
Short Abstract

Prospective memory (PM)- the ability to execute planned actions at some appropriate time in the future- is essential for adaptive, goal-directed behaviour. As vital as this ability is, it is equally essential to inhibit an action associated with a plan or intention once it is completed, cancelled or becomes irrelevant. However, it seems that such is not the case always. And not inhibiting irrelevant actions can have real-world consequences for safety and efficiency. While extensive research has focused on the successful encoding and retrieval of future intentions, relatively little is known about what happens to completed or non-relevant intentions. The process of inhibiting non-relevant or completed intentions is called intention deactivation and the consequences of ineffective deactivation are called aftereffects.

This thesis systematically investigates the cognitive mechanisms underlying intention deactivation and the persistence of intentions beyond their relevance. Using a series of behavioural experiments with event-based paradigms, we examine how factors such as encoding novel intentions, the status of the intention- whether it is suspended or completed, task similarity, and delay from task completion impact the process of deactivation and the resulting aftereffects.

Across multiple experiments, experimental manipulations included (a) repeated cycles paradigm with new intentions encoded and made non relevant in each cycle, (b) encoding of novel prospective tasks, (c) manipulating status of intention completion, (d) manipulating time of non-relevant cue occurrence, and (e) varying task similarity between old and new tasks. Outcomes were measures as mean commission error rates and slowing of response on non-relevant targets.

We find that unlike general forgetting in retrospective memory, deactivation in prospective memory is a more active and effortful process shaped by task completion, similarity between

tasks and how our attentional and inhibitory processes are engaged in effective deactivation. We find support for the newly proposed dual-mechanisms account of prospective memory with both inhibition and retrieval jointly determining the fate of intentions beyond their relevance. We find that intention completion may serve as a crucial bottleneck in deactivation processes. That is, completed intentions exhibit better deactivation than suspended intentions, and are more susceptible to overwriting like mechanisms by new intentions. We also find that task similarity or overlap determines the strength and finality of intention deactivation. We found mixed effects of delay on persistence of intentions beyond their utility.

Overall, the results of this thesis contribute to the understanding of the processes behind intention deactivation and the cognitive flexibility required to live efficient lives.

Keywords: *Prospective Memory, Intention Deactivation, Aftereffects, Suspended Cues, Novel intention, Commission Errors*