Scheduling of Mental Processes in the Stroop task with Critical Path Method

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Schweickert (1983) employed the Critical Path Method (CPM) to study the mental processes underlying the Stroop task. In both the color naming and the word naming tasks, the participants were asked to make two responses, the manual one to the irrelevant dimension and the vocal one to the relevant dimension. The manual response was always to be issued first. The author found that in the color naming task, the word was processed first, whereas in the word naming task, the color was processed first. The results were taken as a challenge to the major account of the Stroop effect, which maintains that the word is automatically processed first.

We hypothesized that Schweickert's results were due to the author's artificially imposing the manual-first response order in their participants. To test this hypothesis, we first replicated Schweickert's experiments using the same procedures (Exp. 1 & 2). Next, we repeated the same experiment, but leaving the participants to decide on their preferred response order (Exp. 3 & 4). The results obtained from Exp. 1 and 2 were similar to Schweickert's. By contrast, the results of Exp. 3 and 4 showed that the word was always processed first regardless of the task. It was also found whether the dual processes took the form of a serial order or of a Wheatstone Bridge depended on the difficulty of each task and their combination. Specifically, when both tasks were easy, a serial process seemed to be in effect, whereas when one of the processes was hard enough, the coordination of the two process turned into the form of a Wheatstone Bridge. We discuss why this might be so.

Keywords: CPM, stroop, serial, wheatstone bridge, S-R compatibility