

Experimental Economics

(and bounded rationality)

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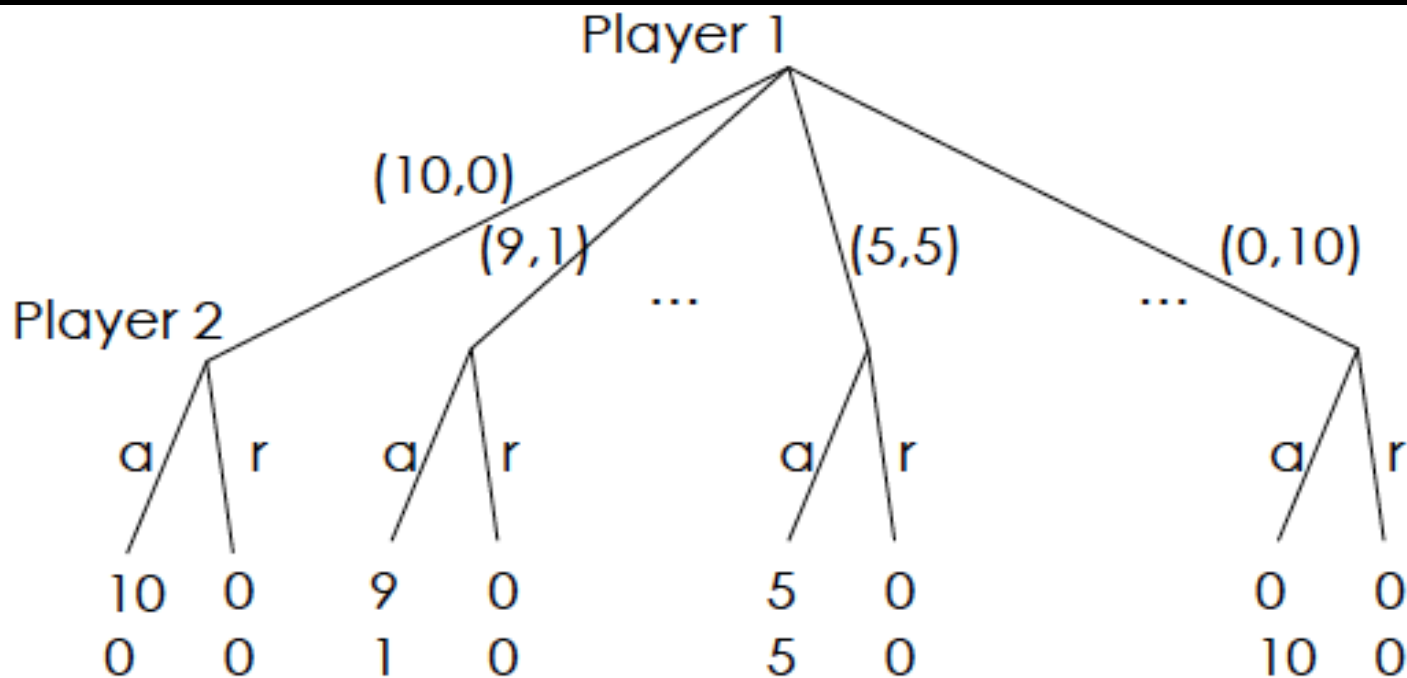
Lecture 2: Bargaining

Bargaining

- Reading
 - Camerer, Colin, Behavioral Game Theory, Princeton 2003: Chapter 2
 - Fehr, E. and S. Gächter. 2000. "Fairness and Retaliation: The Economics of Reciprocity." *Journal of Economic Perspectives*, 14(3), pp. 159-81.
- Learning outcomes
 - Know about the ultimatum game and alternating offers games
 - Be familiar with the dictator game and the trust game
 - Understand common behavior in these games

The ultimatum game

- Proposer (Player 1) suggest split of a fixed pie, say £10.
- Responder (Player 2) accepts (proposal is implemented) or rejects (both receive 0)
- Equilibrium? (Nash? SPNE?)



Ultimatum Game with standard GT

- Nash eq
 - Responder accepts anything in set S
 - Proposer proposes the minimum amount for R in S
- Subgame perfect equilibrium
 - Responder accepts anything (why?)
 - Proposer offers minimum amount
 - In the discrete version one additional SPNE: responder rejects 0, accepts anything above 0; proposer offers one increment above 0

Ultimatum Game with humans

- First UG experiment was conducted by Werner Güth (Journal of Economic Behavior and Organization, 1982)
- Probably **the most influential single** experiment, rivalled only by double auction
- Many, many versions tried since
 - From students
 - To experiments by anthropologists in highly unusual settings such as the Amazon rainforest (Henrich et al, 2001)
 - Different stakes, framing...

UG common results

- **Offers:**
 - Almost no offers above 50% of the pie
 - Mode and median of offers in almost any study in interval [40%, 50%] of the pie
 - Mean offer is usually in the interval [30%, 45%] of the pie.
 - Very few offers in the 0-10% range of the pie
- **Accept/reject decisions:**
 - Rejection rates vary between 0% and 30%
 - Offers larger than 40% are rarely rejected
 - Offers smaller than 20% are rejected about half of the time
 - Probability of rejection decreases as offer s increases
 - When responders are asked which offers they would accept before they know the actual offer, a small number reject very high offers (strategy method)
- Overall, UG results clearly **reject** SPNE for **selfish** individuals

Discussing the results

- **Stakes?**
 - for **higher stakes**, offers and rejection rates are lower, but effect is quite small (see Oosterbeck et al, 2004)
- **Uncertain pie** (the responder doesn't know the pie size)
 - offers are generally smaller
- UG in many **countries** and **cultural settings**
 - Surprisingly weak effects. Two extreme examples (Henrich et al, 2001):

UG in small scale societies

- Machiguenga and Quechua in Peru offer little on average and reject almost never
- Ache headhunters of Paraguay and Lamerela whalers of Indonesia offer more than 50%, and even this is sometimes rejected
- Market integration positively correlated with good offers!



Offers and responses in small scale societies

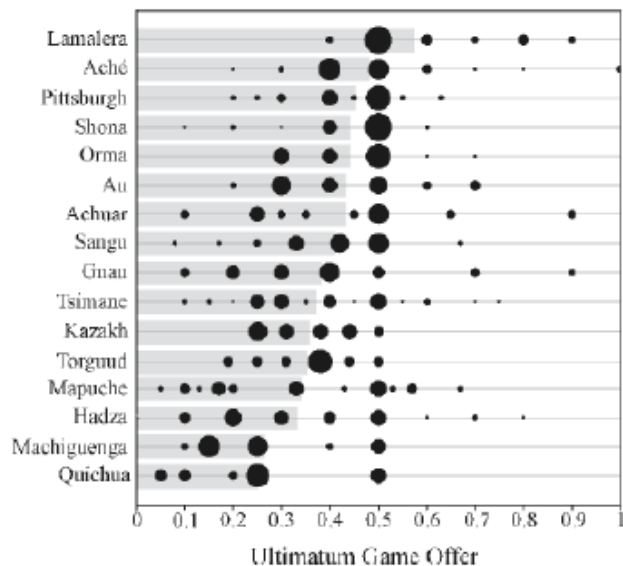


Figure 2. A bubble plot showing the distribution of UG offers for each group. The size of the bubble at each location along each row represents the proportion of the sample that made a particular offer. The right edge of the lightly shaded horizontal gray bar gives the mean offer for that group. Looking across the Machiguenga row, for example, the mode is 0.15, the secondary mode is 0.25, and the mean is 0.26.

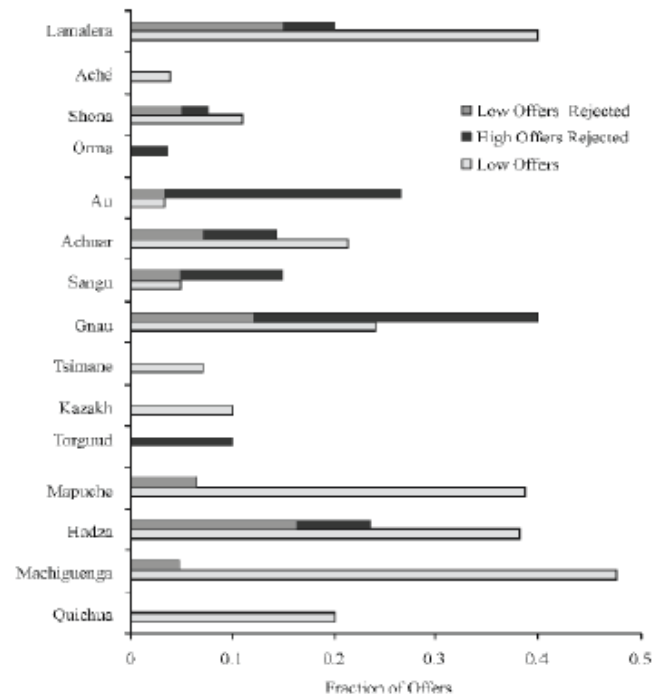


Figure 3. Summary of responder's behavior in ultimatum game. The lightly shaded bar represents the fraction of offers that were less than 20% of the pie. The length of the darker shaded bar gives the fraction of all ultimatum game offers that were rejected, and the gray part of the darker shaded bar gives the number of these low offers that were rejected as a fraction of all offers. The low offers plotted for the Lamalera were sham offers created by the investigator.

Experimental design issue

- There are few very small offers and few of more than half of the pie
 - Not enough responder observations in these cases!
- How to investigate responder behavior to very small or large offers?
 - How to know if proposers behave rationally?
 - Is it indeed optimal not to offer a lot or nothing?
- **“Strategy elicitation method”**: ask responders for their complete strategy, i.e. how they would choose in each decision node before knowing the actual offer

Explaining behavior: proposers

- First interpretations of UG data:
 - **fairness**: Proposers are fair to the responders and give a larger share than necessary. (once more economists find out the bleeding obvious)
- But can we be sure of this?
 - We know smaller offers are more likely to be rejected
 - Hence proposers could just be reacting rationally to the (non-credible) threats of responders
 - We **cannot reject** the possibility that proposers are rational and selfish and the results are just driven by responders
- How to **distinguish** between these explanations?
 - How about removing the responder's opportunity to **reject**
 - Then a positive offer is clearly a sign of the proposer's fairness

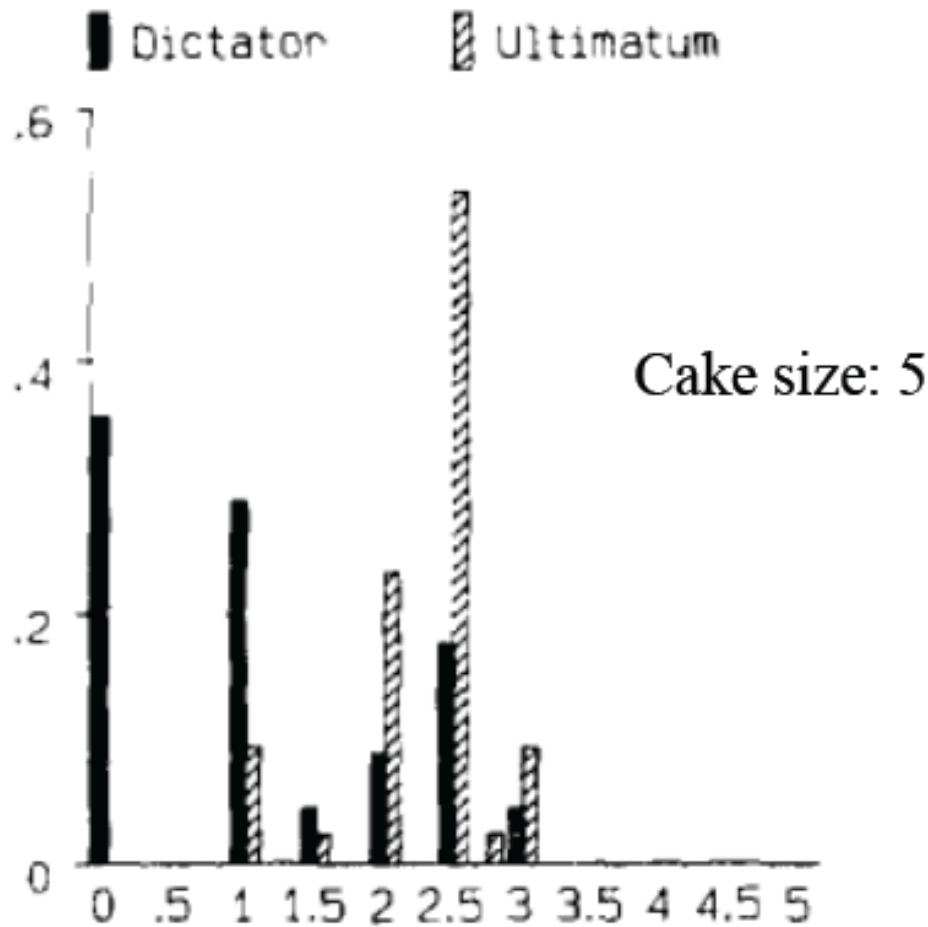
Dictator game

- Simplification of UG
- Designed to check to what extent **proposers** care for **fairness**
- “**Dictator**” has to determine how to divide the pie (say £10) between himself and an anonymous recipient
- In contrast to UG, recipient **cannot reject**
 - **Nash equilibrium:** (selfish) dictator passes $s = 0$ to recipient
- If dictators/proposers mainly driven by fairness, offers should be broadly **the same** in DG and UG
- If proposers in UG only propose $s > 0$ because they fear rejection, we would expect **offers of 0** in DG

Dictator game: results

- Experimental results **reject prediction** of offer $s = 0$:
 - On average dictators give away 20%, but there is a lot of heterogeneity
 - Usually only 20% of the subjects chose $s = 0$; 60% chose $0 < s < 50\%$ and roughly 20% chose $s = 50\%$
- Offers in DG are **lower** than those in UG
 - This supports our suspicion that some high offers in UG were *strategic*
 - made in order to **avoid rejection** and **not** because the proposer cares for **fairness**.
 - Thus results in UG are to large extent driven by fairness concerns (or desire for revenge) of the **responders**
- On the other hand, many subjects still offer $s > 0$ so they seem to care about fairness to *some* extent

Ultimatum vs Dictator



Source: Forsythe, R.; J. L. Horowitz;
N. E. Savin and M. Sefton. 1994.
"Fairness in Simple Bargaining
Experiments." *Games and Economic
Behavior*, 6(3), pp. 347-69.

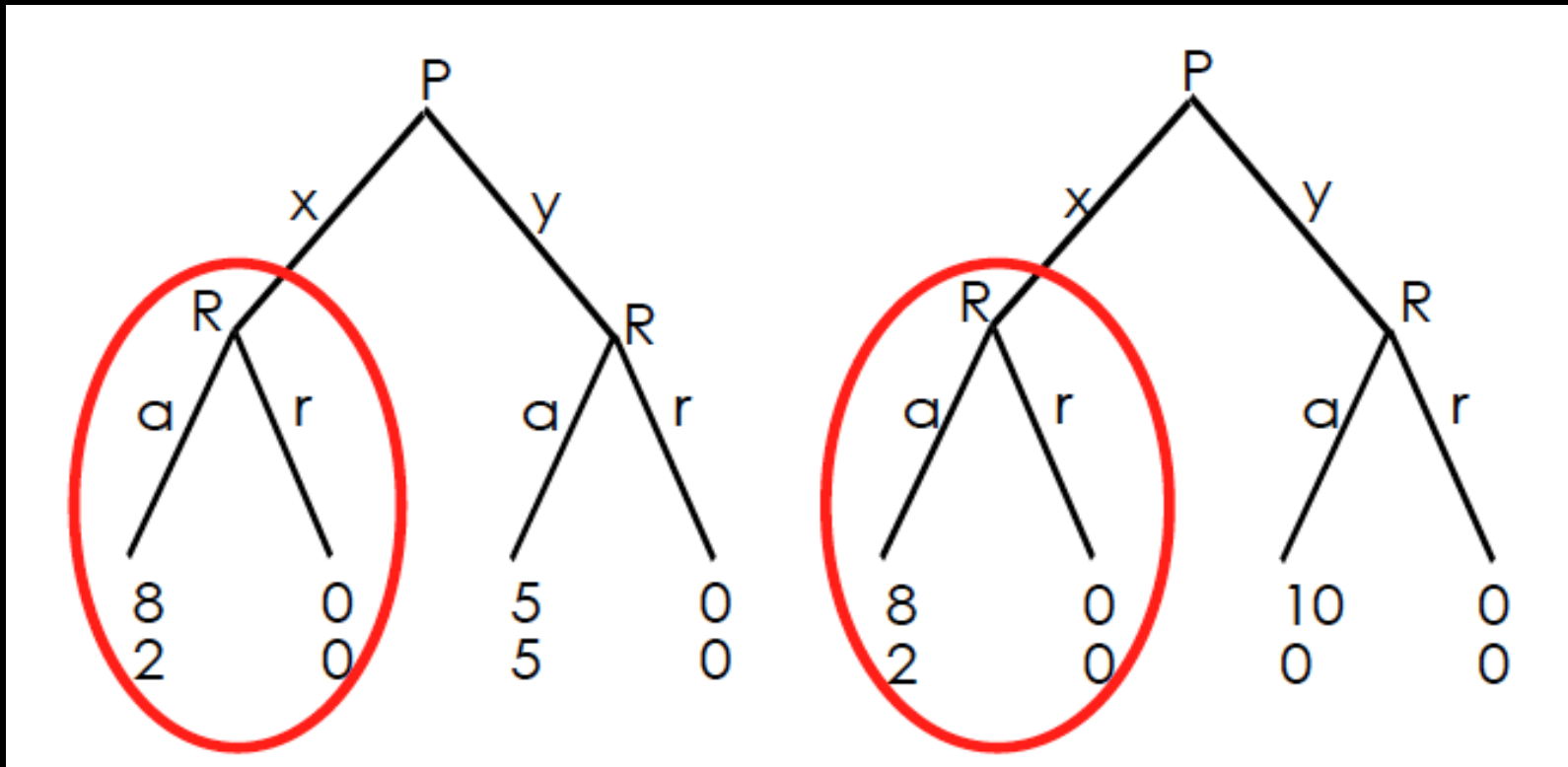
Digging deeper into dictator games

- Several researchers have identified various features that make dictators radically more selfish in DG
 - **Double-blind protocols**
 - This is sufficient to make more than 60% of dictators choose $s = 0$.
 - Average s goes down to about 10%
 - **Uncertain pie size**
 - **Desert**: Making the dictator “**work**” (solve a maze or do an IQ test) for the pie first, such that better results yields larger pie.
 - Combined with double-blind protocol this almost **completely eliminates** positive offers (Cherry et al, AER, 2002)
 - In contrast, if receivers “work”, some dictators offer more than 50%
- In contrast, double blind protocol has almost **no** effect in UG
 - giving in DG seems governed by norms and hence influenced by **observability**
 - Rejections in UG not influenced by observability

Explaining behavior: responders

- Rejecting even small positive offers violates payoff maximization
- **Possible explanations:**
 - lack of **rationality**
 - aversion towards **unequal payoffs** (inequity aversion)
 - **negative reciprocity**: motivation to **punish** “unfriendly” acts (**negative** reciprocity) and **reward** “friendly” acts (**positive** reciprocity) => Intentions matter (Falk, Fehr & Fischbacher 2003)

Outcomes and intentions



If people only care about outcomes, then rejection rates should be independent of the alternative

Both outcomes and intentions matter

Alternative	Rejection rate of 8/2	Rejection rate of alternative	Choice of 8/2
5/5	44%	0%	31%
2/8	27%	2%	73%
8/2	16%	20%	-
10/0	9%	89%	100%

Proposer behavior is compatible with selfishness ,but also with preferences for fairness.

- Evidence in line with model, in which unfair types are punished (Levine, 1998)

Competition eliminates fairness?

- Proposer competition game (Prasnikar & Roth 95)
- 9 proposers simultaneously make an offer x .
 - 1 responder can decide whether to accept or reject the highest offer.
- If the responder rejects, all players receive zero.
- If the responder accepts, he receives x , the proposer who made the offer receives $10\$ - x$ and the other responder receive zero.
- Prediction (smallest monetary unit 0.05\$)
 - Responder accepts every positive offer.
 - All proposers offer 9.95\$ or
 - At least 2 proposers offer 10\$.

Competition and fairness: results

- High offers from the beginning (average 8.9\$)
 - Competition is important.
- Quick convergence to the equilibrium.
- There are fair outcomes in the UG and very unfair outcomes in this proposer competition game.
- How can we reconcile the conflicting evidence? (see fairness models in later lecture)