Evolution of Fairness and Group Formation in Multi-Player Ultimatum Games[*]

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August, 2015

Abstract

Group formation is a fundamental activity in human society. Humans often exclude others from a group and divide the group benefit in a fair way only among group members. Such an allocation is called *in-group fair*. Does natural selection favor an in-group fair allocation? We investigate the evolution of fairness and group formation in a three-person Ultimatum Game (UG) in which the group value depends on its size. In a stochastic model of the frequency-dependent Moran process, natural selection favors the formation of a two-person subgroup in the low mutation limit if its group value exceeds a high proportion (0.7) of that of the largest group. Stochastic evolutionary game theory provides theoretical support to explain the behavior of human subjects in economic experiments of a three-person UG.