



AGENT-BASED MODELING FOR SOCIOLOGISTS:

Principles, Applications and Technical Problems

RELATORE

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Outline

Agent-based modeling is a powerful computational technique that can be used to build micro-founded formal models of complex macro-level social outcomes and dynamics. The workshop aims to introduce the audience to this method by showing what quantitative-oriented sociologists can do with agent-based modeling and how they can do it. The goal is not exhaustiveness. More modestly, the two lectures are meant to give a taste of the method's potentialities and limitations as well as of its technical coulisses.

To this aim, the first lecture presents an application of agent-based modeling to the analysis of two-generation educational mobility in France. In particular, I present a micro-founded formal model of the macro-level structure of educational inequality, which frames educational choices as the result of both subjective ability/benefit evaluations and peer-group pressures. I show how agent-based computational simulations can be employed to assess the relative explanatory contribution of the micro-level and network-based mechanisms hypothesized. On the other hand, I show how agent-based computational simulations can be used to perform counterfactuals that shed light on the impact of social homophily on the amount of educational fluidity at the aggregate level.

The second lecture leaves aside the agent-based simulation analysis of the educational stratification to concentrate on the computer programming activity that makes this kind of analysis possible. In particular, first I clarify the basic programming building blocks (like those of "class" and "object") that explain why agent-based modeling is so powerful as a mechanism design technique. Then, I provide a concrete example of how a simple theoretical model –namely, Granovetter's original threshold model – can be implemented and studied by means of a specific programming language –namely, **NetLogo**.

Workshop Program and Suggested Readings

Lecture 1, 10.30-12.30

G. Manzo, *Educational Choices and Social Interactions: A Formal Model and A Computational Test*, *Comparative Social Research*, 30, 47-100.

Lecture 2, 14.30-17.30

Railsback S. F. and Grimm V. (2011), *Agent-based and Individual-Based Modeling: A Practical Introduction*, Princeton, Princeton University Press.

Participants willing to follow directly the practical part of the workshop should bring their own laptop with **NetLogo** and, if possible, also **R**.

NetLogo can be downloaded here: <http://ccl.northwestern.edu/netlogo/index.shtml>.

R can be downloaded here: <http://www.r-project.org/>

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h. 10:00 - 18:00 AULA SEMINARI SPS
(room 215, second floor, via Passione's side)

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