



Instructor's Guide to the Two-Candidate Election

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 preparation, implementation, and discussion of the BEER Lab two-candidate election family at the Department of Economics of Tecnológico de Monterrey. It is written for instructors in economics, political science, and related fields, including readers without prior experience with oTree or laboratory experiments.

The document offers three routes. The quick guide is enough to launch a session.

Operational chapters follow the instructor and participant screens. Conceptual chapters explain the spatial model, its predictions, evidence, and eight variants. Common rules appear once; each treatment then describes only what changes and how the resulting evidence should be interpreted.

Author

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For the instructor

This guide follows the English interface. Spanish configurations reproduce the same logic. Project only anonymous aggregate results; never connect participant codes to names, identification numbers, or seats.

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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.

dos candidatos — una elección	Elección de dos candidatos / Two-Candidate Election — BEER Lab Seleccione una variante de este juego. Select a version of this game.
dos candidatos — 10 elecciones, mismo grupo	
dos candidatos — 10 elecciones, grupos reasignados	
ate Election — one election	
ate Election — 10 elections, same group	
ate Election — 10 elections, reassigned groups	
dos candidatos extendida — competencia por el cargo	
dos candidatos extendida — electorado polarizado	
dos candidatos extendida — candidatos programáticos	
dos candidatos extendida — ventaja de valencia	
dos candidatos extendida — preferencias electorales ocultas	
dos candidatos extendida — encuesta pública	
dos candidatos extendida — voto costoso	
dos candidatos extendida — dos dimensiones políticas	
vo-Candidate Election — office-seeking competition	
vo-Candidate Election — polarized electorate	
vo-Candidate Election — policy-motivated candidates	
vo-Candidate Election — valence advantage	
vo-Candidate Election — hidden voter preferences	
vo-Candidate Election — public poll	
vo-Candidate Election — costly voting	
vo-Candidate Election — two policy dimensions	

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

Rooms

Current rooms:

[ES] Elección de dos candidatos
[EN] Two-Candidate Election
[ES] Elección de dos candidatos: extendida
[EN] Two-Candidate Election: extended

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

Room: [EN] Two-Candidate Election

Create a new session

Session Config

[EN] Two-Candidate Election — one election

Number of participants

Complete groups of 9 participants. Use a multiple of 9; minimum 9.

Create

[Configure session](#) 

App sequence

two_candidate_election_game (10 rounds) A two-candidate spatial election with office-seeking candidates and seven voters.

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 Basic facts

Purpose	Study spatial competition, proximity voting, median-voter convergence, and limits of the model.
Unit	Experimental Currency Units (ECU).
Group	Nine participants: candidate A, candidate B, and seven voters.
Duration	35–50 minutes for one election; 60–90 minutes for ten elections and debrief.
Requirement	Attendance must be a multiple of nine. Reassignment works best with 18 or more participants.
Participants	election.beer-lab.org/room/two_candidate_election_en .

Instructor	election.beer-lab.org/demo .
Results	Aggregate report with candidate-specific platforms, election map, histograms, convergence, turnout, and efficiency.
Experimental unit	Interactions in groups of 9 participants.
Basic edition	one election; 10 elections, same group; 10 elections, reassigned groups.
Extended edition	office-seeking competition; polarized electorate; policy-motivated candidates; valence advantage; hidden voter preferences; public poll; costly voting; two policy dimensions.
Decision	Candidates choose their policy positions; voters choose a candidate or abstain when the treatment allows it.
Outcome	Vote distribution, each candidate's vote share, and the competition outcome.
Topics	electoral competition; median voter; proximity voting; political economy.
JEL	C92; D72.

Attention

The hostname and routes are proposed for the laboratory deployment. The code already defines the four rooms, but public availability depends on adding the family to the server and DNS. For local validation use <http://localhost:8049/demo>.

1.3 Learning objectives

By the end of the session, students should be able to explain why a voter with single-peaked preferences chooses the closest platform; identify the median voter in one dimension; derive pressure toward convergence when two candidates care only about winning; distinguish the electorate's distribution, candidate positions, and implemented policy; and identify which assumptions fail in each treatment. The aim is not to memorize that candidates “move to the center” but to reconstruct a prediction from preferences, information, rules, and objectives.

The exercise also builds evidence-reading skills. A mean near 50 does not establish convergence when individual elections are polarized. An observed platform gap does not reject the model after candidate motivation or information changes. The report includes distributions and maps to prevent conclusions based on a single mean.

1.4 Minimum sequence

1. Confirm attendance and form a multiple of nine. Do not insert fictitious participants into a live session.
2. Open beer-lab.org, select the teaching area, and continue to teaching.beer-lab.org.
3. Locate the **Two-Candidate Election** and open its instructor access.
4. Enter **Rooms**; choose the basic or extended room in the desired language.
5. Select a configuration, enter participant count, and create the session.

6. Keep **Monitor** and **Report** in separate tabs. Leave the report hidden during play.
7. Share only the room link. Wait for everyone to accept rules and pass comprehension.
8. Do not teach the theorem before choices if convergence is intended to be discovered.
9. Reveal the aggregate report only after completion and follow the diagnostic script.
10. Export data when the class will conduct assignments or comparisons.

Checkpoint

Verify language, treatment, rounds, rematching, and a multiple of nine before admitting participants. Create a new session if any item is wrong.

1.5 Suggested class plan

Allow five minutes for access and rules, ten for instructions and comprehension, fifteen to thirty for decisions, and twenty for feedback. During repeated play, minimize between-round explanation and preserve time for the trend report. Before revealing outcomes, collect three anonymous predictions: mean A platform, mean B platform, and the more frequent winner. Gaps between expectation and evidence start the discussion.

Do not label individual decisions correct or incorrect in front of classmates. Evaluate the argument: assumed objective, available information, and expected rival response. This protects privacy while teaching strategic reasoning.

Access, rooms, and session creation

2.1 From the laboratory website

The institutional route begins at beer-lab.org and continues to teaching.beer-lab.org. The family uses the proposed election.beer-lab.org hostname. Family isolation is deliberate: **Demo**, **Rooms**, **Sessions**, and **Data** should display only 22 election configurations and four rooms, never trust games, auctions, or other families.

2.2 The four rooms

Room	Options	Use
<code>eleccion_candidatos_es</code>	3	One election, ten fixed-group, or ten reassigned-group elections in Spanish.
<code>two_candidate_election_en</code>	3	The same basic modes in English.
<code>eleccion_candidatos_extendida</code>	8	Extended treatments in Spanish.
<code>two_candidate_election_extended</code>	8	Extended treatments in English.

The basic room never mixes extended variants. The extended room lists treatments within this family rather than unrelated games. This architecture lets instructors share a stable link without exposing the full oTree catalog. If a room lists more choices, stop and confirm that the instance started with `GAME_FAMILY=election`.

2.3 Creating and monitoring a session

Selecting a configuration in **Demo** creates temporary testing links. A room creates a session from the persistent participant link. Both routes provide individual links, **Monitor**, **Data**, **Payments**, and **Report**. Individual links are useful for rehearsal; use the room in class so that nine separate addresses are unnecessary.

Monitor shows who remains on welcome, comprehension, candidate choice, voting, or results. Wait pages enforce the protocol: voters cannot see incomplete platforms, and candidates do not observe a rival before submitting. Do not advance a participant manually until a real disconnection has been diagnosed.

oTree Demo Sessions Rooms Data Server Check Logout

[EN] Two-Candidate Election — one election: session 'bgj0igs1' (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 9 browser tabs.

<http://127.0.0.1:8049/join/fosefuku>

Single-use links

Open each link in its own browser tab.

P1	http://127.0.0.1:8049/initializeParticipant/g7dyxiv3
P2	http://127.0.0.1:8049/initializeParticipant/gr21h1zp
P3	http://127.0.0.1:8049/initializeParticipant/sar73sx5
P4	http://127.0.0.1:8049/initializeParticipant/jh3vl32g
P5	http://127.0.0.1:8049/initializeParticipant/u8pgkpat
P6	http://127.0.0.1:8049/initializeParticipant/t9pyeb1h
P7	http://127.0.0.1:8049/initializeParticipant/mw83g5np
P8	http://127.0.0.1:8049/initializeParticipant/hznac6l8
P9	http://127.0.0.1:8049/initializeParticipant/jkc25hbk

Figure 2.1: Links page for a nine-participant session.

For the instructor

Open Report before class and leave it hidden. This verifies the route and saves time later. The show-results button becomes available only after every active group and round has completed calculation.

2.4 Roles and matching

Every group contains two candidates and seven voters. Roles remain stable in repeated sessions to support learning. Under fixed groups, the same nine people interact. Under reassignment, candidate A, candidate B, and each voter type are redistributed across groups without changing their structural roles. This changes social composition without producing groups that lack a candidate or an electoral position.

Interpret fixed-versus-reassigned comparisons cautiously. Fixed groups support reputation and rival-specific adaptation. Reassignment reduces personal continuity while preserving learning about the game. A difference does not identify reputation by itself because experience also changes. Use the modes to generate hypotheses rather than promising causal identification from one class.

Participant experience

3.1 Welcome, rules, and instructions

The cover displays BEER Lab identity, the purpose of the activity, and rules about silence, privacy, navigation, and assistance. Each participant confirms the rules. The next page identifies edition, matching, and treatment; explains sequence, earnings, policy space, and median; and states the assigned role.



Welcome to the BEER Lab

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



Two-Candidate Election

In this activity we will observe how two candidates choose policy positions and how seven voters decide who will govern.

During the session

- Remain quiet and do not talk or communicate with other participants.
- Make your decisions individually and privately.
- Follow the on-screen instructions. Do not refresh, close, or leave this page.
- If you need help, raise your hand or contact the laboratory staff privately.

☐ I have read and understood the laboratory rules.

Start

Powered by [oTree](#)

Figure 3.1: Beginning of the English participant flow. Welcome and laboratory rules.



Basic version - One election

How the election works

Each group contains two candidates and seven voters. Candidates first choose a platform from 0 to 100 simultaneously. Voters then observe both proposals and vote.

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.

Office-seeking competition

Candidates want to win office and know the distribution of voter positions.

Sequence of each election

1. The system assigns two candidates and seven voters.
2. Each candidate chooses a platform without observing the rival's choice.
3. Voters observe both platforms and their own ideal positions.
4. Each voter chooses A or B; the costly-voting treatment also allows abstention.
5. The winner's policy is chosen by the majority.
6. The winner's policy determines voter earnings.

Earnings

A voter receives 100 minus the distance between the ideal point and the winning policy. An office-seeking candidate receives 100 ECU after winning and 20 ECU after losing.

$$U_i = 100 - |\text{posición ideal}_i - \text{política ganadora}|$$

Your role

Candidate A

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

The language is neutral. Candidate A and Candidate B do not represent actual parties. The 0–100 line should not automatically be labeled left–right before play. An instructor may supply a substantive interpretation afterward, but initial neutrality avoids partisan associations outside the payoff design.

3.2 Comprehension

Three items check the median, proximity voting, and the basic candidate objective. The server rejects the set until it is correct and records attempts. This gate limits outcomes driven solely by misunderstanding. If many participants fail, do not announce answers; direct them back to the relevant explanation.

What participants will see

Participants learn their role before choosing. A candidate sees electoral information and selects a platform. A voter sees an ideal point, both platforms, and earnings under each victory. No one needs to infer a complicated payoff blindly.

3.3 Candidate decision

Candidates choose simultaneously in increments of five. The screen highlights the active rule: known median, possible medians, poll signal, policy ideal, or valence advantage. Two-dimensional competition requests two coordinates. A proposal is binding: victory implements it.

Do not suggest 50 or use words such as “optimal” during play. If a participant asks what is best, refer back to payoffs, information, and objective. Strategic choice is the content. Repeated sessions

Sequence of each election

1. The system assigns two candidates and seven voters.
2. Each candidate chooses a platform without observing the rival's choice.
3. Voters observe both platforms and their own ideal positions.
4. Each voter chooses A or B; the costly-voting treatment also allows abstention.
5. The majority wins. A tie is resolved by a fair lottery.
6. The winner's policy determines voter earnings.

Earnings

A voter receives 100 minus the distance between the ideal point and the winning policy. An office-seeking candidate receives 100 ECU after winning and 20 ECU after losing.

$$U_i = 100 - |\text{posición ideal}_i - \text{política ganadora}|$$

Your role

Candidate A

Policy space

Horizontal distance represents disagreement. A platform closer to a voter's ideal point yields a higher payoff for that voter.



Median voter

For 10, 25, 40, 50, 60, 75, and 90, the fourth position is 50. If everyone votes for the closest platform, a platform that wins the median receives at least four votes.

Read the highlighted rule for this session carefully; some treatments change information, candidate preferences, the cost of voting, or the number of dimensions.

Continue

Powered by oTree

Figure 3.3: Current basic-edition instructions, with initial resources and experimental units.
Continuation 2/2.



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



Comprehension questions

Answer correctly before making decisions.

What is the median of 10, 25, 40, 50, 60, 75, and 90?

51

Your answer: 51. The correct answer is 50. Review your answers. The median is 50; the voter in the example prefers A; in the basic version a candidate maximizes the probability of winning.

If your ideal point is 25, A proposes 20, and B proposes 70, which platform is closer?

A

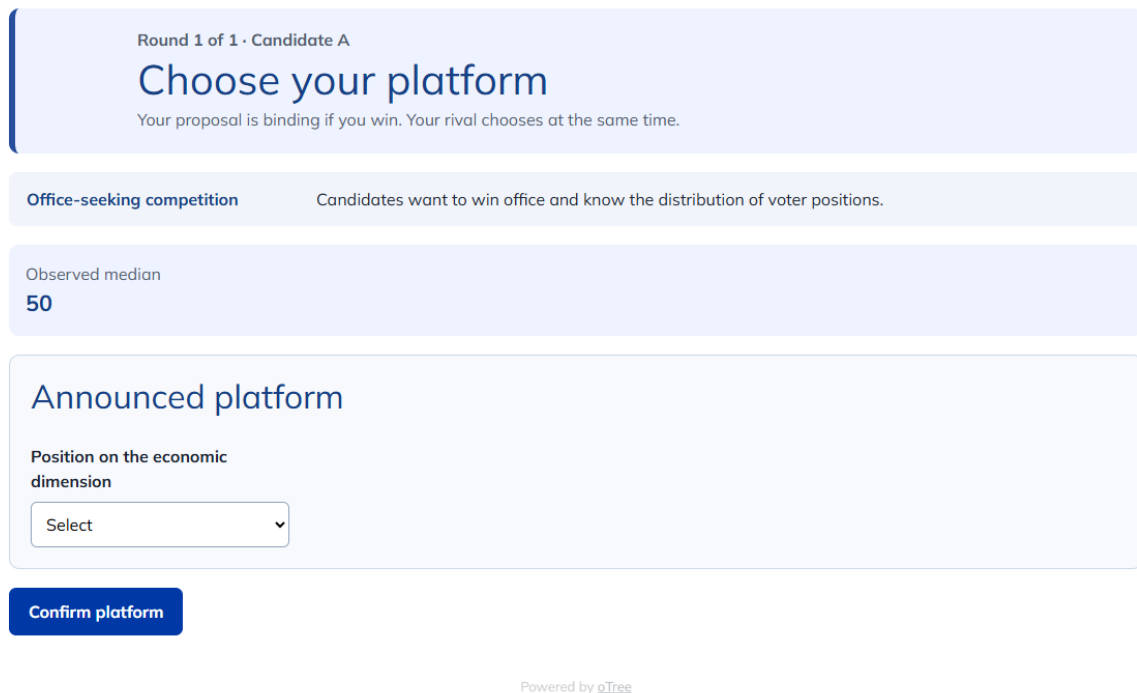
In the basic version, what is the candidate's monetary objective?

Win the election

Continue

Powered by oTree

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



Round 1 of 1 - Candidate A

Choose your platform

Your proposal is binding if you win. Your rival chooses at the same time.

Office-seeking competition Candidates want to win office and know the distribution of voter positions.

Observed median
50

Announced platform

Position on the economic dimension

Select ▼

Confirm platform

Powered by [oTree](#)

Figure 3.5: Platform screen in the reference condition.

present the setting again so candidates can adapt.

3.4 Voter decision

The ballot displays the ideal point, platforms, a location graphic, and earnings under each candidate. Costly voting adds abstention and its cost; two dimensions replace the line with a plane. Ballots remain private.

Displaying earnings does not remove choice: a voter can deviate from the monetarily closest candidate. The aggregate rate of payoff-consistent votes supports discussion of comprehension, nonmonetary preferences, mistakes, or exploration. Do not automatically call a deviation irrational. The laboratory controls monetary incentives rather than every personal motive.

3.5 Results and closure

The result page identifies winner, implemented policy, ballot count, abstention, turnout, own earnings, gap, convergence, and efficiency. A tie produces an explicit lottery message. The final summary confirms completion and prevents an abrupt “No more pages left” ending.

Spatial efficiency compares total proximity utility with the best feasible policy for the electorate. It is not a moral claim that all distance is social loss; it is a measure internal to the experimental payoff model. Under valence and costly voting, distinguish spatial welfare from total earnings.



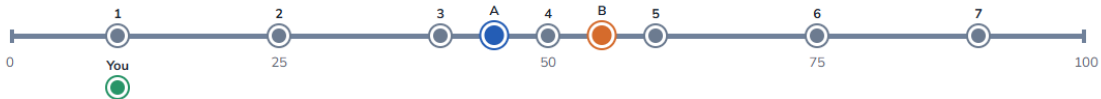
Round 1 of 1 - Voter

Cast your vote

Compare the distance between your ideal point and each platform. Your vote is private.

Office-seeking competition Candidates want to win office and know the distribution of voter positions.

Your ideal point 10



Vote for A

☐ Platform: 45

Earnings if elected: 65 ECU

Vote for B

☐ Platform: 55

Earnings if elected: 55 ECU

Confirm vote

Powered by [oTree](#)

Figure 3.6: One-dimensional ballot with voter points, platforms, and earnings.



Ronda 1 de 10 · Votante

Emita su voto

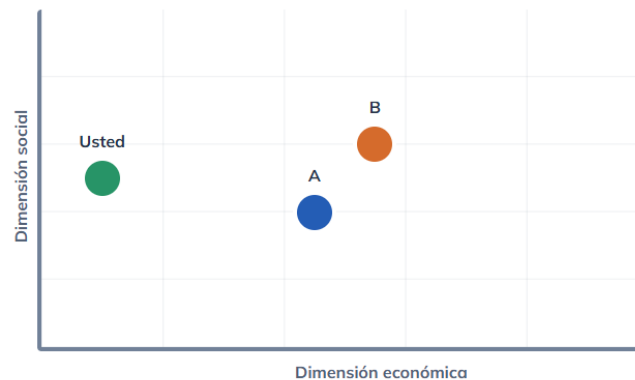
Compare la distancia entre su punto ideal y cada plataforma. Su voto es privado.

Dos dimensiones políticas

Candidatos y votantes tienen posiciones en dos asuntos. La distancia combina ambas dimensiones.

Su punto ideal

10, 50



Votar por A

☐ Plataforma: 45, 40

Ganancia si gana: 77,5 ECU

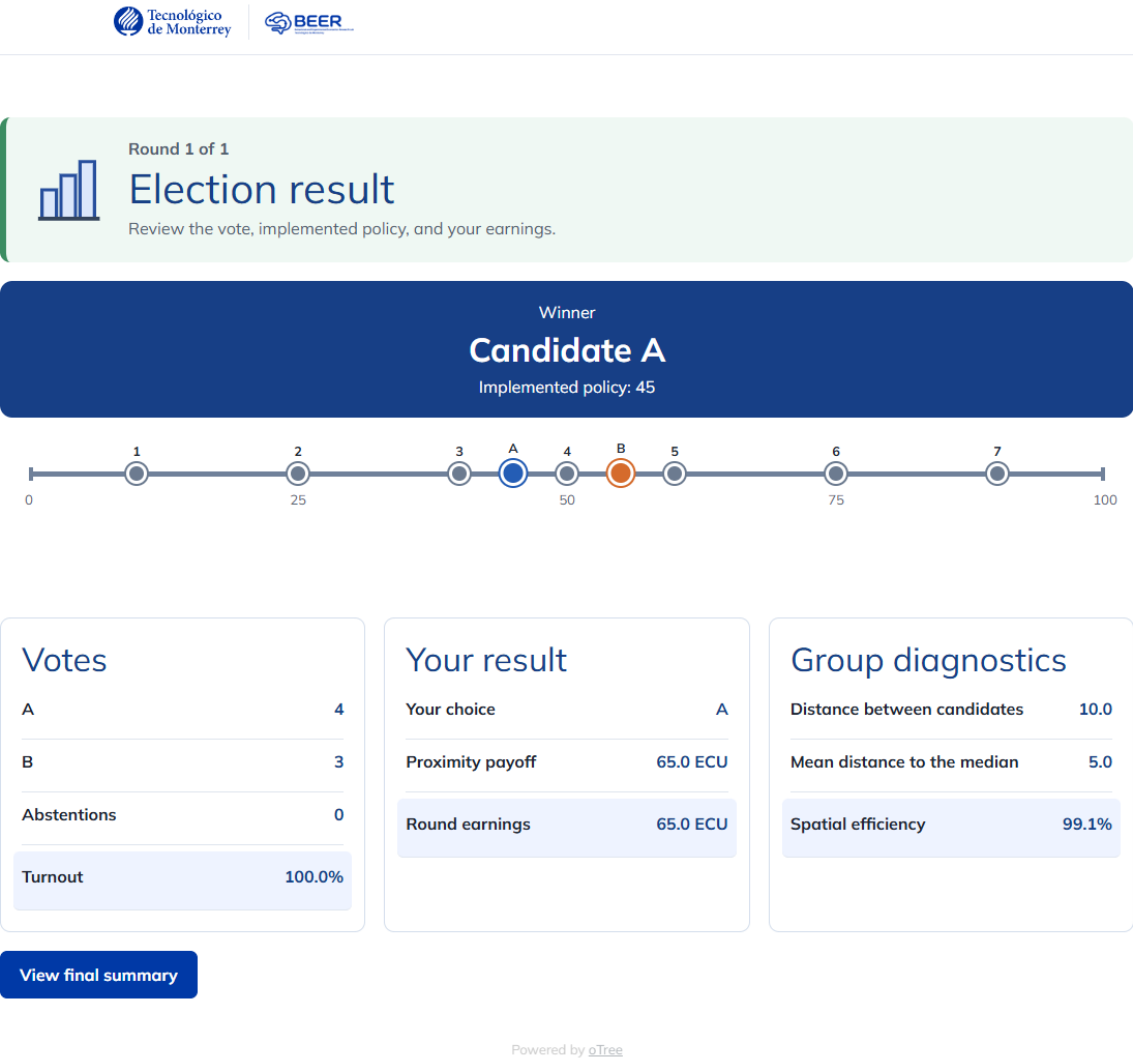
Votar por B

☐ Plataforma: 55, 60

Ganancia si gana: 72,5 ECU

Powered by [oTree](#)

Figure 3.7: Two-dimensional ballot with A, B, and the participant.



Basic model and predictions

4.1 Spatial preferences

Each voter i has an ideal point x_i in $[0, 100]$. If platform z wins, spatial utility is

$$u_i(z) = 100 - |x_i - z|.$$

Utility peaks at x_i and declines in either direction. These are single-peaked preferences. When A proposes a and B proposes b , voter i selects A if $|x_i - a| < |x_i - b|$, B under the reverse inequality, and is indifferent under equality. With two candidates and no cost, choosing the preferred alternative is a direct expression of the payoff comparison.

The line need not mean ideology. It can represent public spending, regulatory stringency, service location, or any ordered policy. This abstraction transfers across courses. A substantive interpretation should still respect one dimension and a common distance metric.

4.2 Median and majority

Order the ideals: 10, 25, 40, 50, 60, 75, 90. The fourth observation is the median, $m = 50$. At least four voters lie at or on either side of m . When one platform lies to the left and another moves closer to the median from that side, the latter can attract the central and right coalition. [Black \(1948\)](#) established the special majority-rule status of the median under single-peaked preferences.

Theoretical foundation

The median-voter theorem does not claim that every democracy chooses the center. It supplies a conclusion under specific assumptions. The extended treatments change one assumption at a time and reveal which part of the prediction survives.

4.3 Candidate competition

An office-seeking candidate maximizes the probability of victory. When a rival is far from 50, a move between that rival and the median can capture a majority. When both converge at 50, a unilateral move lets the rival retain the median. The mechanism parallels minimum differentiation in [Hotelling \(1929\)](#) and electoral competition in [Downs \(1957\)](#).

The discrete grid and simultaneous timing matter. Participants do not choose arbitrary real numbers and cannot observe the rival's proposal. A 45–55 pair produces a close contest even

though neither chooses 50. The pedagogical objective is to explain a tendency from incentives, not to demand an identical profile in every group.

4.4 Observable predictions

Theory becomes four empirical indicators. Mean A and B platforms should approach 50; the gap $|a - b|$ should decline with experience; mean distance $(|a - m| + |b - m|)/2$ should fall; and the winning policy should reach high spatial efficiency. Distributions test whether means describe actual elections.

One-shot dispersion may reflect exploration or differing beliefs. Ten fixed-group rounds support rival-specific adaptation. Reassignment supports general learning but weakens personal continuity. None of these comparative patterns should be announced as guaranteed before they are observed.

4.5 Assumptions and boundaries

The convergence claim relies on two candidates, simple majority, platform commitment, sufficient information, one dimension, and single-peaked preferences. It also assumes office-seeking candidates and voters who respond to spatial payoffs. Primaries, abstention, valence, ideology, polling, ambiguity, and multiple issues alter the problem. A strong debrief asks which assumption changed rather than labeling every difference noise.

The model also does not say convergence is always desirable. A median policy minimizes total absolute distance under the design, yet can omit preference intensity, rights, information inequality, or excluded dimensions. The game's efficiency measure is internal to the model.

Instructor report and feedback strategy

5.1 Controlled revelation

Before completion, Report lists pending groups and disables the button. When all elections finish, the instructor chooses when to reveal. This keeps active participants from receiving aggregate information. Keep the tab off the projector until the last decision is recorded.

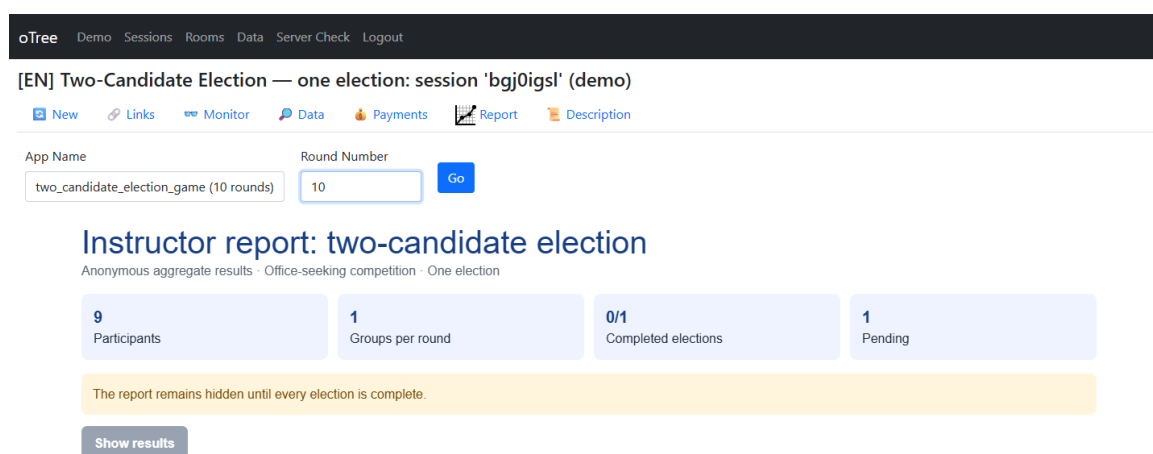


Figure 5.1: Instructor control over the feedback moment. Hidden report.

5.2 Reading each block

Top indicators summarize platforms, gap, convergence, wins, turnout, proximity-consistent ballots, efficiency, and role-specific earnings. The latest-round map places A, B, and the median within each group. Histograms show candidate-specific distributions. The evolution table displays learning.

Begin with description: “A chose..., B chose..., the median was...”. Compare with the prediction next. Only then invoke the treatment. This order reduces motivated reasoning. Do not begin by declaring the theory successful or failed; let the evidence identify the pattern that needs explanation.

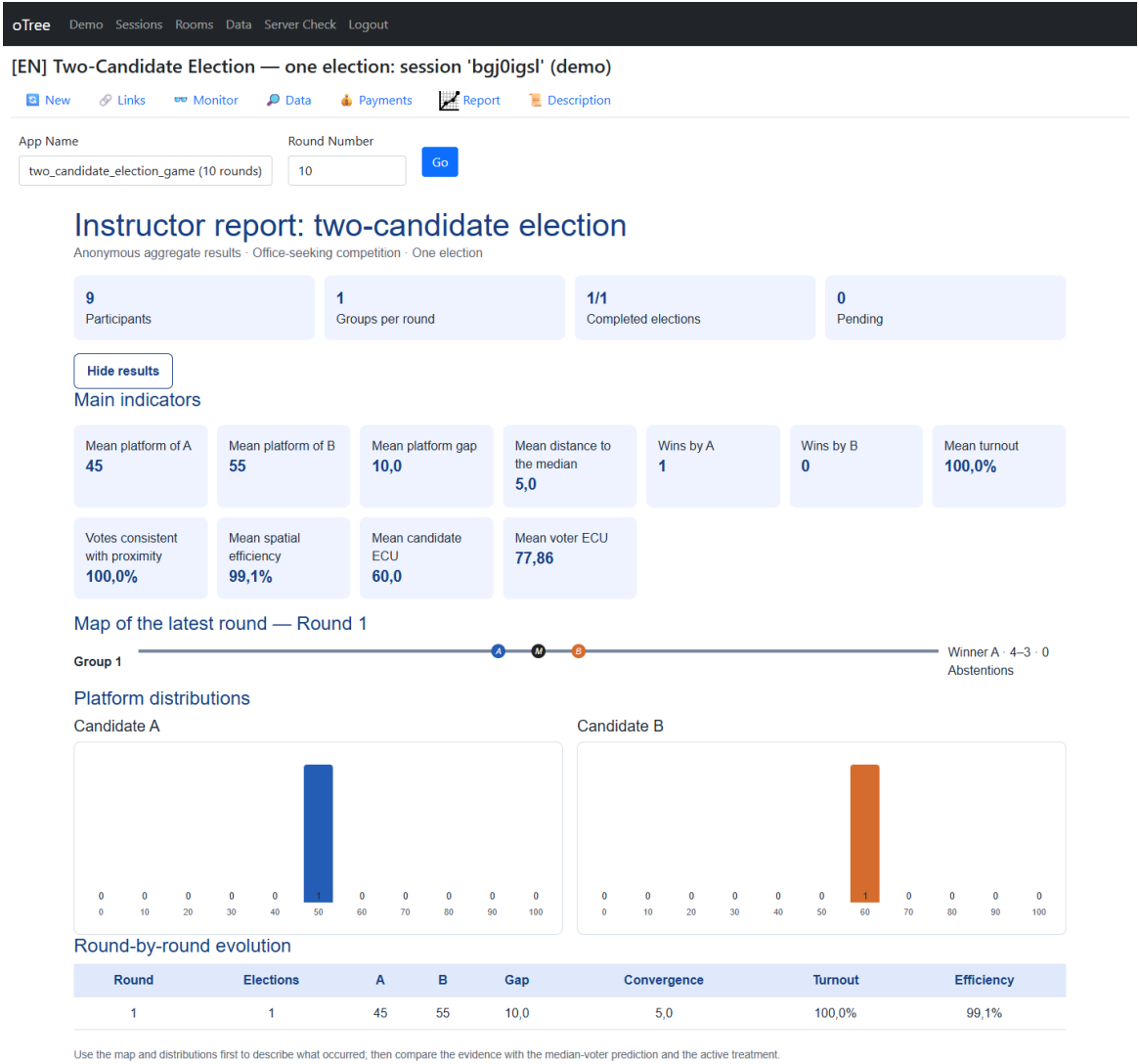


Figure 5.2: Revealed report.

Feedback script

1. **Describe.** Where were A and B? How dispersed were choices? Who won and by what margin?
2. **Reconstruct incentives.** Which voter was decisive? What unilateral move appeared profitable?
3. **Compare.** Did distance to the median fall? Did information or motivation change it?
4. **Evaluate.** Did the winning policy generate high spatial efficiency? Who bore losses?
5. **Generalize cautiously.** Which real institution resembles the treatment and what remains outside it?

5.3 Common interpretation errors

Do not confuse a mean with concentration, victory with welfare, abstention with indifference, a non-proximity ballot with incomprehension, or divergence with irrationality. Do not treat one class as a population estimate. These are incentivized data for visualizing mechanisms. Formal comparisons require repeated sessions, stable protocols, and documentation of sample size, timing, and prior experience.

5.4 Basic repeated versions

5.5 One election

The one-shot mode works well before theory is taught. It limits within-session learning and records initial intuition. Its weakness is that candidates can explore without correction. Use it to generate questions and derive theory afterward.

5.6 Ten elections with a fixed group

Repetition reveals convergence, rival response, and stability. Roles remain fixed. Avoid aggregate feedback between rounds when learning should come from own outcomes. At the end, compare the first three and final three rounds and ask participants to identify strategic changes.

5.7 Ten elections with reassignment

Reassignment requires at least two groups. People are shuffled within structural roles. This weakens bilateral continuity while broadening experience. Tell participants that groups may change without disclosing identities. Compare volatility and learning speed with fixed groups.

For the instructor

All three basic modes use the office-seeking treatment. Horizon and matching change; stage-game payoffs and static theory do not.

Extended treatments

6.1 Office-seeking competition

What changes, predictions, and interpretation

This is the reference treatment. Candidates earn 100 ECU if they win and 20 ECU if they lose; their policy locations do not enter payoffs directly. Both observe all seven voter positions. Platforms are simultaneous and binding. The design removes party reputations, campaign budgets, and ideological constraints to isolate one mechanism: competition for a majority.

With distance preferences and an odd electorate, the median divides voters into two potential coalitions. A unilateral move away from 50 allows the rival to locate slightly closer to the median and attract at least four voters. The reference prediction is therefore convergence toward 50. Because choices come in increments of five, 50 is also a natural focal location. Repeated elections reveal whether experience reduces both mean distance to the median and the platform gap.

Read the report in three steps. First compare the blue and orange distributions: do they accumulate near 50 or remain dispersed? Second use the latest-round map to distinguish convergence from averaging; a mean of 50 can also arise when a candidate alternates between 30 and 70. Third inspect spatial efficiency and the rate of ballots consistent with proximity. Convergence does not require students to know the theorem in advance; it may emerge as they learn which platform can assemble a majority.

The debrief should separate prediction from description. Ask what each candidate tried to maximize, which voter was decisive, and whether the winner could move without losing. Then make the conditions explicit: one dimension, single-peaked preferences, two candidates, majority rule, and commitment. [Black \(1948\)](#) establishes the median's role under single-peaked preferences, while [Downs \(1957\)](#) develops electoral-competition logic. The parallel with [Hotelling \(1929\)](#) provides a useful bridge between political economy and industrial organization.

Checkpoint

Before comparing this treatment, confirm that Report displays its correct name. Describe platforms and ballots first; apply the treatment-specific prediction only afterward.

6.2 Polarized electorate



Ronda 1 de 10 - Candidato A

Elija su plataforma

Su propuesta será vinculante si gana. El rival decide al mismo tiempo.

Competencia por el cargo

Los candidatos desean ganar el cargo y conocen la distribución de posiciones de los votantes.

Mediana observada

50

Plataforma anunciada

Posición en la dimensión económica

Confirmar plataforma

Powered by [oTree](#)

Figure 6.1: Information presented to a candidate under office-seeking competition.

What changes, predictions, and interpretation

This treatment replaces 10, 25, 40, 50, 60, 75, and 90 with 0, 10, 20, 50, 80, 90, and 100. The median remains 50, but dispersion rises and fewer voters are moderate. Everything else matches office-seeking competition. The treatment shows that electoral-location predictions depend on the median, whereas welfare and the intensity of disagreement depend on the full distribution.

If candidates care only about office and voters choose the closest platform, majority logic still pushes both candidates toward 50. Voter polarization therefore does not automatically imply divergent platforms in the canonical model. This distinction is valuable because ordinary discussion often combines preference polarization, party polarization, and affective polarization. The laboratory separates them: dispersion in ideal points is a parameter, the platform gap is a strategic choice, and distance from the implemented policy determines spatial welfare.

Compare platform gaps and convergence with the reference treatment, then inspect efficiency. Even if the winning policy equals 50 in both conditions, extreme voters are farther from that outcome under polarization. Ask the class to identify winners and losers from a centrist platform and whether maximizing votes represents preference intensity. Majority rule records ballot direction and does not directly measure how much each person loses when policy moves away from an ideal point.

The treatment also teaches an inference warning. Convergent parties do not prove that voters are moderate, and polarized citizens do not by themselves predict divergence by two purely office-seeking candidates. Ask students to propose mechanisms that could produce divergence: primaries, activists, donors, policy motivation, uncertainty, or valence. The next treatment adds policy preferences and makes one such mechanism visible. Spatial models distinguish the electorate's distribution from candidate objectives for exactly this reason (Calvert, 1985; Wittman, 1973).

Ronda 1 de 10 - Candidato A

Elija su plataforma

Su propuesta será vinculante si gana. El rival decide al mismo tiempo.

Electorado polarizado El votante mediano sigue en 50, pero hay más votantes cerca de los extremos.

Mediana observada

50

Plataforma anunciada

Posición en la dimensión económica

Seleccione ▼

Confirmar plataforma

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Figure 6.2: Information presented to a candidate under polarized electorate.

Checkpoint

Before comparing this treatment, confirm that Report displays its correct name. Describe platforms and ballots first; apply the treatment-specific prediction only afterward.

6.3 Policy-motivated candidates

What changes, predictions, and interpretation

Candidates retain an office prize but also gain when the implemented policy lies near their own ideal points: 25 for A and 75 for B. Payoffs add up to 40 ECU for policy proximity and reduce the marginal office prize to 60 ECU. Voters continue to value only the winning policy. The candidate screen displays the relevant ideal point so that the tradeoff between electoral moderation and programmatic fidelity is transparent.

Full convergence is no longer mechanical. Moving toward 50 raises the chance of victory but moves a platform away from the candidate's ideal. A candidate may accept a greater risk of losing to avoid implementing an unattractive policy after winning. The exact solution depends on the discrete grid, the rival's response, and the relative weights on office and policy. The classroom prediction is a larger gap than in the reference condition together with platforms that remain partly moderated. [Wittman \(1973\)](#) and [Calvert \(1985\)](#) explain how programmatic motivation weakens convergence.

Project platforms rather than only the winner. Compare A with 25 and B with 75, then compare each with 50. A platform of 40 can look extreme relative to the median and moderate relative to A's

ideal. This double comparison makes clear that moderation is relational. Candidate earnings are also informative: a losing candidate can obtain programmatic utility when the winner implements a nearby policy, and a winner can receive less than the maximum after compromising on a distant platform.

Debrief questions should expose opportunity costs. How many programmatic ECU was a candidate willing to sacrifice to increase the probability of winning? Did repetition generate movement toward the center or stable differentiation? Did voters penalize platforms that were authentic for candidates but distant from voters? Avoid describing every observed gap as irrationality. The treatment changes objectives, so different behavior may be an improved response to the new problem. Close by connecting the result to substantive representation: convergence intensifies competition for the median voter, while policy motivation supplies more differentiated choices.



Ronda 1 de 10 · Candidato A

Elija su plataforma

Su propuesta será vinculante si gana. El rival decide al mismo tiempo.

Candidatos programáticos
Además de ganar, cada candidato valora que la política aplicada quede cerca de su propia posición ideal.

Su posición ideal
25

Mediana observada
50

Plataforma anunciada

Posición en la dimensión económica

Seleccione

Confirmar plataforma

Powered by oTree

Figure 6.3: Information presented to a candidate under policy-motivated candidates.

Checkpoint

Before comparing this treatment, confirm that Report displays its correct name. Describe platforms and ballots first; apply the treatment-specific prediction only afterward.

6.4 Valence advantage

What changes, predictions, and interpretation

Valence represents a characteristic that every voter values, such as competence, honesty, or administrative ability. If A wins, each voter receives 10 additional ECU regardless of ideal point. Platforms remain one-dimensional and binding, and candidates remain office seeking. The ballot

displays total earnings under each candidate so that participants compare proximity and quality in the same unit.

The advantage shifts the indifferent voter. A citizen can support A even when B is somewhat closer because the bonus offsets policy distance. The electorally attractive locations therefore need not be symmetric around 50. The favored candidate may adopt a relatively moderate platform while retaining support, and the disadvantaged candidate may seek an asymmetric location. [Aragones and Palfrey \(2002\)](#) analyze a Downsian model with a favored candidate, and [Aragones and Palfrey \(2004\)](#) find experimental support for systematic quality-driven asymmetries.

The report intentionally separates A and B. Compare their means instead of considering only the absolute gap. Determine which candidate moves closer to the median and in which direction the disadvantaged candidate responds. Then examine ballots consistent with displayed earnings. In this treatment, a payoff-consistent vote incorporates A's bonus; a purely geometric comparison is incomplete. For welfare discussion, state whether valence is being counted as a social benefit or whether the class is focusing only on spatial loss.

Ask what platform A would select without the bonus and how much policy distance 10 ECU can compensate. Consider a voter at 40 when A chooses 30 and B chooses 45: B is closer by five units, yet A supplies ten additional units. This example turns an abstract concept into an observable inequality. Then discuss boundaries of the model. Real quality is often uncertain, campaigns alter perceptions, and voters value traits differently. The treatment assumes common, known, monetized valence. It is a benchmark for reasoning rather than a complete account of real campaigns.



Ronda 1 de 10 - Candidato A

Elija su plataforma

Su propuesta será vinculante si gana. El rival decide al mismo tiempo.

Ventaja de valencia

El candidato A ofrece 10 ECU adicionales de calidad o competencia a todos los votantes si gana.

Mediana observada

50

Ventaja de calidad de A

+10 ECU

Plataforma anunciada

Posición en la dimensión económica

Seleccione ▼

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Figure 6.4: Information presented to a candidate under valence advantage.

Checkpoint

Before comparing this treatment, confirm that Report displays its correct name. Describe platforms and ballots first; apply the treatment-specific prediction only afterward.

6.5 Hidden voter preferences

What changes, predictions, and interpretation

Before each round the system selects an electorate with median 40, 50, or 60. Each voter knows an individual ideal point, while candidates know the three possible states but not the realized one. Platforms are chosen before the median is revealed. The treatment retains one dimension and office-seeking candidates, so any additional dispersion comes from strategic uncertainty rather than new preferences.

With complete information the convergence target is known. Under uncertainty, candidates need a platform that performs reasonably across multiple electorates. A location near 50 can function as insurance, although asymmetric or mixed behavior may emerge depending on beliefs about the rival. [Calvert \(1985\)](#) studies how uncertainty and motivations shape robustness of convergence, and [Morton \(1993\)](#) shows how incomplete information can support ideological divergence.

During the debrief, first reveal platforms without announcing the realized median and solicit predictions. Then show the complete map. This order reconstructs the candidates' information and prevents hindsight evaluation. Compare distance to the realized median and volatility across rounds. A large ex post distance need not imply a poor ex ante choice: a platform of 50 can be sensible when all three states are possible and still finish ten units from the realized median.

Use the treatment to teach ex ante versus ex post assessment. Ex ante, a strategy is judged by expected performance across states; ex post, the class sees one realization. Ask candidates to describe beliefs about the rival and electorate and whether extreme states changed later choices. The design also clarifies why polls, interest groups, and contact campaigns can be valuable: candidates lack direct knowledge of citizen preferences. The next treatment supplies an imperfect public signal and makes the value of common information measurable.

Checkpoint

Before comparing this treatment, confirm that Report displays its correct name. Describe platforms and ballots first; apply the treatment-specific prediction only afterward.

6.6 Public poll

What changes, predictions, and interpretation

The electorate again has median 40, 50, or 60, but both candidates observe a public estimate before choosing platforms. The signal equals the true median with 75 percent probability; when wrong it reports one of the other possibilities. Its precision is announced and A and B receive the same signal. Voters know their own positions and the platforms, while the report ultimately reveals signal, state, and outcome.

A common poll coordinates expectations. If both candidates trust it, platforms should move in its direction and their gap may shrink even though the survey is imperfect. Rational use does not mean blind obedience: a signal of 40 makes a left median more likely but retains a 25 percent error probability. Platform choice balances information and risk. Experimental research on elections shows that polls and electoral histories can coordinate behavior while also generating strategic responses ([McKelvey and Ordeshook, 1985](#); [Forsythe et al., 1993](#)).

Interpret behavior conditionally. Classify rounds by whether the poll was correct and compare platform-to-signal, platform-to-median, and platform-to-rival distances. A platform close to the

Ronda 1 de 10 · Candidato A

Elija su plataforma

Su propuesta será vinculante si gana. El rival decide al mismo tiempo.

Preferencias electorales ocultas

Los candidatos saben que la mediana puede ser 40, 50 o 60, pero no observan cuál se realizó antes de elegir.

Mediana posible

40 · 50 · 60

Plataforma anunciada

Posición en la dimensión económica

Seleccione

Confirmar plataforma

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Figure 6.5: Information presented to a candidate under hidden voter preferences.

signal in a mistaken-poll round is not evidence of poor information use; it may be the consequence of following a signal that was informative *ex ante*. Systematically ignoring a precise signal can instead reflect distrust, Bayesian difficulty, or slow learning. Ask candidates explicitly what weight they placed on the announced 75 percent accuracy.

The treatment connects political economy with information economics. Discuss whether publication improves representation, whether it can induce synchronized movements, and what would change with private or biased polls. Clarify that this implementation does not create bandwagon effects among voters: the poll informs candidates about aggregate preferences and does not announce which candidate is leading. Compare the public-poll and hidden-preference treatments. Their difference in convergence offers a classroom measure of the value of shared information.

Checkpoint

Before comparing this treatment, confirm that Report displays its correct name. Describe platforms and ballots first; apply the treatment-specific prediction only afterward.

6.7 Costly voting

What changes, predictions, and interpretation

Candidates compete as in the reference condition, but each voter may choose A, B, or abstention. Casting a ballot costs 5 ECU and abstention is free. The winner is determined from votes cast, and a tie uses the announced fair lottery. This treatment provides a bridge to the separate turnout family, which can examine pivotality, civic duty, and mobilization in greater depth.

Ronda 1 de 10 - Candidato A

Elija su plataforma

Su propuesta será vinculante si gana. El rival decide al mismo tiempo.

Encuesta pública Los candidatos observan una estimación pública de la mediana que acierta con 75% de probabilidad.

Estimación de la encuesta

50

Probabilidad de acierto: 75%

Plataforma anunciada

Posición en la dimensión económica

Seleccione ▼

Confirmar plataforma

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Figure 6.6: Information presented to a candidate under public poll.

The cost creates a social dilemma. A ballot can change policy when pivotal, but that probability depends on six other citizens. If everyone expects a preferred candidate to win without them, each person wants to save the cost; participation can fall and an unexpected voter can become decisive. [Palfrey and Rosenthal \(1983\)](#) formalize the strategic calculus of voting. The laboratory group deliberately makes pivotality more likely than in a national election, allowing the mechanism to be observed.

The report places turnout beside platforms, votes, and efficiency. Do not interpret abstention as indifference without checking distances. A citizen with a strong preference may abstain because others are expected to secure the result, while a nearly indifferent citizen may vote through error or norm. Compare turnout in close and lopsided contests. Ask whether students responded to the platform gap, an expected vote margin, or only to the fixed cost.

Separate a positive and a normative question. Positively, when did people vote and who was pivotal? Normatively, can a private participation cost alter a collective choice that affects everyone? Remove one ballot at a time as a counterfactual. A ballot that was not pivotal ex post could still have been sensible ex ante. The payoffs omit civic satisfaction and social pressure. The later turnout game can incorporate those forces; this treatment only demonstrates how a small friction changes the link between preference and collective outcome.

Checkpoint

Before comparing this treatment, confirm that Report displays its correct name. Describe platforms and ballots first; apply the treatment-specific prediction only afterward.

Ronda 1 de 10 - Candidato A

Elija su plataforma

Su propuesta será vinculante si gana. El rival decide al mismo tiempo.

Voto costoso Cada votante puede abstenerse; emitir un voto cuesta 5 ECU.

Mediana observada

50

Plataforma anunciada

Posición en la dimensión económica

Seleccione
▼

Confirmar plataforma

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Figure 6.7: Information presented to a candidate under costly voting.

6.8 Two policy dimensions

What changes, predictions, and interpretation

Each platform contains an economic and a social coordinate between 0 and 100. Every voter has an ideal point in the plane. The system uses the average absolute distance across dimensions, keeping utility between 0 and 100. The voting screen plots A, B, and the participant and also states the payoff under each possible victory.

In one dimension an ordering identifies a median. In two dimensions there is generally no individual who divides every possible comparison. Different movements can attract different majorities, and an unbeaten position may not exist. [Plott \(1967\)](#) characterizes demanding conditions for majority-rule equilibrium, while [McKelvey \(1976\)](#) demonstrates the broad scope for cycles when those conditions fail. The treatment turns this theoretical limitation into a visual experience.

Do not use the median of the first coordinate as a sufficient prediction. Project the plane and determine which candidate is closer to each voter. Platforms with the same economic coordinate can assemble different coalitions through the social dimension. The report's horizontal convergence statistic should be supplemented with the two-dimensional screenshots and exported second-coordinate data. For a complete classroom analysis, plot one election and count coalitions before summarizing means.

The debrief can address agenda control and political simplification. What happens when a campaign succeeds in making only one dimension salient? What changes if citizens weight issues differently? This implementation uses equal weights and Manhattan distance for transparent arithmetic; alternative metrics produce different indifference boundaries. Absence of a unique median does not imply unavoidable chaos: institutions, parties, agendas, and valence can stabilize

outcomes. Comparing this treatment with the one-dimensional reference shows exactly what the median-voter assumptions accomplish.



Ronda 1 de 10 · Candidato A

Elija su plataforma

Su propuesta será vinculante si gana. El rival decide al mismo tiempo.

Dos dimensiones políticas

Candidatos y votantes tienen posiciones en dos asuntos. La distancia combina ambas dimensiones.

Mediana observada

50

Plataforma anunciada

Posición en la dimensión económica

Seleccione ▼

Posición en la dimensión social

Seleccione ▼

Confirmar plataforma

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Figure 6.8: Information presented to a candidate under two policy dimensions.

Checkpoint

Before comparing this treatment, confirm that Report displays its correct name. Describe platforms and ballots first; apply the treatment-specific prediction only afterward.

Comparisons, evidence, and classroom discussion

7.1 What can be compared

A useful comparison holds language, rounds, group size, and feedback timing constant and changes one treatment. Compare office seeking with policy motivation to study objectives; hidden preferences with a public poll to study information; or one dimension with two to study preference structure. When the class is small, use different cohorts and describe differences without strong causal claims.

Build a board table with assumption, treatment, prediction, and evidence. The reference assumes a known median, office-seeking candidates, costless compulsory voting, and one dimension. Each treatment should occupy one row and identify the modified element. This prevents eight disconnected stories.

7.2 Relevant experimental evidence

Spatial-competition experiments show responses to convergence incentives, while learning, uncertainty, and heterogeneity produce dispersion. [Aragones and Palfrey \(2004\)](#) study candidate quality and find systematic valence-driven asymmetries. [McKelvey and Ordeshook \(1985\)](#) show that limited information and electoral sequence change strategies. [Forsythe et al. \(1993\)](#) document that polls and histories support coordination when elections offer more alternatives. These findings justify examining distributions and dynamics rather than only one theoretical location.

The teaching implementation is not an exact replication of each paper. It uses smaller groups, a discrete grid, and a common interface across treatments. Literature supplies the conceptual basis and comparison point. Treat differences as opportunities to identify which original design feature was not reproduced.

7.3 Questions for a twenty-minute discussion

1. What information did a voter need to choose by proximity?
2. Why does the fourth voter have a special role with seven citizens?
3. After the round, what was the best response to the rival's platform?
4. Did both candidates converge, or does the mean hide different groups?

5. Did the winning policy maximize spatial welfare? Who remained farthest away?
6. What changed after introducing ideology, valence, or uncertainty?
7. Does a correct poll benefit candidates, voters, or everyone?
8. Why might someone abstain despite a strong policy preference?
9. What does median cease to mean after adding a second dimension?
10. Which real institution would you add next, and what prediction would it generate?

A sequence for closing the discussion

First reconstruct one complete round in the order in which it occurred: available information, platforms, ballots, winner, and earnings. Then separate three questions that students often blend together. The positive question asks what participants did; the strategic question asks what was advantageous given other decisions; the normative question asks which policy generated greater welfare. This sequence prevents hindsight from evaluating a choice with information the participant did not possess and prevents treating victory as evidence of efficiency.

End by comparing the round with a prediction written before the report was opened. When evidence differs from theory, sort explanations into learning, uncertainty, preferences, objectives, and institutions. Select one explanation and derive an implication that another round or treatment could test. Feedback then moves beyond describing bars and averages toward constructing and evaluating hypotheses.

Feedback script

Ask one group to defend the convergence prediction, a second to offer the best explanation for a deviation, and a third to identify the datum that would distinguish the two accounts. Close with one distribution, one trajectory, and one map; each figure should answer a different question.

Data, ethics, and troubleshooting

8.1 Export and variables

The export contains anonymous session and participant identifiers, round, language, edition, treatment, matching, group, role, ideal points, platforms, ballots, median, poll, winner, turnout, gap, convergence, payoff components, and efficiency. Store a dated copy with a dictionary. Do not add names. When combining sessions, retain the configuration code so treatments are never mixed.

For a basic assignment, graph platforms by round and calculate median distance. An advanced assignment can regress platforms descriptively on poll signals, candidate ideals, or treatments. Explain that repeated observations are dependent and that the interaction unit is the group.

8.2 Privacy and participant treatment

The purpose is learning rather than individual psychological assessment. State whether ECU become money, course points, or remain an experimental metric. Do not deceive participants about poll or tie probabilities. Keep codes anonymous and project aggregates. A publishable research project requires ethics review, consent, and a data plan beyond this teaching protocol.

8.3 Frequent problems

When a participant sees “Please wait,” inspect Monitor for a missing candidate or voter. If an old link follows a database reset, create a new session rather than reusing its code. If a room lists unrelated families, verify `GAME_FAMILY=election` and a dedicated database. If Report remains locked, identify incomplete rounds. Never run `resetdb` on production during class.

Attention

Do not change a live configuration or restart the server while participants decide. Treatments and matching are part of the data’s meaning.

8.4 Accessibility

Blue and orange are paired with A and B labels. Read numerical results aloud during feedback instead of relying on color alone. Allow browser zoom, verify keyboard operation of selectors, and provide private assistance. In two dimensions, describe coordinates as well as showing the plane.

Accessible support protocol

Before class, test the interface at 200 percent zoom and with keyboard navigation. Confirm that focus reaches every selector and confirmation button and that no text is hidden. If someone uses a screen reader, describe the plane verbally: economic axis, social axis, the participant's coordinates, and the coordinates of A and B. Assistance should explain the interface without recommending a decision.

When presenting the report, announce each figure's title, unit, and comparison before interpreting it. For a histogram, describe where the distribution is concentrated and whether tails or outliers are present; for a trajectory, state the initial round, final round, and direction of movement. Offer a tabular rendering when a visual cannot be accessed. Never identify publicly who requested support.

Accessibility also concerns cognitive load and language. Read instructions in blocks, allow private questions, and use comprehension checks to detect unfamiliar terms. When additional time is provided, do so without changing information for other participants or revealing results before the controlled close.

Checkpoint

Complete one test using keyboard controls, browser zoom, and a verbal description of a report figure. Verify that color, position, and labels provide redundant information.

8.5 Configurations and technical preparation

8.6 Basic configurations

- `eleccion_candidatos_es_1_eleccion`
- `eleccion_candidatos_es_10_grupo_fijo`
- `eleccion_candidatos_es_10_grupos_reasignados`
- `two_candidate_election_en_one_election`
- `two_candidate_election_en_10_fixed_group`
- `two_candidate_election_en_10_reassigned_groups`

8.7 Pre-session checklist

- ☐ Attendance is a multiple of nine and computers are available.
- ☐ The isolated instance shows 22 configurations and four rooms.
- ☐ Language, treatment, rounds, and matching have been checked.
- ☐ The room link or QR code is ready.
- ☐ Monitor and Report are open; results remain hidden.
- ☐ Comprehension questions have been tested.
- ☐ Feedback questions and theory comparison are prepared.
- ☐ Export and privacy procedures are defined.

8.8 Proposed routes

- Instructor demo: <https://election.beer-lab.org/demo>
- Basic ES room: https://election.beer-lab.org/room/eleccion_candidatos_es
- Basic EN room: https://election.beer-lab.org/room/two_candidate_election_en
- Extended ES room: https://election.beer-lab.org/room/eleccion_candidatos_extendida
- Extended EN room: https://election.beer-lab.org/room/two_candidate_election_extended

Instructor glossary

Convergence: a reduction in distance between platforms or between each platform and the median.

Spatial efficiency: observed proximity welfare as a percentage of the feasible maximum.

Median: an ideal point leaving at least half of observations on either side.

Single peaked: utility falls when moving away from the ideal in either direction.

Binding platform: the announced policy is implemented after victory.

Valence: a nonpositional quality valued in the same direction by all voters.

Proximity-consistent vote: a ballot for the alternative producing higher earnings from displayed platforms.

Pivotality: the possibility that one ballot changes the winner.

Ex ante evaluation: judgment using information and probabilities available before realization.

Ex post evaluation: judgment after the state is observed.

Ideal point: the policy that maximizes a person's utility under unilateral choice.

Indifference boundary: the location at which a voter obtains equal utility from A and B.

Electoral margin: the difference between winner and loser vote totals.

Platform gap: absolute distance, or Manhattan distance in two dimensions, between A and B.

Turnout: the share of eligible voters who submit a ballot.

Public poll: a common signal about the electorate that can be informative without being infallible.

Best response: a decision maximizing earnings given what others did or are expected to do.

Equilibrium: a strategy profile in which no player benefits from a unilateral deviation.

Interaction unit: the group within which participants' decisions affect one another.

Use the glossary as a conceptual checklist. Before feedback, select three terms that correspond to the treatment and write them without definitions. Ask the class to construct each definition from an observed round. Then compare their wording with the guide and identify a report variable that operationalizes the concept.

Do not treat nearby terms as equivalents. Convergence describes movement or distance; equilibrium adds an incentive condition. Majority describes a decision rule; efficiency introduces a welfare criterion. A poll informs beliefs; it does not by itself determine which platform should be chosen.

Notes for extending the family

Future additions should preserve family isolation, bilingual operation, comprehension, aggregate reporting, and export. Third-candidate entry can study entry and strategic voting; primaries can generate divergence; costly campaigns can introduce resource competition; ambiguous platforms can weaken commitment; and turnout can become a separate family. Do not place every extension in one room: pedagogical flexibility requires treatments and families with a clear central question.

The next construction item is turnout and abstention. It should expand the margin introduced by costly voting through civic benefit, mobilization, information, electorate size, and compulsory voting. Keeping it separate preserves this family's focus on spatial candidate competition.

Every extension should begin with an identifiable question. A third candidate can target entry and strategic voting; campaign spending can target how resources change information or valence. Define the contrast first, the treatment second, and the interface last. Extra controls without a linked prediction increase complexity without necessarily increasing learning.

Retain a reference configuration beside the new treatment. Hold the payoff scale, electorate composition, duration, and feedback timing constant unless one is the object of study. Document what candidates and voters know, when they know it, and which outcomes depend on chance. The report should separate new behavior from existing indicators so an instructor can compare without reconstructing data during class.

Before adding an extension to the catalog, require four checks: comprehension by someone outside development, a bot covering every branch, a nine-station pilot, and report inspection with both complete and incomplete data. Then add theory, competing predictions, a feedback script, and references. This sequence preserves quality as the platform grows.

For the instructor

A new treatment is ready when an instructor can state in one sentence which assumption changes, which outcome should move, and which report figure evaluates the prediction.

Instructor analysis cases

11.1 Case 1: partial convergence

Suppose A chooses 40 and B chooses 55 while voters occupy 10, 25, 40, 50, 60, 75, and 90. Before revealing the count, locate the indifference point between 40 and 55: it is 47.5. Voters below it prefer A and those above prefer B, so the voter at 50 gives B a majority. Ask whether A could improve by moving to 50. The answer develops best-response reasoning before a formal equilibrium definition is introduced.

Then distinguish a good ex post decision from an equilibrium strategy. Given 55, A may want 50, but B can anticipate and respond. Equilibrium requires that no player wants to deviate given everyone else's choices; it does not mean that a platform looks sensible in isolation. Repeat the exercise using one actual election from the report map.

11.2 Case 2: same median, different distribution

Compare electorates (10, 25, 40, 50, 60, 75, 90) and (0, 10, 20, 50, 80, 90, 100). Both have median 50. Ask students to predict office-seeking platforms and then calculate total distance to policy 50. The result explains how the median can determine a marginal electoral contest while remaining insufficient for welfare description. Electoral theory and normative evaluation answer different questions.

Extend the case with policy 45. Does its majority status against 50 change? How much does total welfare change, and who bears the difference? This arithmetic prevents students from treating a Condorcet winner as a policy unanimously preferred by everyone. Majority comparison does not remove distributional conflict.

11.3 Case 3: quality versus proximity

Consider a voter at 40, candidate A at 30 with a valence bonus of 10, and B at 45 without a bonus. Utility under A is $100 - 10 + 10 = 100$; utility under B is $100 - 5 = 95$. A wins the ballot despite being farther away. Lower the bonus to three and repeat. B now gives 95 while A gives 93. This identifies a compensation threshold and supports discussion of competence, honesty, or quality without turning them into another ideological coordinate.

Ask what happens when the bonus is uncertain. If A is competent with probability 0.6, how should expected value be calculated? Which campaign signal could inform that probability? Although the app does not implement uncertain valence, this oral extension links the election to belief formation

and information.

11.4 Case 4: a poll that misses

The poll reports median 40 with 75 percent accuracy, both candidates move toward 40, and the realized median is 60. Hindsight makes the platforms look mistaken. Ask students to assess them before the state was known. List all three states, assign probabilities consistent with the signal, and compare choosing 40 with choosing 50. The goal is not a closed-form solution but disciplined evaluation under uncertainty.

Then ask whether a common poll can reduce the platform gap while sometimes moving both candidates away from the actual electorate. This possibility shows that coordination and correct information differ. A signal can coordinate powerfully and still create correlated mistakes. A failed-poll round map is especially effective for this discussion.

11.5 Case 5: abstention and pivotality

Imagine an expected count of three A and three B ballots before the final citizen. If voting costs five, the seventh voter compares that cost with the policy difference and knows a ballot avoids the lottery. Change the expectation to four A and two B. The same citizen no longer changes the winner. Participation depends on beliefs about other ballots as well as own preference.

Distinguish ex post pivotality, reconstructed from the final count, from ex ante probability of being pivotal. A ballot that did not alter the winner may have been reasonable while the margin was uncertain. This prepares the turnout family without taking the current game away from candidate competition.

11.6 Case 6: coalitions in two dimensions

Project the two-dimensional plane. For each voter, compare the sum of horizontal and vertical distance to A and B. Mark all seven ballots and identify the winning coalition. Move only A's social coordinate. The majority may change while the economic position stays fixed. This shows why a single axis can omit decisive variation.

Invite students to propose a third platform and compare it by majority with the winner. Then look for another platform that defeats the third. If cycles arise, they need not be errors; they are a structural possibility in multidimensional spaces. Relate the sequence to agenda power and the order in which proposals reach a vote.

Learning assessment rubric

An adequate answer identifies preferences, rules, and information before stating a prediction. A strong answer derives candidate support using the median or an indifference boundary. An excellent answer compares the prediction with distributions, recognizes uncertainty, and states limits. Grade four dimensions: theoretical reasoning, use of evidence, treatment comparison, and inferential caution.

For a short assignment, request one report figure, a prediction written before inspecting it, and an explanation of the gap. For a longer exercise, ask students to compare two treatments, define the observation unit, discuss dependence across rounds, and propose an extension. Do not reward only outcomes near 50. Reward an explanation of when convergence should occur and which evidence could reject a specific hypothesis.

Dimension	Observable evidence	Suggested weight
Model	Defines preferences, information, and rules; derives a coherent prediction.	30%
Data	Reads distributions, trajectories, ballots, and the observation unit correctly.	25%
Comparison	Holds relevant features fixed and links the contrast to the treatment.	25%
Judgment	Recognizes uncertainty, limits, competing explanations, and ethical inference.	20%

Each dimension can receive zero through four points. Zero means absent; one, mentioned without application; two, partial use with errors; three, correct application; and four, correct application supported by evidence and explicit limits. Return feedback tied to the dimension rather than to the political preference expressed by the student. Assessment should reward economic reasoning and responsible data use.

For group work, ask for a brief individual prediction before the joint answer. This sequence makes learning visible without turning the election outcome into an assessment of a person. If the activity is graded, state criteria, weights, and whether predictive accuracy receives points separately from the argument.

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