

The Cooperation Puzzle: What *Really* Drives People to Cooperate?

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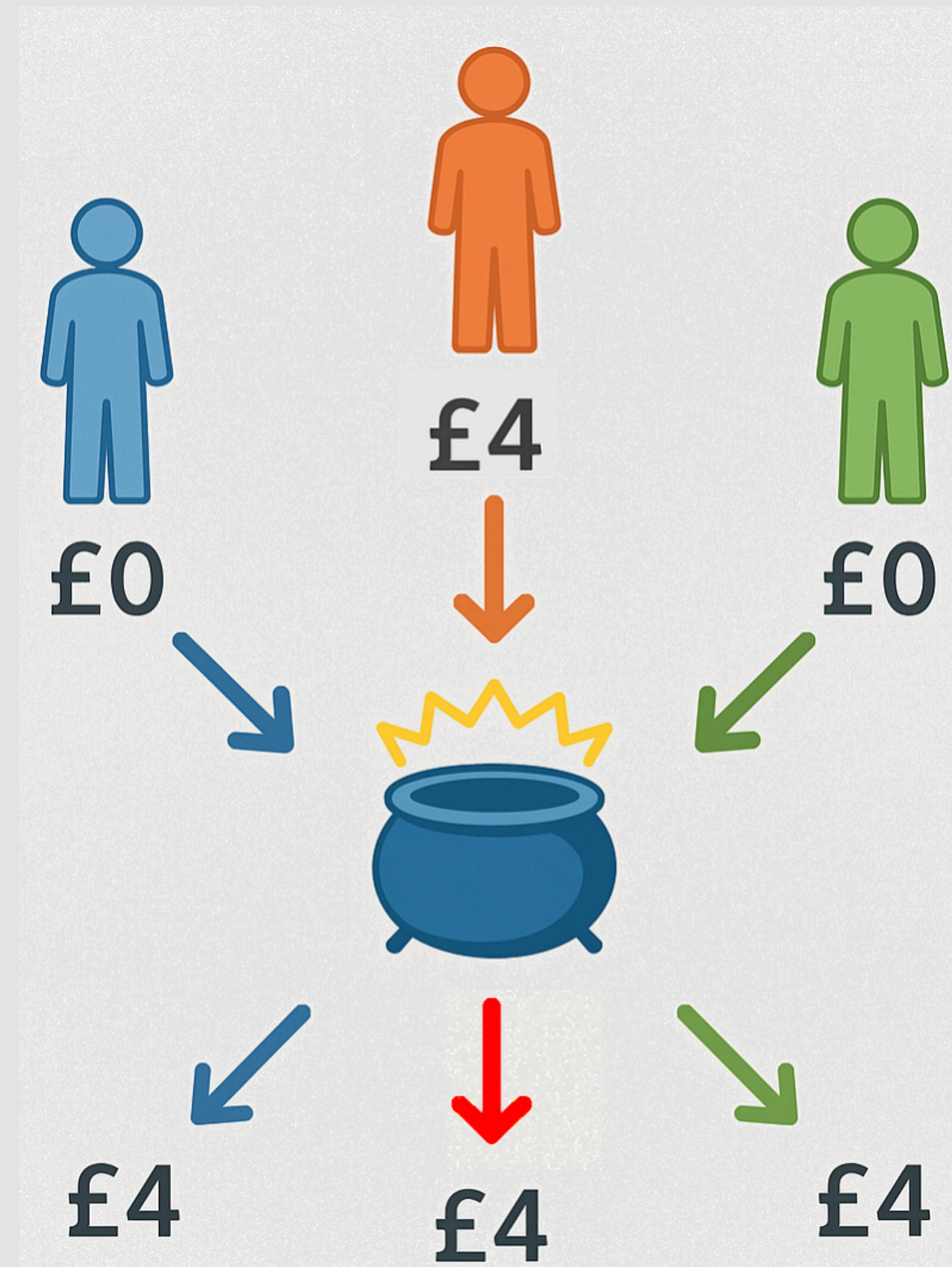
Abstract

This project investigates one of the central puzzles in behavioural economics: why do individuals cooperate in situations where they could be selfish? Using the **public goods game** as a unifying framework, the research will be conducted to produce a newer systematic meta-analysis of experimental studies to identify the conditions under which cooperation emerges or collapses. The previous large meta-analysis on this topic was done by Zelmer in 2003.

Introduction

Why do people give to charity, pay taxes, or pick up litter even when they could walk away without consequence? Economists have long puzzled over this question because rational choice theory predicts people should act selfishly.

The public goods game models this dilemma: individuals decide how much to contribute to a shared pool, which is then multiplied and redistributed equally. Game theory predicts no one should contribute, since free-riding always gives a higher personal payoff. Yet, in practice, people do contribute — often substantially.



Orange contributes £4, while blue and green free-ride, yet all three end up with £4 once the pool is tripled and split equally. The free riders benefitted whilst the cooperator did not.

This puzzle matters because it touches every corner of society: from **tax compliance** and **climate action** to **workplace collaboration** and **neighbourhood trust**. Understanding what drives cooperation has implications for governments, organisations, and communities.

This project is highly multi-disciplinary, bridging **economics**, **psychology**, and **sociology**, advancing our understanding of what truly drives human cooperation.

Research Goals

Replicate and extend Zelmer's findings by incorporating more recent experiments (2003–2025), capturing developments in design, methodology, and context.

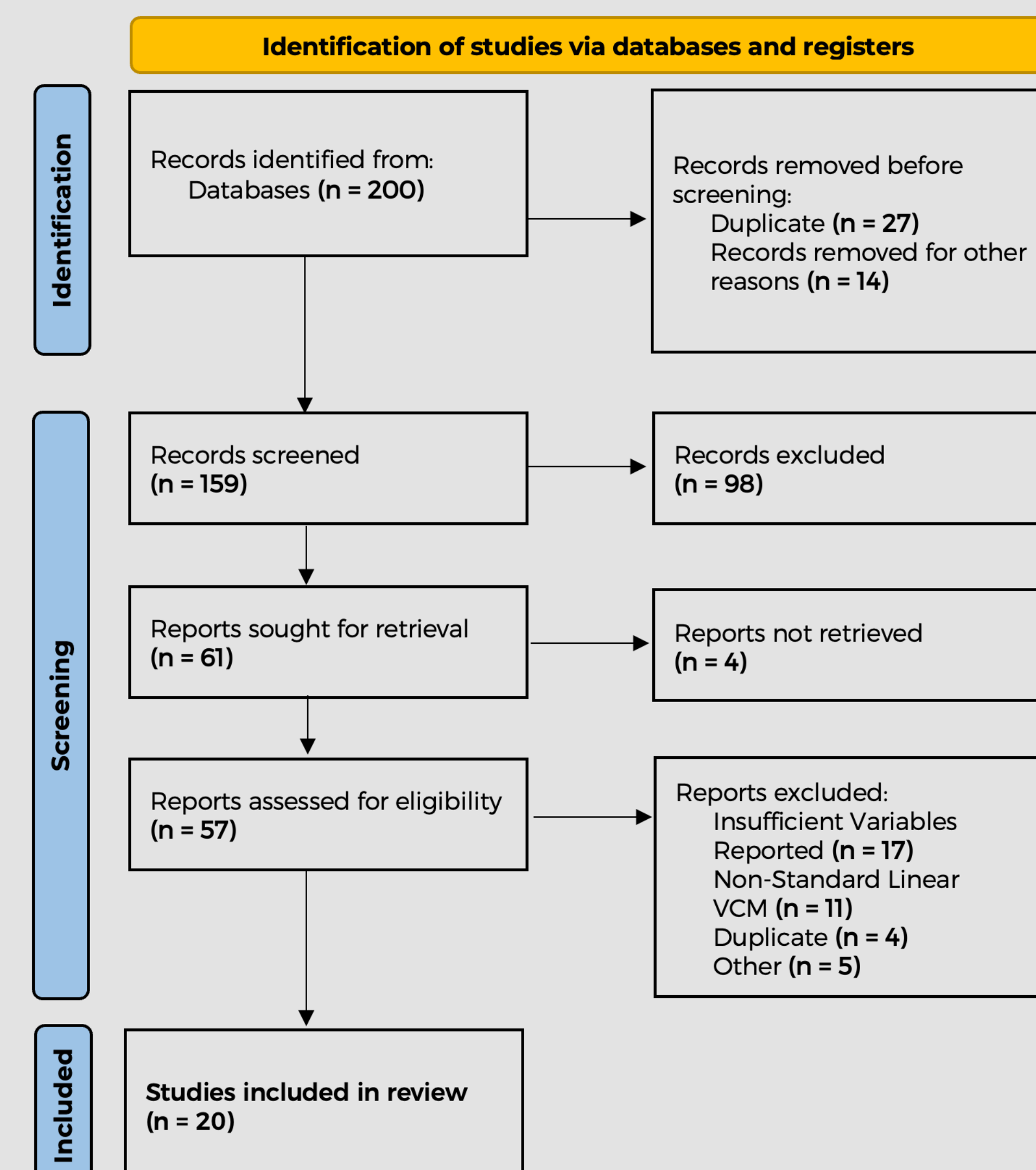
- Examine 'experience effects', assessing whether repeated exposure reduces contributions as players learn the "selfish" equilibrium.
- Explore **cognitive mechanisms**, e.g. whether cooperation is instinctive and free-riding more deliberate.

Goal: Deliver an updated meta-analysis that integrates structural, psychological, and sociological factors to explain when and why cooperation emerges or collapses. This will generate policy-relevant insights into designing institutions and incentives that encourage prosocial behaviour.

Methodology

We applied the PRISMA framework to identify relevant papers to include in our meta-analysis. We conducted a systematic literature search using Google Scholar, focusing on the first 20 pages of results for studies involving the public goods game. This yielded 200 records. After removing duplicate entries, we screened 159 papers based on titles and abstracts for relevance. Of these, 98 were excluded as they did not meet the inclusion criteria (e.g., not experimental studies of cooperation). We then assessed the full texts of the remaining papers, until we found 20 relevant papers, all of which were deemed eligible and included in the meta-analysis.

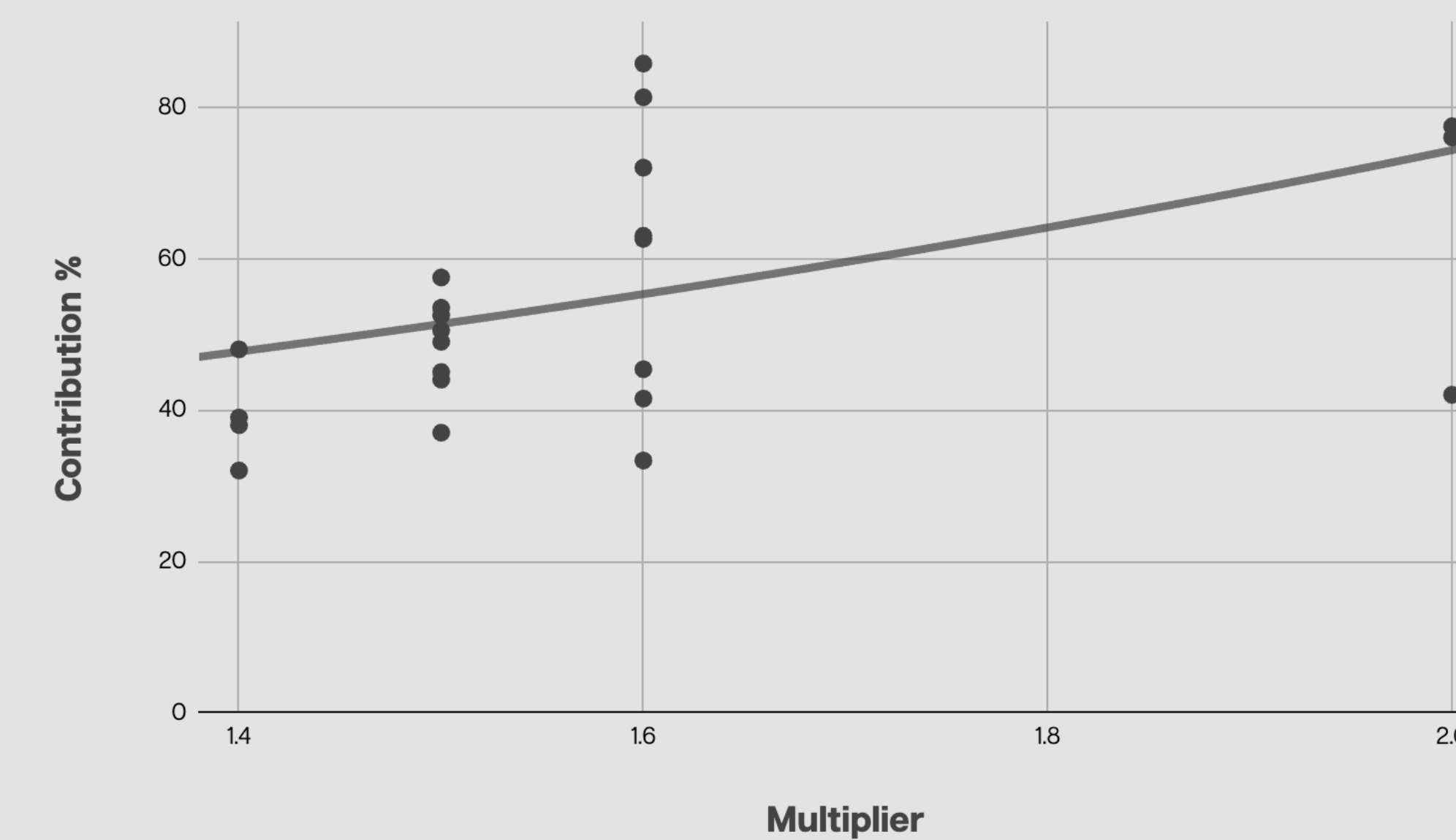
PRISMA Flowchart



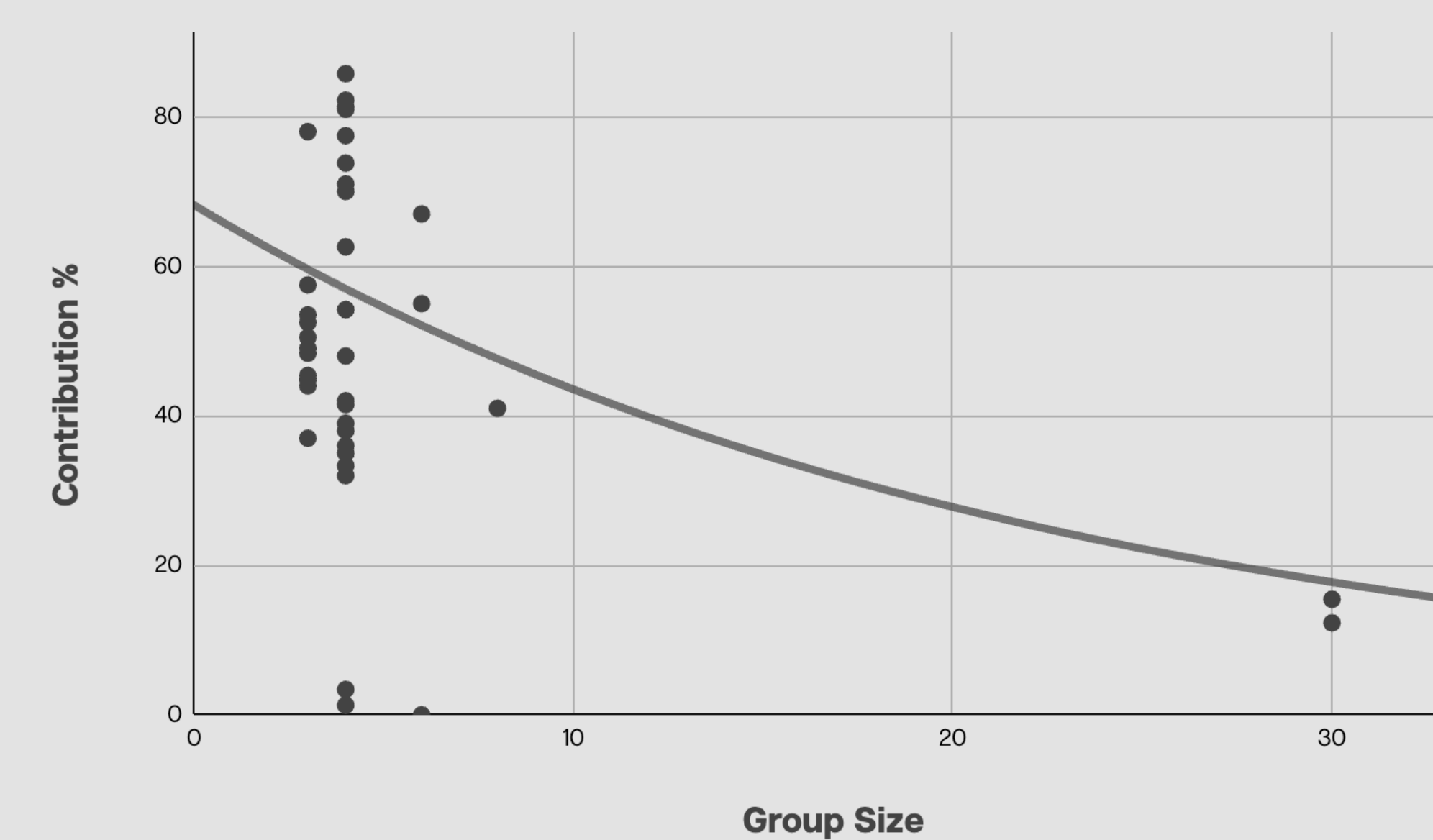
Results

All the results shown are **statistically significant** at the 5% level. The calculation factored in the different sample sizes for each study. Contribution % is used as a proxy for cooperation.

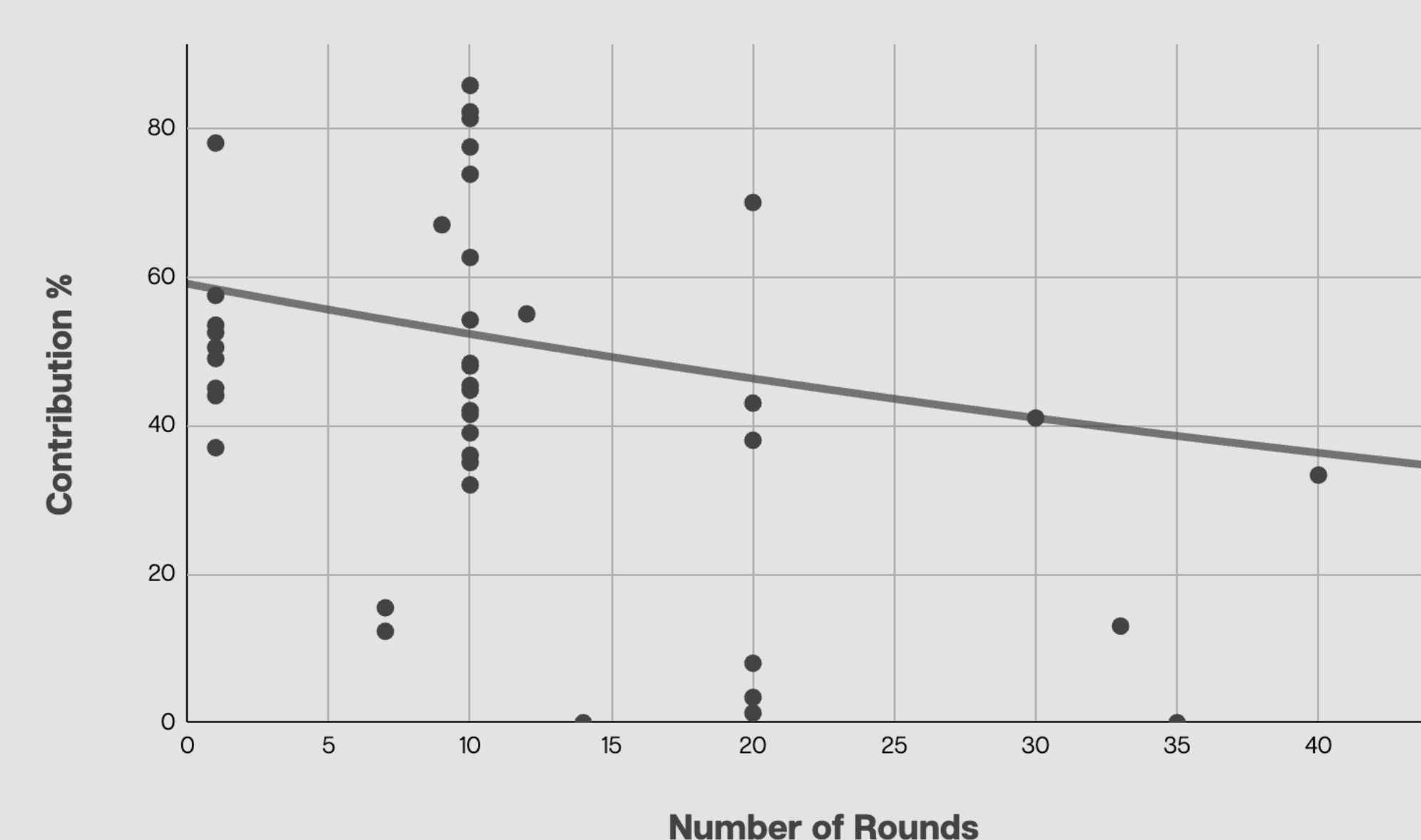
Cooperation increases with a higher multiplier $p = 0.026$



Cooperation decreases with larger group size $p = 0.023$



Cooperation decreases with more rounds $p = 0.0056$



Each dot represents a different result, and some studies were repeated if they reported multiple treatments or experimental conditions.

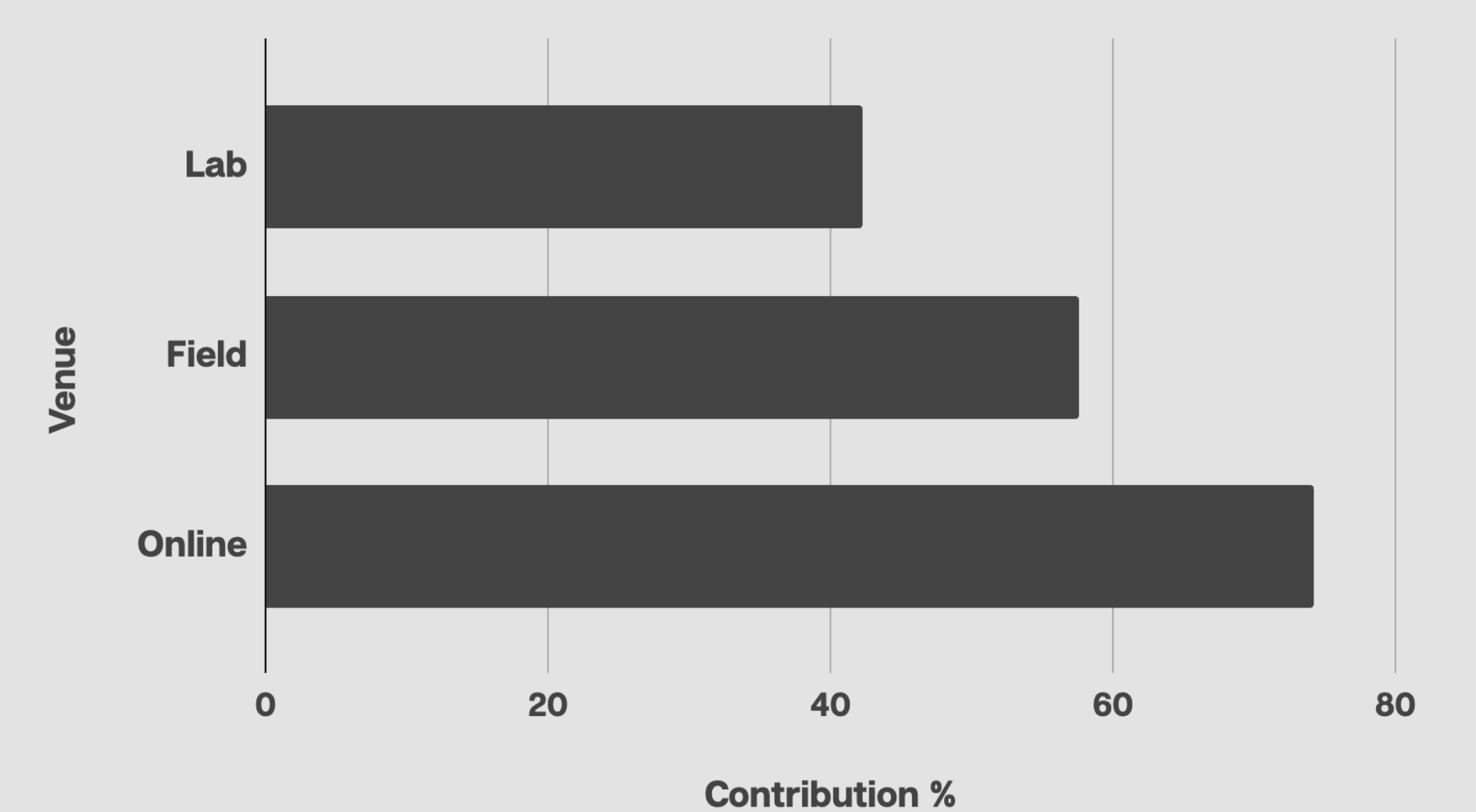
Conclusion

Our results predominantly support Zelmer's findings, with some important nuances.

Similarities: The **multiplier** was one of the strongest drivers of cooperation, and contributions declined with larger groups and repeated rounds. Playing more rounds of the game led to more selfish behaviour, towards the game theory optimal solution. Larger group sizes, as expected, reduced cooperation because responsibility became more diffuse — a dynamic closely related to the bystander effect, where individuals feel less accountable for contributing when many others are present.

Differences: Online participants consistently showed higher cooperation, and cultural variation (e.g. higher cooperation in Switzerland and the UK) suggests that context matters more than Zelmer's framework implied. Perhaps there is a positive correlation between **income** and cooperation. This could be the basis for future studies.

Online Participants showed highest levels of cooperation



UK & Switzerland showed highest levels of cooperation in Europe

