Where did I see that? Age differences in response bias lead to differential retrieval of previously task irrelevant information.

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INTRODUCTION

- Older adults show greater performance than young adults for previously irrelevant information on tasks with indirect memory instructions, yet young adults show greater performance than older adults on tasks with direct instructions to use this information.[1,2]
- Young adults are better at suppressing previously irrelevant information than older adults on tasks with indirect instructions (when the implicit memory task rules out suppression, young adults outperform older adults).[3]
- What are the mechanisms of the suppression? Young adults may be more likely to dismiss previously irrelevant information on tasks with indirect instructions due to its apparent lack of relevance – e.g. a post-retrieval monitoring mechanism. If the goal is to use particular previously encountered items and not others, young participants may disregard previously irrelevant items if they are judged to be unnecessary. On the other hand, older adults may be more liberal in their output of any recently studied/familiar item that comes to mind.
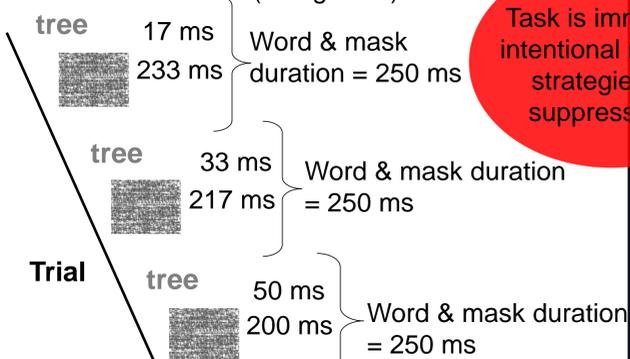
EXPERIMENT 1

Are older adults more liberal in their use of previously irrelevant items?

- Examined priming and recognition for previously irrelevant information in Young and Older adults, and age differences in response bias (tendency to make a positive or negative recognition judgement to a target when in an uncertain state).

Method:

- Healthy Young adults (n=24; *M* age=22.9 years) and Older adults (n=24; *M* age=71.8 years)
- Identified the text color of words and random letter strings (encoding of words was task irrelevant), before studying a list of words partly comprised of previously irrelevant items. Finally they completed the continuous identification with recognition (CID-R) task.
- Four types of item: words that had appeared only in the color identification task (previously irrelevant), words that had appeared in both the color identification task and the study list, words that had appeared only in the study list, and new words.

CID-R task trial: 1) speeded masked word identification (priming)
2) Old / New judgement (recognition)

tree 17 ms
233 ms Word & mask duration = 250 ms

tree 33 ms
217 ms Word & mask duration = 250 ms

Trial

tree 50 ms
200 ms Word & mask duration = 250 ms

tree

Task is immune to intentional memory strategies (no suppression)[4]

… continue blocks until ID word (RT captured)
THEN: "Was the word shown in the study list?"
"yes" or "no"

Results:

Figure 1. A. Priming in Young and Older adults.
B. Corrected recognition (*Pr*) in Young and Older adults

A.

B.
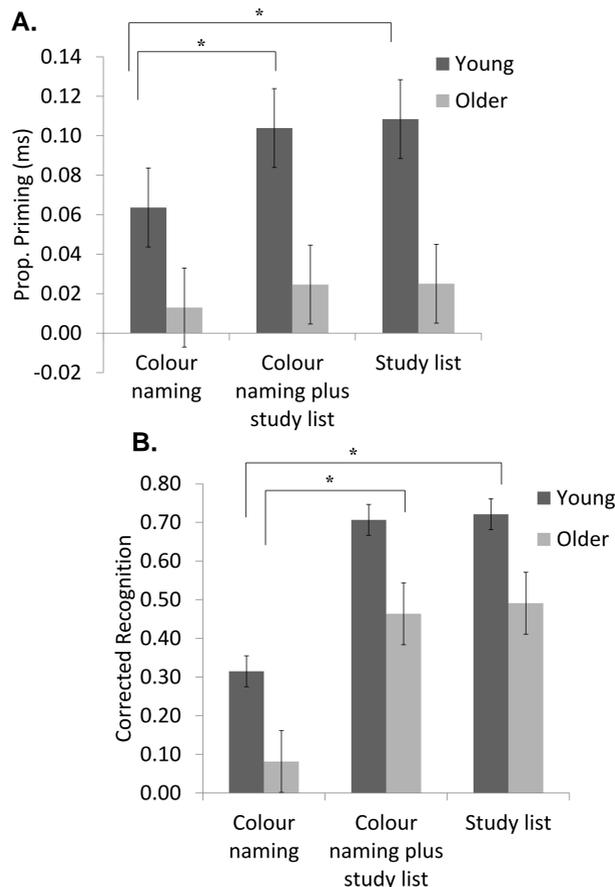
Main effect of word-type and age on priming and recognition. No interaction

Table 1. Response bias (*B*r). Tendency to respond 'yes' to an item when in an uncertain state (< .5 = conservative bias; > .5 = liberal bias).

	Experiment 1		Experiment 2	
	Young	Older	Young	Older
Color ID	.25 (.15)	.37 (.20)*	.27 (.14)	.37 (.26)*
Study list	.66 (.33)	.70 (.28)	.72 (.32)	.73 (.36)
Color ID plus study list	.66 (.36)	.69 (.29)	.71 (.36)	.70 (.25)

Older adults significantly more liberal in responding 'yes' to previously irrelevant items

Previously irrelevant items associated with greater uncertainty about the phase in which they were encountered?
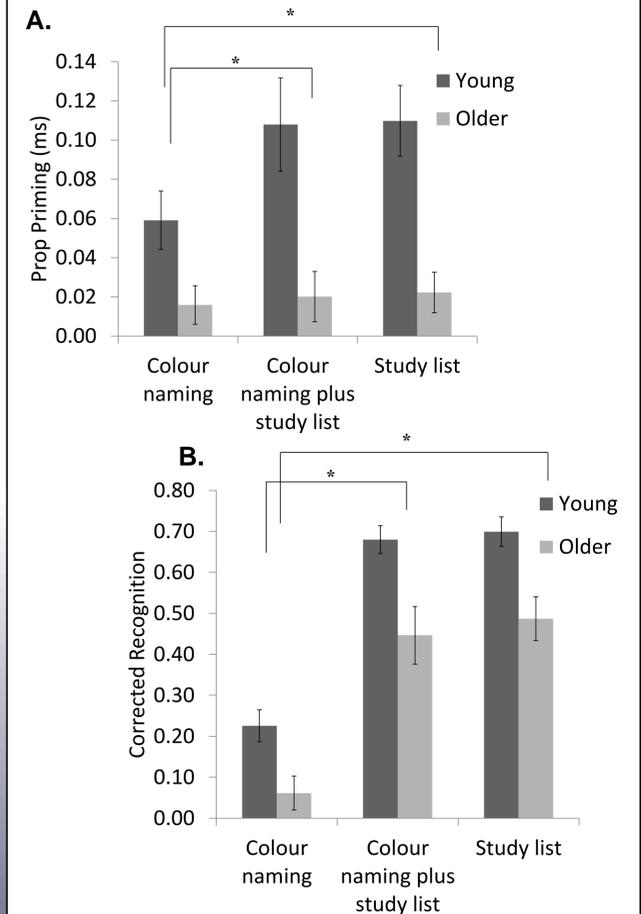
EXPERIMENT 2

Are previously irrelevant items associated with lower source memory than other items?

- Experiment 2 incorporated a source memory judgement at test.
- Following a correct positive recognition response, participants were asked *where* they encountered the word: the color identification task, the study list, or both.

Results:

Figure 1. A. Priming in Young and Older adults.
B. Corrected recognition (*Pr*) in Young and Older adults

A.

B.

- Main effect of word-type and age on priming and recognition, no interaction.
- Older adults more liberal in responding '*yes*' to previously irrelevant items

Table 2. Mean Proportions of Hits and Misses in Young and Older Adults in the Source Judgement Task

	Young		Older	
	Hit	Miss	Hit	Miss
	M (*SD*)	*M* (*SD*)	*M* (*SD*)	*M* (*SD*)
Color ID	.22 (.16)	.18 (.15)	.21 (.11)	.19 (.15)
Study list	.75 (.21)	.08 (.10)	.63 (.25)	.14 (.18)
Color ID plus study list	.13 (.15)	.67 (.27)	.11 (.13)	.66 (.25)

Source judgement: More hits than misses for items presented solely in the study list, but more misses than hits for items presented in both tasks. No difference in hits and misses for previously irrelevant items

CONCLUSIONS

- Although previously irrelevant information is weakly represented in memory in both young and older adults, older adults are significantly more liberal compared to young adults in their use of this information on future tasks.

[1]Thomas, R.C., & Hasher, L. (2012) Reflections of distraction in memory: Transfer of previous distraction improves recall in younger and older adults. *Journal of Experimental Psychology: Learning, Memory, and Cognition, 38,* 30-39. [2]Gopie, N., Craik, F. I. M., & Hasher, L. (2011). A double dissociation of implicit and explicit memory in young and older adults. *Psychological Science, 22,*634–640. [3]Ward, E. V., de Mornay Davies, P., & Politimou, N. (2015). Greater priming for previously distracting information in young than older adults when suppression is ruled out. *Aging, Neuropsychology, and Cognition, 22,* 712–730. [4]Ward, E.V., Berry, C.J., & Shanks, D.R. (2013). An effect of age on implicit memory that is not due to explicit contamination: Implications for single and multiple systems theories. *Psychology and Aging, 28,* 429-442.