

## **The Impact of Individual versus Group Rewards on the Evolution of Cooperation and Performance in Complex Social and Market Systems**

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### **Abstract**

Socio-economic systems are complex adaptive systems and the evolution of cooperation in such systems remains an unresolved issue. In this talk I describe research using computational social science methods to examine the effect of individual versus group evaluation and reward systems on group cooperation and performance under different task conditions. The work builds on the classic research of Axelrod and Hamilton on the evolution of cooperation in Iterated Prisoner's Dilemma Games. Agent based models, simulate group interactions as different forms of iterated games and Genetic Algorithms are used to mimic individual and group evaluation and reward mechanisms. The results show that group based systems outperform individual based and mixed systems, producing more cooperative behavior and the best performing groups as well as the best performing individuals in most types of interaction games. A new role emerges, the self-sacrificer, playing a critical role in enabling other group members and the group as a whole to perform better at their own expense. The findings have implications for the design of incentive systems in social and business systems including university departments!.