

Rapidly Varying Ideomotor Effect Anticipations

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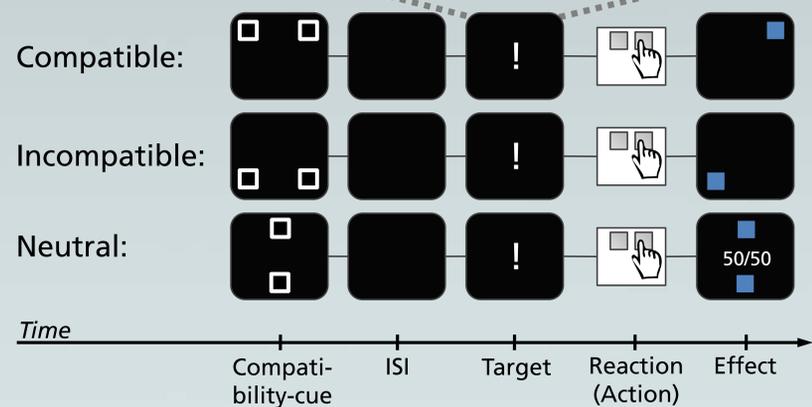

Background & Paradigm

How do we transform a subjective goal into overt action of our body? **Ideomotor theory** assumes that actions can be triggered by anticipating their sensory consequences (i.e., action effects). To date, however, evidence for this functional role of effect anticipations has only been reported for response-effect (R-E) compatibility designs using **blocked** R-E relations (e.g. Kunde, 2001).

Objective: Can ideomotor theory also explain action control in more ecologically valid settings with rapidly varying action-effect relations? To test this speculation, we performed two experiments with trial-by-trial varying action-effect (i.e., response-effect) relations while a cue indicated the current R-E mapping at the beginning of each trial.

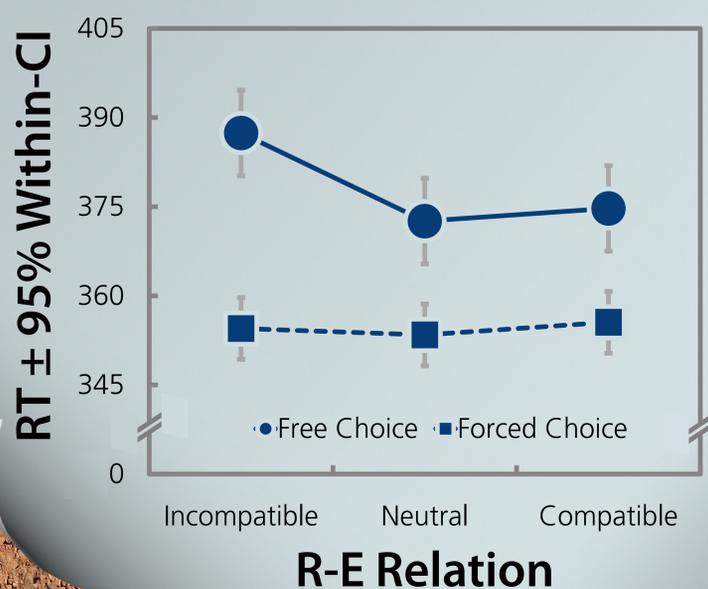
Furthermore, we explored the role of different **action control modes** for the application of ideomotor effect anticipations (intention-based vs. stimulus-based mode; Herwig, Prinz, & Waszak, 2007; Pfister, Kiesel, & Hoffmann, in press).

Free (!) vs. Forced (◀ / ▶)



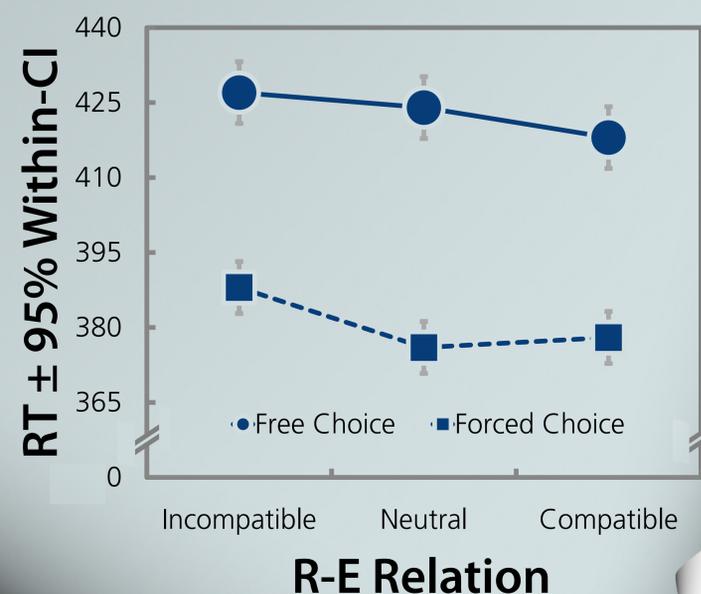
Experiment 1: Anticipations in Intention-Based and Stimulus-Based Action Control

Two groups of participants performed either **free choice trials only** (+ nogo trials) or **forced choice trials only** to induce clear intention-based or stimulus-based action control modes. An R-E compatibility effect resulted for free but not for forced choice actions:



Experiment 2: Is the Intention-Based Mode Dominant Over the Stimulus-Based Mode?

Free and forced choice trials occurred **intermixed** in the same experimental block in order to examine mutual influences of both action control modes. Here, an R-E compatibility effect resulted for both, free and forced choice actions



Summary

The present findings indicate that ideomotor theory can indeed account for more ecologically valid settings with rapidly varying action-effect relations. Furthermore, intention-based action control in free choice trials seems to promote the application of ideomotor effect anticipations (Experiment 1) while this mode can also be generalized to forced choice actions (Experiment 2).

Herwig, A., Prinz, W., & Waszak, F. (2007). Two modes of sensorimotor integration in intention-based and stimulus-based actions. *Quarterly Journal of Experimental Psychology*, 60(11), 1540-1554.
 Kunde, W. (2001). Response-effect compatibility in manual choice reaction tasks. *Journal of Experimental Psychology: Human Perception and Performance*, 27(2), 387-394.
 Pfister, R., Kiesel, A., & Hoffmann, J. (in press). Learning at any rate: Action-effect learning for stimulus-based actions. *Psychological Research*.
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