

## Excerpt

**Axelrod, Robert (2006): The Evolution of Cooperation. Revised ed., Basic Books: New York, Ch. 1 "The Problem of Cooperation", p. 3-24.**

**Topic:** Focus is on the problems of cooperation – from a game theoretical point of view – assuming individuals who pursue their own self-interest without the aid of a central authority to force them to cooperate with each other. The author also provides a content overview of the chapters in the book.

**Questions:** Under which conditions will cooperation emerge in a world of self-interested acting individuals without central authority? How could cooperation develop in face of situations where each individual has an incentive to be selfish? What is the best strategy that will yield a player the highest possible score?

**Problem / Thesis:** The basic problem for cooperation occurs when the pursuit of self-interest by each player leads to a poor outcome for all. If one party decide to cooperate and the other to defect, the cooperative party will lose. Therefore, each player has an incentive to defect that lead to a worse outcome than would have been possible had both players cooperated with each other (p. 7) – the so called Prisoner's Dilemma.

**Definition(s):** The Prisoner's Dilemma is a paradox in decision analysis. Two individuals/players/parties act in their own self-interest and pursue a course of action that does not result in an optimal or winning outcome for all. The dilemma is set up in the situation that both parties must make the choice without knowing what the other will do. Therefore, defection yields a higher payoff than cooperation and both choose to protect themselves at the expense of the other. As a result both parties find themselves in a worse state than if they had cooperated with each other. (p. 7-8)

**Research Strategy:** Abstract consideration of the game theoretical formula "Prisoner's Dilemma" for some common and interesting situations that shows the emergence of cooperation or defection between individuals/players/parties. For advanced analysis of players' strategy the author uses the Markov process (modeling the behaviour of the other player as a complex procedure) or the Bayesian analysis (a method of statistical inference to select best choice for the long run).

**Data Analysis:** Among other sources, the author evaluates daily newspapers with regard to the conditions for the emergence of cooperation, e.g. types of mutually rewarding behaviour like vote trading in the US Senate.

**Results & Interpretation:** Although the original problem actually persists (fundamental form p.11-12), there are several ways to resolve the Prisoner's Dilemma. Each approach allows for additional activities in which the players alter their strategic interaction that could change the nature of the problem. One way to make it possible for cooperation to emerge is the fact that the players might meet again. This means an iterated Prisoner's Dilemma game. The choices made today do not only determine the outcome of this move, but can also influence the later choices of the players. *"The future can therefore cast a shadow back upon the present and thereby affect the current strategic situation."* (p. 12). The strategy is called TIT FOR TAT. (p. 13-14)

In an iterated Prisoner's Dilemma game, the interests of the players should not be in total conflict. Both players can do well by getting the reward for mutual cooperation or both can do poorly by getting the punishment for mutual defection. The strategy that works best depends directly on the strategy chosen by the other player, and on the room for mutual cooperation offered in the other player's strategy. This principle is based on the weight of the next move relative to the current move being sufficiently large to make the future important. (p. 15)

**Conclusion Review:** The simple framework of the game theoretical Prisoner's Dilemma makes it possible to analyse the decision-making process between two individuals/players/parties and to focus on the conditions how cooperation could emerge.