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STATS 670

Mini Project 2

2018NOV05

Congressional Polarization

Across the country, news outlets are predicting the results of the 2018 midterm elections¹. While polls predict every outcome under the sun, Democrats and republicans vie for control of the house in a political climate that seems particularly polarized. Indeed, we live in an America where the president is so disliked that his supporters require their own dating app (Donald Daters). While we haven't yet reached the polarized levels of the civil war time period (as of yet no senator has attempted to beat another on the senate floor, unlike the infamous 1856 'Caning of Senator Charles Sumner'), one can't help but feel that over the past 50 years there has been a "hollowing out" of the political spectrum. That perhaps there may be some truth in the idea that "liberals are becoming more liberal, conservatives are becoming more conservative, or both."

This is a hard question to analyze, as political ideologies are by their very nature extremely subjective; one person might say they are firmly squarely in the middle of

¹ True as of draft completion. By final project turn in the elections will have occurred.

their party's beliefs, while another could say that the same person's beliefs fall on the extreme side of the political spectrum. Adding time, this question becomes even more complicated. One way we can attempt to measure this, however, is to look at the voting patterns of elected officials. Here, this takes the form of senators' voting records for each of the years from 1989 through 2014. For each year we have two files, one containing information on the members of the senate (including political affiliation), and another with the voting records for each bill (indicating whether a senator votes "yea", "nay", or abstained from voting on each particular bill in question).

To investigate this question of whether America has become more polarized in the past 50 years, I will approach the issue in three ways: polarization in two years, polarization over time, and ideological position of one senator. For polarization in two years, I will use PCA to look at the breakdown of voting patterns along the liberal/conservative axis, and to see if senators' voting patterns align more strongly along party lines in current years (2014 vs 1989). Principal component analysis is repeated for the polarization over time section, with the % variance explained by PC1 (in this case party affiliation) used as a measure of polarization and subsequently computed for each year and graphed over time. In the ideological breakdown of senators, I'll present analysis of both John McCain and Kennedy, longstanding

members of the Republican and Democratic parties respectively and analyze how their parties positions have changed (or not changed) over time.

Polarization in Two Years

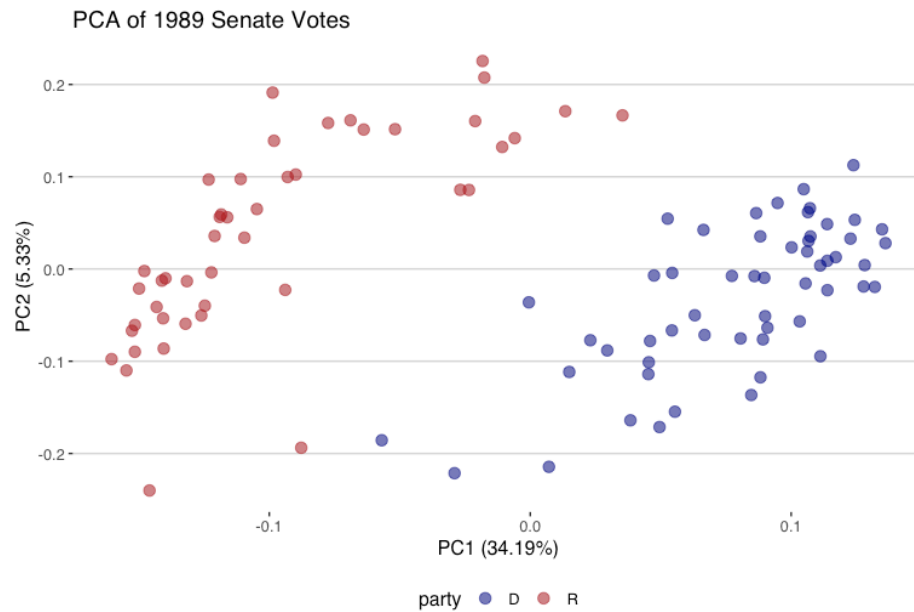


Figure 1

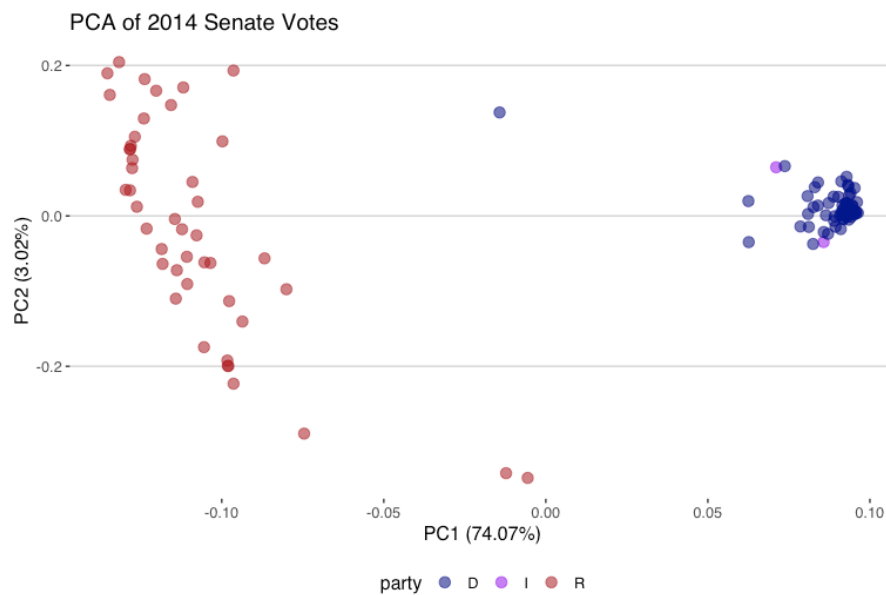


Figure 2

As a first look at visualize polarization, it is helpful to look at two years at the beginning and end of our time frame, 1989 (Figure 1) and 2014 (Figure 2). Partial Component Analysis of both years immediately reveals a change between the two. While both years appear to generally follow a liberal/conservative axis (Republicans represented in red and mostly on the left of the graph, Democrats in blue and mostly on the right of the graph), the separation between the two groups is much stronger in the 2014 graph. In the 1989 graph, while the two clearly have their own clusters, there is some overlap between them, with more than a few points senators from each party in the middle of the spectrum and even 'crossing over' into the domain of the other. In 2014 however, the groups are far more separated, with democrats appearing to be even more tightly clustered than republicans. While a few senators remain in the middle, they are now distinctly outliers. It should also be noted that in 2014 there are also the outliers of independent senators (Angus King and Bernie Sanders, represented in purple and mostly aligning with the democratic group)).

The shape of the two parties is also interesting; the wider spread of the republican senators along principal component 2 indicates wider differences within the party. Finally, a good deal about the increased polarity can be inferred merely from the percentage. Taking PC1 as the one dimensional liberal/conservative bias, in 1984 this accounted for only 34.19% of the variation. In 2014 however, it accounts for 74.07%, indicating that the voting patterns of senators are more closely aligned with

that of other senators who are also of their same party (and thus voting along party lines and increased polarity and partisanship).

Polarization Across Time

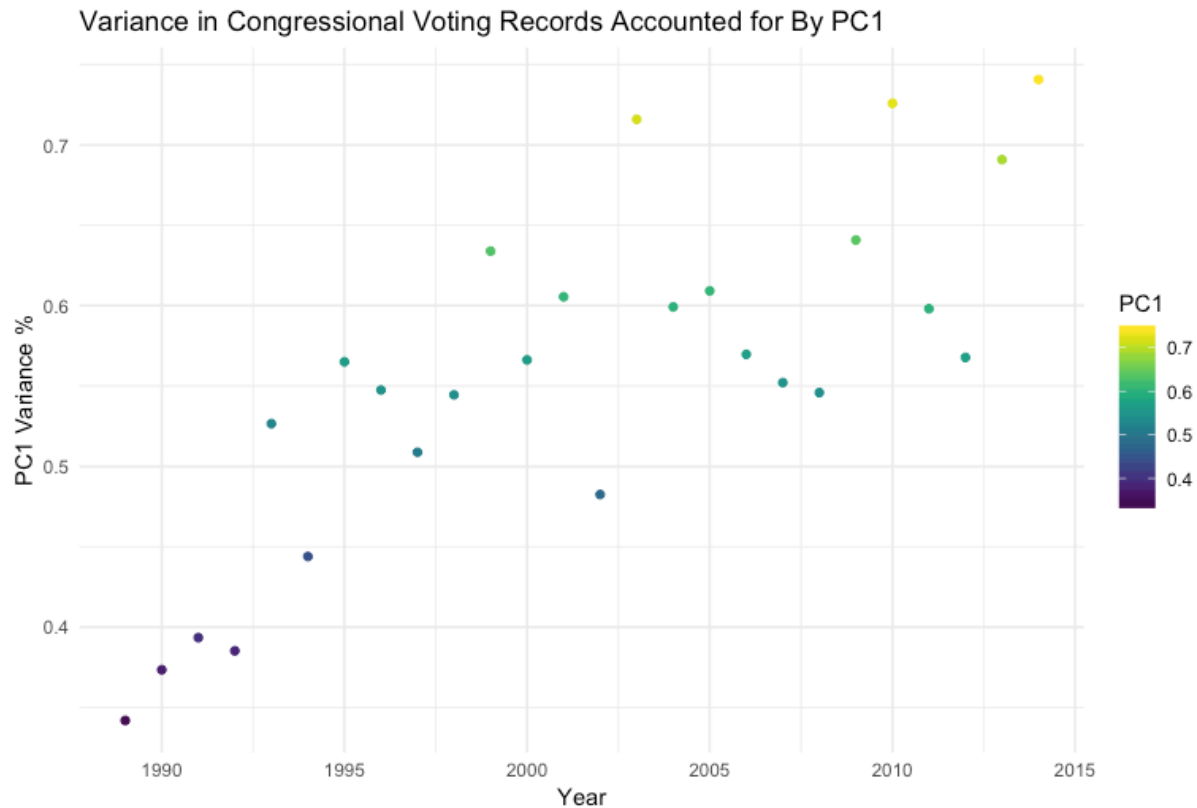


Figure 3

Using the variance explained by PC1 as our measure of polarization (again, from our previous analysis PC1 can generally be thought of as the liberal/conservative axis), with higher values indicating a greater divide in voting habits based off of political party affiliation, we can expand our previous analysis to cover our entire time frame. In Figure 3, it is quite apparent that the increase in variance we saw in the 1989 and 2014 holds true for the other years in this time period as well. While there are some outliers

and a slight drop in the 2005 to 2010 time frame (perhaps due to the financial crisis republican and democrats were able to pull together to vote across the aisle), there is a clear upward trend in variance, and thus political polarization over time. However, it is not entirely as straight forward as this; every few years there appears to be a spike in variance, almost exactly 10% higher. Given that this occurs regularly throughout the dataset, I would guess that these spikes may correlate with midterm election and presidential election years, when senators are even more careful to 'toe the party line.'

Ideological Position of One Senator

Our prior analysis has been useful to gain an understanding of the relative ideological positions and separations between the democrats and republicans. However, it provides little insight into the absolute change between parties each year, and also which party if either, is more responsible this shift. To get a better understanding of the absolute ideological shifts from year to year, it is helpful compare the voting records of specific senators to the overall group over time. To get a fair sampling, I have selected both Ted Kennedy (D) and Mitch McConnell (R). Kennedy served on the senate from 1962 to 2009, and McConnell has been serving since 1984. As Kennedy's tenure ended in 2009 and he was not able to fully serve that year, I will limit the scope of both his and Mitch McConnell's analysis to the 1989 to 2008. I selected both Kennedy and McConnell for their lengthy presence in the

senate, and also because I suspect that neither has had a significant shift in ideology since the 1980s; one is staunchly democratic, and the other staunchly republican. As such, changes in the distance between their "score" along principal component 1 and the overall "score" of their respective parties provides insight into how the parties have shifted.

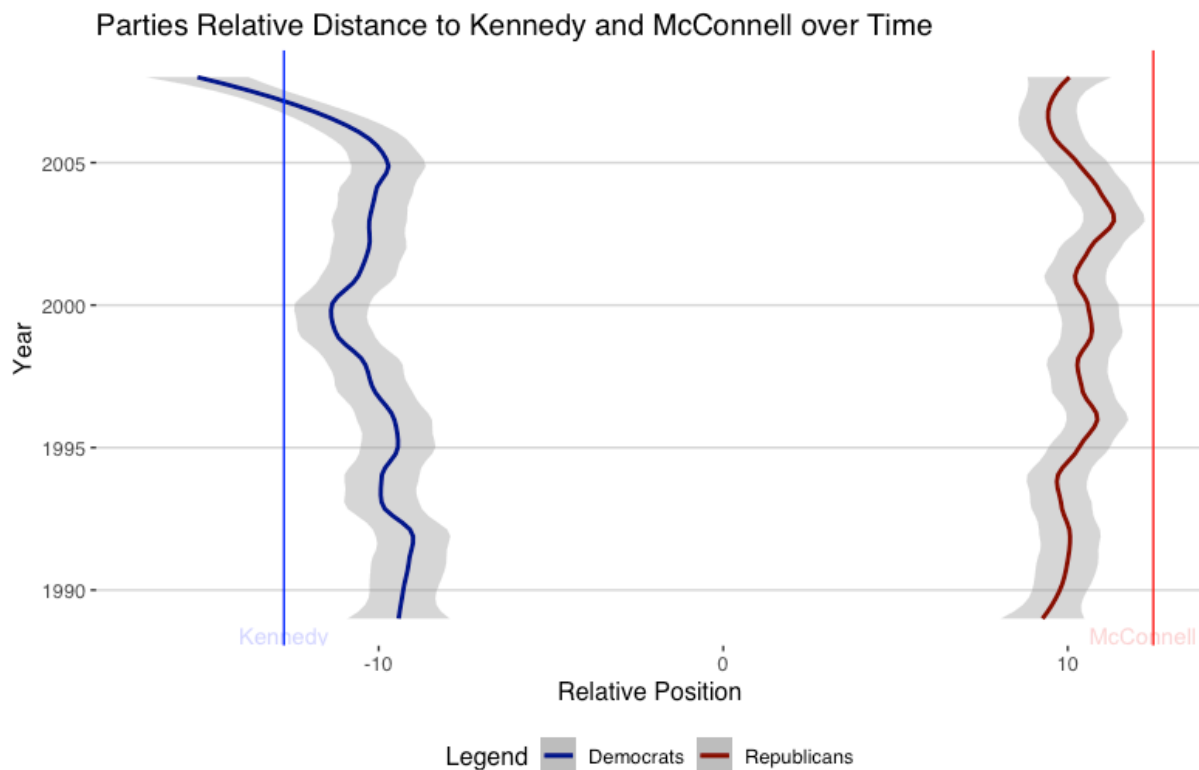


Figure 4

Figure 4, above, graphs this relationship. Time is along the y-axis, with most recent years at the top. Democrats are shown in dark blue, with the mean of Kennedy's votes as a vertical bright blue line generally, but not always, to the left of the mean line. Republicans are shown in dark red with McConnell's mean score shown

as a bright red vertical line. Interestingly, the republican votes are always to the left of McConnell's. While this graph is useful to get an overall picture of the relationship between the two parties and Kennedy and McConnell (it does seem to show the "hollowing out" effect quite well and it is interesting to see that a large part of the difference seems to be democrats), it is useful to also look at simpler graphs of the distance between Kennedy and McConnell and their respective parties.

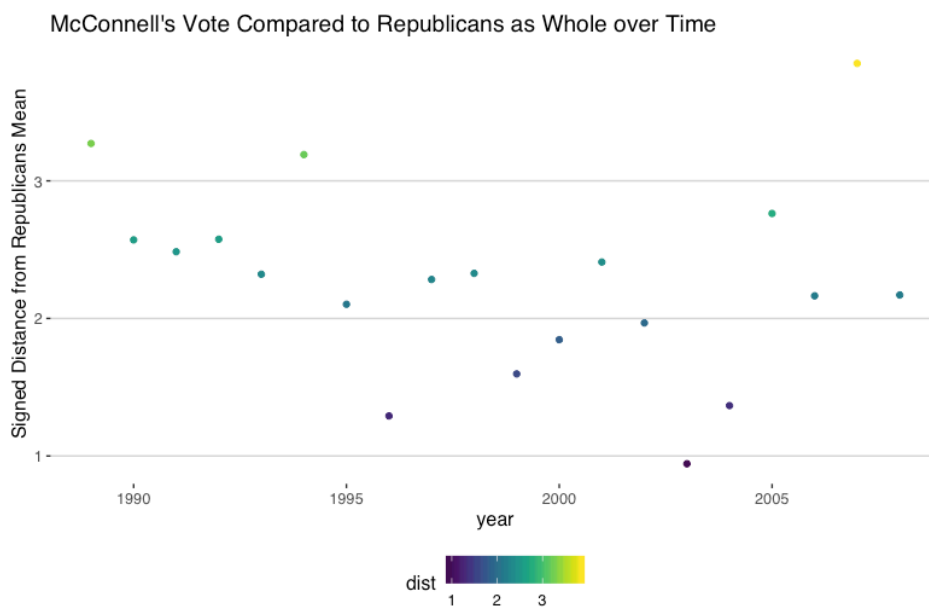


Figure 5

Here we can see that the distance between McConnell and the republicans has overall had a slight downward trend from 1989 to 2008, but have never crossed. In Figure 6 we can see the same decrease in distance holds true for Kennedy and the democrats, however they actually cross over to the other side. indicating that they may be more responsible for the increased polarization. In some ways however the

republicans appear to have been more ideologically unstable, as the distance between McConnell and the mean republican score varied quite a bit from the mid-nineties to 2005. Overall, these graphs support the hypothesis that the country is becoming more ideologically polarized.

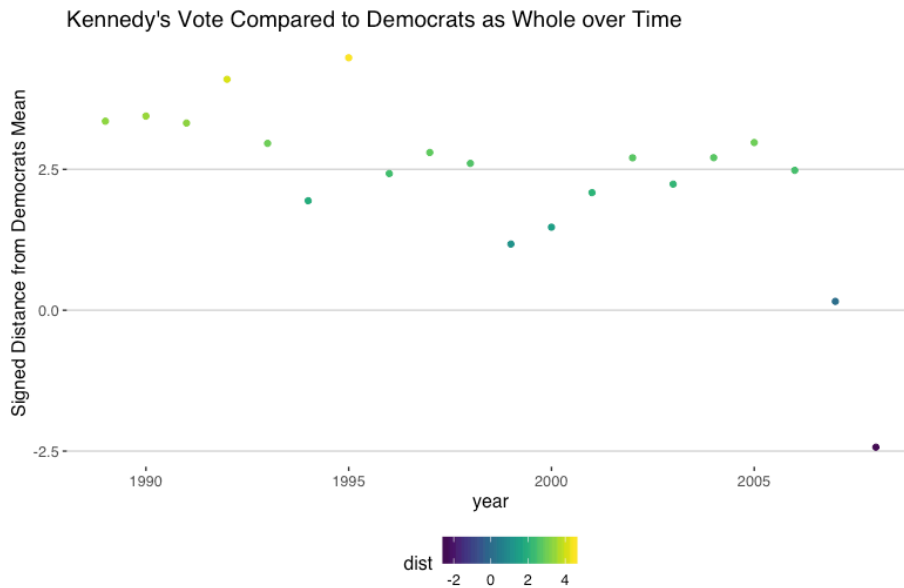


Figure 6

This analysis does have some limitations however. First, it is limited by my own bias; no matter my attempts to remain objective, I can't help but look at the data through an at-least-somewhat liberal lens. Beyond this there are a few more issues:

- While I could have extended McConnell farther, it seemed that it would be unfair to the democrats (or the republicans, depending on what way you look at the issue). Because of this, and recent changes in ideology are missing. This is particularly unfortunate given the rise of such parties like the Tea Party, election

of Trump, etc. which could be viewed as indications that the past few years in particular have seen a rise in polarization.

- It's hard to truly say where Kennedy and McConnell fall along the spectrum: if their viewpoints are more toward the true center then a decrease in the distance between them and their parties would indicate a *decrease* in the ideological divide, whereas if one views them on being further towards the extreme sides of the spectrum then a decrease in distance would indicate *increased* polarization. This analysis assumes the later.
- I assume here that Kennedy and McConnell haven't changed their ideologies much; they very well could have, in which case this analysis becomes much trickier and this representation would not be accurate.

There could also be other explanations for this apparent divide in congressional voting patterns. Perhaps Americans are more ideologically polarized, senators are just voting more strongly towards party lines for other reasons, such as campaign donations from corporations.

Regardless, this exploratory analysis appears to support the thought that America is becoming increasingly polarized. PCA of 1989 and 2014, measurement of variation between parties over time, and a look at the ideological positions of democrats and republicans relative to Kennedy and McConnell all seem to concur that America really is "hollowing out."

References

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