Abstract

Task-switching is commonly used to investigate working memory and attentional control processes. The current study compares predictive versus non-predictive task-sequencing effects on task-switching performance. Participants completed four blocks of the Consonant-Vowel/Odd-Even (CVOE) task: Two single task pure blocks, a predictable switch block in which task switching occurred every two trials, and a random switch block in which switching was unpredictable. In addition to mean error rates and response latencies (RTs), we assessed presentation sequence effects on local switch costs (i.e., switch vs. nonswitch trials) and global costs (i.e., nonswitch vs. pure trials) for both error rates and RTs along with their underlying distributions. Overall, we show that while predictive and random switching produce similar patterns for mean error rates and RTs, a dissociation occurred in RT switch costs. When switching was random, local costs were inflated. In contrast, predictive switching increased global costs. Increased local costs for random versus predictive switching reflect an increase in task-reconfiguration processes as participants struggle to reconfigure to an unpredictable task type in working memory on a subsequent trial. Separately, increased global costs for predictive switching reflect declines in task-set maintenance processes, as participants must maintain both task types in working memory while simultaneously monitoring their progress through the trial sequencing.

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