

# The friendly extortioner takes it all

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Over 100 students from Kiel University played for money in prisoner dilemma game designed by the researchers. Credit: F. Vinken

Cooperating with other people makes many things easier. However, competition is also a characteristic aspect of our society. In their struggle for contracts and positions, people have to be more successful than their competitors and colleagues. When will cooperation lead to success, and

when is egoism more effective? Scientists from the Max Planck Institute for Evolutionary Biology in Ploen have developed an experiment that enables them to examine the success rate of cooperative and egoistic behaviour strategies. A strategy referred to as "extortion" is particularly successful, according to the researchers. This strategy that alternates between cooperation and egoism is difficult for the co-player to resist. The extortion strategy is especially effective when there is strong competitive pressure – that is if there can be only one winner.

"Extortioners often come across as friendly colleagues. They reciprocate friendliness with friendliness, making their competitors feel as though it must be a misunderstanding, if they are taken advantage of again and again. They are forced to play along to avoid losing even more. This seemingly friendly yet extremely tough exploitation strategy is rewarded with additional gain," explains Manfred Milinski from the Max Planck Institute for Evolutionary Biology in Ploen. Together with Lutz Becks, who has meanwhile taken up research work at the University of Konstanz, he examined the willingness of human beings to cooperate and exploit under varying conditions.

Calculations drawn up by scientists show that mutual support can easily turn into extortion. Theorists use the so called prisoners' dilemma to explore this issue of social interaction among human beings. In this game, two participants will benefit more if they cooperate, than they would if both of them behaved egoistically. However, if one player is egoistic while the other one cooperates, the egoistic player will receive the largest prize, while the cooperating player goes away empty-handed.

This means that cooperating is only worthwhile, if you keep encountering the same player, and are thus able to "punish" previous egoism and reward cooperative behaviour. For a long time, scientists have considered this type of "tit for tat" strategy to be the most effective behavioural strategy and a recipe for mutual cooperation.

## **Extortion is unbeatable**

In reality, however, many people tend to cooperate less frequently than is predicted theoretically for the prisoners' dilemma. This discrepancy can be explained by the "extortion" strategy that has been referred to as unbeatable, and was first described by two US researchers in 2012. The extortioner takes advantage of the other player systematically, by forcing them to constantly cooperate. In 60 percent of cases, an "extortioner" will react to their counterpart's cooperation by cooperating themselves. In 40 percent of cases they will behave egoistically and collect the maximum prize.

The co-player has to comply with the extortioner, because it is the only behaviour that will pay off for them. They are only able to increase their small gain, by cooperating more and more frequently, in order to benefit in most cases from the extortioner's 60 percent of cooperation. Their gain will increase steadily as a result, but they will cause the extortioner to obtain a much greater prize.

Experiments conducted by Manfred Milinski and his team in Ploen showed that human beings actually tend to be encouraged to cooperate and to accede to extortion, when they are playing against a computer that employs the extortion strategy. However, a computer is unimpressed, if its human co-players become increasingly unwilling and refuse to cooperate over the second half of the experiment. The experiments could therefore not demonstrate, whether or not a human extortioner would eventually yield to their competitors' attempts to discipline them, and would return to more cooperative behaviour.

## **A bonus as incentive for extortion**

Manfred Milinski and Lutz Becks examined in over 100 students if, and

under which conditions, extortioners can be disciplined. In 49 consecutive rounds of the prisoners' dilemma, two students each played for real sums of money.

The scientists introduced a bonus to increase competitive pressure among the players. In the first experiment, one player was drawn from each pair, who would receive an additional bonus of ten euros in the end, if that player managed to earn at least ten percent more than their co-player. In the second experiment, the bonus was granted to the player who earned ten percent more than their competitor. No bonus was available in a control experiment.

Where there was no prospect of receiving a bonus, the players would quickly cooperate and usually obtain a high profit. They used a cooperative strategy ("generous") that was described only recently. The extortion strategy did not occur in this scenario.

However, if one of the players was additionally enticed with a bonus, this player would turn into an extortioner in many cases. Despite the fact that the other player would keep trying to discipline them by refusing cooperation, the extortioner would resist and cooperate even less rather than more frequently over the course of the experiment. Extortioners were also shown to be most successful in the long-term, even in the experiment in which the potential bonus player was not predetermined.

The bonus enabled extortioners to earn even more than cooperative players using a "generous" strategy, who had no prospect of receiving a bonus. "Willingness to cooperate is not a recipe for success, if competitive pressure is strong. Our results show why human beings frequently prove to be less cooperative in real life, than has been predicted in the past," Becks explains.

**More information:** Lutz Becks et al. Extortion strategies resist

disciplining when higher competitiveness is rewarded with extra gain, *Nature Communications* (2019). [DOI: 10.1038/s41467-019-08671-7](https://doi.org/10.1038/s41467-019-08671-7)

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