

Statistics Project—Strategy Detection

The Question: In a two-sided competitive game how well do people perceive and adjust to the opponent's strategy? Whether it is the Cold War or a family poker game the degree to which people can discover and thwart the strategy of an opponent is the central question. This project addresses that question in the setting of a repeated game of Paper Rock and Scissors (PRS).

Basic Test: Each participant is asked to play a string of PRS games against several different players. Unbeknownst to the participant, each of the opponents is restricted to a predetermined strategy. The overall score of the participant against the predetermined strategies is the measure of "effective strategy detection".

Predetermined Strategies: The predetermined strategies have varying levels of complexity--

1. Strategies independent of the participant's choice: (a) always P, (b) always R, (c) always S, (d) alternate PRPRPR..., (e) rotate PRSPRS..., etc.
2. Strategies based solely on the participant's previous selection: (a) whatever would have won last time, (b) match participant's last one, etc.
3. Strategies based on the outcome of the previous game: (a) previous winning choice or (b) previous losing choice.
4. Strategies based on several previous games: (a) best strategy against last three games, (b) best strategy against all games played so far, etc.
5. Random strategy to start with, then one of the above.

Study Design: The study involves the response variable "number of participant wins (excluding first three games)" to determine "effective strategy detection" against several strategies of varying complexity. Additionally, the first participant choices are examined for bias.

Getting Started: Try some of these strategies to get a rough idea of how long it may take for someone to defeat them.

First Meeting: Prior to the meeting do the "Getting Started" exercise. Meet with your instructor and explain your project. Determine the following for your project—number/type of strategies, number of participants, number of games per strategy, scoring algorithm, and what could go wrong. Write a summary of this meeting and turn it in to the instructor.

Experimental Protocol: Based on the decisions from the First Meeting make up a strategies list and a protocol for handling the participants. Identify your source for participants. Review this protocol with your instructor (second project meeting).

Conduct Tests and Compute Statistics: Your team should end up with a table of test results and a table of statistics based on the test results.

Third Meeting: Present your results. If there are problems with the testing procedures resolve them and run the tests again. Discuss what conclusions are justified. Discuss every section of the project report and what should be there.

Write Project Report Draft: Use the guidance from the Third Meeting to write your draft report.

Fourth Meeting: Present your draft report to the instructor. Use your instructor's critique to write the final report.

Write the Project Report.

Additional Project Guidelines:

Due Dates

[Report Format](#)

[Report Writing Cautions.](#)