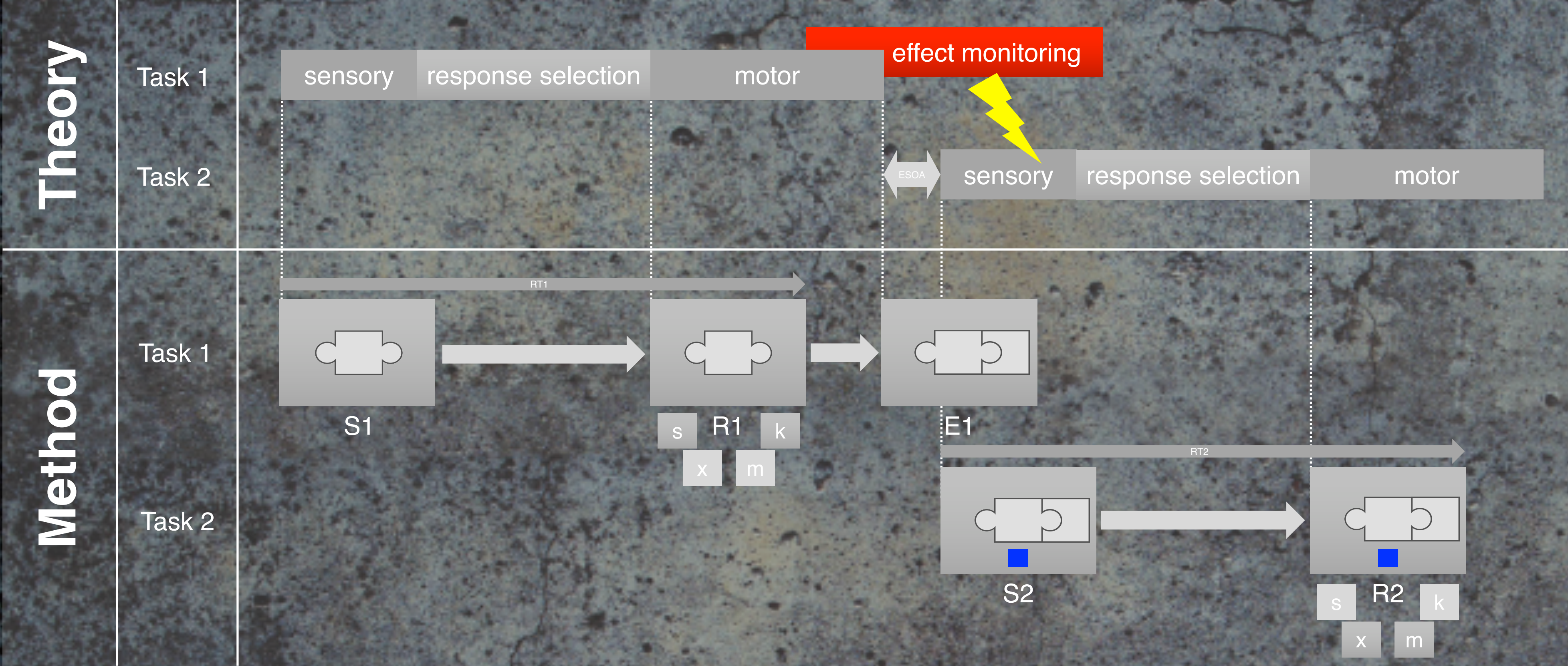


EFFECT MONITORING IN DUAL - TASK PERFORMANCE

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 takes place while another action has to be specified. We study whether and how the monitoring of body-external action effects interferes with the processing of concurrent tasks within a dual-task setup. We identified effect monitoring as an independent process that constrains multitasking performance.

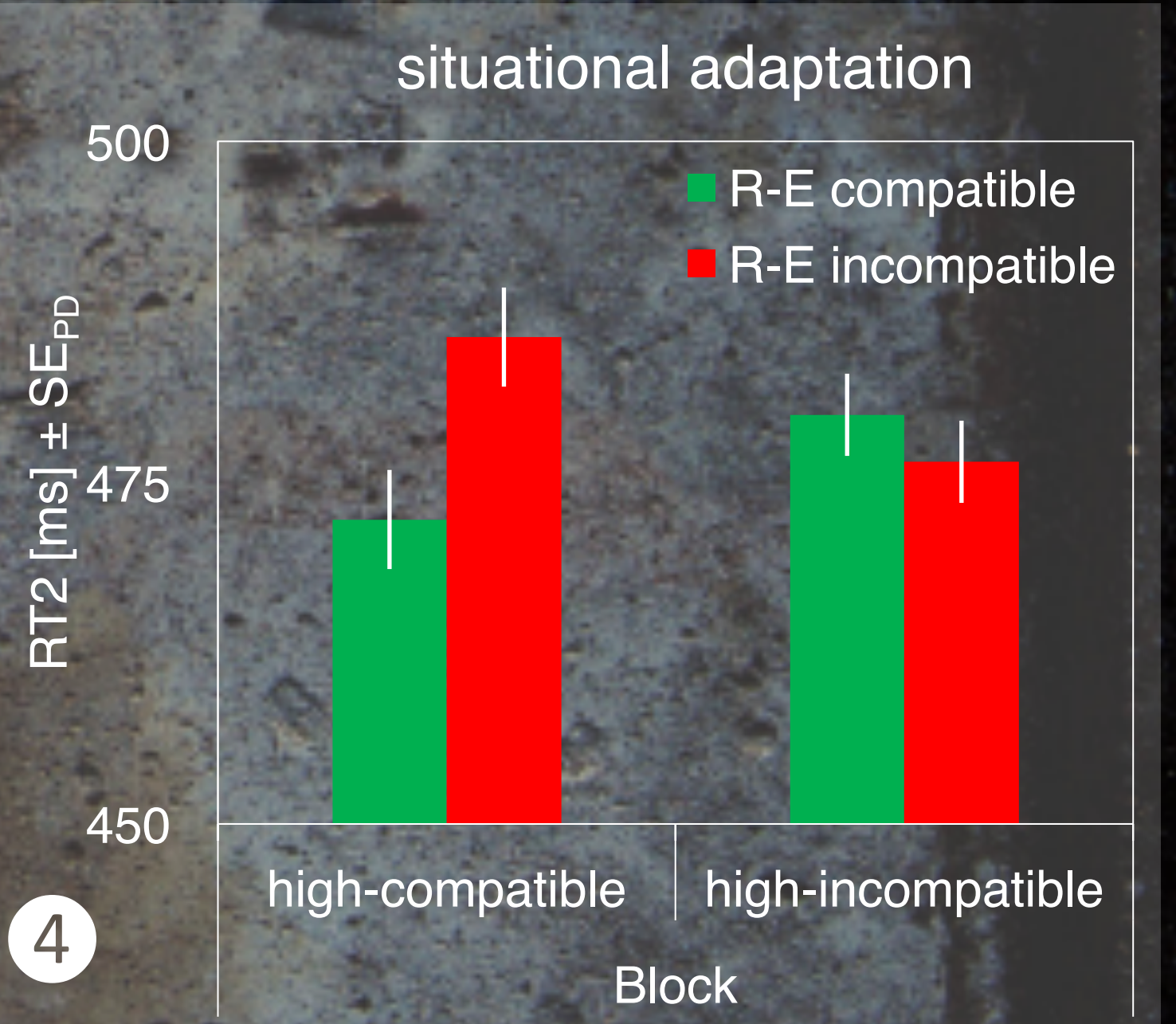
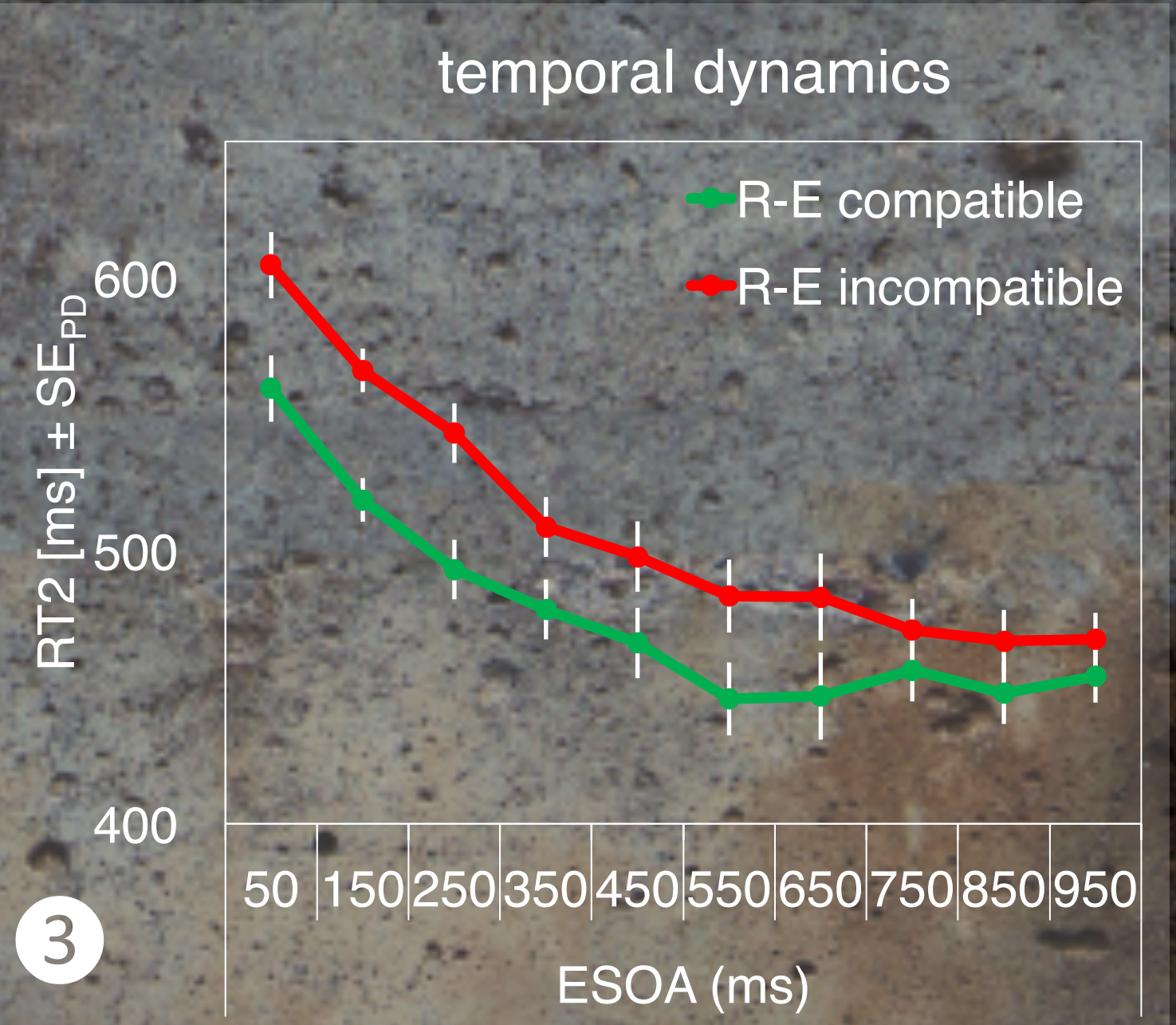
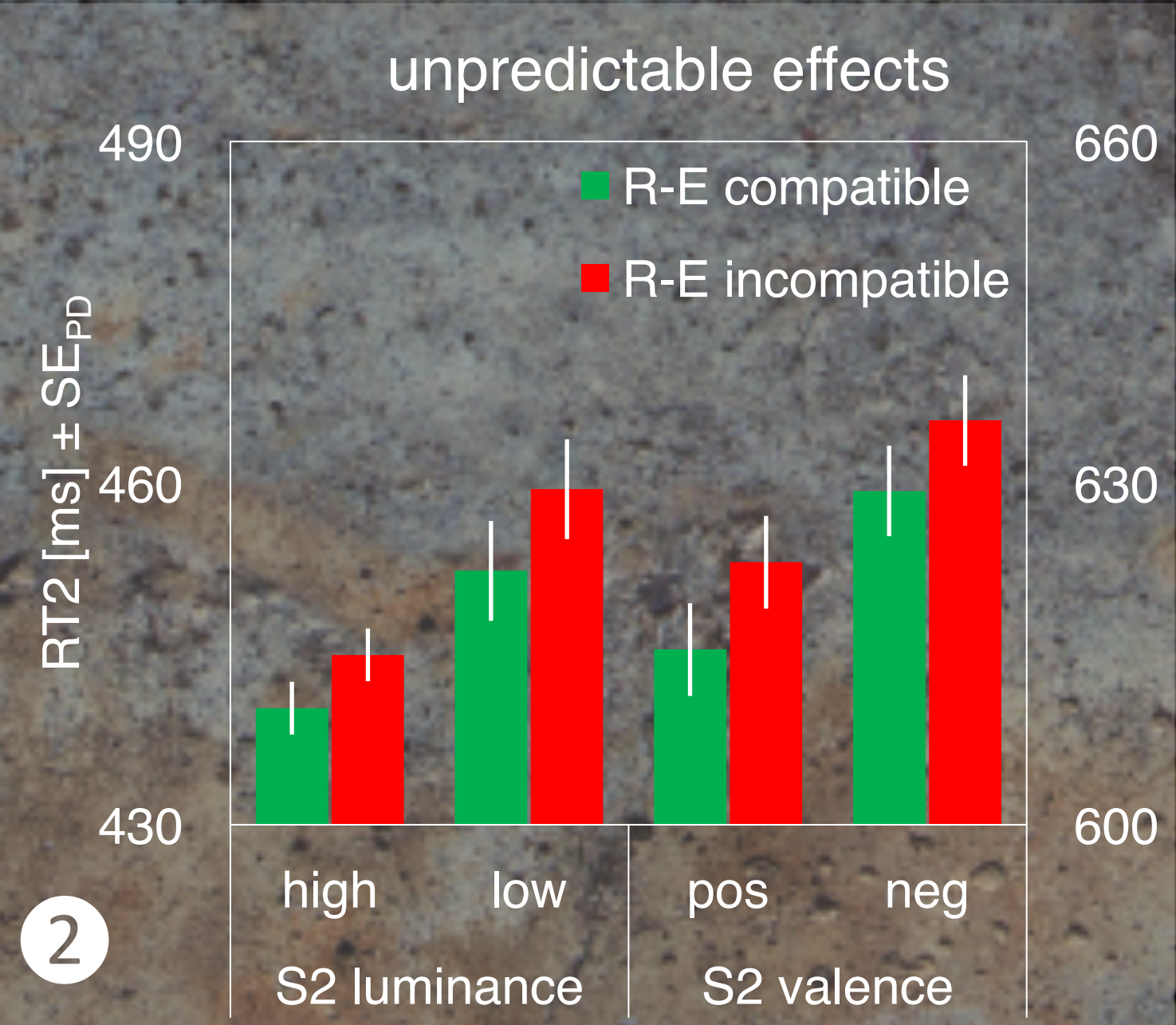
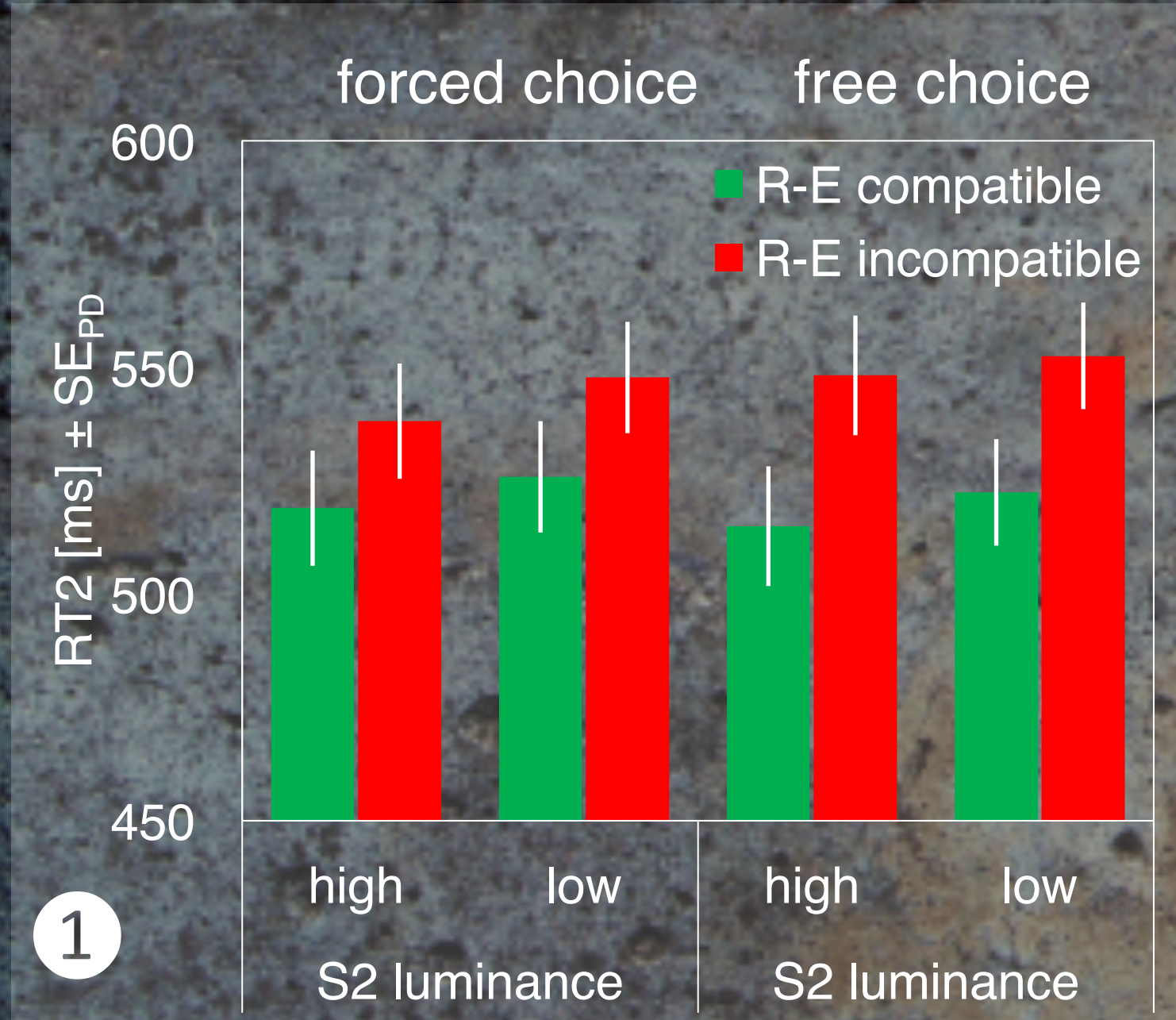


Method

In Task 1, participants produced action effects (E1, the presentation of a puzzle piece) via keypresses (R1). Effects could be either spatially compatible or incompatible to the keypress. After the effect, a stimulus for Task 2 (S2) appeared. We measured the impact of (still ongoing) effect monitoring in Task 1 in terms of Task 2 performance.

Results

- When actions produce spatially incompatible effects, monitoring takes longer relative to responses which produced compatible effects ①.
- This is true even when effect compatibility is unpredictable ② (cf. Wirth, Janczyk et al.).
- Monitoring incompatible action effects leaves a distinct signature in effect-locked ERPs (cf. Wirth, Steinhauser et al.).
- The costs of monitoring incompatible over compatible effects on a secondary task decrease with decreasing temporal task overlap ③.
- The duration of monitoring reduces with frequent as compared to infrequent action consequences ④ (cf. Wirth, Steinhauser et al.).
- With sequential task presentation, effect monitoring delays the start of Task 2 processing as a whole, not just response selection ①.
- With task overlap, monitoring can run parallel to Task 2 processing, but with reduced efficiency (cf. Kunde, Wirth, & Janczyk, in press).



Publications

- Kunde, Wirth, and Janczyk (2017). The role of feedback delay in dual task performance. *Psychological Research, Special Issue*.
- Wirth, Janczyk, and Kunde (in revision). Effect monitoring in dual task performance.
- Wirth, Steinhauser, Janczyk, Steinhauser, and Kunde (in revision). Long term and short term action effect links and their impact on effect monitoring.