

Intergenerational conflict undermines cooperation with the future

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Motivation

Social dilemmas: Overexploitation of resources and underprovision of goods

(e.g. Hardin, 1968; Dawes, 1980; Ostrom, 1990, 2010).

Future generations: freedom of choice and lack of agency

(e.g. Sen, 1988; Gravel, 2004; Owens et al. 2014; Bartling et al. 2014; Neri and Rommeswinkel, 2014)

They cannot rely on bargaining, vote, punishment or other mechanisms

(e.g. Fehr and Gächter, 2000, 2002; Masuda et al. 2014; Hauser et al. 2014)

Intergenerational social dilemmas: a growing literature

(Chermak and Krause, 2002; Fischer et al. 2004; Hauser et al. 2014; Sherstyuk et al. 2016; Lohse and Waichman, 2020; Shahan et al. 2021; Chang et al. 2021; Escobar-Espinosa and Lordemann, 2022; Adjukovic et al. 2025)

Intergenerational social preferences

(Inoue et al. 2021; Inoue et al. 2022; Rodriguez-Lara and Ponti, 2017; Rhode et al. 2022; Kölle and Wenner, 2023)

Behavioral mechanisms: Social learning and Future design

(Jackson and Kalai, 1997; Schotter and Sopher, 2003; Chaudhuri et al. 2006; Grolleau et al. 2016; Kamijo et al. 2017; Shahrier et al. 2017, Saijo, 2020, Farjam and Wolf, 2021, Timilsina et al. 2021, 2022)

Two interpretations of a same dilemma

Weak incentives due to time discounting *(Arrow et al. 2013; Jacquet et al., 2013)*

Local immediate conflict crowding out consideration for the future

Conservation failures, why?

Lack of consideration for the future (selfishness, shortsightedness, social dilemma with the future)

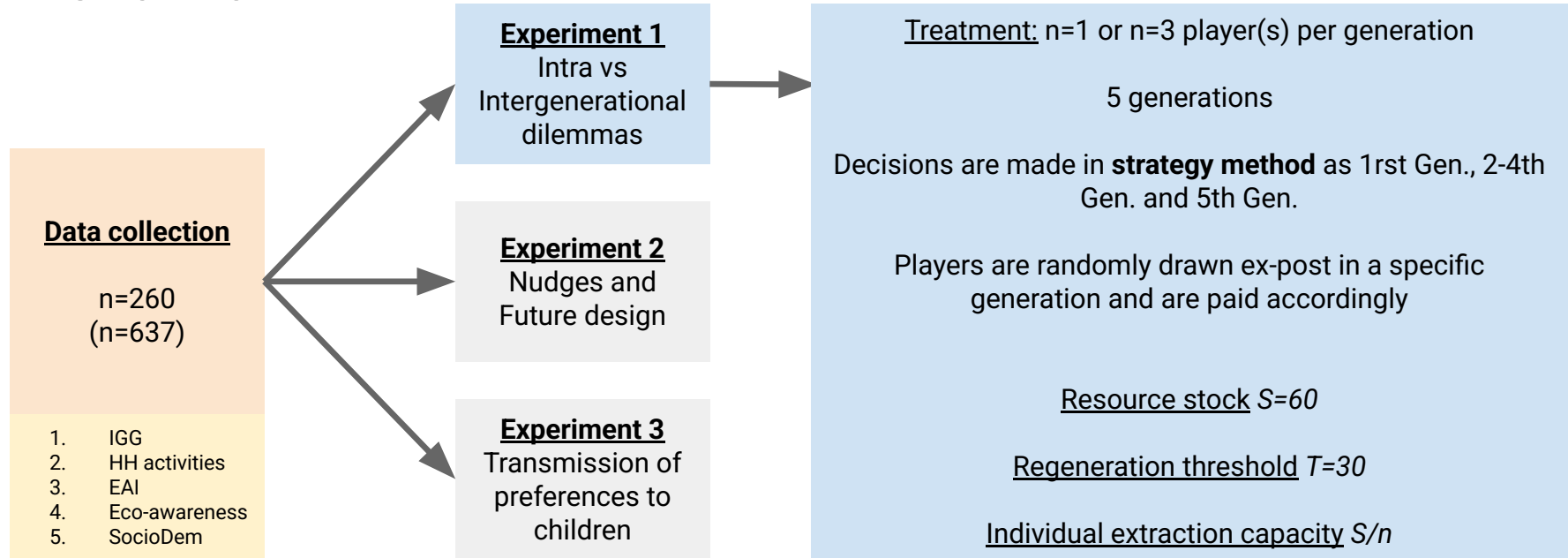
or,

Intra-generational conflict (rivalry, competition, social dilemma with the contemporaries)

or,

Both

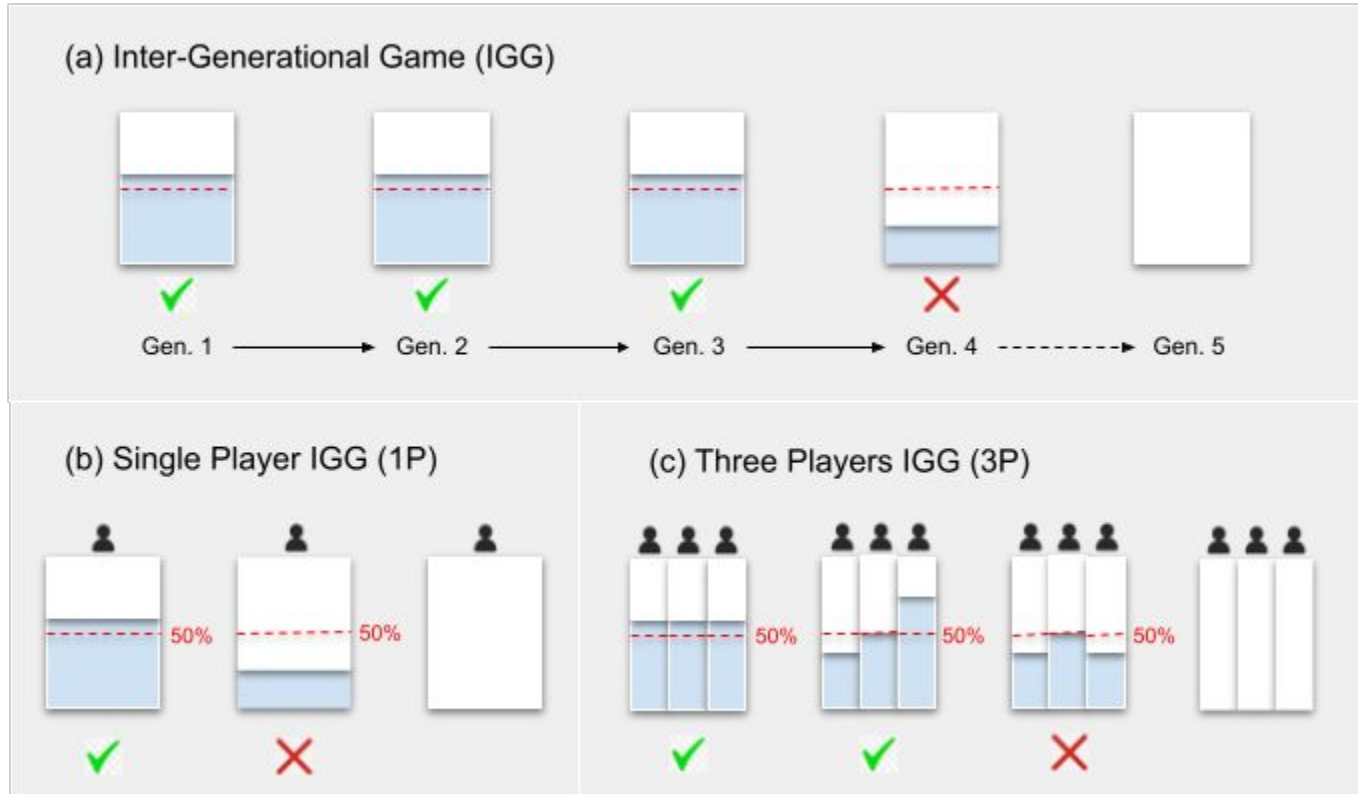
Overview



Ethical committee: July 2024
Pre-registered on OSF: July 2024
Conducted between: Sept. and Oct. 2024

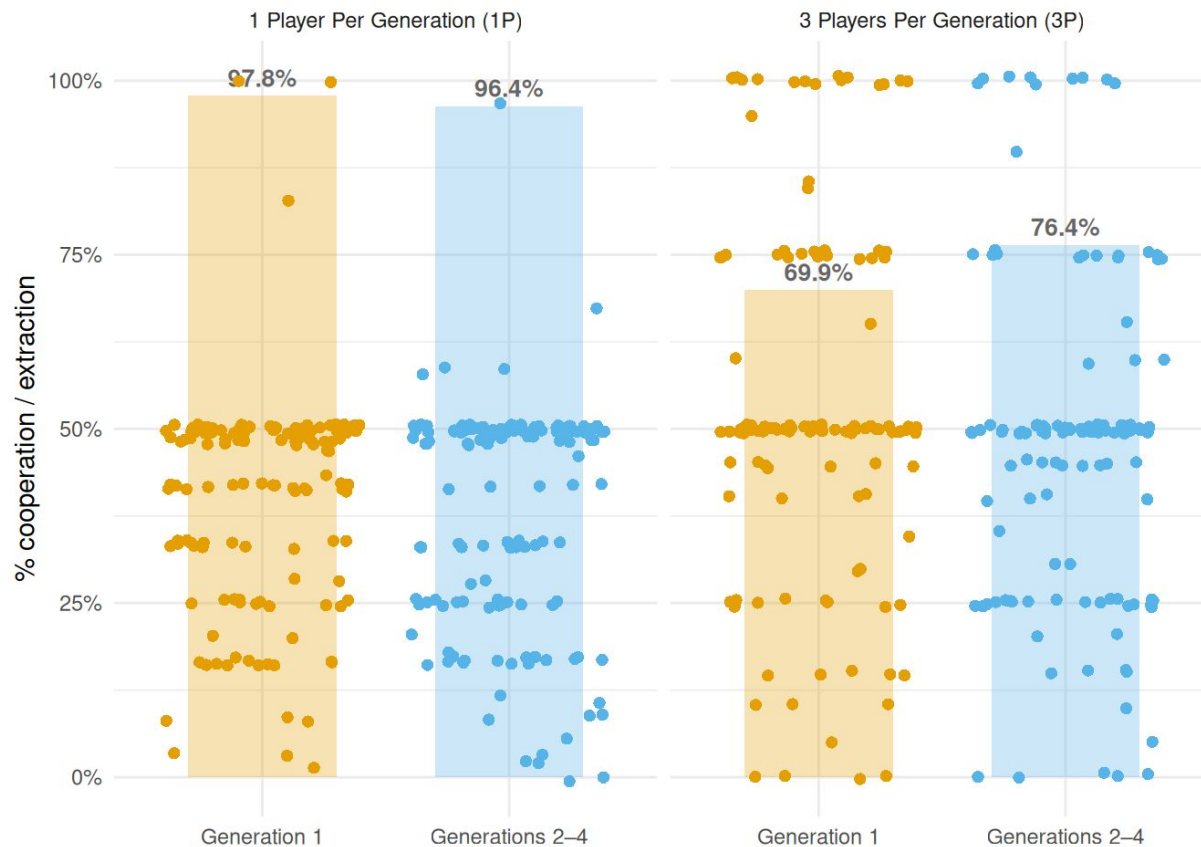
Data collected with a general population sample in three events: "Fête de la science 2024", "Nuit Européenne des Chercheuses" and "Festival Vas-Savoir ?!"

Experimental design

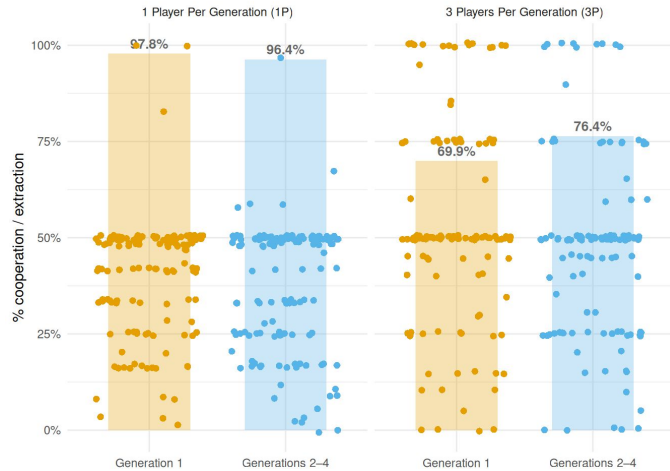


Intra- vs. Inter-generational

*Fisher's exact test, $p < 0.001$ both
between treatments and generations*



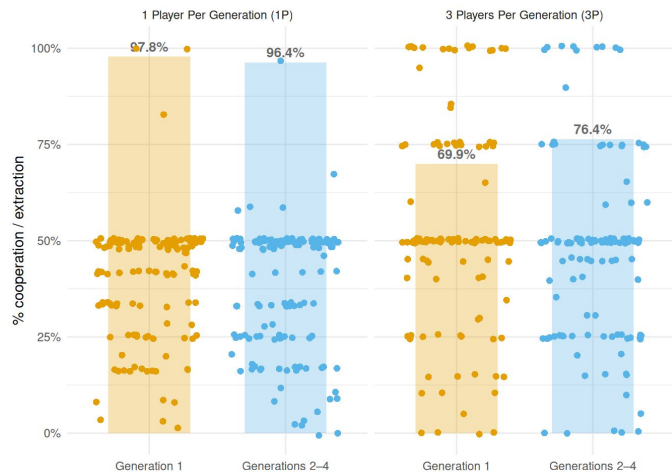
Simulations: two methods



This difference does not seem to be a lot...

What does it imply in terms of resource survival?

Simulations: two methods



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What does it imply in terms of resource survival?

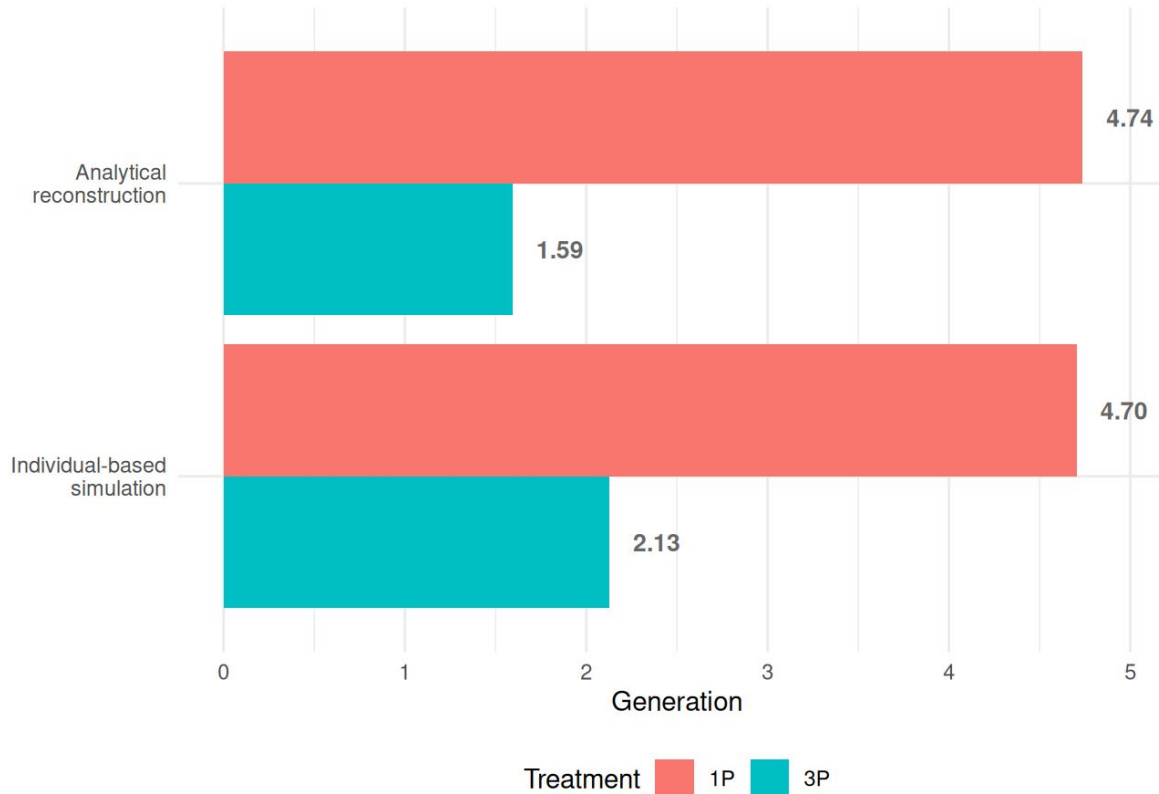
(i) Analytical reconstruction

$$\mathbb{E} = p_1 + p_1 \cdot p + p_1 \cdot p^2 + p_1 \cdot p^3 = p_1 \cdot (1 + p + p^2 + p^3).$$

(ii) Individual-based simulations

We run Monte Carlo simulations with replacement that randomly rematch individual decisions within each treatment, form generations of the appropriate size and compute the implied renewal path over five generations.

Resource survival (max=5)



(i) Analytical reconstruction

In this reconstruction, individuals are either cooperators or not.

(ii) Individual-based simulations

In this simulation, we consider extraction decisions at the individual level

Voluntary sacrifices

We see a gap between the two, showing that under-the-threshold extractions offset a share of the over-extractions

Results from experimental data

- (1) 98% of the individuals are preserving the resource when there is no intra-generational conflict
- (2) Introducing intra-generational conflict lead a large share of players to over-extract (30% vs 2%)
- (3) A share of the population is under-extracting, offsetting a part of the over-extractions

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We propose two descriptive models to explain these behaviors: full rationality and bounded rationality

Theoretical framework: bounded rationality

(1) An instantaneous utility function including

(i) x player's extraction

(ii) β a future-oriented preference (both altruism and discount)

(iii) p the player's belief about contemporaries cooperation

(iv) V the continuation utility (recursive utility of future generations)

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

(2) In the 1P per generation treatment

$$u_C = 30 \left(1 + \frac{\beta_g}{1 - \beta_g} \right) = \frac{30}{1 - \beta_g} \quad \text{VS.} \quad u_D = 60$$

Theoretical framework: bounded rationality

(3) In the 3P per generation treatment

(i) parameter p is function of the perceived distance from the sustainability threshold

$$z = 30 - \mathbb{E}[X_{-i,g}]$$

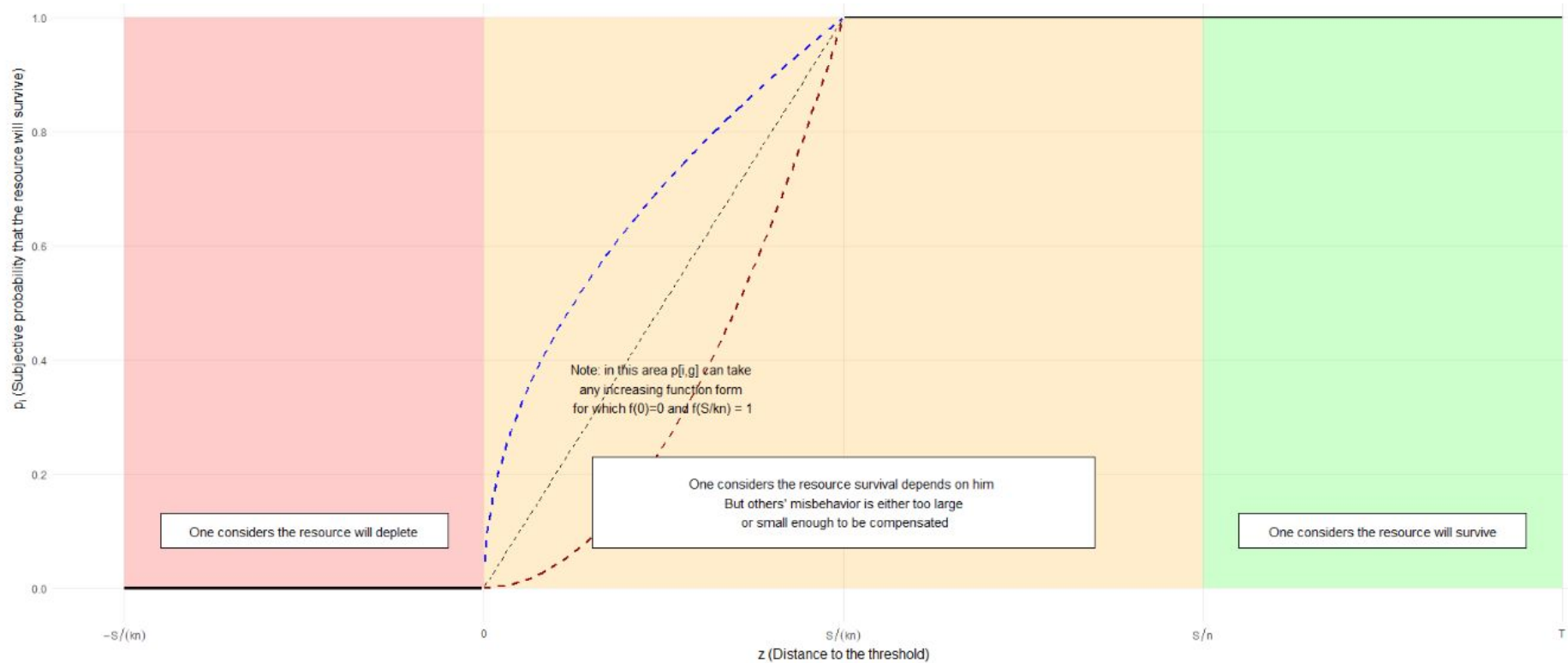
(ii) p is formally defined as a bounded and increasing function mapping the perceived sustainability to the subjective probability that the resource survives to generation $g+1$

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

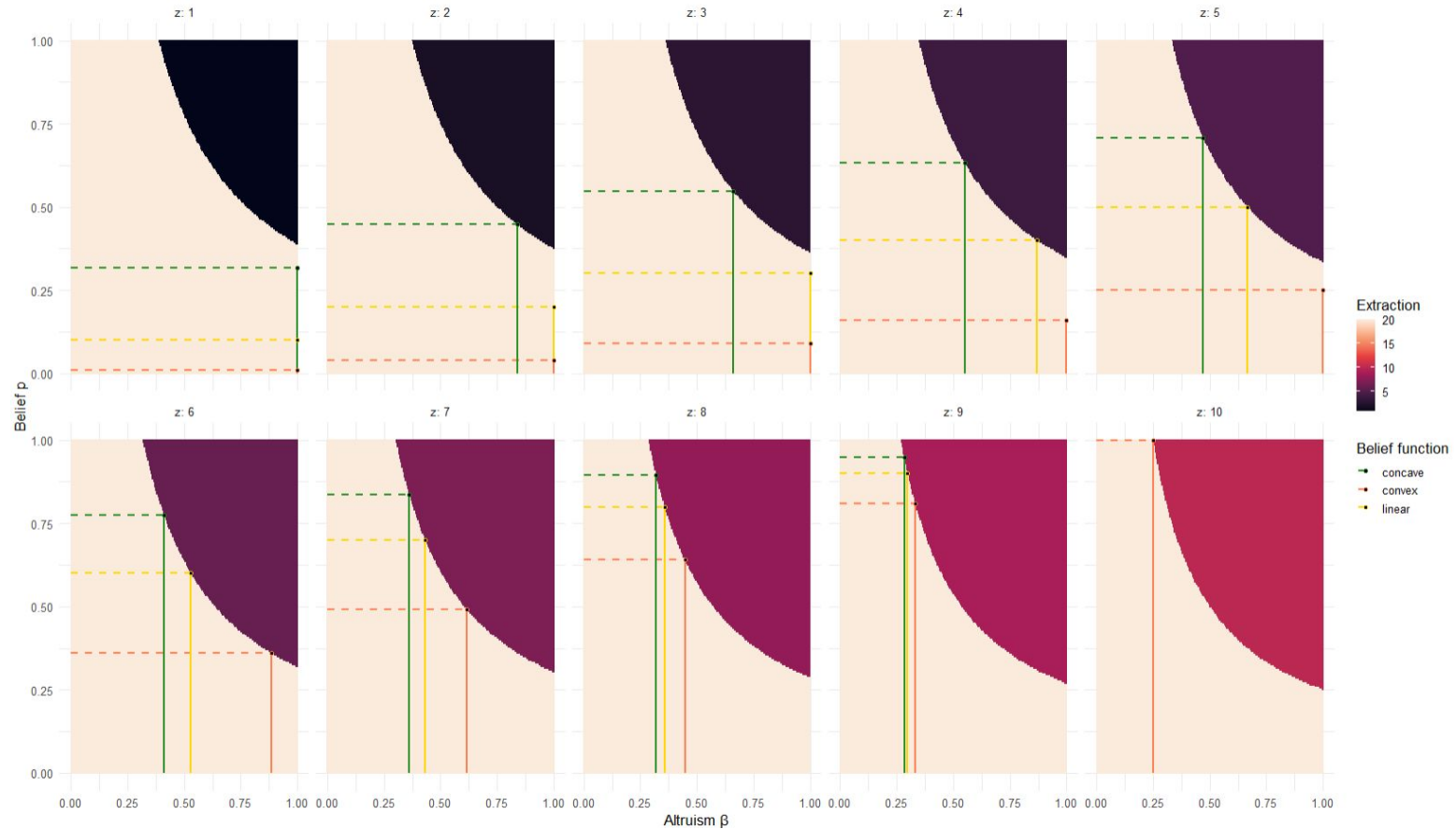
(iii) $f(\cdot)$ concave reflects a more forgiving player, convex a more rigid player

$$\text{e.g.} \quad f(\tilde{z}) = \tilde{z}^\alpha$$

Mapping of perceived sustainability



Extraction decisions, altruism, beliefs and sacrifices



Wrap-up

Shortsightedness and lack of intergenerational altruism do not explain the conservation failure

Intragenerational conflicts are the main driver of depletion

It questions present-oriented vs. future-oriented mechanism design

We suggest:

- (i) That individuals have future-oriented preferences
- (ii) These altruistic preferences are mitigated by beliefs about contemporaries
- (iii) These beliefs are biased toward selfishness (as found in Cohn et al. 2019)

What we want to do next in the lab?

- (1) Replicate the result in a controlled environment
- (2) Test the theoretical hypothesis of beliefs
- (3) Investigate individual motivations
 - (a) Is it true intergenerational altruism? Or social image and beliefs about norms?
 - (b) Are some players shifting to selfishness when they can benefit from a moral wiggle room?

Thank you for your attention!

Project's team



Additional research credits (Support in data collection)

Caroline Cohen, Adrien Coiffard, Chloé Delomel, Stefano Farolfi, Laurent Garnier, Daniel Montoya Herrera, Damien Ricard