# The impact of context familiarity on visual and temporal compression in memory

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## 1. Introduction

Specific detailed **episodic memories** are compressed into **gist representations** and integrated into **schemas** over time and with experience (Robin & Moscovitch, 2017). However, the influence of **familiarity** and **congruency** on memory compression remains unclear.

- Familiarity can provide foundations to guide the encoding of new episodic details (Sekeres et al., 2024); but it can also interfere with it (Bellana et al., 2021) and cause more memory lapses, leading to **more compression** in memory (Jeunehomme & D'Argembeau, 2023).
- On the other hand, congruency and incongruency with prior knowledge and expectations can **equally enhance episodic memory** by integrating details into existing schemas for the former and by attracting attentional resources during encoding (Greve et al., 2019) and facilitating the generation of event boundaries for the latter.

Our experiment will explore these hypotheses on two facets of compression in memory: **temporal compression** and **visual compression**. We hypothesize that contextual familiarity and congruency facilitate compression and recovery of the gist of a scene but hinders the encoding of the specificities inherent to a particular episode.

## 2. Methods

<u>Session 1</u>: incidental encoding of a tour on campus

- Recorded with wearable camera
- Through 6 buildings supposed to vary in familiarity for first-year students

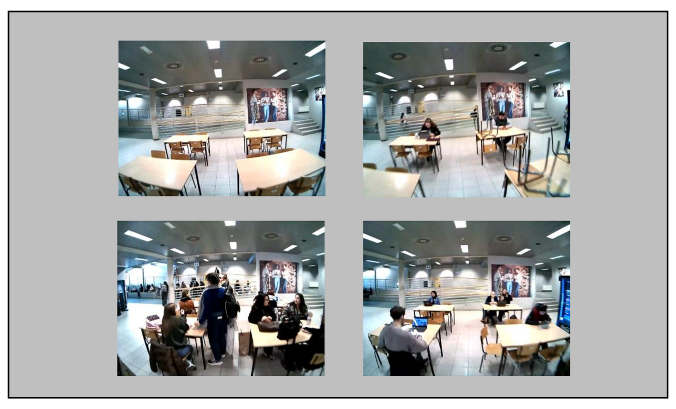
The day after

<u>Session 2</u>: Memory tasks

### Replay phase

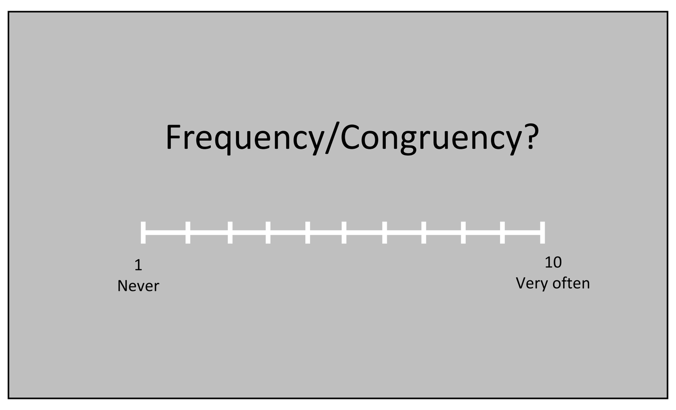

1. Mentally replay your walk in the building as precisely as possible.
2. Rate the vividness of your replay from 1 to 10.
3. Describe the content of your replay.

### Recognition phase



Pick the photo originating from your walk.

### Evaluation phase

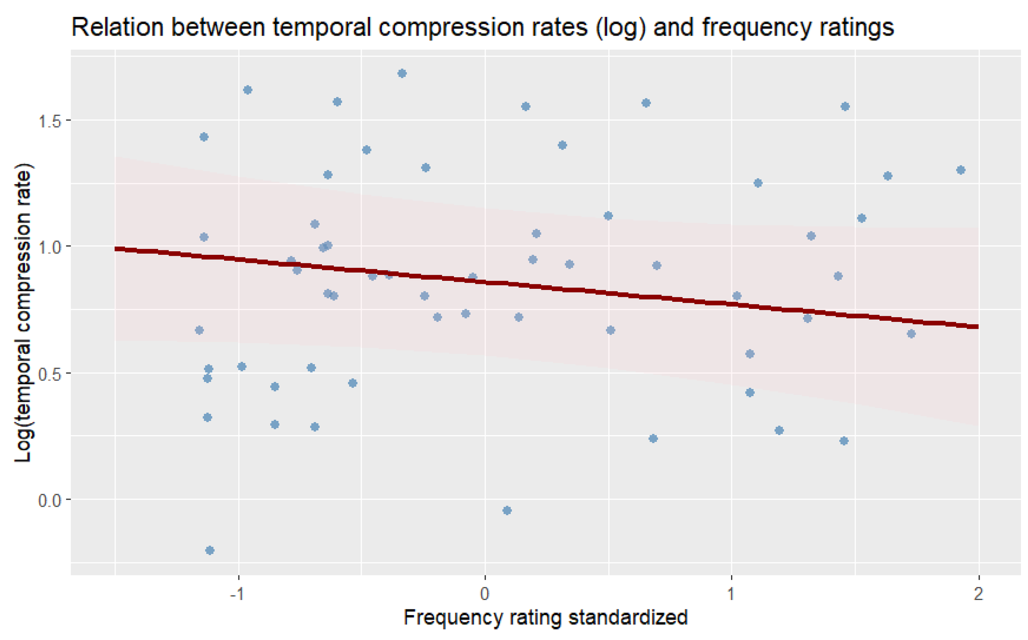



- Rate the frequency you visit each corridor
- Rate the congruency of the walk in each building based on your habits and expectations.

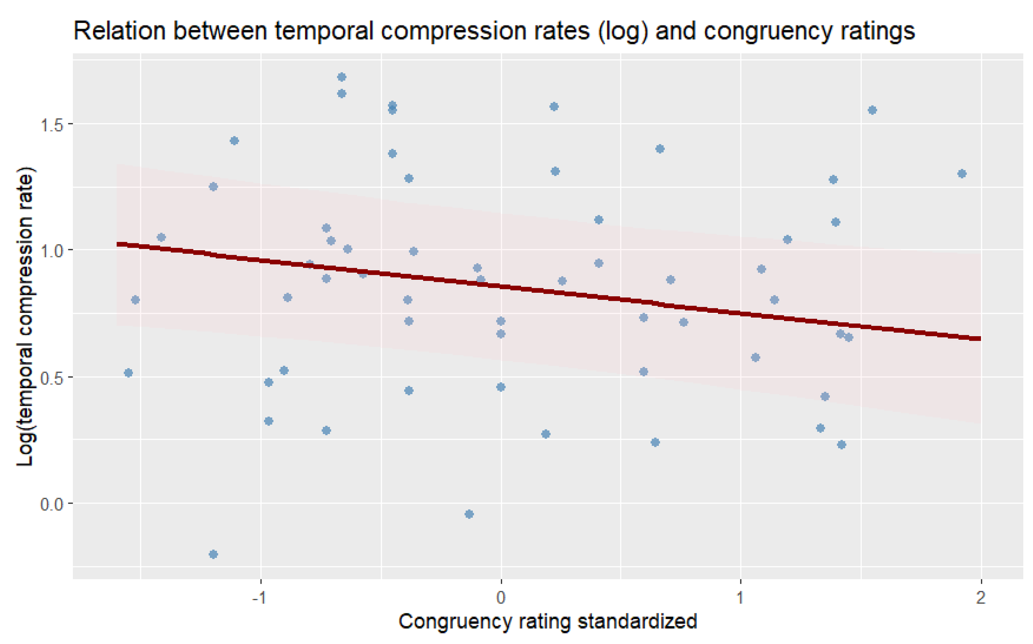
## 3. Preliminary results: N=10/60

Kendall correlation test vividness x hit rate: tau = -0.016; p-value=0.866

- **<u>Temporal compression rate</u>**

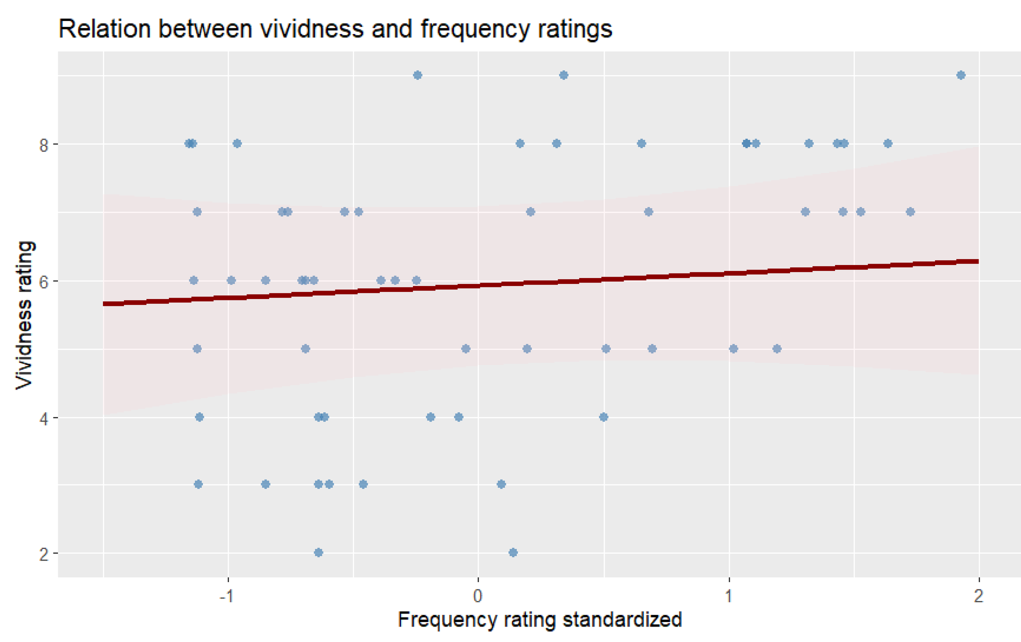



LMM frequency: $\beta = -0.089$, $\sigma_\beta=0.069$, p-value=0.208

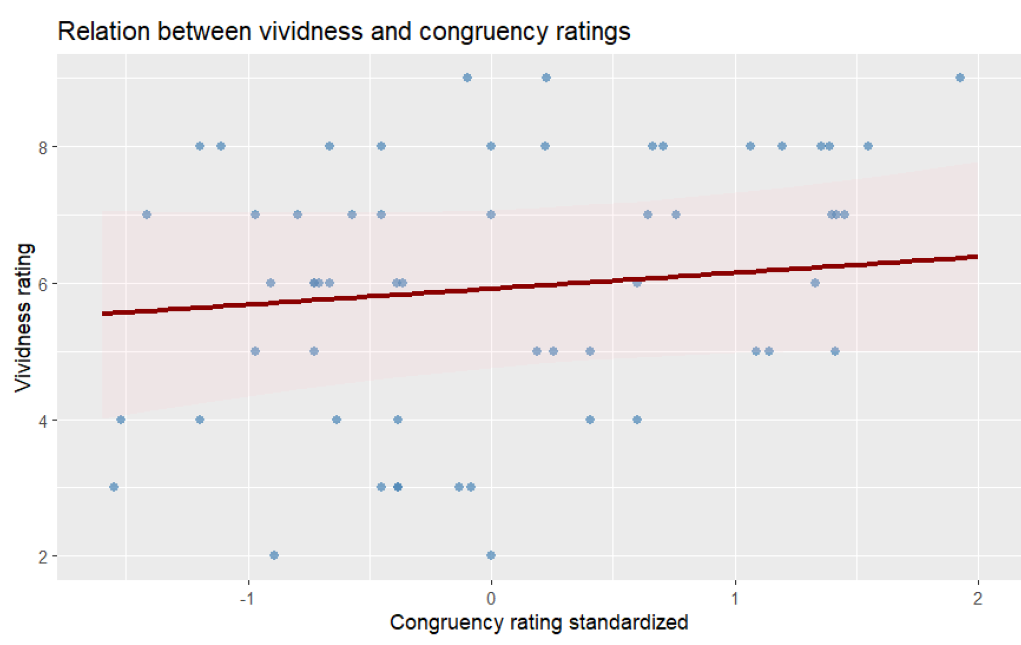



LMM congruency: $\beta = -0.105$, $\sigma_\beta=0.042$, p-value=0.015

- **<u>Vividness rating</u>**

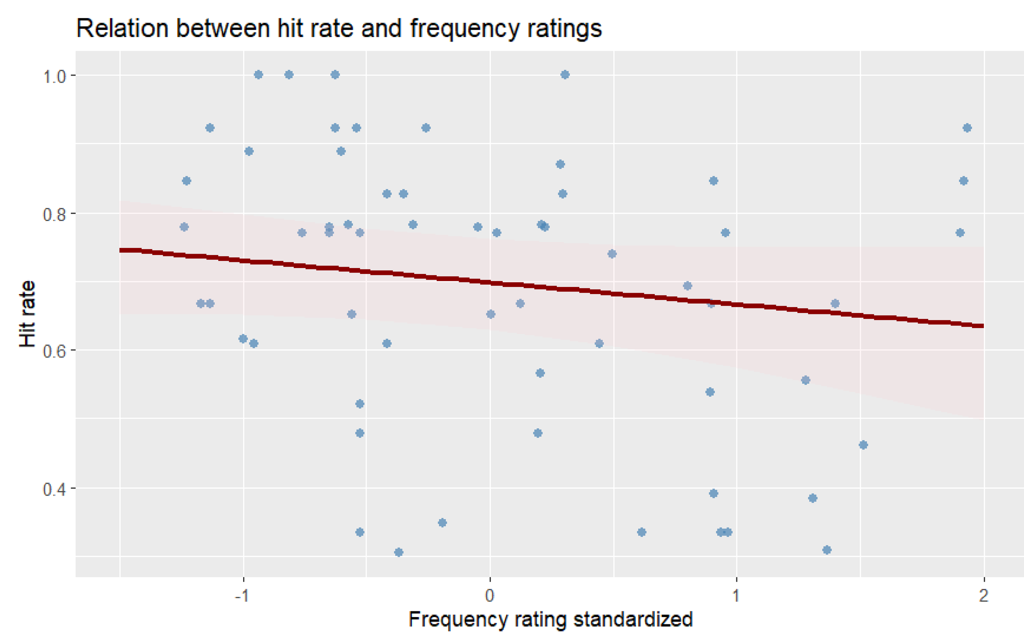



LMM frequency: $\beta = 0.181$, $\sigma_\beta=0.033$, p-value=0.593

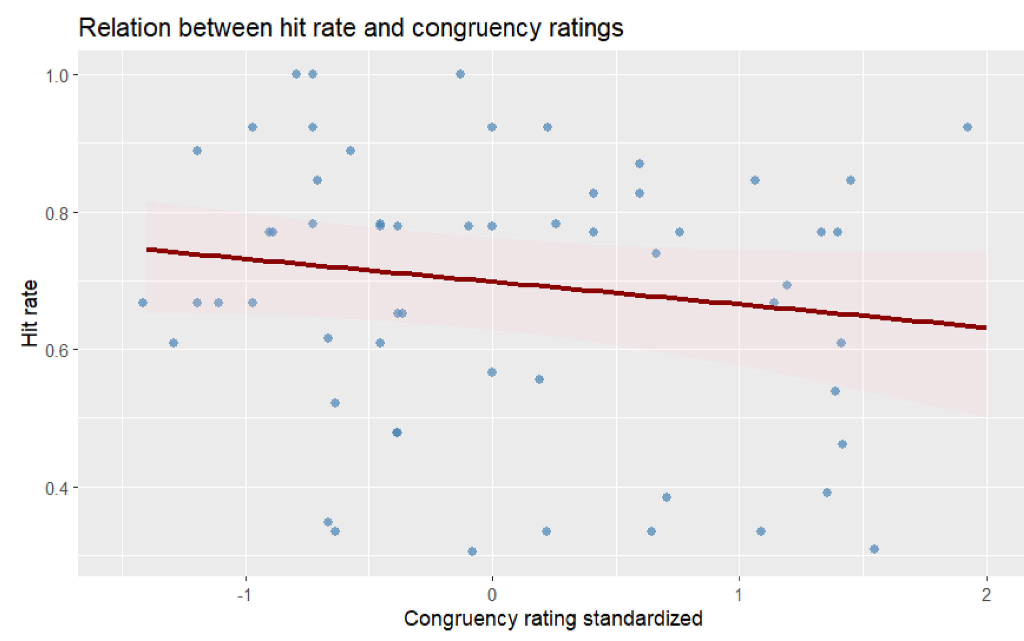



LMM frequency: $\beta = 0.232$, $\sigma_\beta=0.252$, p-value=0.365

- **<u>Hit rate recognition</u>**




GLMM frequency: $\beta = -0.150$, $\sigma_\beta=0.115$, p-value=0.190




GLMM frequency: $\beta = -0.156$, $\sigma_\beta=0.108$, p-value=0.152

## 5. Discussion

- Overall, these preliminary results show no significant effect of familiarity over compression in memory.
- However, trends suggest that participants mentally relived episodes in familiar places slower and more vividly than in unfamiliar places but struggled more to recollect episodic information.
- These indicate that schematic contextual representations are favored during recall of familiar places whereas we focus more on episodic content in unfamiliar places
- Nevertheless, contrary to our predictions, the durations of congruent episodes were significantly less compressed in memory than the incongruent ones.
- Verbal report examination will give us insight about the difference of mental representation between congruent and incongruent events.

## 6. References

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