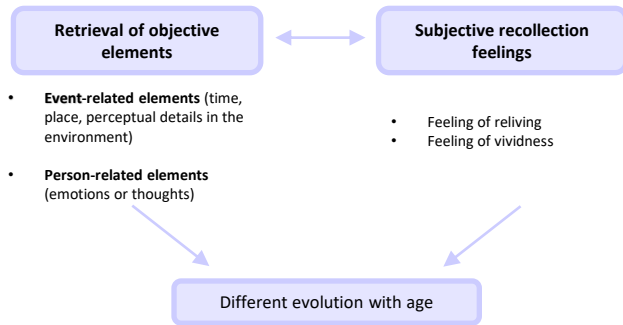


Exploring the effects of age on objective and subjective recollection after visiting a virtual apartment

INTRODUCTION

Retrieval of episodic memories



Whereas **objective recollection decline with age** (partly due to an executive decline (1)), older people consistently make **equivalent or better subjective memory judgments** than younger people (2).

Possible explanation: young and older people do not rely on the same type of information to judge their memories' subjective quality.

→ Older people would rather base their subjective judgments on socio-emotional than visual aspects (3).

In order to reflect memory complaints in daily life, this needs to be explored with ecological material such as virtual reality (VR) (4).

OBJECTIVES

- Using VR to explore **which elements of objective recollection influence subjective judgments** and the evolution of these influences with age
- As VR implies active navigation, it is important to determine **if the age effect on objective performance can be explained by an over-recruitment of executive functions due to a lack of familiarity with technology**
- To confirm that **perception of memory functioning in daily life is more correlated with VR performance** than with performance on traditional tasks and **whether it is better explained by objective or subjective recollection**

METHODOLOGY

60 healthy people from 20 to 79 years (M = 48.85 ; ET = 17.13)

First session

1) Incidental encoding in virtual reality

→ Realization of 8 actions in a virtual apartment



2) Immediate recall phase

3 scores

Event-related elements (what, where, when, and perceptual details)

Person-related elements (emotions and thoughts)

Total binding score

3) Immediate subjective ratings about memories

→ Vividness and feeling of reliving ratings on a visual analogical scale

4) Self-evaluation of memory functioning in daily life

→ Prospective and Retrospective Memory Questionnaire (PRMQ)

Second session (2 to 7 days later)

1) Delayed recall phase

2) Delayed subjective ratings about memories

3) Traditional memory evaluation

→ California Verbal Learning Test (CVLT)

→ Rivermead Behavioral Memory Test (RBMT – III)

4) Evaluation of executive functioning

→ Brown-Peterson

→ Stroop

→ Trail Making Test

RESULTS

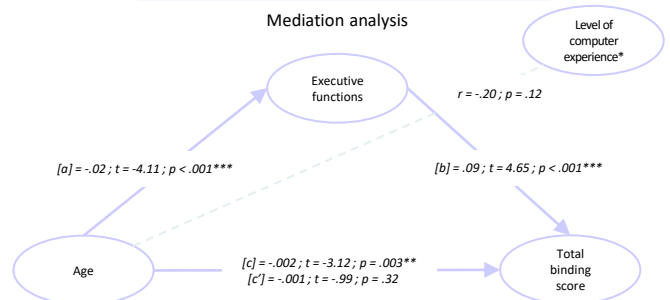
Relation between objective and subjective recollection

Mixed-effects models

Outcome variable	Predictor	β	p
Vividness ratings	Event-related elements	0.19	< .001***
	Age	-0.01	0.34
	Event-related elements x Age interaction	0.003	0.18
	Person-related elements	0.05	0.66
	Age	-0.01	0.35
Feeling of reliving ratings	Event-related elements	0.15	< .001***
	Age	0.002	0.79
	Event-related elements x Age interaction	-0.001	0.63
	Person-related elements	0.84	0.04*
	Age	0.09	0.85
	Person-related elements x Age interaction	-0.09	0.94

Relation between age, executive functions, and memory performance

Mediation analysis



* Due to the absence of correlation between age and level of computer experience, this variable could not be included in the mediation analysis

Correlations between memory performances and subjects' perception of memory functioning

	RBMT-III	CVLT	Total binding score (VR)	Vividness	Feeling of reliving
PRMQ	r = -.24 ; p = .07	r = -.07 ; p = .58	r = -.37 ; p = .004*	r = -.06 ; p = .65	r = -.07 ; p = .59

CONCLUSIONS

- We failed to confirm that older people base their memory judgments on personal and emotional elements more than younger people
- Retrieval of emotions and thoughts is only important to create a feeling of reliving but not to make memories vivid. However, the retrieval of event-related elements is important for both subjective judgments
- The lack of familiarity with technology does not explain the mediating effect of executive functions between age and binding abilities
- Contrary to traditional memory evaluations, VR memory performance is correlated with the perception of everyday memory functioning

PERSPECTIVES AND IMPLICATIONS

Perspectives for future researches:

- Further investigate on which elements subjective judgments of older people are based (e.g., semantic information, narrative coherence) by using memory tasks inducing more emotional involvement
- Study more directly the implication of executive functions in active navigation in VR and its repercussions on memory performance

Clinical implication:

- More ecological memory tasks should be used in clinical settings to better understand memory complaints in daily life

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