Overview

The code in this replication package constructs the figures in the manuscript "Learning from Shared News: When Abundant Information Leads to Belief Polarization" using Julia. One main file runs all of the code to generate the simulated data for 5 figures in the paper and 2 figures in the Online Appendix. A replicator with similar settings to the ones outlined below should expect the code to run for about 10-15 minutes.

This paper does not involve analysis of external data (i.e., the only data are generated by the authors via simulation).

Computational requirements

This section describes the computational and software requirements for replicating the figures in the paper within a similar time frame as described above.

Software Requirements

The code was designed to be run entirely with Julia. It was last run with version 1.8.0 on December 3, 2022.

For easier visual representation of the code, it is strongly recommended to install package IJulia and use Jupyter Notebook to run the code. This can be done by following these instructions:

1. Download and install Julia version 0.7 or older.
2. Run the Julia application and after seeing **julia>** prompt appear, type:
   using Pkg
   Pkg.add("IJulia")
3. To use IJulia and automatically install Jupyter Notebook, type the following commands in the prompt:
   using IJulia
   notebook()
   If you do not have Jupyter already installed, you will be prompted to install it. Otherwise, the command **notebook()** should launch the Jupyter Notebook in your browser.

For additional details on the installation of IJulia and Jupyter Notebook, please refer to https://julialang.github.io/IJulia.jl/stable/manual/installation/.

Once Jupyter Notebook is launched, navigate to the folder with the replication file. When opened in Jupyter Notebook, the code in the replication file will be organized in individual cells. We will refer to these cells throughout the rest of this README document.

Controlled Randomness

Random seed is set in `Cell 3` of file `BDG_simulations_main.ipynb`.

Memory and Runtime Requirements

Approximate time needed to reproduce the analyses on a standard 2022 desktop machine:

- ☐ <10 minutes
- ✓ 10-60 minutes
- ☐ 1-2 hours
- ☐ 2-8 hours
- ☐ 8-24 hours
- ☐ 1-3 days
- ☐ 3-14 days
- ☐ > 14 days
- ☐ Not feasible to run on a desktop machine, as described below.

The code was last run on a **6-core Intel-based laptop with 64-bit Windows 10 operating system**.

Description of programs/code

- Code in `BDG_simulations_main.ipynb` will generate most figures in the main body of the paper and the online appendix. It will save these figures as individual `.png` files in the same folder as the replication file.
- The names of the figure files follow similar conventions. Most of them include strings like "5n6a4b", which refers to the composition of an agent's friend network. String "5n6a4b" should be read as "five normal friends, six A-dogmatic friends, and four B-dogmatic friends".

Instructions to Replicators

- Open Jupyter Notebook and open file `BDG_simulations_main.ipynb`.
- Run the first three cells to set up the necessary packages and set the random seed.
- Run the rest of the code to generate the figures in the main body of the paper and the online appendix.
- The provided code reproduces all figures in the paper and the online appendix except Figure V.
- To replicate specific figures, refer to Details below. Note that the first three cells of the code must be run (in order) on the initial compilation before any other cells.
- Note that the figures that do not have individual legends or titles in the paper will have both when replicated using the code. This is done for more convenient tracking of independent but similar figures.

Details

- `Cells 1-3`: Install/update the necessary packages and set a random seed before generating any figures.

- **Figure I**: The figure is generated by running `Cells 4-5`.
- **Figure II**:
  - Panel (a) is generated by running `Cells 6-7`.
  - Panel (b) is generated by running `Cells 8-9`.
- **Figure III**:
  - Panels (a) and (b) are generated by running `Cells 30-31` and then `Cells 32-36`.
  - Panels (c) and (d) are generated by running `Cells 30-31` and then `Cells 37-41`.
- **Figure V**: The figure is generated by running `Cells 52-54`.
- **Figure VI**: The figure is generated by running `Cells 55-57`.
- **Figure VII (online appendix)**:
  - Panels (a) and (b) are generated by running `Cells 20-21` and then `Cells 22-25`.
  - Panels (c) and (d) are generated by running `Cells 42-43` and then `Cells 44-47`.
  - Panels (e) and (f) are generated by running `Cells 30-31` and then `Cells 32-36`.
  - Panels (g) and (h) are generated by running `Cells 10-11` and then `Cells 12-15`.
- **Figure VIII (online appendix)**:
  - Panels (a) and (b) are generated by running `Cells 20-21` and then `Cells 26-29`.
  - Panels (c) and (d) are generated by running `Cells 42-43` and then `Cells 48-51`.
  - Panels (e) and (f) are generated by running `Cells 30-31` and then `Cells 37-40`.
  - Panels (g) and (h) are generated by running `Cells 10-11` and then `Cells 16-19`.

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