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Role of Implicit Emotion in Response Inhibition and Response Adjustment

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Abstract

Inhibitory control is a crucial executive control function that enables us to adapt to a changing environment. Previous studies have tried to investigate the role of emotion in response inhibition; however, few studies have investigated role of emotion in response adjustment. Here, we examined how emotion influences our ability to inhibit a pre-planned response and then program another appropriate response with the help of the double-step saccade task. Each trial had either a single target or two targets. Upon a single target onset, subjects were required to make a quick saccade, but upon two target onset, subjects were required to inhibit their initial saccades and redirect their gaze to the second target. In Experiment 1, the first target was a geometrical square box, and the second target was a facial stimulus. In experiment 2, this order was reversed; the first target was facial stimulus, the second target was a square box. Finally, in the control experiment, both targets were geometric shapes. This manipulation allowed us to study the effect of emotional stimuli on response inhibition in varying contexts (task relevance). We found that subjects were less successful at inhibiting their initial saccades as the inter-target delay increased. Further results showed that facial stimuli as first target impaired response inhibition compared to geometric shape as first target. While inhibiting saccade to geometric shape first target, angry faces as the second target interfered with both response inhibition and response adjustment compared to happy and neutral faces. Angry faces take more attentional resources to be processed leaving fewer resources available for ongoing activities and hence interfere with inhibitory control.