Intragenerational Conflict and the Framing of the Future

Experimental Evidence on Intergenerational Cooperation

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Context

Three public events	
Nuits des chercheurs (October 2024, Montpellier).	
Festival Va-savoir (October 2024, Montpellier).	
Fête de la Science (October 2024, Montpellier).	

Scientists usually present posters and interactive demonstrations to foster discussions with visitors.

We decided to turn these events into a lab-in-the-field experiment, by collecting experimental data from the general public.

- Behavioral and experimental economics often rely on student samples.
- These events offer a unique opportunity to reach a more diverse population (age, profession, family structure).

- The 2024 Fête de la Science in Montpellier was organized under the theme **“Océan de savoir”** (*Ocean of Knowledge*).
- This theme inspired us to design an experiment about **resource sharing and sustainability**.
- During these events, visitors come to the stand *one group after another* — families, friends, children, grandparents — which naturally mirrors **a sequence of generations** exploiting a shared resource.

> ⇒ **We decided to focus on intergenerational shared resources.**

Ethic committee and pre-registration on OSF. (July 2024)

The Common-Pool Resource (CPR) Problem

- A common-pool resource (CPR) is a resource that is:
    - **rivalrous** (one’s use reduces what remains)
    - **non-excludable** (others can access it).

Examples: fisheries, groundwater, forests …

> *Individually rational extraction leads to collective collapse.*
> ⇒ known as **the tragedy of the commons** (Hardin, 1968).

The CPR Game

Walker, Herr, Gardner & Ostrom (2000)

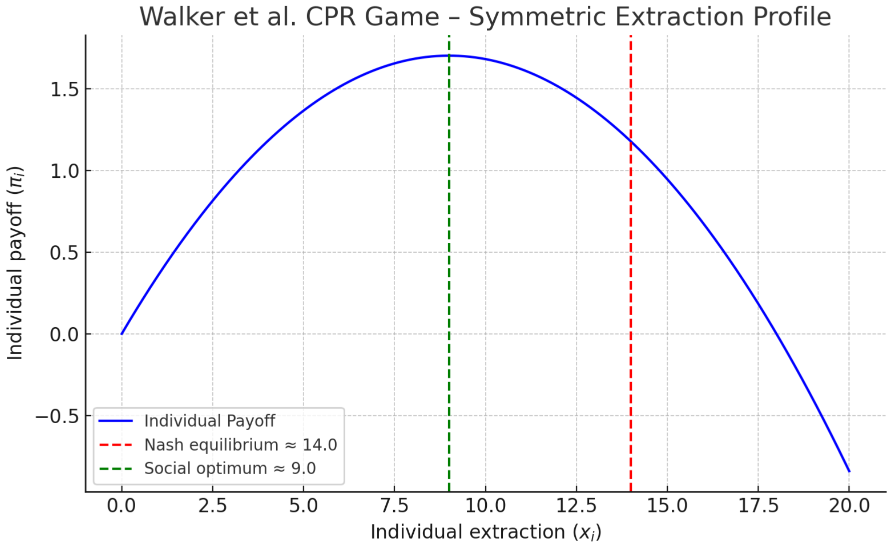
- n players share a common resource.
- Each player i chooses an extraction level x_i.
- Total extraction: $X = \sum_{j=1}^{n} x_j$
- Individual Payoff: $\pi_i(x_i, X) = ax_i - bx_i^2 - x_i(c + kX)$

Where:

- $B_i(x_i) = ax_i - bx_i^2$: Individual benefit function (increasing, concave)
- $C_i(x_i, X) = x_i(c + kX)$: Individual cost function (increasing, convex, with negative externality from total extraction)

Nash equilibrium: Each player maximizes their own payoff given the others' decisions: $\max_{x_i} \ \pi_i(x_i, X_{-i}) = ax_i - bx_i^2 - x_i(c + kX)$
Assuming symmetry $x_i = x$, $X = nx \Rightarrow x_i^N = \frac{a-c}{2b+k(n+1)}$

Social optimum: Maximize total group payoff $\Pi = \sum_{i=1}^{n} \pi_i$
$\max_{x_1,...,x_n} \ \sum_{i=1}^{n} \left(ax_i - bx_i^2 - x_i(c + kX)\right) \Rightarrow x_i^{SO} = \frac{a-c}{2b+2kn}$



E. Ostrom: Beyond the Tragedy — Institutions and Collective Action

- showed that collapse is not inevitable.
- Field and lab evidence that many communities often create institutions, norms, and rules to manage CPRs sustainably (Ostrom 1990, Ostrom, Walker & Gardner 1992, Walker et al. 2000).

Key mechanisms:

- Communication and shared norms
- Monitoring and graduated sanctions
- Collective choice (voting, self-governance)

From Intragenerational to Intergenerational CPRs

- Almost all naturally occurring CPRs are **intergenerational**: climate change, biodiversity loss, and resource depletion depend on today's choices.
- Mechanisms that have been shown to mitigate the overexploitation problem are not easily available across distant generations of users: future generations have **no agency** — they cannot reciprocate, vote, or punish.

⇒ **Cooperating with the future** is a special kind of social dilemma.

> In most CPR studies and experiments, players belong to the same generation and interact simultaneously.
> *What happens when **different generations** exploit the same resource over time?*

Intergenerational CPR - Related literature

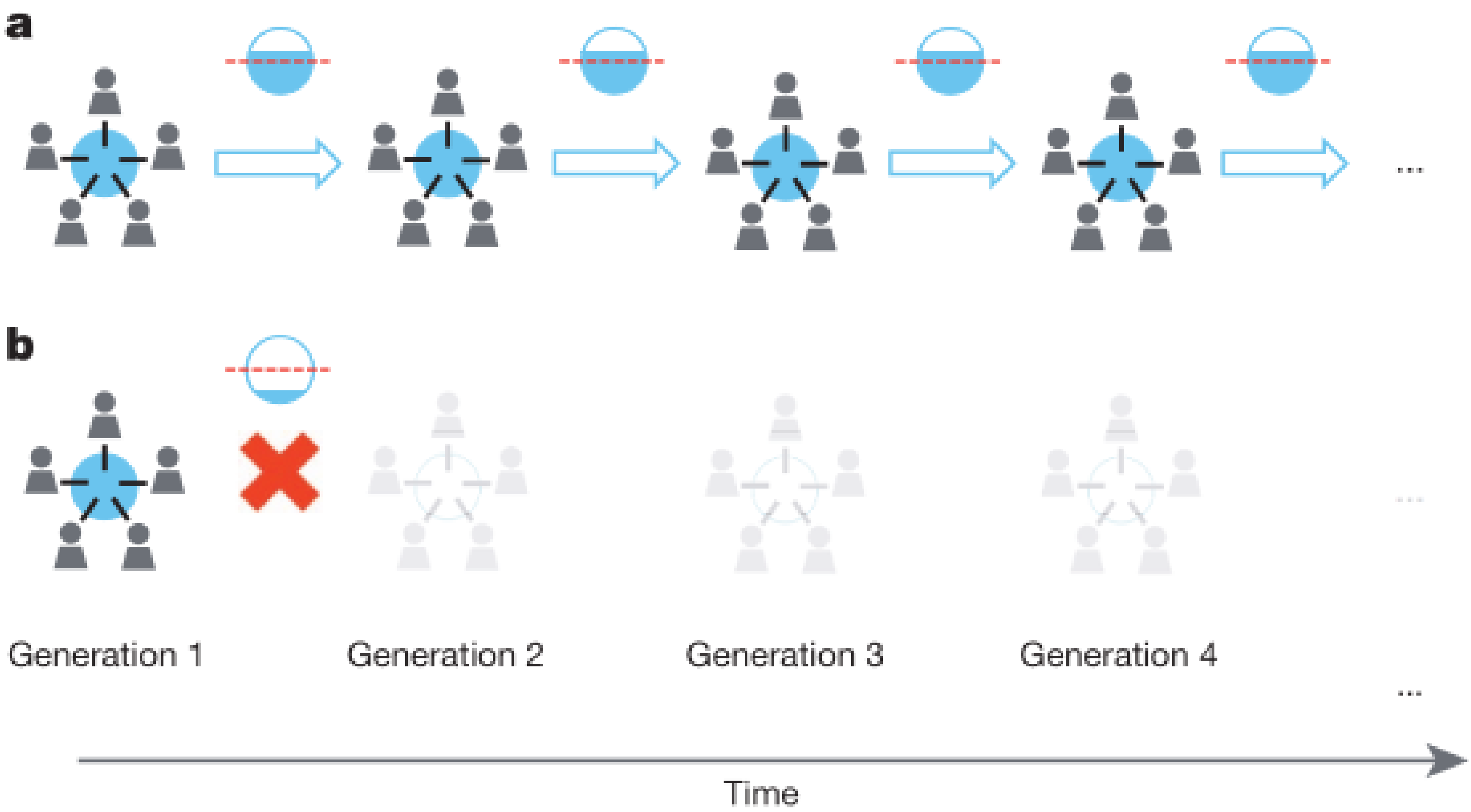
- **Fischer, Irlenbusch & Sadrieh (2004, JEEM)**
  Intergenerational link raises expectations but not actual cooperation.
- **Jacquet et al. (2013, Nature Climate Change)**
  Intergenerational discounting severely undermines cooperation —short-term gains dominate long-term welfare.
- **Hauser et al. (2014, Nature)**
  Democracy (median voting) sustains cooperation across generations.
- **Shahrier et al. (2017, Nature Sustainability), Timilsina et al. (2017, PlosOne)**
  Urban (more capitalist) communities show lower intergenerational concern than rural ones.
- **Chang et al. (2021, Royal Soc. Open Sci.)**
  Material interest in future use of the resource promotes sustainability, but when many others share the resource (high density cues) trust in future benefit drops and extraction rises.

The Intergenerational Goods Game (IGG)

Hauser, Rand, Peysakhovich, Nowak (2014, Nature)

- Successive generations of 5 players share a common pool of 100 units.
- Each player can extract 0–20 units.
- If total extraction ≤ threshold T = 50%, the pool renews to 100 units.
- If extraction > T, the resource collapses → all future generations get 0.
- The game continues with probability $\delta = 0.8$ (≈ 5 generations expected).

> **Social optimum:** 10 units per player
> **Individual temptation:** 20 units


a
b
...
Generation 1
Generation 2
Generation 3
Generation 4
...
Time

Intragenerational conflict undermines cooperation with the future

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Research Question

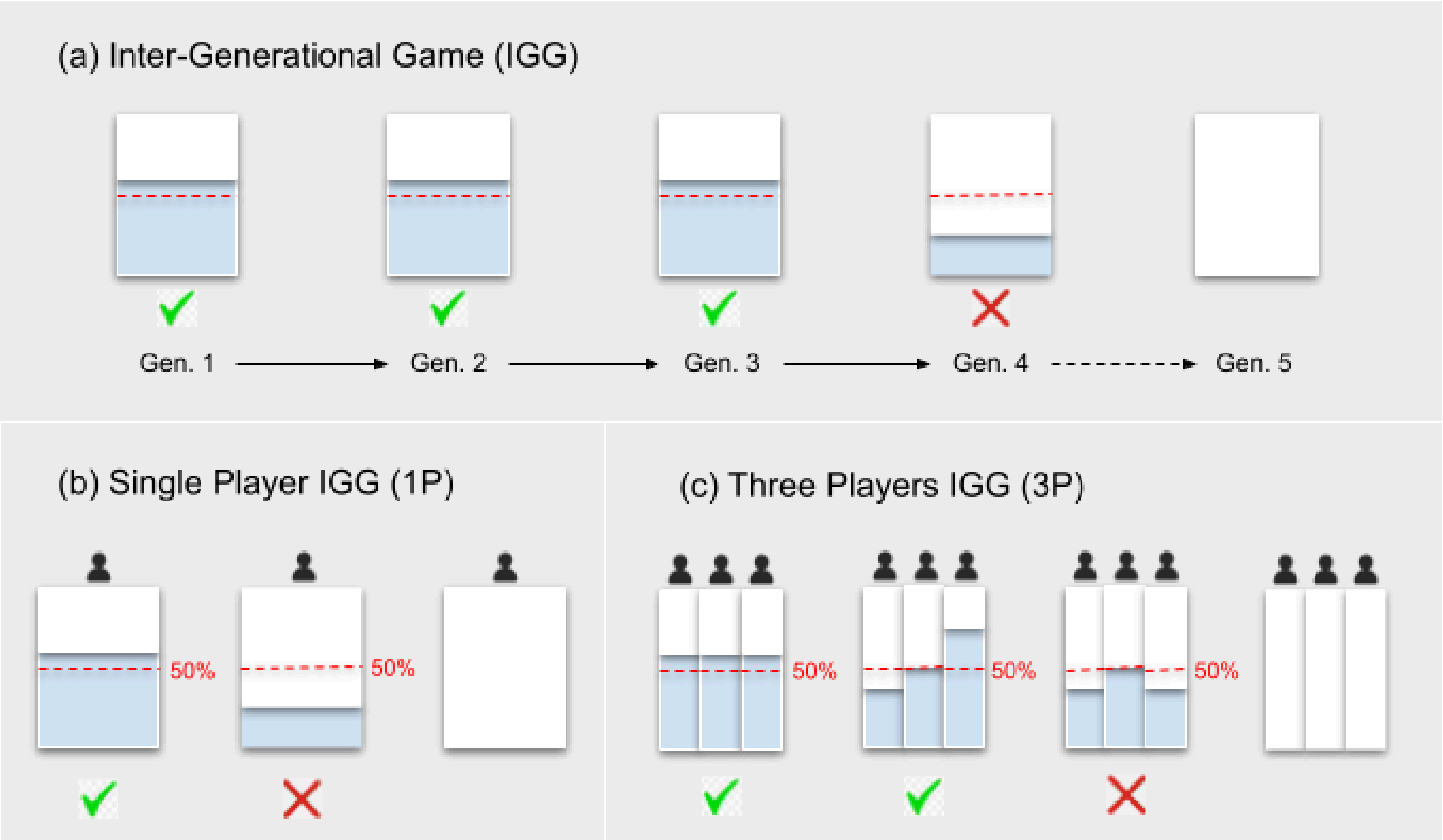
Does intragenerational conflict undermine cooperation with the future?

We disentangle:

- Intergenerational dilemma: present vs. future.
- Intragenerational dilemma: conflict among current individuals.

Adapted IGG

- Two treatments:
  - **1P**: one player extracts 0–60 units (intergenerational dilemma only).
  - **3P**: three players extract 0–20 units each (inter + intragenerational dilemmas).
- Renewal threshold T = 30 units (≤ 50 % of the resource).
- If extraction > T → resource collapses → all future payoffs = 0.
- No probabilistic continuation (5 generations fixed).


(a) Inter-Generational Game (IGG)
Gen. 1
Gen. 2
Gen. 3
Gen. 4
Gen. 5
(b) Single Player IGG (1P)
50%
50%
(c) Three Players IGG (3P)
50%
50%
50%

Hypotheses

1. **H1:** Cooperation is higher when no intragenerational conflict exists (1P > 3P).
2. **H2:** Intragenerational conflict reduces sustainability via coordination failures.

Data collection

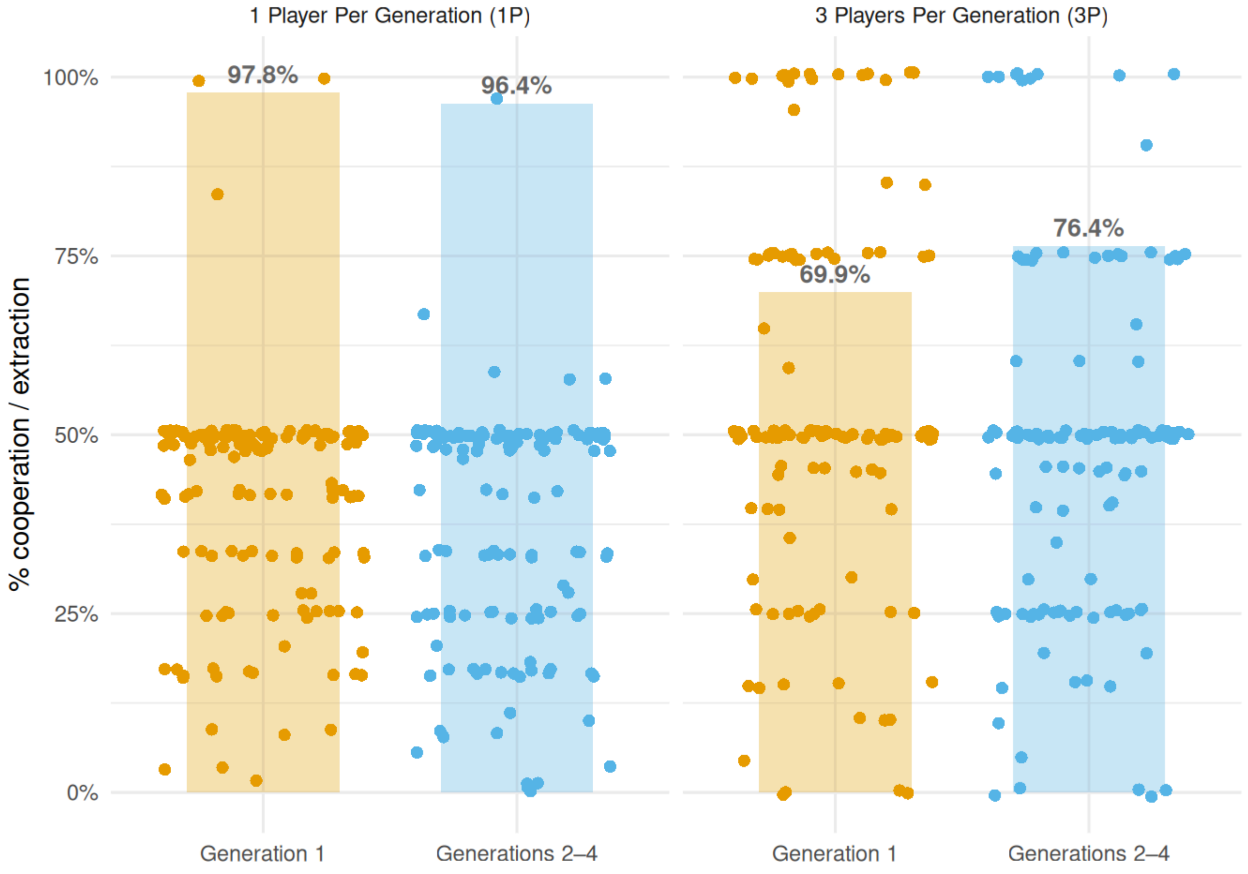
- During the 2024 *Nuits des chercheurs* and the 2024 *Fête de la Science*
- Participants included students and members of the general public.
- Experiment implemented on tablets.
- 5 generations.
- Strategy method : participants took decisions for generation 1, generations 2–4, and generation 5 (no future value).

- Generations were constructed ex post, after individual decisions were collected.
- Participants were paid according to their extraction decisions, by bank transfer (€ 0.15/unit in 1P and € 0.45/unit in 3P).

Participants

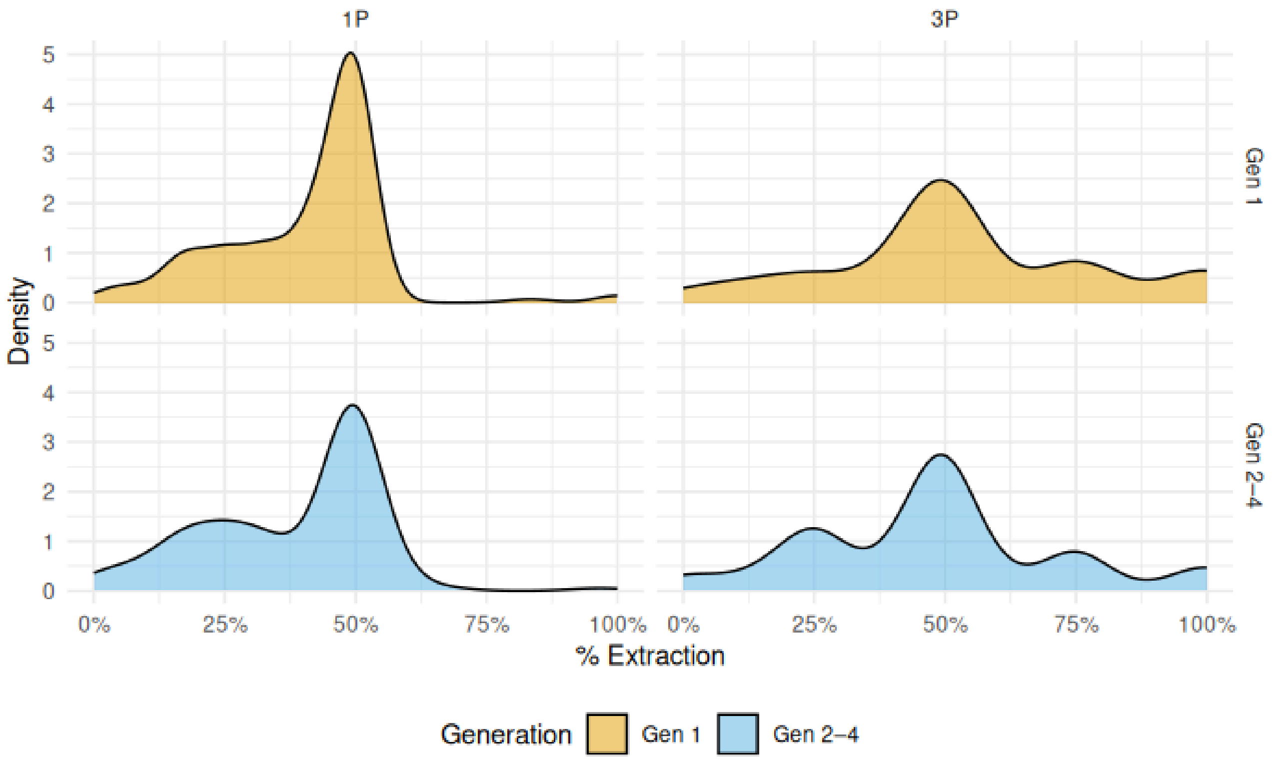
	1P Treatment	3P Treatment
Participants	137	123
Age (mean)	30.40	32.05
Gender (male)	37.96%	39.84%
Single	57.66%	56.10%
With children	48.18%	49.59%
Students	47.45%	38.21%
Executives	29.20%	30.89%

Results



⇒ With contemporaries, cooperation collapses (*fisher's exact test p<0.001*).

Extraction Distributions



Distributions are significantly different between the two treatments

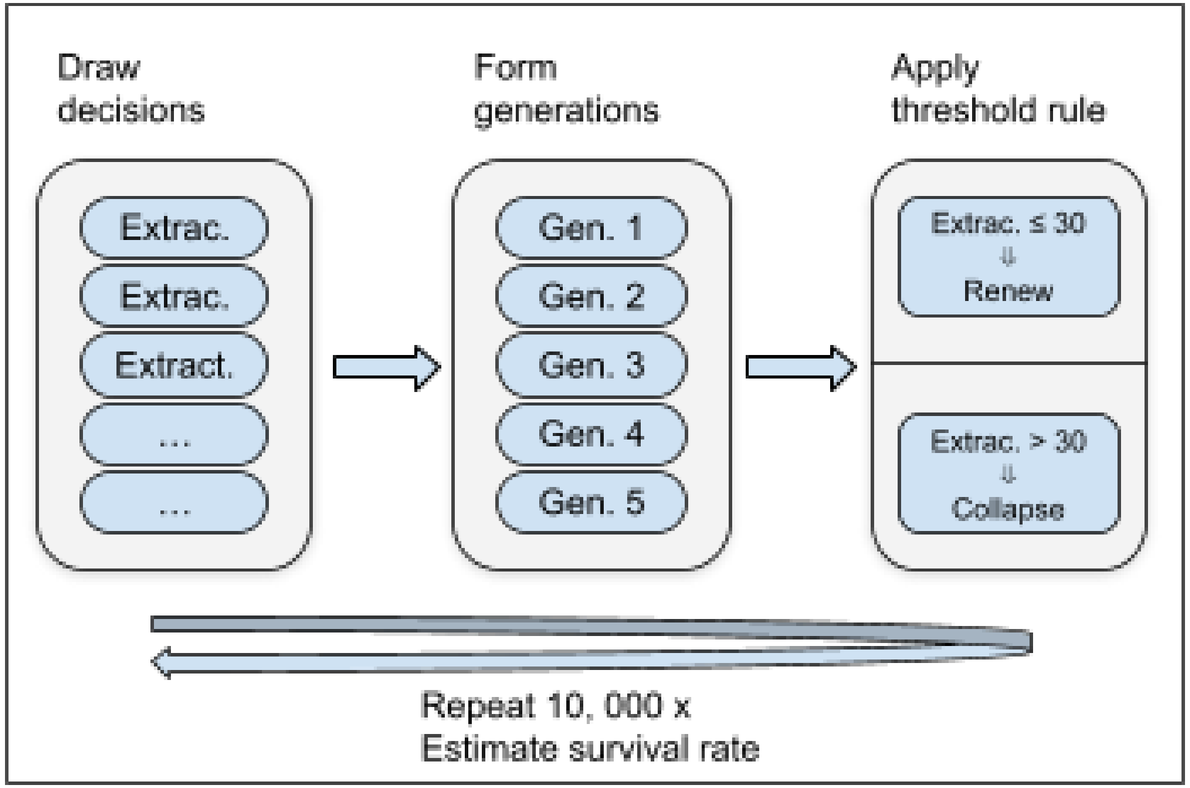
ks-test, p < 0.001

	Cooperation	**Extraction (%)**
1P × Gen 1 (réf.)	13.015***	0.364***
3P vs 1P	-4.572*	0.123***
Gen 2–4 vs Gen 1	-1.835	-0.027
Interaction (3P × Gen 2–4)	4.674*	-0.027
Num.Obs.	520	520

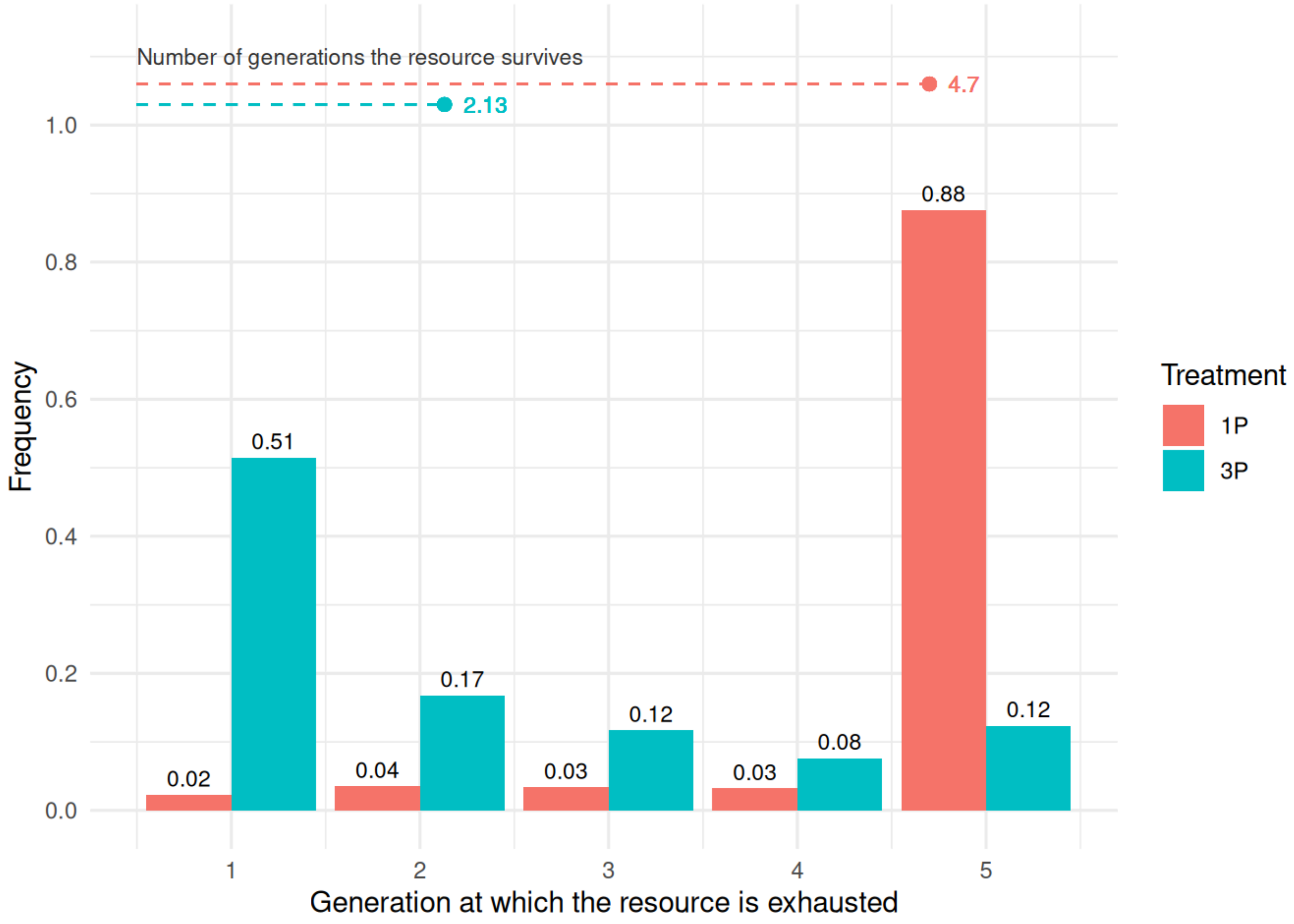
Notes:
* p < 0.05, ** p < 0.01, *** p < 0.001
Control variables: gender, age, num. of children.
Cooperation: Generalized Linear Mixed Model (GLMM); Extraction: Linear Mixed Model (LMM).

Resource sustainability

Monte Carlo (10 000 trajectories) to estimate the **expected survival of the resource** over five generations.



1. Draw participants from the experiment (4 in 1P, 12 in 3P, w/o replacement).
2. Form 4 generations (1 or 3 players per generation).
3. Apply the renewal rule:
    - Resource renews if total extraction in the generation ≤ 30 units.
    - If extraction > 30 → resource collapses.
4. Store the generation at which the resource collapses (if any), otherwise store 5 (full survival).
5. Repeat the process 10,000 times to simulate variability in group composition and decisions.
6. Compute, for each generation, the fraction of trajectories in which the resource is depleted, and the expected survival duration of the resource.



⇒ Intragenerational conflict drastically reduces resource sustainability.

Ex-post theoretical models

- The first model assumes fully rational agents with perfect foresight and common knowledge — they know the game and reason infinitely forward.
- The second model assumes boundedly rational agents — they maximize utility, but their beliefs are simplified and shaped by heuristics rather than full strategic reasoning.

1. Rational Intergenerational Goods Game (IGG)

- Let $u_g = x_g$: utility of generation g equals its extraction.
- Let V_g the total utility of generation g:

$$V_g = u_g + \beta V_{g+1}$$

β captures the intergenerational altruism.

- $\beta \in [0, 1)$: future generations weighted less than the present (present = 1).
- β constant across generations — current altruism projected forward.

$$
\begin{aligned}
V_1 &= u_1 + \beta V_2 = u_1 + \beta(u_2 + \beta V_3) \\
&= u_1 + \beta u_2 + \beta^2(u_3 + \beta V_4) = \cdots = u_1 + \beta u_2 + \beta^2 u_3 + \cdots \\
&= u \cdot \frac{1}{1-\beta} \quad \text{if } u_g = u, \forall g \text{ and } n \to \infty
\end{aligned}
$$

⇒ cooperation if $V_1 > 60 \Rightarrow 30 \times \frac{1}{1-\beta} > 60 \Rightarrow \beta > 0.5.$

1P (n=1)

- If $\beta > 0.5$, the extraction path is sustainable.
- If $\beta \leq 0.5$, the extraction path is non-sustainable.

3P (n=3)

Introduce $\hat{x}_g^{-i}$ which is player i's belief about the total extraction of the two other players in his generation.

$\Rightarrow V_g^i = u_g^i(x_g^i, \hat{x}_g^{-i}) + \beta V_{g+1}$

3 possible cases:

1. The two other players have $\beta \leq 0.5$.
2. The two other players have $\beta > 0.5$.
3. One player has $\beta \leq 0.5$ and the other $\beta > 0.5$.

Myopic players: *they assume that the composition of their current generation will not change in future generations.*

- if $\beta_i \leq 0.5$, player i extracts 20 units, whatever their beliefs about others.
- if $\beta_i > 0.5$, player i's extraction depends on their beliefs about others' altruism.
    - Case 1 (others' $\beta \leq 0.5$): $\hat{x}_g^{-i} = 40 \Rightarrow x_g^i = 20$.
    - Case 2 (others' $\beta > 0.5$): $\hat{x}_g^{-i} = 20 \Rightarrow x_g^i = 10$.
    - Case 3 (mixed): the player with $\beta \leq 0.5$ extracts 20, leading i to believe $\hat{x}_g^{-i} \geq 20 \Rightarrow$ both players with $\beta > 0.5$ have to coordinate to reach $x_g^i + x_g^k = 10$, but coordination failure may occur ($x_g^i + x_g^k > 10$).

Farsighted player: *they anticipate that the composition of their current generation may change in future generations.*

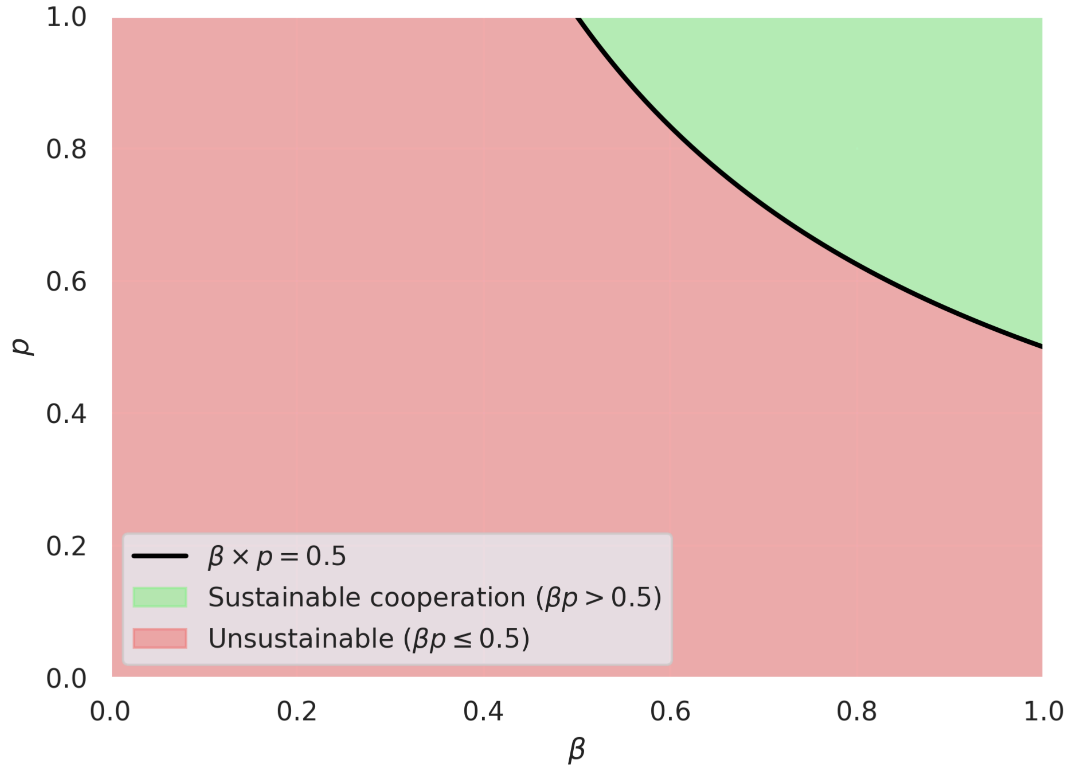
Let p be the probability that the next generation will not deplete the resource.

$$V_1^i = u_1^i(x_1^i, x_1^{-i}) + \beta E[V_2], \quad \text{where} \quad E[V_2] = pV_2^{\text{sust}} + (1-p) \times 0 = pV_2^{\text{sust}}$$

$$\begin{aligned}
V_1 &= u_1 + \beta p \left[u_2 + \beta V_3\right] \\
&= u_1 + \beta p \left[u_2 + \beta p \left[u_3 + \beta V_4\right]\right] \\
&= u_1 + \beta p u_2 + \beta^2 p^2 u_3 + \cdots \\
&= u \times \left(\frac{1}{1-\beta p}\right) \quad \text{if } u_g = u, \forall g \text{ and } n \to \infty
\end{aligned}$$

Cooperation if $\frac{30}{1-\beta p} > 60 \Rightarrow \beta p > 0.5$

With farsightedness, as the probability of sustainability decreases, the altruistic component must increase to compensate.



Rationality model — Key insights

- In the one-player case, sustainability requires that intergenerational altruism exceeds a critical threshold — cooperation arises only if $\beta > 0.5$.
- In the three-player case, the same logic applies, but each player must also believe that the next generation will cooperate. The condition becomes $\beta p > 0.5$, where p represents the perceived probability that future generations will sustain the resource.
  $\Rightarrow$ **Even highly altruistic players will defect if they expect others not to cooperate** — beliefs about the future are as important as altruistic preferences.

From rationality to bounded rationality

- The rational model provides a clear normative benchmark — cooperation is possible if $\beta p > 0.5$ — but it assumes perfect reasoning, common knowledge and accurate beliefs.
- In reality, people's expectations about others and the future are uncertain, biased, and shaped by simple heuristics rather than full strategic reasoning.

> ⇒ The rational model tells us when cooperation should occur, but to understand when it actually occurs, we must model how individuals form beliefs and process uncertainty — that's the goal of our bounded-rationality model.

2. Boundedly Rational Intergenerational Goods Game (IGG)

$$u_{i,g} = \begin{cases} x_{i,g} + \beta_{i,g} \cdot p_{i,g} \cdot V_{g+1}, & \text{if } X_g \leq 30 \\ x_{i,g}, & \text{if } X_g > 30 \end{cases}$$

- $\beta_i \in [0, 1]$ is the player's future oriented preference (intergenerational altruism / discount factor).
- $p_i \in [0, 1]$ is the player's subjective belief that others will cooperate and the resource will survive.
- $V_{g+1} = 30 + \beta_{i,g} \cdot p_{i,g} \cdot V_{g+2} \Rightarrow V_{g+1} = \frac{30}{1-\beta_{i,g}p_{i,g}}$ assuming $X_{g+m} = 30 \ \forall m \geq 1$ and infinite horizon.

$\Rightarrow u_{i,g} = x_{i,g} + \beta_{i,g} \cdot p_{i,g} \cdot \frac{30}{1-\beta_{i,g}p_{i,g}}$

1P (n=1)

- $p_{i,g} = 1$, beliefs about others' cooperation are irrelevant.

$$u_{i,g} = \begin{cases} 30 + \beta_{i,g} \cdot \frac{30}{1-\beta_{i,g}} = 30 \cdot \frac{1}{1-\beta_{i,g}} & \text{if cooperation} \\ 60 & \text{if defection} \end{cases}$$

⇒ cooperation if $\beta_{i,g} \geq 0.5$.

> In the absence of intragenerational competition, cooperation depends only on the player's personal valuation of future welfare.

3P (n=3)

- Players must form beliefs about others' behaviors.
- Cooperation is contingent on altruism and expectations.

Let the belief parameter $p_{i,g}$ be a function of the perceived distance from the sustainability threshold $z = 30 - \mathbb{E}[X_{-i,g}]$

where $\mathbb{E}[X_{-i,g}] \in \{0, 40\}$ is player i's expectation of the total extraction by the other two players in generation g.

z is referred to as the ***perceived sustainability***.

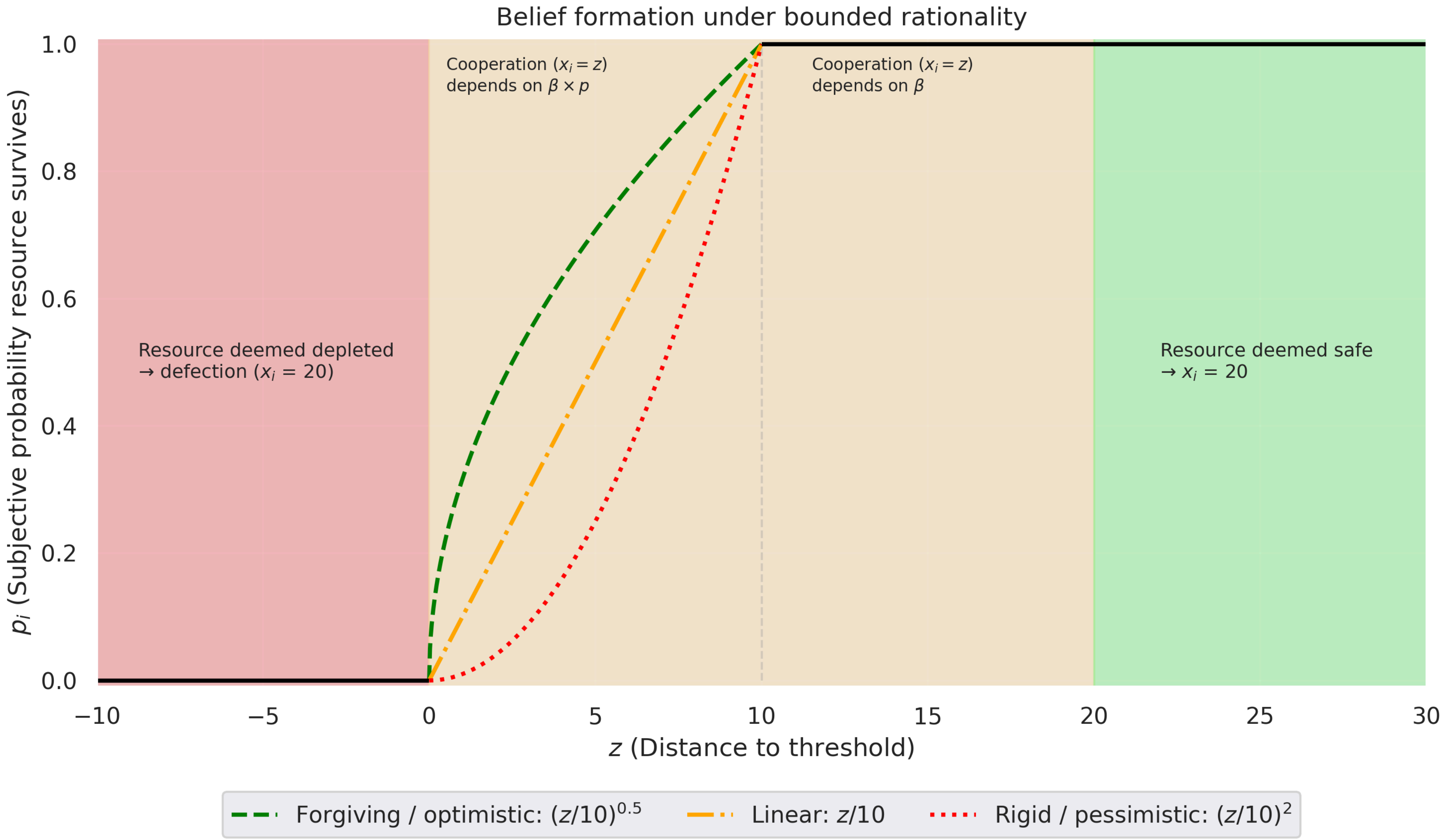
> A higher z means player i believes others will extract less. If player i has altruistic concerns for the future, z represents the maximum amount they believe they can extract without depleting the resource.

Let $p_{i,g} = \phi(z, \alpha)$ such that:

$$\phi(z,\alpha) = \begin{cases} 1, & \text{if } z \geq 30 \\ f(z,\alpha), & \text{if } 0 < z < 30, \ \text{with } \alpha > 0 \\ 0, & \text{if } z < 0 \end{cases}$$

⇒ $p_{i,g}$ is a bounded, increasing function that maps perceived sustainability to the subjective probability that the resource survives to generation $g + 1$.

- $f(z, \alpha)$ is an increasing function that captures how beliefs adjust within the uncertainty range.
- α governs the willingness to make a sacrifice based on perceived deviations from the sustainability threshold.
- The form of $\phi(z, \alpha)$ over $z \in [0, 10)$ critically shapes player i's behavior: they believe $X_{-i,g} > 20$ but see an opportunity to prevent depletion through personal sacrifice.



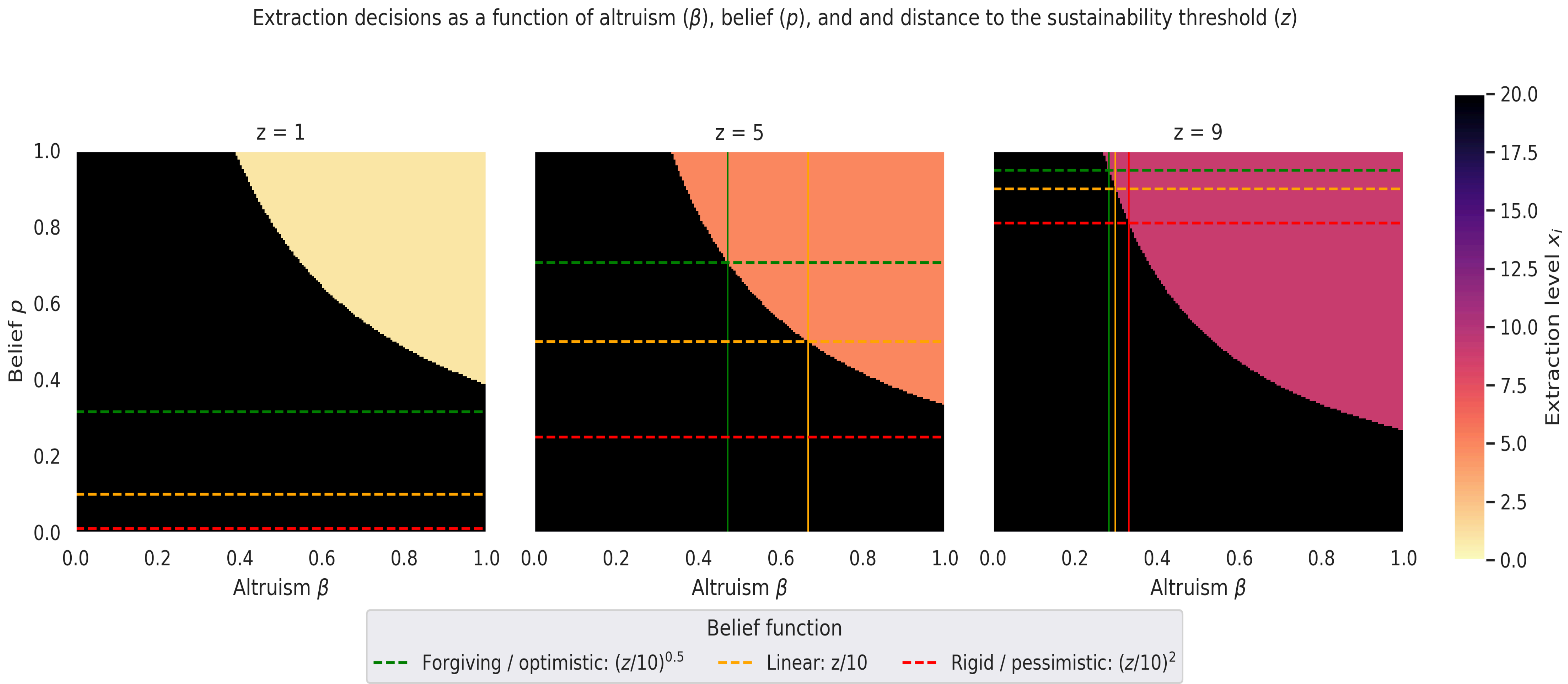
Belief formation under bounded rationality
Resource deemed depleted
→ defection (x_i = 20)
Cooperation ($x_i = z$)
depends on $\beta \times p$
Cooperation ($x_i = z$)
depends on β
Resource deemed safe
→ x_i = 20
p_i (Subjective probability resource survives)
z (Distance to threshold)
1.0
0.8
0.6
0.4
0.2
0.0
−10
−5
0
5
10
15
20
25
30
Forgiving / optimistic: $(z/10)^{0.5}$
Linear: $z/10$
Rigid / pessimistic: $(z/10)^2$

For $z \in [0, 10)$:

$$U_{i,g} = \begin{cases} z + \beta_{i,g} \cdot p_{i,g} \cdot \frac{30}{1-\beta_{i,g} \cdot p_{i,g}} & \text{if cooperation} \\ 20 & \text{if defection} \end{cases}$$

⇒ cooperation with $x_{i,g} = z \ \text{ if } \ \beta_{i,g} \cdot p_{i,g} \geq \frac{20-z}{50-z}$

> ⇒ the smaller z (greater required sacrifice) the higher player i's altruism, belief, or both (i.e., $\beta_{i,g} \cdot p_{i,g}$) must be to justify cooperation


Extraction decisions as a function of altruism (β), belief (p), and and distance to the sustainability threshold (z)
z = 1
z = 5
z = 9
Belief p
1.0
0.8
0.6
0.4
0.2
0.0
0.0 0.2 0.4 0.6 0.8 1.0
Altruism β
Extraction level x_i
20.0
17.5
15.0
12.5
10.0
7.5
5.0
2.5
0.0
Belief function
Forgiving / optimistic: $(z/10)^{0.5}$
Linear: z/10
Rigid / pessimistic: $(z/10)^2$

Bounded-rationality model — Key insights

- Extends the rational benchmark by replacing objective probabilities with **subjective beliefs** about others' cooperation.
- Players combine intergenerational altruism (β) and beliefs (p) into an effective altruism term.
- Beliefs follow heuristic functions $\phi(z, \alpha)$ capturing **optimistic, neutral, or pessimistic** expectations.
- Stronger altruism (β) or optimism (p) promotes sustainability: **forgiving types cooperate** under uncertainty; **rigid types defect** unless success is almost certain.

> ⇒ Cooperation may fail not because players are selfish, but because **their beliefs and heuristics distort** how they perceive the future.

Findings and implications

- **Intragenerational social dilemmas significantly reduce cooperation** with the future and resource sustainability.
- **Effective sustainability policies** must address both *Intergenerational dilemmas* (future concern, altruism) and *Intragenerational dilemmas* (trust, coordination, social norms).
- Policy Implications
  - **Structural tools**: institutions, monitoring, and group decision mechanisms to mitigate free-riding among current users.
  - **Normative tools**: education, nudges, and future-oriented framing to promote concern for long-term outcomes.

Next steps — Back to the lab

- Replicate the field experiment under controlled laboratory conditions to confirm causal mechanisms and rule out contextual confounds.
- Elicit beliefs about future generations' cooperation to test the theoretical predictions of the rational and bounded-rational models.
- Disentangle the drivers behind extreme future-oriented behaviors: altruism, optimism, coordination motives, or social identity effects?

Legacy or Lineage? Framing the Future for sustainability

Barragan-Jason, G., Bayle, G., Bazart, C., Dubois, D., Ibanez, L., Pinçon, V., Roussel, S., Syssau-Vaccarella, A., Willinger, M.

Research Question

Can behavioral framings reduce psychological distance and foster cooperation with future generations?

Related literature

- **Kamijo et al. (2017, Sustainability Science)**
  Introducing an Imaginary Future Generation representative makes future interests salient and doubles sustainable choices.
- **Saijo (2020, Sustainability)**
  Proposes the Future Design framework — institutionalizing the idea of “thinking as future generations” to foster long-term sustainability.

From Future Design to Framing the Future

- Kamijo et al. (2017) and Saijo (2020) show that giving future generations a voice — through imaginary future representatives — promotes sustainable choices.
- Our project translates this idea into individual cognitive framings that evoke the future within the decision-maker’s mind.
- We test whether subtle perspective framings can reduce psychological distance and trigger concern for future generations.

Conceptual distinctions

Priming: subtle activation of concepts, norms, or emotions that influence later behavior (Bargh 1994, Bargh et al. 1996, Bargh & Chartrand 2000).

Framing: explicit presentation of information that shapes how individuals interpret and respond to a choice (Tversky & Kahneman 1981, Levin et al. 1998).

Nudges: subtle changes in the choice architecture that alter behavior without forbidding options (Thaler & Sunstein, 2008).

	Priming	Framing	Nudge
Definition	Implicit activation of concepts or norms	Explicit presentation shaping interpretation of a choice	Contextual modification steering behavior without constraint
Cognitive level	Mostly unconscious	Conscious interpretation	Conscious / semi-conscious
Focus	Perception & associations	Meaning & perspective	Actual choice behavior
Example	Reading “future generations” primes prosocial thinking	Framing extraction as “for 2100” or “for your descendants”	Changing default extraction or payoff display
Discipline	Cognitive psychology	Cognitive + behavioral economics	Behavioral public policy

> Framing acts as a **bridge** between priming and nudging:
> it changes *how people interpret a choice, rather than what choices they face*.

Experimental Design: Four Treatments (all in 3P IGG)

Control: No message.

Near future and close kin: (on the decision screen)

> Common resources, such as fish stocks or forests, are renewable — but they can be depleted if not managed sustainably. When we extract too much, these resources cannot regenerate and may disappear permanently. Adopting responsible practices helps preserve these valuable resources for
> **Near Future**: Future generations (up to 2100)
> **Close Kin**: Your close descendants (up to 2100)

Self-projection treatment (screen before decision screen)

Before making their extraction decision, participants were asked to imagine themselves as members of the next generation:

> "If you belonged to the next generation, what amount of the resource would you want your generation to extract?"

They were reminded that they did not know their actual generation (1, 2, 3, 4, or 5), the goal was to mentally adopt the perspective of those who will face the consequences.

Dimensions of Psychological Distance

Framings target different dimensions of distance between the decision-maker and future generations:

Treatment	Targeted dimension	Mechanism
Near Future	*Temporal distance*	Makes the future *feel closer in time*
Close Kin	*Social distance*	Makes future people *feel personally related*
Self-Projection	*Self–other distance*	Encourages *empathic perspective-taking*

Hypotheses

Reducing psychological distance — in time, social ties, or perspective — can activate future concern and foster sustainable decisions.

1. **H1:** Framing the future (Near future, Close kin) increases cooperation compared to Control.
2. **H2:** Self-projection enhances cooperation by fostering empathy with future generations.

Close kin > Near future > Control

Self-projection > Control

Future framing ? self-projection

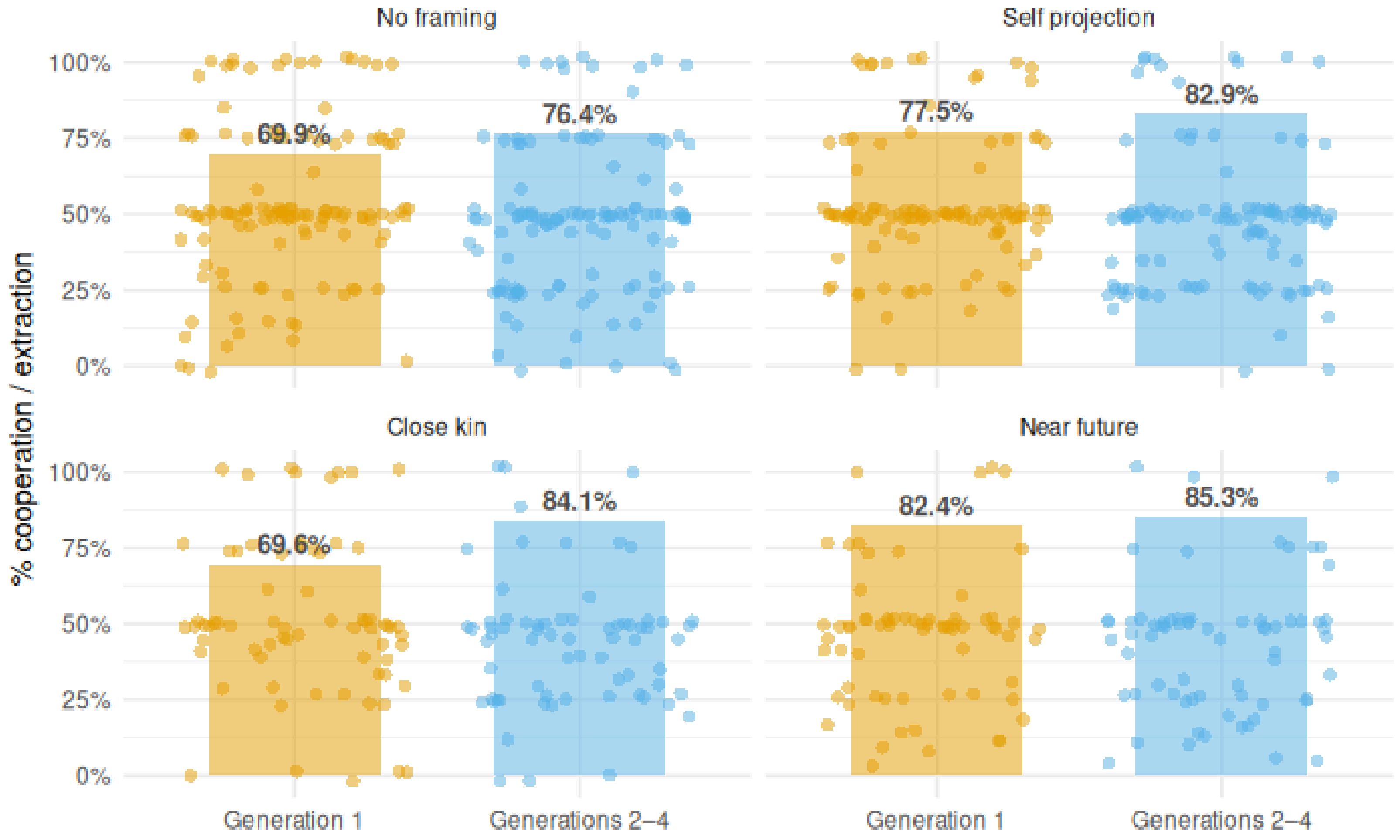
Data collection

- same set-up as previous experiment (5 generations, 3P IGG).
- Strategy method : participants took decisions for generation 1, generations 2–4, and generation 5 (no future value).
- Generations were constructed ex post, after individual decisions were collected.
- Participants were paid according to their extraction decisions, by bank transfer.

Participants

	Control	Near future	Close kin	Self-projection
Participants	123	68	69	111
Age (mean)	32.05	34.99	35.94	35.50
Gender (male)	39.84%	45.59%	42.03%	45.95%
Single	56.09%	60.29%	47.83%	56.76%
With children	49.59%	45.59%	49.28%	43.24%
With grandchildren	18.03%	12.90%	2.94%	12.50%
Students	38.21%	20.59%	28.99%	34.23%
Executives	30.59%	44.12%	33.33%	36.94%

Results



No framing
Self projection
Close kin
Near future
% cooperation / extraction
100%
75%
50%
25%
0%
69.9%
76.4%
77.5%
82.9%
69.6%
84.1%
82.4%
85.3%
Generation 1
Generations 2–4
Generation 1
Generations 2–4

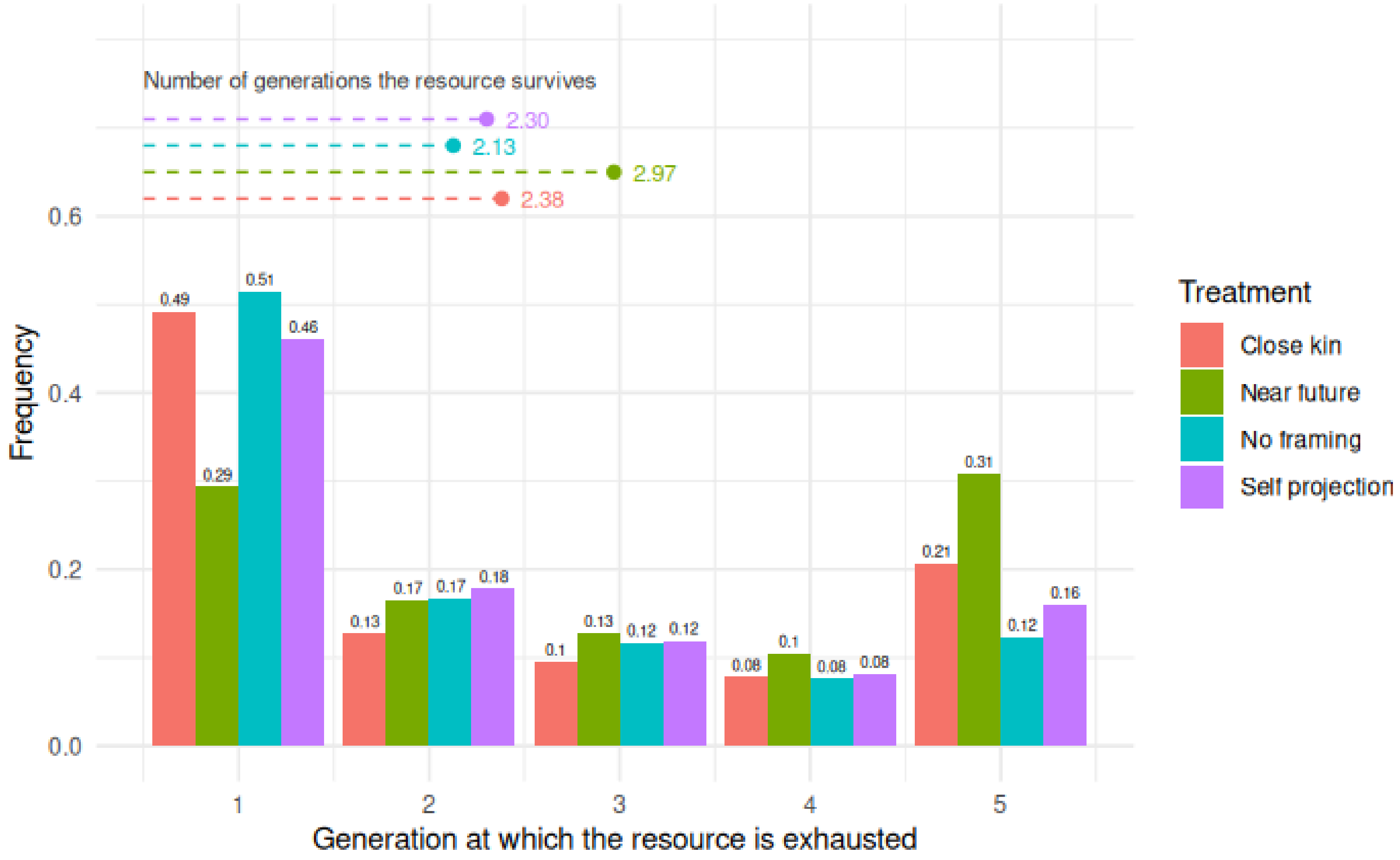
Num. Obs. 742 — (371 × 2)	Cooperation	Extraction (%)
No framing (Gen 1)	9.073***	0.503***
Self projection (Gen 1)	0.514	–0.007
Close kin (Gen 1)	–0.070	–0.016
Near future (Gen 1)	0.984	–0.075*
No framing (Gen 2–4)	3.658*	–0.054**
Self projection (Gen 2–4)	-0.024	0.002
Close kin (Gen 2–4)	4.371*	–0.026
Near future (Gen 2–4)	–2.237	0.023

Note: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Control variables: gender, age, num. of children.

Cooperation: Generalized Linear Mixed Model (GLMM); Extraction: Linear Mixed Model (LMM).

Monte Carlo (10 000 trajectories).



Findings and implications

- Framing the future as benefiting the "**near future**" (up to 2100) increases cooperation and resource sustainability.
- Framing the future as benefiting "**close kin**", as well as "**self-projection**", does not significantly affect cooperation compared to the control.

> - Effective communication strategies should emphasize the tangible benefits of sustainable practices for the near future to foster cooperation and long-term resource sustainability.
> - Future research should explore additional framings and interventions to further enhance cooperation with future generations.