

Mistakes versus Preferences in Games



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INTRODUCTION

Question: *Do people make “mistakes” when they deviate from what is considered rational behavior in economic games?*

- Typical responses to the systematic deviations
 - Behavioral principles (framing, heuristics...) or theory (learning etc.)
- Another possibility: People **do not** understand the normative principles.
 - **Mistake:** “Behavior that people would have changed (to comply with the normative standard) if they understood these principles.”

Contribution:

- The first paper to study **mistakes in games**.
- Literature on individual decision making:
 - **Initial:** MacCrimmon (1968); Slovic and Tversky (1974)
 - **Recent:** Nielsen & Rehbeck (2022); Humphrey & Kruse (2024)

Focus: “Dominance” as a solution concept

- Arguably the strongest principle in Game Theory.
 - Two influential games with a **dominant strategy equilibrium**.

EXPERIMENT 1: Prisoner’s Dilemma Game

Study:

- 450 participants from **Prolific**
 - After the comprehension checks
 - **49.56%** female, **39** mean age
- Fully incentivized, Mean time: **27 min**
- Fixed payment: **£2** & Mean bonus: **£1.7**

Other Player	Strategy A	Strategy B
You		
Strategy A	£6, £6	£5, £9
Strategy B	£9, £5	£8, £8

Stage 1: Rule Decisions

- Choose to follow a given rule in making decisions for you in the games or not
 - **Rule 1:** Playing strictly **dominant** strategies (the “normative” rule)
 - **Rule 2:** Playing strategies that allow for more **efficient** outcome

Stage 2: Game Play

- 10 different 2x2 Prisoner’s Dilemma type games



Stage 3: Reconsideration

- Reconsider all the **inconsistencies** between the rule and game decisions
 - Any **contradicting decisions** are explained clearly to the participant.
 - Can change rule decision, game decision, both or neither.

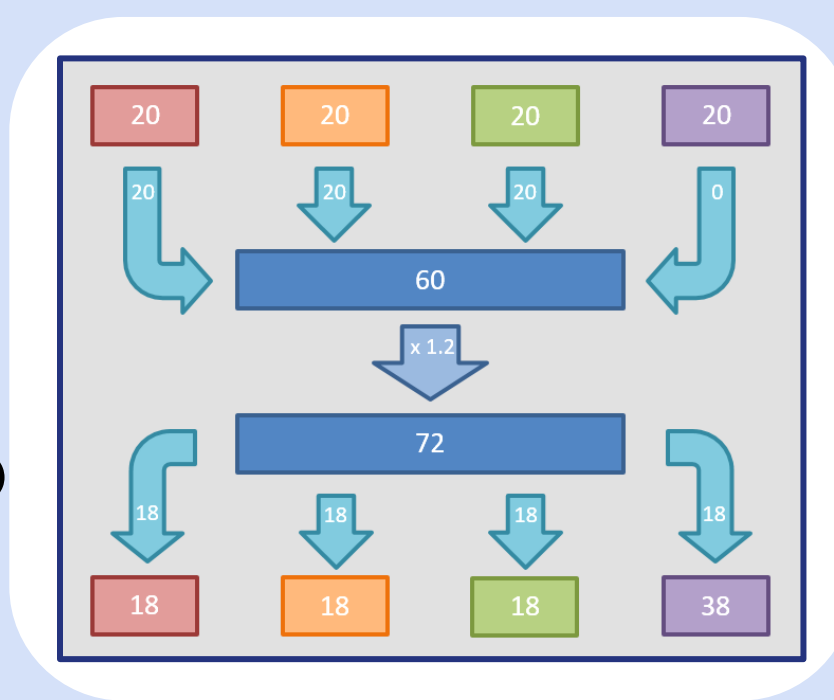
Treatments:

- Main treatment: **Neutral** (as explained above, neutral study of mistakes)
- **One-Sided** (no Rule 2) & **Control** (no explanation of inconsistencies)

EXPERIMENT 2: Public Goods Game

Study:

- 450 players: **51.89%** female, **40** mean age
- Fully incentivized, Mean time: **16 min**
- Fixed payment: **£1.5** & Mean bonus: **£1.05**



Stage 1: Rule Decisions

- **Rule 1:** Contributing **nothing** (“normative”)
- **Rule 2:** Contributing **all** the endowment

Stage 2: Game Play

- 10 games with varying parameters (endowment, players, multiplication factor)

Stage 3: Reconsideration (Same)



RESULTS: Experiment 1

Rule Decisions

Proportions of Participants who Decided to Apply the Rules			
	Rule 1	Rule 2	N
Neutral	0.653	0.741	147
One-Sided	0.751		169
Control	0.679	0.746	134
Total	0.698	0.744	450

Game Play

Proportions of Game Decisions that Complied with the Rules		
	Rule 1	Rule 2
Neutral	0.688	0.510
One-Sided	0.778	0.420
Control	0.682	0.530
Total	0.720	0.482

Inconsistencies

Proportions of Inconsistencies between Rule Preferences and Game Decisions				
	Rule 1	N	Rule 2	N
Neutral	0.286	576	0.457	654
One-Sided	0.201	762		
Control	0.273	546	0.433	600
Total	0.248	1884	0.446	1254

Note: N is the total number inconsistency possibilities.

Reconsideration

Proportions of Changes to Solve the Inconsistencies				
	Changes in Game Decisions (to comply with rules)		Changes in Rule Decisions (to unfollow rules)	
	Rule 1	Rule 2	Rule 1	Rule 2
Neutral	0.352	0.237	0.527	0.418
One-Sided	0.386		0.320	
Control	0.094	0.081	0.154	0.112
Total	0.281	0.165	0.340	0.275

Mistakes

Proportion of Initial Deviations Attributed to Mistakes				
	Rule 1	N	Rule 2	N
Neutral	0.211	275	0.164	432
One-Sided	0.262	225		
Control	0.055	256	0.056	378
Neutral – Control	0.156		0.109	

Note: N is the total number of initial deviations from the given rule. The last row provides the proportions of mistakes in the Neutral condition, factoring out the baseline proportions of changes in the Control condition.

RESULTS: Experiment 2

Rule Decisions

Proportions of Participants Who Decided to Apply the Rules			
	Rule 1	Rule 2	N
Neutral	0.265	0.429	147
One-Sided	0.500		146
Control	0.274	0.439	157
Total	0.344	0.434	450

Game Play

Proportions of Game Decisions that Complied with the Rules		
	Rule 1	Rule 2
Neutral	0.227	0.279
One-Sided	0.358	0.149
Control	0.174	0.305
Total	0.251	0.246

Inconsistencies

Proportions of Inconsistencies between Rule Preferences and Game Decisions				
	Rule 1	N	Rule 2	N
Neutral	0.403	390	0.508	630
One-Sided	0.477	730		
Control	0.637	430	0.436	690
Total	0.503	1550	0.470	1320

Note: N is the total number inconsistency possibilities.

Reconsideration

Proportion of Changes to Solve the Inconsistencies				
	Changes in Game Decisions (to comply with rules)		Changes in Rule Decisions (to unfollow rules)	
	Rule 1	Rule 2	Rule 1	Rule 2
Neutral	0.255	0.556	0.401	0.162
One-Sided	0.580		0.164	
Control	0.150	0.276	0.212	0.140
Total	0.363	0.420	0.228	0.151

Mistakes

Proportion of Initial Deviations Attributed to Mistakes				
	Rule 1	N	Rule 2	N
Neutral	0.035	1137	0.168	1060
One-Sided	0.216	937		
Control	0.032	1297	0.076	1091
Neutral – Control	0.003		0.092	

Note: N is the total number of initial deviations from the given rule. The last row provides the proportions of mistakes in the Neutral condition, factoring out the baseline proportions of changes in the Control condition.

CONCLUSION

- Most of the deviations are due to **preferences**, not mistakes.
- Future studies needed to study different principles or games.

Summary for Neutral Condition	Prisoner’s Dilemma		Public Goods	
	Rule 1	Rule 2	Rule 1	Rule 2
Decision to apply the rules	66%	74%	27%	43%
Deviations from rules in games	31%	49%	77%	72%
Mistakes	21%	16%	4%	17%

