

Models and Simulations: Discussion Questions Week 13

Readings: Epstein, “Why Model?”; Janssen and Ostrom “Empirically Based Agent-Based Models.”

Goal: By the end of the conversation, students should be able (1) to identify several different goals of the models discussed in the course, (2) to assess how well those models meet those goals, (3) to describe the type of evidence that is provided for those models, and (4) to discuss the type of evidence that could, in principle, be provided for such models.

Directions: You will be assigned one of the following three models to discuss in a small group with other students: (1) Alexander’s “small worlds” network model of the evolution of cooperation, (2) The Skyrms-Peamantle “dynamic network” model of the evolution of cooperation, or (3) a $2 \times 2 \times 2$ signaling game in which players learn by Roth-Erev reinforcement learning.

Discussion Question 1: Epstein enumerates sixteen uses of models other than prediction, and he discusses six in depth. Explain how, if at all, the model you have been assigned meets each of the following goals:

1. Explanation
2. Guiding data collection
3. Illuminate core dynamics
4. Raise new questions

Discussion Question 2: Janssen and Ostrom discuss four different methodologies that might be used to make an ABM “empirically based.” Explain how each method might be used to constrain and revise the model you have been assigned:

- Statistical analysis
- Laboratory experiments
- Role-playing games
- Case analysis

Discussion Question 3: In the first two sections of the paper, Janssen and Ostrom also discuss difficulties that one can encounter when employing each of the above methodologies. Explain how such difficulties might arise in making your model “empirically based.”