

Invited Talk to be given at *Econophysics Colloquium 2019*

## **Agent-Based Modeling and the Complexity of Humanities**

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### **Abstract**

While the first wave of consilience between science and the humanities was mainly promoted in the form of reductionism, the second wave of consilience has redirected this development into the consilience of equal regards. This evolution provides us two models of consilience, namely, the original model of hierarchical consilience and the alternative model of horizontal consilience. In this article, we argue that agent-based modeling (ABM) can be understood as an attempt to contribute to this second wave of consilience and hence provide a very different account for the question, ‘*why agent-based modeling?*’ Our argument is based on the five unique features that distinguish agent-based modeling from the conventional equation-based modeling. These five unique features are individuality, autonomy, plurality, particularity, and mimesis. These five features together can demonstrate a *humanistic turn* of social sciences if an ABM project can be properly erected. Hence, ABM, as a ‘formalistic method’, when duly implemented is not a pursuit for simplification solely for reducing the complexity of the humanities and hence distorting the nature of the humanities. Instead, being consilience of equal regards, it is to be enlightened, enriched, and extended by the humanities. As Morson and Shapiro (2017) emphatically point out, the humanities have much to offer social scientists, such as radical uncertainty, unpredictability, irrationality, subjectivity, incomprehension, indiscernibility, consequential decisions, dilemma, paradoxes, postmodernism, a long yet not exhaustive list that one may like to ‘abstract away’ by scientific reduction. However, ABM with its unique capacity makes social scientists possible to appreciate this long list and explore their possible role in social scientific modeling, such as reasoning in between early and late Ludwig Wittgenstein, from his *Tractatus* to *Philosophical Investigations*. We end this talk by revisiting the pioneering effort made by Nicolas Rashevsky (1899-1972) on his *Looking at History*

*through Mathematics* (Rashevsky, 1972).