Caffeine strengthens action monitoring: evidence from the error-related negativity *Tieges Z*, Ridderinkhof KR, Snel J, Kok A Dept of Psychonomics, University of Amsterdam, Amsterdam

The medial frontal cortex, especially the anterior cingulate cortex (ACC), is involved in action monitoring. We studied the role of moderate amounts of caffeine in action monitoring as expressed by the error-related negativity (ERN), an event-related brain component that reflects ACC activity. In a double-blind, placebo-controlled, within-subjects experiment, two caffeine doses (3 and 5 mg/kg body weight) and a placebo were administered to habitual coffee drinkers. Compared with placebo, both caffeine doses enlarged the ERN. Amplitudes of the P2 and P3 components were not affected by caffeine. Thus, the enlarged ERN after caffeine reflects a specific effect on action monitoring. We conclude that consumption of a few cups of coffee strengthens central information processing, specifically the monitoring of ongoing cognitive processes for signs of erroneous outcomes. Our findings will be discussed in terms of the neurochemical effects of caffeine on brain areas related to action monitoring, such as the ACC.

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