



Instructor's Guide: Legitimacy, Procedures, and Consent

Laboratory implementation, theoretical foundations,
experimental evidence, and variants

Behavioral and Experimental Economics Research Lab
Department of Economics



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

How to use this guide

This guide supports the preparation, implementation, and classroom discussion of the family on legitimacy, procedures, and consent available through the Behavioral and Experimental Economics Research Lab (BEER Lab) at the Department of Economics of Tecnológico de Monterrey. It is written for instructors with different levels of familiarity with experimental economics, public goods, and political economy.

The document offers three reading paths. The **quick guide** is sufficient to launch a session. The operational chapters explain what students and instructors will see. The conceptual chapters develop the social dilemma, institutional choice, and the distinction between institutional selection and a procedural effect. Variants are covered within a single family so that common instructions are not repeated.

The activity is a teaching adaptation inspired by the literature; it is not a certified replication of a particular article. Parameters, screens, and treatments are documented so instructors can state precisely what each configuration compares and which conclusions it cannot support.

Author

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For the instructor

The guide follows the English interface. Spanish configurations reproduce the same logic, parameters, and measures. Never project individual codes or connect results to names, student numbers, or seats in the laboratory.

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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.

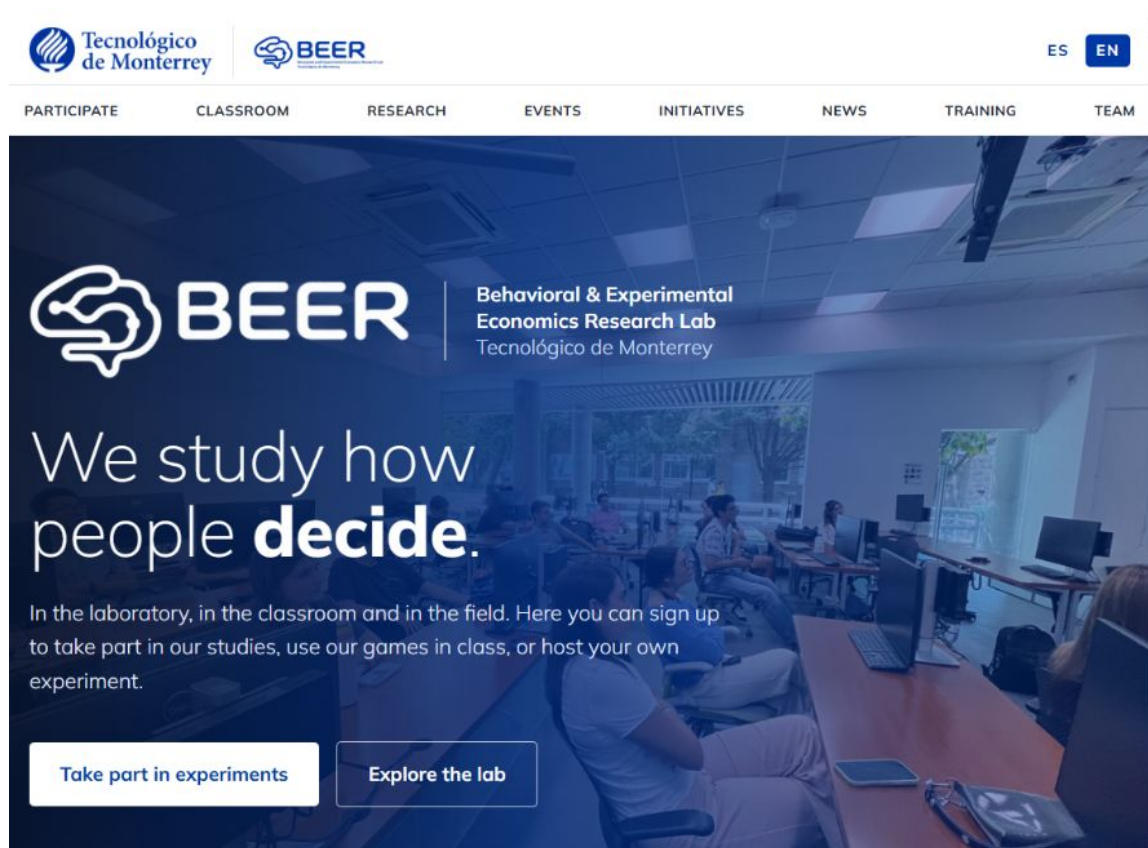


Figure 1.1: Current institutional website. Select CLASSROOM in the top navigation menu to open the teaching experiments. Captured on October 7, 2026.



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.

tos y reglas — una interacción	Legitimidad, procedimientos y consentimiento / Legitimacy, Procedures, and Consent — BEER Lab Seleccione una variante de este juego. Select a version of this game.
tos y reglas — 10 periodos, grupo fijo	
tos y reglas — 10 periodos, grupos reasignados	
and rules — one interaction	
and rules — 10 periods, fixed group	
and rules — 10 periods, reassigned groups	
extendida — referencia	
extendida — voz sin poder de decisión	
extendida — resultados por alias	
extendida — preferencia y aceptabilidad	
extendida — revisión de la regla	
extendida — representación por sorteo	
gitimacy — benchmark	
gitimacy — voice without decision power	
gitimacy — individual results by alias	
gitimacy — preference and acceptability	
gitimacy — rule review	
gitimacy — representation by lot	

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

Rooms

Current rooms:

[ES] Procedimientos, reglas y contribuciones
[EN] Procedures, Rules, and Contributions
[ES] Legitimidad, procedimientos y consentimiento: extendido
[EN] Legitimacy, Procedures, and Consent: extended

Figure 1.4: Rooms contains the four rooms for this family: basic and extended editions in Spanish and English.

Room: [EN] Procedures, Rules, and Contributions

Create a new session

Session Config

[EN] Procedures and rules — one interaction

Number of participants

Complete groups of 4 participants. Use a multiple of 4; minimum 4.

Create

[Configure session](#) 

App sequence

procedural_legitimacy_game (10 rounds)

Procedural choice, imposed rules, voice, feedback, appeal, and representation in a public-goods setting.

Figure 1.5: 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 Core facts

Purpose	Study how the origin of a rule, voice, social information, preference congruence, review, and representation relate to cooperation.
Experimental unit	A four-person group; in repeated designs, the fixed or reassigned group block is the natural comparison unit.
Basic edition	One interaction, ten periods with a fixed group, or ten periods with reassigned groups.

Extended edition	Benchmark, voice, individual information, congruence, appeal, and representation by lot.
Decision	A preference for N or S, followed by the institutional procedure and a private contribution from 0 to 20 ECU.
Topics	institutional legitimacy; institutional choice; public goods; compliance; voice; political economy.
JEL	A22; C92; D02; D72; H41.
Participants	Four per group; a total divisible by four is recommended.
Unit of account	Experimental Currency Units (ECU). Each person has 20 ECU to allocate and a non-contributable reserve of 4 ECU.
Group	Four participants.
Baseline game	Preference for Rule N or S, procedural selection, simultaneous contribution, and outcome.
Rule N	Applies no automatic deductions.
Rule S	Deducts 4 ECU from anyone contributing less than 10 ECU.
Suggested duration	35–45 minutes for one interaction; 60–80 minutes for ten periods.
Student access	legitimacy.beer-lab.org/room/legitimacy_en .
Instructor access	legitimacy.beer-lab.org/demo .
Outcome	Individual ECU payoff and an anonymous report with a histogram, time path, compliance, deductions, rule origin, and congruence.

1.3 Learning objectives

By the end of the session, a student should distinguish private incentives, collective efficiency, and compliance; calculate payoffs under both rules; explain why the same material rule may produce different behavior when chosen or imposed; separate institutional selection from a procedural effect; and assess the roles of voice, reputation, review, and representation. In advanced courses, students should also identify the experimental unit, justify comparisons conditional on prior majority preference, and recognize why periods played by one group are not independent observations.

1.4 Minimum classroom sequence

1. Before class, confirm that attendance is a multiple of four or prepare an explicit contingency.
2. Start at beer-lab.org and open the teaching-games section.
3. At teaching.beer-lab.org, locate the legitimacy and procedures card.
4. Open the instructor access, log in, and select one of the family's four rooms.
5. Choose a configuration. Use one interaction for an introduction, a fixed group for dynamics, or an extended condition for procedural comparison.
6. Keep **Monitor** and **Report** open. Do not reveal results while decisions remain pending.
7. Share only the appropriate room link with participants.
8. Read the neutral instructions without announcing a hypothesis or implying that one rule is morally superior.

9. At completion, elicit predictions, reveal the histogram, and move from description to interpretation.
10. Export data only for a clear teaching purpose and preserve anonymity.

Checkpoint

Before opening the room, confirm language, edition, treatment, active periods, and grouping. A basic room must start with a basic configuration and must never display games from another family.

1.5 Choosing a variant

The benchmark is sufficient to teach the identification problem: a draw determines whether the group majority or the computer fixes the rule. Voice adds nonbinding messages only when the computer decides. Individual information displays contributions by alias. Congruence elicits a private rating. Appeal permits a rule change after period five. Representation selects a person by lot whose previously recorded preference determines the rule. These conditions are not labels; each changes one explicit step and should be compared with the benchmark or stated control.

Access, rooms, and family isolation

2.1 Path from the laboratory website

The institutional path begins at beer-lab.org. The faculty-and-students section links to teaching.beer-lab.org, where every card summarizes the mechanism, participants, decisions, topics, and JEL codes. The proposed address for this family is legitimacy.beer-lab.org. Until the subdomain is deployed, instructors can inspect the same isolated structure on the local instance documented in the project README.

The administrative panel requires credentials. Students do not need access to **Demo**, **Sessions**, **Data**, or **Server Check**. The instructor should never share the administrative link or project the password. For a regular class, students join a stable room while the instructor creates a session and oTree assigns anonymous codes.

2.2 The four rooms

The family contains exactly four rooms. `legitimidad_es` and `legitimacy_en` contain the three basic modes. `legitimidad_extendida` and `legitimacy_extended` contain the extended benchmark and five variants. Room names are exact prefixes of their configurations, so filtering requires no manually maintained lookup table.

The proposed student routes are:

- basic: [legitimacy_en](#);
- extended: [legitimacy_extended](#).

Spanish routes end in `legitimidad_es` and `legitimidad_extendida`. If the room shows dictator, trust, public-goods, or any other family, do not start: the instance is not scoped to `GAME_FAMILY=legitimacy`.

2.3 Session creation and monitoring

After a configuration is selected, oTree displays individual links, the room link, Monitor, and Report. Keep the links page available in case a computer must re-enter. Monitor shows progress without exposing choices. Report contains the aggregates designed for the debrief. Data exports this instance only; family isolation prevents sessions from other games from appearing in the same panel.

Attention

Do not create a second session in the same room while the first remains active. Do not reuse participant links from an earlier demonstration: resetting a local database invalidates those codes.

The screenshot shows the oTree web interface. At the top is a navigation bar with links: Demo, Sessions, Rooms, Data, Server Check, and Logout. Below this is a header for the current session: "[EN] Procedures and rules — one interaction: session '1jgb8bda' (demo)". A secondary navigation bar contains icons and labels for New, Links, Monitor, Data, Payments, Report, and Description. The main content area includes instructions: "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:". Under "Combined views", there are two buttons: "Split-screen view" (marked "Not available") and "Grid view" (with a "Launch" link). The "Session-wide testing link" section instructs to "Open the below link in up to 8 browser tabs." and provides a single URL: <http://127.0.0.1:8069/join/menubivi>. The "Single-use links" section instructs to "Open each link in its own browser tab." and lists eight participant links, each with a unique ID (P1 to P8) and a URL starting with <http://127.0.0.1:8069/initializeParticipant/> followed by a unique alphanumeric code.

oTree Demo Sessions Rooms Data Server Check Logout

[EN] Procedures and rules — one interaction: session '1jgb8bda' (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
Not available ⓘ

Grid view
[Launch](#)

Session-wide testing link

Open the below link in up to 8 browser tabs.

<http://127.0.0.1:8069/join/menubivi>

Single-use links

Open each link in its own browser tab.

P1	http://127.0.0.1:8069/initializeParticipant/1uis0p1
P2	http://127.0.0.1:8069/initializeParticipant/acyf2sv2
P3	http://127.0.0.1:8069/initializeParticipant/4yqfhhm4
P4	http://127.0.0.1:8069/initializeParticipant/key9ujpq
P5	http://127.0.0.1:8069/initializeParticipant/od0x2hr1
P6	http://127.0.0.1:8069/initializeParticipant/hc4kmmvl
P7	http://127.0.0.1:8069/initializeParticipant/ccaiy5l5
P8	http://127.0.0.1:8069/initializeParticipant/vucvuq10

Figure 2.1: Links for a demonstration session. Each code identifies an anonymous participant.

Participant experience

3.1 Welcome and general rules

The cover displays the BEER Lab logo, identifies the Department of Economics at Tecnológico de Monterrey, and states rules on silence, communication, and technical help. Participants confirm that they have read the rules. This screen belongs to the protocol: it limits side communication and clarifies that messages are allowed only when the interface opens a specific channel.

3.2 Instructions and visual structure

Instructions show the group of four, the 20 ECU decision endowment, the 4 ECU reserve, the return of 0.4 for every contributed ECU, and both rules. A highlighted box contains the payoff equation. N and S use distinct cards, yet neither is labeled good or bad. The assigned condition is explained in operational language below.

The universal reserve is an accounting device that keeps payoffs nonnegative when a deduction applies. It is not another token participants allocate. Instructors should not call it a reward; it is part of the payoff endowment and remains constant across conditions.

3.3 Comprehension and practice

Three questions check the group return, the deduction, and a complete payoff. If total contributions equal 40, each member receives 16 from the group account. If someone contributes 8 under S, the deduction is 4. If all four people contribute 10, each earns $24 - 10 + 0.4(40) = 30$. Incorrect answers produce a concrete explanation and prevent advancement.

3.4 Preference and procedure

Before learning the procedure, each person privately chooses N or S. Recording preference first is central because it separates what the group wanted from how the rule was implemented. In the benchmark, a public draw determines with probability 0.5 whether the group decision applies or the computer assigns N/S independently with equal probabilities.

Rule S requires three preferences for S. A two-to-two tie implements N. This convention is announced before the choice. Under computer assignment, the screen displays the prior majority and final rule but not individual preferences. Privacy is preserved and direct peer pressure is limited.



Welcome

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.

In this activity, you will make private decisions about a collective rule and the use of an ECU endowment.

General laboratory rules

- Remain quiet throughout the activity.
- Do not talk to or communicate with other participants unless the screen enables a specific channel.
- Follow only the instructions shown on your screen.
- Raise your hand if you encounter a technical problem.

☐ I confirm that I have read and accept these rules.

Start

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Figure 3.1: Institutional cover and general laboratory rules.



Instructions

Benchmark: group decision or computer assignment

Resources and unit of account

Initial individual endowment: 20 ECU.

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

This session does not convert ECU into real money.

The activity

Each group has four participants. In every period, each person receives 20 ECU and decides how much to keep and how much to contribute to a group account. Each person also receives a 4 ECU reserve that cannot be contributed.

Every contributed ECU is added to the group account. The total is multiplied by 0.4, and that amount is paid equally to every member. Thus, each person receives 0.4 ECU for every ECU contributed by any member.

Before contributions, one of two rules is put in force. Rule N applies no deductions. Rule S automatically deducts 4 ECU from anyone who contributes less than 10 ECU.

1

Each person states a rule preference.

2

The procedure determines the rule in force.

3

Each person privately decides how much to contribute.

4

The period results are calculated.

Figure 3.2: Current instructions for the basic edition: initial resources, decision rules, and experimental units. Continuation 1/2.

Payoff = 24 – own contribution + 0.4 × total contributions – automatic deduction.

Rule N

Rule N: no automatic deduction.

Rule S

Rule S: 4 ECU are deducted when one's own contribution is below 10 ECU.

Condition in this session: Benchmark: group decision or computer assignment

After preferences are recorded, a public draw determines whether the group decision or an independent computer assignment applies.

11

When the group decides, Rule S requires at least three preferences for S; a two-to-two tie implements N. When the computer decides, N and S are equally likely and the outcome does not depend on preferences.

Resources and unit of account

Initial individual endowment: 20 ECU.

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

This session does not convert ECU into real money.

The activity

Each group has four participants. In every period, each person receives 20 ECU and decides how much to keep and how much to contribute to a group account. Each person also receives a 4 ECU reserve that cannot be contributed.

Every contributed ECU is added to the group account. The total is multiplied by 0.4, and that amount is paid equally to every member. Thus, each person receives 0.4 ECU for every ECU contributed by any member.

Before contributions, one of two rules is put in force. Rule N applies no deductions. Rule S automatically deducts 4 ECU from anyone who contributes less than 10 ECU.

1

Each person states a rule preference.

2

The procedure determines the rule in force.

3

Each person privately chooses a contribution.

4

The period results are calculated.

Payoff = 24 – own contribution + 0.4 × total contributions – automatic deduction.

Rule N

Rule N: no automatic deduction.

Rule S

Rule S: 4 ECU are deducted when one's own contribution is below 10 ECU.

Condition in this session: Benchmark: group decision or computer assignment

After preferences are recorded, a public draw determines whether the group decision or an independent computer assignment applies.

When the group decides, Rule S requires at least three preferences for S; a two-to-two tie implements N. When the computer decides, N and S are equally likely and the outcome does not depend on preferences.

Continue

Con tecnología de [oTree](#)

Figure 3.3: Current instructions for the basic edition: initial resources, decision rules, and experimental units. Continuation 2/2.



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

Comprehension questions

Benchmark: group decision or computer assignment

Resources and unit of account

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

This session does not convert ECU into real money.

If the group contributes 40 ECU in total, how many ECU does each member receive from the group account?

Your answer: 17. The correct answer is 16. Review the rules: a total of 40 generates 16 ECU for every person; under S, a contribution of 8 triggers a deduction of 4; if everyone contributes 10, each person receives 30 ECU.

Under Rule S, how many ECU are deducted from a person who contributes 8 ECU?

If all four people contribute 10 ECU, what is each person's payoff?

Continue

Con tecnología de oTree

Figure 3.4: Current comprehension check: specific feedback explains the incorrect answer and preserves the other responses.



Practice example

Benchmark: group decision or computer assignment

This example does not affect your payment. All four people contribute 10 ECU, so the group account collects 40 ECU.

Endowment and reserve
minus contribution

14 ECU

Return from the group
account

16 ECU

Deduction under N or S

0 ECU

Individual payoff

30 ECU

Each person receives $24 - 10 + 0.4 \times 40 = 30$ ECU. Under S there is no deduction because the contribution reaches 10 ECU.

Continue

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Figure 3.5: Worked example with no payoff consequences.



Rule preference

Period 1 of 1

Privately indicate which rule you would prefer for this group. Your answer is recorded before you learn which procedure will be used.

I prefer Rule N

It applies no automatic deductions.

I prefer Rule S

It deducts 4 ECU from anyone contributing less than 10 ECU.

Continue

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Figure 3.6: Preference recorded before assignment. Private rule preference.

Rule for the group

Period 1 of 1

Rule in force

Rule S

Rule S: 4 ECU are deducted when one's own contribution is below 10 ECU.

Procedure used

Group decision

Preferences for Rule S

3 / 4

Rule preferred by at least three people

Rule S

Continue

Powered by [oTree](#)

Figure 3.7: Procedure, prior majority, and implemented rule.

3.5 Contribution and outcome

Participants move a slider from 0 to 20 and simultaneously see how much they keep. The active rule remains visible. After submission, a wait page synchronizes the four choices. Results show total and mean contribution, return to every member, own contribution, own deduction, and own payoff. The individual-information condition adds a table by alias.

3.6 Explicit completion

The final active period ends with “Activity completed,” the cumulative total, and a period table. Participants remain quiet while the instructor prepares the report. This explicit screen replaces a technical “No more pages left” message and confirms that the data were recorded.



Contribution decision

Period 1 of 1

Choose how many of your 20 ECU to contribute to the group account. You keep the ECU you do not contribute.

Rule in force

Rule S

Under Rule S, 4 ECU are deducted if your contribution is below 10 ECU.

Contribution to the group account



Contribution to the group account

10 ECU

ECU kept from the endowment

10 ECU

Continue

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Figure 3.8: Decision and period result. Contribution decision.



Period result

Period 1 of 1

Rule in force

Rule S

Group decision

Total group contribution

40 ECU

Mean contribution

10 ECU

Return to each member

16 ECU

Mean group payoff

30 ECU

Your contribution

10 ECU

Your automatic deduction

0 ECU

Your payoff

30 ECU

Continue

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Figure 3.9: Aggregate and individual outcome.



Resultado del periodo

Periodo 1 de 10

Regla vigente

Regla N

Asignación por computadora

Aporte total del grupo

32 ECU

Aporte promedio

8 ECU

Retorno para cada integrante

12.80 ECU

Pago promedio del grupo

28.80 ECU

Su aporte

8 ECU

Su descuento automático

0 ECU

Su pago

28.80 ECU

Resultados por alias

Integrante	Su aporte	Descuento	Pago individual
Integrante 1	8	0	28.80
Integrante 2	8	0	28.80
Integrante 3	8	0	28.80
Integrante 4	8	0	28.80

Continuar

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Figure 3.10: Individual-information condition: contributions, deductions, and payoffs by alias.



Activity completed

Benchmark: group decision or computer assignment

You have completed all periods. Please remain quiet while the instructor prepares the results discussion.

Cumulative total

30 ECU

Period	Rule in force	Your contribution	Deduction	ECU earned
1	Rule S	10	0	30

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Figure 3.11: Explicit completion and cumulative participant summary.

Benchmark economic model

4.1 Sequence and payoffs

Let $c_i \in \{0, 1, \dots, 20\}$ be person i 's contribution and let $C = \sum_{j=1}^4 c_j$. Every person receives $0.4C$. Under rule $r \in \{N, S\}$,

$$\pi_i = 24 - c_i + 0.4C - 4\mathbf{1}\{r = S \text{ and } c_i < 10\}.$$

The constant 24 combines the decision endowment and reserve. A contributed ECU costs its contributor one ECU and returns 0.4, so its marginal private monetary effect is -0.6 . It generates $4(0.4) = 1.6$ for the group and costs one, increasing total surplus by 0.6 before deductions.

Theoretical foundation

Without the discontinuous deduction, zero contribution is strictly dominant for a person who maximizes only own monetary payoff. The collective optimum is for everyone to contribute 20. The conflict between private incentive and total surplus defines the social dilemma.

4.2 Prediction under Rule N

Under N, payoff is $24 + 0.4C_{-i} - 0.6c_i$. For any vector of others' contributions, reducing one's own contribution by one raises own payoff by 0.6. Thus $c_i = 0$ strictly dominates every positive contribution, and the unique pure-strategy Nash equilibrium is $(0, 0, 0, 0)$. Each person earns 24 and the group earns 96.

The social optimum under N is $(20, 20, 20, 20)$. Each person earns $24 - 20 + 0.4(80) = 36$, and the group earns 144. The 48 ECU gap between equilibrium and optimum is the surplus lost when everyone follows only the private monetary incentive. Positive contributions do not invalidate the calculation; they show that own monetary payoff alone does not summarize every motive, belief, or error.

4.3 Prediction under Rule S

Rule S creates a discontinuity at 10. For any $c_i < 10$, the person loses 4. Within 0–9, raising a contribution remains costly because the marginal effect is -0.6 . Moving from 9 to 10 avoids the deduction, producing a payoff change of $-0.6 + 4 = 3.4$, so 10 dominates 9. But comparing 0 with 10 gives

$$\pi_i(10) - \pi_i(0) = -6 + 4 = -2.$$

An own-payoff maximizer therefore prefers 0 to 10. The sanction is intentionally mild and does not eliminate free riding. Its teaching value lies in studying compliance, expectations, and institutional origin when material deterrence alone cannot explain a high contribution.

Under S, the main individual candidates are 0 and 10. Contributing 20 is 6 ECU worse privately than contributing 10, although it raises group surplus. All-zero contributions pay 20 per person; all-10 pays 30; all-20 pays 36. Instructors should separate three objects: monetary equilibrium, compliance with the threshold, and efficiency. Reaching 10 avoids a deduction and raises surplus, but it is not the collective maximum of 20.

4.4 Rule origin and selection

Suppose groups preferring S are already more cooperative. If those groups vote for S and subsequently contribute more than N groups, the difference combines selection and the rule's effect. Random N/S assignment helps, but simply comparing chosen S with imposed S is still insufficient because the groups choosing S may have stronger prior cooperative preferences. The design records the majority before the draw so instructors can compare groups whose majority preferred S and obtained it by vote with groups whose majority preferred S and received it by computer.

[Dal Bó, Foster y Putterman \(2010\)](#) develop an experimental strategy to separate the effect of choosing a policy from selection into that policy. This activity retains the intuition of recording preferences and exogenously varying procedure, but it does not replicate every feature of the original protocol. A small class can contain empty cells, which the report must display rather than conceal.

4.5 Social preferences and beliefs

Contributions may reflect altruism, inequality aversion, reciprocity, norms, conditional cooperation, or errors. Rule S can also coordinate expectations: if someone believes the threshold will induce others to contribute, that person may respond cooperatively even when the deduction is not strictly deterrent. [Tyran y Feld \(2006\)](#) find that mild sanctions can work better when endogenously chosen and connect compliance to expected cooperation.

Choosing S does not by itself reveal a taste for punishment. It may express demand for coordination, beliefs about peers, preference for an equal rule, or an attempt at collective commitment. Likewise, choosing N does not demonstrate selfishness: someone may reject the mechanism and still contribute 20. Preference, rule, contribution, and deduction remain separate data fields precisely so the discussion does not turn one choice into a moral label.

Theory and evidence

5.1 Chosen and imposed institutions

The central question is whether procedure changes behavior beyond the material content of the rule. [Dal Bó, Foster y Putterman \(2010\)](#) show experimentally that a policy can have a stronger effect on cooperation when democratically chosen than when exogenously imposed. Their design emphasizes the need to control selection. The result does not imply that every vote improves every policy; it identifies an effect in a particular environment under a particular strategy.

[Sutter, Haigner y Kocher \(2010\)](#) examine endogenous choice between reward and punishment institutions in social dilemmas and report stronger cooperation under selected institutions. [Markussen, Putterman y Tyran \(2014\)](#) study voting over sanction regimes and find that adoption by vote can improve the performance of some institutions. Together these studies motivate a teaching family that records preferences, rule origin, conduct, and welfare at the same time.

5.2 Mild sanctions and norm activation

A deterrent sanction makes noncompliance unattractive even to a purely monetary agent. The 4 ECU deduction here fails that test when 0 is compared with 10. If S raises contributions, the explanation cannot rest only on fear of the material penalty. A descriptive norm, prescriptive norm, reciprocity expectation, or signal about appropriate behavior may operate.

Research on punishment in public-goods settings shows that costly sanctions can sustain cooperation, although they consume resources and can provoke retaliation ([Fehr y Gächter, 2000](#)). The current deduction is automatic: no peer selects a target and no person pays to impose it. This is a formal rule, not peer punishment, and the distinction should remain explicit.

5.3 Procedural utility

Procedural utility means that individuals value not only outcomes but also how decisions are made. [Frey y Stutzer \(2005\)](#) develop and measure this idea in relation to participation rights. The congruence condition brings the concept into class without assuming that one acceptability rating is a pure measure. Ratings can respond to outcome, own preference, perceived fairness, payoff satisfaction, or procedure.

To teach the concept, compare people facing the same rule and parameters after different procedures, then ask whether the rule matched their preference. Timing matters: preference is recorded before the procedure; acceptability is elicited after it. Even so, classroom ratings are descriptive and

should not be presented as a causal estimate.

5.4 Voice, transparency, and reputation

Voice is the ability to express a recommendation without controlling the decision. Messages appear only when the computer will assign the rule; they change neither probabilities nor payoffs. Behavioral changes can arise through expectations, group identity, or expressive commitment. This is not unrestricted deliberation: the N/S/no-recommendation menu limits content and protects the classroom.

Information by alias changes the environment after a contribution. Although an alias hides real identity, it makes behavior observable within a fixed group and can create experimental reputation. It should not automatically be combined with voice or appeal. Each extension is a separate preset so that a comparison has one clear procedural difference.

5.5 Appeal and representation

Appeal permits a review after five periods. The initial rule remains unless three people vote to switch. If the threshold is met, the other rule applies from period six onward without another draw. This creates a clear midpoint, yet a before/after contrast is not causal because experience, time trends, and disappointment also change.

Representation by lot records all four preferences and randomly selects one person. The chosen person's preferred rule is implemented. This differs from majority rule and exogenous assignment: the representative expresses a real preference but can belong to the minority. The condition supports discussion of equal opportunity, mandate, congruence, and acceptance without claiming to reproduce a real legislature.

5.6 Scope and limits

The laboratory simplifies complex institutions. N and S are complete and transparent, whereas real compliance depends on monitoring, enforcement, trust, and many sanctions. Voice is structured, representation lasts one block, and appeal uses a fixed threshold. These limits are pedagogically useful because they isolate mechanisms, but they restrict external validity.

Attention

A difference between two classroom sessions does not automatically identify a causal effect. Credible inference requires appropriate assignment, comparable groups, enough independent units, and analysis at the level where treatment and interaction occur.

5.7 Basic modes

5.8 One interaction

`legitimacy_en_one_interaction` removes strategic history. Each group states preferences once, learns the procedure, contributes, and finishes. Use it to introduce private versus social incentives or to add an institutional exercise to a lecture without devoting the full session to the lab. A

demonstration has two groups with eight participants, but a serious comparison needs more independent groups.

5.9 Ten periods with a fixed group

`legitimacy_en_10_fixed_group` keeps the group and initial rule. Participants observe outcomes and learn about peers. Repetition introduces reputation, reciprocity, and serial dependence. Falling contributions may reflect learning about incentives; rising contributions may reflect coordination; no time path has a unique interpretation.

5.10 Ten periods with reassigned groups

`legitimacy_en_10_random_groups` treats every period as a separate institutional block: groups are reassigned, preferences are recorded again, and a new procedure is run. A rule never travels from one group to another. Re-encounters can occur in a small class. Reassignment reduces group continuity but does not remove general learning about the activity.

Extended variants

6.1 Complete map

Condition	Changed element	Teaching question
Benchmark	Vote or assignment with probability 0.5	Does behavior change with the origin of the same rule?
Voice	Message before exogenous rule draw	Can expression without authority coordinate expectations?
Individual information	Contributions visible by alias	Does observability create reputation or convergence?
Congruence	Rating from 0 to 10	Does matching one's preference matter for acceptance?
Appeal	Switch vote after period five	Do experience and review change support and compliance?
Representation	Preference of a delegate chosen by lot	How does representation compare with majority and assignment?

6.2 Extended benchmark

The benchmark repeats ten periods with a fixed group. Vote or computer assignment produces one stable rule. Stability provides a behavioral time path without another mechanism. Compare N and S while conditioning on prior majority preference. The report shows rule-S frequency, contributions, compliance, and payoffs.

The monetary prediction remains zero under both rules. A coordination prediction allows S to raise contributions if it changes expectations or activates a norm. If S lowers contributions, possible accounts include reactance, motivational crowd-out, or sampling variation. The theory does not permit the instructor to correct the result.

6.3 Voice without decision authority

When the procedure is exogenous, every member sends N, S, or no recommendation before the computer draws the rule. The group sees aggregate messages. Messages are not votes, do not alter the 0.5 probability, and do not bind contributions. The appropriate comparison is voice versus

benchmark among computer-assigned groups.



Instrucciones

Voz sin poder de decisión

La actividad

Cada grupo está formado por cuatro participantes. En cada periodo, cada persona recibe 20 ECU para decidir cuánto conservar y cuánto aportar a una cuenta del grupo. Además, recibe una reserva de 4 ECU que no puede aportar.

Cada ECU aportada se suma a la cuenta del grupo. El total se multiplica por 0.4 y esa cantidad se entrega por igual a cada integrante. Por ello, cada persona recibe 0.4 ECU por cada ECU aportada por cualquier integrante.

Antes de contribuir se determina cuál de dos reglas estará vigente. La Regla N no aplica descuentos. La Regla S descuenta automáticamente 4 ECU a quien aporte menos de 10 ECU.

1

Cada persona indica qué regla prefiere.

2

El procedimiento determina la regla vigente.

3

Cada persona elige su aporte en privado.

4

Se calculan los resultados del periodo.

Figure 6.1: Voice without formal control. Instructions for voice. Continuation 1/2.

During the debrief, separate preference information, expectation coordination, and expressive commitment. Do not compare people recommending S with those recommending N as if the message were randomized. The message is a choice that may reveal participant type.

Regla N

6.4 Individual information by alias

Regla S

Regla S: se descuentan 4 ECU si el aporte propio es menor que 10 ECU.

The results page adds a table with contribution, deduction, and payoff for every alias. Nothing changes before contributions. In a fixed group, this information can support reciprocity or informal sanction through future contributions. The alias protects external identity while remaining stable enough for experimental reputation.

Compare the time path with the benchmark. A first-period difference is not caused by already observed contribution data, because disclosure occurs afterward; anticipation may nevertheless matter. Later changes are consistent with social learning but do not uniquely identify reciprocity.

6.5 Congruence and acceptability

Continuar

After the procedure and rule are known, every person rates acceptability from 0 to 10. The report separates those obtaining their preferred rule from those who do not. This describes procedural winners and losers; congruence itself is not randomized.

Do not treat one rating as a complete measure of legitimacy. It records stated acceptability at a particular time and can launch discussion about procedure and outcome, not diagnose a stable political attitude.

Antes de contribuir se determina cuál de dos reglas estará vigente. La Regla N no aplica descuentos. La Regla S descuenta automáticamente 4 ECU a quien aporte menos de 10 ECU.

1
Cada persona indica qué regla prefiere.

2
El procedimiento determina la regla vigente.

3
Cada persona elige su aporte en privado.

4
Se calculan los resultados del periodo.

Pago = 24 – aporte propio + 0.4 × aportes totales – descuento automático.

Regla N
Regla N: no hay descuento automático.

Regla S
Regla S: se descuentan 4 ECU si el aporte propio es menor que 10 ECU.

Condición de esta sesión: Voz sin poder de decisión
Cuando la computadora decide, el grupo envía mensajes estructurados antes del sorteo de la regla. Los mensajes no alteran probabilidades ni pagos.

Cuando decide el grupo, la Regla S requiere al menos tres preferencias por S; con dos votos para cada regla se aplica N. Cuando decide la computadora, N y S tienen la misma probabilidad y el resultado no depende de las preferencias.

Continuar

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Figure 6.2: Voice without formal control. Instructions for voice. Continuation 2/2.

Mensaje estructurado

Periodo 1 de 10

La computadora determinará la regla. Antes del sorteo, cada integrante puede enviar un mensaje no vinculante al grupo. Los mensajes no cambian las probabilidades ni los pagos.

Recomiendo la Regla N

Recomiendo la Regla S

No deseo hacer una recomendación

Continuar

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Figure 6.3: Structured message menu.



Instrucciones

Preferencia y evaluación de la regla

La actividad

Cada grupo está formado por cuatro participantes. En cada periodo, cada persona recibe 20 ECU para decidir cuánto conservar y cuánto aportar a una cuenta del grupo. Además, recibe una reserva de 4 ECU que no puede aportar.

Cada ECU aportada se suma a la cuenta del grupo. El total se multiplica por 0.4 y esa cantidad se entrega por igual a cada integrante. Por ello, cada persona recibe 0.4 ECU por cada ECU aportada por cualquier integrante.

Antes de contribuir se determina cuál de dos reglas estará vigente. La Regla N no aplica descuentos. La Regla S descuenta automáticamente 4 ECU a quien aporte menos de 10 ECU.

1

Cada persona indica qué regla prefiere.

2

El procedimiento determina la regla vigente.

3

Cada persona elige su aporte en privado.

4

Se calculan los resultados del periodo.

Pago = 24 – aporte propio + 0.4 × aportes totales – descuento automático.

Regla N

Regla N: no hay descuento automático.

Regla S

Regla S: se descuentan 4 ECU si el aporte propio es menor que 10 ECU.

Condición de esta sesión: Preferencia y evaluación de la regla

Después de determinar la regla, cada persona evalúa en privado su aceptabilidad en una escala de 0 a 10.

Cuando decide el grupo, la Regla S requiere al menos tres preferencias por S; con dos votos para cada regla se aplica N. Cuando decide la computadora, N y S tienen la misma probabilidad y el resultado no depende de las preferencias.

Continuar

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Figure 6.5: Post-procedure evaluation. Congruence instructions. Continuation 2/2.

Evaluación de la regla

Periodo 1 de 10

Regla S

En una escala de 0 a 10, indique qué tan aceptable le parece que esta regla se aplique al grupo mediante el procedimiento utilizado.

0 = nada aceptable



5

10 = completamente aceptable

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Figure 6.6: Private acceptability scale.

6.6 Appeal

After period five, each person votes to keep the current rule or switch. Three votes trigger the change. The computer does not intervene, and the resulting rule applies in periods 6–10. The design creates a clean procedural midpoint and records demand for revision.

Compare pre- and post-review levels and trends, but explain that the temporal change is not a pure causal effect. Appeal responds to prior experience. Treat it as an endogenous outcome: which groups request change, what happens after a failed appeal, and does the new rule improve payoffs or merely compliance?

6.7 Representation by lot

All four preferences are recorded before selecting the representative. The computer draws positions with equal probability and implements that person's preferred rule. The screen shows the alias, majority, and final rule. A minority rule may therefore originate from a participant rather than a computer.

The condition does not model campaigns, legislative bargaining, or accountability. It isolates a minimal form of delegation. Compare it with majority and assignment conditional on individual and group preferences; do not call a difference across one session of each type an identified representation effect.



Instrucciones

Revisión de la regla a mitad del bloque

La actividad

Cada grupo está formado por cuatro participantes. En cada periodo, cada persona recibe 20 ECU para decidir cuánto conservar y cuánto aportar a una cuenta del grupo. Además, recibe una reserva de 4 ECU que no puede aportar.

Cada ECU aportada se suma a la cuenta del grupo. El total se multiplica por 0.4 y esa cantidad se entrega por igual a cada integrante. Por ello, cada persona recibe 0.4 ECU por cada ECU aportada por cualquier integrante.

Antes de contribuir se determina cuál de dos reglas estará vigente. La Regla N no aplica descuentos. La Regla S descuenta automáticamente 4 ECU a quien aporte menos de 10 ECU.

1

Cada persona indica qué regla prefiere.

2

El procedimiento determina la regla vigente.

3

Cada persona elige su aporte en privado.

4

Se calculan los resultados del periodo.

Pago = 24 – aporte propio + 0.4 × aportes totales – descuento automático.

Regla N

Regla N: no hay descuento automático.

Regla S

Regla S: se descuentan 4 ECU si el aporte propio es menor que 10 ECU.

Condición de esta sesión: Revisión de la regla a mitad del bloque

Después del quinto periodo, el grupo vota si desea cambiar de regla. Se requieren tres votos y no interviene un nuevo sorteo.

Cuando decide el grupo, la Regla S requiere al menos tres preferencias por S; con dos votos para cada regla se aplica N. Cuando decide la computadora, N y S tienen la misma probabilidad y el resultado no depende de las preferencias.

Continuar

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Figure 6.8: Appeal condition: the rule can be reviewed at the midpoint. Continuation 2/2.



Revisión de la regla

Periodo 5 de 10

El grupo puede conservar la regla actual o cambiar a la otra regla para los periodos 6 a 10. El cambio requiere al menos tres votos.

Regla vigente

Regla S

Regla alternativa

Regla N**Conservar la regla actual**

Regla S

Cambiar a la otra regla

Regla N

ContinuarPowered by [oTree](#)

Figure 6.9: Institutional review. Vote to keep or switch.



Resultado de la revisión

Periodo 5 de 10

Votos por cambiar

2 / 4

El grupo conservó la regla.

Regla para los periodos restantes

Regla S**Continuar**Powered by [oTree](#)

Figure 6.10: Outcome and rule for remaining periods.



Instrucciones

Representación por sorteo

La actividad

Cada grupo está formado por cuatro participantes. En cada periodo, cada persona recibe 20 ECU para decidir cuánto conservar y cuánto aportar a una cuenta del grupo. Además, recibe una reserva de 4 ECU que no puede aportar.

Cada ECU aportada se suma a la cuenta del grupo. El total se multiplica por 0.4 y esa cantidad se entrega por igual a cada integrante. Por ello, cada persona recibe 0.4 ECU por cada ECU aportada por cualquier integrante.

Antes de contribuir se determina cuál de dos reglas estará vigente. La Regla N no aplica descuentos. La Regla S descuenta automáticamente 4 ECU a quien aporte menos de 10 ECU.

1

Cada persona indica qué regla prefiere.

2

El procedimiento determina la regla vigente.

3

Cada persona elige su aporte en privado.

4

Se calculan los resultados del periodo.

Pago = 24 – aporte propio + 0.4 × aportes totales – descuento automático.

Regla N

Regla N: no hay descuento automático.

Regla S

Regla S: se descuentan 4 ECU si el aporte propio es menor que 10 ECU.

Condición de esta sesión: Representación por sorteo

Después de registrar las preferencias, la computadora selecciona al azar un representante y aplica la regla que esa persona prefirió.

Cuando decide el grupo, la Regla S requiere al menos tres preferencias por S; con dos votos para cada regla se aplica N. Cuando decide la computadora, N y S tienen la misma probabilidad y el resultado no depende de las preferencias.

Continuar

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Figure 6.12: Random representation with recorded preferences. Representation instructions. Continuation 2/2.



Rule for the group

Period 1 of 10

Rule in force

Rule N

Rule N: no automatic deduction.

Procedure used

**Representative selected
by lot**

Preferences for Rule S

3 / 4

Rule preferred by at least three people

Rule S

Selected representative

Member 1

Continue

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Figure 6.13: Selected representative and implemented rule.

Instructor report and debrief

7.1 Controlled reveal

The report can be opened from the beginning, but aggregates remain hidden while active decisions are pending. When every contribution is recorded, **Reveal results** becomes available. The instructor controls projection and can hide the display again. Early finishers therefore cannot influence those still deciding through public statistics.

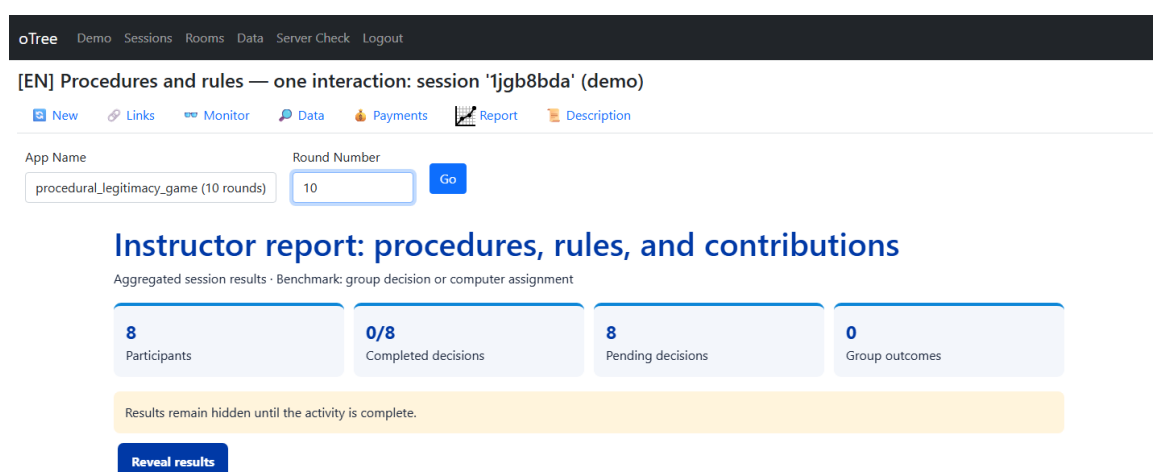


Figure 7.1: Controlled results. Report before reveal.

7.2 Indicators and denominators

Cards report participants, completed decisions, and group-periods. Mean contribution uses completed choices; compliance is the share with $c_i \geq 10$; deductions count people actually losing 4 ECU; periods under S use group-periods; group decision describes origin; preference for S uses available constitutional choices. The acceptability count is zero outside the congruence condition.

The histogram uses bins 0–4, 5–9, 10–14, 15–19, and 20 so bunching around the threshold remains visible. Evolution reports contribution, compliance, rule, and payoff by period. Origin rows distinguish group decision, computer, and representative. A row with no observations is an empty cell, not an observed mean of zero.

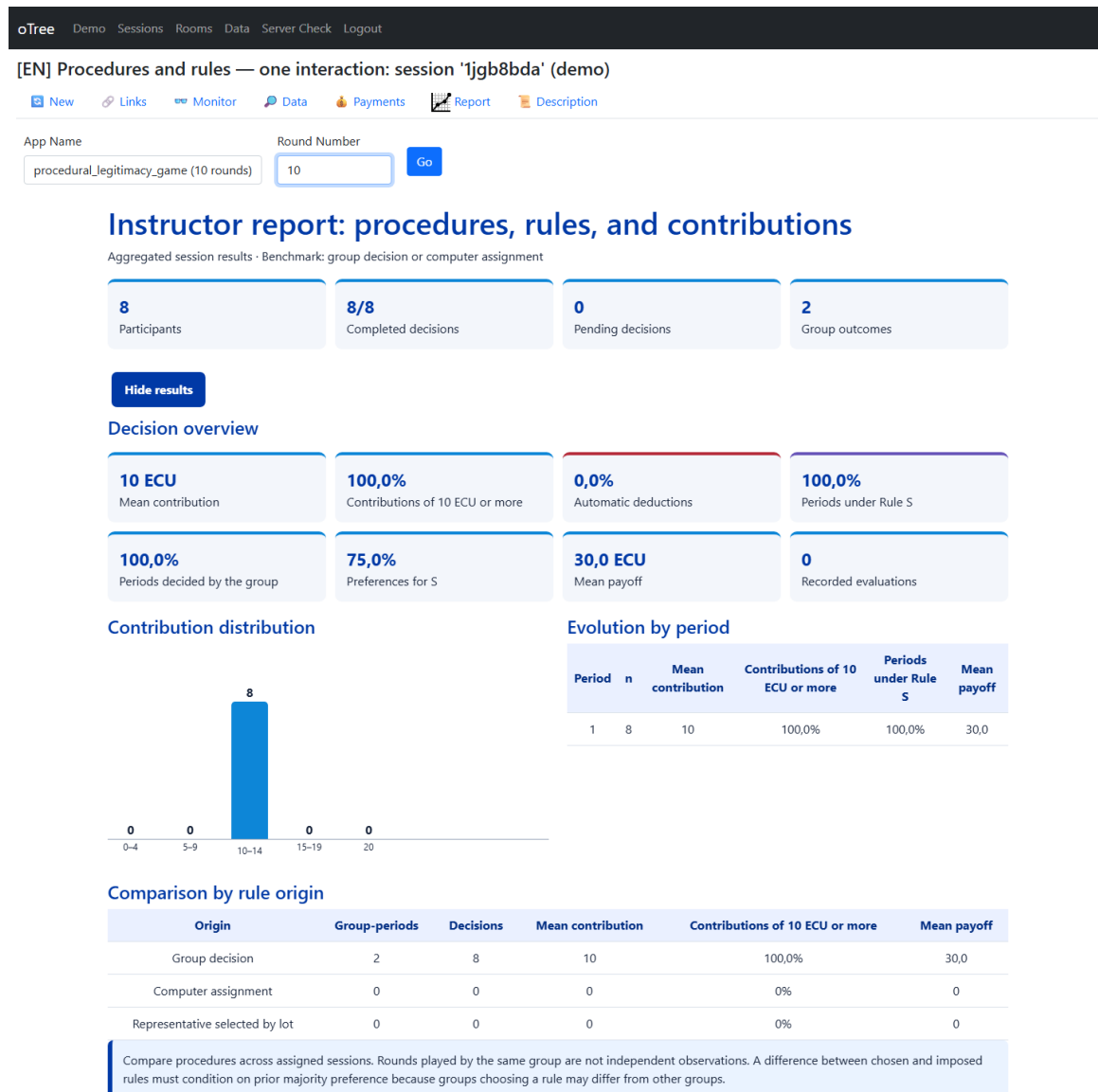


Figure 7.2: Aggregates, histogram, and comparisons.

7.3 Debrief script

Feedback script

First ask for the monetary prediction without showing results. Second reveal the histogram and describe its shape. Third compare N and S while separating rule from procedure. Fourth examine the time path and variants. Fifth discuss mechanisms, welfare, and inferential limits. End by asking for a new hypothesis that another session could test.

A useful prompt is: “We observe a difference; which comparison produced it?” High contributions may reflect conditional cooperation, beliefs, norms, or selection. Low contributions may reflect incentives, distrust, or reactance. If sanctions increase compliance but lower some payoffs, separate compliance from welfare. If voting and assignment look similar, that is also evidence: this class and sample show no visible gap.

7.4 Lesson plans

7.5 Fifty-minute session

Allow five minutes for entry, ten for instructions and comprehension, ten for one interaction, twenty for debrief, and five for closure. Before reveal, calculate equilibrium under N and compare 0 with 10 under S. Project the histogram and end with the distinction between choice and imposition.

7.6 Eighty-minute session

Use ten periods with a fixed group or one extended variant. Allocate ten minutes to theory, thirty to play, and thirty to the report. Ask half the class to predict contributions and half to predict acceptability. Compare at the end. Do not comment between periods in ways that could alter conduct.

7.7 Parallel-session comparison

Assign parallel groups to benchmark and voice or benchmark and individual information. Hold periods and group size fixed. Do not expose everyone to one treatment and then another in a single order without counterbalancing: learning and carryover contaminate the contrast. Treat each group as the dependent unit and show group points where possible.

7.8 Advanced seminar

Ask students to construct a table containing prior majority, procedure, rule, mean contribution, and compliance. They must propose a conditional comparison, explain selection, state the clustering level, and mark empty cells. They can then compare the teaching design with [Dal Bó, Foster y Putterman \(2010\)](#), listing retained ideas and adaptations.

7.9 Questions and solved exercises

7.10 Questions before reveal

1. What is the own-money best response under N if everyone else contributes 20?
2. Does the S deduction make contribution 10 dominate contribution zero?
3. Why record preferences before drawing the procedure?
4. Which comparison best separates selection into a rule from rule origin?
5. Can a rule increase compliance while reducing welfare?
6. How does voice differ from voting?
7. Why can an alias influence later periods while preserving external anonymity?
8. What does an empty report cell mean?

7.11 Interpretation problems

A mean does not display heterogeneity. Compliance does not equal maximum contribution. Stated acceptability is not a complete measure of legitimacy. Higher cooperation after a vote may reflect selection. A falling time path does not prove rational learning. A change after appeal does not prove that switching rules caused it. Always request the denominator, experimental unit, measurement timing, and an alternative explanation.

7.12 Short rubric

An excellent answer calculates correctly, separates private and social predictions, identifies the relevant procedure, proposes a valid comparison, and states a limitation. A competent answer calculates and describes but does not develop identification. An inadequate answer confuses contribution with payoff, treats association as effect, or assigns moral motives without evidence.

Bank of quantitative and interpretation cases

The following cases support calculation and critical interpretation before or after the session. Each solution states the mechanism and an interpretive caution.

8.1 1. Group return

Problem. The group contributes 32 ECU. Calculate the return to each member and the total distributed.

Reasoned solution

Each person receives $0.4(32)=12.8$ ECU; the group receives 51.2. Since 32 was contributed, net surplus created is 19.2.

8.2 2. Payoff under N

Problem. One person contributes 6 and the group total is 30 under N. What is the payoff?

Reasoned solution

Payoff is $24-6+0.4(30)=30$ ECU. Rule N applies no deduction.

8.3 3. Payoff under S

Problem. The same person contributes 6 and total contribution is 30 under S. What is the payoff?

Reasoned solution

Payoff before the deduction is 30; because 6 is below 10, 4 is deducted and final payoff is 26.

8.4 4. Discontinuous threshold

Problem. Compare contributing 9 and 10 while holding others fixed under S.

Reasoned solution

The extra ECU has a net private cost of 0.6 but avoids a deduction of 4. Moving from 9 to 10 raises own payoff by 3.4.

8.5 5. Zero versus ten

Problem. Compare contributing 0 and 10 under S with others fixed.

Reasoned solution

Contributing 10 costs 6 net ECU and avoids 4; it remains 2 ECU below contributing zero. The sanction is mild, not deterrent.

8.6 6. Institutional tie

Problem. Two people prefer S and two prefer N. If the group decision applies, which rule is implemented?

Reasoned solution

N applies because S requires at least three preferences. The tie rule is announced before choices.

8.7 7. Exogenous assignment

Problem. The majority prefers S, but the computer assigns N. Is this an error?

Reasoned solution

No. Under the exogenous procedure, N/S are drawn with equal probability independently of preferences.

8.8 8. Minority representative

Problem. Three prefer S and the selected representative prefers N. Which rule applies?

Reasoned solution

N applies. The condition represents delegation by lot; the majority is reported but does not decide.

8.9 9. Voice

Problem. Everyone recommends S and the computer draws N. Did messages change the probabilities?

Reasoned solution

No. Voice is nonbinding. Any effect operates through expectations or expression, not through the draw rule.

8.10 10. Information and anticipation

Problem. The alias condition differs from the benchmark in period one. Can this come from already observed information?

Reasoned solution

No, the table appears after contribution. Anticipation of future observability, sample selection, or chance may matter.

8.11 11. Congruence

Problem. A person preferred S, received S by computer, and rated 9. Does this prove procedural utility?

Reasoned solution

No. The rating combines congruence, outcome, payoff, and other perceptions. It is descriptive.

8.12 12. Appeal

Problem. Three vote to replace N with S after period five. When does S apply?

Reasoned solution

S applies from period six through ten. No new draw occurs.

8.13 13. Efficiency

Problem. Compare all zero under N with all twenty.

Reasoned solution

All zero produces 96 total ECU; all twenty produces 144. Full cooperation creates a social gain of 48.

8.14 14. Compliance and welfare

Problem. A group under S moves from contributions of 9 to contributions of 10. What changes?

Reasoned solution

Four deductions disappear and higher contributions create surplus. Compliance and payoffs rise here, but remain distinct concepts.

8.15 15. Experimental unit

Problem. Forty decisions come from four people over ten periods. Are there forty independent units?

Reasoned solution

No. Decisions share group, history, and treatment. The independent unit is at most the assigned group.

8.16 16. Empty cell

Problem. No majority-S group received S by computer. What mean should be reported?

Reasoned solution

The cell should appear with no observations. Replacing it with zero would manufacture a result.

8.17 17. Selection

Problem. Groups voting for S contribute more. Give an alternative to a voting effect.

Reasoned solution

Those groups may have been more cooperative before the procedure. Prior majority records this selection.

8.18 18. Histogram

Problem. The mean is 10, but half contribute 0 and half 20. What does the mean omit?

Reasoned solution

It hides polarization and the absence of observations near the threshold. The histogram reveals the structure.

8.19 19. External validity

Problem. Voice raises contributions in one class. Does that imply a real public hearing will raise compliance?

Reasoned solution

No. Structured voice, anonymity, student participants, and payoffs limit extrapolation.

8.20 20. Next design

Problem. Propose a session contrasting voice and voting without combining other mechanisms.

Reasoned solution

Assign parallel groups, hold the rule, parameters, periods, and information fixed, and change only whether the message advises or determines.

8.21 Glossary and conceptual map

Contribution	Amount of the 20 ECU endowment sent to the group account.
Compliance	Contribution of at least 10 ECU, which avoids the deduction under S.
Congruence	Match between an individual's prior preference and the implemented rule.
Group decision	Procedure implementing S when at least three people prefer S.
Assignment	Computer draw of N/S independent of preferences.
Mild sanction	Deduction that does not make compliance optimal for an own-payoff maximizer.
Voice	Opportunity to recommend without authority to determine the outcome.
Representation	Implementation of the preference of one person selected by lot.
Appeal	Mid-block vote to keep or switch the rule.
Institutional selection	Pre-existing differences between groups choosing different rules.
Procedural effect	Change attributable to how a rule was reached while holding its content fixed.
Group-period	One group observed in one period, used as a descriptive denominator.

The conceptual map links private incentive to social dilemma, rule to material content, procedure to origin, prior preference to selection, and acceptability to post-procedure evaluation. Keeping these pairs separate prevents one statistic from carrying too many interpretations.

Notes for rigorous interpretation

9.1 Separate the rule from the procedure

The design contains two objects that the instructor should keep separate throughout the discussion. The first is the substantive rule: N applies no deductions, whereas S deducts 4 ECU from anyone who contributes less than 10 ECU. The second is the procedure that produces the rule: group choice, computer assignment, or selection of a representative. Two groups may both end under S while reaching it through different routes. The relevant teaching comparison therefore goes beyond asking whether S raises contributions. It also asks whether the same rule produces different responses when participants had a role in choosing it.

This distinction prevents a common but mistaken inference. If groups that choose S contribute more than groups assigned N by the computer, the observed difference combines rule content, procedural origin, and prior group composition. People who prefer S may already be more willing to contribute. The report therefore preserves the preference recorded before the procedure is known. The instructor can first display the descriptive comparison and then ask which variables would have to be held constant to attribute the difference to the procedure. This sequence turns the classroom result into a concrete lesson about causal identification.

9.2 Use the public randomization

In the benchmark condition, the system records preferences and then conducts a public 0.5 draw that determines whether the group or the computer selects the rule. The order is deliberate. Recording preferences first prevents participants from adapting their stated preference to a procedure they already know. The later draw creates groups that are comparable in expectation with respect to observed and unobserved preferences. A procedural comparison still requires many independent units; a single realization can display a large difference by chance.

During the debrief, it is useful to draw three columns: assigned procedure, resulting rule, and subsequent contribution. The first column is the exogenous source of variation. The second is an intermediate outcome that can itself respond to treatment. The third is the final behavior. Conditioning carelessly on the resulting rule can destroy the comparability created by random assignment. For example, comparing only groups under S selects different subsets within each procedure. This observation offers an accessible introduction to the distinction among an intention-to-treat effect, a rule effect, and an effect of the rule's procedural origin.

9.3 Read levels, trends, and dependence

The report provides means, distributions, and changes over periods because each summary answers a different question. A mean communicates central magnitude but can conceal polarization. Two groups may both average 10 ECU: in one, everyone contributes 10; in the other, half contribute 20 and half contribute zero. The histogram reveals this difference. The time profile can reveal learning, reciprocity, fatigue, or movement toward a shared norm. None of these patterns, by itself, identifies the psychological mechanism that produced it.

Repeated decisions within a group are related. Four members who interact for ten periods do not generate forty independent observations. Their choices respond to a common history and institutional environment. For classroom purposes, it is enough to recognize this dependence and treat the group as the natural unit of analysis. In a formal research project, standard errors should respect the assignment unit and panel structure. The guide does not turn one teaching session into a definitive estimate; it uses the session to teach what evidence a defensible conclusion would require.

9.4 Distinguish compliance, cooperation, and welfare

Contributing at least 10 ECU under S avoids the deduction, so the report labels this event operational compliance. Yet meeting the threshold is not the same as maximizing the contribution and does not establish civic motivation. A person may contribute exactly 10 to avoid a loss, contribute 20 because of a social preference, or contribute less than 10 while knowingly accepting the deduction. The same observable choice can be consistent with incentives, reciprocity, inequality aversion, internalized norms, or misunderstanding.

Welfare is not summarized by the compliance rate either. A deduction destroys ECU and can reduce earnings even when it changes behavior. Rule S may raise total contributions while also generating costs when some members remain below the threshold. The instructor should compare aggregate contributions, the frequency of deductions, and mean payoffs. The class can also discuss dimensions that monetary earnings do not directly measure, including procedural acceptability, autonomy, and frustration. This discussion shows why evaluating an institution requires an explicit normative criterion.

9.5 Interpret voice, appeal, and representation

The voice variant permits a structured message while the computer retains decision authority. The message changes neither probabilities nor payoffs. If behavior changes, the session suggests that communicating a recommendation may make a norm salient, coordinate expectations, or create a perceived obligation. These explanations compete with one another. Distinguishing them would require additional treatments, belief measures, or changes in privacy and publicity. The responsible conclusion is to describe the pattern and propose mechanisms rather than claim that one mechanism has been proven.

Appeal introduces a review after period five. The vote affects the remaining periods and requires three supporters. The instructor can examine whether the group responds to accumulated experience, rejects a rule that produced deductions, or retains an institution that helped coordinate contributions. Representation instead concentrates authority in one randomly selected person. The resulting rule reflects one individual preference and need not match the majority. Comparing these conditions supports a discussion of mandate, accountability, and legitimacy of origin without confusing representation with electoral competition.

9.6 Close the session without overclaiming

A sound conclusion distinguishes result, interpretation, and extrapolation. The result is what happened in the session. The interpretation offers an explanation compatible with the design. Extrapolation asks whether the same pattern would appear in organizations, communities, or governments. Each step requires additional assumptions. The instructor can close with four questions: which comparison was generated by random assignment, which intermediate outcome changed along with the procedure, what additional mechanism should be measured to distinguish competing explanations, and which feature of the laboratory limits external validity? This discipline prevents a classroom demonstration from being presented as a universal law while preserving its value for making problems of institutions, selection, compliance, and consent visible.

Annotated references

[Dal Bó, Foster y Putterman \(2010\)](#) is the central reference for separating institutional selection from an effect of choice. [Tyran y Feld \(2006\)](#) connects mild sanctions, endogenous adoption, and expectations. [Sutter, Haigner y Kocher \(2010\)](#) and [Markussen, Putterman y Tyran \(2014\)](#) extend the discussion to endogenous reward and sanction institutions. [Fehr y Gächter \(2000\)](#) helps distinguish an automatic rule from peer punishment. [Frey y Stutzer \(2005\)](#) develops procedural utility. None of these articles exactly reproduces this teaching protocol.

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10.1 Implementation card

For the instructor

Before: select treatment, confirm multiples of four, open Monitor and Report, and share only the room. **During:** do not interpret results between periods, answer technical questions without recommending strategies, and preserve procedural neutrality. **After:** check denominators, reveal the histogram, separate rule from origin, and close with inferential limits.

Proposed routes:

- <https://legitimacy.beer-lab.org/demo>
- https://legitimacy.beer-lab.org/room/legitimacy_en
- https://legitimacy.beer-lab.org/room/legitimacy_extended