0- Short summary/abstract (up to 250 words).

**Abstract**

Maintaining cooperation when group interests are at odds with individual ones constitutes a major challenge. However, previous research has shown that reputation effects may constitute an important means to combat cooperation problems. According to the framework of indirect reciprocity, actors are more likely to cooperate with partners who have shown cooperative behavior in the past. Thus, cooperative individuals, are more likely to receive cooperative acts than uncooperative ones, keeping overall cooperation constant and high. Our experiment builds upon Milinksi et al’s (2002) work, which amongst others, showed the benefits of implementing reputation to solve public dilemmas. However, we focused on comparing against a control group, where building a reputation was not possible at all. In our experiment both groups played alternately one round of a public good game followed by an indirect reciprocity game.

1. Description of your problem that you are investigating.

1.1 Why is it important?

1.2 What is the state-of-the-art in academic research for your problem?

**Introduction & Theoretical Background**

The tragedy of the commons is a dilemma described in an influential article titled “the tragedy of the commons” written by ecologist Garret Hardin and published in 1968 (Hardin 1968). The Dilemma is caused by actors, who share a common good but act rationally according to each self interest. Thus, they behave contrary to the best interests of the whole community which leads to depletion of the good. Nevertheless, in everyday life persistent cooperation amongst humans seems to be a common phenomenon.

Social Dilemmas predominantly have been studied via public good games (Sylwester & Roberts 2013). In public good games, each individual is assumed to be tempted to exploit other group members and profit from the cooperation of the other players. However, indeed the group would be better off, if all members would cooperate. Typically, cooperation declines after a few rounds of playing public good games. Nevertheless, it showed that some game features can foster cooperation and even maintain it.

Amongst other factors, research on reputation in social dilemmas has shown, that it can improve the likelihood of cooperation and thus preventing recources from depletion (Milinski et al. 2002). In their experiment the authors used two game sequences, where the first sequence consisted of 16 rounds of a public good game alternated with an indirect reciprocity game. In the second sequence, participants played eight consecutive rounds of public goods games, followed by eight rounds of indirect reciprocity. In the first sequence the levels of cooperation remained high throughout the 16 alternating rounds, while during the second sequence, cooperation declined over the course of the eight repeated public goods game rounds and was restored over the course of the indirect reciprocity games. Subsequent studies pointed in the same direction, by supporting Milinski et al.’s (2002) findings in showing, that participants will cooperate more often, when an incentive to gain reputation exists.

2. Description of your proposed investigation. How does it improve the

state-of-the-art?

We therefore, build upon Milinski et al’s (2002) work, however we focus on the reputational effect and try to isolate it. Therefore, contrary to Milinski et al. (2002) we do not change the sequence of the experiment as a treatment. We focus on the effect of the reputation by introducing a control group where the players do not know the history of other player's decision. We expect that this group will be more likely to run into a tragedy than the other group, where the individuals are interested in maintaining their individual reputation.

* Reproduction mechanism
* Extinction mechanism (close to reality)

3. High-level description of your software implementation.

* Was wir genutzt haben: widgets, stages, entscheidungen mit buttons, verrechnung, Pool vs private earnings

3.1 What problems did you encounter and how did you solve them?

* SumPool und Loops: Stefanos Lösung; Extinction Pool Lösung: if Bedingungen und loops (mehrere Loops)
* IR-Game: Differing code for own decision and other player’s decision
* Treatments und unterschiedliche HTML-Elemente
* Allg. Kommunikation Server und Player Ebene

3.2 Are there some open problems in your implementation that you were

not able to code? Say what and why you could not code them.

* Vollständige History(!)
* Id array vs offer array

4. Results (optional). Describe early findings.

5. Conclusions

5.1 How can your implementation be extended to test future/related problems.

* ??

5.2 Honestly assess the reliability, robustness, and validity of your

implementation (very important!)

* Critique: Treatment simplified: no reputation, but punishment
* Validity: Mixed motivations to cooperate: Reputation/punishment not isolated, motivation to keep the pool alive (disadvantage of being close to reality: external vs. internal validity)
* Robustness: eg coins (between the games; höhe coins (social psychology. Effekte)
* IR-Game als verlust frame, stattdessen wäre auch gewinnframe möglich gewesen. Sonst keine motivation nichts zu geben

6 Lessons Learnt

6.1 Reflect about what you knew before lecture 1, and what you have

achieved at the end of the course.

6.2 What recommendations would you give to a future participant of this course and to the lecturer.

* Little bit html in parts of the team, no experience with experiments at all
* Some school knowledge in JavaScript (one group member)
* We developed an elaborated online experimental design on the basis of scientific literature
* We started almost from scratch and in the end, we ended up with an online experiment that runs without major errors.
* 6.2 Take more time for coding if your design is somewhat complex
* Do some JavaScript coding at home, playing around
* Lecturer: Provide students with some easy homework (not mandatory) to get some experience how simple coding works (both JavaScript and basic nodegame functions. Some tasks to early start working in the nodegame environment. E.g. “Take the dictator basic game and change some simple details”