# Experimental Issues: Influences of the Environment and the Design parameters

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# What we will learn in this session?

Even though economic theory does not say anything, there are potential factors which may affect subject's decision. For example, the duration of decision time is most likely to affect the results of "reasoning."

In this session, we will go over what the existing literature says, and understand how the environment and the design parameters affect the subject's decision in a laboratory.

# Overview of this session

1. The effects of Group size
2. The effects of strategy space
3. The effects of decision time
4. The effects of matching protocol
5. Double blind vs Single Blind: Are there behavioral implications?

# The effects of Group size

Isaac, R. M.; Walker, J. M. and Williams, A. W. Group size and the voluntary provision of public goods : Experimental evidence utilizing large groups *Journal of Public Economics*, 1994, 54, 1-36

$\rightarrow$ Large group provided the public good more efficiently than small group

FRANZEN, A. "Group Size and One-Shot Collective Action," *Rationality and Society*, 1995, 7, 183-200

$\rightarrow$ There are no group-size effects in the one-shot Prisoner's dilemma game and Chicken game. However, group size does have a negative effect on cooperation rate in both the Volunteer's Dilemma and in the Assurance game.

Barcelo, Hé. and Capraro, V. "Group size effect on cooperation in one-shot social dilemmas," *Scientific reports*, 2015, 5

$\rightarrow$ Larger groups are more cooperative in the Public Goods game, but less cooperative in the N-person Prisoner's dilemma

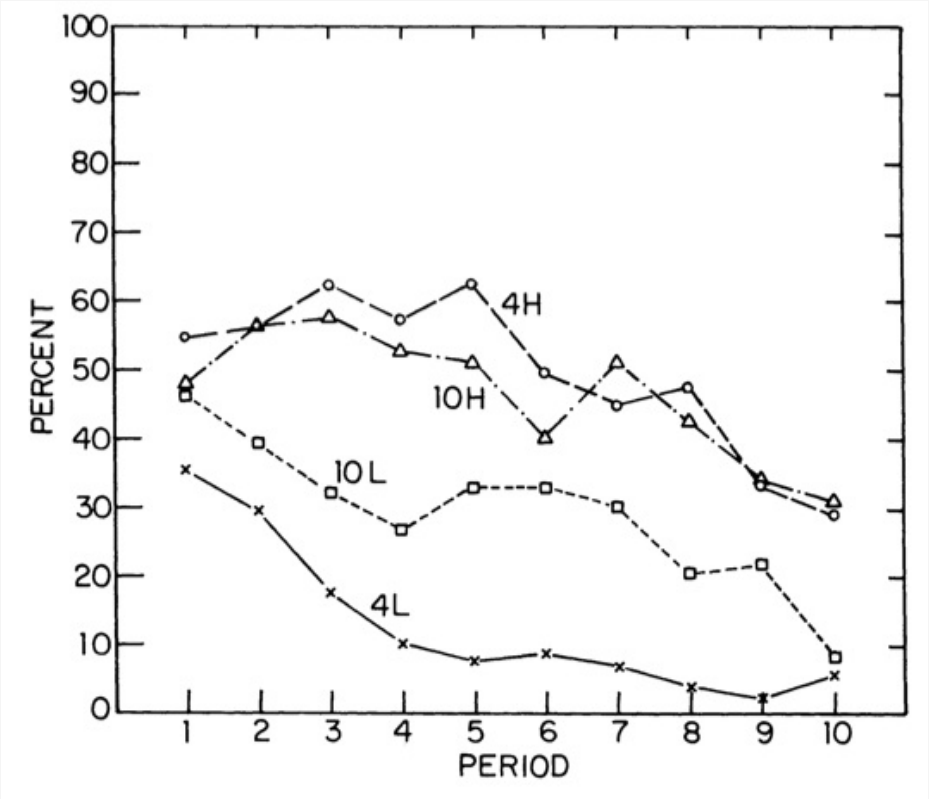
# The effects of Group size

Isaac, R. M. and Walker, J. M. "Group Size Effects in Public Goods Provision: The Voluntary Contributions Mechanism," *Quarterly Journal of Economics*, 1988, 103, 179-199

**Experimental Design:**

| Experiment type | Group size | Group payoff function | MPCR | Individual tokens per period ($Z_i$) | Number of experiments |
|---|---|---|---|---|---|
| $4L$ | 4 | $1.2(\Sigma m_i)¢$ | 0.30 | 62 | 6 |
| $4H$ | 4 | $3.0(\Sigma m_i)¢$ | 0.75 | 25 | 6 |
| $10L$ | 10 | $3.0(\Sigma m_i)¢$ | 0.30 | 25 | 6 |
| $10H$ | 10 | $7.5(\Sigma m_i)¢$ | 0.75 | 10 | 6 |

# The effects of Group size




$\rightarrow$ Increasing group size leads to a reduction in allocative efficiency when accompanied by a decrease in marginal return from the public good

# The effects of strategy space

Choo, L. C. and Kaplan, T. R. "Explaining Behavior in the "11-20" Games," Workingpaper, 2014.

**Experimental settings**

Two subjects choose from following payoffs:

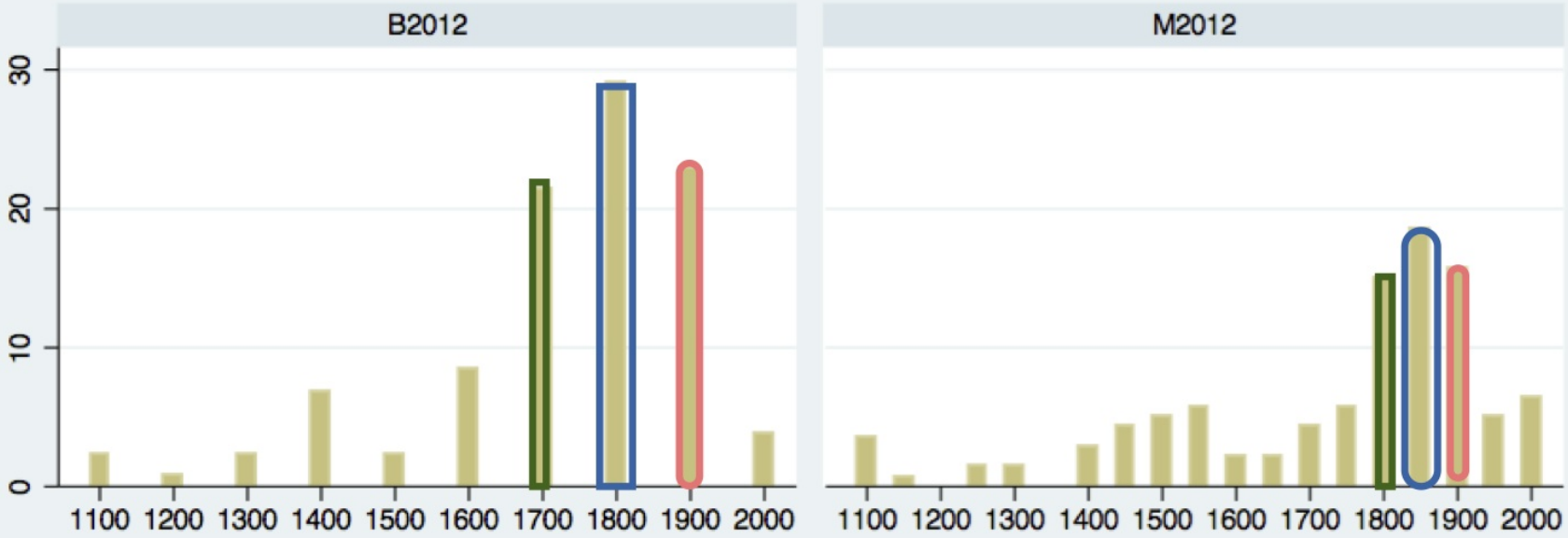
In Baseline Game: the set {2000, 1900, 1800, 1700, ..., 1100}

In Medium Game: the set {2000, 1950, 1900, 1850, ..., 1100}

In Extreme Game: the set {2000, 1975, 1950, 1925, 1900, ..., 1100}

$\rightarrow$ In addition to the chosen payoff, a subject receives the Bonus (2000) if the subject's amount is 100 Less than the other player's amount

# The effects of strategy space: Choo and Kaplan (2014)



# The effects of decision time

Rubinstein, A. "Instinctive and Cognitive Reasoning: A Study of Response Times," *Economic Journal*, 2007, 117, 1243-1259.

Rubinstein, A. Response time and decision making: An experimental study *Judgment and Decision Making*, 2013, 8, 540-551

→ Gathering data on response time in web-based experiments on his didactic website: *http://gametheory.tau.ac.il.*
→ Teachers who register on the site can assign problems to their students from a bank of decision and game situations. The students are promised that their responses will remain anonymous.
→ Criticisms: (a) The lack of monetary incentives and (b) The use of a non-laboratory setting.
→ There is a close connection between short response time and choices that are clearly a mistake.

# Matching protocol: Stranger vs Fixed

Most studies use a fixed matching protocol within a supergame;

Palfrey, T. R. and Rosenthal, H. "Repeated Play, Cooperation and Coordination: An Experimental Study," *Review of Economic Studies*, 1994, 61, 545-565

Aoyagi, M. and Fréchette, G. "Collusion as public monitoring becomes noisy: Experimental evidence," *Journal of Economic Theory*, 2009, 144, 1135-1165

Dal Bó, P. "Cooperation under the Shadow of the Future: Experimental Evidence from Infinitely Repeated Games," *American Economic Review*, 2005, 95, 1591-1604

$\rightarrow$ Under this design, subjects always interact with the same person and generally support a significant level of (sometimes full) cooperation.

# Matching protocol: Stranger vs Fixed

Random matching protocol within a supergame: In any given period subjects meet in pairs but after each period matches are destroyed and new pairs are formed drawing subjects at random from the entire economy.

Camera, G. and Casari, M. "Cooperation among Strangers under the Shadow of the Future," *American Economic Review*, 2009, 99, 979-1005

Schwartz, S.; Young, R. and Zvinakis, K. "Reputation Without Repeated Interaction: A Role for Public Disclosures," *Review of Accounting Studies*, 2000, 5, 351-375

Duffy, J. and Ochs, J. "Cooperative Behavior and the Frequency of Social Interaction," *Unpublished*, 2006,

$\rightarrow$ Duffy and Ochs (2006) found remarkably higher cooperation in fixed than in random matching economies.

# Matching protocol: Computerized Player

**Bardsley's method:** tell that one being real and true and to be implemented for real at the end, the rest made up by you and not real

Bardsley, N. "Control Without Deception: Individual Behaviour in Free-Riding Experiments Revisited," *Experimental Economics*, 2000, 3, 215-240

Eckel, C. and Wilson, R. "Social learning in coordination games: does status matter?" *Experimental Economics*, 2007, 10, 317-329

**David's method:** use robots implementing strategies specified by others

Peysakhovich, A. and Rand, D. G. "Habits of Virtue: Creating Norms of Cooperation and Defection in the Laboratory," *Management Science*, Forthcoming

Chen, Y.; Jiang, M.; Kesten, O.; Robin, S. and Zhu, M. "Matching in the Large: An Experimental Study," 2015

# Double blind vs Single Blind

Blank, R. M. "The Effects of Double-Blind versus Single-Blind Reviewing: Experimental Evidence from The American Economic Review," *American Economic Review*, 1991, 81, 1041-1067

$\rightarrow$ A randomized experiment conducted at The American Economic Review on the effects of double-blind versus single-blind peer reviewing on acceptance rates and referee rating

**Interesting and important question**: Authors at highly ranked schools would do worse under blind refereeing and authors at lower-ranked schools would do better?

# Double blind vs Single Blind: Blank (1991)

| Sample | (1) Number of papers | Acceptance rates (2) Total sample | (3) Blind sample | (4) Nonblind sample | (5) Difference: blind − nonblind |
|---|---|---|---|---|---|
| 1) All papers | 1,498 | 12.1 | 10.6 | 14.1 | −3.5 |
| | | (0.8) | (1.1) | (1.4) | (1.8) |
| By gender: | | | | | |
| 2) Female-authored papers | 180 | 10.6 | 10.0 | 11.2 | −1.2 |
| | | (2.3) | (3.0) | (3.5) | (4.6) |
| 3) Male-authored papers | 1,266 | 12.7 | 11.0 | 15.0 | −4.0 |
| | | (0.9) | (1.2) | (1.5) | (1.9) |
| By institutional rank: | | | | | |
| 4) Universities ranked 1–5 | 149 | 28.9 | 29.5 | 28.2 | 1.3 |
| | | (3.7) | (5.2) | (5.3) | (7.4) |
| 5) Universities ranked 6–20 | 274 | 16.4 | 13.4 | 20.9 | −7.5 |
| | | (2.2) | (2.7) | (3.9) | (4.7) |
| 6) Universities ranked 21–50 | 239 | 12.1 | 10.1 | 15.0 | −4.9 |
| | | (2.1) | (2.6) | (3.6) | (4.4) |
| 7) Colleges/universities ranked > 50 | 426 | 6.6 | 6.2 | 7.1 | −0.9 |
| | | (1.2) | (1.5) | (1.9) | (2.4) |
| 8) U.S. nonacademic institutions | 134 | 6.7 | 4.1 | 10.0 | −5.9 |
| | | (2.2) | (2.3) | (3.9) | (4.5) |
| 9) Foreign | 276 | 10.1 | 8.2 | 12.0 | −3.8 |
| | | (1.8) | (2.4) | (2.7) | (3.6) |

*Note:* Standard errors are reported in parentheses.

# Double blind vs Single Blind: Blank (1991)

He finds:

$\rightarrow$ Acceptance rates are lower and referees are more critical when the reviewer is unaware of the author's identity.

$\rightarrow$ Authors at top-ranked universities and at colleges and low-ranked universities are largely unaffected by the different reviewing practices, but authors at near-top-ranked universities and at non academic institutions have lower acceptance rates under double-blind reviewing.