

Public opinion dynamics, preference falsification and social influence

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Opinion dynamics and preference falsification

- Public opinion: opinion people express in public
- Private opinion: real people's opinion
- Models usually leave out that they can diverge
 - Preference falsification, pluralistic ignorance, surprising and abrupt changes
- Timur Kuran: *Private Truths, Public Lies*
 - Few attempts to develop / build alternatives to Kuran's models
 - No attempts to apply Kuran's models (and the idea of PF) to the field of OD



Our model

- Repeated game played over 300 rounds
- 1.600 agents (40x40)
 - Torus
- In each round, 100 not overlapping 4x4 groups are activated

Agents' initial attributes

- **Status (s_i):** $[0,1]$, invariable

- **Private opinion (x_i):** $[0,1]$, initial perfect correlation with s

- **Public opinion (z_i):** binary, 0 or 1

- **Threshold to falsify preferences (y_i):** $[0,1]$
 - Heterogeneous agents
 - Evolve during the simulation

Model dynamic

- **Initial state changes in segregation level**

- **Step 1. Coherence heuristic:** *match your private opinion with the one you most frequently defend in public*
 - Heterogeneous agents regarding their tolerance for hypocrisy

$$\text{if } \frac{\sum_{t-k}^t |x_i - z_i|}{k_i} \geq 0.5 \rightarrow \begin{cases} x_{i,t} = \begin{cases} [0.5, (1 - x_{i,t-1})] & \text{if } x_{i,t-1} < 0.5 \\ [(1 - x_{i,t-1}), 0.5] & \text{if } x_{i,t-1} \geq 0.5 \end{cases} \\ y_{i,t} = 1 - x_{i,t} \end{cases}$$

$$k_i = [(32x_i^2 - 32x_i + 10), 10]$$

Model dynamics

- **Step 2. Goffman's heuristic:** *(if you are a low status agent) when interacting with somebody of high status (s) (and an opinion different from yours), reduce your threshold (y)*

$$\text{if } \begin{cases} s_i \leq 0.5 \text{ and } x_i \leq 0.5 \text{ and } z_j = 1 \\ \text{or} \\ s_i \leq 0.5 \text{ and } x_i > 0.5 \text{ and } z_j = 0 \end{cases} \rightarrow y_{i,t}^* = x_i + \frac{|y_i - x_i|}{1 + |s_i - s_j|}$$

- **Not included in the k rounds that agents can resist before changing x**

Model dynamics

- **Step 3. Computing the reference opinion.**

$$go_{t-1} = \frac{\sum z_{t-1}}{N} \quad eo_i = \frac{\sum z_j^*}{16} \quad \forall j \in MN \quad ro_i = p * go_{t-1} + (1-p) * eo_i$$

- **Step 4. Expressing an opinion in public (z):** *falsify your private opinion if the reference opinion is beyond your threshold*

$$z_{i,t} = \begin{cases} 1 & \text{if } ro_i \geq y_{i,t}^* \\ 0 & \text{if } ro_i < y_{i,t}^* \end{cases}$$

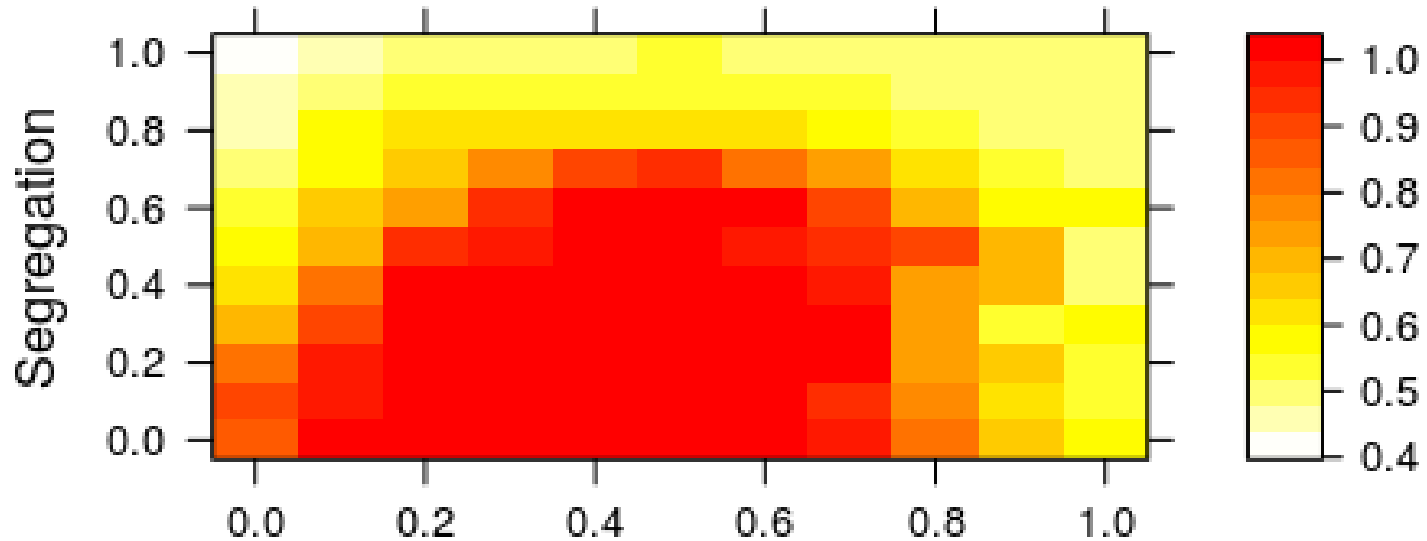


Analysis

- **The model behavior: conducting sensitive analysis and unravelling the micro-level generative process**

- **External “shocks”: testing which conditions can trigger a process of equilibrium change**

Public declarations



P

$$ro_i = p \cdot go_{t-1} + (1-p) \cdot eo_i$$

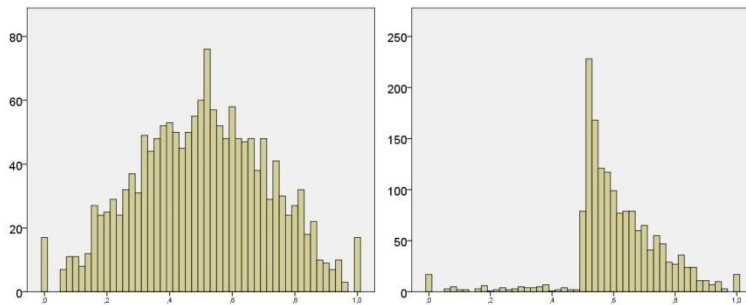
go_{t-1} : general public opinion

eo_i : expected opinion in current neighborhood

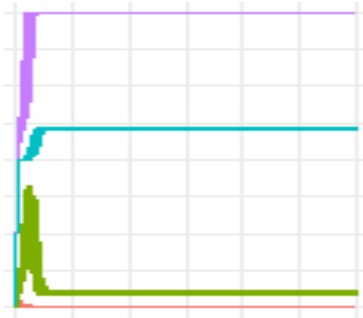
Unanimity

Low segregation, intermediate levels of p

Initial and final distribution of private beliefs



Evolution of mean values of z and x , and proportion of falsifications



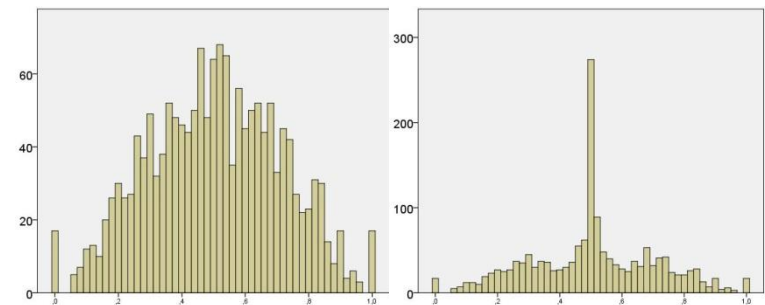
In sum:

- Private beliefs: low change in the mean, great change in distribution
- Falsifications: pattern of raising and falling

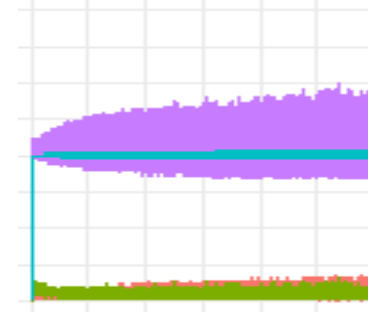
No unanimity

High segregation, either high or low values of p

Initial and final distribution of private beliefs



Evolution of mean values of z and x , and proportion of falsifications



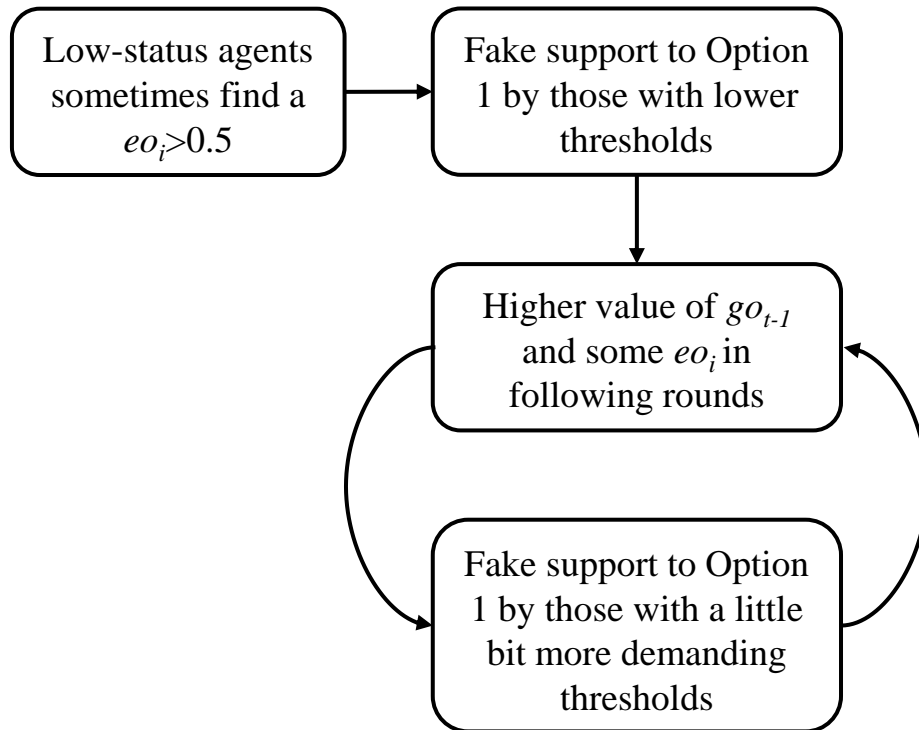
In sum:

- Private beliefs: peak in mean value
- Falsifications: low and constant frequency

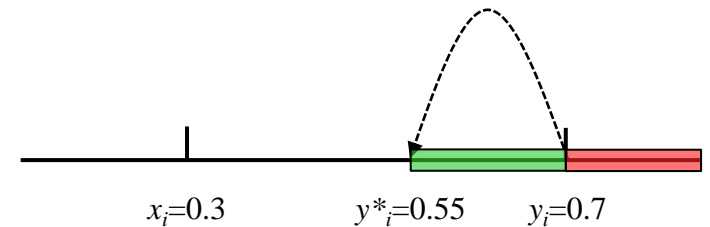
Why does uniformity emerge?

(low segregation, intermediate levels of p)

Falsifications make uniformity emerge

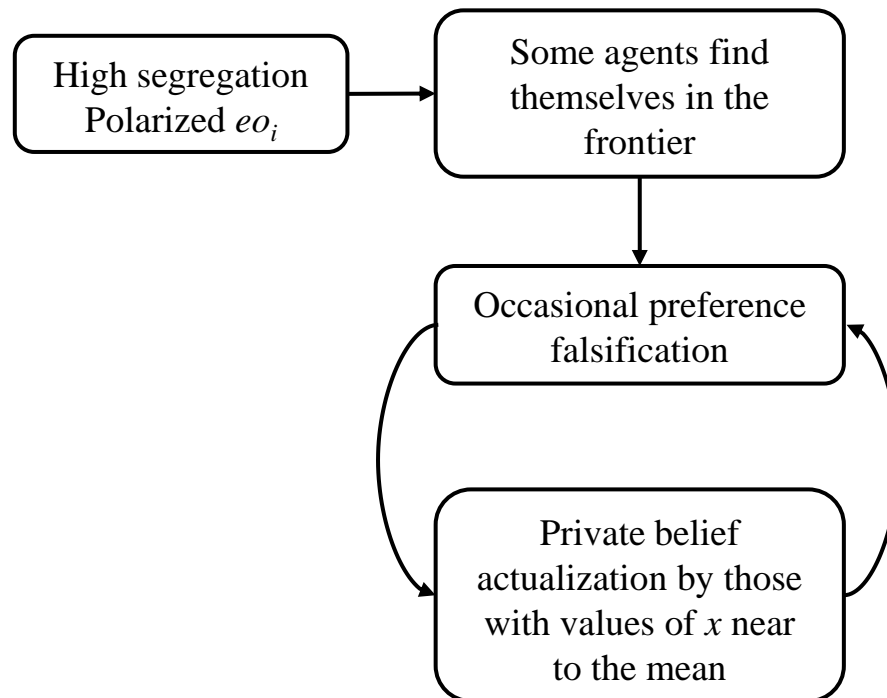


Uniformity is kept by itself



Majoritarian non-unanimous support

(High segregation, either high or low values of p)





Some provisional conclusions

- **Unanimity in public declarations emerge when high and low status agents frequently interact**
 - This uniformity can lead to a massive change in private beliefs
 - Uniformity is grounded in a non-extremist distribution of private opinions (options for a public opinion change)
- **Segregation prevents unanimity**
 - Minor changes in private beliefs
 - More balanced distribution of private beliefs (options for a public opinion change)



Thanks for your attention