Modelling, estimating, simulating:

formalizing attitudes towards inequality as a complex network

Arturo Bertero[1] &   Gonzalo Franetovic[2]

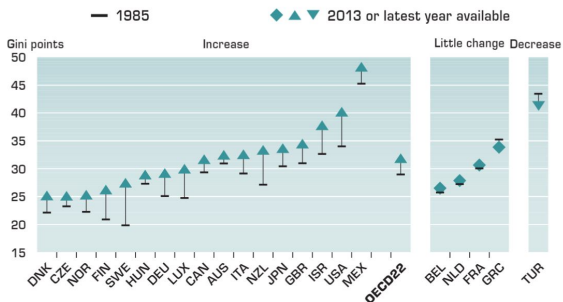[1]Ph.D. Student in Political Science
University of Milan

[2]Ph.D. Student in Sociology
University of Milan

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Contents

Introduction

Source: OECD (2015), *In It Together: Why Less Inequality Benefits All*,
http://dx.doi.org/10.1787/888933207711.

Figure: Gini measure of income inequality, mid-1980s and 2013

- However, the increase in inequality **has not led to a corresponding increase in people's concerns about inequality** (A. Alesina & Glaeser, 2004; Kenworthy & McCall, 2007; Lierse et al., 2022; Lübker, 2007).

Introduction

- **Attitudes towards inequality**
    - A multidimensional construct (Janmaat, 2013):
        1. **Perceptions** of existing inequality
        2. **Beliefs** about fair inequality
        3. **Judgments** of existing inequality
    - Related topics:
        1. **Taxes** (Berens & Gelepithis, 2019)
        2. **Redistribution** (Kenworthy & McCall, 2007)

Introduction

- **Objectives**
  1. **Model** attitudes towards inequality as a network of interconnected conceptions regarding inequality, redistribution, and taxation.
  2. **Estimate** this network from survey data representative of the Italian population
  3. Investigate attitude change by **simulating** persuasion attempts on central and peripheral nodes, to demonstrate that interventions on the former have larger effects than those on the latter.

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Theory: network approach

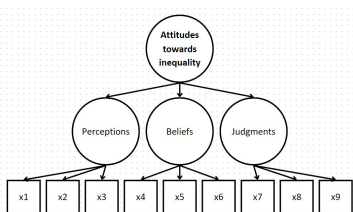- **Attitudes as belief system** composed of many evaluative reactions (Dalege et al., 2016).
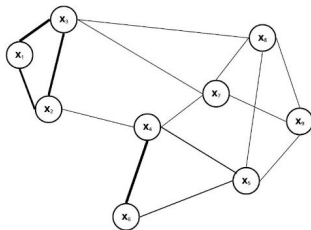

Figure: Latent variable model

Figure: CAN model

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Theory: network model

PMRF: **undirected and weighted** network models in which **nodes** are survey variables, and **edges** reflect their conditional associations.
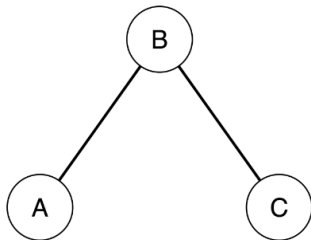

Figure: Parsimony

Figure: No equivalence

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Theory

Scholars applying the **network approach to the study of attitudes** demonstrated that:

- They possess a **small world** structure (Dalege et al., 2017).
- Change in the states of central nodes -rather than peripheral ones- are associated with wider **downstream effects** (Chambon et al., 2022).

Methods

- **Data:** ISSP 2019 - Social Inequality Module, Italy (N=1,009).
- **Research design:**
    1 **CAN** attitude network estimation.
    2 **Ising** attitude change simulation.

Methods

- **Variables:** 10 indicators

	Evaluative reaction	Variable
	Perception of unequal distribution of resources	p_ineq
Perceptions	Perception of large income inequality	p_inc_ineq
	Perception of tax regressivity	p_tax
	Belief in equal distribution of resources	b_ineq
Beliefs	Belief in progressive taxation	b_tax
	Belief in public redistribution	b_red_pub
	Belief in market redistribution	b_red_mar
	Judgment about existing unfair distribution	j_ineq
Judgments	Judgment about political disinterest in redistribution	j_red_unca
	Judgment about the failure of public redistribution	j_red_fail

Methods

Phase 1: CAN attitude network estimation

- **eLasso** (van Borkulo et al., 2014): Set of regularized **logit** regressions; coefficients are averaged and dictate colors and width of network edges.

Phase 2: Ising attitude change simulation

- **Ising simulation** (Dalege et al., 2017). The overall configuration of the attitude network depends on the following parameters:

$$H(\chi) = -\sum_i \tau_i \chi_i - \sum_{i,j} \omega_{i,j} \chi_i \chi_j,$$

Methods

Hypotheses:

- **H1 (Estimating):**
  The network of attitudes towards inequality will show a
  small-world structure.

- **H2 (Simulating):**
  Changes in the thresholds of central nodes in the network
  of attitudes towards inequality, rather than peripheral ones,
  are associated with **downstream effects**.
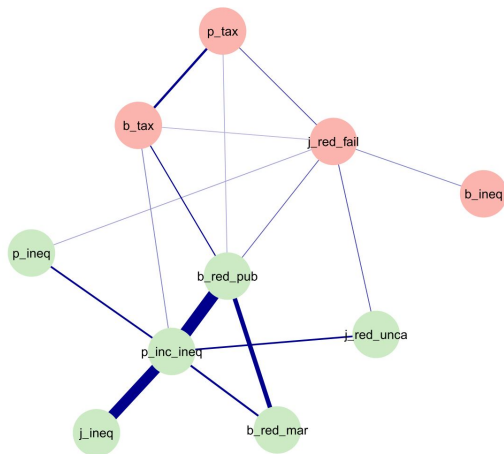
Results

Figure: The network of attitudes towards inequality

Notes: Node names: perception of unequal distribution of resources (*p_ineq*), perception of large income inequality (*p_inc_ineq*), perception of tax regressivity (*p_tax*), belief in equal distribution of resources (*b_ineq*), belief in progressive taxation (*b_tax*), belief in public redistribution (*b_red_pub*), belief in market redistribution (*b_red_mar*), judgment about existing unfair distribution (*j_ineq*), judgment about political disinterest in redistribution (*j_red_unca*), judgment about the failure of public redistribution (*j_red_fail*).
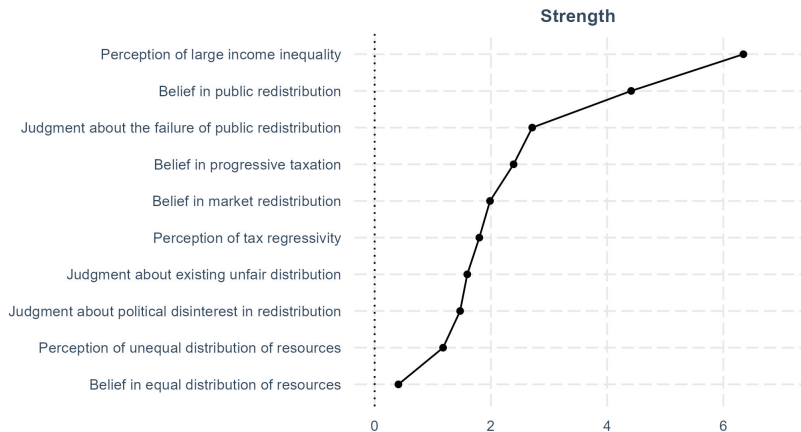
Results

Figure: Centrality table of the network of attitudes towards inequality

Results

Table: Small world index

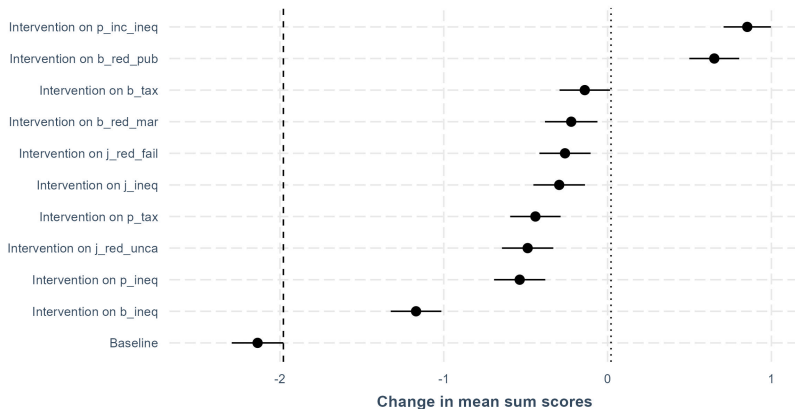| Transitivity	ASPL	ASPL (weighted)	Small world
0.346	1.778	1.827	0.836

Results

Figure: Changes in mean sum scores of simulated networks

Conclusions

- **Summary**
    1. **Modelling:** Inequality, redistribution, and taxation evaluative reactions formed **a fully connected network**, which means that **all these topics are essential** to validly study the concept in question.
    2. **Estimating:** Contrary to our expectations, **we did not find support of the small-world hypothesis**.
    3. **Simulating:**
        a. **Changes in central nodes** produce wider downstream effects.
        b. **Perception of income inequality and belief in public redistribution** are the most important nodes explaining how people understand inequality in Italy.

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Conclusions

- **Limitations**
    1. **Simulated** rather than experiment or panel data.
- **Contributions**
    1. **Holistic comprehension** of how people understand inequality.
    2. A step toward a **formalized account** of attitudes structure and dynamic.

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