REGULAR SESSION INFORMATION

Title of Session: Social Interaction: Experimental and Computational Analysis

Name of Session Convener(s): *Flaminio Squazzoni*, University of Brescia;

Károly Takács, MTA TK "Lendület" Research Center for Educational and Network Studies (RECENS), Budapest

Chairs: *Flaminio Squazzoni*, University of Brescia; *Károly Takács,* MTA TK "Lendület" Research Center for Educational and Network Studies (RECENS), Budapest

Comments: -

I) Social Influence and the Matthew Mechanism: The Case of an Artificial Cultural Market

Miia Bask, University of Bergen

Mikael Bask, Uppsala University

II) The Network Antidote: Agent Based Models and Experiments on Labour Market Discrimination

Károly Takács, MTA TK "Lendület" Research Center for Educational and Network Studies (RECENS), Budapest

Flaminio Squazzoni, University of Brescia

Giangiacomo Bravo, University of Torino, and Collegio Carlo Alberto, Torino

III) Modeling the Nonlinear Dynamics of 'Simple' Interaction

Ton Jörg

IV) When Experimental and Computational Research Meet: The Participatory Extension Module v2.0

Tamás Máhr, AITIA International, Inc., Budapest

Richard O. Legendi, AITIA International, Inc., Budapest

László Gulyás, AITIA International, Inc., Budapest

Rajmund Bocsi, AITIA International, Inc., Budapest

Vilmos Kozma, AITIA International, Inc., Budapest

Session description:

This track aims to bring together sociologists doing experimental and computational research on social interaction to examine the complexity of micro-macro processes in the economy and the society. Recent findings on the growing globalization of societies and economies and the strength and diffusion of social media have testified to the importance of understanding social interaction as a source of unpredictability of collective, social system behaviour. Experiments in the lab, field or on the web, and computer simulation focusing on agent behaviour and social networks share the idea of looking at social interaction as a way to fill the gap between micro behaviour and macro outcomes. By using formalized modelling, these studies can also help us to disentangle social mechanisms, understand relevant factors and capture the interplay of behavioural and structural components, not to mention the possibility of ensuring inter-subjective replicability, fostering cumulativeness of findings and creating conditions for incremental developments of knowledge.

While this type of research has gained momentum in behavioural and social sciences in the last decades, this is still a marginal endeavour in sociology. This track aims to provide a forum to these innovative studies in our discipline. Priority will be given to empirically-grounded models, attempts to integrate experimental and computational methods and examples of mixed method research (also combining experiments and simulation with empirical data).

Topics of interest include but are not limited to: social norms and market behaviour, trust and reputation models, social networks, social influence models, game theory and cooperation, coordination, and collaboration problems, social and cultural dynamics, political behaviour, complex organizational behaviour and dynamics.

Abstracts:

I) Social Influence and the Matthew Mechanism: The Case of an Artificial Cultural Market
Miia Bask, University of Bergen
Mikael Bask, Uppsala University

We show that the Matthew effect, or Matthew mechanism, was present in the artificial cultural market Music Lab when social influence between individuals was allowed, whereas this was not the case when social influence was not allowed. We also sketch on a class of social network models, derived from social influence theory, that may generate the Matthew effect. Thus, we propose a theoretical framework that may explain why the most popular songs were much more popular, and the least popular songs were much less popular, than when disallowing social influence between individuals.

II) *The Network Antidote: Agent Based Models and Experiments on Labour Market Discrimination*
Károly Takács, MTA TK "Lendület" Research Center for Educational and Network Studies (RECENS), Budapest
Flaminio Squazzoni, University of Brescia
Giangiacomo Bravo, University of Torino, and Collegio Carlo Alberto, Torino

In this research project we modelled certain fundamental mechanisms that lead to discriminative practices in hiring. We analyzed under which structural configurations discrimination is likely to occur and under which network conditions they can be avoided. With the combination of agent-based simulation and laboratory experiments, we demonstrated how discrimination can be decreased by social network and priming mechanisms. Our key finding was that large inequality in employment can be pervasive even when there are no differences in average quality between different worker categories and employers only strive for high quality workers. In our agent-based model we showed that social networks might have a different impact on discrimination depending on the type of network ties. In addition, both simulations and laboratory experiments confirmed that high aspirations can lead to a higher extent of discrimination.

III) *Modeling the Nonlinear Dynamics of 'Simple' Interaction*
Ton Jörg

Although it may seem clear what interaction is, the truth is that there is no such thing as an accepted theory of interaction. There are only isolated descriptions of interaction, which are very different. This is the case because of the very complexity of interaction. Not everyone fully recognizes this complexity. Even worse, we do not seem to acknowledge that we miss "the conceptual equivalent of calculus", so much needed to understand and explain the effects of interaction between entities. This calculus is based on the modeling of the effects of interaction within a causal framework. Modeling interaction, based on mutual causality with mutual shaping forces, shows the potential nonlinear effects of causal interaction within a reciprocal causal relationships. With this model of interaction it is possible to link interaction with a model of generative change. It shows a dynamics of interaction, based on a kind of self-generative mechanism of change. This kind of modeling interaction goes way beyond the Newtonian paradigm of cause and effect. Based on our modeling of interaction, the focus is on understanding:
-   The unknown causal, generative mechanism of interaction
-   The potential nonlinear total effects over time
-   The unknown generative power of interaction
-   Interaction as a process of "bootstrapping each other"
-   The possibility of deviation amplifying changes through interaction
Understanding these generative mechanisms, power, and effects of interaction implies the understanding of hitherto unknown conditions of possibility for opening new spaces of the possible in a 'world of the possible'.

IV) When Experimental and Computational Research Meet: The Participatory Extension Module v2.0

Tamás Máhr, AITIA International, Inc., Budapest

Richard O. Legendi, AITIA International, Inc., Budapest

László Gulyás, AITIA International, Inc., Budapest

Rajmund Bocsi, AITIA International, Inc., Budapest

Vilmos Kozma, AITIA International, Inc., Budapest

Experimental and computational research is gaining more and more interest in the last decades in the field of social science and economics. Conducting laboratory experiments and incorporating heterogeneity within agent-based models help us get a better understanding of the analyzed phenomena and the micro-macro rules driving them by taking the human factor into account -- either directly or through stylized personal preferences.

Our contribution is a new tool called the Participatory Extension Module v2.0 which is intended to help scientists conducting mixed-method research (i.e., perform experimental research using existing agent-based models). It is an improved version of the original PET [1], a robust and generic web framework that allows modellers to extend their models to participatory simulations. It is a set of web applications that incorporates agent-based simulations into a web interface compatible with any of the major web browsers, enabling users to administrate, run and participate in simulations in a way that they are familiar with, applying the mechanisms and practices they use every day while browsing web-pages and using other web-based applications.

Applications of PET v2.0 may include online case studies for demonstrative and teaching purposes, or the conduct of lab experiments for behavioural studies of a model. The presentation includes a hands-on live demo of the features of the framework using a widely known model.

[1] Ivanyi, Marton, Rajmund Bocsi, Laszlo Gulyas, Vilmos Kozma and Richard Legendi. "The multi-agent simulation suite." In Emergent Agents and Socialities: Social and Organizational Aspects of Intelligence. Papers from the 2007 AAAI Fall Symposium, pp. 57-64. 2007.