

# MONITORING OF PROXIMAL AND DISTAL EFFECTS AND ERRORS

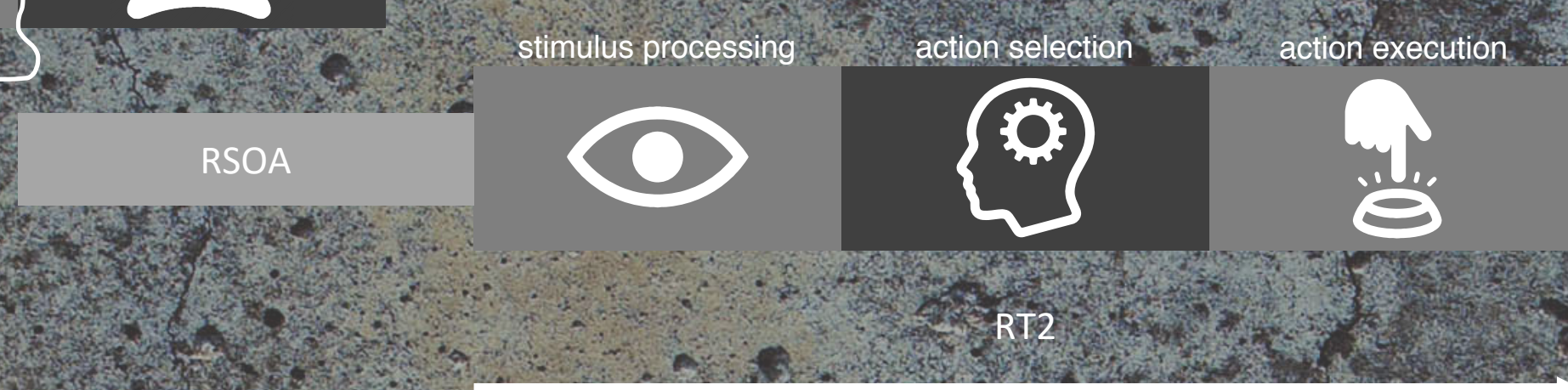
## Introduction

Humans typically act to produce changes in the environment. To do so, we have to monitor the effects we produce by our motor behavior. With temporally close tasks, such effect monitoring can take place while another action has to be specified. Here, we study whether and to which degree body-related and body-external action effects interfere with the processing of concurrent tasks within a dual-task setup.

### Task 1



### Task 2



### Task 1



### Task 2



Stimulus in Task 1:  
[Red] [Green] [Red]

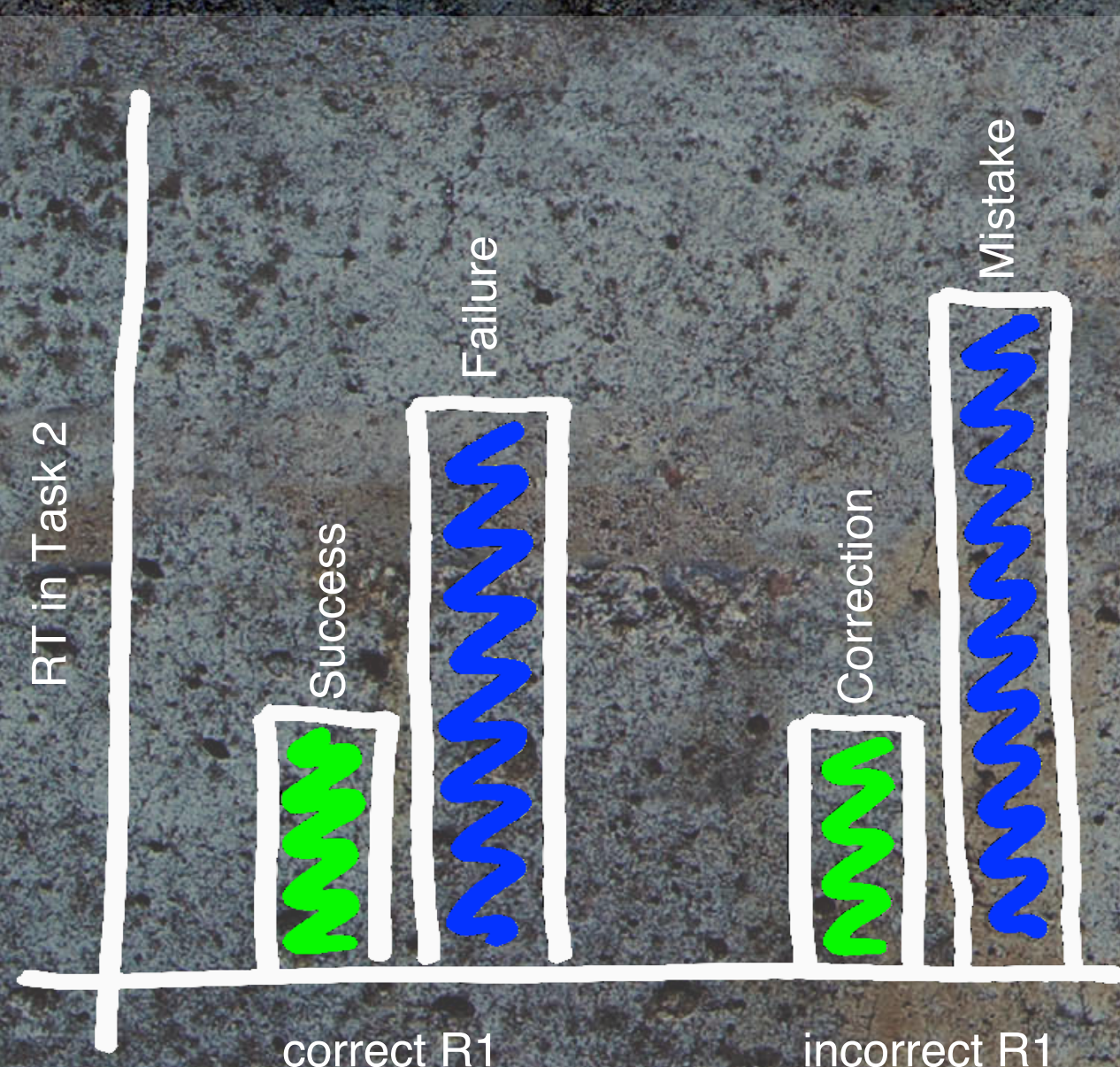
	75% correct effect	25% incorrect effect
??% correct action	Success [Green lightbulb]	Failure [Blue lightbulb]
??% incorrect action	Correction [Green lightbulb]	Mistake [Blue lightbulb]

## Method

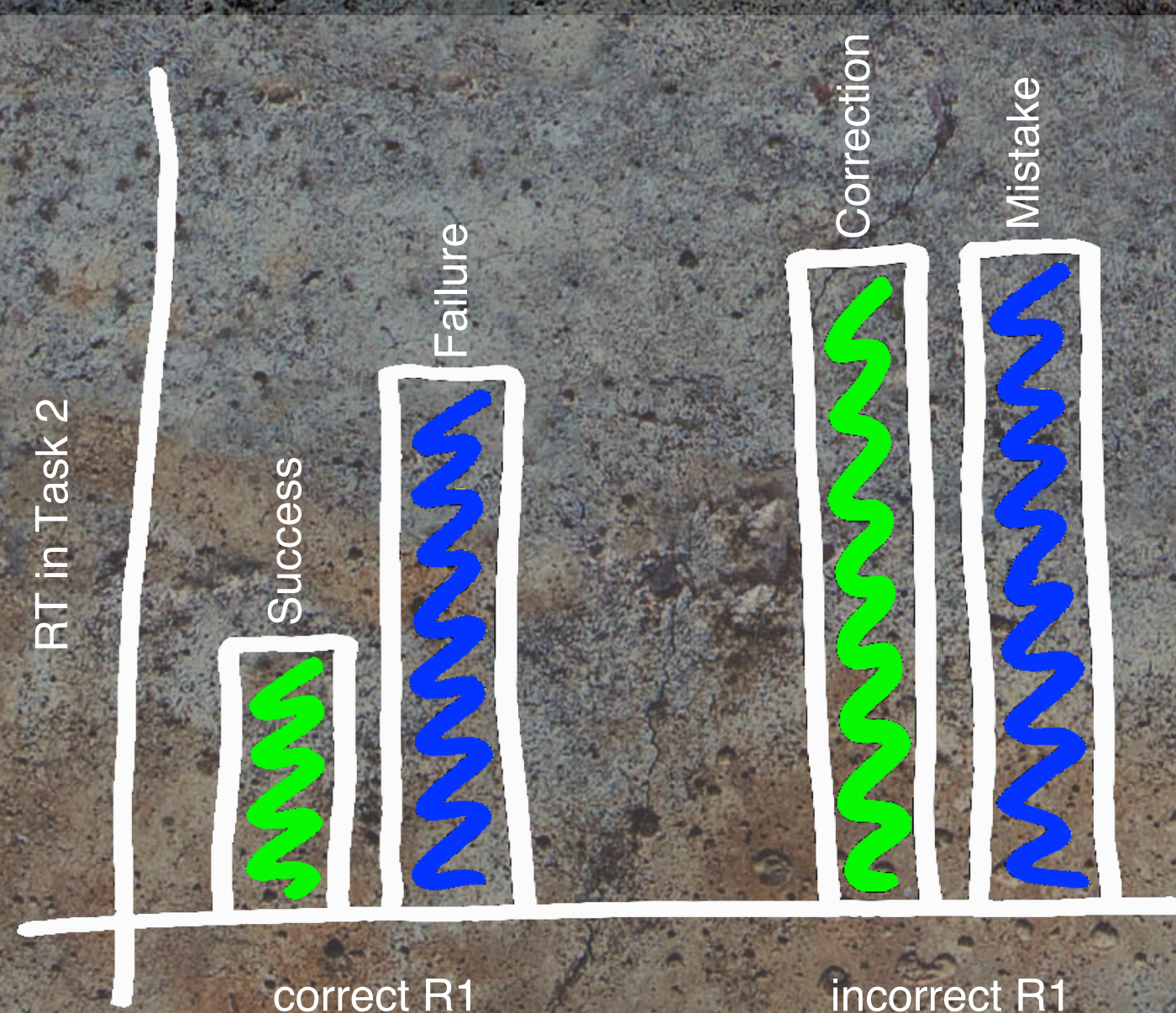
Participants changed the color of a lamp via keypress (Task 1). The requested color of the lamp was indicated by a color stimulus (which was flanked by two incompatible distractors to increase action errors). In *success* trials, the correct action produced the correct effect. In *failure* trials, the correct action produced an incorrect effect. In *correction* trials, an incorrect action still produced the requested effect. In *mistake* trials, an incorrect action produced an incorrect effect. Shortly after the color change, participants discriminated between two letters (Task 2).

## Hypotheses

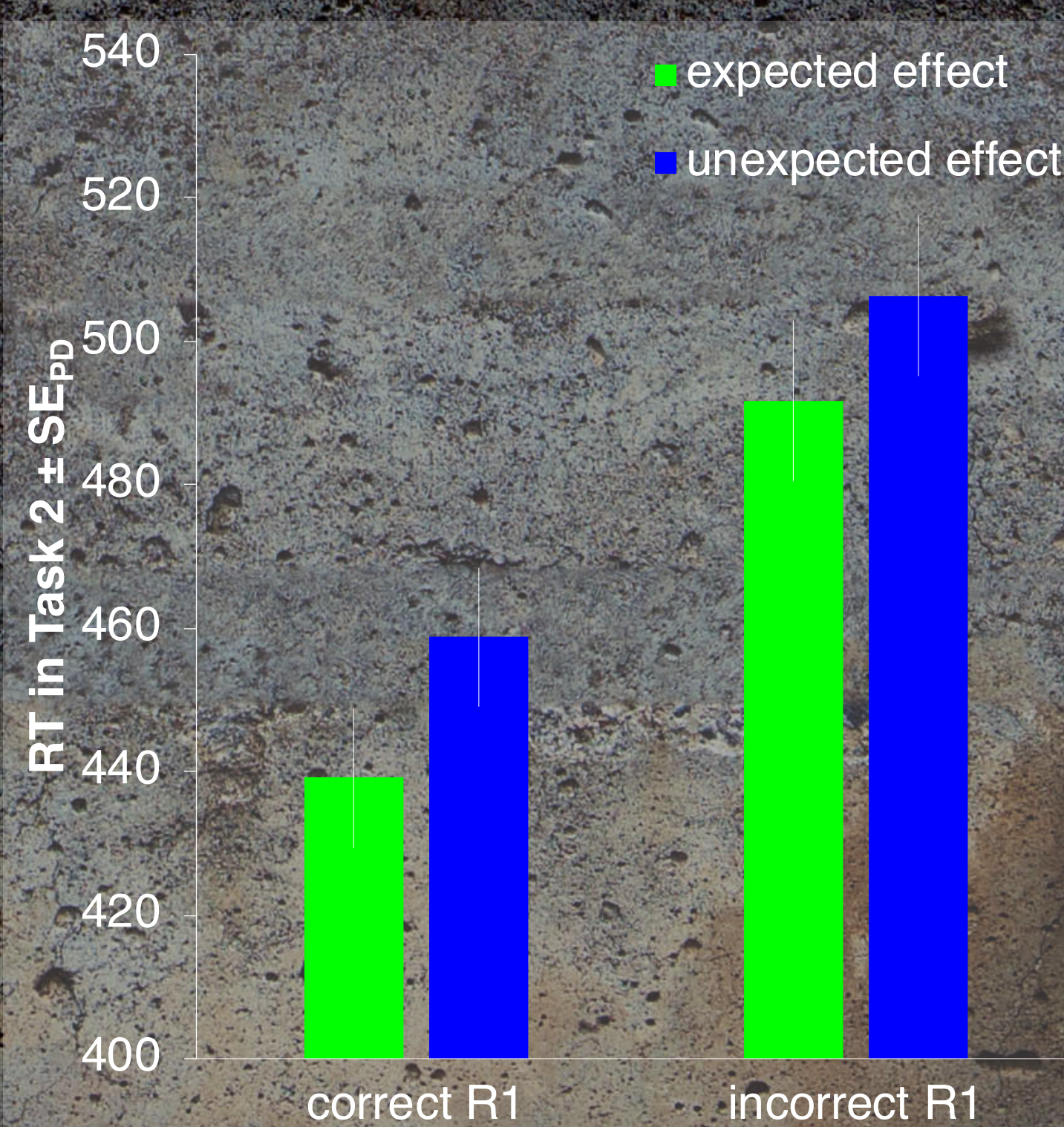
monitoring of body-external  
feedback only



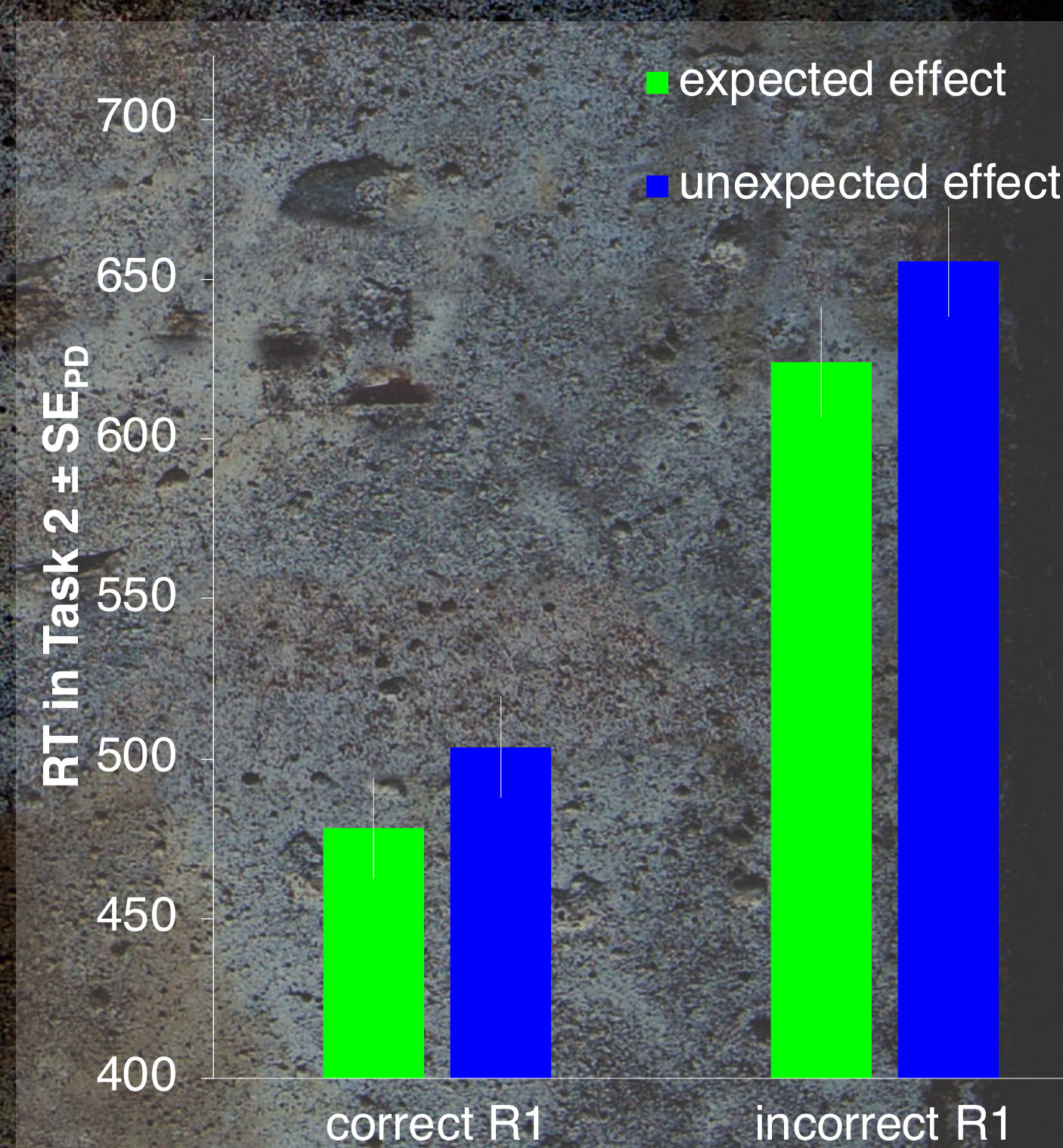
monitoring of body-related  
and body-external feedback



## Experiment (ACC<sub>1</sub>=62.1%)



## Replication (ACC<sub>1</sub> = 84.1%)



## Discussion

- Both action-only and effect-only errors lead to a slowdown in Task 2
- Proximal errors (incorrect actions) and distal errors (incorrect effects) delay Task 2 performance in an additive manner
- Possibly, body-related and body-external feedback is monitored independently