

A GUIDE TO BEING PURPOSEFULLY WRONG (BUT SCIENTIFICALLY USEFUL)

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A review of the book

Modeling Social Behavior: Mathematical and Agent-Based Models of Social Dynamics and Cultural Evolution

By Paul E. Smaldino, 2023.

Princeton University Press. US. 360 pages.

ISBN 9780691224138 (Hardcover, UK £125.00, US\$ 150.00)

Murmurations stop us in our tracks. Thousands of starlings moving in perfect harmony—how do they do it? Are they following a plan? A leader? Does it matter? Many other social phenomena are just as dizzying: religion, markets, political movements, the flow of traffic in New York. There are thousands, even millions of moving parts, and yet, something larger and cohesive takes shape. “Modeling Social Behavior” by Paul E. Smaldino is for the social scientist drawn to complex systems, where the connection between individual behaviors and large-scale patterns is anything but clear from observation alone.

Smaldino’s intent with this book is clear: it’s a comprehensive guide for social scientists on how to construct formal models—whether mathematical or computational. Smaldino isn’t concerned with prescribing the “right way” to build a model, which is comforting—especially for those without formal training in quantitative methods. He makes it clear that modeling approaches are often complementary, not competing. For example, both mathematical and computational models have their strengths and limitations. Mathematical models offer precision but often struggle to accommodate heterogeneity. Computational models can handle more complexity and variation, but they require time, resources, and greater computational power. Ultimately, what matters most is the question being asked—and a model’s ability to capture the relevant information needed to answer it.

Smaldino excels as a guide through the complex modeling landscape, clearly articulating its philosophy and practical utility. Models often get a bad reputation for being overly simplistic. As a novice computational social scientist, I've felt paralyzed by the fear of building a model that's "too basic" to survive peer review. But Smaldino urges us to embrace the fact that all models, by definition, do violence to reality—and that's not a flaw, it's the point. He drives this home again and again. He reminds us that everything is a model. We all rely on mental models to make sense of the world, and academic theories—whether it's Boas' cultural relativism (Boas, 1940) or Durkheim's theory of mechanical solidarity (Durkheim, 1984)—are models too, even if they aren't labeled as such. However, when theories are only expressed through language, they can be ambiguous. Words require endless clarification and caveats to avoid misunderstanding, and even then, interpretation can vary. Smaldino argues that formal models—whether through equations, simulations, or visualizations—strip away much of that ambiguity. They force you to define exactly what you mean and often do so more concisely than pages of prose. Formal models don't introduce new problems; they clarify old ones.

The book is also a practical handbook for building models, with Smaldino walking the readers through a clear, actionable pipeline: how to code, experiment with, and extract meaningful insights from even the simplest models. In Chapter 3, for example, Smaldino explores the classic Schelling segregation model, often taught in the social sciences to demonstrate how neighborhoods become segregated—even when individual preferences for homophily are weak (Schelling, 1971). He begins by explaining the goals of the model, then points readers to an interactive version they can explore. From there, he breaks down the key components: who the agents are, what their properties are, and how they behave. Smaldino then walks the reader through all the relevant code—how to initialize the model (setting the stage or initial conditions), how to set up the simulation procedure, and how to run the model multiple times to explore different outcomes. In the same chapter, he shows how to create visualizations and how to vary the parameters to test different scenarios. In doing so, he also explains the assumptions baked into the Schelling model, its limitations, and what it can and cannot tell us about social segregation. But perhaps the most important lesson Smaldino offers is this: he encourages readers to *play* with the model. By tweaking parameters and observing how outcomes change, readers can see firsthand how simple social preferences can lead to complex, emergent patterns. This hands-on exploration is key to understanding how formal models reveal the mechanisms driving social phenomena from the bottom up.

The book is thoughtfully scaffolded. The examples Smaldino uses build in complexity over time, and by the end, the reader can expect to have a solid grasp of many foundational formal models used to study social dynamics and cultural evolution—whether it's opinion dynamics, contagion, coordination, or cooperation. Readers not only learn the underlying mechanisms but also become familiar with the basic equations that drive these models. Each chapter ends with suggestions for further exploration, offering a gentle invitation to "play" with the models—an encouraging cushion for readers who might otherwise feel overwhelmed. The book primarily uses NetLogo, a platform often described as *low-threshold, high-ceiling* (Wilenski, 1999). NetLogo is beginner-friendly for those without coding experience, yet powerful enough to develop complex models regularly featured in peer-reviewed research. For readers who prefer other programming languages, Smaldino's models are foundational enough that equivalent code can be found online—or recreated with a bit of patience.

While the book has clear pedagogical strengths, it can be overwhelming at times—especially for casual readers or academics in the social sciences and humanities who are new to computational methods, particularly if they try to get through it quickly in a week or two. Even within the first couple of chapters, Smaldino covers quite a few key concepts and steps for building models. The same intensity carries through to the final chapters, which shift focus to more philosophical and abstract topics: the scientific method, interpreting results, working

with social networks, and mapping models onto empirical data. Except for the chapter on social networks, these final chapters are more explanatory and discursive, rather than Smaldino's usual exercise-driven, "play with the model" approach. That's not to say these chapters are unnecessary—grappling with abstract concepts is exactly what helps move novice modelers toward becoming intermediates. But because these heavier ideas are clustered at the end of the book, there's less space for them to crystalize the way earlier concepts do. This book is likely to deliver the biggest bang for its buck when used alongside a course (as a textbook) or in a peer reading group, where readers can take their time to read, practice, and internalize the ideas.

"Modeling Social Behavior" is a valuable resource for social scientists. At times, Smaldino's critique of the social sciences as lacking clear and precise theory might seem unduly harsh—especially now, when more researchers are embracing the utility of formal models. But even his sharpest critiques come across as a genuine attempt to advance the role of modeling in the social sciences. His tone is honest, funny, and sometimes sarcastic, but rarely judgmental. He dishes out tough love when needed, anticipating where novice modelers are likely to fumble or get discouraged, and encourages them to push through. All in all, this book is poised to become a foundational text for the future of quantitative and computational social science.

ABOUT THE AUTHOR

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