

Detecting influential beliefs in large-scale surveys

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1. **Motivation** - Belief systems in large surveys
2. **Analytical strategy** - Belief networks
3. **Results** - Influence of beliefs
4. **Future directions**

Cross-sectional **Omnibus** Social Surveys Focusing
on Social Behavior, Attitudes, and Values

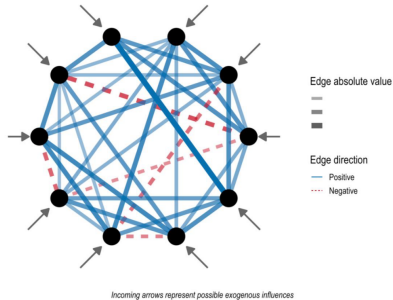
Cross-sectional **Omnibus** Social Surveys Focusing on Social Behavior, Attitudes, and Values

- No single research goal
- Variety of topics and modules



Belief systems

Example Belief System Network

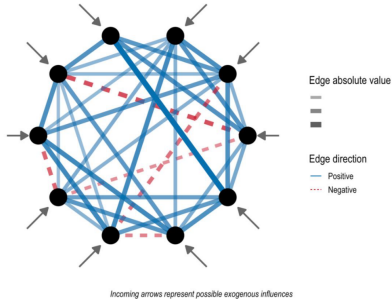


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Beliefs = **evaluations** or **cognitive** aspects of attitudes

Belief systems

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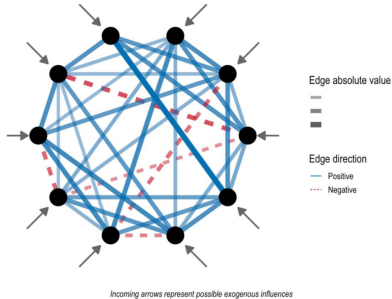
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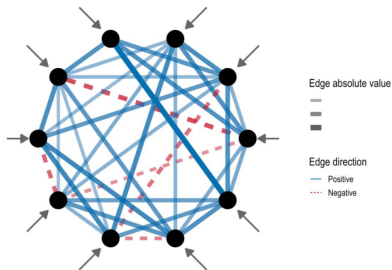
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Connectionist framework

Belief systems

Example Belief System Network



Incoming arrows represent possible exogenous influences

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Network Flow

Motivating example - European Social Survey

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- Round 9, 2018/2019
- 30 European countries
- **Attitude towards national government**



Motivating example

Governmental Performance

Satisfaction with **Economy**

Satisfaction with **Democracy**

State of **Healthcare**

State of **Education**

Political Trust

Parliament

Legal system

Police

Politicians

Political parties

Representation & Fairness

Systems allows people to have **a say**

Systems allows people to have **influence**

Gov. decisions are **transparent**

Gov. takes into account **interests of all**

System gives a **fair chance** to all

Unique Variable Analysis (Christensen, Garrido & Golino, 2020)

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Weighted topological overlap (wTO, Zhang & Horvath, 2005)
on partial correlation matrix

Estimate Gaussian Graphical Model

graphical LASSO regularization, extended BIC for model selection

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Split the sample & test network differences.

Integrated Value of Influence (IVI)
(Salvaty, Ramialson & Currie, 2020)

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Representation & Fairness

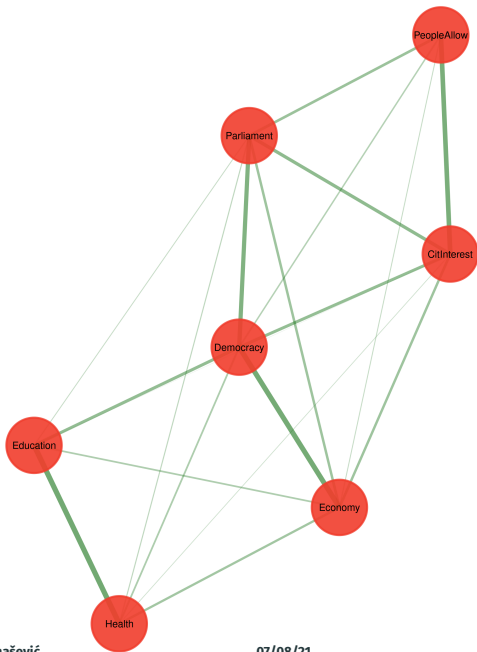
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Electoral autocracies VS Liberal Democracies



$$IVI_i = (\text{Hub}_i)(\text{Spread}_i)$$

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$$Hub_i = DC_i + LH_{index_i}$$

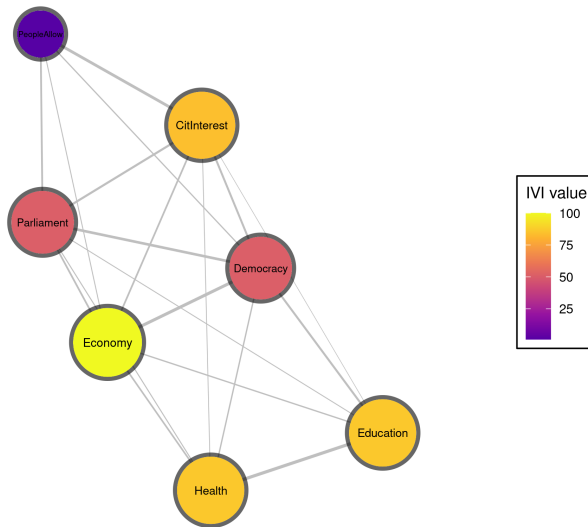
$$Spread_i = (NC_i + CR_i)(BC_i + CI_i)$$

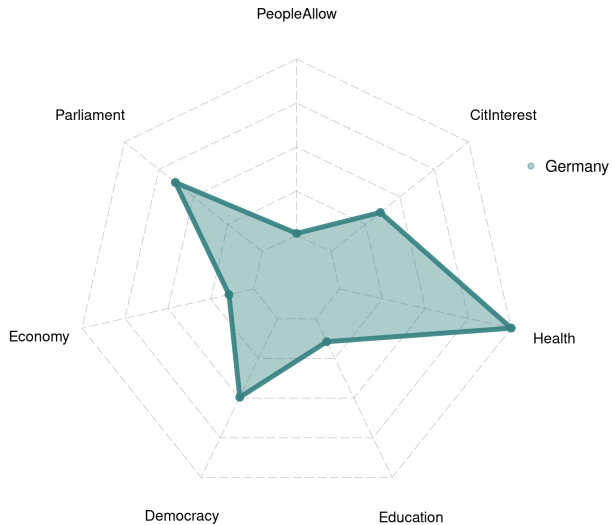
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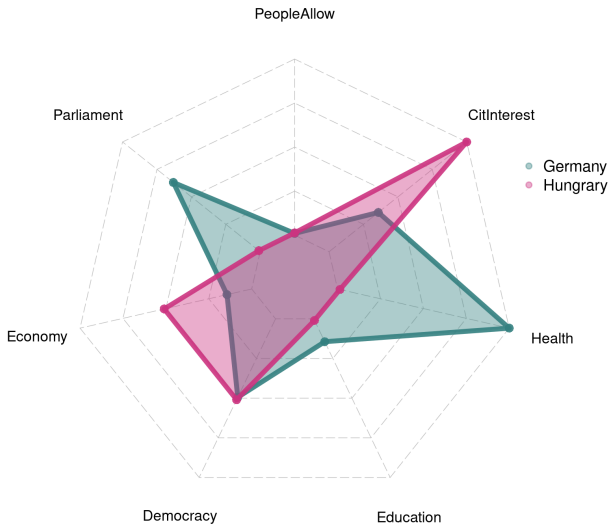
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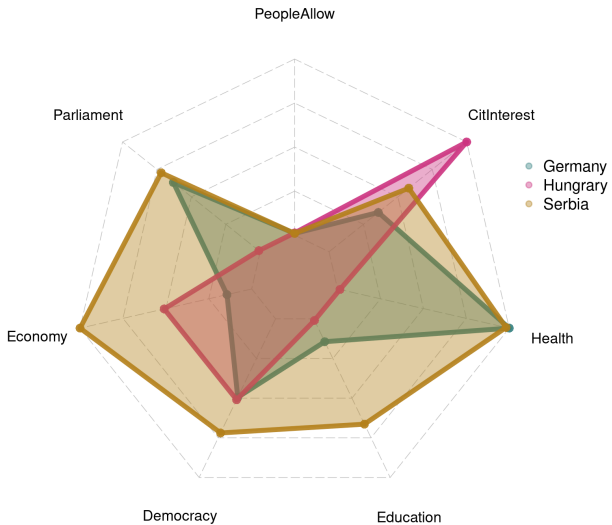
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Belief Network IVI - Complete ESS R9 dataset

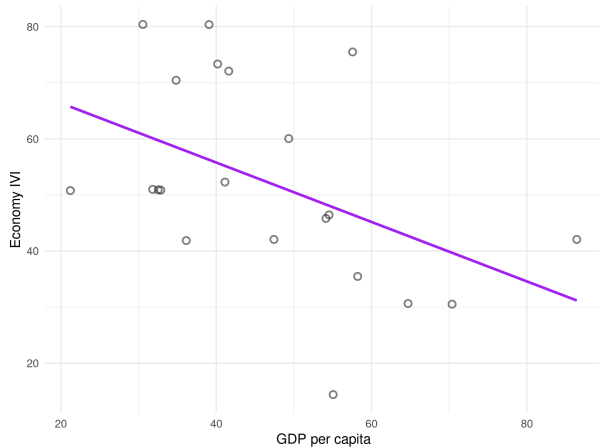








GDP per capita vs Economy IVI



$$r = 0.429 \quad p = 0.02$$

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- Network structure differences between subgroups (regime type)
- High Influence of beliefs related to problematic domains for a given society

- Differences between ruling and opposition parties voters
- Pairwise Ising model (binary beliefs)
- Compare with other influence/centrality metrics
- Investigate time temporal stability in panel surveys

Thank You!

github.com/atomashevic/essnet

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