



Instructor's Guide to Ultimatum Games

Laboratory implementation, theoretical foundations,
experimental evidence, and variants

Behavioral and Experimental Economics Research Lab
Department of Economics



Revised edition | October 2026

<https://beer-lab.org/>

How to use this guide

This guide supports the preparation, implementation, and classroom discussion of the family of ultimatum games developed for the Behavioral and Experimental Economics Research Lab (BEER Lab) at the Department of Economics of Tecnológico de Monterrey. It is intended for instructors with different levels of familiarity with experimental and behavioral economics.

The **quick guide** is enough to launch a session. The operational chapters explain every screen.

The conceptual chapters present theories, predictions, and evidence for classroom feedback. Common procedures appear once; each variant then describes only what changes relative to the basic game.

Author

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For the instructor

This guide follows the English interface. A separate Spanish guide is available. Project aggregated results only; never connect codes to names, student IDs, seats, or individual choices.

Contents

How to use this guide	i
1 Quick implementation guide	1
1.1 Access through the updated laboratory website	1
1.2 At a glance	5
1.3 Minimum sequence	6
1.4 Checklist	6
2 Accessing the platform	7
2.1 Route from the laboratory website	7
2.2 Student and instructor routes	7
2.3 Creating and monitoring a session	7
3 Elements common to all versions	10
3.1 Rules	10
3.2 Cover, instructions, and comprehension	10
3.3 Roles and decisions	10
3.4 Instructor report	10
4 Theoretical foundations and evidence	22
4.1 Equilibrium benchmark	22
4.2 Social preferences	22
4.3 Reciprocity, intentions, and norms	22
4.4 Emotion and costly punishment	22
4.5 Strategic offers	22
4.6 Empirical regularities	23
5 Implementing the basic game	24
5.1 Configurations	24
5.2 Before and during the session	24
5.3 Basic-game feedback	24
5.4 Repeated versions	25
6 Variants	26
6.1 Map of variants	26
6.2 Strategy method	26
6.3 Earned endowment	26
6.4 Structured communication	27
6.5 Responder outside option	27
6.6 Impunity	27
6.7 Mini-ultimatum	27
6.8 Asymmetric information	28

6.9	Social information	28
6.10	Observable decisions	28
6.11	Role reversal	28
6.12	Interpretation and classroom feedback	28
6.13	Reading the report	28
6.14	Prediction matrix	29
6.15	Recommended sequence	29
6.16	Data, limits, and troubleshooting	29
6.17	Data and privacy	29
6.18	Responsible interpretation	30
6.19	Common problems	30
A	Configurations	31
A.1	Basic	31
A.2	Extended	31
A.3	Glossary	31
B	Expanded teaching manual for nonspecialist instructors	33
B.1	Conceptual map before opening the session	33
B.1.1	Unit of analysis	33
B.1.2	Benchmark prediction	33
B.1.3	Alternative mechanisms	34
B.2	Worked example and explanation	34
B.3	Reading the instructor report	34
B.4	Step-by-step debrief script	35
B.5	Comparable class plans	35
B.5.1	A 50-minute class	35
B.5.2	An 80-minute class	36
B.5.3	A 110-minute class	36
B.6	Exercises with answer guidance	36
B.6.1	1. Reconstructing the prediction	36
B.6.2	2. Auditing a percentage	36
B.6.3	3. Reading heterogeneity	36
B.6.4	4. Separating explanations	36
B.6.5	5. Interpreting no difference	37
B.6.6	6. Transferring carefully	37
B.7	Frequently asked questions and model answers	37
B.8	Diagnostic cases for interpretation practice	38
B.8.1	Agreement with the benchmark	38
B.8.2	Two groups with opposite behavior	38
B.8.3	A large difference with few units	39
B.8.4	A null difference	39
B.9	Explanatory sequence for a complete class	39
B.9.1	Step 1: pose the problem without labels	39
B.9.2	Step 2: reconstruct rules and incentives	39
B.9.3	Step 3: derive the benchmark	39
B.9.4	Step 4: record predictions	39

B.9.5	Step 5: reveal in layers	40
B.9.6	Step 6: work through one sequence	40
B.9.7	Step 7: compare institutions	40
B.9.8	Step 8: transfer and close	40
B.9.9	A short script to read aloud	40
B.10	Assessment bank with solutions	40
B.11	Advanced seminar: from evidence to mechanism	41
B.12	Selected bibliography	42

List of Figures

1.1	Current institutional website. Select CLASSROOM in the top navigation menu to open the teaching experiments. Captured on October 7, 2026.	1
1.2	Current catalog: search by title, topic, or JEL code. Then locate this family's card and select language and edition. Captured on October 7, 2026.	2
1.3	Demo contains only the configurations of this game family, in both languages and editions. Continuation 1/2.	3
1.5	Rooms contains the four rooms for this family: basic and extended editions in Spanish and English.	4
1.6	Session-creation form for the basic English room. Check the selected configuration and participant requirement before creating the session.	5
2.1	Two routes with different functions. Student room.	8
2.2	Administrative login.	8
2.3	Creating and monitoring a session. Temporary test links.	9
2.4	Participant progress.	9
3.1	Entry and instructions. BEER Lab rules.	11
3.2	Current basic-edition instructions, with initial resources and experimental units.	12
3.3	Current comprehension check with an incorrect answer, its specific explanation, and retained responses. Continuation 1/2.	13
3.5	Role assignment. A makes the offer.	14
3.6	B responds.	15
3.7	Offer and synchronization. A's offer.	15
3.8	B waits.	16
3.9	Response to the offer. B accepts or rejects.	17
3.10	A waits.	18
3.11	Private round result. Result for A.	19
3.12	Result for B.	19
3.13	Participant's individual outcome at completion.	20
3.14	Aggregated report before results are revealed.	20
3.15	Indicators, histogram, and rejections after revealing results.	21

Quick implementation guide

1.1 Access through the updated laboratory website

Start at <https://beer-lab.org/en/>. Select **CLASSROOM** in the top navigation menu; it opens <https://teaching.beer-lab.org/en/>. In the **Classroom experiments** catalog, use the search box to locate the activity by name. You can also filter by **Topic** or **JEL code**. Clear any filters left from an earlier search before looking for another game.

Each family's card distinguishes **Español** and **English** access links. The **Show extended version** checkbox selects that edition before following a link. Catalog language and session language are separate choices: verify both. Students use the room specified by the instructor; the instructor prepares and monitors the session through this family's own administrative pages.

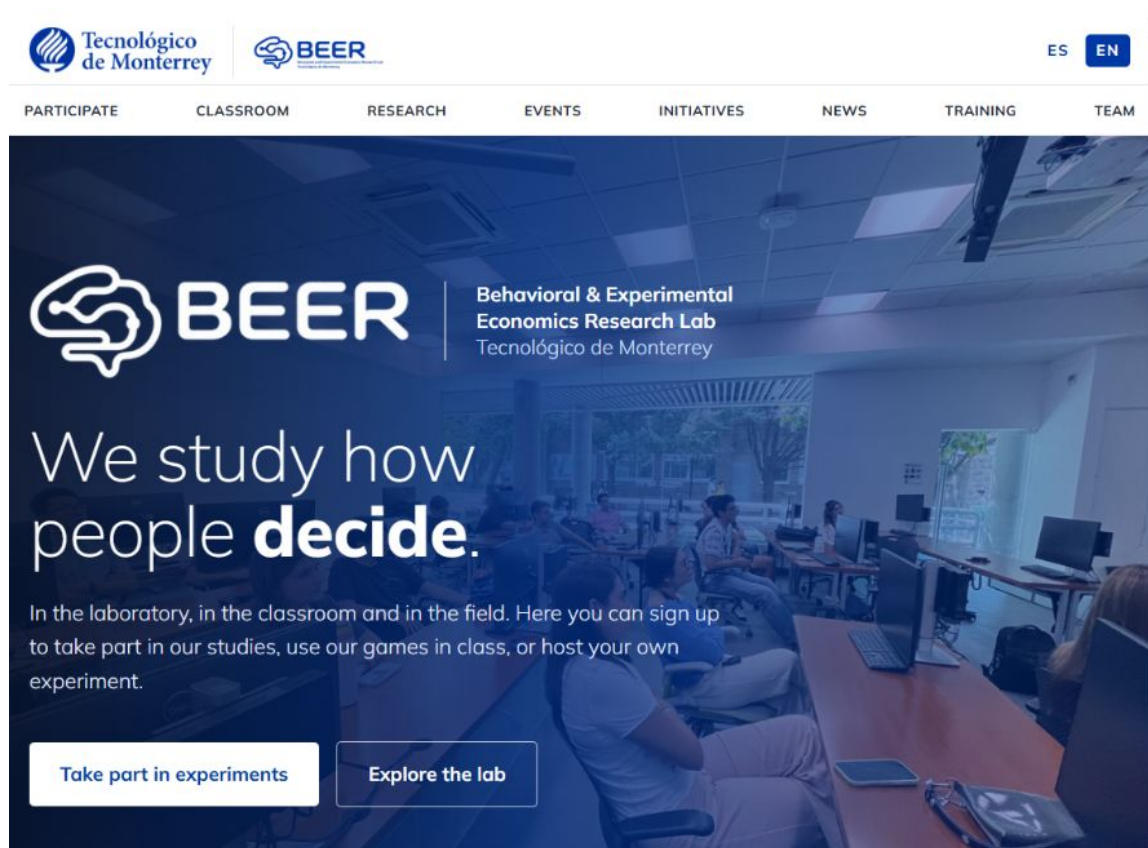


Figure 1.1: Current institutional website. Select CLASSROOM in the top navigation menu to open the teaching experiments. Captured on October 7, 2026.



Figure 1.2: Current catalog: search by title, topic, or JEL code. Then locate this family's card and select language and edition. Captured on October 7, 2026.

Checking resources, comprehension, and participant requirements

Before opening the room, check the selected configuration and the number of students present. The session-creation form states the group size and minimum required by that configuration. An individual activity accepts any positive participant count; an interactive activity must satisfy its stated requirement: complete groups when size is fixed, or a minimum participant count when size is flexible. Requirements may change across treatments, for example when adding a third party or changing an institution's size. If you edit a grouping parameter, check the requirement for the edited configuration, rather than relying only on the demo's suggested count.

In the instructions, ensure that students can identify what each role receives, what they can decide, and how the outcome is calculated. An initial account, a distributable budget, and final earnings need not be the same amount. Refer to the resources panel and the example for the selected treatment. Do not carry the basic edition's endowment into a treatment that changes accounts or introduces additional positions.

ECU stands for *Experimental Currency Units*: the activity's unit of account. An outcome of 100 ECU does not automatically equal 100 pesos or 100 dollars. Conversion depends on the session configuration. Before announcing a payment, confirm with the laboratory whether money is paid, the conversion rate, and which decisions count for payment. In hypothetical modules, describe amounts as outcomes in the stated situation.

When a comprehension check is included, an incorrect response receives an explanation beside that question, identifying the submitted answer and the correct answer. Other answers remain in the form. Ask the student to return to the example, locate the relevant rule, and redo the calculation before correcting the response. Avoid revealing answers to the entire class for an individual error, and do not interpret a comprehension mistake as an economic choice in the game.

xtendido — versión básica, una ronda
xtendido — versión básica, 10 rondas, pareja fija
xtendido — versión básica, 10 rondas, parejas aleatorias
xtendido — método de estrategia
xtendido — dotación ganada
xtendido — comunicación estructurada
xtendido — opción externa de B
xtendido — juego de impunidad
xtendido — miniultimátum
xtendido — información asimétrica
xtendido — información social, 10 rondas
xtendido — decisiones observables
xtendido — cambio de roles, 10 rondas
timatum — baseline, one round
timatum — baseline, 10 rounds, fixed partner
timatum — baseline, 10 rounds, random partners
timatum — strategy method
timatum — earned endowment
timatum — structured communication
timatum — responder outside option
timatum — Impunity Game
timatum — Mini-Ultimatum Game
timatum — asymmetric information
timatum — social information, 10 rounds
timatum — observable decisions
timatum — role reversal, 10 rounds
timátum — una ronda
timátum — 10 rondas, pareja fija

Juego del ultimátum / Ultimatum Game — BEER Lab

Selecione una variante de este juego. Select a version of this game.

Figure 1.3: Demo contains only the configurations of this game family, in both languages and editions. Continuation 1/2.

BE	xtendido — información social, 10 rondas
	xtendido — decisiones observables
BE	xtendido — cambio de roles, 10 rondas
	timatum — baseline, one round
	timatum — baseline, 10 rounds, fixed partner
	timatum — baseline, 10 rounds, random partners
	timatum — strategy method
	timatum — earned endowment
	timatum — structured communication
	timatum — responder outside option
	timatum — Impunity Game
	timatum — Mini-Ultimatum Game
	timatum — asymmetric information
	timatum — social information, 10 rounds
	timatum — observable decisions
	timatum — role reversal, 10 rounds
	timátum — una ronda
	timátum — 10 rondas, pareja fija
	timátum — 10 rondas, parejas aleatorias
	ñame — one round
	ñame — 10 rounds, fixed partner
	ñame — 10 rounds, random partners

Figure 1.4: Demo contains only the configurations of this game family, in both languages and editions. Continuation 2/2.

Rooms

Current rooms:

[ES] Juego del ultimátum
[EN] Ultimatum Game
[ES] Juego del ultimátum extendido
[EN] Extended Ultimatum Game

Figure 1.5: Rooms contains the four rooms for this family: basic and extended editions in Spanish and English.

Room: [EN] Ultimatum Game

Create a new session

English room. Only the three English configurations for this game are shown below.

Session Config

[EN] Ultimatum Game — one round

Number of participants

Complete groups of 2 participants. Use a multiple of 2; minimum 2.

Create

[Configure session](#) 

App sequence

ultimatum_game (10 rounds)

Juego del ultimátum bilingüe / Bilingual Ultimatum Game.

Figure 1.6: Session-creation form for the basic English room. Check the selected configuration and participant requirement before creating the session.

Downloading a session with several rounds

For the instructor

Open **Data** within the relevant session and use that session's CSV or CSV-for-Excel download link. The general export has one row per participant and columns for the different rounds. Ten rounds do not necessarily mean ten rows per person. When the family provides its own long-format export, observations may instead be organized by participant and round or another unit defined by the design.

Save the original file together with the configuration name, session code, and active-round count. Check that columns for the last active round are present and that the data belong to the selected session. Empty cells can represent inactive rounds, a pending decision, or a field that does not apply to a role; do not automatically recode them as zeros. To compare learning, preserve round and group identifiers alongside participant identifiers. Share only anonymous aggregates in class, and record session incidents before constructing derived tables.

1.2 At a glance

Purpose	Study bilateral bargaining when A proposes a division and B can accept or reject it.
Unit	Experimental Currency Units (ECU); default endowment of 100 ECU.
Participants	An even number; pairs with A (proposer) and B (responder).
Suggested time	30–40 minutes for one round; 45–60 for ten rounds.
Student route	ultimatum.beer-lab.org/room/ultimatum_en .

Instructor route	ultimatum.beer-lab.org/demo .
Report	Mean and median offers, histogram, rejection by offer, equal splits, and round trends.
Experimental unit	Interactions in groups of 2 participants.
Basic edition	one round; 10 rounds, fixed partner; 10 rounds, random partners.
Extended edition	baseline, one round; strategy method; earned endowment; structured communication; responder outside option; Impunity Game; Mini-Ultimatum Game; asymmetric information; social information, 10 rounds; observable decisions; role reversal, 10 rounds.
Decision	A proposes a transfer to B; B accepts or rejects the proposal.
Outcome	If B accepts, A keeps the endowment minus the offer and B receives the offer; if B rejects, both receive zero in the basic game.
Topics	bargaining; fairness; negative reciprocity; social preferences; repeated games.
JEL	C72; C91; C92; D63; D91.

1.3 Minimum sequence

1. Confirm an even number of participants and select the treatment.
2. Open beer-lab.org, select **View games**, and continue to teaching.beer-lab.org.
3. Select the ultimatum-game card.
4. From the instructor route, open **Rooms** and choose the basic or extended room.
5. Select the configuration, create the session, and open **Monitor** and **Report**.
6. Share the room or QR code, wait for completion, and reveal the aggregated report.

1.4 Checklist

- ☐ Computers, internet, browsers, and projector are ready.
- ☐ Participant count is even; variant and rounds are confirmed.
- ☐ Credentials, room link, and QR code have been tested from another device.
- ☐ Payment conversion or purely pedagogical status has been explained.
- ☐ Monitor, report, and discussion questions are ready.

Accessing the platform

2.1 Route from the laboratory website

At beer-lab.org, select **View games** in the instructors and students area.

The catalog is hosted at teaching.beer-lab.org. On this page, select the ultimatum-game card and the session language.

2.2 Student and instructor routes

	Students	Instructor
Path	/room/ultimatum_en	/demo
Purpose	Join the active session	Create and supervise sessions
Identification	Anonymous code	Administrative credentials
Projection	No	Aggregated report only

What participants will see

Students do not need oTree, GitHub, or ORSEE accounts. They open the room, join the session, and receive an anonymous code.

2.3 Creating and monitoring a session

Under **Rooms**, open the relevant room and choose the configuration and participant count. Use the persistent room for class and **Demo** for testing. At the address for this game, **Demo** lists only the 32 ultimatum game configurations, and **Rooms** shows only its four rooms (basic and extended in Spanish and English). If another game appears, do not start the session; contact the laboratory coordinator.

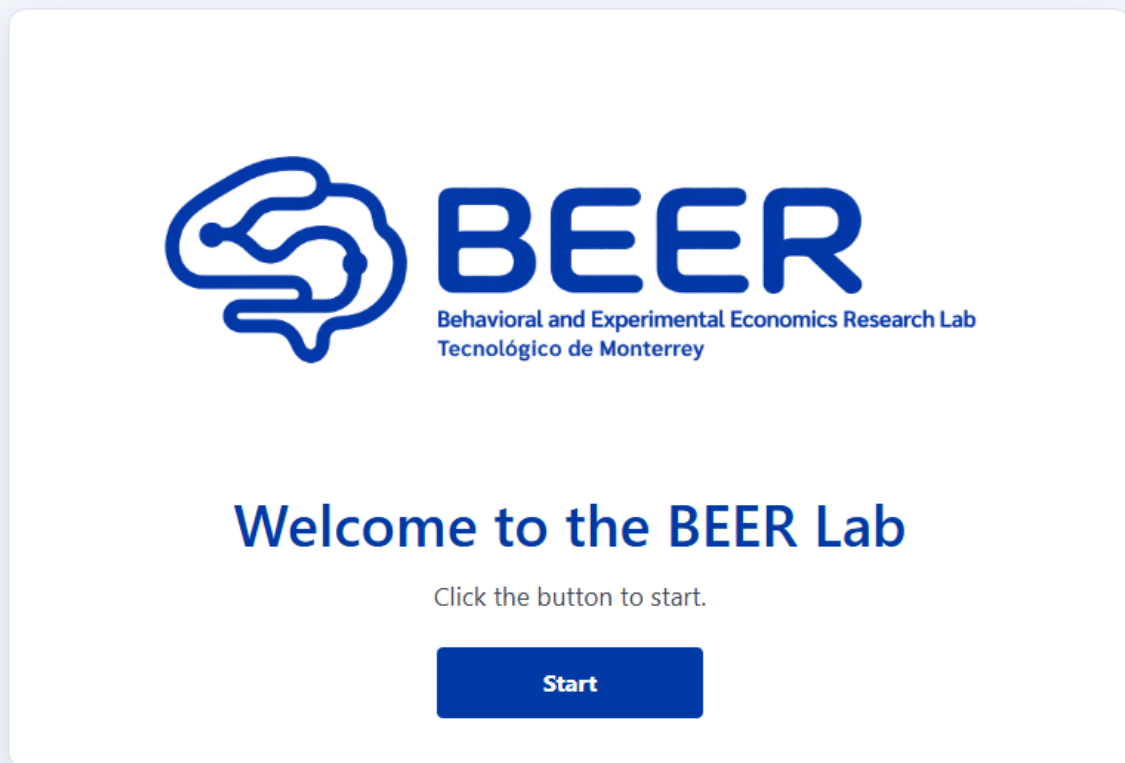


Figure 2.1: Two routes with different functions. Student room.

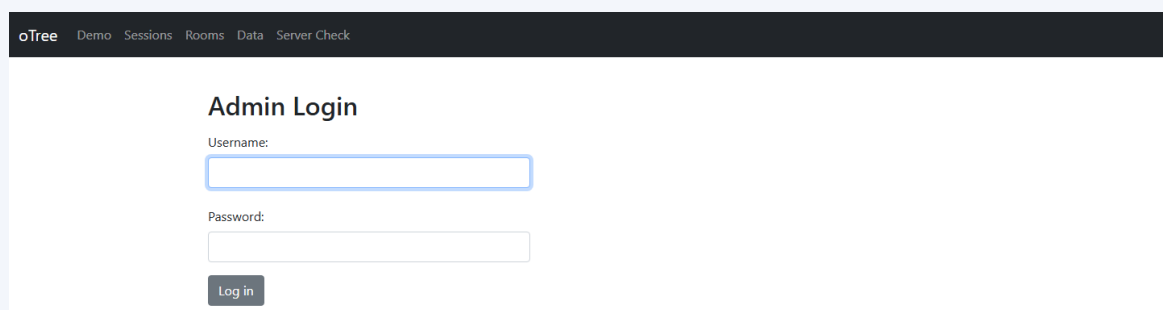
The image shows an administrative login interface. At the top, there is a dark navigation bar with the text "oTree" and several links: "Demo", "Sessions", "Rooms", "Data", and "Server Check". Below this, the main content area has the heading "Admin Login". Under the heading, there are two input fields: the first is labeled "Username:" and the second is labeled "Password:". Below the password field, there is a small, dark rectangular button with the text "Log in" in white.

Figure 2.2: Administrative login.

oTree

[Demo](#)[Sessions](#)[Rooms](#)[Data](#)[Server Check](#)

[EN] Ultimatum Game — one round: session 'gwpxhym1' (demo)

New

Links

Monitor

Data

Payments

Report

Description

Below are temporary links for testing and demonstration. To launch a real study, either create persistent links by setting up a [room](#), or create a session through the [sessions page](#).

Choose one of the following options to play the session:

Combined views

Split-screen view

Launch

Grid view

Launch

Session-wide testing link

Open the below link in up to 4 browser tabs.

<http://127.0.0.1:8001/join/morenupx>

Single-use links

Open each link in its own browser tab.

P1

<http://127.0.0.1:8001/initializeParticipant/tysifdj4>

P2

<http://127.0.0.1:8001/initializeParticipant/tt85fhy7>

P3

<http://127.0.0.1:8001/initializeParticipant/vumbazmr>

P4

<http://127.0.0.1:8001/initializeParticipant/v6zc8nc6>

Figure 2.3: Creating and monitoring a session. Temporary test links.

oTree

[Demo](#)[Sessions](#)[Rooms](#)[Data](#)[Server Check](#)

[EN] Ultimatum Game — one round: session 'gwpxhym1' (demo)

New

Links

Monitor

Data

Payments

Report

Description

ID	Code	Label	Progress	App	Round	PageName	Waiting	WaitFor	Since	
P1	tysifdj4		10/100	ultimatum_en	1	Resumen			1m	
P2	tt85fhy7		10/100	ultimatum_en	1	Resumen			1m	
P3	vumbazmr		10/100	ultimatum_en	1	Resumen			1m	
P4	v6zc8nc6		10/100	ultimatum_en	1	Resumen			1m	

4 started, 4 in progress (total: 4)

Updates: P1, P2, P3, P4

Advance slowest participants

Figure 2.4: Participant progress.

Elements common to all versions

3.1 Rules

The pair has an endowment E . A offers x to B, where $0 \leq x \leq E$. B accepts or rejects:

$$(\pi_A, \pi_B) = \begin{cases} (E - x, x), & \text{if B accepts,} \\ (0, 0), & \text{if B rejects.} \end{cases}$$

A trades off retaining more conditional on acceptance against reducing the risk of rejection.

3.2 Cover, instructions, and comprehension

The comprehension check covers payoffs, B's rejection power, number of rounds, and matching. Errors are explained and participants can try again.

3.3 Roles and decisions

3.4 Instructor report

The report allows results to be revealed only after every pair completes the round. The instructor then presses the reveal button, preventing partial results from influencing participants who are still deciding. The built-in oTree selector may show `ultimatum_game` (10 rounds) even for a one-round session; the report heading shows the effective round for that version.

For the instructor

Use **Monitor** to confirm completion. State the number of pairs: in a small class, the graph illustrates mechanisms but does not support broad statistical inference.



Welcome to the BEER Lab

The **Behavioral and Experimental Economics Research Lab** of the Department of Economics at Tecnológico de Monterrey is a space for learning about economic decision-making through controlled activities.

During this session, you will make individual decisions. Read each screen carefully and respond according to your own judgment. Class results will be presented in aggregate form for discussion.

Laboratory rules

- Remain silent and do not talk with other participants.
- Do not look at other participants' screens or decisions.
- Put away your phone and use only authorized materials.
- Do not close, refresh, or leave the page.
- If you have a problem, raise your hand.
- When you finish, wait for the instructor's directions.

By continuing, you confirm that you have read and understood these instructions.

☐ I have read and understood the laboratory rules.

Continue to the instructions

Powered by [oTree](#)

Figure 3.1: Entry and instructions. BEER Lab rules.



Ultimatum Game

BEER Lab · Tecnológico de Monterrey

Baseline

One round · One random pair

Resources and unit of account

Total endowment to divide this round: 100 ECU. A proposes its allocation between A and B; B responds under the rules below.

ECU stands for Experimental Currency Units. It is the unit of account for this activity.

This session does not convert ECU into real money.

In each pair, A proposes how to divide an endowment and B can accept or cause the proposal to be rejected.

Participant A

Knows the available endowment and chooses the offer to B.

Participant B

Decides whether the offer is accepted or rejected.

If the offer is accepted: A receives the endowment minus the offer, and B receives the offer.

If the offer is rejected: A receives 0 ECUs and B receives 0 ECUs.

The activity uses ECUs, and identities are not shown. Pair members cannot communicate.

Continue

Powered by [oTree](#)

Figure 3.2: Current basic-edition instructions, with initial resources and experimental units.



Review the marked questions. Each shows your answer and an explanation; your other answers are retained.

Check the rules

Answer correctly before continuing.

Baseline
One round

Example: the endowment is **100 ECUs**, and A offers B **30 ECUs**. Apply this treatment's rules.

In the example, how many ECUs does A receive if the offer is accepted?

Your answer: 71. The correct answer is 70.

In the example, how many ECUs does B receive if the offer is accepted?

In the example, how many ECUs does A receive if the offer is rejected?

In the example, how many ECUs does B receive if the offer is rejected?

Can B cause an offer to be rejected?

- ☒ Yes
☐ No

How many rounds does this session have?

- ☒ 1 round
☐ 10 rounds

How are pairs formed?

- ☒ The interaction occurs once.

Figure 3.3: Current comprehension check with an incorrect answer, its specific explanation, and retained responses. Continuation 1/2.

In the example, how many ECUs does B receive if the offer is accepted?

In the example, how many ECUs does A receive if the offer is rejected?

In the example, how many ECUs does B receive if the offer is rejected?

Can B cause an offer to be rejected?

☒ Yes

☐ No

How many rounds does this session have?

☒ 1 round

☐ 10 rounds

How are pairs formed?

☒ The interaction occurs once.

☐ The same pair continues for all 10 rounds.

☐ The partner changes each round.

Check answers

Powered by [oTree](#)

Figure 3.4: Current comprehension check with an incorrect answer, its specific explanation, and retained responses. Continuation 2/2.

Your role in this session

Your role remains fixed across rounds.

Baseline
100 ECUs

You begin as Participant

A

You will make the proposal to B.

Start

Powered by [oTree](#)

Figure 3.5: Role assignment. A makes the offer.

Your role in this session

Your role remains fixed across rounds.

Baseline
100 ECUs

You begin as Participant

B

You will decide whether the proposal is accepted or rejected.

Start

Powered by [oTree](#)

Figure 3.6: B responds.

Make your proposal

Participant A · Round 1 of 1

Baseline
One random pair

Enter a whole number from 0 to 100 ECUs.

Offer to B (Ecu)

A would receive if accepted

—

B would receive if accepted

—

If B causes rejection: A receives 0 ECUs and B receives 0 ECUs.

Confirm offer

Powered by [oTree](#)

Figure 3.7: Offer and synchronization. A's offer.

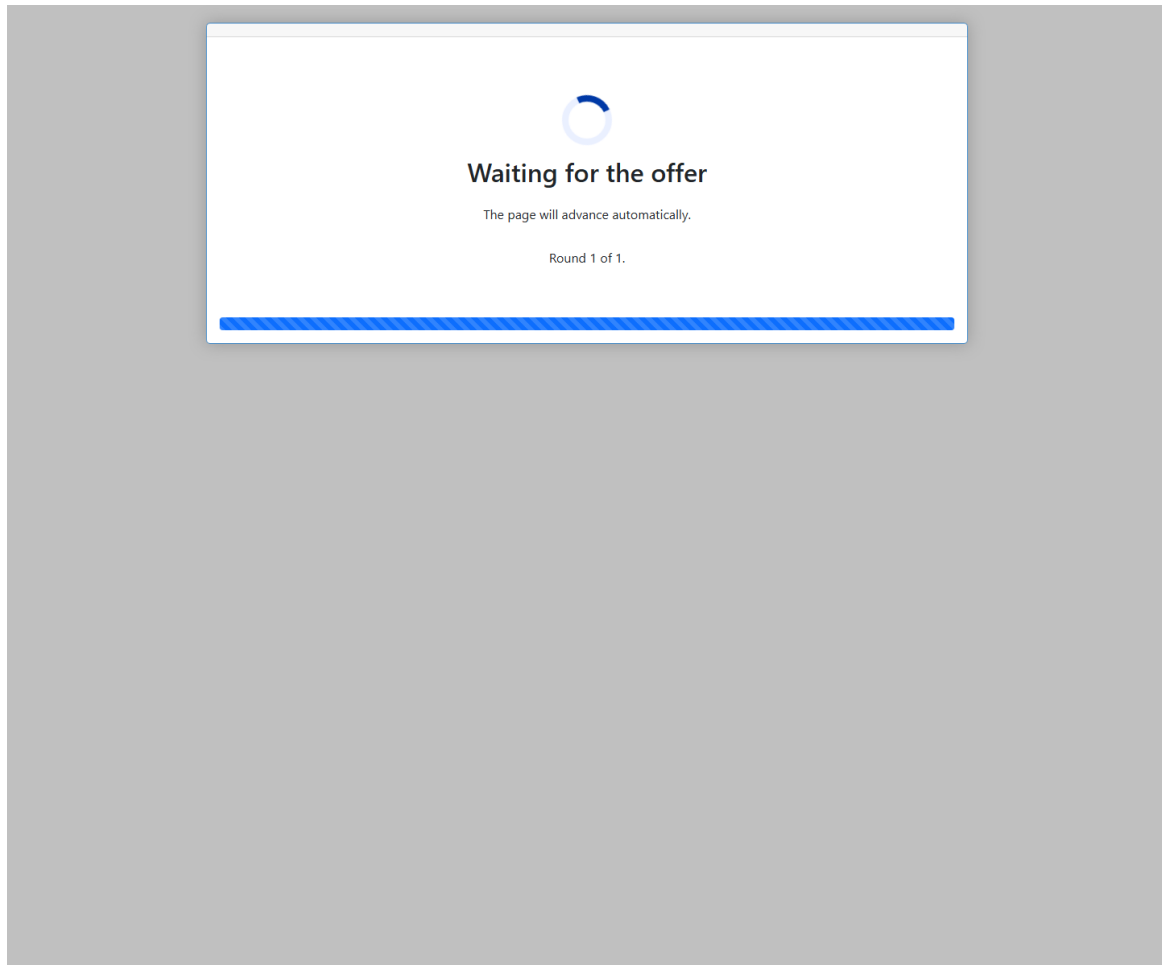


Figure 3.8: B waits.

Respond to the offer

Participant B · Round 1

Baseline

One random pair

A offers you **30 ECUs**.

If you accept, A receives

70

If you accept, you receive

30

If you reject: A receives 0 ECUs and you receive 0 ECUs.

Do you accept or reject the offer?

☐ Accept

☐ Reject

Confirm response

Powered by [oTree](#)

Figure 3.9: Response to the offer. B accepts or rejects.

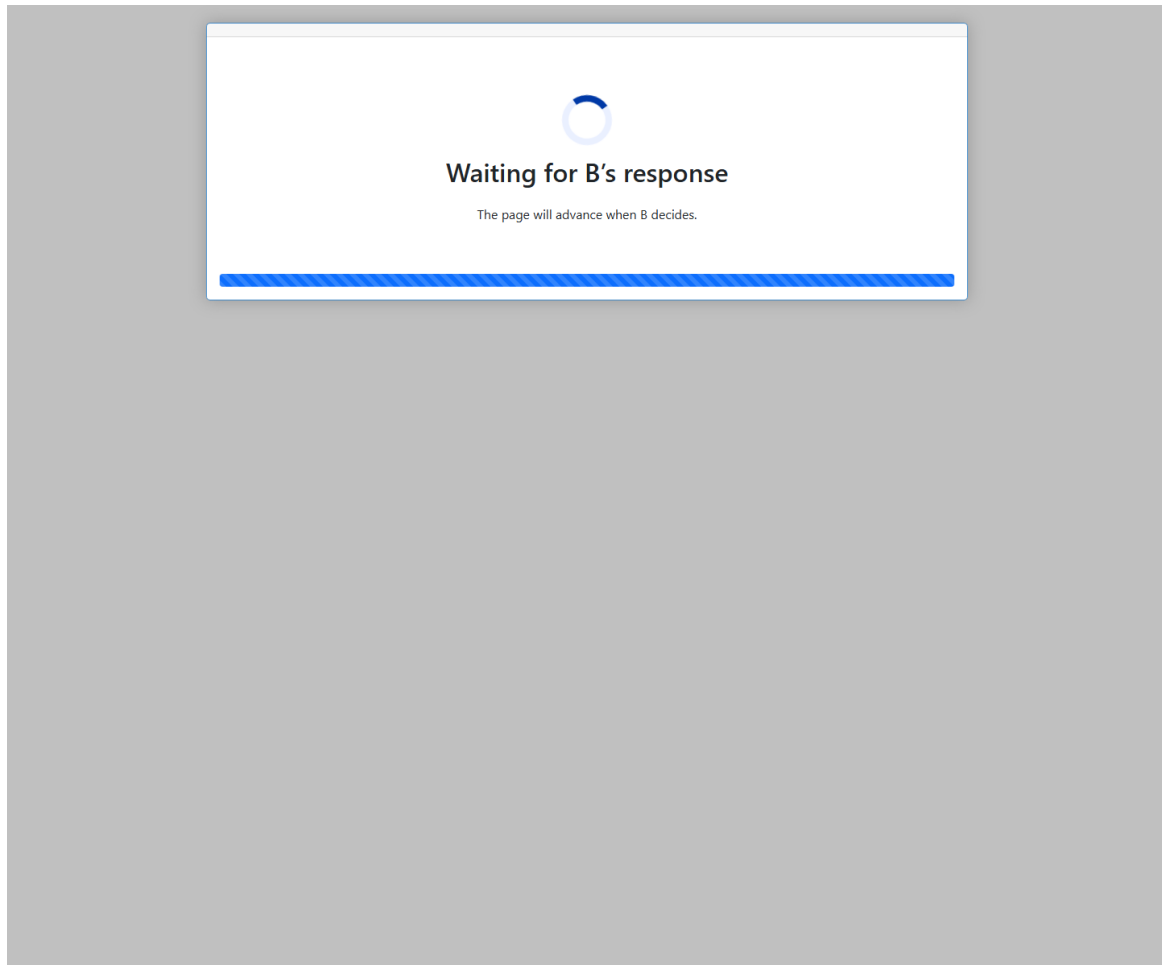


Figure 3.10: A waits.

Round 1 result

Participant A

Baseline
One round

A offered **30 ECUs**. The offer was rejected.

A receives**0**

ECUs

B receives**0**

ECUs

Your outcome this round**0 ECUs**

This was the final round.

ContinuePowered by [oTree](#)

Figure 3.11: Private round result. Result for A.

Round 1 result

Participant B

Baseline
One round

A offered **30 ECUs**. The offer was rejected.

A receives**0**

ECUs

B receives**0**

ECUs

Your outcome this round**0 ECUs**

This was the final round.

ContinuePowered by [oTree](#)

Figure 3.12: Result for B.

Summary of your participation

The activity is complete.

Baseline
Participant B

Total outcome

0 ECUs

Session complete

Remain on this page while the instructor presents the aggregate results.

Powered by [oTree](#)

Figure 3.13: Participant's individual outcome at completion.

oTree Demo Sessions Rooms Data Server Check

[EN] Ultimatum Game — one round: session '94t0ez7g' (demo)

[New](#) [Links](#) [Monitor](#) [Data](#) [Payments](#) [Report](#) [Description](#)

App Name Round Number

ultimatum_game (10 rounds) 10 [Go](#)

Ultimatum Game · Baseline

One round · Round 1 of 1 · One random pair

Participants 4	Pairs 2	Completed 2	Pending 0
---------------------------------	--------------------------	------------------------------	----------------------------

[Reveal round results](#)

Figure 3.14: Aggregated report before results are revealed.

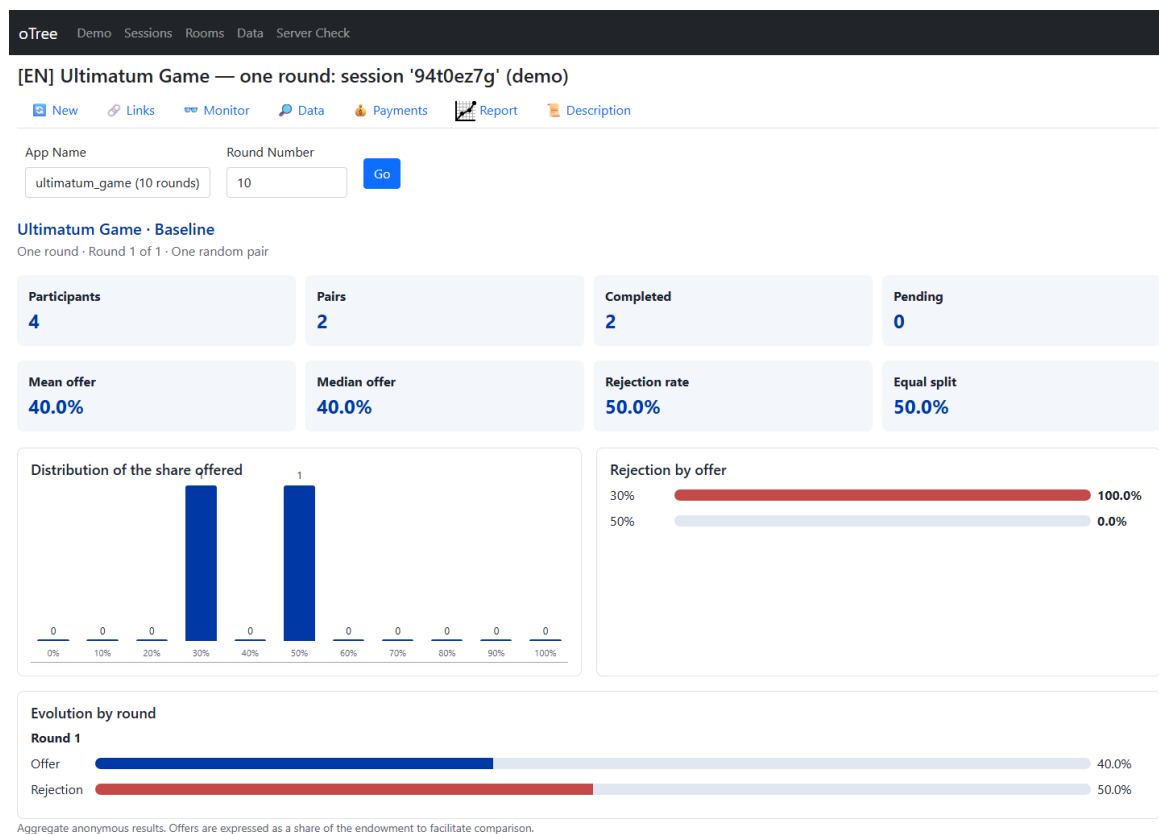


Figure 3.15: Indicators, histogram, and rejections after revealing results.

Theoretical foundations and evidence

4.1 Equilibrium benchmark

If both players maximize only money and the game occurs once, B accepts every strictly positive offer. By backward induction, A offers the smallest positive unit: 1 ECU when $E = 100$. If B accepts zero when indifferent, zero can be sustained under that tie-breaking rule. The benchmark therefore does not predict a generous offer.

The original experiment documented substantial offers and rejection of low offers (Güth et al., 1982). The meta-analysis by Oosterbeek et al. (2004) reports average offers near 40% and an overall rejection rate around 16%.

4.2 Social preferences

In Fehr and Schmidt (1999), B may reject a low offer because acceptance creates disadvantageous inequality; A anticipates that cost. Bolton and Ockenfels (2000) emphasize a person's relative share. These theories make costly rejection consistent with broader preferences.

4.3 Reciprocity, intentions, and norms

Reciprocity theories evaluate actions, beliefs, and perceived intentions (Rabin, 1993; Dufwenberg and Kirchsteiger, 2004). The same allocation can trigger different reactions depending on the alternatives A rejected, which motivates the mini-ultimatum treatment (Falk et al., 2003). Equality norms also act as reference points and vary across contexts (Roth et al., 1991; Henrich et al., 2001).

4.4 Emotion and costly punishment

In the basic game, rejection lowers both payoffs. It may express punishment, inequality aversion, anger, or a norm. Sanfey et al. (2003) show that unfair offers engage both emotional and deliberative processes. The impunity variant helps isolate whether B wants to reduce A's payoff.

4.5 Strategic offers

A's offer combines distributional preference and beliefs about rejection. A high offer does not by itself establish altruism. Comparing dictator and ultimatum games helps separate distribution

from strategic pressure ([Forsythe et al., 1994](#)).

Theoretical foundation

Separate **outcome** (allocation), **response** (acceptance), and **mechanism** (reason). The data observe the first two; the third requires treatment comparisons.

4.6 Empirical regularities

- Offers often cluster near the equal split; very low offers are less common.
- Rejection probability declines as the offered share rises.
- Contexts differ, especially in responder behavior.
- Repetition and experience can change offers and thresholds ([Slonim and Roth, 1998](#); [Cooper and Dutcher, 2011](#)).
- Strategy-method responses can differ from direct responses ([Brandts and Charness, 2011](#)).

Implementing the basic game

5.1 Configurations

Configuration	Rounds	Matching
ultimatum_en_1_round	1	One pair
ultimatum_en_10_fixed_partner	10	Same partner
ultimatum_en_10_random_partners	10	Rematched each round

5.2 Before and during the session

Define the learning objective, ECU rule, version, and time. Collect anonymous predictions for the offer and acceptance threshold before play. Do not describe 50 as the correct answer. During play, use the monitor to resolve waits and keep partial results hidden.

What participants will see

“You will work in anonymous pairs. A has 100 ECUs and proposes how many to offer B. B observes the offer and accepts or rejects it. If accepted, the proposed allocation applies; if rejected, both receive zero. Read each screen carefully and do not communicate.”

5.3 Basic-game feedback

Feedback script

1. Recall the monetary benchmark without presenting it as a norm.
2. Show n , median, mean, and the histogram.
3. Ask A what rejection risk was expected and B what was acceptable.
4. Display rejection by offer interval.
5. Contrast the equal split with the smallest positive offer.
6. Close by separating preferences, expectations, and punishment.

5.4 Repeated versions

A fixed partner permits reputation, reciprocity, and partner-specific learning. Random rematching reduces bilateral reputation, while population learning and history effects remain. The difference is not a pure reputation effect unless treatment assignment and information are controlled.

Variants

6.1 Map of variants

Configuration	Design change	Concept
<code>ultimatum_extended_strategy_method</code>	B sets a threshold	Minimum acceptable offer
<code>ultimatum_extended_earned_endowment</code>	A earns the endowment	Entitlement
<code>ultimatum_extended_communication</code>	Structured message	Expectations
<code>ultimatum_extended_outside_option</code>	B receives 20 on rejection	Reservation payoff
<code>ultimatum_extended_impunity</code>	Rejection does not hurt A	Punishment
<code>ultimatum_extended_mini_ultimatum</code>	A chooses 20% or 50%	Intentions
<code>ultimatum_extended_asymmetric_information</code>	B does not observe E	Private information
<code>ultimatum_extended_social_information</code>	Previous-round statistics	Social norms
<code>ultimatum_extended_observable_decisions</code>	Anonymous pair table	Observability
<code>ultimatum_extended_role_reversal</code>	Roles switch in round 6	Perspective

6.2 Strategy method

B states the minimum acceptable offer before observing x ; acceptance is automatic when x meets the threshold. This elicits an individual cutoff, but the method itself can affect reasoning ([Brandts and Charness, 2011](#)).

Feedback script

Compare threshold and offer distributions. Do proposers overestimate rejection? Does responding hypothetically change B's choice?

6.3 Earned endowment

A solves three sums to obtain the endowment. Merit can legitimize retaining more even though B's formal power is unchanged ([Hoffman et al., 1994](#)).

Feedback script

Compare with the basic game. Does completing a task create a moral entitlement? Do A and B share that view?

6.4 Structured communication

A selects a predefined, nonbinding message that B reads before the offer. Communication can coordinate expectations, activate norms, or create a reference point (Rankin, 2003). Free conversation is not allowed.

Feedback script

Show offers and rejection by message. The association is not causal because A chooses both message and offer. Discuss credibility and promises.

6.5 Responder outside option

On rejection, A receives 0 and B receives 20. A money-maximizing B rejects $x < 20$, accepts $x > 20$, and is indifferent at 20.

Feedback script

Mark 20 on the histogram. Does fairness depend on the proposed split or on B's available alternative?

6.6 Impunity

On rejection, A keeps $E - x$ and B receives 0, so B cannot reduce A's payoff. If rejection aims to punish, it should fall; if it expresses unwillingness to accept inequality, it may persist (Bolton and Zwick, 1995).

Feedback script

Is rejection still punishment when it cannot hurt A? Compare rejection rates with the basic game.

6.7 Mini-ultimatum

A can offer only 20 or 50. The restricted menu identifies intentions: the same unequal outcome can be judged differently depending on the alternative A rejected (Falk et al., 2003).

Feedback script

Ask which alternative A had. Do not interpret the 20% outcome without its choice set.

6.8 Asymmetric information

E is 100 or 200. A observes it and B does not. An offer of 40 can be 40% or 20%, separating amounts, shares, and beliefs ([Mitzkewitz and Nagel, 1993](#); [Kagel et al., 1996](#); [Croson, 1996](#); [Pillutla and Murnighan, 1995](#)).

Feedback script

Present offers in ECUs and as actual shares. What can B infer? Do not call an offer deceptive when A never stated the pie size.

6.9 Social information

From round 2, A sees the previous mean, histogram, and rejection rate; partners remain fixed. Information may produce strategic learning or convergence toward a descriptive norm.

Feedback script

Plot offers and rejection by round. The design combines social information and fixed partners, so it does not separately identify their effects.

6.10 Observable decisions

At completion, the class sees an anonymous table of pair offers and responses. Observability may activate social image even when personal identity is hidden.

Feedback script

Ask whether anticipated publication changed choices and what degree of anonymity participants perceived.

6.11 Role reversal

Across ten rounds, roles switch beginning in round 6. Everyone experiences both sides, but the second role includes learning and carryover ([Macfarlan and Quinlan, 2011](#)).

Feedback script

Compare rounds 1–5 and 6–10 by role. Do not attribute every change to role; experience changes too.

6.12 Interpretation and classroom feedback

6.13 Reading the report

1. **Mean and median:** center of the offer distribution.

2. **Histogram:** shape, dispersion, and clustering at 50%.
3. **Rejection by offer:** B's response conditional on x/E .
4. **Equal split:** share of exactly equal offers.
5. **Round trend:** learning and changes over time.

Always report n : one bar may represent a single pair.

6.14 Prediction matrix

Mechanism	Prediction for A	Prediction for B
Money maximization	Smallest positive offer	Accept every positive offer
Inequality aversion	Raise offer	Reject disadvantageous inequality
Reciprocity	Anticipate intentions and cutoff	Punish perceived hostility
Equality norm	Offer near 50%	Norm-linked cutoff
Outside option 20	Offer near or above 20	Reject below 20
Impunity	May lower offer	Rejection falls if it served punishment
Private information	May use ambiguity	Respond using beliefs about E
Social information	Adapt toward the group	Threshold may converge

6.15 Recommended sequence

Feedback script

1. Elicit predictions before revealing results.
2. Show n , mean, median, and distribution.
3. Relate rejection to offer size.
4. Hear proposer and responder explanations without judgment.
5. Connect explanations to theories and possible treatment tests.
6. Compare the treatment with the basic game.
7. Close with the limits of a classroom demonstration.

6.16 Data, limits, and troubleshooting

6.17 Data and privacy

The export contains configuration, round, anonymous pair, treatment, role, endowment, offer, share, response, threshold, message, payoffs, and comprehension attempts. Research use requires separate consent, ethics, and institutional data procedures.

6.18 Responsible interpretation

Do not label individuals selfish or irrational, grade their decisions, report percentages without n , or treat unmatched classroom sessions as a controlled experiment.

6.19 Common problems

Symptom	Action
"Please wait"	Check whether the partner completed the complementary decision; use Monitor.
User does not exist	The database was reset or the link is old; create a new session.
No more pages	Do not reuse links; confirm that the version includes the summary.
Odd participant count	Adjust the count before creating the session.
Empty report	Wait for at least one complete offer and response.
The route does not respond	Check the address and contact the laboratory server administrator.

Checkpoint

Before the first class, rehearse from two devices, create a fresh session, complete one acceptance and one rejection, reveal the report, and download the data.

Configurations

A.1 Basic

- ultimatum_en_1_round
- ultimatum_en_10_fixed_partner
- ultimatum_en_10_random_partners

A.2 Extended

- ultimatum_extended_1_round
- ultimatum_extended_10_fixed_partner
- ultimatum_extended_10_random_partners
- ultimatum_extended_strategy_method
- ultimatum_extended_earned_endowment
- ultimatum_extended_communication
- ultimatum_extended_outside_option
- ultimatum_extended_impunity
- ultimatum_extended_mini_ultimatum
- ultimatum_extended_asymmetric_information
- ultimatum_extended_social_information
- ultimatum_extended_observable_decisions
- ultimatum_extended_role_reversal

A.3 Glossary

Offer	Amount x that A proposes to transfer to B.
Minimum acceptable offer	Threshold stated by B.
Outside option	Payoff available when no agreement occurs.

Backward induction	Solving from the final decision backward.
Reciprocity	Responding to perceived intentions.
Inequality aversion	Disutility from payoff differences.
Cheap talk	A message without a direct binding effect.
Fixed or random matching	Same partner or reassignment across rounds.

Expanded teaching manual for nonspecialist instructors

This part brings together what an instructor needs to turn Ultimatum game into a learning experience. It complements the operational material above. It can be read before the first session and reused as a script during the discussion of results. The central question is how bargaining power, fairness, and costly punishment interact when an offer can be rejected. The guide always separates four levels: rules, benchmark prediction, observed behavior, and interpretation. Moving directly from a bar in a chart to a psychological explanation confuses those levels.

B.1 Conceptual map before opening the session

B.1.1 Unit of analysis

The relevant unit is the pair in each round, distinguishing proposer and responder. One data row is not always one independent person: the same person may decide repeatedly, and interacting participants share information, payoffs, or history. The instructor should therefore state what enters the numerator, what enters the denominator, and whether observations are people, decisions, pairs, groups, or rounds. This prevents thirty repeated decisions from being presented as thirty independent participants.

The task is to the proposer offers a split and the responder accepts or rejects. Before presenting theory, ask students to restate the rule and identify what information is available when they decide. A correct calculation does not guarantee understanding of the strategic or behavioral structure. Check available actions, information, payoffs, order, and feedback timing separately.

B.1.2 Benchmark prediction

The starting point is: with divisible payoffs and purely material players, the responder accepts any positive amount and the proposer offers the smallest unit. The benchmark is a disciplined comparison, not a moral statement about what a person ought to do. First write the assumptions that support it, then derive the action or pattern, and only then compare it with the class. If information, repetition, incentives, matching, or the reference point changes, derive the prediction again instead of carrying it over automatically.

Keep equilibrium, efficiency, and fairness separate. An action can be a best response and generate a poor joint outcome; another action can raise surplus and remain vulnerable to unilateral deviation. Likewise, an equal outcome need not be efficient, and an efficient distribution does not reveal the process that produced it. Asking the class to label each statement as positive, normative, or

strategic reduces confusion.

B.1.3 Alternative mechanisms

The literature and treatments permit discussion of inequality aversion, negative reciprocity, fairness norms, emotion, reputation, and strategic offering. These mechanisms are not interchangeable labels. Two can predict the same baseline action and separate only when a treatment changes. The informative comparison therefore asks not only how much behavior occurred but also what experimental change should increase, reduce, or leave the pattern unchanged if one mechanism matters.

Organize discussion in three columns. Write the observed fact in the first, such as a share, median, or trajectory. List compatible mechanisms in the second. Record the additional evidence needed to distinguish them in the third. The third column is essential because a classroom session rarely identifies a stable preference or causal relationship by itself.

B.2 Worked example and explanation

With a pie of 100, an offer of 20 pays 80 and 20 if accepted and zero to both if rejected. If the estimated rejection rate for 20 is 40 percent, the proposer's expected payoff is 48, below the certain payoff of 50 from an offer of 50 if it is always accepted. A generous offer can be strategic as well as fairness motivated.

Solve the example in six steps. First list actions and possible states. Second calculate payoffs or consequences without interpreting motives. Third derive the theoretical benchmark under its assumptions. Fourth identify the minimum observation needed to evaluate that benchmark. Fifth compare treatments while stating what is held constant and what changes. Sixth formulate a limited conclusion: "the pattern is consistent with" is more accurate than "the experiment proves" when rival explanations remain.

Then change one parameter and ask for a new prediction before calculating. This pause turns the example into a reasoning tool. It also reveals whether students memorized an answer or understood the mechanism. If answers diverge, ask each group to identify the assumption producing the difference.

B.3 Reading the instructor report

The central measures are offer as a share of the pie; rejection by offer level; proposer's expected payoff; distribution and treatment differences. Write the denominator next to every indicator. A rate can divide by eligible participants, completed decisions, formed pairs, groups, or rounds; these alternatives are not equivalent. If records are incomplete, show how many were excluded and why.

Use this reading order:

1. Verify participants, groups, and completed decisions. Do not interpret percentages before checking coverage.
2. Inspect the full distribution. A mean can hide two groups with opposing responses or a concentration at focal values.
3. Compare the median, range, and theoretically relevant categories. Explain whether the graph counts people or decisions.

4. Inspect time paths only when rounds are comparable. Changes in matching or treatment must be marked.
5. Compare treatments with absolute differences and denominators, not merely with bars of different heights.
6. Select one anonymous case or sequence connecting rules and the aggregate. Never use it to identify or ridicule a student.

A visible difference in a small class is descriptive evidence from that session. Do not call it a causal effect without appropriate assignment, adequate size, and a comparison defined before seeing the data. Across classes, composition, time, and prior experience may change together. The pedagogical value lies in stating a prediction, confronting it with evidence, and asking what design would teach us more.

B.4 Step-by-step debrief script

Begin without revealing results. Ask for the benchmark prediction and which assumption students find most demanding. Record two quantitative class predictions. Next reveal the observation count and distribution, initially withholding the mean if it would distract from heterogeneity. Ask students to describe the chart without explaining causes.

In a second stage, show aggregate measures and ask: which observation contradicts the simplest prediction, which remains compatible with it, and what heterogeneity disappears in the average? Accept multiple explanations, but require each to yield a testable prediction. Introduce the variants: strategy method; earned endowment; communication; outside option; impunity; mini-ultimatum; asymmetric information; observability and role reversal. For each variant, identify the single changed element, predicted direction, and report measure to inspect.

Close by connecting the laboratory to wage bargaining, conflict resolution, contracts, and distributive legitimacy. Point out which elements of the real setting are absent: institutions, selection, repetition, long-run consequences, or rich information. The analogy is useful when it isolates a mechanism; it becomes misleading if the class assumes that the laboratory reproduces the full context.

A verbal sequence that works well is: “first describe,” “now derive,” “then interpret,” and “finally ask what evidence is missing.” This discipline allows a nonspecialist instructor to lead a rigorous discussion without treating every departure as a bias or every match as definitive confirmation.

B.5 Comparable class plans

B.5.1 A 50-minute class

Use one mode. Spend five minutes on rules and comprehension, five on private predictions, ten on the activity, five collecting predictions about the aggregate, fifteen revealing the report in layers, and ten connecting the result to theory. The goal is not to cover every variant but to ensure that every student can explain how bargaining power, fairness, and costly punishment interact when an offer can be rejected. End with one written sentence separating outcome from mechanism.

B.5.2 An 80-minute class

Run the baseline and one variant from strategy method; earned endowment; communication; outside option; impunity; mini-ultimatum; asymmetric information; observability and role reversal. Allow ten minutes for instructions, fifteen for each treatment, twenty for comparing distributions, and fifteen for theory and applications. Before the second treatment, request a directional prediction. If the result points the other way, do not dismiss it: inspect comprehension, composition, denominators, and descriptive power.

B.5.3 A 110-minute class

Combine experience, derivation, and design. After two treatments, give small groups a rival explanation and ask them to propose a third condition that distinguishes it. Each group must define the manipulated variable, outcome, unit of analysis, and prediction. Close by comparing proposals with existing variants and with wage bargaining, conflict resolution, contracts, and distributive legitimacy. This stage turns the student from participant into experimental designer.

B.6 Exercises with answer guidance

B.6.1 1. Reconstructing the prediction

Question. State the benchmark and three indispensable assumptions. What observation would be a departure?

Guidance. Begin from with divisible payoffs and purely material players, the responder accepts any positive amount and the proposer offers the smallest unit. Mention incentives, information, and horizon, and define the observation at the correct level. A departure is inconsistent with the full assumption set; it does not automatically identify its cause.

B.6.2 2. Auditing a percentage

Question. The report displays 60 percent. Propose two possible denominators and explain how interpretation changes.

Guidance. It could be 60 percent of eligible people or of completed decisions. If some people did not decide, the rates differ. A complete answer names numerator, denominator, exclusions, and aggregation level.

B.6.3 3. Reading heterogeneity

Question. Two classes have the same mean, but one is concentrated around it and the other has two modes. What does the instructor learn?

Guidance. The mean does not exhaust the distribution. The second class may combine different strategies or interpretations. Compare the median, dispersion, and categories linked to offer as a share of the pie; rejection by offer level; proposer's expected payoff; distribution and treatment differences before explaining mechanisms.

B.6.4 4. Separating explanations

Question. Select two mechanisms from this list: inequality aversion, negative reciprocity, fairness norms, emotion, reputation, and strategic offering. Design a contrast that produces different

predictions.

Guidance. Change one relevant element, hold others constant, and state each directional prediction. A variant from strategy method; earned endowment; communication; outside option; impunity; mini-ultimatum; asymmetric information; observability and role reversal may help, but the justification must connect manipulation and report measure.

B.6.5 5. Interpreting no difference

Question. Two treatments produce similar means. Does the manipulation not matter?

Guidance. Not necessarily. There may be weak comprehension, a small sample, offsetting responses, manipulation failure, or effects in tails and dispersion. Inspect descriptive uncertainty and the full distribution before concluding.

B.6.6 6. Transferring carefully

Question. Relate the activity to wage bargaining, conflict resolution, contracts, and distributive legitimacy and identify two contextual differences.

Guidance. A convincing application states the common mechanism and the limits. Real consequences, selection, experience, institutions, and repetition can change behavior. The conclusion should be an informed hypothesis rather than a universal prediction.

B.7 Frequently asked questions and model answers

Should theory be explained before play? In a first session, collect predictions without revealing the full solution. Explain rules, payoffs, and information. Then derive with divisible payoffs and purely material players, the responder accepts any positive amount and the proposer offers the smallest unit. In a second session, reverse the order and assess whether theory improves prediction or only changes vocabulary.

Is there a correct answer? Separate a normative or equilibrium solution from a behavioral prediction. Theory supplies a conditional benchmark. The laboratory reveals what occurs and why a reasonable person may choose differently.

Does a departure prove irrationality? No. It may reflect omitted preferences, beliefs, error, weak comprehension, or a different institution. Check controls and incentives. Then treat inequality aversion, negative reciprocity, fairness norms, emotion, reputation, and strategic offering as hypotheses requiring further comparisons.

Why show the distribution? The same mean can arise from moderate consensus or two opposing groups. A distribution reveals focal values, boundaries, and heterogeneity. In Ultimatum game, connect those shapes to offer as a share of the pie; rejection by offer level; proposer's expected payoff; distribution and treatment differences.

How many observations are enough? There is no universal threshold for debriefing. A small class is useful when described cautiously. Treatment comparisons require several independent units, clear assignment, and common protocols. Repeated decisions do not create new participants.

Can sessions be pooled? Yes, if parameters and definitions remain fixed. Retain session identifiers and inspect each cohort first. If instructions, composition, or incentives change, document the heterogeneity.

What if results contradict the literature? Check rules, treatment, comprehension, exclusions, and calculation. If no error exists, preserve the result. A class need not reproduce a published

estimate. Ask what design would distinguish chance, composition, and mechanism.

How can embarrassment be avoided? Project aggregates and anonymous sequences. Avoid personal labels. Describe actions and consequences. The laboratory studies decisions under specific rules; it does not diagnose traits.

Should the decision be graded? Do not grade agreement with a prediction. Assess understanding: derive the benchmark, calculate a measure, explain a limitation, and design a comparison. Experimental incentives and academic assessment serve different purposes.

How should a variant be chosen? Begin with the mechanism to separate. Select from strategy method; earned endowment; communication; outside option; impunity; mini-ultimatum; asymmetric information; observability and role reversal, state a direction and measure, and hold other elements constant. Do not run more conditions than can be analyzed.

What conclusion is appropriate? Use three sentences: what was observed, which mechanism it is consistent with, and what evidence is missing. The connection to wage bargaining, conflict resolution, contracts, and distributive legitimacy should preserve those limits.

What should students remember? They should reconstruct the central tension, explain the benchmark, read the main denominator, and propose an institution that could change the outcome.

B.8 Diagnostic cases for interpretation practice

B.8.1 Agreement with the benchmark

The distribution is concentrated near the prediction derived from with divisible payoffs and purely material players, the responder accepts any positive amount and the proposer offers the smallest unit. Do not conclude that everyone shared the same motive. Some calculated, others followed a signal, and others chose intuitively. The evidence supports the aggregate prediction under session conditions but does not identify individual reasoning. Ask what belief, process, or response-time measure would distinguish those routes.

Then introduce a variant from strategy method; earned endowment; communication; outside option; impunity; mini-ultimatum; asymmetric information; observability and role reversal. If the pattern remains when the seemingly obvious mechanism weakens, the original explanation needs revision. A correct prediction does not automatically validate all its assumptions.

B.8.2 Two groups with opposite behavior

Half the class is at one extreme and half at the other; the mean lies where almost nobody chose. Showing only the average would create a fictional description. Calculate the median, modes, range, and share in theoretical categories. Ask whether heterogeneity is related to role, round, treatment, or comprehension.

Consider inequality aversion, negative reciprocity, fairness norms, emotion, reputation, and strategic offering. Write one additional observation for each. If it predicts role differences and none appear, it receives less relative support. If it predicts learning, inspect the trajectory. Do not fill missing measurement with a compelling story.

B.8.3 A large difference with few units

One treatment apparently doubles the main measure but contains two groups and the comparison contains three. Display each group before pooling. One extreme unit can create the difference. Twenty decisions nested in two groups are not twenty independent units.

Ask students to plan the next session: groups, assignment, primary measure, and exclusions. The answer should mention offer as a share of the pie; rejection by offer level; proposer's expected payoff; distribution and treatment differences and incomplete data. The experience thereby introduces design and transparency.

B.8.4 A null difference

Two conditions have the same mean. Before declaring that the manipulation does not matter, inspect compliance, comprehension, tails, and dispersion. Opposing subgroup effects can cancel. Define what range of differences would be pedagogically or economically meaningful and what size could distinguish it.

The cases teach four disciplines: do not infer motives from agreement, hide heterogeneity, confuse rows with units, or treat absence of evidence as evidence of absence.

B.9 Explanatory sequence for a complete class

B.9.1 Step 1: pose the problem without labels

Present the decision as a concrete situation and ask what information is missing. Do not announce the name of the bias, equilibrium, or preference at the start. The question is how bargaining power, fairness, and costly punishment interact when an offer can be rejected. Collect private responses so the first speaker does not become a focal point.

B.9.2 Step 2: reconstruct rules and incentives

Ask one student to describe actions and another to describe consequences. A third explains available information. Draw the sequence. In Ultimatum game, the decision is to the proposer offers a split and the responder accepts or rejects. Do not move to interpretation until the class can calculate a simple case.

B.9.3 Step 3: derive the benchmark

Write with divisible payoffs and purely material players, the responder accepts any positive amount and the proposer offers the smallest unit. Underline each assumption. Ask what happens if one fails. Distinguish a logical derivation from an empirical expectation: an equilibrium strategy need not be played immediately by everyone.

B.9.4 Step 4: record predictions

Request one prediction about the mean, another about the distribution, and a third about a variant. Predictions should use offer as a share of the pie; rejection by offer level; proposer's expected payoff; distribution and treatment differences. Preserve the record; later comparison reveals learning and reduces hindsight.

B.9.5 Step 5: reveal in layers

Show coverage first, then distribution, measures, and comparisons. At every layer request description before explanation. If someone proposes inequality aversion, negative reciprocity, fairness norms, emotion, reputation, and strategic offering, ask what observation would distinguish it from another mechanism.

B.9.6 Step 6: work through one sequence

Use the worked example in this guide. Recalculate slowly and change one parameter. Ask each team to find one excessive conclusion and rewrite it with limited language. Editing claims is as important as calculation.

B.9.7 Step 7: compare institutions

Choose one condition from strategy method; earned endowment; communication; outside option; impunity; mini-ultimatum; asymmetric information; observability and role reversal. Write a table with constant, change, prediction, and measure. If the variant changes several elements, acknowledge it. Ask whether a third treatment would separate explanations.

B.9.8 Step 8: transfer and close

Connect the mechanism to wage bargaining, conflict resolution, contracts, and distributive legitimacy. Identify two differences between the laboratory and the real context. End with an exit response: prediction, evidence, compatible mechanism, and limitation. This structure assesses understanding without rewarding a particular decision.

B.9.9 A short script to read aloud

“Describe what happened before explaining why. Identify the prediction and its assumptions. Compare the distribution with the mean. Propose two compatible mechanisms. Finally, state which treatment or additional evidence could distinguish them.” The script keeps discussion in a common sequence across families.

B.10 Assessment bank with solutions

Exercise 1. List actions, information, and payoffs. **Solution:** reconstruct the proposer offers a split and the responder accepts or rejects without adding information unavailable to the participant.

Exercise 2. Derive the material benchmark. **Solution:** begin from with divisible payoffs and purely material players, the responder accepts any positive amount and the proposer offers the smallest unit and name at least two assumptions. For an interactive game, state best responses; for an individual task, state the decision rule.

Exercise 3. The report shows 40 percent. **Solution:** it cannot be interpreted without numerator, denominator, exclusions, and unit. Eligible people and completed decisions are alternative denominators.

Exercise 4. The mean matches the prediction. **Solution:** inspect the distribution. A correct mean can combine extremes, offsetting errors, or different strategies. Agreement does not identify

reasoning.

Exercise 5. Select two mechanisms from inequality aversion, negative reciprocity, fairness norms, emotion, reputation, and strategic offering. **Solution:** design a condition changing one prediction but not the other, with an outcome from offer as a share of the pie; rejection by offer level; proposer's expected payoff; distribution and treatment differences.

Exercise 6. Compare treatments of different sizes. **Solution:** report counts and shares, preserve the independent unit, and do not compensate for a small group by multiplying rounds.

Exercise 7. Mean differences are absent. **Solution:** inspect dispersion, tails, compliance, and comprehension; define a relevant difference. A broad null does not establish equivalence.

Exercise 8. Propose a figure. **Solution:** use histograms or dots for distributions, lines for rounds, separate bars for roles, and bivariate plots when a response depends on a prior action.

Exercise 9. Explain a variant from strategy method; earned endowment; communication; outside option; impunity; mini-ultimatum; asymmetric information; observability and role reversal. **Solution:** identify what changes, what remains constant, predicted direction, and an interpretive threat.

Exercise 10. Transfer to wage bargaining, conflict resolution, contracts, and distributive legitimacy. **Solution:** describe the common mechanism and two institutional differences. Do not claim that one session determines policy.

Exercise 11. Write a three-sentence conclusion. **Solution:** observation with denominator; compatible mechanisms; evidence needed to distinguish them.

Exercise 12. Design a replication. **Solution:** preserve parameters, record assignment, announce the primary measure, set exclusions, and archive the export.

A twelve-point rubric awards one point for each correct component. For a short assignment use Exercises 2, 3, 5, and 11. For a project use all twelve and request a reproducible figure.

B.11 Advanced seminar: from evidence to mechanism

Divide the class into four teams: benchmark model, alternative preferences or beliefs, institutions, and identification critique. Each interprets the same report from its assigned role. The first derives with divisible payoffs and purely material players, the responder accepts any positive amount and the proposer offers the smallest unit; the second uses inequality aversion, negative reciprocity, fairness norms, emotion, reputation, and strategic offering; the third selects a variant from strategy method; earned endowment; communication; outside option; impunity; mini-ultimatum; asymmetric information; observability and role reversal; the fourth identifies missing evidence.

In a replication round, every team writes a quantitative prediction and a condition that could refute it. It exchanges the proposal with another team, which audits unit, denominator, and manipulation. A useful explanation does not merely accommodate past outcomes; it risks a prediction about new evidence.

End with a one-page memo containing question, benchmark, descriptive finding, two mechanisms, discriminating design, application to wage bargaining, conflict resolution, contracts, and distributive legitimacy, and limitation. Grade causal clarity, technical correctness, use of evidence, and inferential restraint.

For a quantitative extension, export data and reproduce three figures: individual distribution, aggregate by independent unit, and treatment comparison. All three require titles, denominators,

and exclusion notes. Compare how the narrative changes when the correct unit is used.

An ethics extension asks which decisions should remain private, when an incentive is proportionate, and how to communicate results without turning group patterns into personal judgments. The answer should separate participant protection, instructional integrity, and analytical transparency.

B.12 Selected bibliography

Start with [Güth et al. \(1982\)](#), [Camerer \(2003\)](#), and [Oosterbeek et al. \(2004\)](#). For social preferences, see [Fehr and Schmidt \(1999\)](#) and [Bolton and Ockenfels \(2000\)](#). Variant foundations include [Bolton and Zwick \(1995\)](#), [Falk et al. \(2003\)](#), [Rankin \(2003\)](#), [Mitzkewitz and Nagel \(1993\)](#), [Kagel et al. \(1996\)](#), and [Hoffman et al. \(1994\)](#).

Bibliography

- Bolton, G. E. and Ockenfels, A. (2000). ERC. *American Economic Review*, 90(1), 166–193. [doi](#).
- Bolton, G. E. and Zwick, R. (1995). Anonymity versus punishment in ultimatum bargaining. *Games and Economic Behavior*, 10, 95–121. [doi](#).
- Brandts, J. and Charness, G. (2011). The strategy versus the direct-response method. *Experimental Economics*, 14, 375–398. [doi](#).
- Camerer, C. F. (2003). *Behavioral Game Theory*. Princeton University Press.
- Cooper, D. J. and Dutcher, E. G. (2011). The dynamics of responder behavior. *Experimental Economics*, 14, 519–546. [doi](#).
- Croson, R. (1996). Information in ultimatum games. *Journal of Economic Behavior & Organization*, 30, 197–212. [doi](#).
- Dufwenberg, M. and Kirchsteiger, G. (2004). A theory of sequential reciprocity. *Games and Economic Behavior*, 47, 268–298. [doi](#).
- Falk, A., Fehr, E., and Fischbacher, U. (2003). On the nature of fair behavior. *Economic Inquiry*, 41, 20–26. [doi](#).
- Fehr, E. and Schmidt, K. M. (1999). A theory of fairness, competition, and cooperation. *Quarterly Journal of Economics*, 114, 817–868. [doi](#).
- Forsythe, R. et al. (1994). Fairness in simple bargaining experiments. *Games and Economic Behavior*, 6, 347–369. [doi](#).
- Güth, W., Schmittberger, R., and Schwarze, B. (1982). An experimental analysis of ultimatum bargaining. *Journal of Economic Behavior & Organization*, 3, 367–388. [doi](#).
- Henrich, J. et al. (2001). In search of Homo economicus. *American Economic Review*, 91, 73–78. [doi](#).
- Hoffman, E. et al. (1994). Preferences, property rights, and anonymity. *Games and Economic Behavior*, 7, 346–380. [doi](#).
- Kagel, J., Kim, C., and Moser, D. (1996). Fairness with asymmetric information and payoffs. *Games and Economic Behavior*, 13, 100–110. [doi](#).
- Macfarlan, S. and Quinlan, R. (2011). The dual-role method and ultimatum game performance. *Field Methods*, 23, 78–97. [doi](#).
- Mitzkewitz, M. and Nagel, R. (1993). Ultimatum games with incomplete information. *International Journal of Game Theory*, 22, 171–198. [doi](#).

- Oosterbeek, H., Sloof, R., and van de Kuilen, G. (2004). Cultural differences: A meta-analysis. *Experimental Economics*, 7, 171–188. [doi](#).
- Pillutla, M. and Murnighan, J. (1995). Information, fairness, expectations, and lowest acceptable offers. *Journal of Economic Behavior & Organization*, 27, 345–364. [doi](#).
- Rabin, M. (1993). Incorporating fairness into game theory and economics. *American Economic Review*, 83, 1281–1302.
- Rankin, F. (2003). Communication in ultimatum games. *Economics Letters*, 81, 267–271. [doi](#).
- Roth, A. et al. (1991). Bargaining and market behavior in four cities. *American Economic Review*, 81, 1068–1095.
- Sanfey, A. et al. (2003). The neural basis of economic decision-making. *Science*, 300, 1755–1758. [doi](#).
- Slonim, R. and Roth, A. (1998). Learning in high stakes ultimatum games. *Econometrica*, 66, 569–596.