

# COORDINATION: THE CORNERSTONE FOR THE COOPERATION?

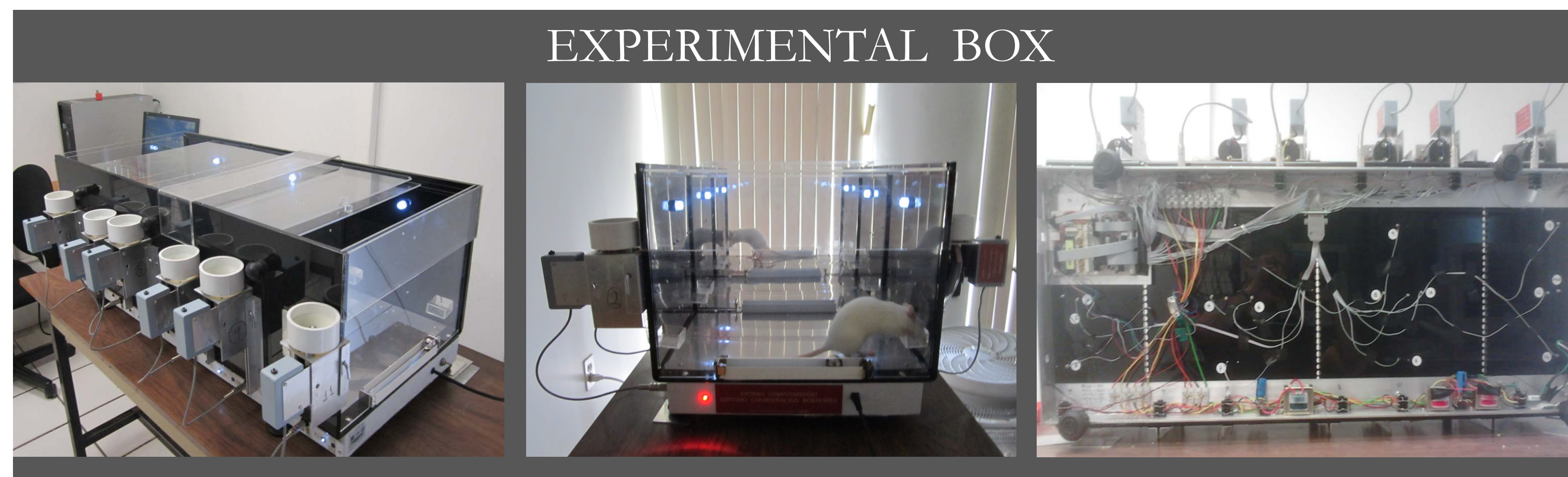


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## INTRODUCTION

The study of cooperation has been approached from two main paradigms: the Iterated Prisoner's Dilemma and Cooperative Problem Solving, whose findings suggest unstable cooperative equilibrium, temporal and probability discounting and difficulty in identifying emerging behavior patterns as coordination. In summary, it is likely that subjects will not fit to interdependent environments.

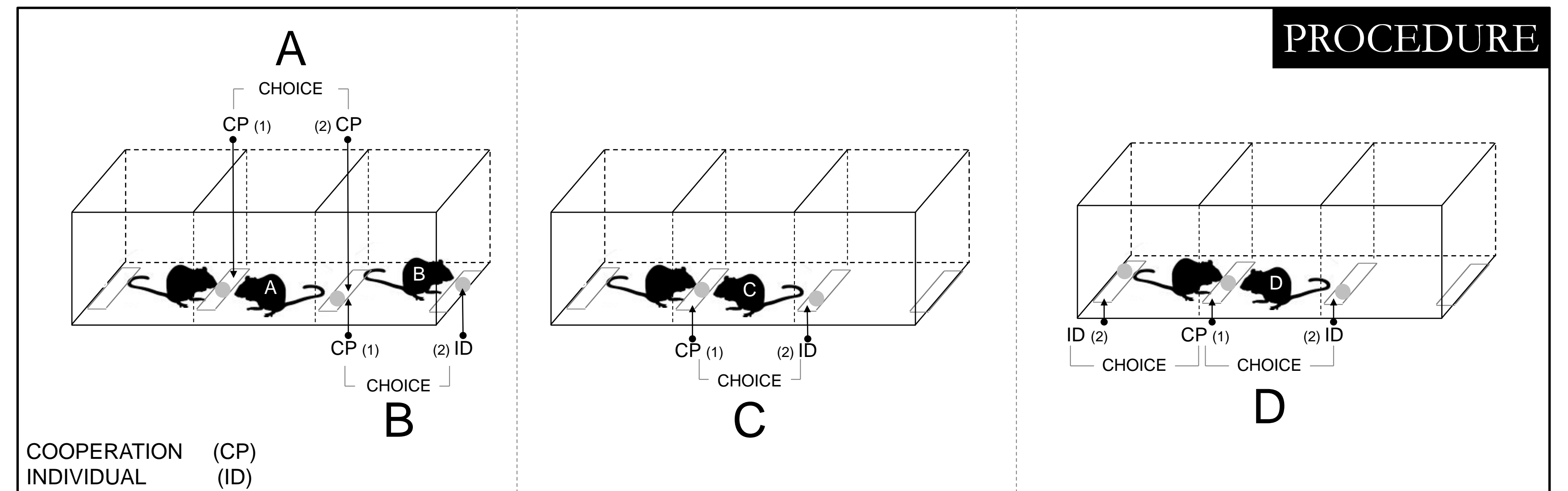
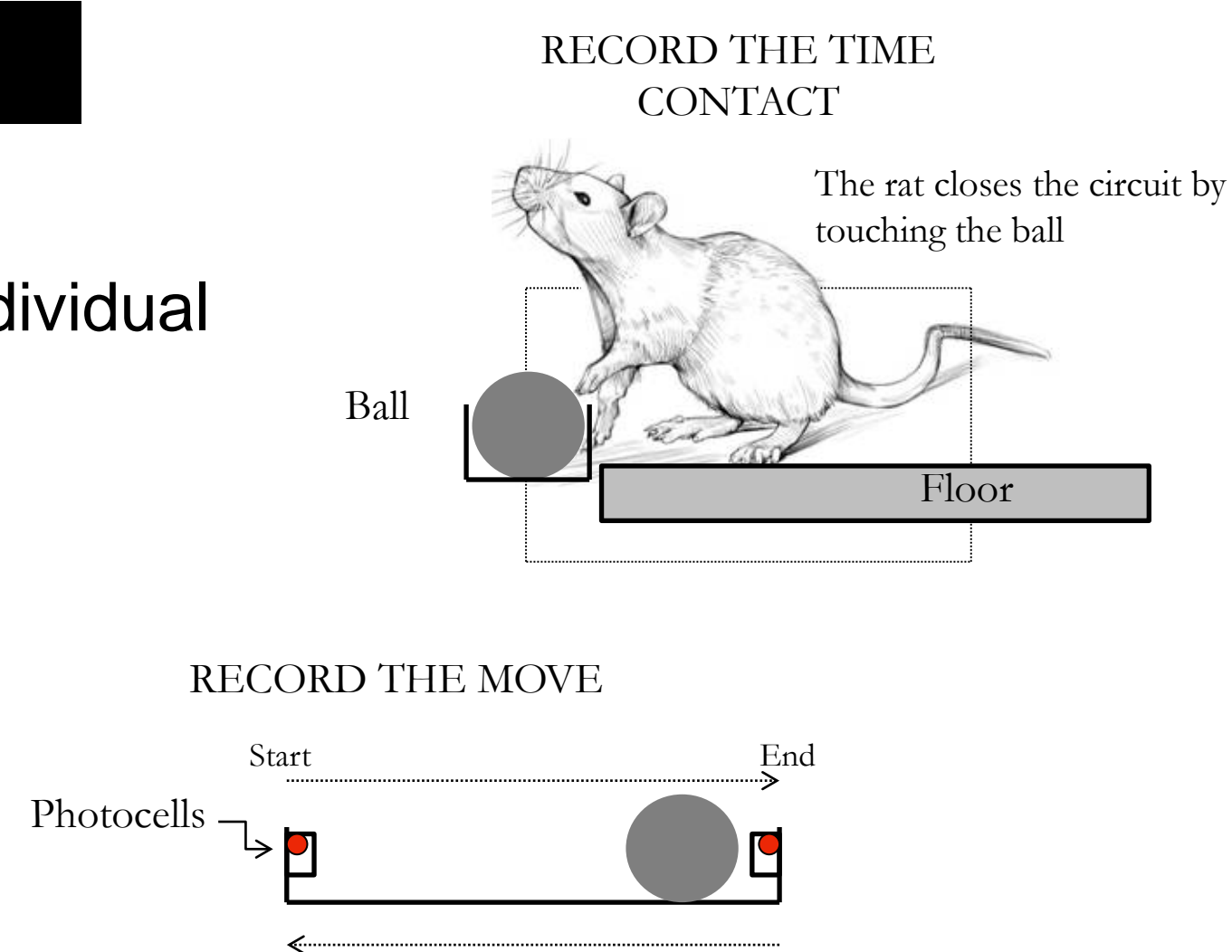
## METHOD



- Within-Subject Design.
- Wistar Rats ♀.
- The order of exposure to experimental conditions was randomized.

## NEED TO IDENTIFY

1. Stable equilibria
2. The allocation of behavior between individual and cooperative options
3. Patterns that emerge to act together



## PROCEDURE

EXPERIMENT 1

### CONTINGENCIES

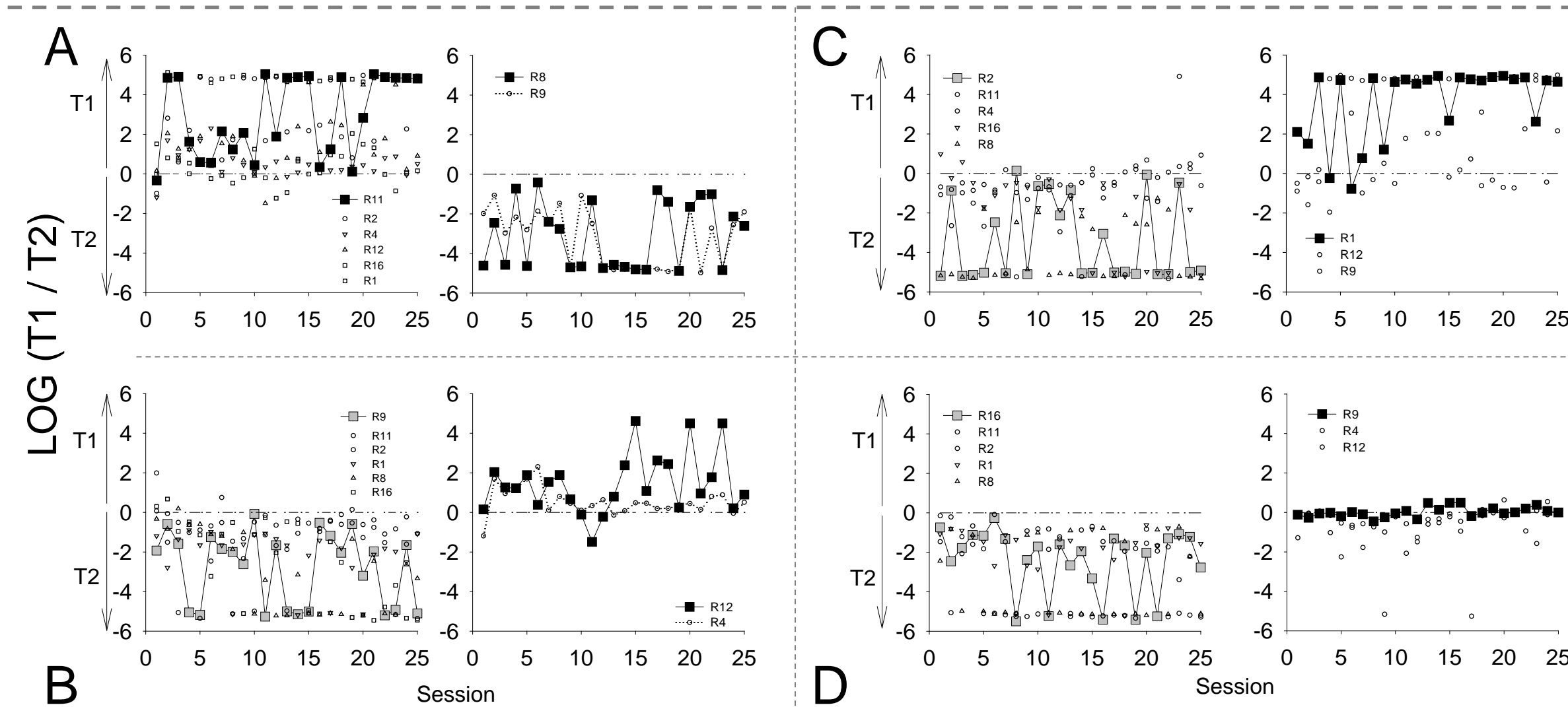
#### COOPERATIVE BEHAVIOR

- Access to 6 pellets
- Probability of Reinforcement (1.0)
- Individual time investment in joint action:  $0.4 \leq \text{RANGE} \leq 0.6$

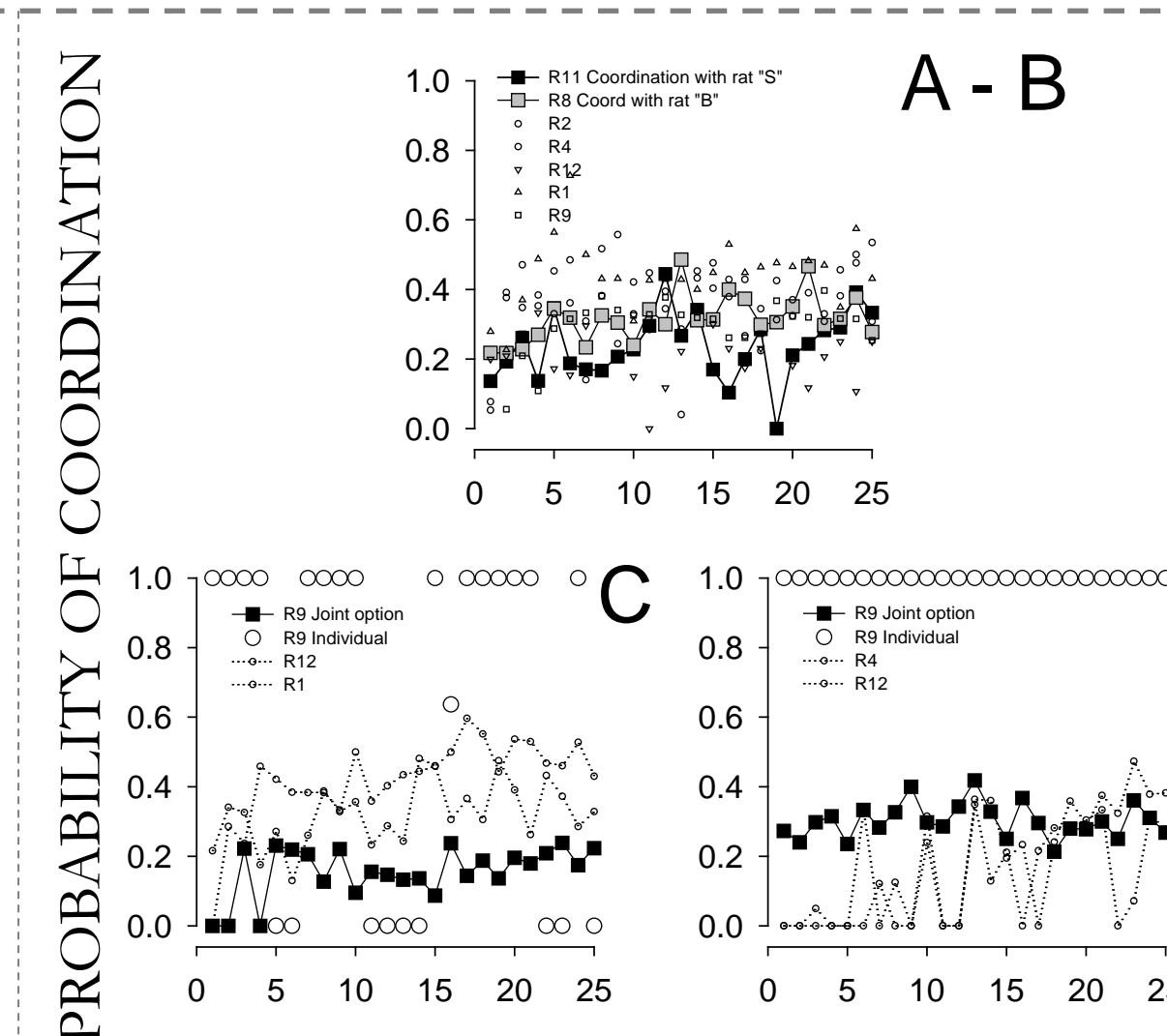
#### INDIVIDUAL BEHAVIOR

- Access to 1 pellet
- Probability of Reinforcement (1.0)

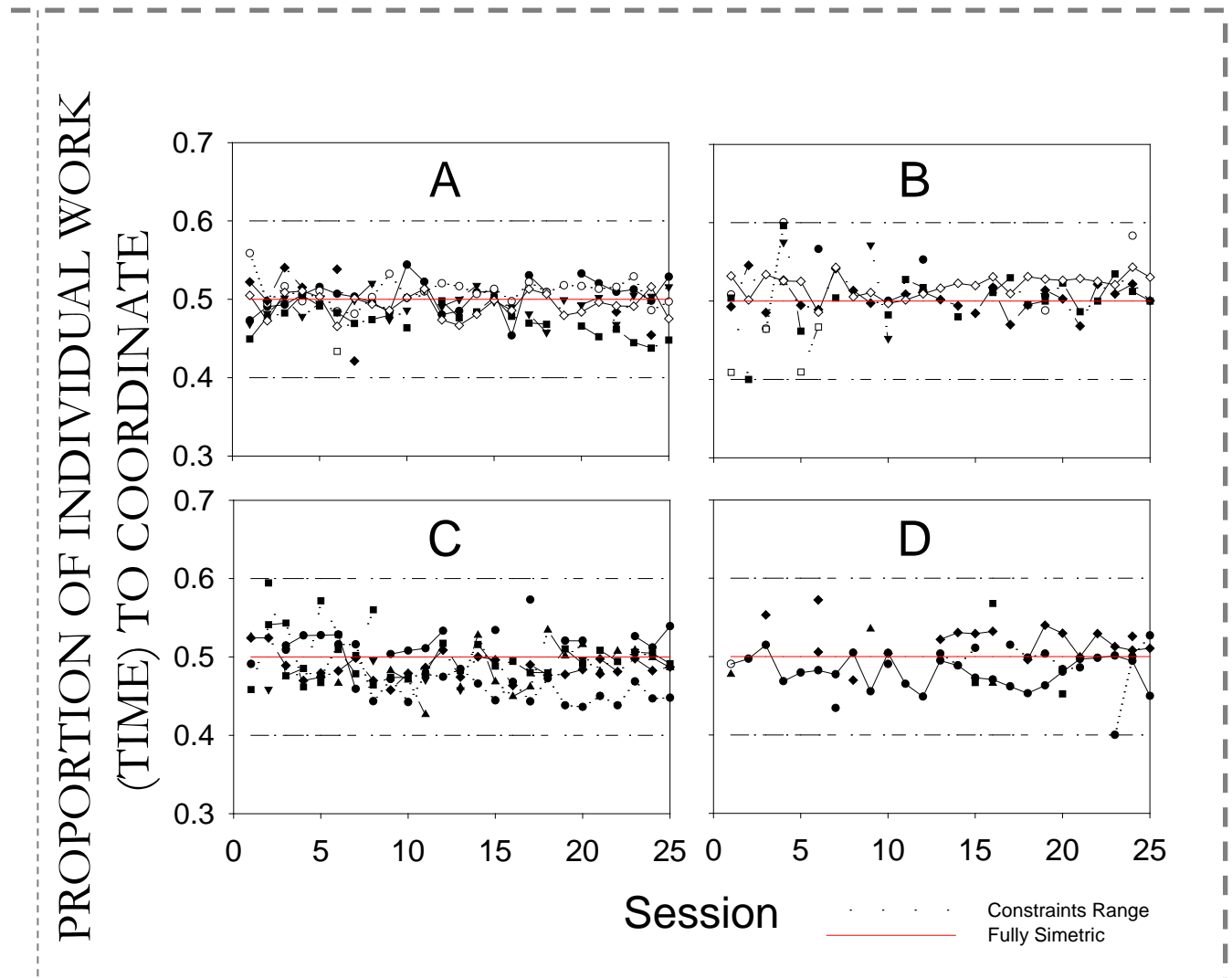
### DISTRIBUTION OF TIME



### COORDINATION INDEX

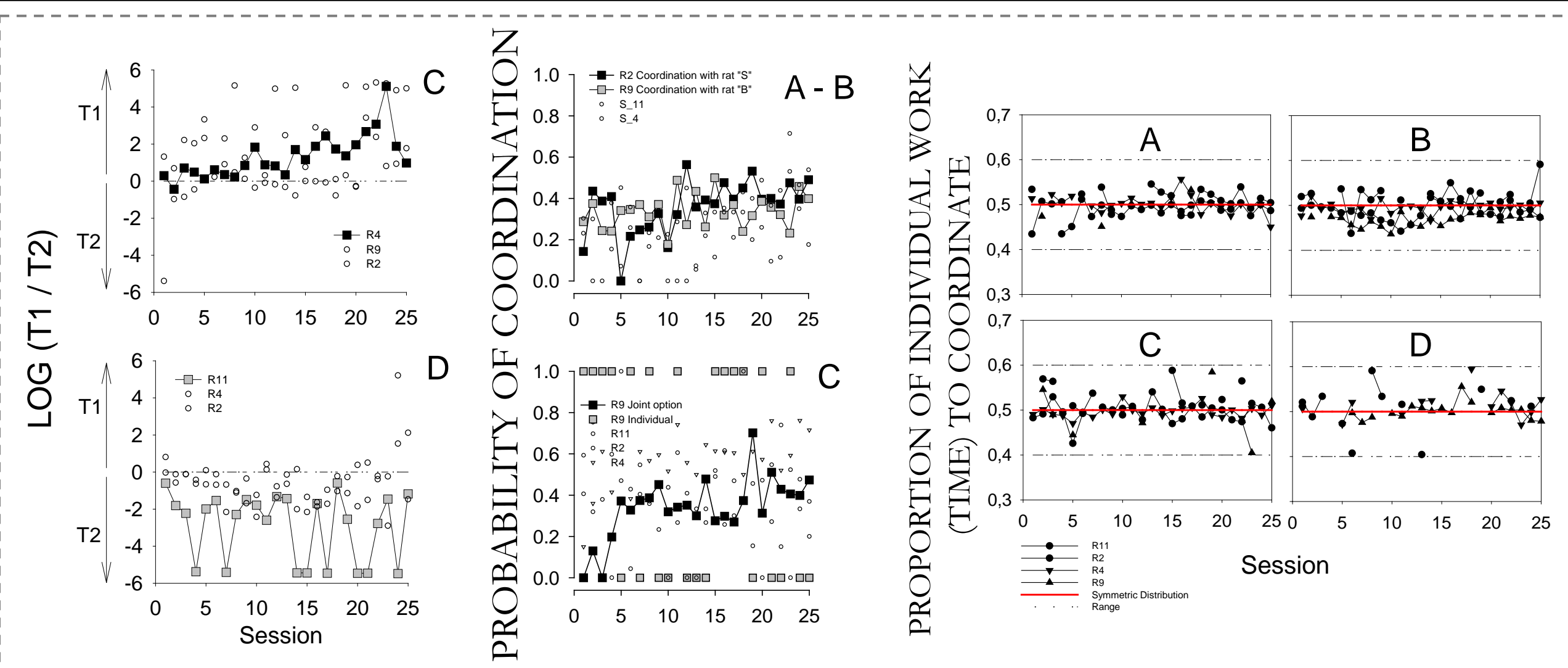


### JOINT ACTION



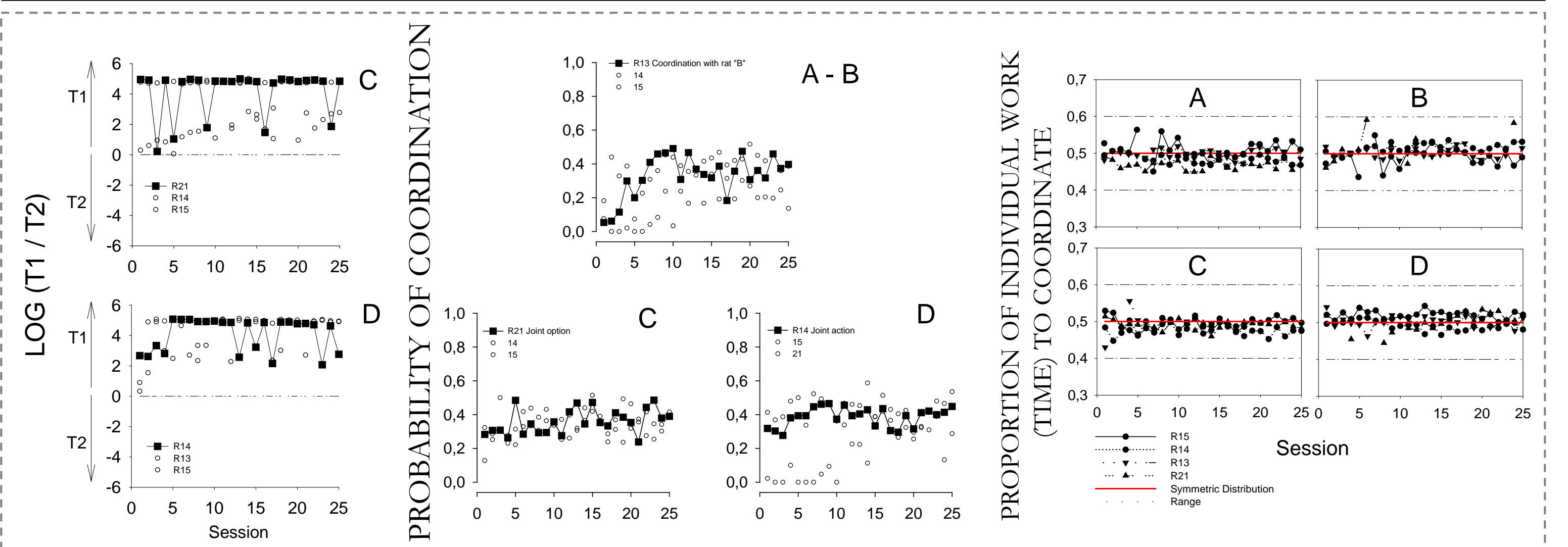
EXPERIMENT 2

Change the Probability of Reinforcement in both Options (CP- ID),  $p=0.33$



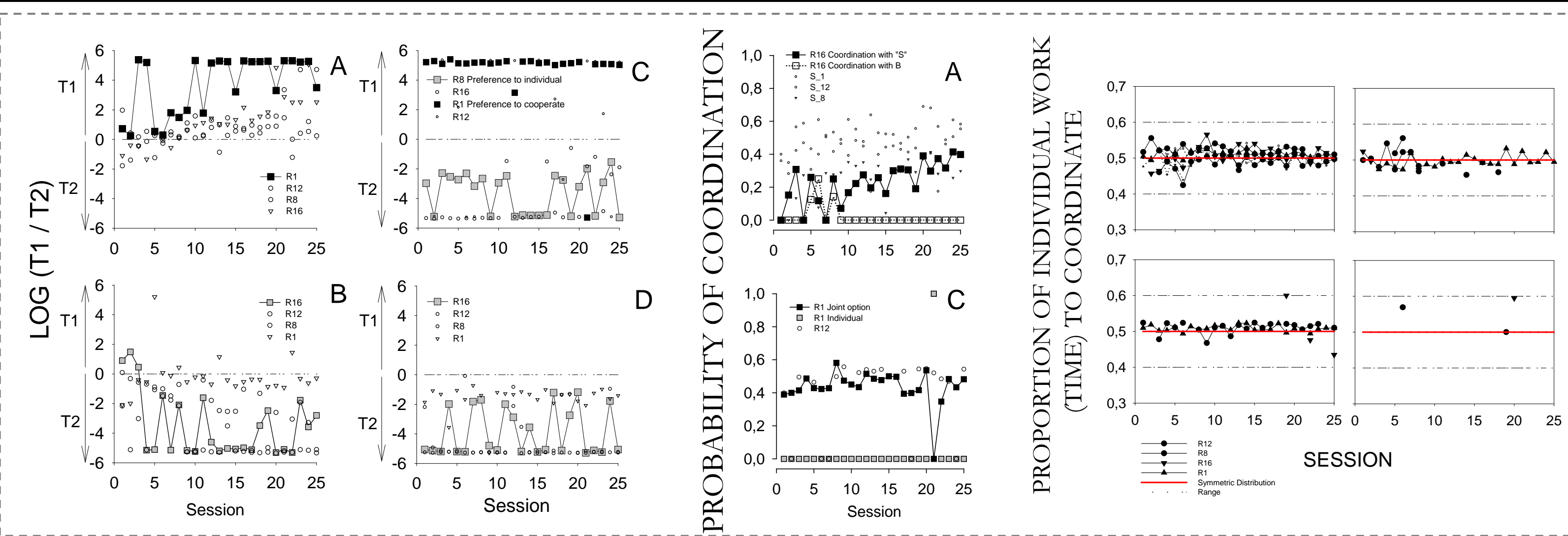
EXPERIMENT 4

Change the Probability of Reinforcement only in Individual Option (ID),  $p=0.33$



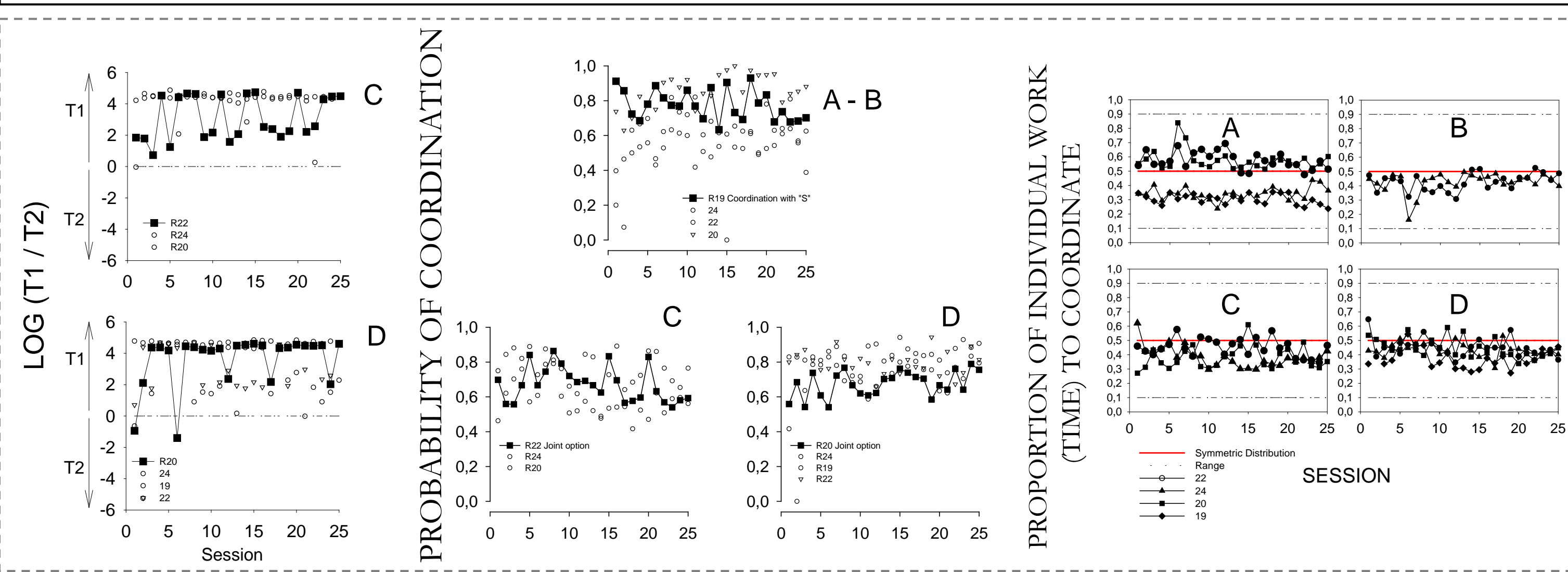
EXPERIMENT 3

Same Amount in both Options (CP- ID), 1 pellet



EXPERIMENT 5

Individual Time Investment in Joint Action, Change the Range ( $0.1 \leq R \leq 0.9$ )



## DISCUSSION

1. The task allows the identification of more stable equilibria than those traditionally reported. It is useful to compare individual and interdependent concurrent alternatives.
2. This protocol allows to investigate the adjustment of cooperative behavior to interdependent payments as a result of joint action patterns.
3. The coordination of actions is a critical element for social behavior, its occurrence enables contact with delayed and probabilistic rewards.
4. Our data are consistent with the proposal that these behaviors are a product of the sensitivity to the consequences of temporally extended patterns of acts.
5. The relative ease with which coordinated patterns emerge (and their stability across the experimental conditions) may reflect a strong biological preparation for its implementation and be a byproduct of gregarious life in this species.

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