

# L-RECAP: A new way to explore personal memories of everyday events after a traumatic brain injury



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## INTRODUCTION

**Memory difficulties** are common after a **Traumatic Brain Injury (TBI)**<sup>1</sup> and can affect many aspects of daily life. However, **traditional validated memory assessments do not address the complexity of memory functioning** as described by current theoretical models and **do not reflect patients' everyday memory performance**. This may explain why some individuals show severely impaired autobiographical memory despite performing within the average range on standard memory tasks using materials such as stories or word lists.<sup>2</sup> To address this issue, **we propose a novel memory assessment**, called **L-RECAP (Liège – Recall of Events via Continuous Assessment of Personal experiences)**, designed to align with current conceptions of memory of everyday events, and we explore its sensitivity to memory difficulties occurring after a TBI.

**Objective:** to explore the discriminant validity of L-RECAP by comparing the accuracy, richness, specificity, and phenomenology of memories of a group of TBI patients and their matched controls

## METHOD

### Participants

12 females and 20 males in each group

	TBI group (n = 32) M (SD)	Control group (n = 32) M (SD)
Age	38.5 (16.48)	38.47 (16.37)
U = 511 (p = .99)		
Years of education	15.06 (2.85)	14.44 (1.72)
U = 476 (p = .63)		

Time elapsed since brain injury: From 3 to 600 months (M = 120.32; SD = 147.91)

Loss of consciousness (LOC): n = 23 (from a few minutes to 40 days)

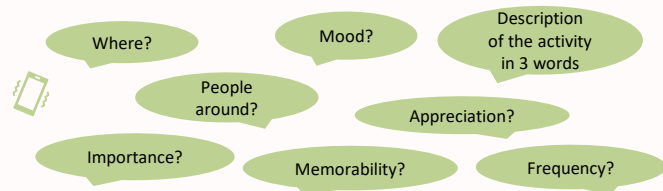
Post traumatic amnesia (PTA): n = 23 (from a few seconds to 1 month)

### Material

#### Evaluation of the accuracy of everyday memories (L-RECAP)

##### 1) Sampling of everyday experienced events

5 times/day for 7 days: participants were asked about what they were doing at the present time via the m-Path mobile application



##### 2) Recalling phase

At the end of the week: free recall of 5 recorded events (selection based on their memorability, frequency, and importance)

Assessment on 4 memory scores:

##### Richness

Number of episodic details reported about the events (including happenings, time, place, perceptual and internal details).

##### Accuracy

Comparison between the information reported by the participants and that encoded in the application. → Ratio score from 0 to 1.

##### Specificity

Precision of the information reported (on scales from 0 to 3).

##### Phenomenology

Self-assessment of the vividness, coherence, reliving feelings, rehearsal, the ability to reconstruct the scene, and the amount of visual details on VAS from 0 to 100. The mean of all the items was calculated.

## RESULTS

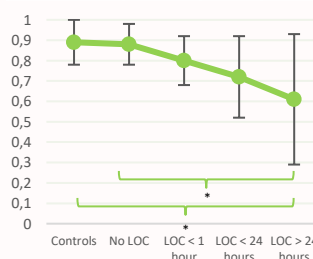
Mann-Whitney U tests comparing TBI patients and their matched controls on L-RECAP memory scores

	Group	Mean (SD)	U	p
Accuracy	TBI	.76	290	.003
	Controls	.88		
Richness	TBI	26.09	382.5	.08
	Controls	33.78		
Specificity	TBI	1.92	481	.68
	Controls	2.06		
Phenomenology	TBI	61.39	500.5	.88
	Controls	64.75		

ANCOVA testing the effect of the group on L-RECAP performances with LOC and PTA duration as covariates

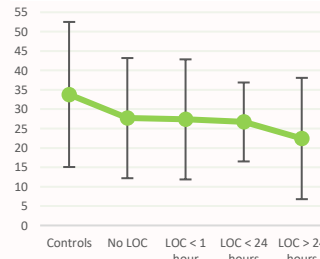
##### Accuracy

	F	p	$\eta^2_p$
Group	.26	.61	.004
LOC duration	10.43	.002	.15
PTA duration	1.11	.30	.02



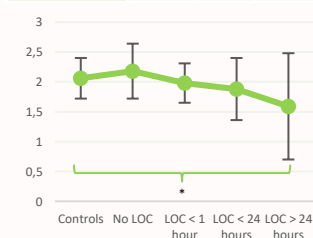
##### Richness

	F	p	$\eta^2_p$
Group	.55	.46	.009
LOC duration	.29	.59	.005
PTA duration	.03	.86	.001



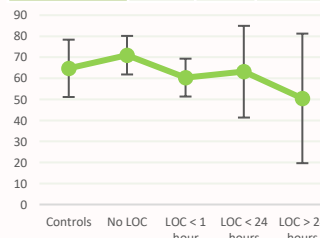
##### Specificity

	F	p	$\eta^2_p$
Group	.41	.52	.007
LOC duration	6.19	.02	.09
PTA duration	.02	.89	<.001



##### Phenomenology

	F	p	$\eta^2_p$
Group	.68	.41	.01
LOC duration	4.66	.03	.07
PTA duration	.004	.95	<.001



## DISCUSSION

These results demonstrated **the discriminant validity of the L-RECAP accuracy scores**, as well as **the specificity and phenomenology scores when looking at the LOC duration**. However, it remains difficult to determine the exact LOC duration threshold after which memory difficulties emerge. Moreover, given the notable interindividual variability, it seems necessary to compare patients' individual performance with normative data to determine the presence of memory difficulties in daily life (norms available upon request).

Other studies have also demonstrated **the good predictive validity** of L-RECAP with self-assessment memory questionnaires (*r* from .40 to .47) and quality of life (*r* from .39 to .53), as well as **convergent validity** and **sensitivity to age effect**.

While further work is needed to explore its applicability in other populations or neurological conditions, **these findings support the utility of the tool as an ecologically valid measure of everyday memory, with potential applications in both clinical assessment and research contexts**. It can also be useful in the context of memory revalidation, as it provides relevant insights concerning memory difficulties encountered in daily life.

### References

- <sup>1</sup>Vakil et al. (2019). *Neuropsychology Review*, 29, 270-287.  
<sup>2</sup>Palombo et al. (2015). *Neuropsychologia*, 72, 105-188.