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Exploring automatic metacognitive monitoring processes: Are errors in equations detected without intentional calculation?

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Abstract

Metacognitive monitoring, like error detection, is crucial for appropriate self-regulating processes. Some researchers argue that metacognitive monitoring automatically occurs (Spehn & Reder, 2000). Whether the automatic monitoring processes exist or not and what tasks are needed to investigate the processes have been topics of considerable discussion. We attempted to observe these automatic metacognitive monitoring processes. Two calculus equations were vertically presented on a computer screen for 50ms, followed by an auditory cue to indicate one of the two equations. Twenty-seven university students were asked to judge whether the cued equation was correct or incorrect. The result showed that RT was longer when the distractor, non-cued equation, was incorrect than when it was correct, although the distractor couldn't have been intentionally calculated. This finding suggests that errors in equations were rapidly and automatically detected. We discuss whether automatic metacognitive monitoring processes are observed in our task.