Assignment 6: the weighted MDS model

In this assignment, we will fit the weighted MDS for individual differences to the new class-demo nations data (collected in Spring 2019 and Spring 2020). The data can be found in the first tab of the spreadsheet document "nations_ALLDATA_1920.xlsx".

The main point is, certain advantages arise from keeping the multiple proximity matrices separate, and fitting the INDSCAL model, rather than averaging the data as we did in Assn 5.

1) read in the "new nations" data on all individual subjects' similarity ratings (in the first tab). Note that SPSS Proxscal will take a "stacked" set of proximity matrices in this form (see Proxscal manual). However, in order to analyze these data in R, we will need to manipulate them into the form of multiple matrices of type "dist". See Example 1 of smacofIndDiff in R.

2a) Using a torgerson start and a nonmetric ("ordinal") model, try analyzing the data in r=1 to 6 dimensions. Make a plot of Stress versus dimensionality. Using this plot, select what seems to be the best dimensionality. Check interpretability as well to make this decision.

2b) Do the same steps for smacof analyses of the averaged similarity data from Assignment 5. Does the best dimensionality differ for the INDCSCAL model fit to the individual proximity matrices and the unweighted Euclidean model fit to the averaged data?

3) Interpret the dimensions of your chosen INDSCAL solution.

4) compile the weights from the diagonals of the individual subjects transformation matrices into a single n (subjects) by R (dimensions) weights matrix. Use this matrix to plot the weights space (dim 1 vs dim2, etc). First label this plot by subject ID code. Then do another version, labeling the points by native language. Discuss.