

POLARIZATION IN THE US POLITICS

Implemented By:

Sushant Kotwal (skotwal)

Ritwik Srivastava (ritsriv)

What is Political Polarization?

The most accurate definition for this term can be stated as the extent to which opinions on an issue are opposed, and the process by which this opposition increases over time.

Now our task for this problem statement is to investigate the Political Polarization in US over the years

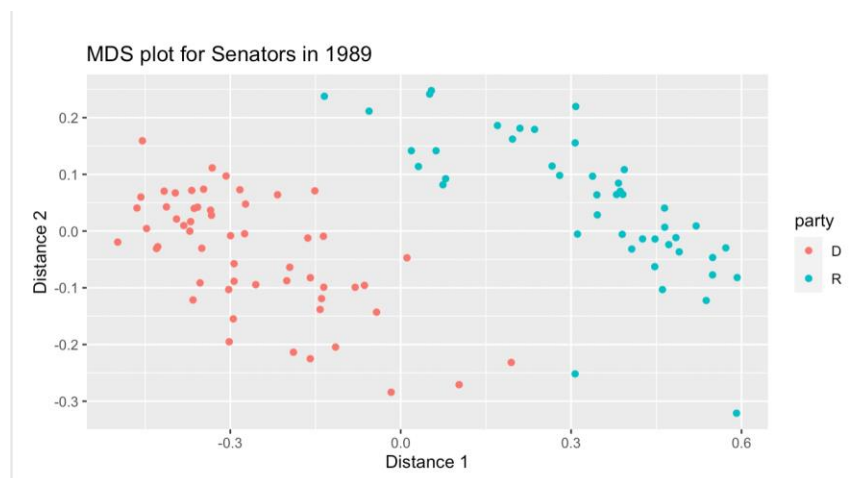
For the sake of analyzing the problem, we use data containing the records of all the bills that were passed along with the information of those senators who supported the bills as well as those who were against the bills. We also used the data having information of those senators especially the party which they belonged to. This data was analyzed for the years 1989 to 2014.

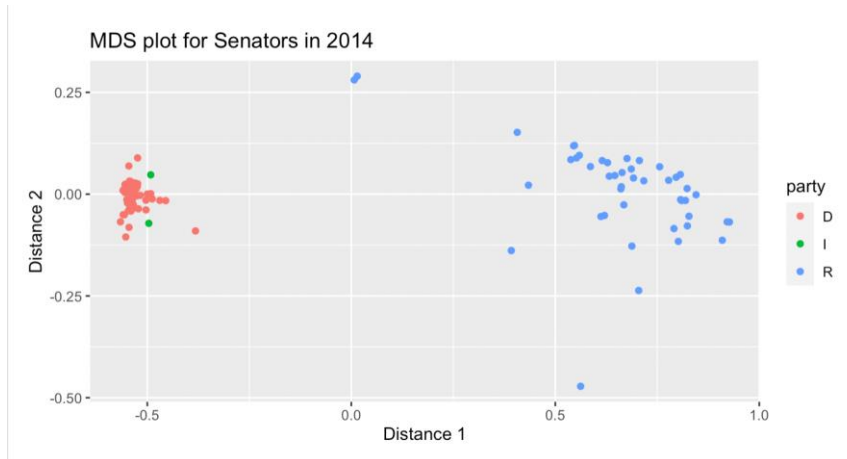
The analysis of this task is broken down into 3 parts.

First we compared the voting results for 2 years. Here we used data for two years i.e. 1989 and 2014 which were far apart in order to determine how the trend in ideologies of the senators at the beginning of the analysis and how these ideologies changed at the end of our analysis.

For this task, **we use the concept of multi-dimensional scaling to project all points on an n-dimensional plane and compare their distances.** In layman's terms, this method helps in finding out elements/points that are similar to each other and can form clusters/groups.

We used this method to find out how senators between 1989 and 2014 formed clusters based on their ideologies.



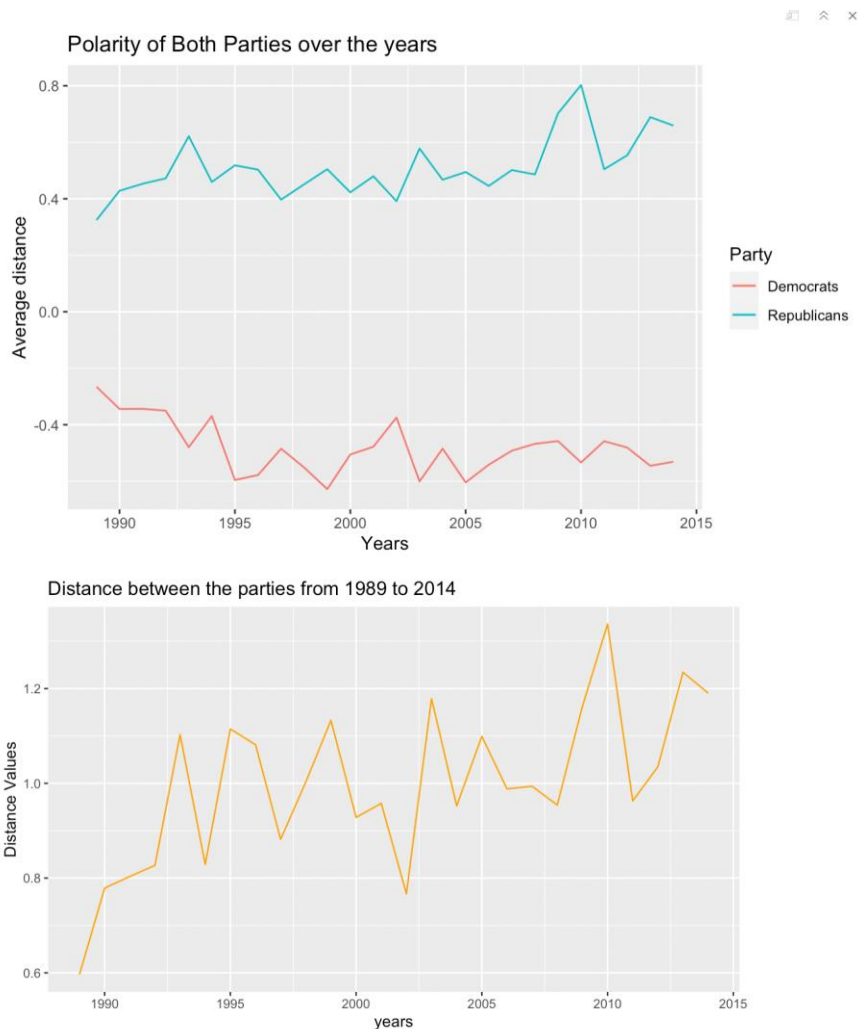


As expected from our analysis, we see 2 distinct groups of senators being formed. One group falls to the extreme left of the plot. This group represents the Democrats. Another group falls to the far right of the plot. This group represents the Republicans.

Another thing to note here is that the variation in distances between points (which translates to ideologies between senators in the same party) is much higher in 1989 than in 2014. This means that over the years, senator ideologies became clearer and more distinct, resulting in sharper similarities among senators in the same party.

Now that we understand how different the ideologies were for years 1989 and 2014, we will now see how this change happened over the years.

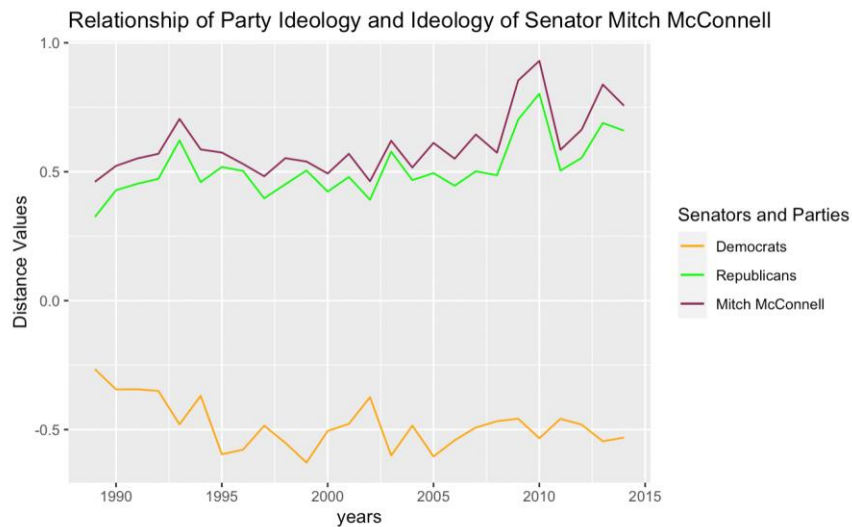
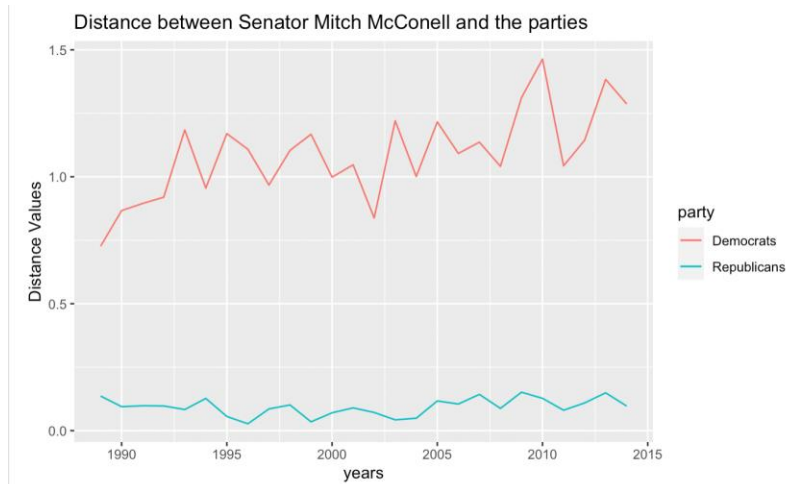
Here, we do the same analysis as before but this time we consider distances between points (again, differences between ideologies) over the years and not just for two years. **The plots for distances of senators for each year are given in the Appendix section.** A mean of the distances over time has been considered here to find the polarization.



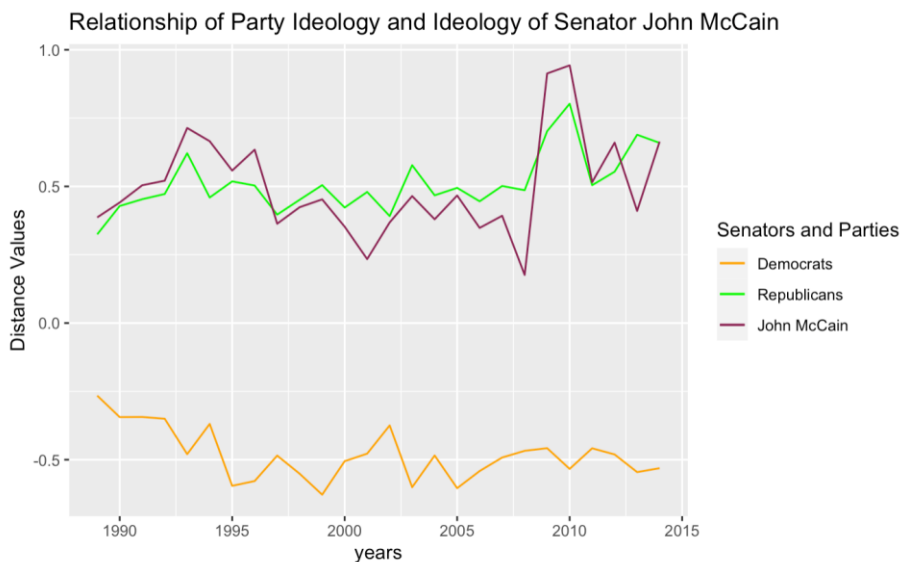
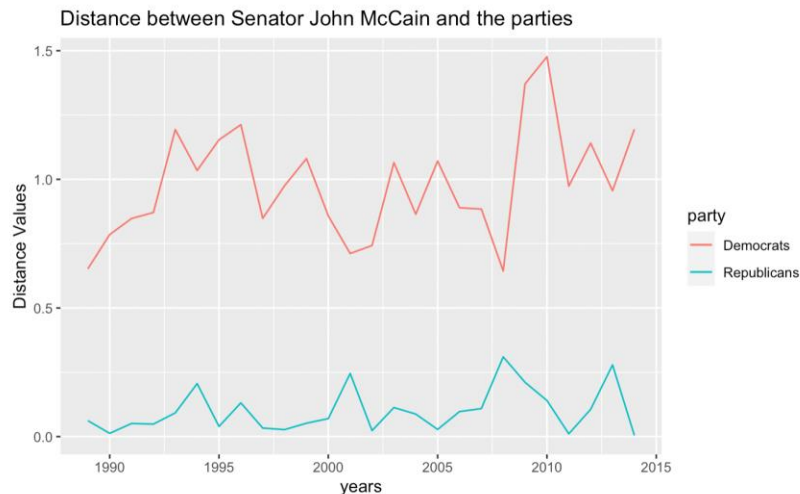
As we were bound to get, the results are very similar to the previous analysis. We see a constant increase in polarization between the two parties over time (barring a dip in 2002), suggesting a wider difference in party ideologies between Democrats and Republicans. As discussed before, the most plausible explanation for this is that over time, opinions and views on public matters become more and more crystal clear, causing a bigger distinction in who supports what. Hence, even the voting on bills shows a clear trend of juxtaposition in opinions.

Lastly, we compare the change in ideologies with respect to a specific senator. For this, we considered Senator Mitch McConnell and Late Senator John McCain from the Republican Party.

We could see from the earlier analyses that senators were almost always aligning with the ideologies of the parties that they belonged to, and also the two major parties (Republican and Democratic) always had a clear distinction between their ideologies which just grew wider and wider over the years. This observation explains a lot of the plot above.



Mitch McConnell: Mitch McConnell is and has always been known to be a strong and loyal Republican candidate, so unsurprisingly, the distance between (in layman's terms, the difference in ideologies between) the Republican ideologies and McConnell's has a very low difference factor. On the other hand, the distance between McConnell and the Democrat ideologies just keeps on increasing over the years. Similarly, in another plot where we directly compare the trend lines of ideologies of both parties and the candidate, we see that McConnell's ideologies quite closely resemble the same of the Republican party.



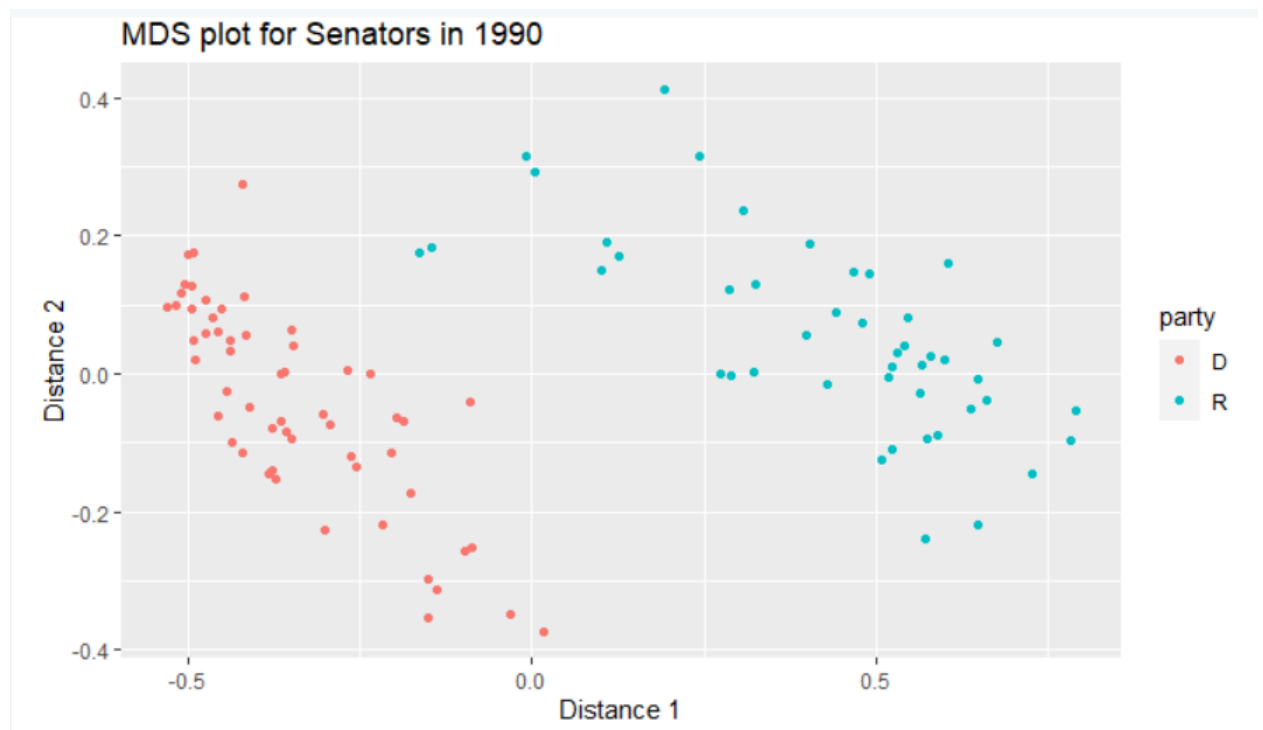
John McCain: We saw very interesting results in this analysis. Even though John McCain is someone who strictly adheres to only one party, he has always been known to have his own opinions on public matters too which sometimes garners interesting responses from supporters of either party. From the distances, we see that the distance between the ideologies is again a similar trend as McConnell's wherein the distance to Democrats is higher than the distance to Republicans, and then again we see a similar trend in the plot for the relationship of party ideologies. However, in both plots, there is a sharp dip in the middle which indicates a leaning towards the Democrat party/support from Democrat supporters. This is because McCain garnered support (very little, however) from Democrat supporters when in 2008 he ran for the presidency and few of his ideologies resounded with mindsets from the far left of the political axis. He also worked with a few Democratic senators to pass laws that other Republican senators would probably not agree to.

CONCLUSIONS:

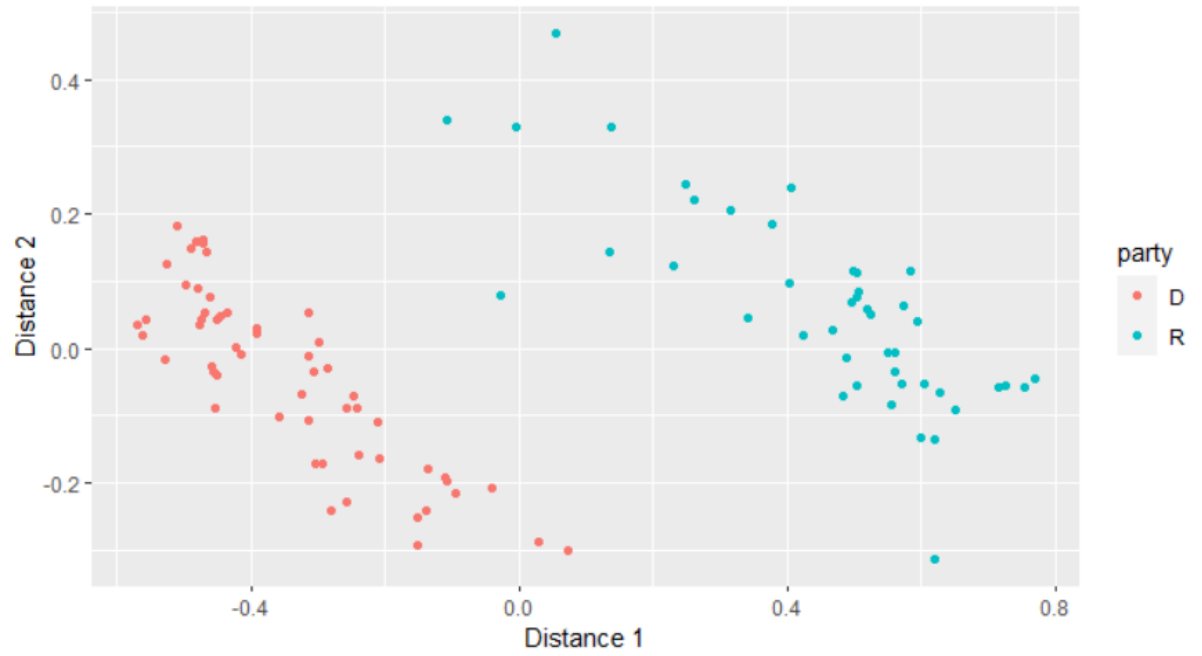
In conclusion, we could see that almost all political ideologies in the US can be classified into either a Democrat mindset or a Republican mindset, which in turn can be visualized in a one-dimensional projection. Another thing to note is that the difference in ideologies of the two parties is ever-increasing as we go over the years. This makes a lot of sense because, with the increase in public matters, the clash in opinions also increases resulting in stronger beliefs. On the other hand, the similarities in ideologies between a particular candidate and the party they belong to are also almost always at a high level.

APPENDIX :

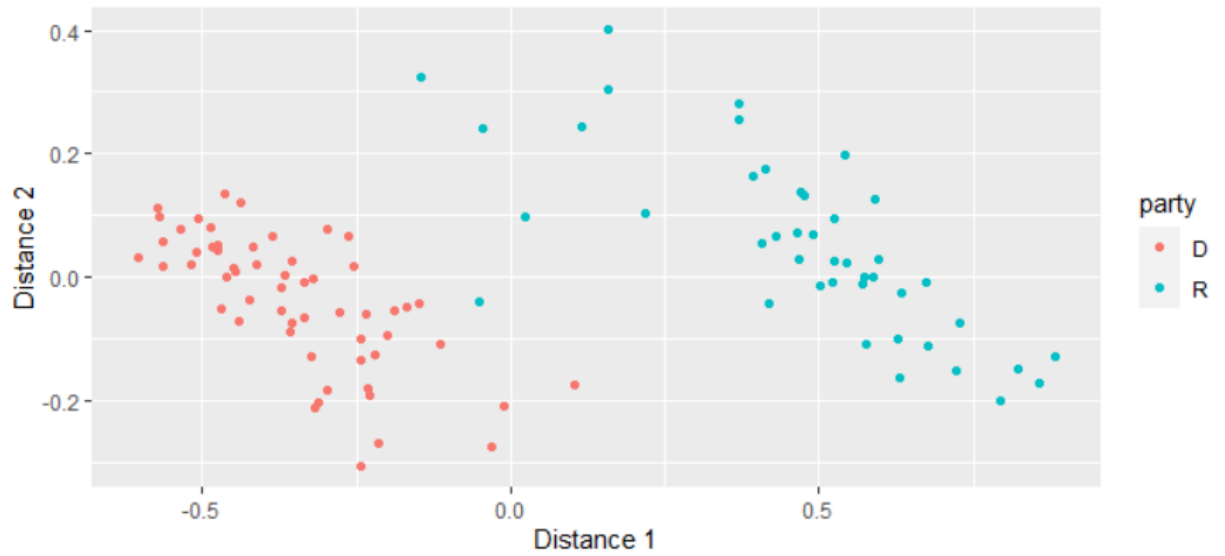
The MDS Plots used for Determining the Polarization over time:



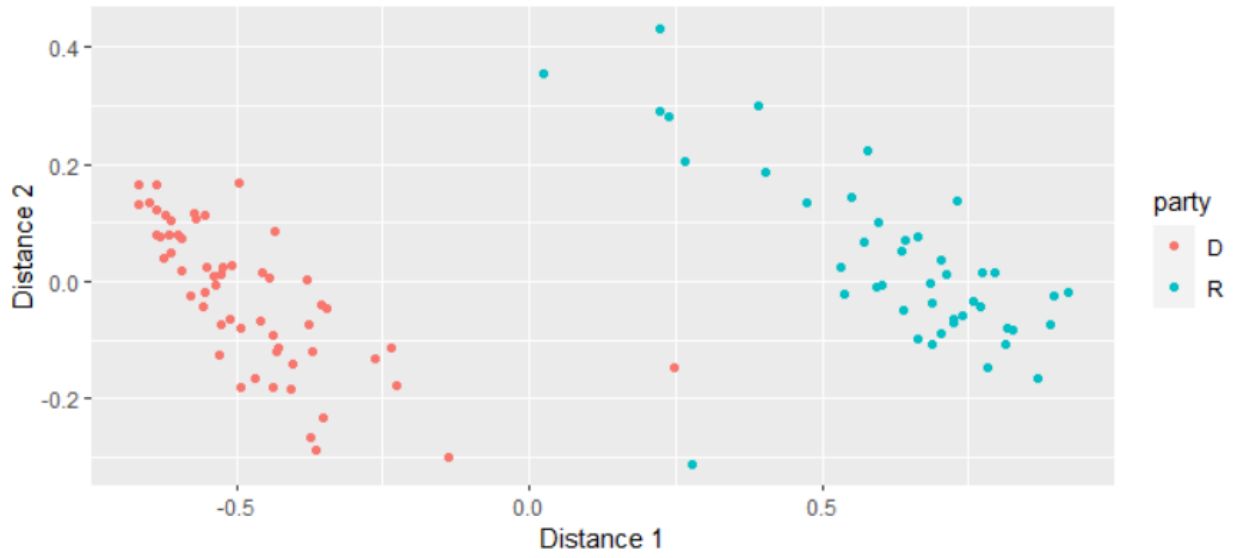
MDS plot for Senators in 1991



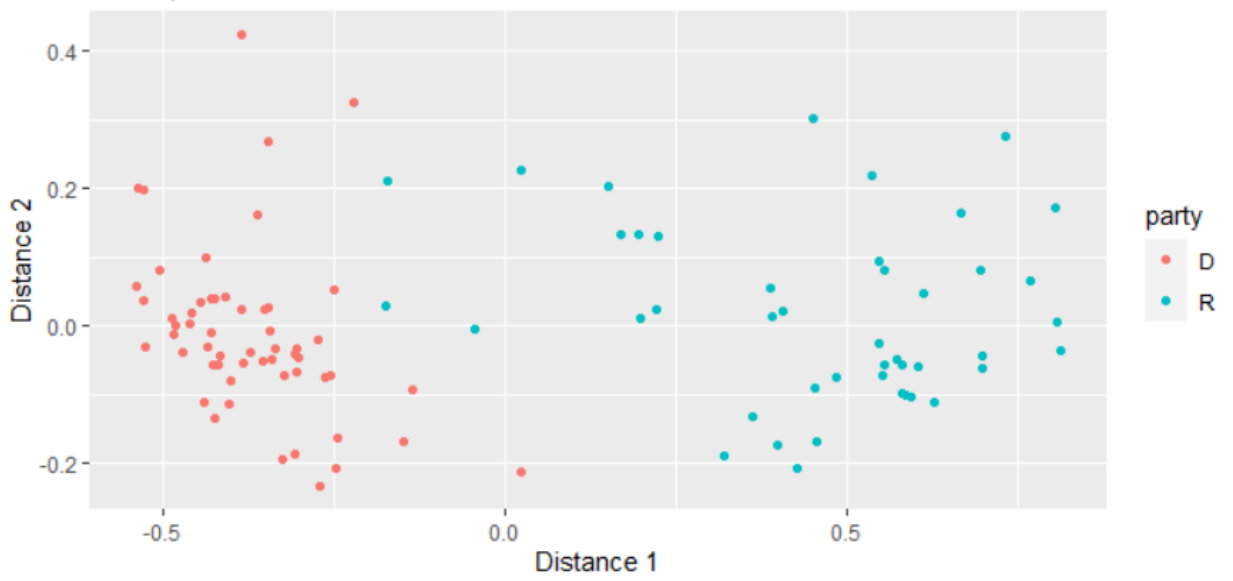
MDS plot for Senators in 1992



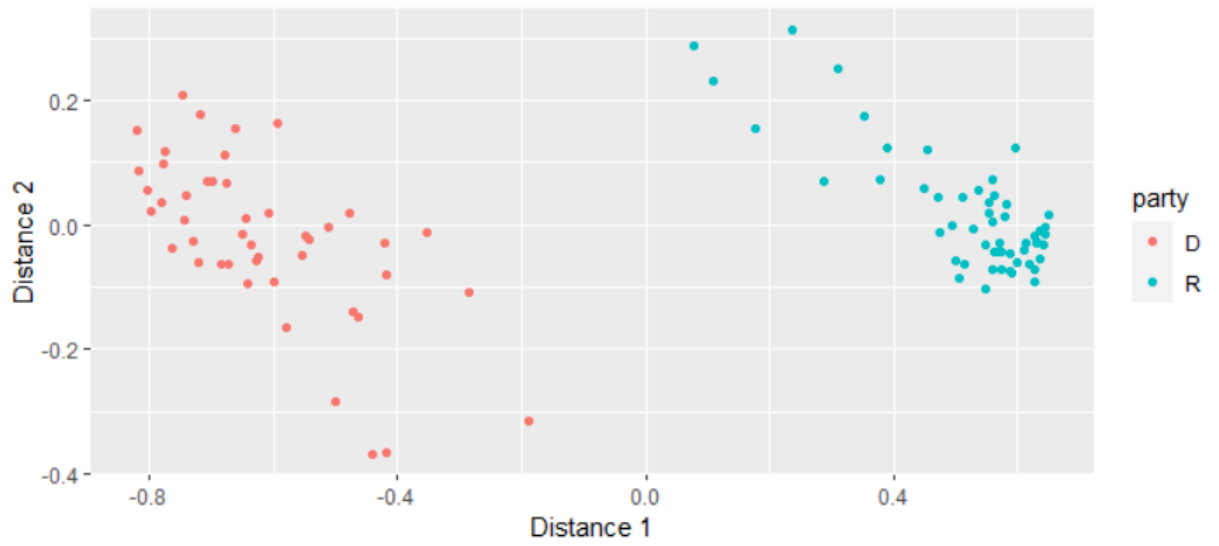
MDS plot for Senators in 1993



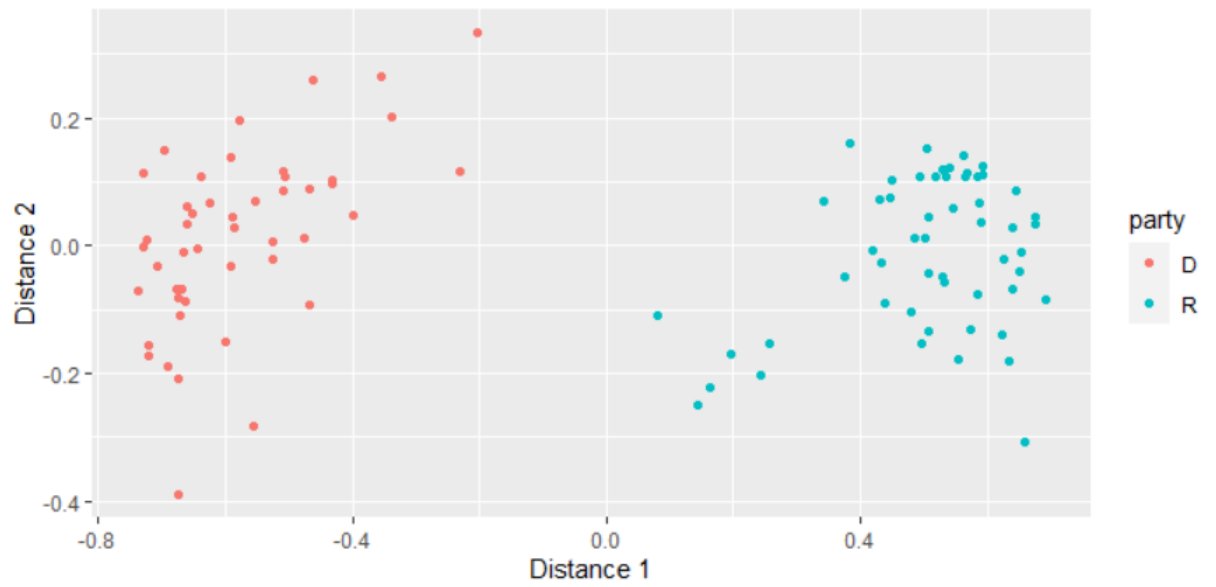
MDS plot for Senators in 1994



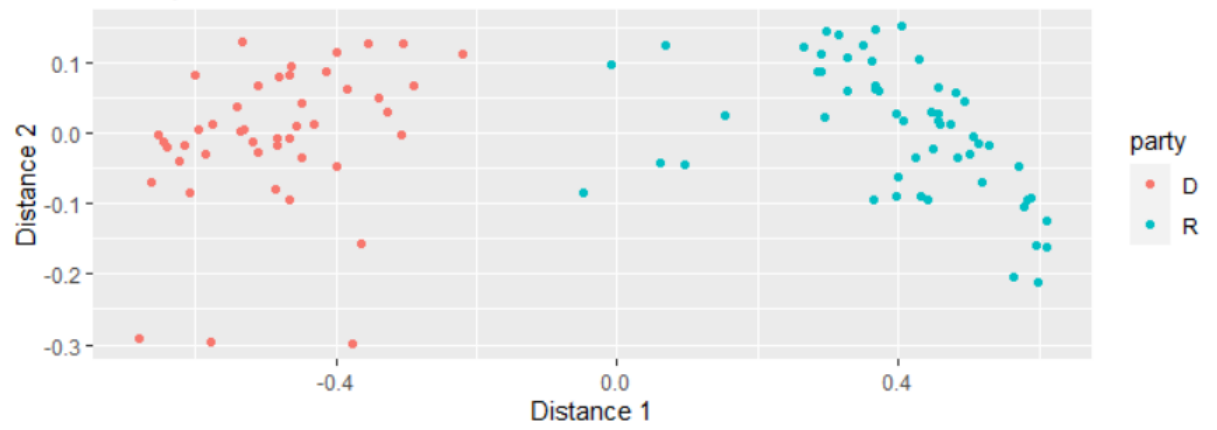
MDS plot for Senators in 1995



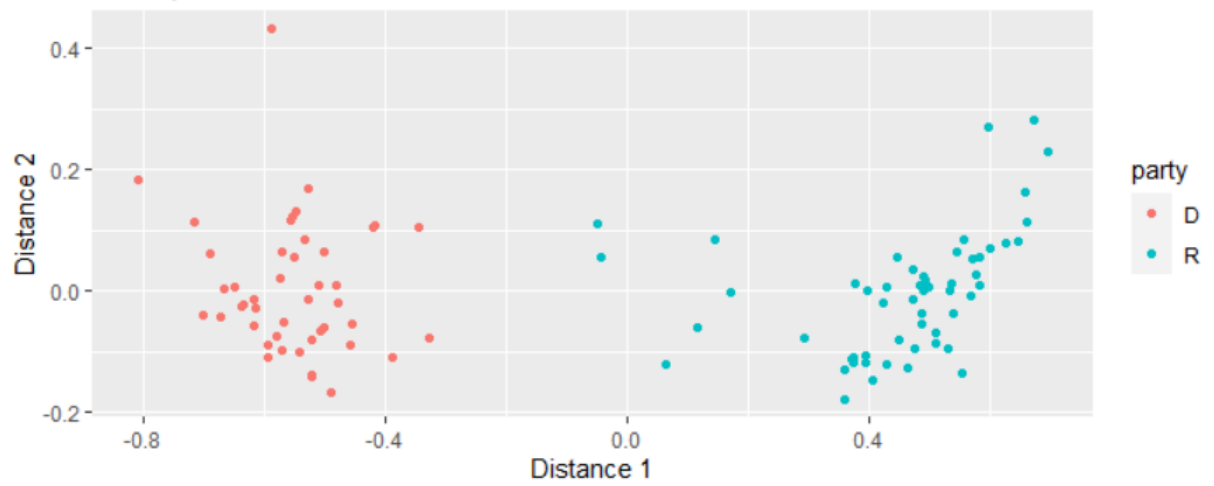
MDS plot for Senators in 1996



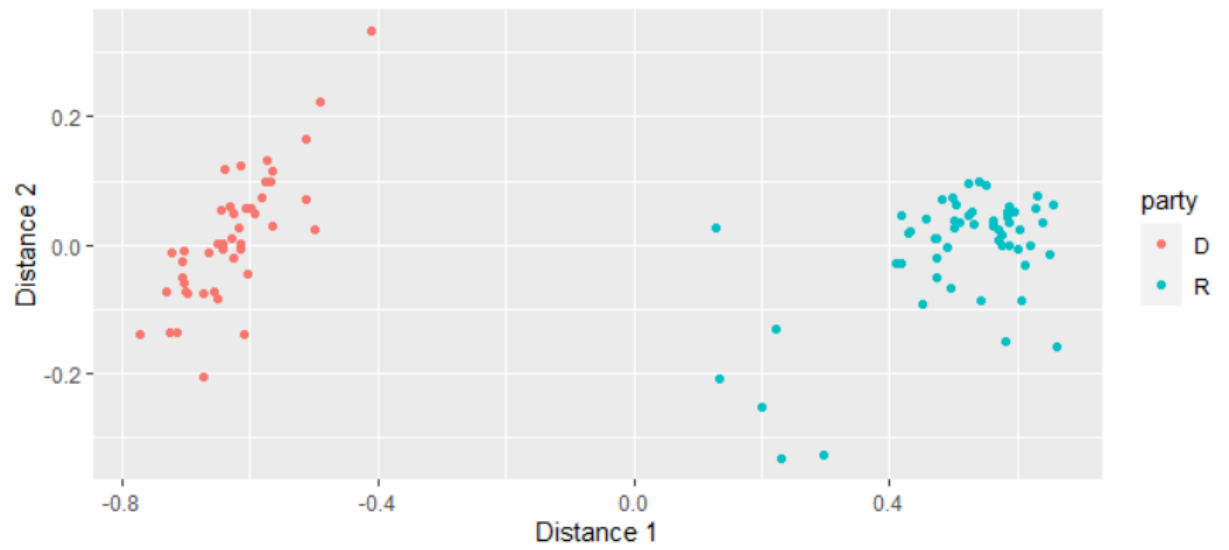
MDS plot for Senators in 1997



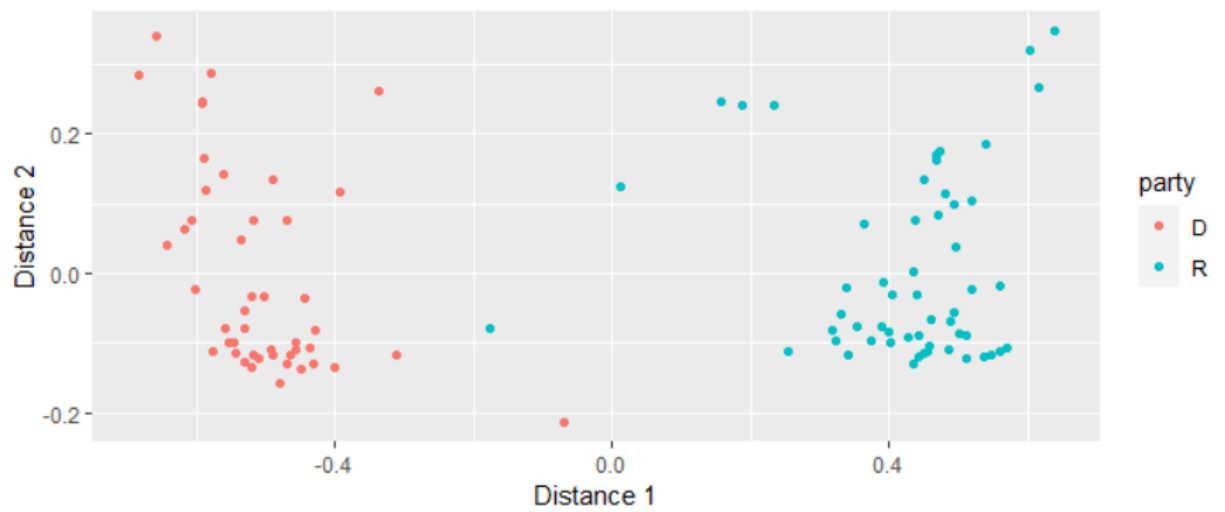
MDS plot for Senators in 1998

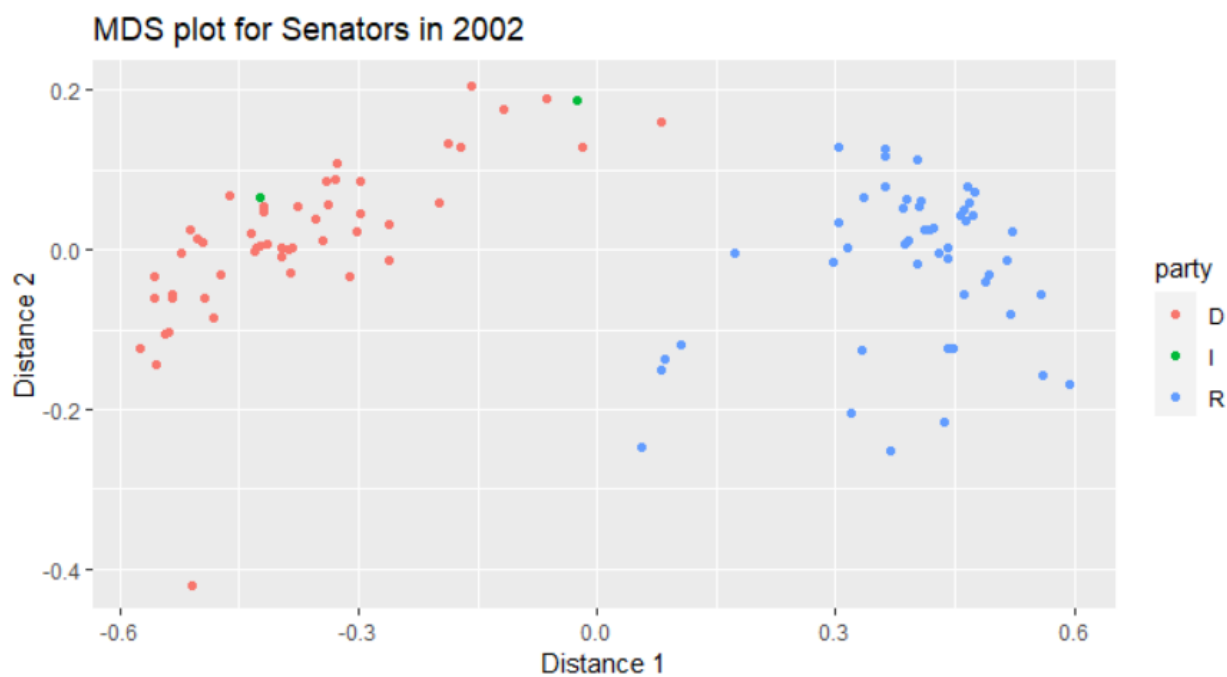
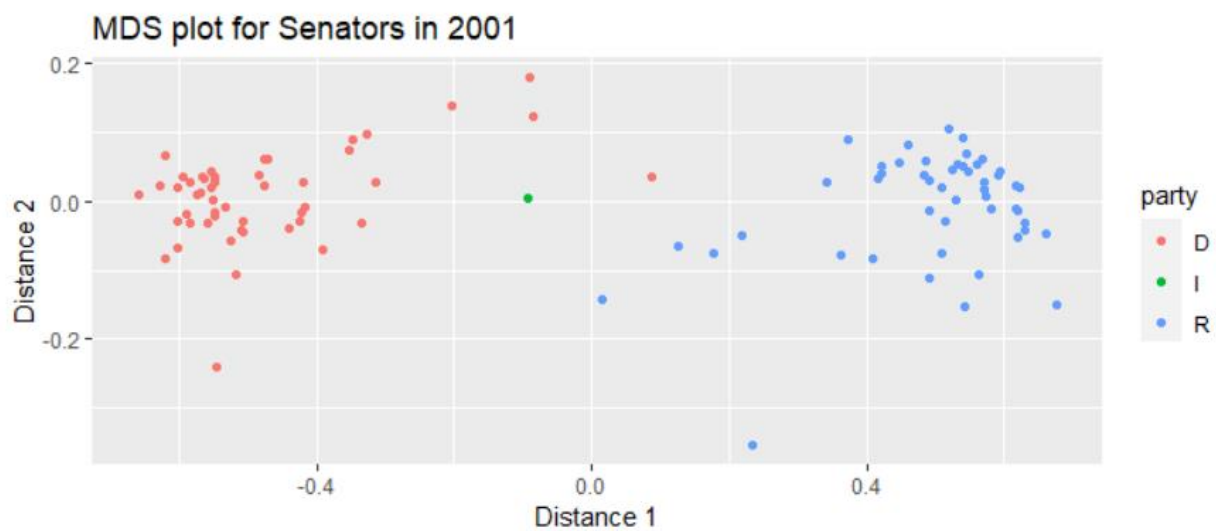


MDS plot for Senators in 1999

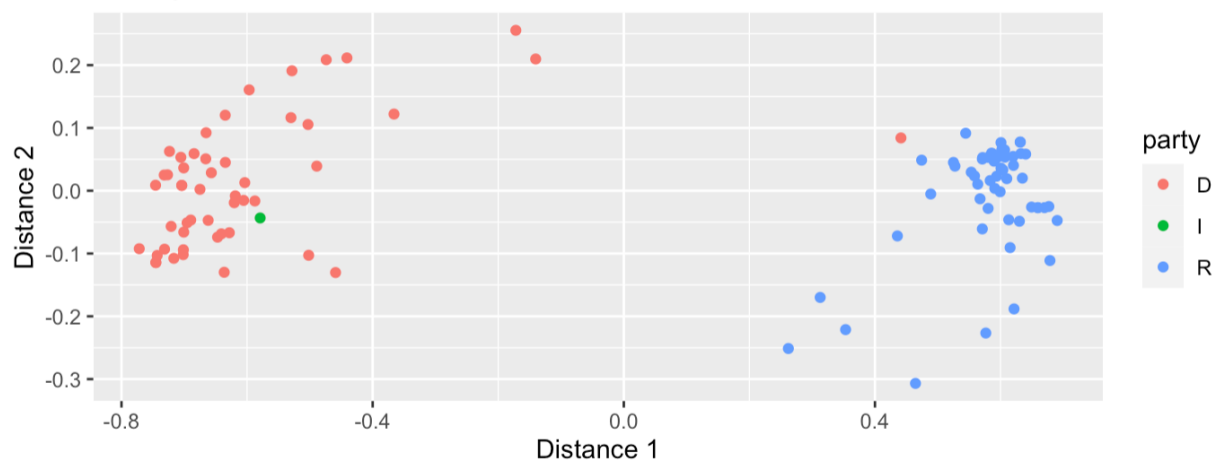


MDS plot for Senators in 2000

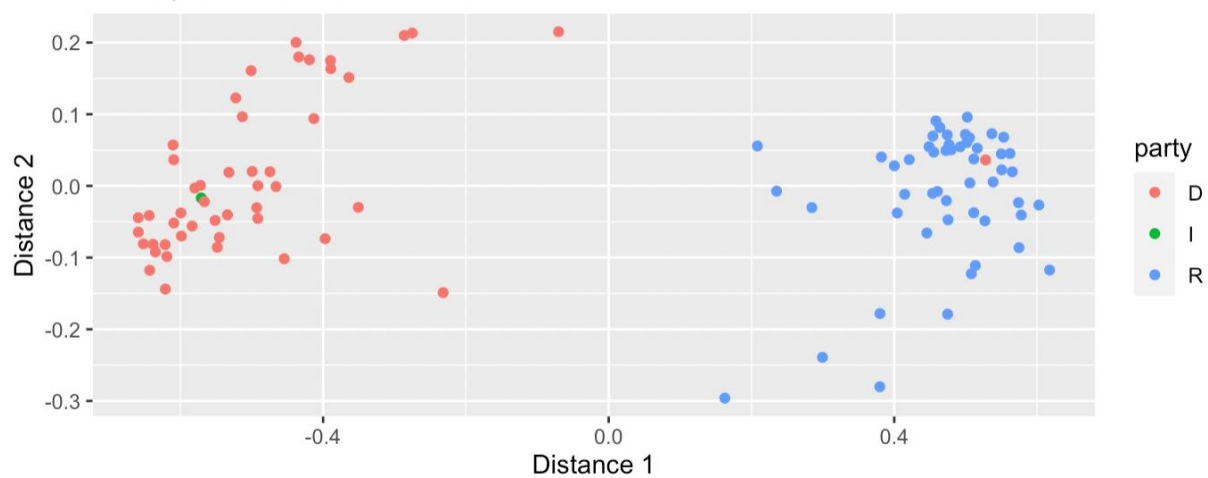




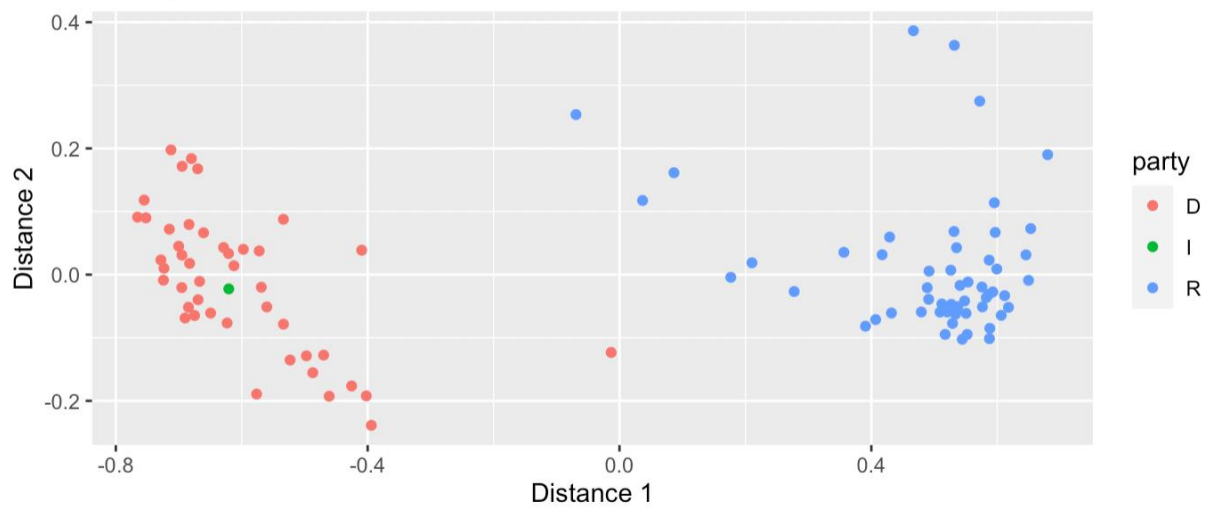
MDS plot for Senators in 2003



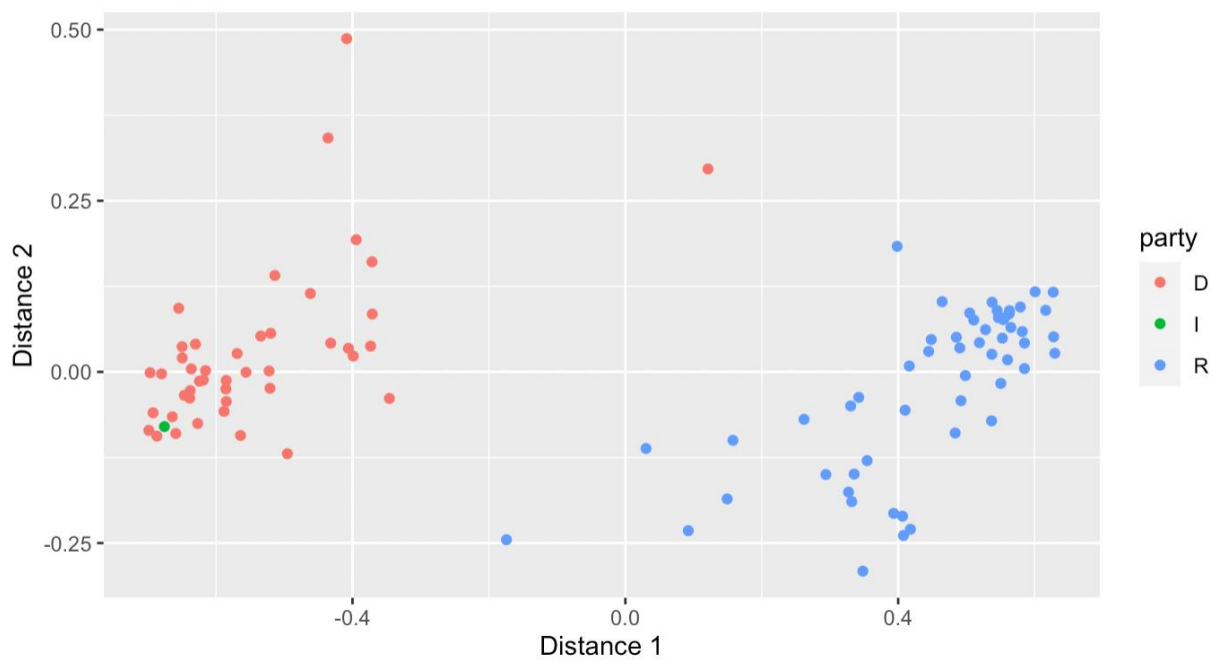
MDS plot for Senators in 2004



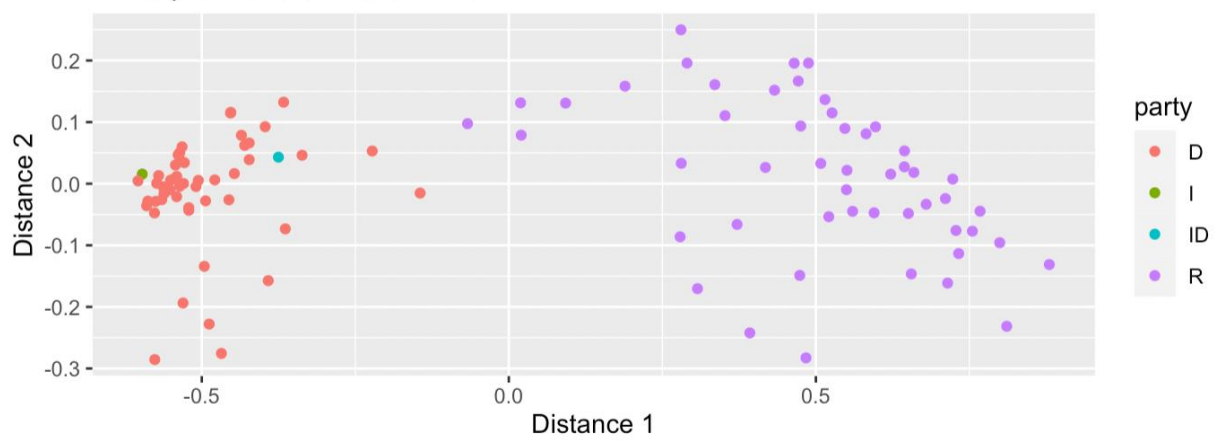
MDS plot for Senators in 2005



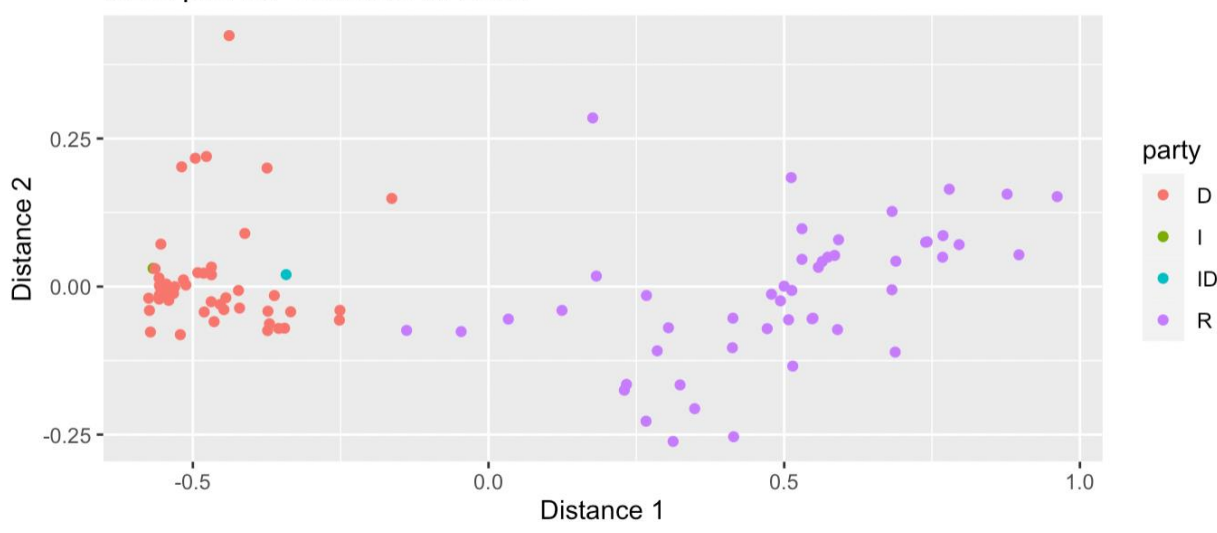
MDS plot for Senators in 2006



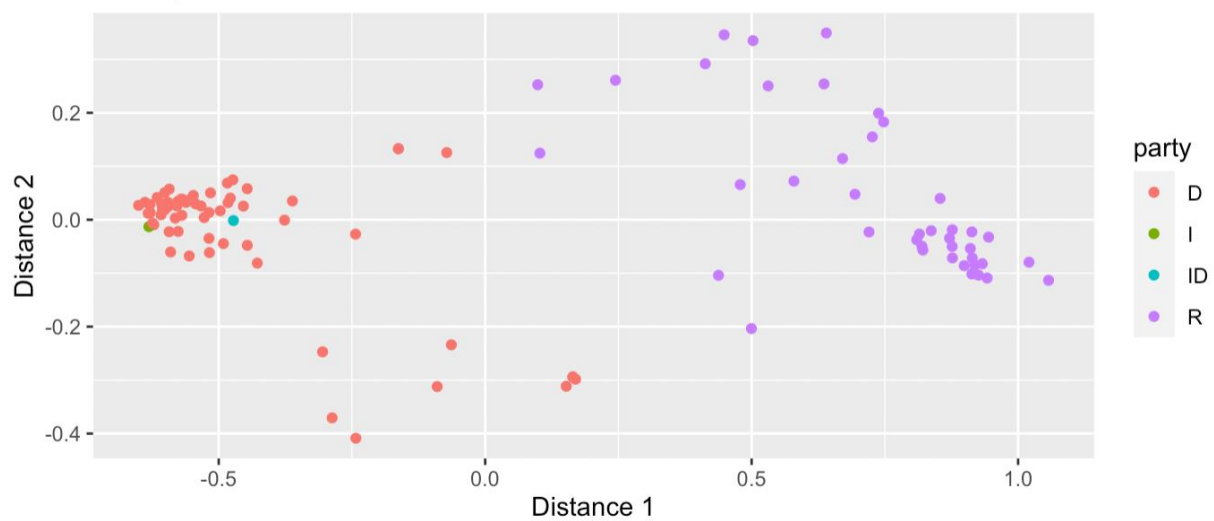
MDS plot for Senators in 2007



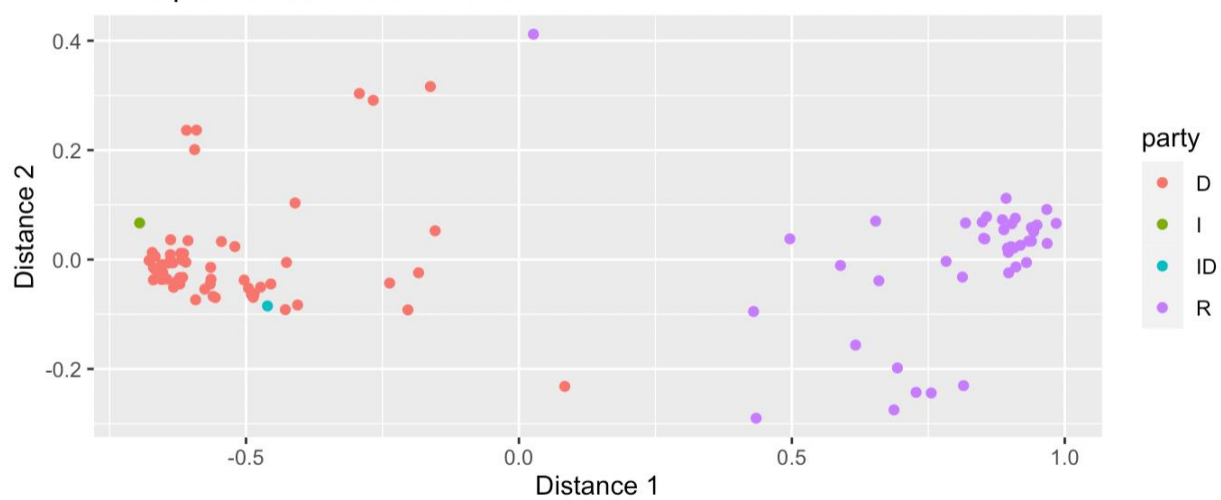
MDS plot for Senators in 2008



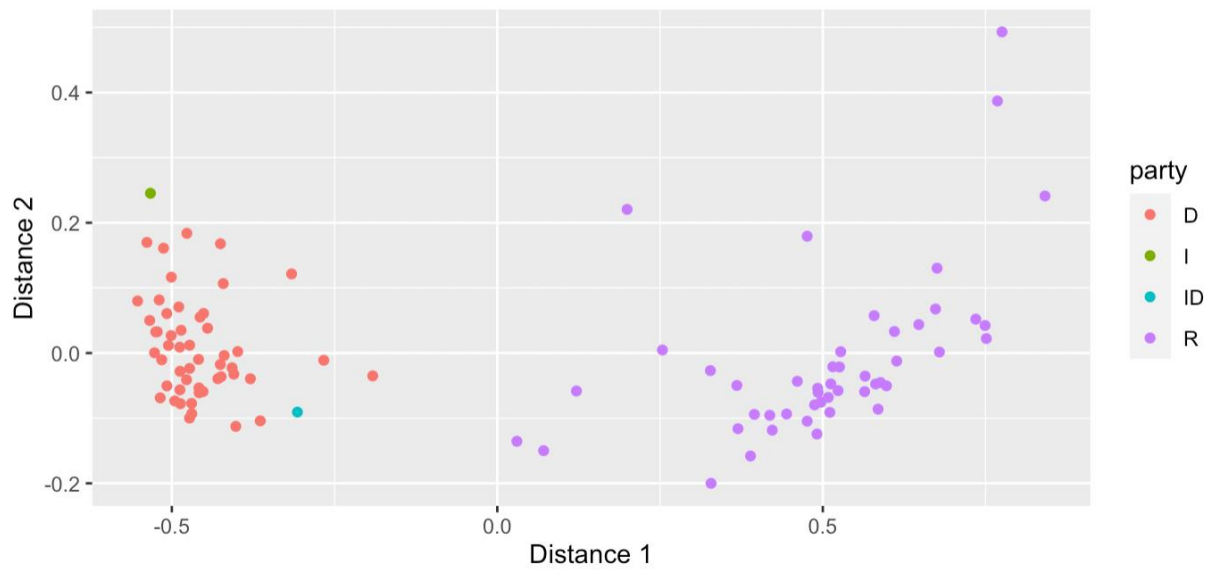
MDS plot for Senators in 2009



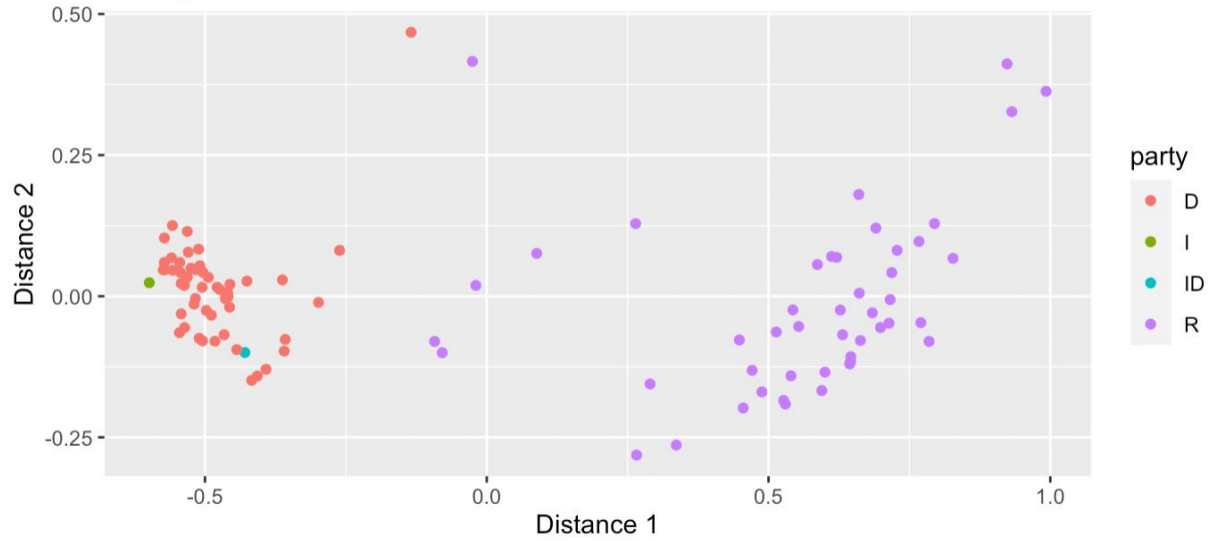
MDS plot for Senators in 2010



MDS plot for Senators in 2011



MDS plot for Senators in 2012



MDS plot for Senators in 2013

