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# A model for gossip-mediated evolution of altruism with various types of false information by speakers and assessment by listeners

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## Abstract

Indirect reciprocity is considered to be important for explaining altruism among humans. The evolution of altruism has been modeled using several types of reputational scores, most of which were assumed to be updated immediately after each game session. In this study, we introduce gossip sessions held between game sessions to capture the spread of reputation and examine the effects of false information intentionally introduced by some players. Analytical and individual-based simulation results indicated that the frequent exchange of gossip favored the evolution of altruism when no players started false information. In contrast, intermediate repetitions of gossip sessions were favored when the population included liars or biased gossipers. In addition, we found that a gossip listener's strategy of incorporating any gossip regardless of speakers usually worked better than an alternative strategy of not believing gossip from untrustworthy players.

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