Influence of information and worldviews on decision-making under unclear goals

Giovanni Cunico, Michael Shayne Gary, and Kerry Humphreys

email: g.cunico@unsw.edu.au

UNSW Business School, University of New South Wales, Sydney, Australia

ISDC2024
2024 INTERNATIONAL SYSTEM DYNAMICS CONFERENCE
Bridging Perspectives for New Insights
Bergen, Norway & Online
August 4-8, 2024

BACKGROUND

Experimental literature highlights how **decision-makers** are highly **responsive to** the **information** received, where slight variations (even in format) profoundly impact decisions**.**
These ideas support a **linear view** of **information use**, central to approaches like evidence-based decision-making, suggesting that providing evidence (e.g., on climate change) can sway decision-makers towards alternative (e.g., more sustainable) actions.

Vs

However, field research and real-world experiences reveal **frequent deviations from** this **linear model** in the use of information (e.g., often marginal and delayed impact of sustainability research).
The assumption that the sheer existence of knowledge presses towards its use is often not true. **Instead,** the **decision-making** process is 'messy', **non-linear** and less rational: the acquisition of additional information by decision-makers does not guarantee its appropriate use.

Problem

- The non-use of information can be the source of **suboptimal** decision **strategies**.
- The **provision of knowledge** to decision-makers is the main **pathway researchers** and professionals attempt to **influence** the decision-making processes in the 'real' world, but this does not always work.

Why?

SCOPE

Personal agendas, trust in information sources, and the socio-organizational context have been found to influence the (non) use of information.
Moreover, some research suggests that **tasks with clear objectives** (technical/**operational** decisions) adhere **more** to the **linear** model **than tasks with unclear goals** (political/**strategic** decisions).
For example, **evidence-based medicine is not like evidence-based policymaking**.

With **unclear** and ambiguous **goals**, there is **no** explicit definition of direction for the optimal **benchmark**. Decision-makers may try to **fill this 'void'** with their **worldviews**, which **become the basis for action** and **affect information use**.

This study explores how the **impact** of **additional information** is **influenced** by **goal clarity** and decision-makers' **worldviews**.

REFERENCES

Cairney & Oliver, 2017; Cardinaels & Veen-Dirks, 2010; Citroen, 2011; Criado-Perez et al., 2024; Dorner, 1997; Forrester, 1971; Geden, 2016; Humphreys et al. 2016; Koltko-Rivera, 2004; Rahmandad & Gary, 2020; Rich & Oh 2000; Weiss, 1979

METHOD

Dynamic decision-making **experiment -** 255 participants. W**orldviews** (economic growth vs environmental sustainability) were initially collected (**IV1**). Participants then managed a fictional human settlement, **allocating resources** between economic growth (productivity) or environmental sustainability (impact reduction). Before finalising their **optimal strategy** (DV), they interacted with a simulation model to explore various strategies. The **information provided** (IV2) and **goal clarity** (IV3) were manipulated during this process.
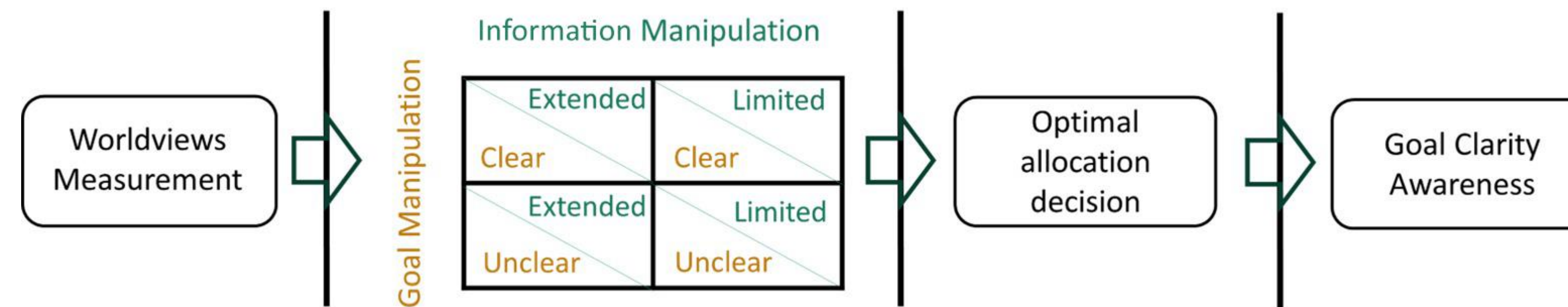
Goal Manipulation: Participants were randomly assigned different goals

| UNCLEAR GOAL	CLEAR GOAL
"Lead Planet X to a thriving future"	"Maximise the Perceived Quality of Life indicator"

Information Manipulation: Participants were randomly assigned to simulation models with different dashboards
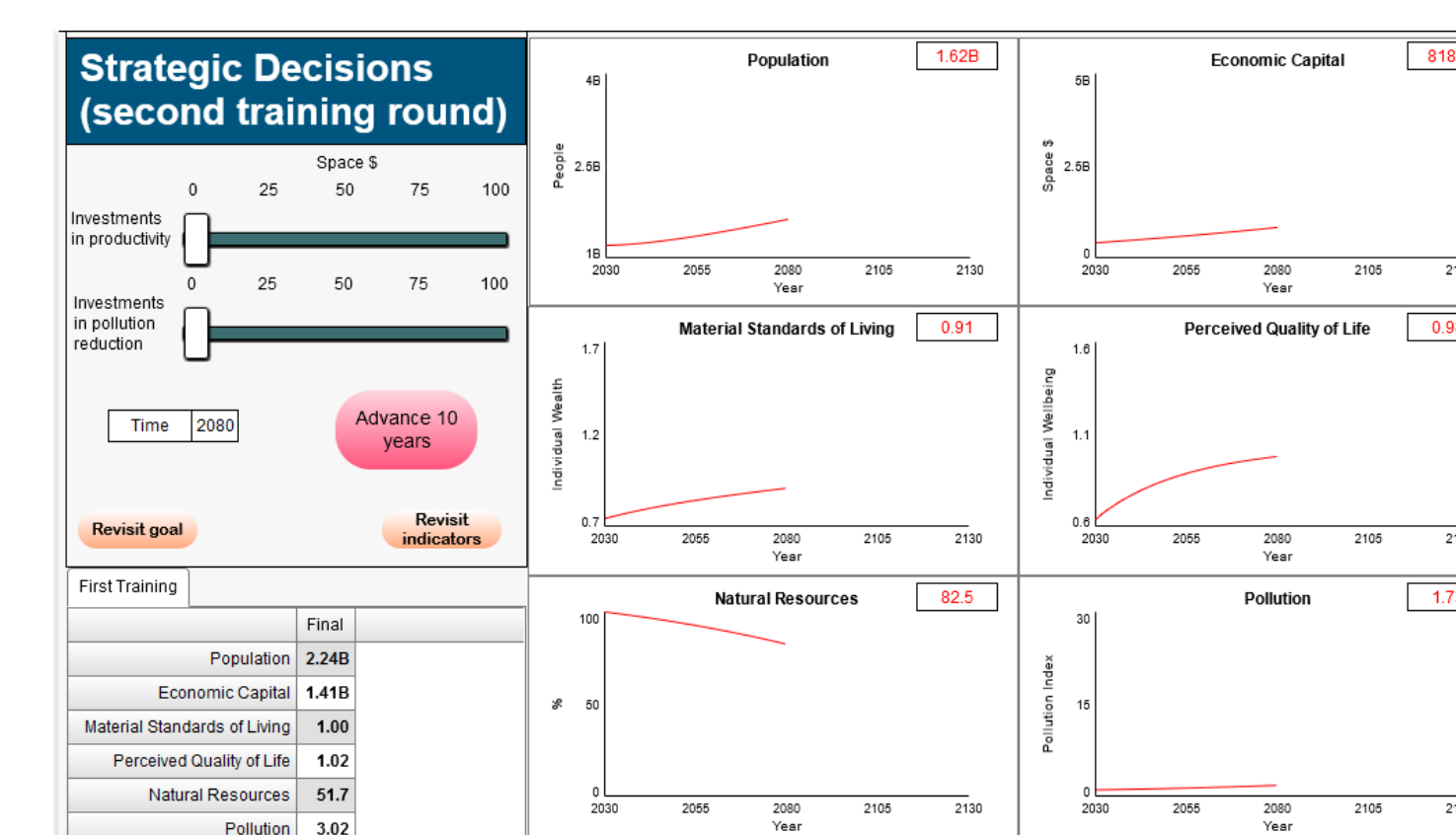
LIMITED DASHBOARD
4 indicators (Population, Economic Capital, Material Standard of Living, **Perceived Quality of Life**), mostly focused on economic elements.
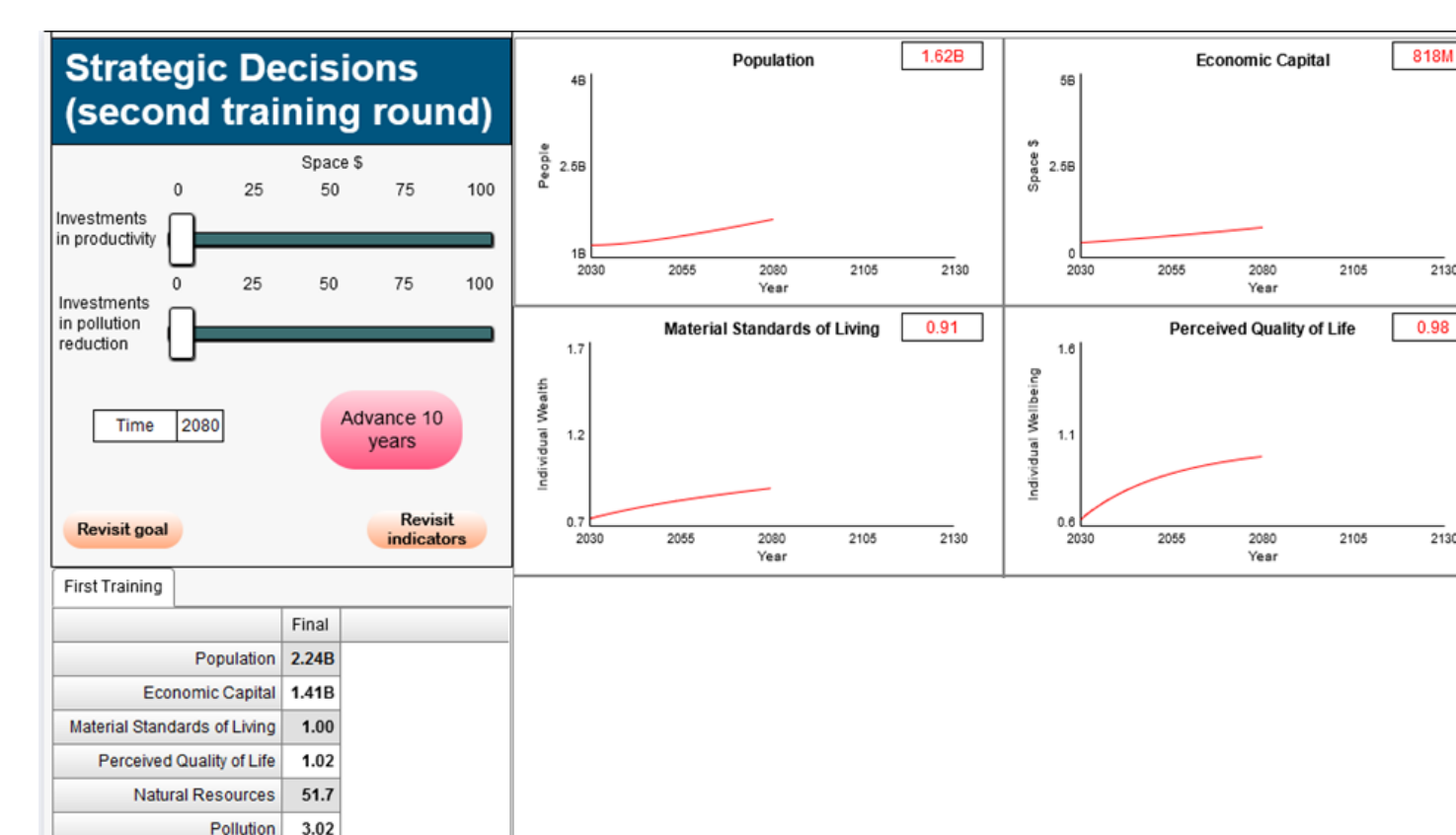
EXTENDED DASHBOARD
6 indicators, same as in the Limited Dashboard with additional environmental elements (*Natural Resources, Pollution*)


Experimental Task

The fictional human settlement task was created by gamifying and recalibrating Forrester's World Dynamics model (1971) to align with the experiment's narrative and ensure an unclear payoff landscape, given the two decision leverages (productivity Vs impact reduction).
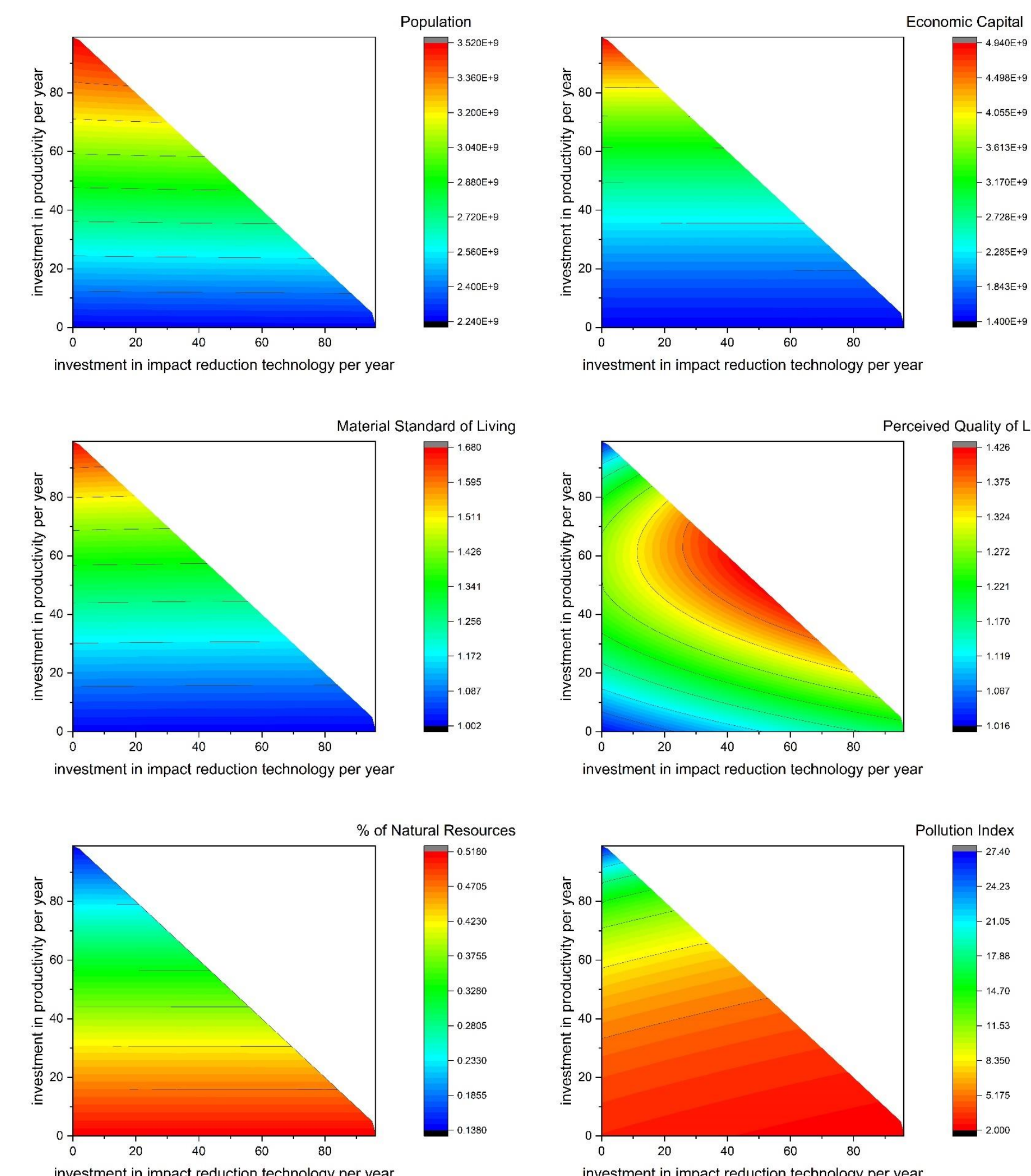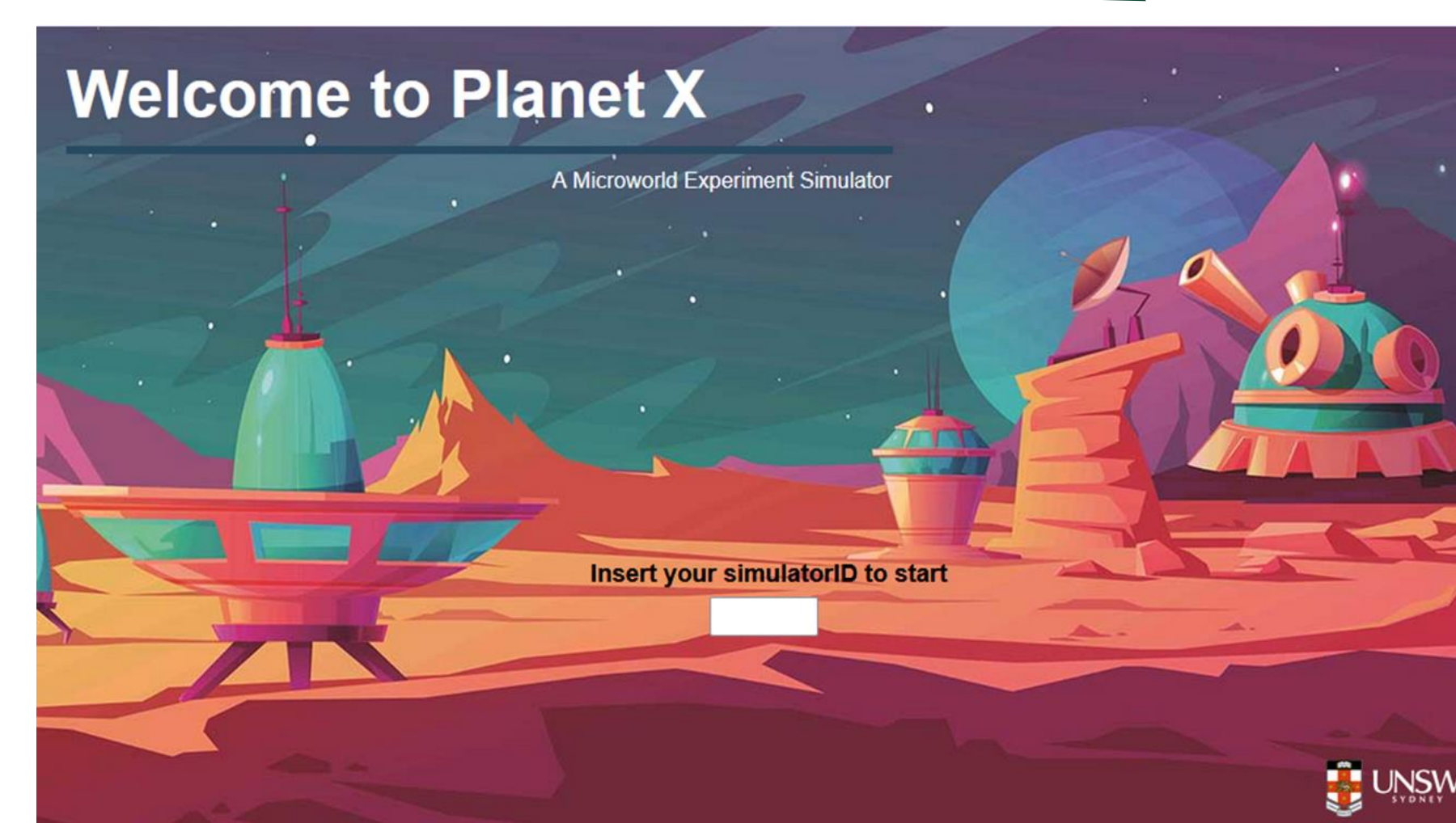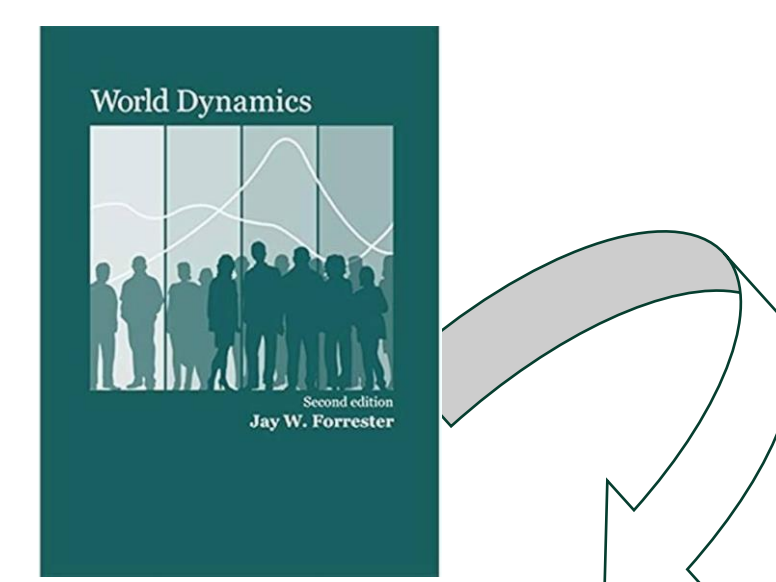

RESULTS

Goal clarity influence: information ($p < 0.01$) and worldviews ($p < 0.01$) affect decisions, more in unclear goal conditions ($p < 0.05$). When considered together, **worldviews** are by far the **strongest explanatory factor** under **unclear goals** ($p < 0.05$) but do not significantly affect decisions in clear goal conditions.
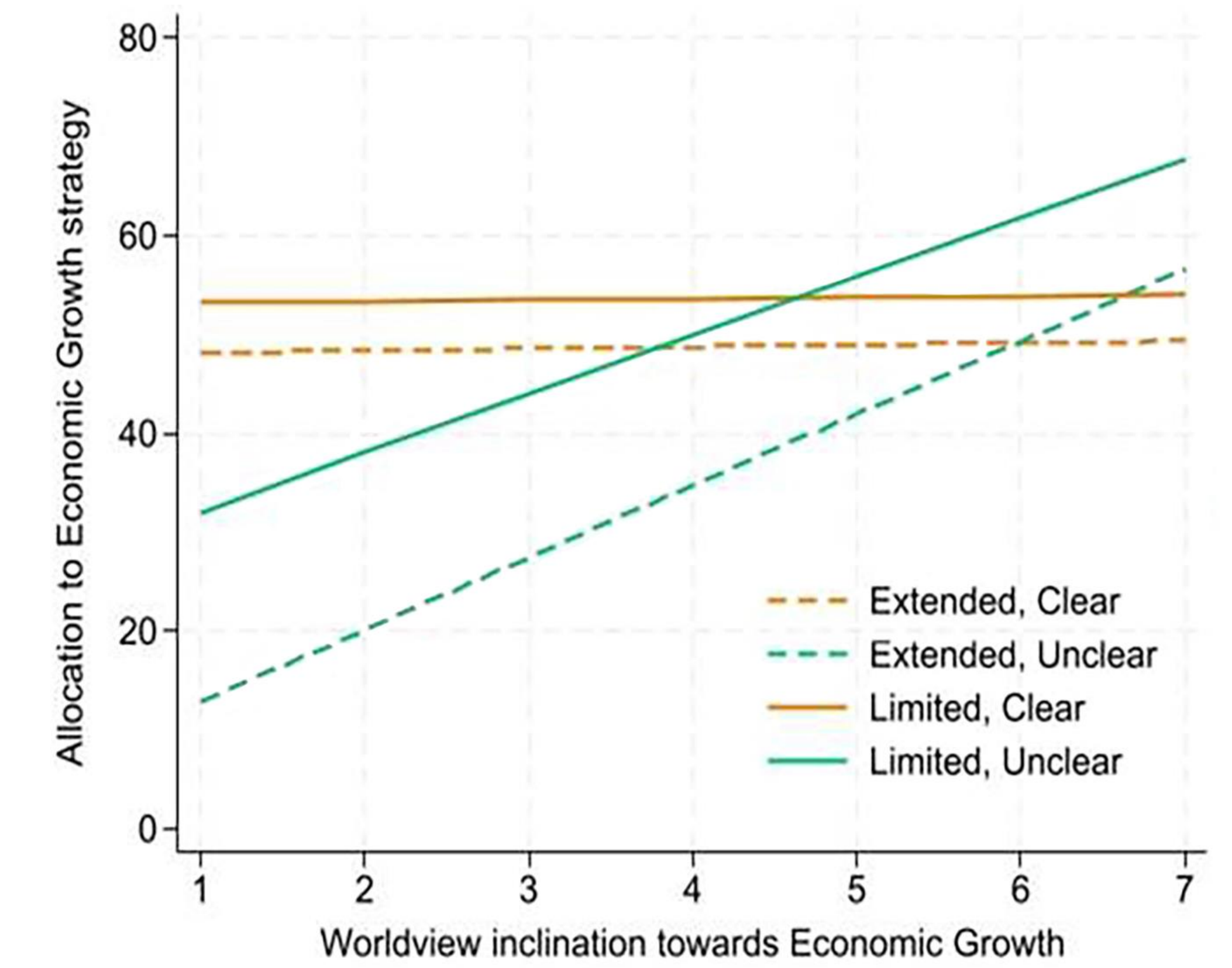
Goal clarity awareness: decision-makers may **not realise** when they are **handling unclear** tasks.
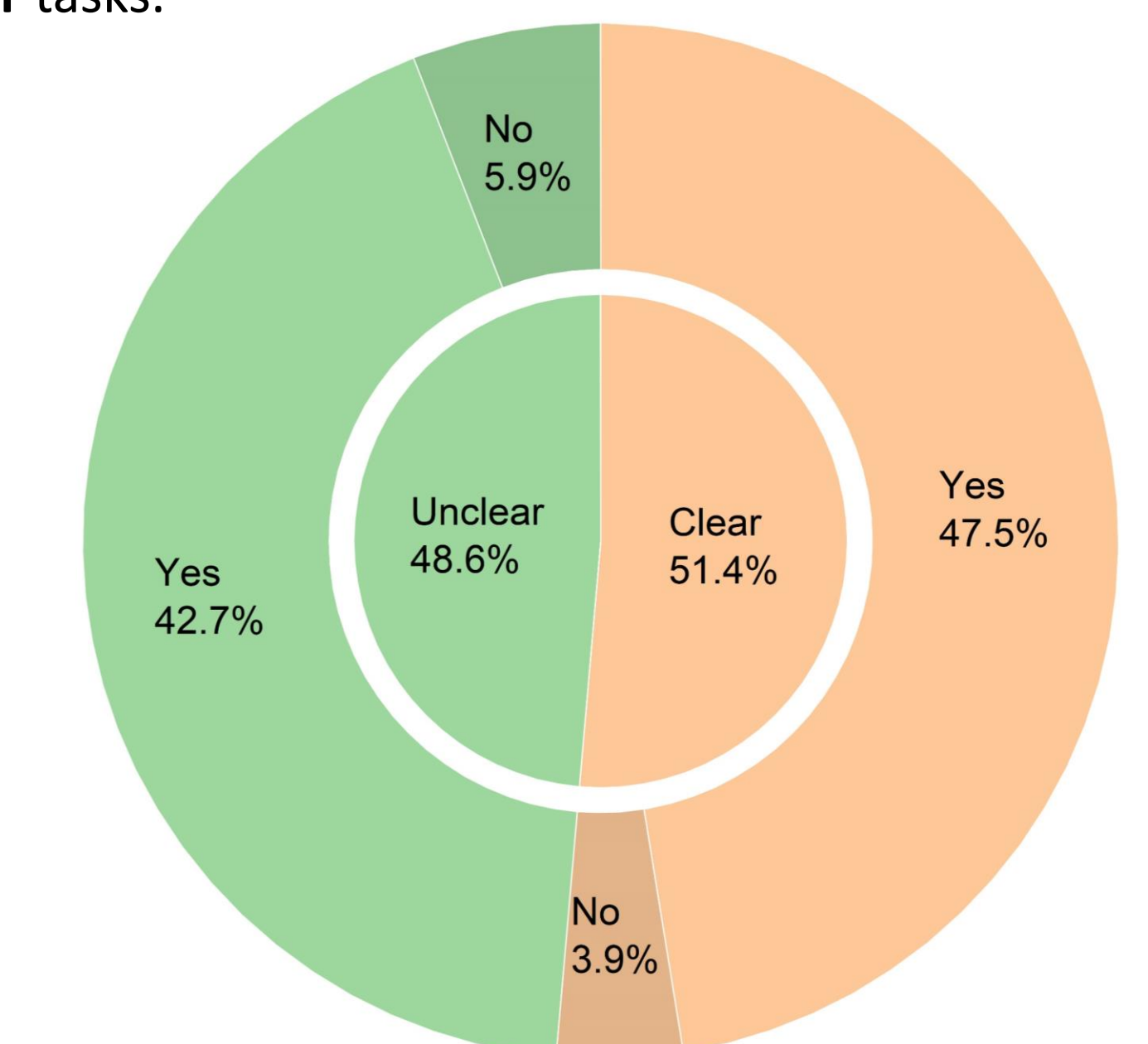
'Was the goal for Planet X provided to you straightforward?
In this case, 'straightforward' means that it was clear and unambiguous what you were supposed to achieve.'

INSIGHTS

- The impact of information and worldviews on influencing decisions is amplified in the unclear context.

- Goal clarity significantly moderates the impact of worldviews on decisions. When goals are unclear, worldviews drive the decision process. Conversely, with clear goals, the explicit objectives limit the influence of worldviews.

- People did not seem to recognise whether they were assigned an unclear goal. Intrinsic challenge in political/strategic decisions?

- In experiments, participants usually have clear performance goals, unlike the ambiguous goals faced by real-life policymakers, which may explain the discrepancy between experimental and field research findings.