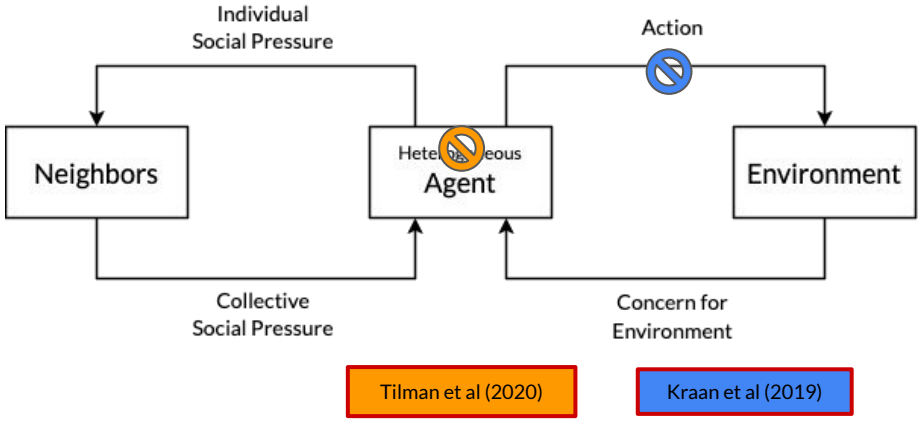
How do feedback loops shape climate action transitions and environmental impact?



$$V_i(a) = (1 - w_i) \cdot U_i(a, n_i^t) - w_i \cdot (a - \overline{a_i})^2$$

$$\frac{dn_i}{dt} = r(1 - n_i^t) \cdot a_i^t - p n_i^t \cdot (1 - a_i^t)$$

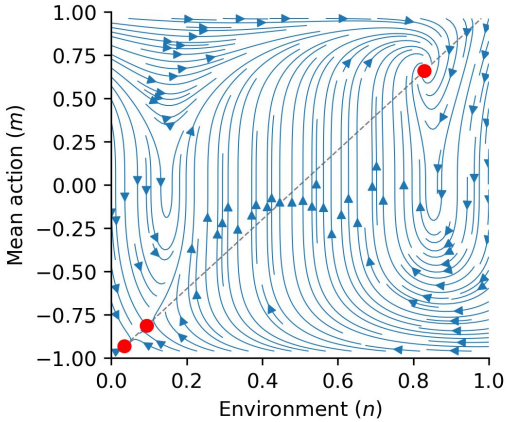


Fig 1: Mean-field dynamics

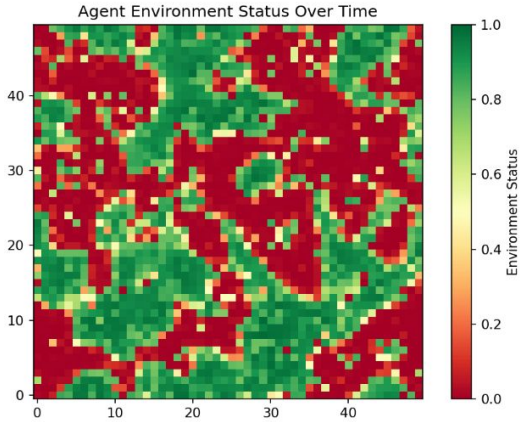
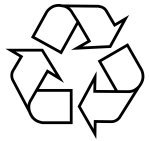


Fig 2: Cluster formation

Usage

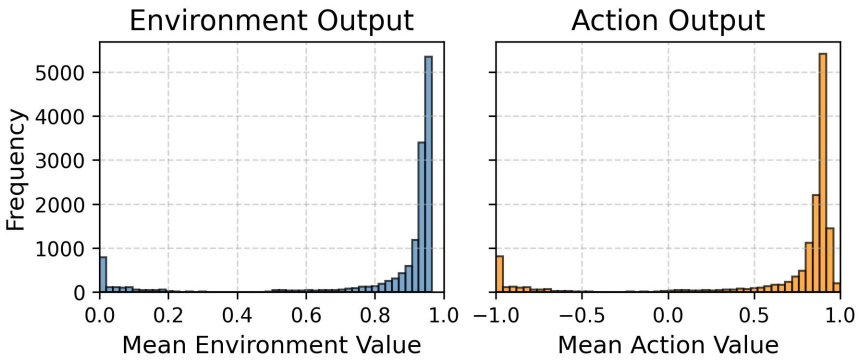
Policy testing. Improving recycling effectiveness.

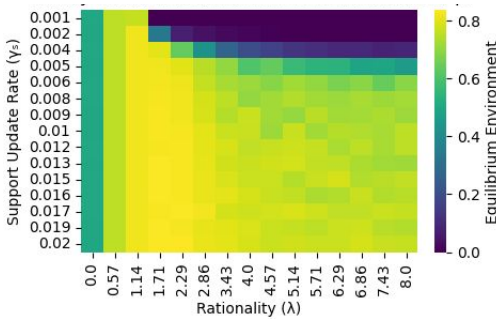


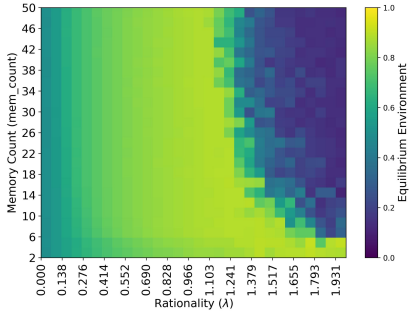
References:

Kraan, O., Dalderop, S., Kramer, G. J., & Nikolic, I. (2019). Jumping to a better world: An agent-based exploration of criticality in low-carbon energy transitions. Energy Research & Social Science, 47, 156-165.

Tilman, A. R., Plotkin, J. B., & Akçay, E. (2020). Evolutionary games with environmental feedbacks. Nature communications, 11(1), 915.







Step 1: Output is bimodal

Step 2: Sobol sensitivity

Step 3: phase transition

Step 4: PAWN sensitivity