Getting the Flu in El Farol: Exploring Epidemiological Dynamics in a Social Dilemma

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The Covid-19 pandemic has emphasized the critical need for research on epidemic spread within complex social systems, highlighting the interaction between disease dynamics and socio-behavioral patterns [1]. These kinds of problems are often addressed with social dilemma [2].

A popular social dilemma is the El Farol Bar problem, which models where the decision-making process of individuals choosing to visit a bar with limited capacity, aiming to avoid overcrowding [3]. Each individual act independently, relying on historical attendance data to predict future enjoyment.

This study introduces an epidemiological adaptation [4] of the El Farol Bar problem, striving to enhance comprehension of the interrelated social and epidemiological aspects of certain systems. The model employs agent-based modeling (ABM) simulation, a computational method that replicates the behaviors of individual agents and their interactions in a specific setting.

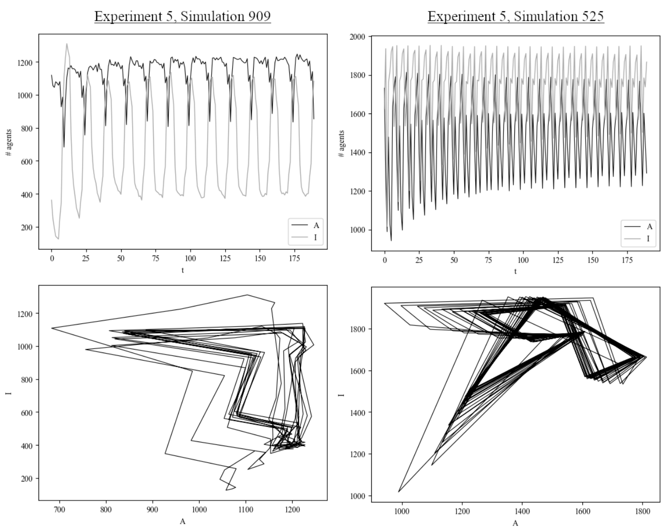

Figure 1: Figure caption.

The findings from the model indicate that ostensibly simple models can manifest remarkably complex dynamics. Notably, the analysis reveals that a basic configuration, wherein each agent possesses merely two states, is capable of giving rise to a limit cycle, and thus, a dynamic attractor within the state space comprising infection rate and event attendance. This insight accentuates the possibility of significant complexity within real-world contexts, highlighting the imperative for more comprehensive research to refine the management of social systems amidst the propagation of a disease.

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