Behavioural Economics and Consumer Decision Making

Second experimental problem set

Academic Year 2023-24

Instructors: Matilde Giaccherini, Nicola Campigotto

- Due date: November 19, 2023 at 12PM (noon). Assignments must be uploaded on Luiss Learn. Late submissions will be awarded zero points.
- The files you should upload are:
  1. A pdf file with your answers to the questions.
  2. A stata do file (with comments describing your steps).
- Each file must be named after your group in the following way:

  `Groupname_assignment_2`

  For example, group Barney must upload two files, named `Barney_assignment_2.pdf` and `Barney_assignment_2.do`.
- Be sure to write the names of all group members at the top of page 1 of the pdf file.
- This assignment is worth up to 5 points.
- *Buon lavoro!*

The data

In this assignment you will examine experimental data from a public goods game without punishment. Subjects were divided into groups of four anonymous players and played 10 rounds of the same game. The group composition remained the same for all 10 rounds. In each round, each subject received an endowment of 20 tokens and had to decide how many tokens to contribute to a common project. The total number of tokens contributed to the project was multiplied by 1.6 and distributed equally among all four members. Thus, each player received 0.4 tokens for each token contributed to the project by any member. At the end of the round, subjects were told the total amount of tokens contributed to the project and their payoff (in tokens). A subject's payoff was equal to the number of tokens they kept for themself plus the tokens they received from the project.

The data set consists of the following variables.

- `player_id`: Subject identifier.
- `age`: Subject's age in years.

- `sex`: Subject's sex.
- `canale`: Subject's canale (A or B).
- `group_id`: Group identifier.
- `round`: Round identifier.
- `player_contribution_in_round`: Subject's contribution in round t.
- `group_mean_contribution`: Average contribution to the project by group members in round t.
- `player_payoff_in_round`: Subject's payoff in round t.
- `player_final_payoff`: Subject's accumulated payoff at the end of round 10.

Questions

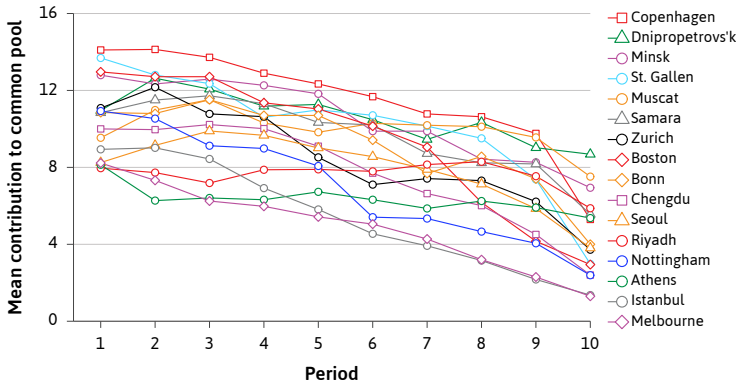
1. Is there a statistically significant difference between the average contributions of females and males in round 1? And in round 10?
2. Draw a graph showing the average contribution per round for the whole sample. Describe the graph and compare it with the graph shown in Figure 1 below. Do the two graphs look similar?

   Hint: Create a new variable, named `mean_contribution_in_round`, using the following command:

   ```
   by round, sort: egen mean_contribution_in_round =
           mean(player_contribution_in_round)
   ```

   To create the graph, use the `line` command followed by the names of the variables on the vertical and horizontal axes. For ease of comparison with Figure 1, you can add the "`, yscale(range(0 16)) xlabel(0(1)10) ylabel(0(1)16)`" option after the names of the variables.

Figure 1: Worldwide public good experiments (source: Hermann et al. 2008)



3. Is there a statistically significant difference between subjects' average contribution in rounds 1 and 10?

   Hint: Create a new variable, named `firstlast`, that takes value 0 in the first round, value 1 in the tenth round, and a missing value (`.`) in all other rounds. Then run a t-test for `player_contribution_in_round` using the "`, by(firstlast)`" option.

4. Draw a graph showing the average contribution per round for all 10 groups. Are there any groups where the average contribution increased steadily over time? If yes, how do you explain this result? If no, how do you explain this result?

   Hint: To create the graph, sort your data by `group_id round` and then use the following command:

   ```
   twoway line group_mean_contribution round if group_id==1 ///
   || line group_mean_contribution round if group_id==2 ///
   || line group_mean_contribution round if group_id==3 ///
   [etc. etc.]
   || line group_mean_contribution round if group_id==10, ///
   legend(order(1 "Group 1" 2 "Group 2" [etc. etc.])) ///
   yscale(range(0 20)) xlabel(0(1)10) ylabel(0(1)20)
   ```

   Replace `[etc. etc.]` with the appropriate code chunk!

5. Focus on Group 3. Draw *(a)* a graph showing each group member's contribution per round, and *(b)* a graph showing each group member's payoff per round. Discuss the observed change in each subject's contribution over time. Which group members had the highest and lowest payoff at the end of the experiment? Why?

   Hint: To create the first graph, sort your data by `group_id group_member round` and then use the following command:

   ```
   twoway line player_contribution_in_round round if group_id==3 & group_member==1 ///
   [etc. etc.]
   || line player_contribution_in_round round if group_id==3 & group_member==4, ///
   legend(order(1 "1st member" 2 "2nd member" 3 "3rd member" 4 "4th member"))
   ```

   A similar command can be used to create the second graph. Replace `[etc. etc.]` with the appropriate code chunk!

References

Hermann, Benedikt, Christian Thöni, and Simon Gächter (2008), "Antisocial punishment across societies", *Science*, vol. 319, no. 5868, pp. 1362-1367.