

Psychophysiological studies into task-set inertia in switching paradigms

ABSTRACT:

Background

We switch between tasks multiple times every day. A robust finding is that switching results in poorer task performance, because people usually take longer to complete tasks and they are more subject to errors. These outcomes are known as switch costs. One influential explanation for them is that they reflect interference arising from completing a previous task - known as task-set inertia.

Aim of the study

In this program of work we used a novel approach for assessing task-set inertia in memory experiments using Event-Related Potentials (ERPs). Our aim was to examine how task properties affect task-set inertia, which in turn will give insight into the mechanisms which underlie this phenomenon.

Method

Healthy volunteers completed an initial study phase followed by a switching task, during which ERPs were acquired. In this task participants switched between completing a memory task (retrieving information from the study phase) and a perceptual task. These tasks alternated every two trials.

Results

An ERP index of the retrieval of study information was evident in the memory task. It was also present on the first trial of the perceptual task but was markedly attenuated on the second. Moreover, this task-irrelevant ERP activity was positively correlated with the behavioural cost associated with switching between tasks.

Conclusion

These findings indicate that in the perceptual task irrelevant information was more active on the first trial compared to the second. This provides direct neural evidence of task-set inertia, its duration, and the functional role it plays in switch costs.

Keywords

Task switching, Episodic memory, Task-set inertia, Event-Related Potentials (ERPs)

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Published Work:

Evans, L., Herron, J., & Wilding, E. (in press). Direct real-time neural evidence for task-set inertia. *Psychological Science*.

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