Replication Code Instructions for Table I and Figure 3

These instructions correspond to the methods labeled Eigenvector Correlation, Assortativity, and Variable Simulation in Table I.

The code was run on Matlab R2017a.

Unzipping the compressed file, will produce a folder entitled `GHGMatlabCode`, which contains the necessary Matlab functions and the `input` and `results` subfolders. The network, ideology, and power data are stored in the `input` folder. Generated output is saved in `results`. The name `GHGMatlabCode` can be changed but not `input` or `results`.

The commands listed below must be run from the `GHGMatlabCode` folder (unless it is added to the Matlab path).

Note: The correspondence between variables in Table I and the output generated by the code are as follows: Conflict Frame = SECT; Ideal Polity = SALAF; Territorial Asp. = REV; Average Ideol. = AVG; Power = MID

EIGENVECTOR CORRELATION

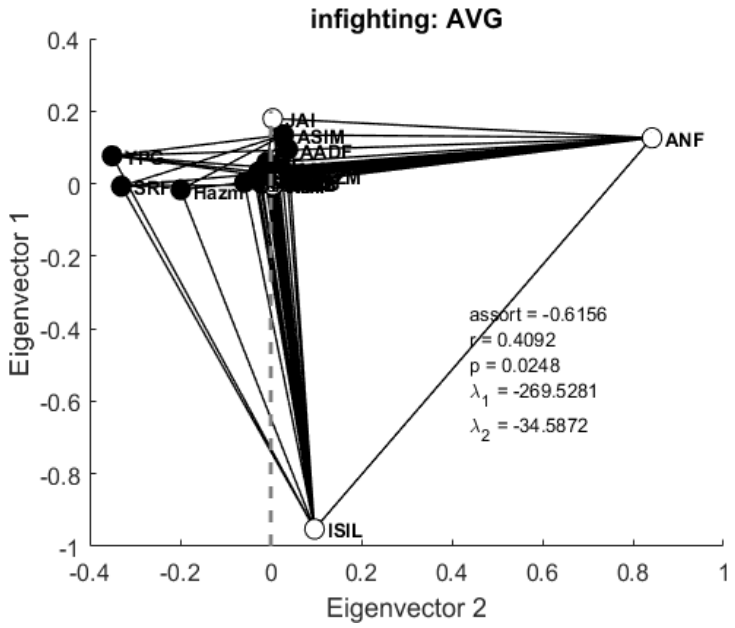
The commands for the eigenvector correlation columns in the table are listed first since they run fastest.

For each independent variable, two figures are generated: (1) a network diagram; (2) a scatter plot of group eigenvector coordinates vs. variable values. The correlation and p-value used in Table I are shown as r and p on either plot.

2013-2015 Time Period
For SECT, SALAF, and AVG, the eigenvector that yields the best correlation is the 2nd most negative eigenvector. Enter the commands:

```
pars=Syria_modcomm_pars('Full','ideo',2,'het');
Syria_modcomm(pars)
```

The correlation and p-value for Average Ideology, for example, are shown on AVG network plot below as r = 0.4092 and p = 0.0248. The plot below also corresponds to Figure 3 in the paper. Note that the vertical axis may sometimes be flipped relative to the paper. The figure is saved in `results` under the filename `IdFull_infighting_wei_ev2_net_AVG.fig`.



For REV, the first most negative eigenvector yields the best correlation:

```
pars=Syria_modcomm_pars('Full','ideo',1,'het');
Syria_modcomm(pars)
```

For MID (power), enter:

```
pars=Syria_modcomm_pars('Full','power',2,'het');
Syria_modcomm(pars)
```

2014 Time Period

For SECT, SALAF, REV, and AVG:

```
pars=Syria_modcomm_pars('2014','ideo',2,'het');
Syria_modcomm(pars)
```

For MID (power), the homophily test is used since the observed assortativity is greater than the null assortativity:

```
pars=Syria_modcomm_pars('2014','power',2,'hom');
Syria_modcomm(pars)
```

2015 Time Period

For SECT and SALAF:

```
pars=Syria_modcomm_pars('2015','ideo',2,'het');
Syria_modcomm(pars)
```

For REV and AVG:

```
pars=Syria_modcomm_pars('2015','ideo',1,'het');
Syria_modcomm(pars)
```

For MID (power):

```
pars=Syria_modcomm_pars('2015','power',2,'het');
Syria_modcomm(pars)
```

ASSORTATIVITY

For purposes of reducing the run time while still closely approximating the results in Table I, the number of runs is set equal to 1000 in the commands below. Change this to 10000 to correspond to the number of runs used in the table. As these are Monte Carlo simulations, the numerical results may vary slightly with each execution.

Each set of commands below generates an Excel table. The correspondences between the columns in Table I and the Excel table are:
α = thetaObs
α_{null} = thetaSimAv
σ_{null} = thetaSimDev
p = pvalAssort

2013-2015 Time Period

For all ideology variables:

```
pars=Syria_netsim_pars('Full','ideo',0,1000);
netsim_mc(pars,1);
Syria_netsimanalysis(pars);
```

The output Excel table is shown below with the relevant columns highlighted. The file is saved under the name `IdFull_Null_infighting_nr1000_wei_sum.xlsx`.

idNames	rObs	pvalStand	rSimAv	rSimDev	pvalCorr	thetaObs	thetaSimAv	thetaSimDev	pvalAssort	ev1Av
REV	-0.393454556	0.031469667	-0.012249868	0.303097581	0	-0.571946831	-0.284934519	0.035291276	0	-188.5193178
SALAF	-0.179965332	0.341286231	-0.000616481	0.152046441	0.026	-0.342262274	-0.147234821	0.034074501	0	-188.5193178
SECT	0.325490632	0.079227678	-0.02091786	0.25083019	0	-0.581897563	-0.263360848	0.036765329	0	-188.5193178
AVG	0.328823049	0.076026707	-0.006401516	0.258654668	0	-0.615642628	-0.282986828	0.035681703	0	-188.5193178

For power:

```
pars=Syria_netsim_pars('Full','power',0,1000);
netsim_mc(pars,1);
Syria_netsimanalysis(pars);
```

2014 and 2015 Time Periods

Replace `'Full'` by `'2014'` or `'2015'` as appropriate in the above commands.

VARIABLE SIMULATION

The primary output used in Table I is a histogram of the number of times a given value of the suppression length (heterophily) or interaction length (homophily) of the simulated variable yields the minimum squared error between simulated and observed networks. In the paper, the homophily or heterophily simulation is used to generate 1000 runs at each length value and the squared error between the simulated and observed network is found. These squared errors are then used to form a resample (with replacement) of size 50 at each length value. The average over the resample is then taken to represent the squared error at each length value. The length value which gives the minimum squared error is then found. This is repeated 1000 times to form the histogram. The mean and confidence interval of this distribution are used in Table I.

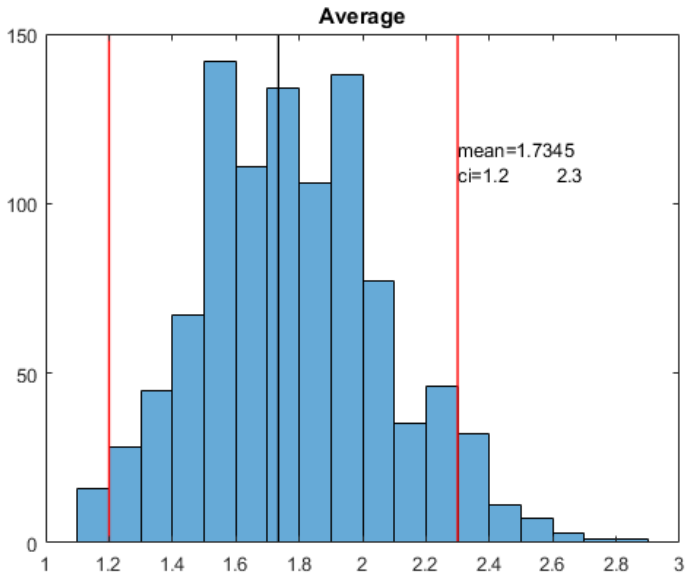
The below commands use 1000 simulation runs at each point as in the paper. Each variable takes about an hour to run on a desktop PC. However, using 250 runs gives a reasonable approximation of the results in Table I (replace 1000 by 250 in the argument of `Syria_netsim_pars`). The heterophily and homophily simulations correspond, respectively, to the -1 and 1 arguments in `Syria_netsim_pars`.

2013-2015 Time Period

For Average Ideology (AVG):

```
pars=Syria_netsim_pars('Full','ideo',-1,1000);pars.idIdx=4;
netsim_mc(pars,1);
Syria_netsimanalysis_single(pars);
Syria_netsimanalysis_hist(pars,1000,50);
```

The histogram, shown below, is the third figure generated and the file is saved under `IdFull_Anti_infighting_nr1000_AVG_wei_sum_hist_R_1000_L_50.fig`. The mean suppression length and 95% confidence interval boundaries are listed as numerical values and also displayed as black line and red lines, respectively.



For the other ideology components, use the following values of `pars.idIdx` in the above commands:

Territorial Aspiration (REV): `pars.idIdx=1`
Ideal Polity (SALAF): `pars.idIdx=2`
Conflict Frame (SECT): `pars.idIdx=3`

For Power:

```
pars=Syria_netsim_pars('Full','power',-1,1000);pars.idIdx=1;
netsim_mc(pars,1);
Syria_netsimanalysis_single(pars);
Syria_netsimanalysis_hist(pars,1000,50);
```

2014 Time Period

Replace `'Full'` by `'2014'` in the above commands. Otherwise, the commands for the ideology variables are the same.

For power, the homophily simulation must be run (as the observed assortativity is greater than the null assortativity in Table I):

```
pars=Syria_netsim_pars('2014','power',1,1000);pars.idIdx=1;
netsim_mc(pars,1);
Syria_netsimanalysis_single(pars);
Syria_netsimanalysis_hist(pars,1000,50);
```

2015 Time Period

Replace `'Full'` by `'2015'` in the commands for the 2013-2015 time period.