Attitude network analysis: Uncovering multidimensional polarisation

Keywords: weights, network analysis, political attitudes, polarization, survey data

Extended Abstract

Polarisation is frequently viewed as an intrasocietal process of drifting toward the extremes on political attitudes, e.g., being further away from each others' opinion on a scale. Current approaches often rely on mean differences to identify polarization, and frequently equate polarization with extremism [1]. In attitude networks, drawn from attitudinal survey data, polarisation occurs with decreasing overlap between groups or increasing within-group density.

Here, we use a network-based method to explore polarization in the multidimensional opinion-based political identity structure from 2012-2020 in American National Election Studies (ANES) data (N≈4000). From the ANES data, we identify relevant dimensions with a data-driven Boruta method [3], evaluating the importance of the used items for self-reported political identity in these samples. For each, a bipartite projection generates a network where edges represent similarity in responses between dyads, i.e. alignment on attitude-related questions from survey participants. The data provides us with pre-identified groups (Republicans & Democrats), which we use as our network communities to calculate an edge-based polarization. The data sets vary in size and participants. To address this, we introduce a resampling procedure for the network method, where the overall evaluation relies on a set of resampled networks. It also opens up the possibility of a weighted resampling procedure. The weights account for structural biases in group representation in our networks and enhance the representativeness [2].

We analyse identity-related shifts in opinion structure over time (see Fig. 1). We discuss how polarization results from both between- and within-group dynamics and lay open the effects of weights on the results. The opinion space of the self-identified groups of Republicans and Democrats diverges progressively in their mutual topic alignment over the last decade, with a striking increase from 2016 to 2020. The network analysis of each within-group opinion space reveals two trends: the Republicans diverge, while the Democrats converge. We extract the level of within-group cohesiveness, as related to the distance of the group members' attitude positions from the in-group average path length. The weights reassure the visible patterns but reduce their sharpness.

The conversion of survey data to similarity-based attitude networks provides insights into the synchronisation of opinion space and its development over time. We show how our network approach indicates a shift in polarisation between the Republic and Democratic attitude positions, even when adjusting possible biases.

References

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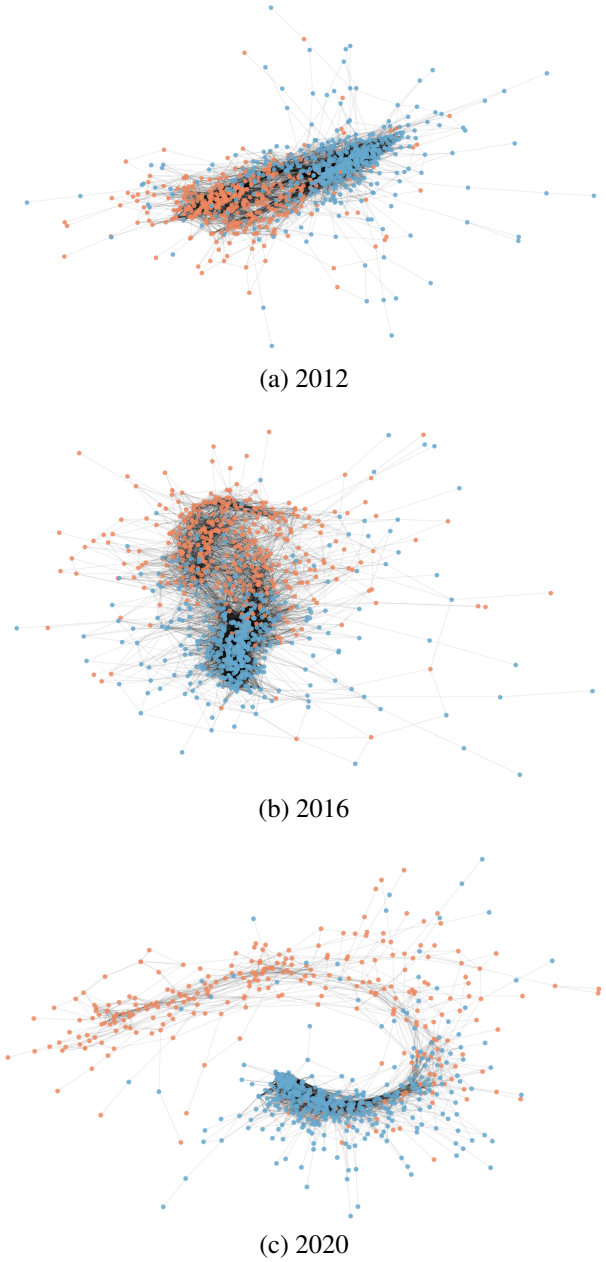

(a) 2012

(b) 2016

(c) 2020

Figure 1: **Network projection of the opinion space of predefined Republican and Democratic communities.** - The nodes coloured as red (blue) are self-identified Republicans (Democrats), which determine the communities. The data is provided by the ANES data sets (2012-2020).