

PUNISH OR PERISH? STRATEGIC THINKING IN A COMMONS GAME

DEVELOPMENTS IN ECONOMICS EDUCATION CONFERENCE 2025

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INTRODUCTION

MOTIVATION AND LITERATURE

- Classroom games as a pedagogical tool
 - Creating a cohesive and enjoyable learning environments in diverse classrooms enhancing student's participation and comprehension (Dewey, 1994; Azriel et al., 2005)
 - Incorporating real world issues in a relaxed and interactive environment (Guest, 2015)
- Classroom experiments increase engagement and improve assessment performance compared to traditional lectures (Dickie (2006); Durham et al. (2007))
- Prisoner's Dilemma and Tragedy of the Commons effectively demonstrate strategic interdependence, cooperation challenges, and resource overuse (Holt & Laury (1997); Holt & Capra (2000); Brauer & Delemeester (2001))

GAME DESIGN

- Game played on the online platform, ClassEx.
- Played over multiple rounds, with students across different years of study; a sample of participants completed a post-game questionnaire to capture their reasoning and strategic choices
 - EC981 ($n = 15$)(Warwick): postgraduate, small cohort, questionnaire administered
 - 08 30397 ($n = 28$) (Dubai): undergraduate, small cohort, questionnaire administered
 - EC202 ($n = 328$) and EC320 ($n = 112$) (Warwick): undergraduate modules, large cohort

GAME RULES

Main Rules

- All of you are fisherpeople and you are fishing in a local pond. The pond is public so everyone can fish there without any costs.
- Each round of the game you decide upon how many fish you want to catch: 0, 1, 2, 3 or 4 fish.
- You will receive one point for each fish you catch. Your aim is to have as many points by the end of the game as possible.
- At the beginning, the amount of fish in the pond: **5 * the number of players**.
- **The game will be played for six rounds.**
- Each round the amount of fish in the pond doubles. So, at the end of each round there will be two times the amount of fish in the pond that you left in the previous round. **But:** The amount of fish in the pond cannot exceed the initial amount. If 0 fish is left, the game ends.

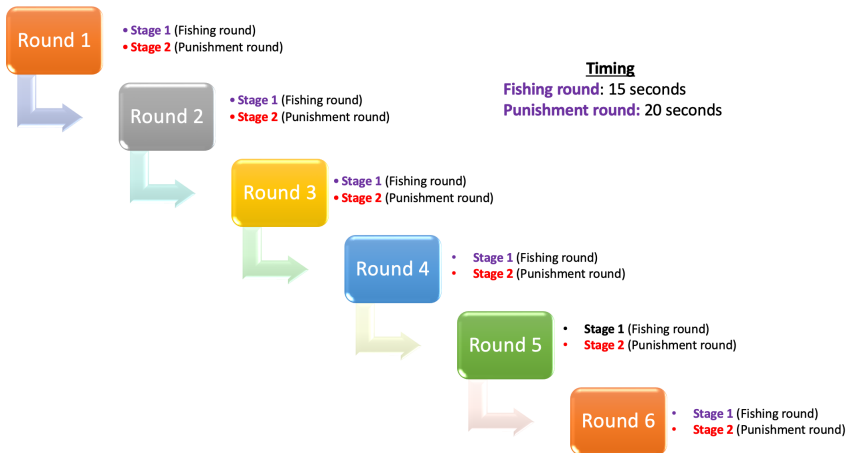
Punishment

Additionally, you can punish other players. After catching fish, you can decide to give up one fish in order to punish fisherpeople who caught more than 2 fish.

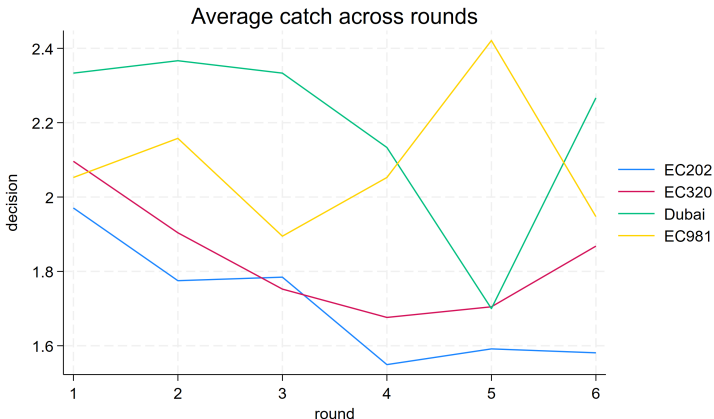
As a punishment those catching more than 2 fish will be deducted the following amount of fish: **number of punishers minus 1**.

So, a minimum of two punishers is required for it to work. A maximum of 4 fish can be deducted.

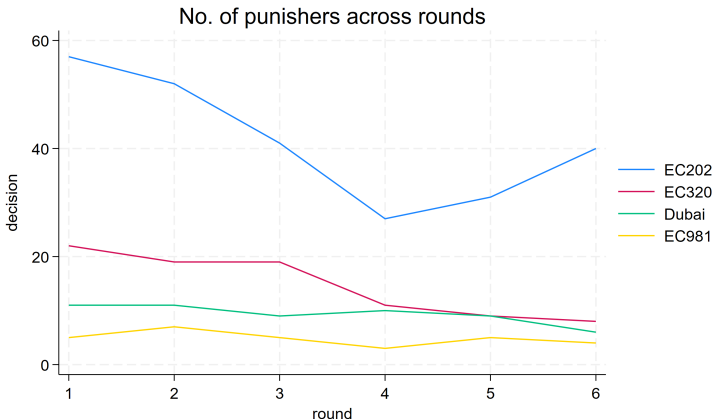
GAME ROUNDS



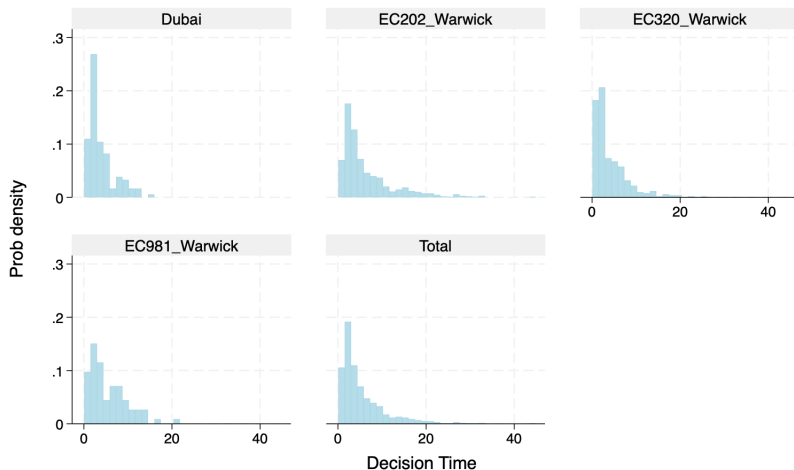
RESULTS AND OBSERVATIONS



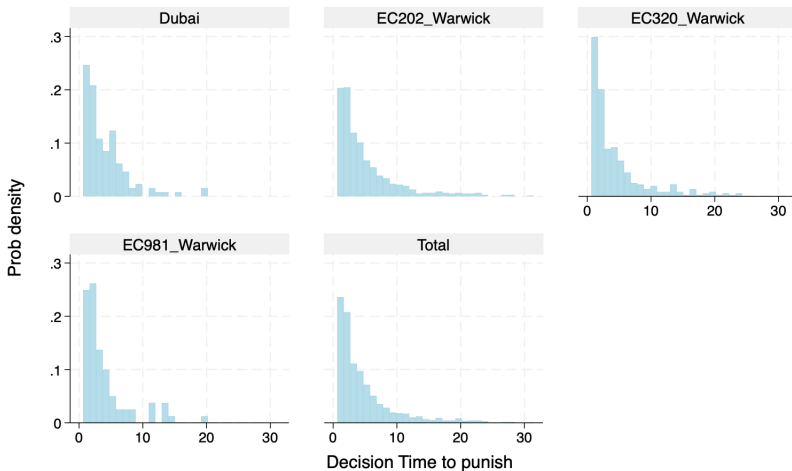
RESULTS AND OBSERVATIONS



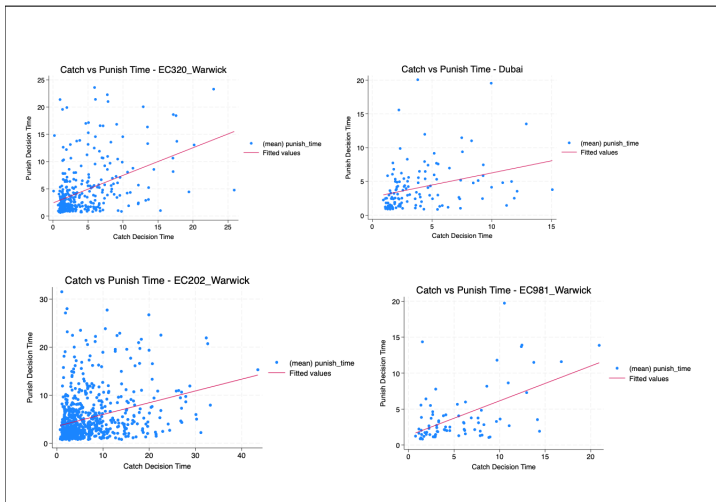
DISTRIBUTION OF DECISION TIMES TO CATCH



DISTRIBUTION OF DECISION TIMES TO PUNISH



CORRELATION BETWEEN TIME TAKEN TO CATCH AND PUNISH

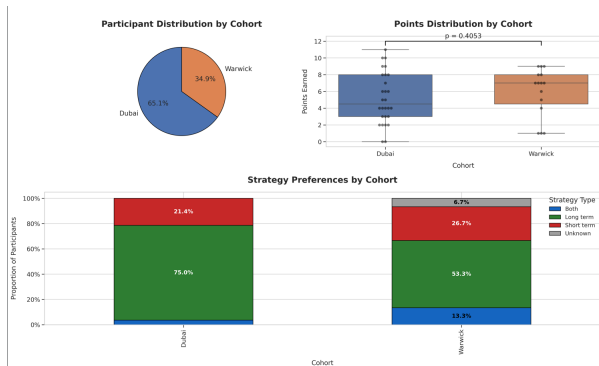


- For reasons of practicality and timing, we limited the questionnaire to two modules (EC981 (Warwick) and 08 30397 (Dubai)) with smaller cohort sizes.
 - These smaller class environments offered a more conducive setting for immediate reflection and discussion.
- Limitation: as the data is drawn from only two cohorts, both of which represent self-contained educational environments, the findings may not be generalisable to wider populations or cultural contexts.
- Designed to be brief (requiring around 5-10 minutes to complete) and was administered immediately after the game, during the same teaching session.
- Questionnaire consisted of both objective (students' behaviour during the game) and open-ended questions (reflect on their own strategy and how it evolved, any feelings of regret about their choices etc.)

“DID YOU ENJOY THE GAME?”

- Game was well received across contexts and that it effectively stimulated further curiosity about the subject matter.
- Enjoyment levels were high across both cohorts (Q1), with Dubai recording a slightly higher proportion of “Yes” responses (82.1%) compared to Warwick (80%). However, Warwick’s responses were entirely positive or neutral, with 20% selecting “Somewhat” and no negative (“No”) responses, whereas 17.9% of Dubai students responded “No”.
- For Q2, which asked whether the game increased interest in learning more about the topic, positive responses were again high in both groups, with Warwick slightly ahead (85% “Yes” vs. 82.1% in Dubai).

PARTICIPANT DISTRIBUTION, POINTS, AND STRATEGY PREFERENCES



COOPERATE OR NOT COOPERATE?

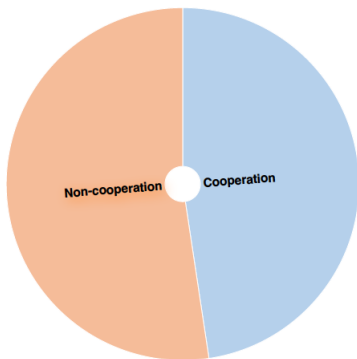


FIGURE: Dubai

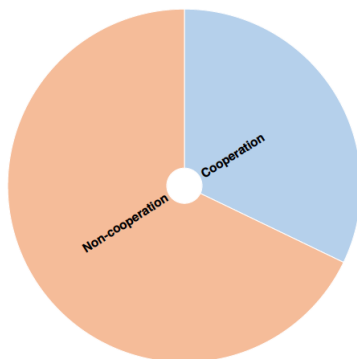
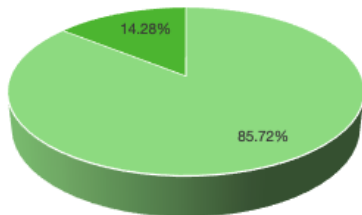


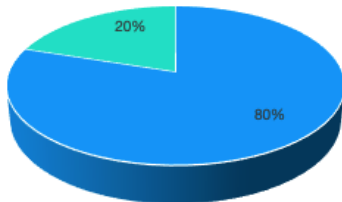
FIGURE: Warwick

QUESTION: “DID YOU CHOOSE TO PUNISH AT ANY POINT IN THE GAME?”

Dubai



Warwick



"WHY DID YOU CHOOSE TO PUNISH": BROAD THEMES

► CLASSIFICATION

Theme Name	Theme Description	Example Quotes
Risk Avoidance and Self Preservation	Responses focused on minimizing risk and ensuring personal gain or stability.	- others would lose their points - I did not punish as I would lose my fish at hand
Curiosity and Experimentation	Responses driven by a desire to explore, test, or understand the game mechanics.	- First round to test the "waters" - Once, because I was curious to see how many of the others were punishing
Retaliation and Fairness	Responses motivated by a sense of justice, fairness, or reaction to others' actions.	- every round except first 2 because 11 people kept punishing - I did punish once because I felt someone caught more than 2 fish
Influence/Controlling the Game	Responses aimed at affecting or managing the behavior of other players.	- others would lose their points - Once, because I was curious to see how many of the others were punishing



CONCLUSION

- Enhanced engagement; serves as an icebreaker; improves retention and healthy cooperation
- Serves as a way to model real world situations; also facilitating more structured discussion around the actions taken and outcomes achieved, help to provide a more deeper understanding of the topic
- Traditional theory predictions may not always (fully) hold!

QUESTIONNAIRE

- Did you enjoy the game?
- After playing the game, are you more keen to learn about the topic?
- How many points did you gain in the game?
- What was your general strategy (e.g., consistently increased/decreased the number of fish you caught every round OR increased and then decreased etc.)?
- What was the logic behind your strategy?
- Were there any moments during the game when you regretted your decisions? Why?
- Did you prioritise short-term gains (catching more fish) or long-term sustainability (preserving the fish population) in your strategy? Why did you make that choice?

QUESTIONNAIRE CONTD.

- How did the doubling of fish in the pond each round impact your decisions? Did it make you to be riskier?
- Did you choose to punish at any point during the game? Why?
- Did other player(s) punishing you affect your overall strategy (catching fish and/or inflicting punishment)?
- Would you have changed your strategy if there was no punishment involved?
- Did you observe any patterns of cooperation or competition among the players as the game progressed?
- Do you think your actions (number of fish to catch and decisions on whether to punish) impact the decisions of others?
- Are there any real-world issues that you can relate to this game? Explain in 100 words.

► Back

CLASSIFICATION

