The Effect of Top-Down Control on the Perceptual Decision Process in a Double-Dot Detection Task

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Top-down control plays an important role in the selection of an optimal perceptual-decision strategy. However, in previous studies, inferences about the strategies have primarily been based on the participants' subjective reports after they completed all experiments, which can not reflect their trial-by-trial strategies. Hence, this study investigated whether participants can be consciously aware of and control their strategies. A double-dot detection task was conducted and *Systems Factorial Technology* (SFT) was used for the experimental design, data analysis, and inferences. In Experiment 1, participants were asked to report their strategy (serial or parallel strategy) immediately after each trial; in Experiment 2, participants were asked to pre-select a strategy before a trial started. The results of Experiment 1 showed that all participants utilized either parallel self-terminating processing or coactive processing regardless of their reported strategies. Similarly, the results of Experiment 2 showed that all participants adopted parallel self-terminating processing regardless of their chosen strategies. These findings suggest that participants fail to intentionally adopt serial processing to detect redundant targets. Moreover, these outcomes occurred perhaps because pre-attentive processing is not affected by top-down control; accordingly, our results could further help understandings of how top-down control affects the perceptual decision process.

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