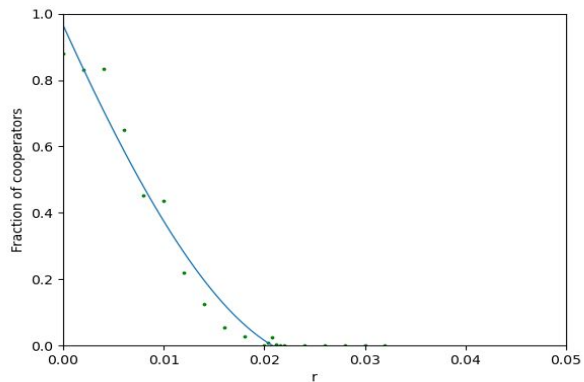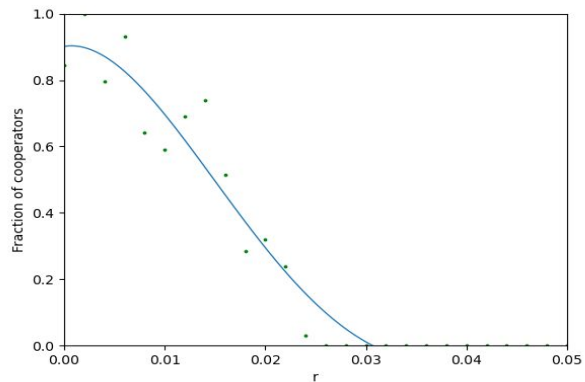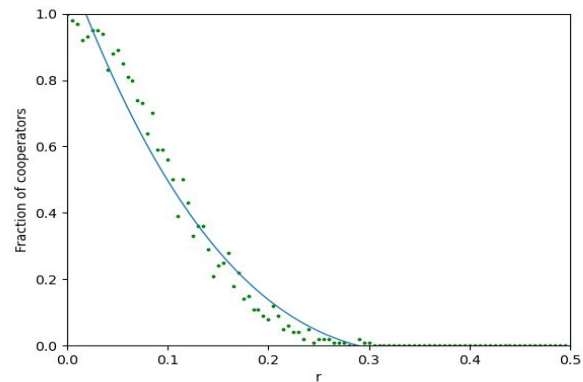# Models

1. Imitation-based
2. Bayesian
3. Reputation-based
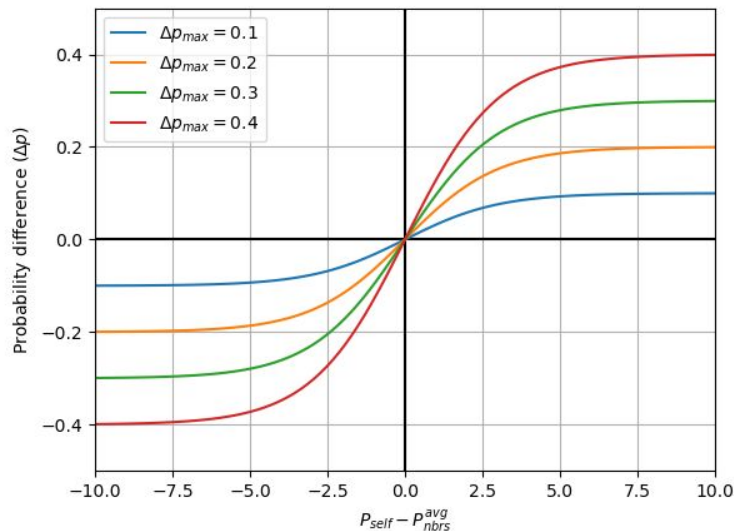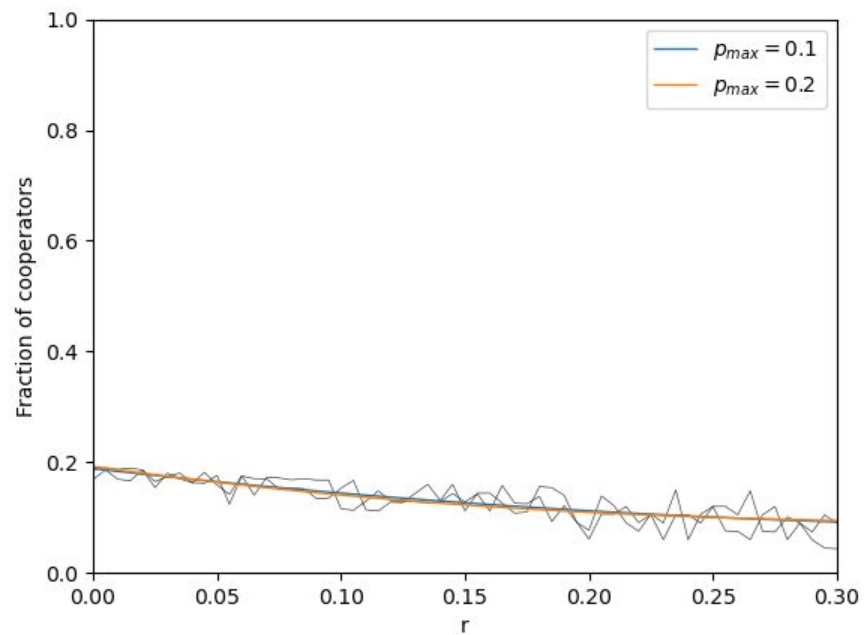

Lattice
0.02

Smallworld
0.03

Scalefree
0.3

Bayesian

Each strategy is assigned a fixed probability (specific to an individual agent) and this is probability distribution is updated after every time step (every round of the game). The rule for updation is as follows (p = probability of coordinating):
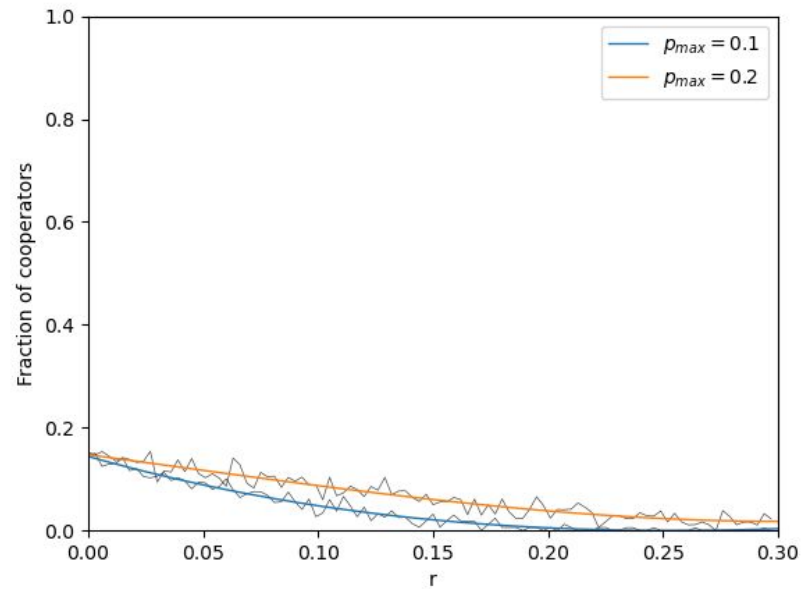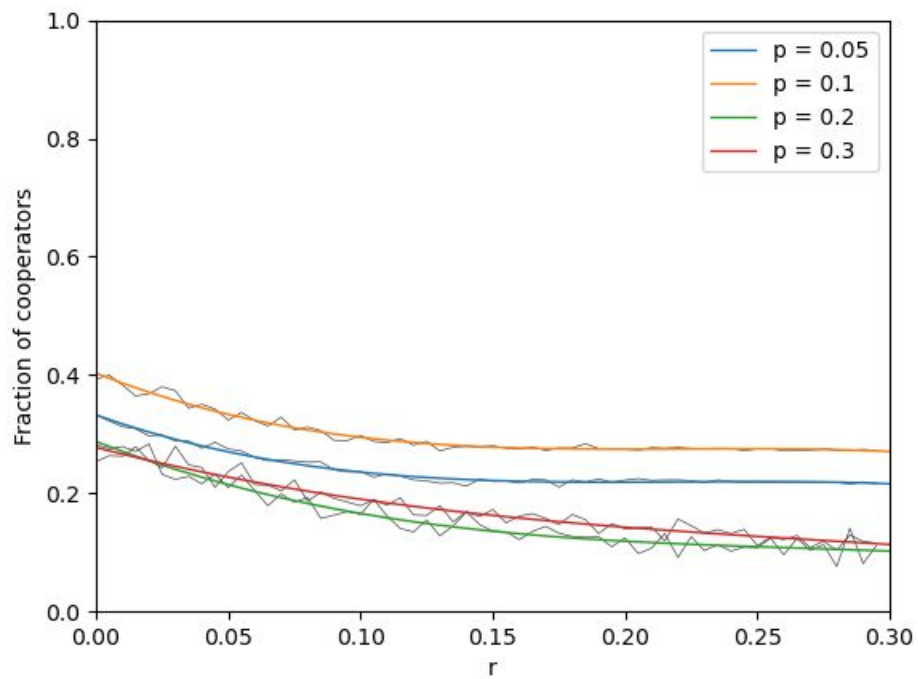
$$p_t = p_{t-1} + \Delta p$$

Bayesian (Lattice)

Bayesian (Smallworld)


Q = 0.6

Bayesian (Scalefree)

Reputation-based

Every agent has a "reputation" which is represented by a number between 0 and 1. After every round of the game, a randomly chosen agent imitates one of it neighbours based on either the difference in their reputation or the difference in their payoffs from that round.

The probability with which an agent chooses a "reputation-based" imitation is the parameter p. The imitation itself occurs with a Fermi-like probability (shown below).
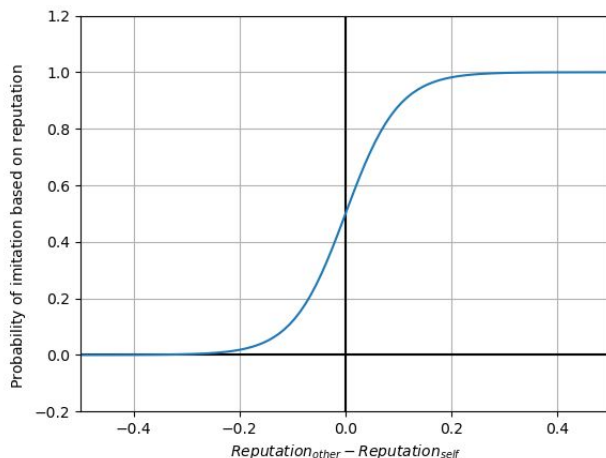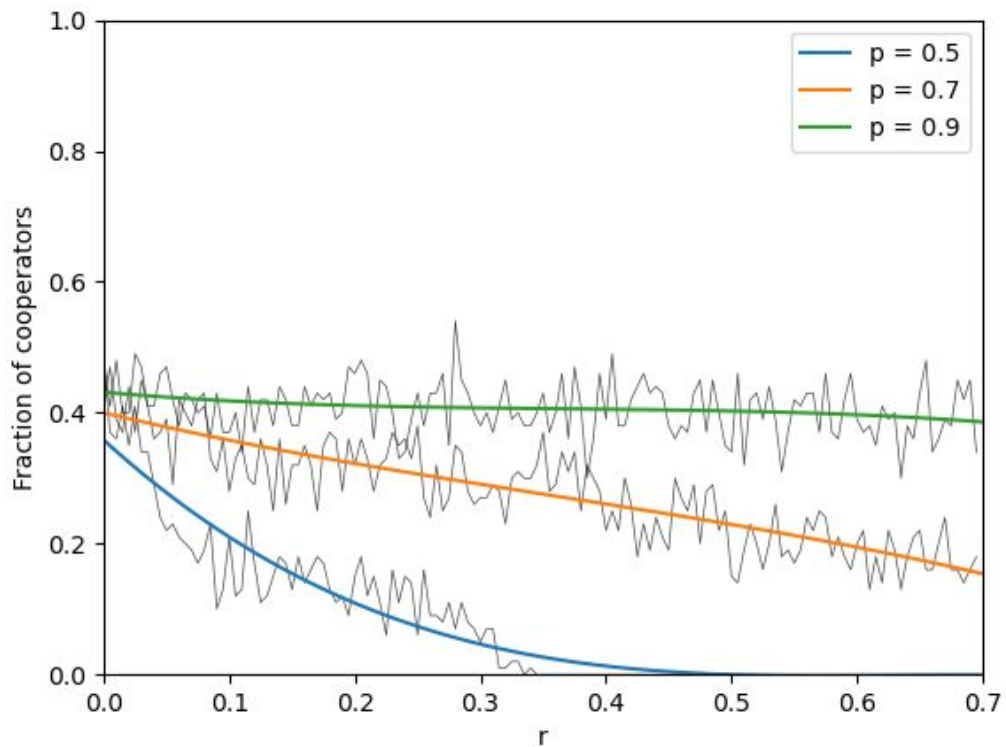
Reputation-based

Every time an agent chooses to cooperate, its reputation increases. This increase is modeled as shown below. Therefore, the reputation of an agent is a loose indicator of its history of cooperation.
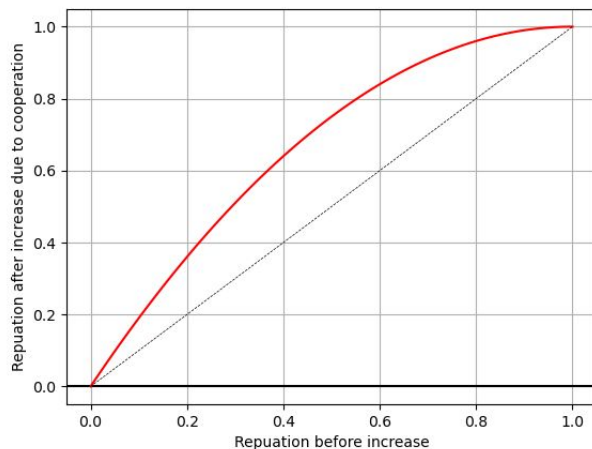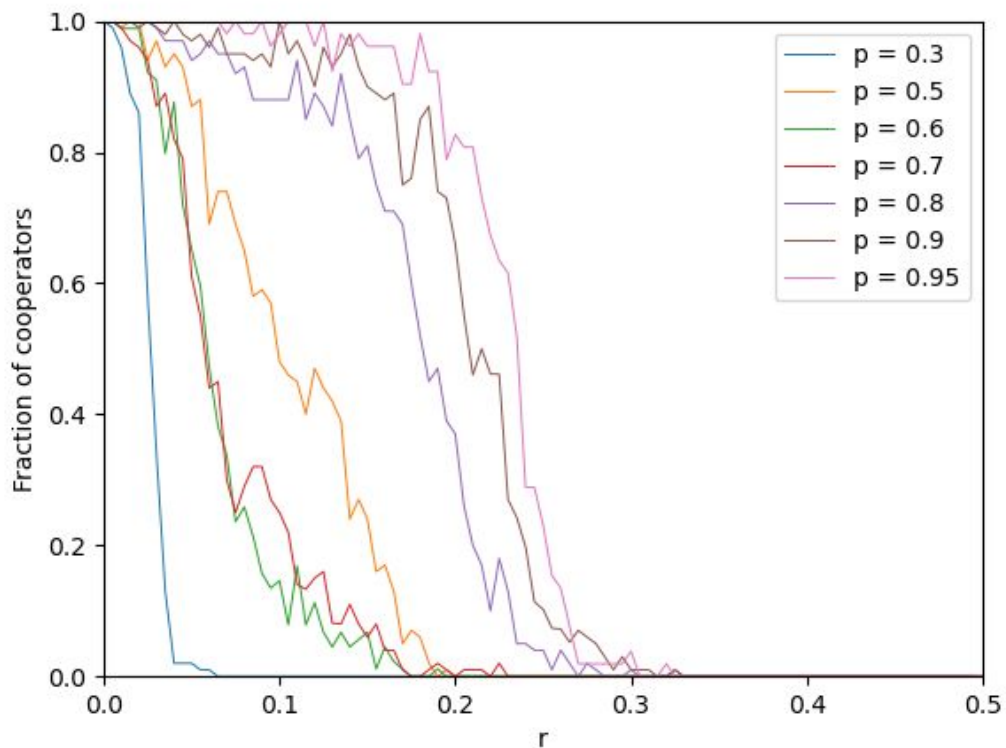
Reputation-based (Lattice)

Reputation-based (Smallworld)

Reputation-based (Scalefree)