

Ultimatum Game

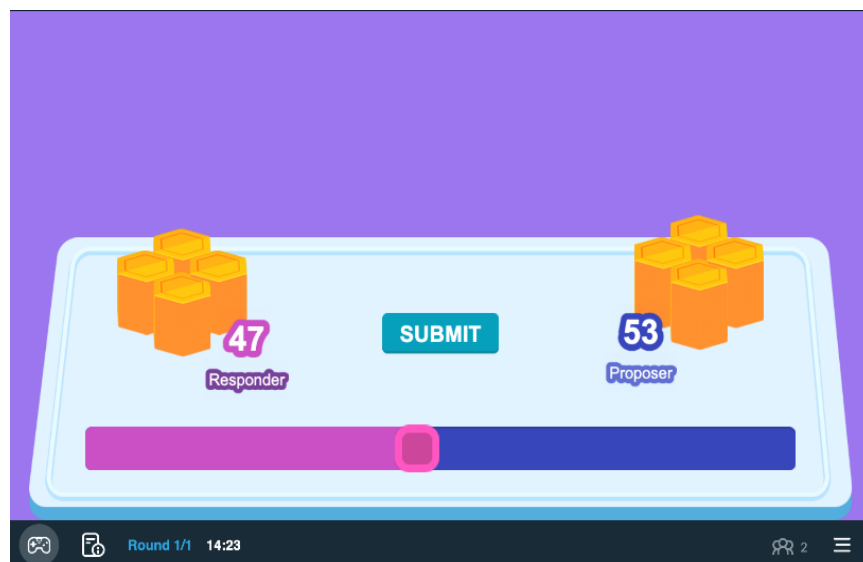
Teaching Note | MobLab x Harvard Business Impact

Primary Topic:	Behavioral Economics, Game Theory, Fairness and Norms
Typical Duration:	Prep: 2-3 min Game: 3-5 min Debrief: 15-20 min
Group Size:	Pairs; scales to any class size
Difficulty Level:	Introductory
Prerequisites:	None. One of the most accessible entry points into behavioral economics.

1. Overview & Learning Objectives

Students are paired as a Proposer and a Responder. The Proposer offers a split of \$100. The Responder can Accept, in which case both receive the proposed amounts, or Reject, in which case both receive nothing. One decision each, one round.

Under standard game theory, the Responder should accept any positive offer (something is better than nothing), so the Proposer should offer as little as possible, \$1. In practice, this almost never happens. Most Proposers offer 40-50%, and most Responders reject offers below 25%. Responders are willing to incur a real financial cost to punish Proposers they perceive as unfair. This result is one of the most replicated findings in experimental economics — and one of the most accessible entry points into the gap between standard theory and human behavior.



By the Numbers (MobLab Data): Across more than 10,000 observations, Ultimatum offers average approximately 10 percentage points higher than Dictator offers under the same parameters. This veto premium is the measurable effect of the Responder's power to reject.

By the end of this simulation, students will be able to:

- Backward Induction: Derive the subgame-perfect Nash equilibrium in the Ultimatum game and explain why it predicts near-zero offers to the Responder.
- Fairness and Negative Reciprocity: Explain why Responders reject positive offers as evidence of a preference for fairness and a willingness to punish perceived unfairness.
- Strategic vs. Altruistic Proposing: Distinguish between a Proposer offering 40% because they are altruistic and offering 40% because they fear rejection.
- Real-World Bargaining: Apply the logic of the Ultimatum game to negotiation contexts where one party has the power to make a take-it-or-leave-it offer and the other has the power to walk away.

2. Setup & Configuration

Configuration	Recommended Setting
Periods	1 (one-shot) or multi-period games. Repetition allows for norm evolution.
Total Pie	Default \$100. Avoid very small totals.
Chat	Optional. Chat allows pre-offer negotiation and tends to increase both offers and acceptance rates — useful for comparing to the no-chat baseline.
Robot — Proposer	Nash: offers \$1. Prosocial: offers 40-50%.
Robot — Responder	Nash: accepts all offers. Prosocial: rejects offers below 40%.
Pair with Dictator (All-Access Package)	Educators using the All-Access package on HBI can pair with the Dictator game. The difference in offers across games measures the strategic premium from the veto right.

3. Instructions & Debrief

Pre-Game

Explain the rules clearly: the Proposer uses the slider to divide \$100 and submits; the Responder sees the offer and chooses Accept or Reject; if Rejected, both earn \$0. Do not use the words 'fair' or 'rational.' Let students bring those concepts in themselves.

Instructor Tip: After the game, before showing any results, ask the class by show of hands: how many Responders rejected an offer? This simple question produces immediate engagement and sets up the core puzzle, why would anyone reject money?

Discussion Questions

- Responders: if you rejected an offer, why? You walked away from money — what made that worth it?
- Proposers: Why did you offer what you did? Were you being generous, or were you worried your offer would be rejected?
- Standard theory says the Responder should accept any positive offer. The data shows many do not. What does this tell us about what people maximize?

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- Think of real-world situations with ultimatum-like structure — salary negotiations, take-it-or-leave-it contracts, UN Security Council vetoes. How does the logic of this game apply?
 - Is rejecting an unfair offer irrational? What would have to be in someone's utility function for rejection to be rational?

Theoretical Connections

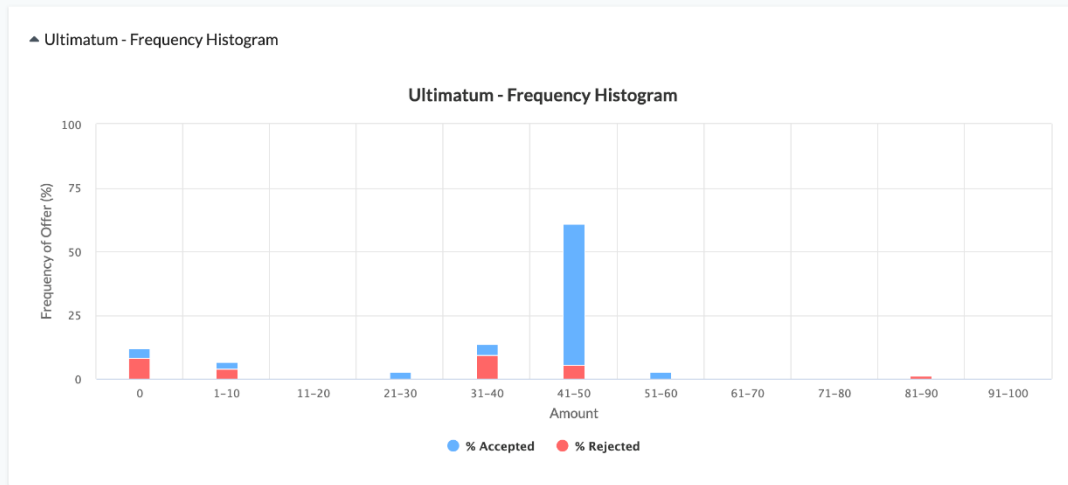
- Subgame-Perfect Nash Equilibrium: The backward induction argument predicts near-zero offers and universal acceptance. Actual behavior departs sharply from this prediction, making the Ultimatum game one of the most cited anomalies in standard game theory.
- Inequity Aversion: Fehr and Schmidt (1999) proposed that people have preferences over payoff differences — disliking both being worse off and being better off than others. This model fits Ultimatum rejection patterns well and has influenced a generation of contract theory and organizational economics.
- The Veto Premium: MobLab data across 10,000+ observations shows Ultimatum offers are consistently about 10 percentage points higher than Dictator offers. This demonstrates a clean, large-sample estimate of the strategic value of the Responder's veto right. *Educators using the All-Access package can pair with the Dictator Game.*
- Punishment and Social Norms: Responders who reject low offers are engaging in costly punishment — paying to enforce a norm of fairness. This behavior is found cross-culturally (with some variation) and connects to debates about the evolutionary origins of cooperation.
- Bargaining Applications: The Ultimatum game is the stylized core of take-it-or-leave-it bargaining models used in labor economics, trade negotiation, and industrial organization. Understanding why near-zero offers fail in the lab informs real-world negotiation design.

4. Results & Extensions

Reading the Results

The Frequency Chart (Graphs tab) shows a stacked bar chart of offers, with accepted offers in one color and rejected offers in another. The pattern is typically clear: offers below 25-30% have high rejection rates; offers of 40-50% are almost universally accepted. The Summary Table shows the mean and distribution of accepted vs. rejected offers — the gap between these is one of the most striking numbers in the dataset.

Period 1



Key Variations

- **Enable Chat:** Allow pre-offer bargaining. This tends to increase both offers and acceptance rates, and the chat transcripts often produce vivid examples of fairness reasoning for the debrief.
- **Strategy Method Variant:** MobLab's Ultimatum (Strategy Method) has every student play both roles and each Responder sets a minimum acceptable offer in advance. This gives a more precise measure of rejection thresholds and lets students identify whether they would accept their own offers.
- **Multi-Period:** Run 3-5 rounds to observe whether norms evolve. Proposers typically learn the rejection threshold and cluster offers near it; Responders may adjust their thresholds based on experience.

References

- Guth, W., Schmittberger, R., & Schwarze, B. (1982). An Experimental Analysis of Ultimatum Bargaining. *Journal of Economic Behavior and Organization*, 3(4), 367-388. The original Ultimatum game paper.
 - Fehr, E. & Schmidt, K.M. (1999). A Theory of Fairness, Competition, and Cooperation. *Quarterly Journal of Economics*, 114(3), 817-868. The inequity aversion model.
 - Henrich, J. et al. (2001). In Search of Homo Economicus: Behavioral Experiments in 15 Small-Scale Societies. *American Economic Review*, 91(2), 73-78. Cross-cultural evidence on Ultimatum behavior.
 - Thaler, R.H. (1988). Anomalies: The Ultimatum Game. *Journal of Economic Perspectives*, 2(4), 195-206.
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