Event Segmentation and Memories of Daily Life after a Traumatic Brain Injury

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Introduction

- **Segmentation** = parsing the continuous flow of our daily activities into discrete, meaningful events (for a review, see Zacks, 2020).

- While there is generally **good agreement** across individuals about where event boundaries occur (Newtson, 1976), individual differences still exist.

- People who are better at **identifying the same boundaries as others** also tend to **remember these events better** (Richmond et al., 2017).

- This relationship between normative segmentation and memory can be explained by the **Event Horizon Model** (Radvansky & Zacks, 2017), which highlights the role of attention, working memory, and organizational processes in segmentation, thereby facilitating event encoding and retrieval.

- After a **Traumatic Brain Injury (TBI)**, this ability to **segment in a normative way can be impaired** (Zacks et al., 2016), which could partly account for the reduced memory performance observed in this population.

- However, these findings are based on laboratory memory tasks (e.g., memorizing third-person videos).

→ It remains to be determined whether segmentation difficulties in TBI patients can predict their ability to recall personal memories from their daily life.

Method

Participants

6 females and 9 males in each group

	TBI group (n = 15) M (SD)	Control group (n = 15) M (SD)
Age	40.40 (19.34)	39.47 (18.88)
	U = 104.5 (p = .76)	
Years of education	14.79 (2.69)	14.67 (2.32)
	U = 87 (p = .64)	

Time elapsed since brain injury: From 3 to 185 months (M = 67.29; SD = 58.17)
Loss of consciousness: n = 13 (from a few minutes to 35 days)
Traumatic amnesia: n = 7 (from a few hours to 1 month)

Material

Segmentation evaluation

Segmentation of a 5' video of a woman preparing her breakfast (see Sargent et al., 2013).

"Press the space bar when you consider that a meaningful unit of activity ends and another begins."

→ **Agreement score** = degree of concordance between the participant's segmentation and that of a healthy normative sample. → Percentage score of agreement from 0 to 1.

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

Where ? Mood ? Description of the activity in 3 words
People around ? Appreciation?
Importance ? Memorability? Frequency?

2) Recalling phase

At the end of the week, selection of 5 events (based on their memorability, frequency, and importance).

→ **Accuracy of memories =** comparison between the information reported by the participants and those encoded in the application (day, time of the day, mood, number of people present, and place). → Ratio score from 0 to 1.
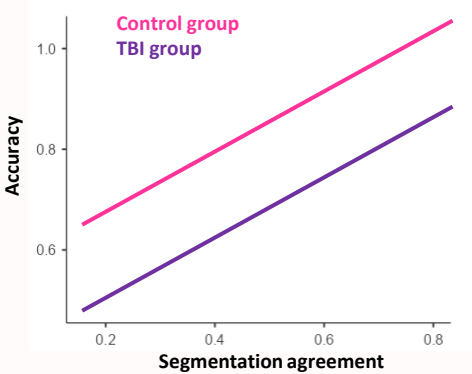
Results

Descriptive statistiques

	Accuracy	Segmentation agreement
Control group	M = .89; SD = .09	M = .56 ; SD = .11
TBI group	M = .68; SD = .29	M = .46 ; SD = .18

Linear regression – Effect of segmentation and group on memory accuracy

	Estimation	t	p	R²
Segmentation	.60	2.25	.03	.35
Group	.17	2.23	.04	

Discussion

These results confirm the influence of the segmentation process on memory functioning and demonstrate for the first time that this relationship extends beyond laboratory-based materials, predicting the recall of real-world, personally experienced memories in both healthy individuals and TBI patients.

This opens new avenues for memory rehabilitation programs in TBI patients by training them to segment events in a more normative way in order to reduce their memory difficulties.

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References

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