

The Prisoner's Dilemma ad infinitum

International Relations Discussion Section

1 Introduction

This section is intended for the proctor of the game; do not read this to the students.

The goal of this simulation is to give students' a healthy taste of playing the prisoner's dilemma and what to expect from it. The initial rounds are played to show that defection is the optimal strategy and that preference can change given different rules for playing the game. The final few variants are done in large groups that comprise the entire classroom.

2 Goals

The goal of each player is to have the highest number of points at the end of the class. Each student will be responsible for keeping track of their own score throughout the game and should be reminded after each round to write down their gain from the round.

3 Rules

On the blackboard, draw a 2x2 Square with the following payouts:

		Player 2	
		Cooperate	Defect
Player 1	Cooperate	3,3	1,4
	Defect	4,1	2,2

Explain to the students how the payoffs work and that in each round of the game they will be selecting a strategy of either cooperating with the other person or defecting against them (which harms the other player). Students need to have something to write with and something to write on. **Each student is responsible for keeping track of their own score.** For each round they should write down the round number, the first name of their partner, and their score from that round. Their score sheet should look something like this:

Round #	Partner	Score
1	Milhouse	2
2	Bart	4
.	.	.
Total	—	34

You will have to remind them after every round to write down the score they receive from the round or some are likely to forget to do so. The game proceeds in the following rounds:

1. The students find a person not sitting next to them to be their partner for the first round. The students are not allowed to talk to each other prior to making a decision. Each player writes down either cooperate or defect privately on a piece of paper. Once they are done, they reveal their answers and then write down their score.
2. Find a new partner, repeat round 1.
3. Find a new partner, repeat round 1.
4. Find a new partner, repeat round 1 with double the payoffs.
5. Find a new partner, repeat round 1 with triple the payoffs.
6. Find a partner they have not had previously. This time, they can negotiate/bargain with the other person, but they still write down their decisions in private and reveal them simultaneously.
7. Find a new partner that the students have not had in the previous three rounds. The students play rock–paper–scissors (best of 1) to determine who becomes player 2. The loser of the match becomes player 1. After they determine the player order, player 1 announces their strategy (cooperate/defect). Player 2 decides after knowing what player 1 is doing.
8. Each student now finds a new partner who was the opposite player in the previous round. A person who was player 1 in Round 4 needs to find someone who was player 2. Someone who was player 2 needs to find someone who was player 1. They flip roles. Now play the sequential version of the game again.
9. Students need to find a new partner who they have not been partners with in the last three iterations of the game. This time, announce that they are going to play three iterations of the basic game (from round 1) with the same partner. Play three iterations.
10. Repeat the previous game with a partner they have not played against in the last three rounds.
11. This time, after they have found a new partner different the last four rounds of the game, announce that they will be repeating several iterations of the game, without a known end. Make sure the class does the same number of iterations simultaneously and end it after round 4–6 (instructor’s choice). Optional: announce the final iteration when they are about to play it. This, in theory, should spawn a round defection in the final iteration. *This version is supposed to represent the infinitely repeating game.*
12. Bring the class together. They are now in a super group. Their strategy effects the entire group. They privately pick defect/cooperate. However, if one person in the group defects, then it counts as a defection against all players for purposes of the score. All students secretly pick their strategy and reveal it simultaneously. If there is one defect, then it counts as a defect for all player’s scores. Play like this for 2 additional iterations. Example scoring from this round:
 - If all 25 students cooperate, then everyone gets 3 points.
 - If 24 students cooperate and one defects, then all the cooperating students get 1 point each, and the defecting student gets 4 points.
 - If 2 or more students defect, then all cooperating students get 1 point each, and the defecting students get 2 points each.
13. Final group round: same as before, however, at the end of each round the group can decide to vote one person out of the group. If a person is voted out, then they no longer can accumulate points. Play the game until there is a stable set of people who are no longer getting voted out. Optional: announce the final iteration when they are about to play it. This, in theory, should spawn a round defection in the final iteration.
14. Each student now tallies up their score and a winner is declared.

4 Discussion Questions

1. Which type of game encouraged cooperation? Why?
2. Which version of the game encourage defection? Why?
3. Did knowing your partner make you more likely to cooperate?
4. Would you change your strategy in any version of the game if you could go back?
5. Who, as Player 2 in the sequential version of the game, cooperated? Why would you ever cooperate?
6. How does this relate to International Relations?

For more information on using PD or other games in class, see Asal (2005)

References

Asal, V. 2005. "Playing games with international relations." *International Studies Perspectives* 6(3):359–373.