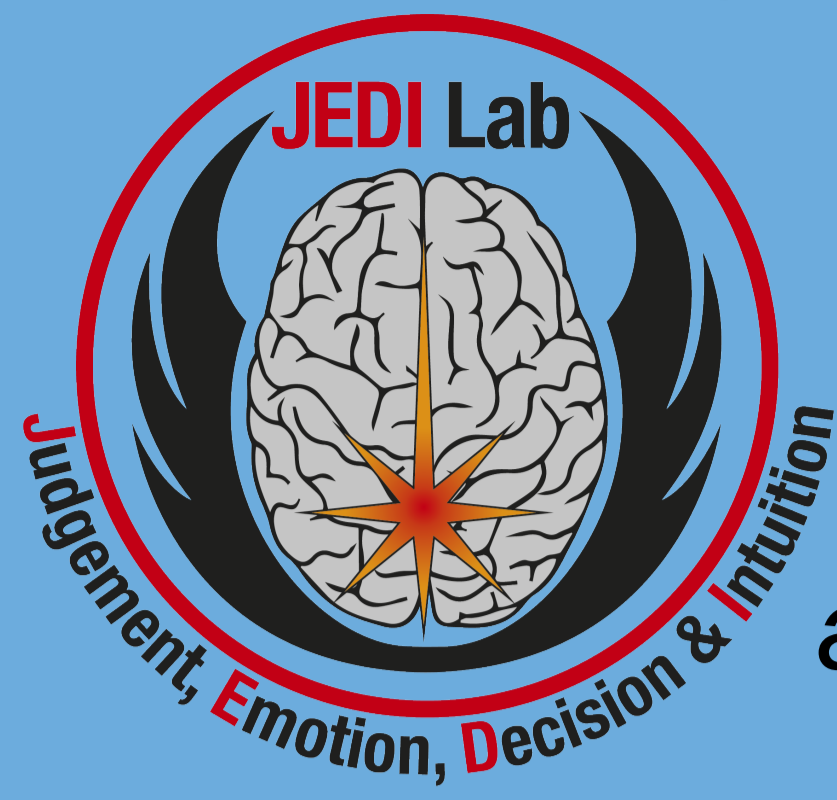# Fairness versus Efficiency: How Procedural Fairness Concerns Affect Coordination

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Abstract

We examine in a laboratory experiment if procedural fairness concerns (about inequality in expected payoffs) affect how well individuals are able to solve a coordination problem. To overcome potential miscoordination, participants receive external action recommendations. We manipulate the fairness of the coordination procedure by varying probabilities of favourable recommendations between treatments. Recommendations that serve as coordination mechanism improve efficiency regardless of their consequences for payoff distribution.

Motivation

- Coordination is important in many social situations, e.g. common pool resource
- Failure to coordinate is costly for the whole society
- The introduction of an external coordination mechanism can overcome coordination problems (Aumann, 1987; Duffy and Feltovich, 2010)
- It has been shown that individuals care about fairness of outcomes as well as procedures that lead to these outcomes (Bolton, Brandts, and Ockenfels 2005)
- **Research question**: *How do procedural fairness concerns affect behavior and beliefs about others' behavior in situations requiring coordination?*

Methods

- 216 participants (58% females, M_{age}=24 years)
- 30 rounds of 2-player Volunteer's Dilemma (Table 1) (Diekmann, 1985), random matching in every round, no feedback

Table 1: The experimental calibration of Volunteer's Dilemma

		Player 2	
		X	Y
Player 1	X	5, 5	5, 10
	Y	10, 5	0, 0

- Introduction of external action recommendations that lead to one of Nash equilibria: (X,Y) or (Y, X) with commonly known distribution
- Between-subject design, 3 treatments that differ only in the probability of different action recommendations (Table 2)
- Post-experimental non-incentivized elicitation of beliefs about other players following recommendations (summarized into a binary variable)

Table 2: Experimental treatments

Treatment	Recommendation	Expected payoff for player 1	Expected payoff for player 2
Baseline	None	5	5
Fair mechanism (FM)	P(X,Y)=0.5 P(Y,X)=0.5	7.5	7.5
Unfair mechanism (UM)	P(X,Y)=0.1 P(Y,X)=0.9	9.5 (advantaged)	5.5 (disadvantaged)

Results

*Results are based on Wilcoxon rank-sum with the data collapsed at the subject level across periods.*

- Recommendations increase the frequency of coordination (Figure 1)

Figure 1: Frequency of reaching one of Nash equilibria *(X,Y) or (Y,X)*
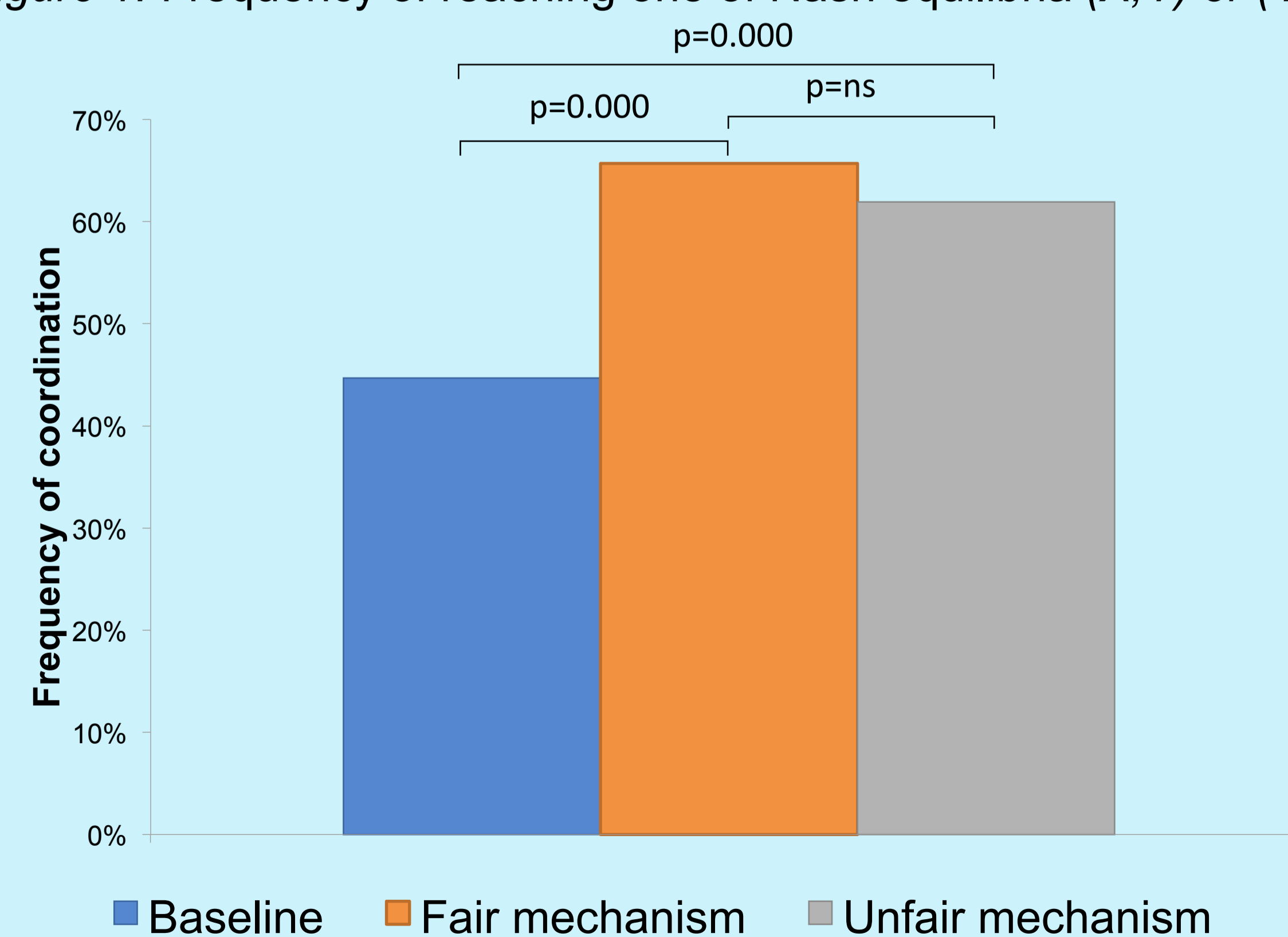
- No significant differences in the frequency of coordination between treatments with recommendations
- Individuals in the UM treatment are less positive in their beliefs about others following recommendations compared to FM treatment
- Beliefs affect decision to follow only when individuals receive favourable recommendation that involves payoff uncertainty (Figure 2)

Figure 2: Rates on following the recommendations contingent on the type of recommendation and beliefs about others' actions
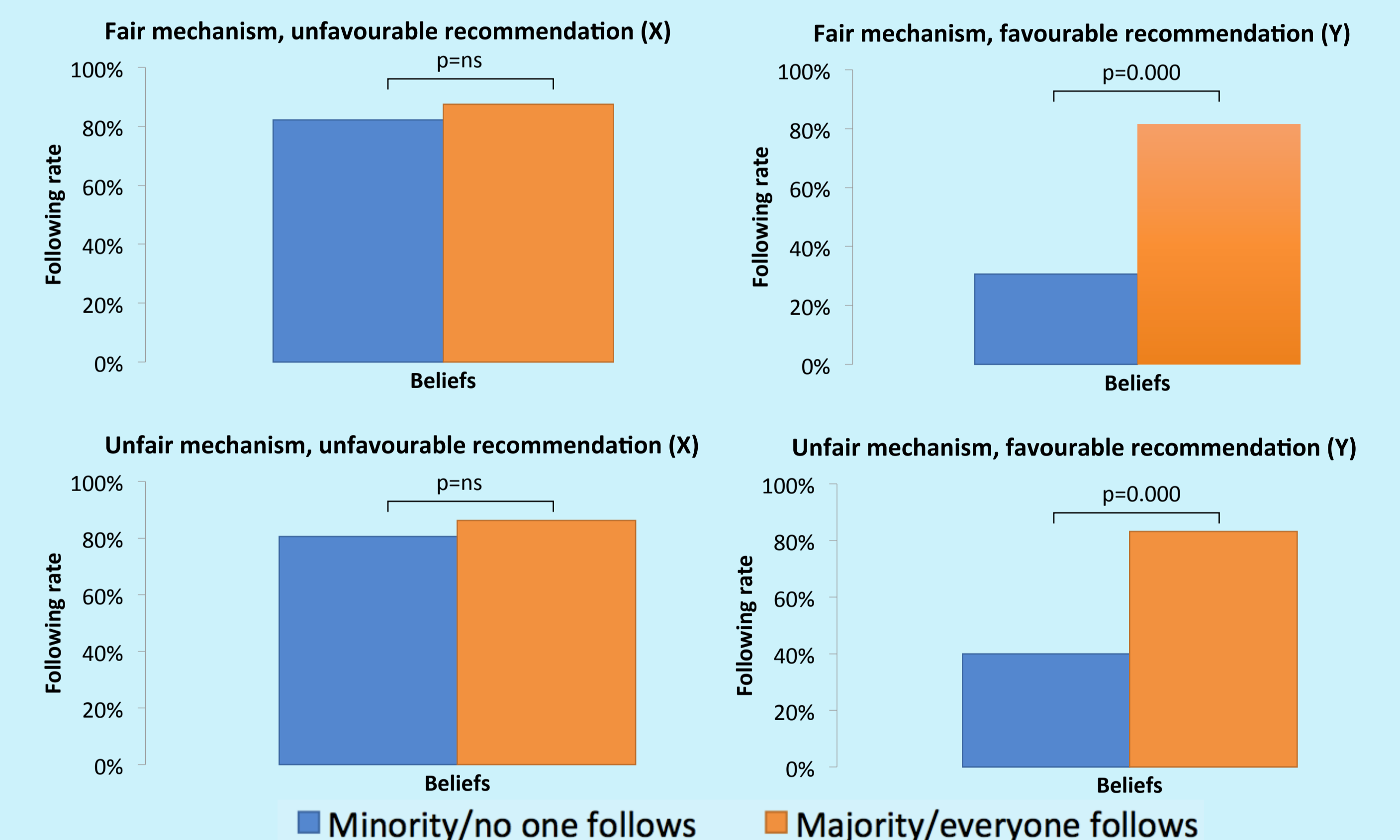
Discussion

- The study highlights the benefits of external coordination devices in improving coordination
- Most of the subjects are more concerned about potential gains from coordination rather than differences in expected payoffs
- Beliefs play an important role only when following the recommendation is not a risk-dominant strategy

References

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