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DEPARTMENT OF SOCIOLOGY

**What Actually Stops Us Going
“Beyond” Schelling and Axelrod:
Three Challenges**

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1. Plan

- Sorry: Really has to be just a taster for other work in progress.
- What kind of thing is ABM?
- Challenge 1: Element selection.
- Challenge 2: “Heaps of ABM”.
- Challenge 3: Research design.
- Conclusions.

2. Caveats

- One of the difficulties is that people don't really write this stuff down so it can be properly scrutinised/criticised.
- The development of ABM is inevitably part of wider trends and historical contingencies in the academy.

3. What kind of thing is ABM?

- Hypothesis: ABM is a research method (compare statistics or ethnography).
- Corollary: It needs a methodology.
- It has one for empirical ABM (calibration and validation: see Gilbert and Troitzsch and Hägerstrand).
- But if it is used in other ways, there still has to be a way of evaluating it beyond “fan clubs” or it isn’t “science”. How do we impartially evaluate a “thought experiment?” Did Schelling actually discover anything about ethnic segregation?

4. Challenge 1: Element selection

- How do we justify having (not having) a social network structure in a “Schelling type” model?
- In a sense once you have identified an ABM, calibration and validation is *relatively* straightforward.
- What seems plausible to one discipline may seem equally implausible to another. Can this issue be resolved without data? IMO unlikely.

5. Some possible solutions

- Synthesis of existing approaches: Suits ABM but still problematic without data? KISS?
- “Switchable” models: Models that differ only in an element to inform “how much difference it makes” and perhaps even “what kind of difference”. (See unpublished draft paper.)
- “Modular” interdisciplinarity: Different disciplines take ownership of different aspects (but must listen to other potential contributors). Lovely if it works. I will go to the celebration on my flying pig.
- Modelling competitions with the same raw material?
- Just recognising the issue?

6. Challenge 2: “Heaps of ABM”

- We already know what happens if we don't address this issue: Very large numbers of non-commensurable, non-empirical and “not implausible” ABM.
- Can we decide in a “scientific” way if one non empirical ABM is “better” than another? IMO no.
- Danger of twiddling models to produce “arbitrary” outputs like opinion polarisation (which may themselves not be soundly empirical). Best empirical example of PD?
- Chattoe-Brown (2014): The very popular Zaller-Deffuant model looks nothing like real opinion data (turning points).

7. Possible solutions

- If I were you I wouldn't start from here at all: Only ABM that are validated (and ideally calibrated too) can be progressive.
- What do we make of having an example of this methodology from 1965 (Hägerstrand) that is very rarely cited? Later examples too: Kalick and Hamilton, Abdou and Gilbert.
- Methodology here is clearly describable procedures to rank models by validation and calibration status. (See submitted draft chapter.)

8. Challenge 3: Research design

- To make life trickier, these challenges are connected.
- We have to say what we want to “prove”. (Compare “greater wealth is associated with greater educational success” or “doctors start with a best guess diagnosis based on obvious symptoms and then disconfirm by “experimental” intervention”.)
- Compare “how do I use an ABM to prove the theory of cognitive dissonance is coherent?” and “how do I use an ABM to prove the theory of cognitive dissonance is correct?”
- In published ABM, look for comparisons of real and simulated data, substantive uses of empirical research and explicit claims for evaluating the model. Good luck!

9. Possible improvements

- Make better use of existing research design ideas. Inter-coder reliability: Do two independent ABM from the same “raw material” come out the same?
- Related ideas from statistics (over fitting, mis-specification, equi-finality): How discriminating can a two type Schelling model really be?

10. Two asides on data

- Housing complaints (Rossi 1955): Amount of closet space (33%), open space about the house (28%), street noise (23%), amount of room (22%), heating equipment (16%), rent (15%), nearness to friends or relatives (15%), amount of air and sunlight (14%), **kind of people around here (13%)**, amount of privacy (12%), nearness to church (9%), travel to work (8%), **kind of schools around here (6%)**, shopping facilities (6%).
- From 129 articles containing the search term <agent-based> in the journal *Social Networks*, 6 were validated and arguably none were also calibrated.

11. Conclusions

- Taking the methodology (or perhaps methodologies) of ABM seriously gives us a way forward to “ranking” models. Without this, we can certainly proliferate ABM but it is not clear we can progress them.
- While it may be cosy/easy to be hazy about what we are aiming at and how we prove we succeeded, this may harm ABM except among those who are already converts.

12. Fin

- Questions?
- Comments?
- Criticisms?

13. Now read on

- Abdou, M. and Gilbert, N. (2009) 'Modelling the Emergence and Dynamics of Social and Workplace Segregation', *Mind and Society*, 8(2), December, pp. 173-191.
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- Chattoe-Brown, E. (2017) 'Why Questions Like "Do Networks Matter?" Matter to Methodology', draft paper. [Available from the presenter.]
- Chattoe-Brown, E. (2017) 'Agent-Based Modelling', draft paper. [Available from the presenter.]
- Gilbert, N. and Troitzsch, K. (2005) *Simulation for the Social Scientist*, second edition (Milton Keynes: Open University Press).
- Hägerstrand, T. (1965) 'A Monte Carlo Approach to Diffusion', *Archives Europe/ennes de Sociologie*, 6(1), pp. 43-67.
- Kalick, M. and Hamilton, T. (1988) 'Closer Look at a Matching Simulation: Reply to Aron', *Journal of Personality and Social Psychology*, 54(3), March, pp. 447-451.