

Cooperation through Imitation and Exclusion in Networks

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Abstract

We develop a simple model to study the coevolution of interaction structures and action choices in Prisoners' Dilemma games. Agents are boundedly rational and choose both actions and interaction partners via payoff-based imitation. The dynamics of imitation and exclusion yields polymorphic outcomes under a wide range of parameters. Depending on the parameters of the model two scenarios can arise. Either there is "full separation" of defectors and cooperators, i.e. they are found in two different, disconnected components. Or there is "marginalization" of defectors, i.e. connected networks emerge with a center of cooperators and a periphery of defectors. Simulations confirm our analytical results and show that the share of cooperators increases with the speed at which the network evolves, increases with the radius of interaction and decreases with the radius of information of agents.

JEL Classification: C70, C73, D85.

Keywords: Game Theory, Cooperation, Imitation Learning, Network Formation.