

A Smale type solution for multiplayer Prisoners Dilemma
M.W. Hirsch

ABSTRACT – In a symmetric N-player PD game, each 2-player partial game (with the actions of the other players arbitrary but fixed) is a classical PD. In the full game, mutual cooperation pays every player more than mutual defection. The game is repeated infinitely. A crucial hypothesis is that each player cares only about her long run average payoff.

In the 2-player game Smale suggested that in each game, Player 1 should cooperate unless her current average payoff is somewhat less than her opponent's, in which case she should defect. Smale proved (in a particular case) that this guarantees her long-term average is no worse than the mutual defection payoff, and her opponent's is no better than mutual cooperation. Moreover, if Player 2 adopts a similar policy, both get the mutual cooperation payoff in the long run. Therefore (according to Smale) it is rational for both players to use such policies.

In this talk I will adapt Smale's solution to the N-player game, and discuss whether it is really "rational."