 88% of them describing it as an issue very important to their vote (Pew Research Center, 2020), suggesting that framing climate change in terms of the economy could be effective in increasing support for climate policies among conservatives.

With these two divides in rhetoric across ideological lines, the author set out to numerically analyze both politicians’ climate change rhetoric to examine for any clear differences.

### **Methodology**

To compare and contrast the political rhetoric of Joe Biden and Bernie Sanders, data from when each politician was discussing climate change in a public setting was manually collected and selected. This data totalled 10,272 words across 44 different sample texts, of which approximately two-thirds of the total words were collected from Joe Biden due to the ease of collecting data. Sanders’ sample texts were mostly selected from all throughout the 2020 democratic presidential primary campaign, while Bidens’ texts were mostly selected in the closing months of the general election. The time periods from which data was

collected was intentionally selected to draw the maximum contrast between the two politicians, since candidates tend to use rhetoric more appealing to those of similar political leanings than during the general election, during which rhetoric may be more diverse in target audience. Due to the large amount of data collected, the author feels that these sample texts are an accurate representation of both politicians' climate change rhetoric during their respective time periods.

To process this data, the author wrote a parser in Python to normalize and read all of the sample texts to yield a distribution of word use frequency for each politician. Phrases with multiple words, such as "climate change", "fossil fuel", or "donald trump" could be manually added to also be tabulated in the results. Then, specific words or phrases were manually selected to be compared between the word use frequency distributions of the two politicians. Both the singular distributions and comparative distributions were exported in .txt files compatible with Google Sheets for easy data analysis.

The parser was written with infinite expansion in mind to allow for adding or changing speakers, as well as adding or removing data to be analyzed, for which instructions are provided in the code documentation. All of the code, sample data, and results are publicly available at the following URL:

<https://github.com/ashleyzhang216/rhetoric-analysis>.

## Hypothesis

Among the two previously discussed divides in rhetoric, moral foundations and political issues,

one would need to appeal to one or more of them to gain support among a demographic. Thus, to account for one possible factor behind the large gap between the approval rating of Joe Biden's climate plan and the Green New Deal among conservatives, Biden's rhetoric would need to appeal more to moral foundation of purity that is associated more with conservatives, and reframe climate change in terms of issues popular with this group, namely the economy.

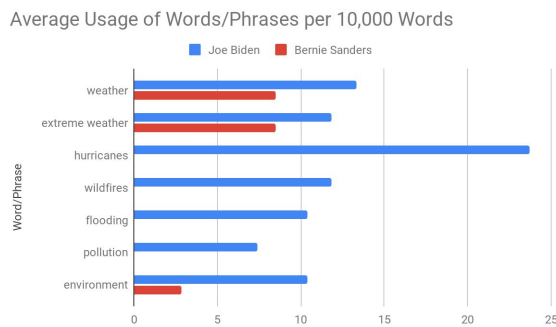
From this reasoning, the author proposes two hypotheses:

- Hypothesis 1: In comparison to that of Bernie Sanders, the climate change rhetoric of Joe Biden appeals more to the conservative moral foundation of Purity/Sanctity.
- Hypothesis 2: In comparison to that of Bernie Sanders, the climate change rhetoric of Joe Biden appeals more to the conservative political issue of the economy.

## Study 1a: Analysis of Conservative Moral Foundations

With the findings of previous research in mind, the author manually selected seven words/phrases that represent the purity/sanctity moral foundation; i.e. those that represent the contaminated and harmed the environment has become. These are weather, extreme weather, hurricanes, wildfires, flooding, pollution, and environment. Through reading all 10,272 words worth of sample text, the parser

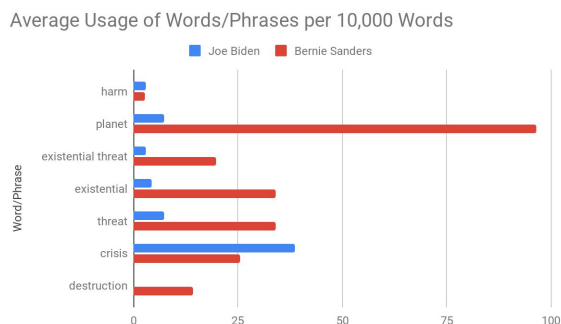
generated the following data:



In accordance with the hypothesis, one would expect that Joe Biden would use these words/phrases noticeably more than Bernie Sanders. This is indeed the case.

### Study 1b: Analysis of Liberal Moral Foundations

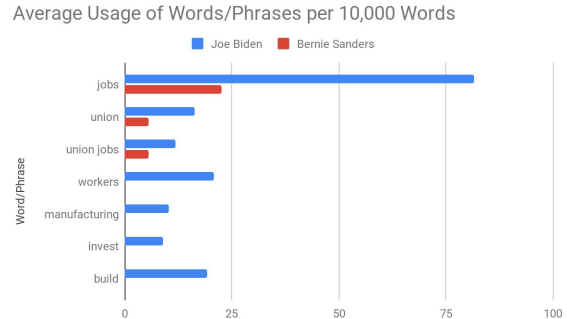
To build upon the findings in Study 1a, we test the opposite, namely that if Joe Biden uses more conservative moral foundations to appeal more to conservative audiences when compared to Bernie Sanders, he also utilizes liberal moral foundations to a lesser extent. In accordance with previous findings (Feinberg and Willer, 2012), the author manually selected seven words/phrases that represented the harm/care foundation, which are: harm, planet, existential threat, existential, threat, crisis, and destruction. Through reading all 10,272 words worth of sample text, the parser generated the following data:



In accordance with the hypothesis, one would expect that Bernie Sanders would use these words/phrases noticeably more than Joe Biden. Overall, except for two outliers (where “harm”’s usage is roughly the same, and Biden utilizes “crisis” slightly more), this is indeed the case.

### Study 2a: Analysis of Conservative Political Issues

With the findings of previous research in mind, the author manually selected seven words/phrases that represent the “Economy”; i.e. those that are closely related to economic political issues which conservatives tend to prioritize. These are jobs, union, union jobs, workers, manufacturing, invest, and build. Through reading all 10,272 words worth of sample text, the parser generated the following data:

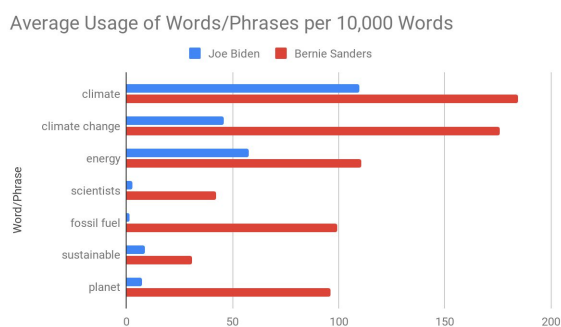


In accordance with the hypothesis, one would expect that Joe Biden would use these words/phrases noticeably more than Bernie Sanders. This is indeed the case. Of high interest is that besides for the word “climate”, “jobs” was actually the most often used word in the data for Joe Biden, being used 81.55 times per 10,000 words on average.

### Study 2b: Analysis of Liberal Political Issues

To build upon the findings in Study 2a, we test the opposite, namely that if Joe Biden discusses

political issues that appeal more to conservative audiences at a higher frequency when compared to Bernie Sanders, he also discusses political issues that appeal more to liberal audiences at a lower rate. As previously mentioned, liberals tend to prioritize climate change as a political issue at a much higher rate, so the author manually selected seven words/phrases to represent this topic. These are climate, climate change, energy, scientists, fossil fuel, sustainable, and planet.



In accordance with the hypothesis, one would expect that Bernie Sanders would use these words/phrases noticeably more than Joe Biden. This is indeed the case.

## Conclusion

This present research examined the climate change rhetoric of Joe Biden and Bernie Sanders throughout the 2020 presidential election, analyzing for differences in rhetoric that may be partially responsible for the large difference in popularity between the two politicians' respective proposals. Studies 1a and 1b demonstrate that when compared to Bernie Sanders, Joe Biden utilized rhetoric that appealed more to conservative moral foundations and less to liberal moral foundations. Studies 1a and 1b demonstrate that when compared to Bernie Sanders, Joe Biden spoke about climate change more often in terms of the economy, an issue that appeals

more to conservatives, and less so as the issue of climate change itself, which is significantly more popular than liberals.

Based on the data, these studies provide evidence that the climate change rhetoric of Joe Biden and Bernie Sanders have noticeable differences that may have contributed to differences in attitudes towards their climate plans among conservatives. Thus, these results tentatively suggest that using a diverse set of political rhetoric may be effective in reducing politicization over climate change.

That the climate change proposals of Joe Biden and Bernie Sanders are, when read anecdotally in the opinion of the author, quite similar in many respects, reinforces this tentative conclusion. Even while Biden's plan calls Sanders' plan a "crucial framework", it enjoys a much higher approval rating among republicans, which the author has hypothesized is partially due to a different choice of rhetoric.

It is important to note that the conclusion made by the author is only tentative. Many design choices were made with time constraints in mind such as a manual selection of words that seemed to appeal to conservative moral attitudes that should be considered and corrected in future work. However, the author believes that such choices were accurate enough to complete a preliminary analysis on the data, but also strongly encourages future discussion on this topic to confirm or repudiate these findings.

## Declaration of Conflicting Interests

The author declares no conflicting interests regarding any aspects of this article.

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