

The role of working memory in encoding the temporal structure of events in episodic memory

Marianthi TERPINI ^a, Nathan LEROY ^{a,b}, Steve MAJERUS ^{a,b} & Arnaud D'ARGEMBEAU ^{a,b}



^a University of Liège, Psychology and Neuroscience of Cognition Unit - PsyNCog
^b Fund for Scientific Research (FNRS)



INTRODUCTION

When recalling a past event, the time it takes to remember it is usually shorter than its actual duration.

This **temporal compression** depends on:

→ the density of recalled **experience units** (i.e., moments of prior experience; Jeunehomme & D'Argembeau, 2020)

which in turn is predicted by :

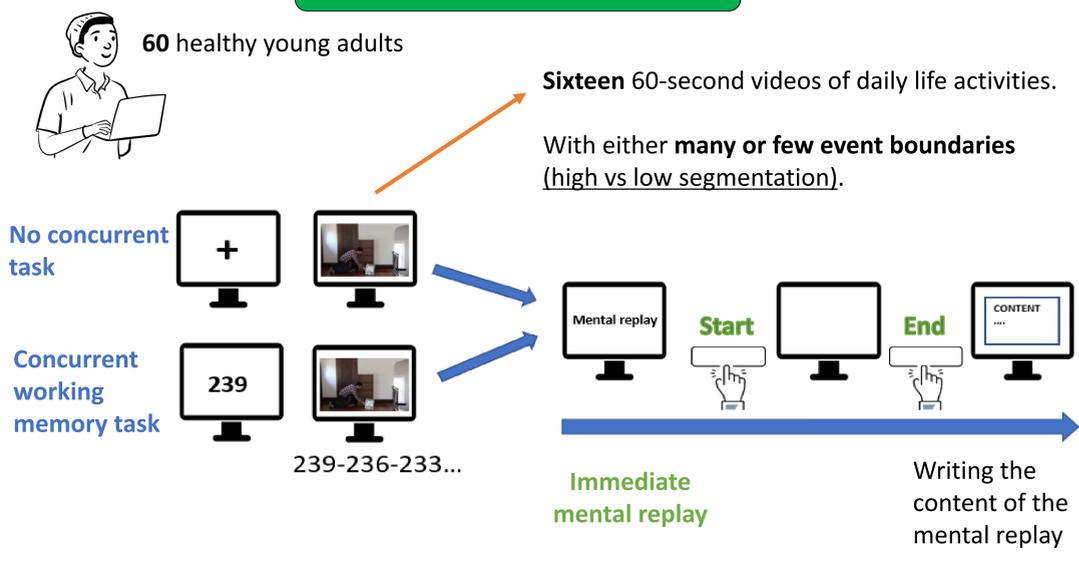
→ the density of **event boundaries** (i.e., moments perceived as the end of one sub-event and the beginning of another; Zacks, 2020).

↑ Event boundaries → ↑ Recalled experience units → ↓ Temporal compression

Recent studies suggest that **working memory** could play a crucial role in this context (see Zacks, 2020).

In this study, we hypothesize that temporal compression and the number of recalled experience units for a given event **are determined by both the structure of the event** (i.e., its density of event boundaries) **and the level of working memory resources available** during its perception.

METHOD



DISCUSSION

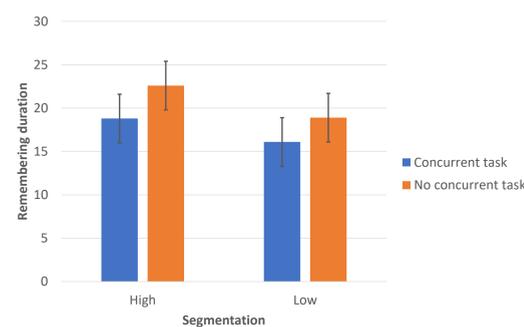
This study supports the idea that the density of event boundaries affects the formation of experience units and highlights **the role of working memory processes in the formation of memories for daily life events**.

From a theoretical perspective, these results are in line with the view that working memory enables us to continually form and maintain event models during perception. These models are then integrated in episodic memory in the form of experience units during the perception of event boundaries.

RESULTS

Robust Linear Mixed-Effects Models (Koller, 2016)

1 Remembering Duration



Effect of segmentation:

$b = 3.20, 95\%CI [2.18, 4.22], t(918) = 6.13, p < .001$

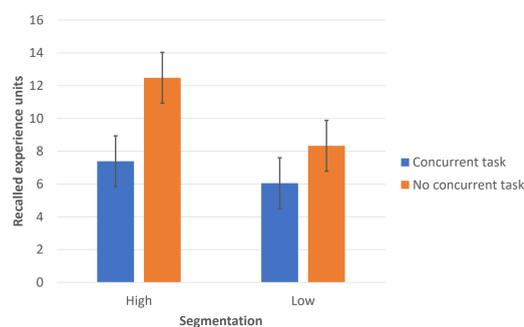
Effect of concurrent task:

$b = 3.31, 95\%CI [2.28, 4.33], t(918) = 6.34, p < .001$

Interaction:

$b = 1.02, 95\%CI [-1.03, 3.06], t(918) = 0.98, p = .329$

2 Recalled Experience Units



Effect of segmentation:

$b = 2.74, 95\%CI [2.36, 3.13], t(918) = 14.09, p < .001$

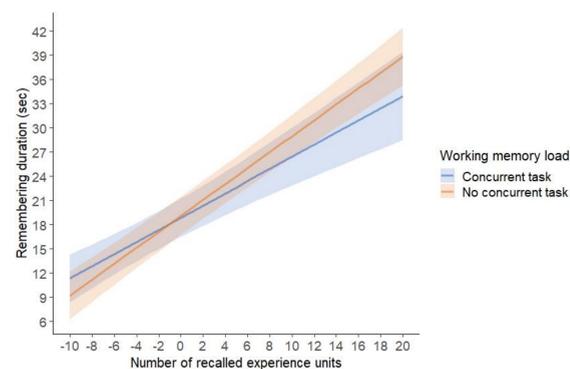
Effect of concurrent task:

$b = 3.69, 95\%CI [3.31, 4.07], t(918) = 18.95, p < .001$

Interaction:

$b = 2.80, 95\%CI [2.04, 3.57], t(918) = 7.20, p < .001$

3 Remembering Duration ↻ Recalled Experience Units



Effect of recalled EUs (concurrent task):

$b = 0.77, 95\%CI [0.57, 0.98], t(919) = 7.28, p < .001$

Effect of recalled EUs (no concurrent task):

$b = 0.99, 95\%CI [0.85, 1.14], t(919) = 13.43, p < .001$



Performing a **concurrent working memory task** during encoding **reduced** the number of **recalled experience units** and **remembering duration**.

Moreover, the concurrent task had a stronger impact on the number of recalled experience units when the segmentation was high.

Importantly, the number of **recalled experience units predicted remembering duration** regardless of the working memory load.

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