
How positive response outcomes guide task performance

Senne Braem*^{†1}, Tom Verguts¹, Chantal Roggeman², Femke Houtman¹, Clio Janssens¹,
and Wim Notebaert¹

¹Department of Experimental Psychology Ghent University – Belgium

²Karolinska Institutet, Stockholm – Sweden

Abstract

In a recent model by Verguts and Notebaert (2008, 2009), cognitive control effects such as the conflict adaptation effect and the task switch cost modulation are captured in terms of adaptation by binding. It has recently been shown that positive response outcomes increases binding (Colzato, van Wouwe, & Hommel, 2007; Waszak & Pholulamdeth, 2009). If reward strengthens task-relevant associations, it can be expected that conflict adaptation and the conflict-modulated task switch cost will increase after reward. In a series of experiments we have put this hypothesis to the test combining both a standard flanker task and a task switch paradigm with reward signals. Both experiments confirmed our predictions. Moreover, individual differences, as measured by the BAS Reward Responsiveness scale, show that the more sensitive people are to rewards, the more reward strengthens task-relevant associations. In a second series of studies we demonstrated by both reaction time analyses and electrophysiological markers how task- or stimuli-specific reinforcement schedules modulate overall task performance. More specifically, our results show how reward associations enhance early frontocentral attentional components, for congruent rewarding stimuli only. This difference in amplitude is also shown to correlate with the congruency effect, as well as individual differences in BAS Reward Drive. These findings suggest that reward probability alters stimuli processing in a very early stage (150 ms). Together, these studies point towards the beneficial effects of (relative) reward signals on both trial-to-trial cognitive adaptations and overall task focus.

*Speaker

[†]Corresponding author: senne.braem@ugent.be