



Instructor Guide to Framing Effects

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 selection, implementation, and discussion of the BEER Lab framing-effects family.

The basic edition contains the central contrasts.

The extended edition separates risky choice, attributes, goals, public policy, joint presentation, order, and numeric format so instructors can activate one mechanism or a complete diagnostic.

Author

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For the instructor

All decisions are individual. There are no partners or waiting pages. To preserve the treatment, each student sees only one wording before responding. Do not reveal alternative versions until the session has ended.

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Quick reference

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.

marco — problema de la enfermedad asiática	Efectos de marco / Framing Effects — BEER Lab Seleccione una variante de este juego. Select a version of this game.
marco — ganancias y pérdidas	
marco — atributos: núcleo	
marco — núcleo	
ffects — Asian disease problem	
ffects — gains and losses	
ffects — attribute core	
ffects — core	
marco extendidos — elección riesgosa	
marco extendidos — atributos	
marco extendidos — objetivos	
marco extendidos — política pública	
marco extendidos — presentación conjunta y separada	
marco extendidos — orden de presentación	
marco extendidos — porcentajes y frecuencias	
marco extendidos — diagnóstico completo	
aming Effects — risky choice	
aming Effects — attributes	
aming Effects — goals	
aming Effects — public policy	
aming Effects — joint and separate presentation	
aming Effects — presentation order	
aming Effects — percentages and frequencies	
aming Effects — complete diagnostic	

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

Rooms

Current rooms:

[ES] Efectos de marco
[EN] Framing Effects
[ES] Efectos de marco extendidos
[EN] Extended Framing Effects

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

Room: [EN] Framing Effects

Create a new session

Session Config

[EN] Framing Effects — Asian disease problem ▾

Number of participants

Individual decisions: any positive participant count is allowed.

Create

[Configure session](#) ⚙️

App sequence

framing_effects_game (12 rounds)

Between-subject and within-subject activities on risky-choice, attribute, goal, policy, presentation-order, and numeric-format framing. Most vignettes are hypothetical. The monetary gain/loss task has identical final outcome distributions across frames and can be realized in ECU.

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.

Purpose	Show how different descriptions of equivalent or closely related information affect choices, ratings, and intentions.
Participants	Any number; six or more yield balanced groups and useful denominators.
Basic edition	Asian disease, gains/losses, attributes, or core.
Extended edition	Risky choice, attributes, goals, public policy, presentation, order, numeric format, or full diagnostic.
Interaction	Individual; balanced assignment across frames within the session.
Payoff	Vignettes are hypothetical. Only the monetary decision can produce an ECU balance.
Students	https://framing.beer-lab.org/room/framing_effects_en
Instructor	https://framing.beer-lab.org/demo
Local test	http://localhost:8014/demo with <code>GAME_FAMILY=framing</code> .
Experimental unit	Individual decisions; each person completes their own tasks.
Decision	Choose or evaluate equivalent options presented in different frames.
Topics	framing effects; invariance; decisions under risk; information presentation; behavioral economics.
JEL	C91; D81; D91.

Attention

The framing.beer-lab.org domain is a proposed route. The laboratory must create its DNS record, isolated instance, and separate database before classroom use. The local version is verified on port 8014.

1.2 Learning objectives

After the activity, students should be able to:

- define a framing effect and distinguish it from a real change in outcomes;

- demonstrate equivalence across the Asian-disease and monetary formulations;
- distinguish risky-choice, attribute, and goal framing;
- connect gain and loss frames to changes in risk attitudes;
- explain why survival and mortality, employment and unemployment, or success and failure can produce different evaluations;
- recognize how joint presentation, order, and numeric format alter comparison;
- interpret percentages, means, differences, and denominators without making individual diagnoses.

Theoretical foundation

2.1 Invariance and description dependence

Normative choice theory requires invariance: transparently equivalent formulations should induce the same preference. A framing effect occurs when wording changes the response while relevant outcomes remain fixed. [Tversky and Kahneman \(1981\)](#) demonstrated this pattern with the Asian disease problem. The positive frame commonly raises choice of the sure option, while the negative frame raises choice of the risky option.

Prospect theory provides an account of risky-choice framing. A result represented as a gain can activate concavity and risk aversion; the same result represented as a loss can activate convexity and risk seeking. This family remains separate from the prospect-theory family because the object here is the information description rather than measurement of the value function's components.

2.2 Three types of valence framing

[Levin et al. \(1998\)](#) distinguish three mechanisms that should not be treated as interchangeable:

1. **Risky-choice framing** changes the sign used to describe outcomes of sure and risky alternatives; the response is a choice.
2. **Attribute framing** changes the valence of an equivalent characteristic, such as 75% lean versus 25% fat; the response is an evaluation.
3. **Goal framing** emphasizes the consequences of performing or not performing a behavior; the response is intention or persuasion.

The configurations and report preserve these distinctions. An observed difference does not by itself identify one psychological mechanism.

2.3 Applications and extensions

[McNeil et al. \(1982\)](#) show that survival versus mortality wording changes treatment preferences even among physicians. [Levin and Gaeth \(1988\)](#) report more favorable evaluations for meat labeled lean than for the same composition labeled fat. [Meyerowitz and Chaiken \(1987\)](#) study preventive messages framed as gains or losses. In public policy, source credibility, political competence, and deliberation can limit a frame's influence ([Druckman, 2001](#)).

Joint presentation may expose equivalence and attenuate a gap found under separate evaluation; this

extension relates to the joint-versus-separate evaluation literature ([Hsee et al., 1999](#)). Percentage versus frequency changes numeric representation and can affect comprehension ([Gigerenzer and Hoffrage, 1995](#)); it is not a pure valence frame. The order module shows both frames to the same person and therefore measures consistency and sequence effects rather than a clean between-subject contrast.

Theoretical foundation

A session difference is descriptive. A causal interpretation requires adequate assignment, sample size, no communication, and a prespecified analysis rule. The report helps teach those requirements; it does not replace them.

Access and preparation

Start at <https://beer-lab.org/>, open <https://teaching.beer-lab.org/>, and select Framing Effects once the family is published. Proposed routes are:

Basic Spanish: https://framing.beer-lab.org/room/efectos_marco_es

Basic English: https://framing.beer-lab.org/room/framing_effects_en

Extended Spanish: https://framing.beer-lab.org/room/efectos_marco_extendido

Extended English: https://framing.beer-lab.org/room/framing_effects_extended

Instructors: <https://framing.beer-lab.org/demo>

The isolated instance lists 24 configurations and four rooms, with no path to other families.

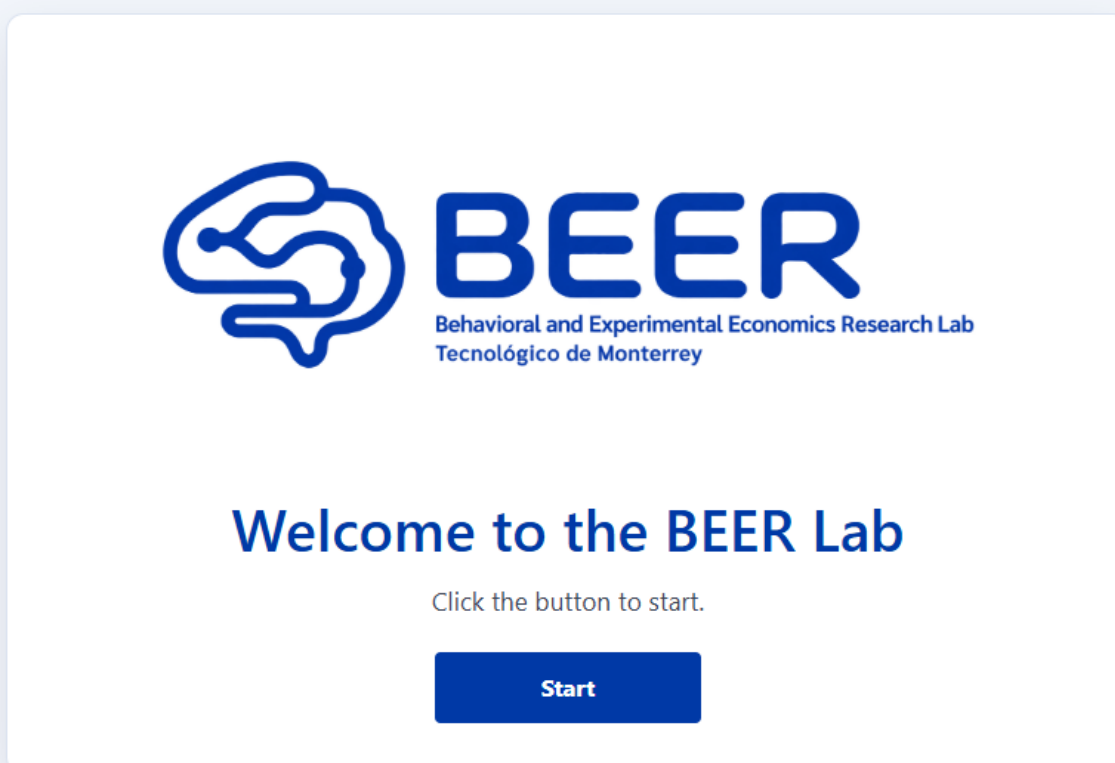


Figure 3.1: Public participant page for the basic English room.

Choose the configuration before distributing links. Keep the room silent, do not project student screens, and open **Monitor** and **Report** on the instructor computer. Use at least six participants

and, when the comparison is central, prefer an even number; joint/separate presentation works best with a multiple of three.

oTree Demo Sessions Rooms Data Server Check

[EN] Framing Effects — core: session 'gscys7u0' (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 6 browser tabs.

<http://127.0.0.1:8014/join/maniluka>

Single-use links

Open each link in its own browser tab.

P1	http://127.0.0.1:8014/InitializeParticipant/o1dl00h0
P2	http://127.0.0.1:8014/InitializeParticipant/5dv9e3wp
P3	http://127.0.0.1:8014/InitializeParticipant/oxboqz6l
P4	http://127.0.0.1:8014/InitializeParticipant/x1ios9fl
P5	http://127.0.0.1:8014/InitializeParticipant/0d13ab1g
P6	http://127.0.0.1:8014/InitializeParticipant/y3ce7p2r

Figure 3.2: Links for a six-participant basic session.

Student sequence



Welcome

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

In this activity, you will make individual decisions using the information shown on screen. Read each situation carefully and respond independently.

General laboratory rules

- Remain silent throughout the session.
- Do not talk or communicate with other participants.
- Make your decisions individually and privately.
- Follow the instructions shown on screen.
- Do not refresh, close, or leave this page.
- If you have a question or technical problem, raise your hand and wait for assistance.

☐ I have read and agree to follow these rules.

Start

Con tecnología de [oTree](#)

Figure 4.1: Institutional welcome and general laboratory rules.

independence across decisions, and the monetary condition. The check covers possible equivalence, privacy, and the 0–100 scale.



Instructions

1 individual decisions

Basic version · Asian disease problem

This activity studies how people interpret different descriptions of a decision. There are no right or wrong answers.

1

Information assignment

The platform automatically assigns one version of each situation. During the activity, you will see only your assigned version. Respond using only the information shown.

2

Independent decisions

Treat each screen as a new situation. Do not return to earlier responses or try to infer what other participants see.

3

Hypothetical and monetary decisions

Most situations are hypothetical. If your module includes a monetary decision, that screen will say so and its outcome will be shown only at the end.

Continue

Con tecnología de [oTree](#)

Figure 4.2: Current instructions for the basic edition: initial resources, decision rules, and experimental units.

The two cards share a consistent hierarchy and clearly mark the selected alternative. Each participant sees one frame before responding. The monetary decision displays final balances so equivalence can be demonstrated. Health and policy vignettes remain hypothetical. Ratings use a 0–100 slider with labeled endpoints and a visible value. The final page explicitly confirms completion. When a monetary decision exists, it reports the option and balance; other modules state that all situations were hypothetical.



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

Comprehension check

Asian disease problem

Answer correctly before continuing.

Can versions assigned to different participants describe objectively equivalent outcomes using different words?

☐ Yes

☒ No

Your answer: No. The correct answer is Yes. Review your answers: descriptions may be equivalent, decisions are private, and 100 is the highest evaluation or intention.

Should you talk with other participants to compare the version you received?

☒ No; I respond individually and privately

☐ Yes; I compare my screen during the activity

On a 0–100 scale, what does 100 represent?

☒ The highest evaluation or intention

☐ The lowest evaluation or intention

Check answers

Con tecnología de [oTree](#)

Figure 4.3: Current comprehension check with an incorrect answer, its specific explanation, and retained responses.

Public-health decision

Decision 1 of 5

Risky-choice framing

Risky-choice framing

An unusual disease threatens 600 people. Two programs are proposed.

Which program do you prefer?

This situation is hypothetical and does not determine payment.

Option A

☐

Program A

- 200 people will be saved.

Option B

☐

Program B

- 1/3 probability that all 600 people will be saved.
- 2/3 probability that no one will be saved.

Confirm decision

Con tecnología de [oTree](#)

Public-health decision

Decision 1 of 1

Risky-choice framing

Risky-choice framing

An unusual disease threatens 600 people. Two programs are proposed.

Which program do you prefer?

This situation is hypothetical and does not determine payment.

Option A

☐

Program A

- 400 people will die.

Option B

☐

Program B

- 1/3 probability that no one will die.
- 2/3 probability that all 600 people will die.

Confirm decision

Con tecnología de [oTree](#)

Figure 4.5: Contrasting wording assigned to another participant.

Monetary decision

Decision 2 of 5

Gain and loss framing

Gain and loss framing

For this decision, you start with a balance of 600 ECU.

Choose one alternative.

This decision may determine an ECU outcome. The two descriptions used in the session produce the same possible final balances.

Option A**Sure alternative**

- Gain 200 ECU.
- Final balance: 800 ECU.

Option B**Risky alternative**

- 1/3: gain 600 ECU; final balance 1,200 ECU.
- 2/3: gain 0 ECU; final balance 600 ECU.

Confirm decisionCon tecnología de [oTree](#)

Figure 4.6: Monetary frame with equivalent final balances.

Choice between treatments

Decision 3 of 5

Survival and mortality

Survival and mortality

Imagine choosing between two treatments. The figures come from comparable patients.

Which treatment would you choose?

This situation is hypothetical and does not determine payment.

Option A



Surgery

- 90 of 100 survive treatment.
- 68 are alive after one year.
- 34 are alive after five years.

Option B



Radiation therapy

- 100 of 100 survive treatment.
- 77 are alive after one year.
- 22 are alive after five years.

Confirm decision

Con tecnología de [oTree](#)

Figure 4.7: Survival or mortality wording for treatment choice.

Labor-market evaluation

Decision 4 of 5

Attribute framing

Attribute framing

In one region, 94% of the labor force is employed.

How do you evaluate the labor-market situation?

This situation is hypothetical and does not determine payment.

Move the control to the value that best represents your response.

0 · Very unfavorable

100 · Very favorable



Selected value

50**Confirm decision**

Activity completed

Your responses were recorded successfully. Please wait for the instructor.

Monetary-decision outcome

Task

Monetary decision

Choice

Risky alternative

Final balance

600 ECU

Do not discuss the versions of the situations until the instructor begins the discussion.

Con tecnología de [oTree](#)

Figure 4.9: Explicit close and reminder not to discuss frames yet.

Instructor report

The report is private. While responses are pending, reveal remains disabled and the page refreshes automatically. When everyone has finished, the instructor controls the exact reveal moment.

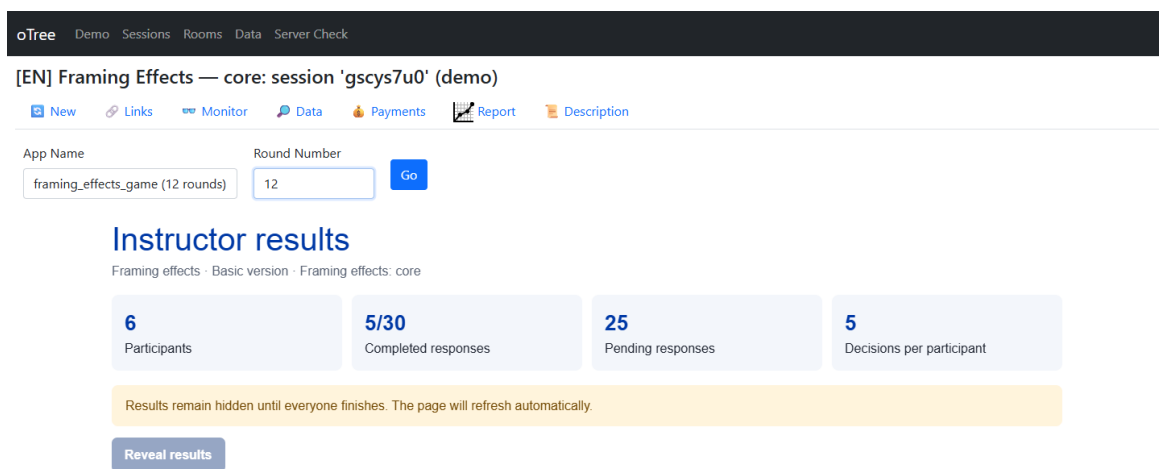


Figure 5.1: Results hidden while the session is incomplete.

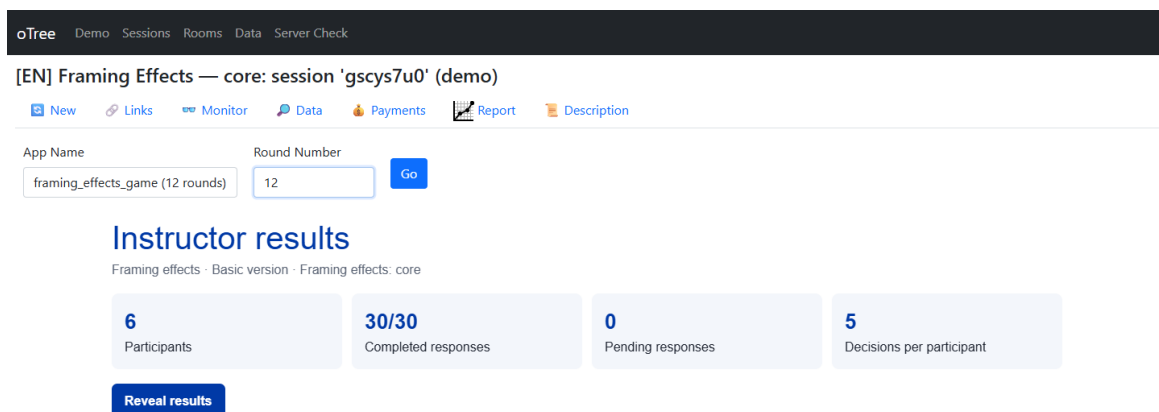


Figure 5.2: Completed report before the instructor clicks reveal.

The report provides:

- focal choices by task and frame, with numerator and denominator;
- means and medians for each 0–100 rating;
- descriptive differences in percentage points or scale points;

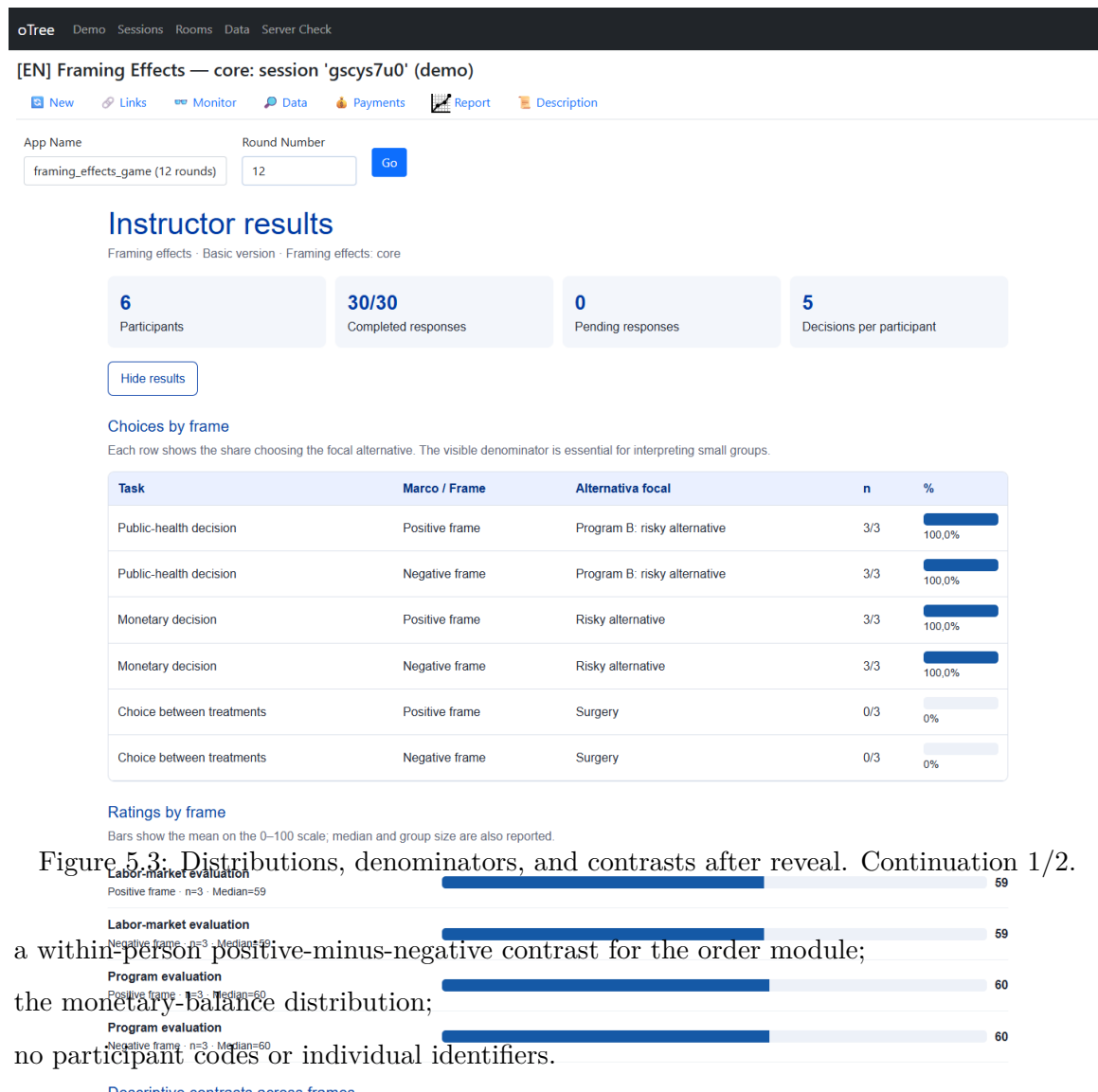


Figure 5.3: Distributions, denominators, and contrasts after reveal. Continuation 1/2.

- a within-person positive-minus-negative contrast for the order module;
- the monetary-balance distribution;
- no participant codes or individual identifiers.

Feedback script

1. Before reveal, write the invariance prediction: equivalent formulations should yield the same distribution.
2. Reveal bars without naming the theory; ask students to describe magnitude, direction, and denominators.
3. Demonstrate equivalence algebraically: 200 saved equals 400 deaths, and the risky programs imply the same distribution.
4. Separate risky choice, attribute, and goal mechanisms. Do not use one explanation for all three.
5. Discuss small samples, balance, communication, and order before claiming causality.
6. Close with applications to medical consent, policy communication, labor reports, and risk presentation.

The report presents aggregate results and never shows identifiers. Reveal frame equivalence only after everyone has finished.

5.1 Basic edition

BE

6 Participants	30/30 Completed responses	0 Pending responses	5 Decisions per participant
--------------------------	-------------------------------------	-------------------------------	---------------------------------------

cts

Hide results

Choices by frame

Each row shows the share choosing the focal alternative. The visible denominator is essential for interpreting small groups.

Task	Marco / Frame	Alternativa focal	n	%
Public-health decision	Positive frame	Program B: risky alternative	3/3	100,0%
Public-health decision	Negative frame	Program B: risky alternative	3/3	100,0%
Monetary decision	Positive frame	Risky alternative	3/3	100,0%
Monetary decision	Negative frame	Risky alternative	3/3	100,0%
Choice between treatments	Positive frame	Surgery	0/3	0%
Choice between treatments	Negative frame	Surgery	0/3	0%

Ratings by frame

Bars show the mean on the 0–100 scale; median and group size are also reported.

Labor-market evaluation Positive frame · n=3 · Median=59		59
Labor-market evaluation Negative frame · n=3 · Median=59		59
Program evaluation Positive frame · n=3 · Median=60		60
Program evaluation Negative frame · n=3 · Median=60		60

Descriptive contrasts across frames

Differences are descriptive. With small groups they may reflect sampling variation as well as the frame.

Task	Métrica / Metric	Contraste / Contrast	Difference
Public-health decision	Program B: risky alternative	Negative frame – Positive frame	0,0 percentage points
Monetary decision	Risky alternative	Negative frame – Positive frame	0,0 percentage points
Choice between treatments	Surgery	Positive frame – Negative frame	0 percentage points
Labor-market evaluation	Mean	Positive frame – Negative frame	0 scale points
Program evaluation	Mean	Positive frame – Negative frame	0 scale points

Distribution of monetary balances

Includes only participants who completed the monetary decision. The balance depends on the chosen alternative and, for the risky option, a draw with the same distribution in both frames. Observed balances: 6.



The report presents aggregate results and never shows identifiers. Reveal frame equivalence only after everyone has finished.

Figure 5.4: Distributions, denominators, and contrasts after reveal. Continuation 2/2.

5.2 Asian disease

`framing_effects_en_asian_disease` contains one choice. Invariance is the normative prediction. The classic pattern is more risky choice under the mortality frame. Ask participants to justify their choice before comparing screens.

5.3 Gains and losses

`framing_effects_en_gains_losses` translates the same structure into ECU. The positive frame starts at 600 ECU and the negative frame at 1,200 ECU; both produce either a sure 800 ECU or a lottery between 1,200 and 600 ECU with probabilities $1/3$ and $2/3$. The laboratory may realize this decision using a stated conversion.

5.4 Attribute core

`framing_effects_en_attribute_core` combines survival/mortality, employment/unemployment, and success/delay. The first response is a choice and the remaining two are ratings. Compare direction and size; a null difference is also pedagogically useful.

5.5 Core

`framing_effects_en_core` combines the five basic decisions. Allow 8–12 minutes for responses and 20 minutes for discussion. This is the recommended broad introduction.

Extended edition

6.1 Risky choice

This module combines the Asian disease problem and its monetary analogue. Ask whether the sign persists when the context moves from hypothetical lives to ECU. Compare directions rather than levels because content and scales differ.

6.2 Attributes

This module adds 75% lean versus 25% fat to survival, employment, and performance. The focal prediction is a more favorable rating under the positive frame. It adapts the logic of [Levin and Gaeth \(1988\)](#); it does not reproduce tasting or product experience.

6.3 Goals

The backup vignette emphasizes recoverable files if one acts or unrecoverable files if one does not. It measures willingness to activate backup. A loss frame can be more persuasive, but direction depends on the behavior, risk, and message credibility.

6.4 Public policy

The same flood coverage appears as 70 of 100 neighborhoods protected or 30 of 100 unprotected. The outcome is policy support. Discuss the source, omitted information, and why framing cannot replace cost-benefit analysis.

6.5 Joint and separate presentation

Three groups see 85% completed, 15% not completed, or both descriptions together. Joint presentation makes equivalence explicit. Interpret group means cautiously because three cells divide the sample.

6.6 Order

Each person rates one frame and then the other; order is balanced. The report calculates positive minus negative within person and by first frame. The second response may reflect contrast, memory, or consistency motives.

6.7 Numeric format

A risk appears as 10% or 10 out of 100. The values are identical, but representation differs. Do not impose a universal directional prediction. Use this module to discuss denominators, comprehension, and statistical literacy.

6.8 Full diagnostic

The full version contains 12 decisions and all modules. Use it for a dedicated 20–30 minute session. A focused configuration is preferable in an ordinary class when conceptual separation matters.

6.9 Configuration catalogue

Treatment	Spanish / English config
Asian disease	efectos_marco_es_enfermedad_asiatrica / framing_effects_en_asian_disease
Gains and losses	efectos_marco_es_ganancias_perdidas / framing_effects_en_gains_losses
Attribute core	efectos_marco_es_atributos_nucleo / framing_effects_en_attribute_core
Core	efectos_marco_es_nucleo / framing_effects_en_core
Risky choice	efectos_marco_extendido_eleccion_riesgosa / framing_effects_extended_risky_choice
Extended attributes	efectos_marco_extendido_atributos / framing_effects_extended_attribute
Goals	efectos_marco_extendido_objetivos / framing_effects_extended_goal
Public policy	efectos_marco_extendido_politica_publica / framing_effects_extended_public_policy
Presentation	efectos_marco_extendido_presentacion / framing_effects_extended_presentation
Order	efectos_marco_extendido_orden / framing_effects_extended_order
Numeric format	efectos_marco_extendido_formato_numerico / framing_effects_extended_numeric_format
Full diagnostic	efectos_marco_extendido_diagnostico_completo / framing_effects_extended_full_diagnostic

6.10 Data, limitations, and troubleshooting

The export contains one row per participant and decision: task, module, frame, choice or rating, monetary eligibility, draw, balance, and payment selection. Preserve the within-person structure for the order module. Do not combine different task scales as if they measured one parameter.

If *Please wait* appears, inspect Monitor: this family never depends on another participant. If a link fails after rebuilding the database, create a new session. If Demo lists other games, stop the instance and inspect `GAME_FAMILY=framing`. If one report group is missing, confirm that students used distinct links and completed every screen. Results stay hidden until all expected responses are complete.

Expanded teaching manual for nonspecialist instructors

This part brings together what an instructor needs to turn Framing effects 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 whether different descriptions of equivalent consequences change choices. 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.

7.1 Conceptual map before opening the session

7.1.1 Unit of analysis

The relevant unit is each participant and the randomized contrast between equivalent frames. 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 choose between options described as gains, losses, survival, mortality, or other attributes. 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.

7.1.2 Benchmark prediction

The starting point is: invariance requires the same choice when states, probabilities, and consequences are equivalent. 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.

7.1.3 Alternative mechanisms

The literature and treatments permit discussion of reference points, loss aversion, attribute attention, affect, pragmatic ambiguity, and comprehension. 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.

7.2 Worked example and explanation

With 600 people at risk, one program saves 200 for sure and another saves 600 with probability one third. In the loss frame, one implies 400 certain deaths and the other no deaths with probability one third. The consequences are equivalent. A treatment difference identifies sensitivity to description; it does not by itself show which word caused the change.

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.

7.3 Reading the instructor report

The central measures are share choosing each option by frame; percentage-point difference; consistency across equivalent items; confidence. 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.

7.4 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: gains and losses; survival and mortality; attributes; goals; narrow and broad framing. For each variant, identify the single changed element, predicted direction, and report measure to inspect.

Close by connecting the laboratory to health, saving, risk communication, public policy, and marketing. 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.

7.5 Comparable class plans

7.5.1 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 whether different descriptions of equivalent consequences change choices. End with one written sentence separating outcome from mechanism.

7.5.2 An 80-minute class

Run the baseline and one variant from gains and losses; survival and mortality; attributes; goals; narrow and broad framing. 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.

7.5.3 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 health, saving, risk communication, public policy, and marketing. This stage turns the student from participant into experimental designer.

7.6 Exercises with answer guidance

7.6.1 1. Reconstructing the prediction

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

Guidance. Begin from invariance requires the same choice when states, probabilities, and consequences are equivalent. 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.

7.6.2 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.

7.6.3 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 share choosing each option by frame; percentage-point difference; consistency across equivalent items; confidence before explaining mechanisms.

7.6.4 4. Separating explanations

Question. Select two mechanisms from this list: reference points, loss aversion, attribute attention, affect, pragmatic ambiguity, and comprehension. Design a contrast that produces different predictions.

Guidance. Change one relevant element, hold others constant, and state each directional prediction. A variant from gains and losses; survival and mortality; attributes; goals; narrow and broad framing may help, but the justification must connect manipulation and report measure.

7.6.5 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.

7.6.6 6. Transferring carefully

Question. Relate the activity to health, saving, risk communication, public policy, and marketing 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.

7.7 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 invariance requires the same choice when states, probabilities, and consequences are equivalent. 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 reference points, loss aversion, attribute attention, affect, pragmatic ambiguity, and comprehension 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 Framing effects, connect those shapes to share choosing each option by frame; percentage-point difference; consistency across equivalent items; confidence.

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 gains and losses; survival and mortality; attributes; goals; narrow and broad framing, 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 health, saving, risk communication, public policy, and marketing 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.

7.8 Diagnostic cases for interpretation practice

7.8.1 Agreement with the benchmark

The distribution is concentrated near the prediction derived from invariance requires the same choice when states, probabilities, and consequences are equivalent. 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 gains and losses; survival and mortality; attributes; goals; narrow and broad framing. 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.

7.8.2 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 reference points, loss aversion, attribute attention, affect, pragmatic ambiguity, and comprehension. 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.

7.8.3 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 share choosing each option by frame; percentage-point difference; consistency across equivalent items; confidence and incomplete data. The experience thereby introduces design and transparency.

7.8.4 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.

7.9 Explanatory sequence for a complete class

7.9.1 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 whether different descriptions of equivalent consequences change choices. Collect private responses so the first speaker does not become a focal point.

7.9.2 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 Framing effects, the decision is to choose between options described as gains, losses, survival, mortality, or other attributes. Do not move to interpretation until the class can calculate a simple case.

7.9.3 Step 3: derive the benchmark

Write invariance requires the same choice when states, probabilities, and consequences are equivalent. 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.

7.9.4 Step 4: record predictions

Request one prediction about the mean, another about the distribution, and a third about a variant. Predictions should use share choosing each option by frame; percentage-point difference; consistency across equivalent items; confidence. Preserve the record; later comparison reveals learning and reduces hindsight.

7.9.5 Step 5: reveal in layers

Show coverage first, then distribution, measures, and comparisons. At every layer request description before explanation. If someone proposes reference points, loss aversion, attribute attention, affect, pragmatic ambiguity, and comprehension, ask what observation would distinguish it from another mechanism.

7.9.6 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.

7.9.7 Step 7: compare institutions

Choose one condition from gains and losses; survival and mortality; attributes; goals; narrow and broad framing. 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.

7.9.8 Step 8: transfer and close

Connect the mechanism to health, saving, risk communication, public policy, and marketing. 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.

7.9.9 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.

7.10 Assessment bank with solutions

Exercise 1. List actions, information, and payoffs. **Solution:** reconstruct choose between options described as gains, losses, survival, mortality, or other attributes without adding information unavailable to the participant.

Exercise 2. Derive the material benchmark. **Solution:** begin from invariance requires the same choice when states, probabilities, and consequences are equivalent 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 reference points, loss aversion, attribute attention, affect, pragmatic ambiguity, and comprehension. **Solution:** design a condition changing one prediction but not the other, with an outcome from share choosing each option by frame; percentage-point difference; consistency across equivalent items; confidence.

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 gains and losses; survival and mortality; attributes; goals; narrow and broad framing. **Solution:** identify what changes, what remains constant, predicted direction, and an interpretive threat.

Exercise 10. Transfer to health, saving, risk communication, public policy, and marketing. **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.

7.11 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 invariance requires the same choice when states, probabilities, and consequences are equivalent; the second uses reference points, loss aversion, attribute attention, affect, pragmatic ambiguity, and comprehension; the third selects a variant from gains and losses; survival and mortality; attributes; goals; narrow and broad framing; 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 health, saving, risk communication, public policy, and marketing, 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.

7.12 Quality control before teaching

7.12.1 Full rehearsal

Open a test session and complete one full participant path. Check cover, language, comprehension, decision, waiting, result, and close. In Framing effects, verify especially that the participant understands how to choose between options described as gains, losses, survival, mortality, or other attributes. Open the report before class, keep it hidden, and confirm that share choosing each option by frame; percentage-point difference; consistency across equivalent items; confidence appear with their denominators.

7.12.2 Fifteen control questions

1. Does the configuration belong only to this family and the correct language?
2. Can expected attendance form every required unit?
3. Do the rules describe actions, information, order, and payoffs?
4. Does the comprehension question detect the most likely mistake?
5. Is the benchmark derived rather than merely asserted?
6. Will students record a prediction before seeing the result?
7. Does the report show counts as well as percentages?
8. Does every rate state numerator and denominator?
9. Is the distribution readable from the classroom?
10. Are roles, treatments, and rounds labeled and colored consistently?
11. Was the main comparison selected before observing data?
12. Is there time to describe results before interpreting them?
13. Do questions avoid judgments about individual participants?
14. Does the link to health, saving, risk communication, public policy, and marketing state explicit limits?
15. Will the export and incidents be documented?

7.12.3 A micro-rehearsal of the debrief

Practice a three-minute explanation. Begin with invariance requires the same choice when states, probabilities, and consequences are equivalent. Then show a hypothetical distribution and state two compatible interpretations from reference points, loss aversion, attribute attention, affect, pragmatic ambiguity, and comprehension. Identify which variant among gains and losses; survival and mortality; attributes; goals; narrow and broad framing would distinguish them. End with one limitation. If the sequence cannot fit in three minutes, simplify the session objective.

7.12.4 After class

Record attendance, completed decisions, parameters, and incidents. Note which explanation caused confusion and which graph worked. Preserve one question for the next cohort. Cumulative

improvement depends on documenting experience rather than changing parameters without a record.

The closing condition is concrete: a person who did not attend should be able to read the report and know what was decided, what the benchmark was, how many units participated, what pattern appeared, and what cannot be concluded. If any element is missing, complete the instructor note before archiving the session.

7.12.5 A complete paired-frame interpretation

Suppose 62 percent select the risky option in a loss frame and 28 percent select the corresponding risky option in a gain frame. Before naming a framing effect, reconstruct the final outcomes and probabilities for both versions. Verify that the alternatives are extensionally equivalent, that the randomization assigned comparable participants to each frame, and that missing responses were not counted as choices of the safe option. Report the numerator and denominator for each percentage, the percentage-point difference, and an uncertainty interval when the class size permits it.

The instructor can then ask three different questions. The descriptive question is whether choices differ across wording conditions. The theoretical question is whether the direction matches the reflection pattern associated with reference-dependent evaluation. The design question is whether anything besides wording changed, such as order, salience, comprehension, or the identity of the outcome recipient. Keeping these questions separate prevents a significant difference from becoming automatic proof of one psychological mechanism. A null difference also deserves interpretation: the sample may be small, the frame may be weak, or students may have recognized equivalence.

For transfer, present a policy message in two forms and have students predict the direction of the difference before seeing data. Require each prediction to specify the reference point, the coded outcome, and the comparison group. After the reveal, ask whether the conclusion concerns this item, this sample, or a broader population. This sequence turns a memorable wording demonstration into a disciplined lesson about equivalence, causal contrasts, and the limits of classroom evidence.

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