JACOBY–WHITEHOUSE ILLUSION FROM TAXONOMIC AND THEMATIC ASSOCIATIONS IN ALZHEIMER'S DISEASE

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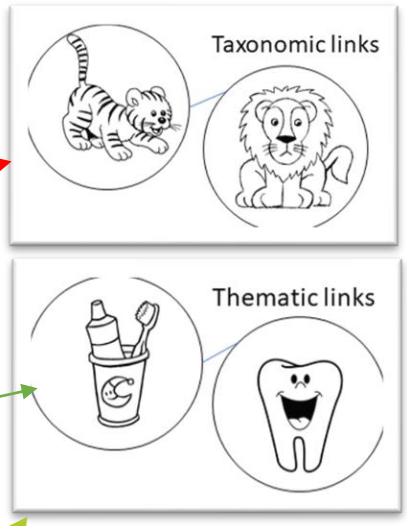
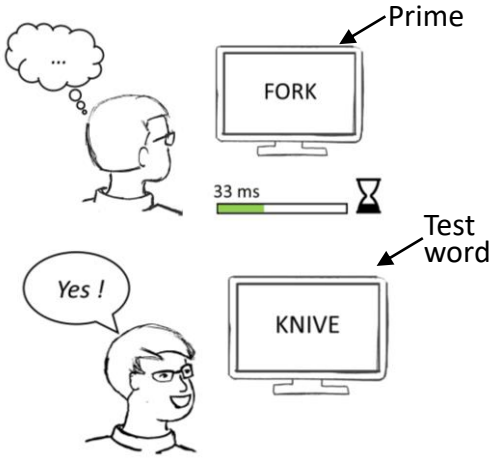
INTRODUCTION



Familiarity is built on fluency cues (*i.e.* ease of processing) and provides a sense of strength of a memory trace. In **Alzheimer's disease (AD)** impaired recognition memory mainly relies on deficient recollection while familiarity is relatively preserved.

In a word recognition task, **false recognitions** of unlearned test words can be elicited by the prior masked presentation of a prime which is the same word[1] or a semantically related word[2]. This effect is named **Jacoby-Whitehouse illusion** after the authors who first experimented it [1].

Semantical links are impaired in AD following a hierarchical order with **taxonomic links** (within the same category, *e.g.* dog-cat) being more rapidly impaired than **thematic links** (concepts often co-occurrent, *e.g* . hair-brush) [3]. In a lexical decision task where test words were primed by either taxonomically or thematically related words, first-stage AD patients demonstrated a shorter response time in the taxonomic condition, then called **taxonomical hyperpriming effect**[3].



False recognitions happen when the subject erroneously recognizes a word that has not been studied

METHOD

Seventeen mild AD patients (MMSE= 24.7 ± 2.9) and 15 healthy older adults were recruited to perform a word recognition task based on the paradigm from **Jacoby and Whitehouse**[1] derived in three conditions (**repetition, taxonomic and thematic** priming). They first encoded 32 words, each presented for 2s, and then had to recognize them amongst 32 new words through an old/new judgment. The design is depicted in Figure 1.

During the recognition phase, each word was preceded by a **33ms prime word**, either identical to the test word, thematically or taxonomically related to it. Half of the words were preceded by a **related prime** and the other half by an **unrelated prime**.

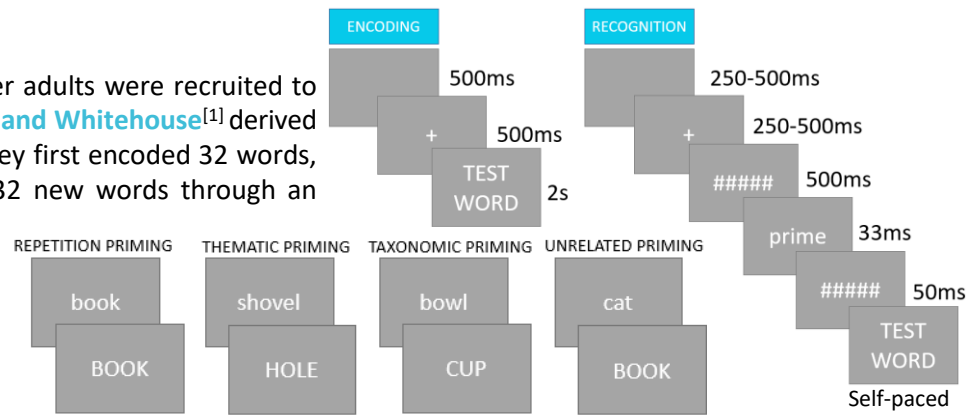
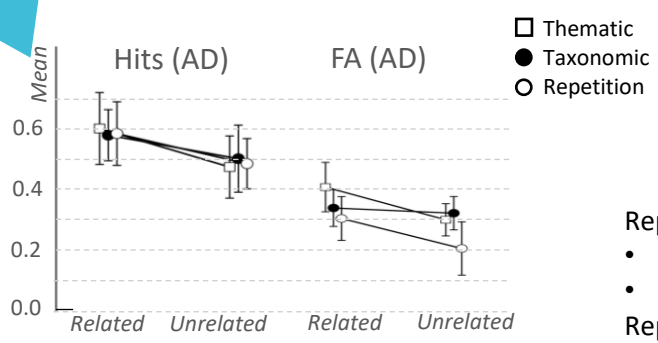


Figure 1: Study design, in general and in each condition

RESULTS



Graph 1: *Proportion of hits (correct recognitions) and FA (false alarms) for the AD group*

	Repetition		Taxonomic		Thematic	
	Related	Unrelated	**Related**	Unrelated	**Related**	Unrelated
Hits (AD)	**.59 (.20)**	.53 (.23)	**.59 (.27)**	.54 (.19)	**.60 (.30)**	.52 (.25)
FA (AD)	**.30 (.23)**	.22 (.19)	**.33 (.22)**	.32 (.19)	**.39 (.26)**	.30 (.17)
Hits (Ctrl)	**.70 (.14)**	.67 (.16)	**.75 (.15)**	.73 (.15)	**.80 (.18)**	.76 (.15)
FA (Ctrl)	**.12 (.15)**	.15 (.14)	**.15 (.13)**	.10 (.11)	**.11 (.10)**	.12 (.08)

Table 1: *Proportion of hits (correct recognitions) and FA (false alarms) in both groups (AD and control), each condition for each relation type.*

Repeated measures ANCOVA on proportions of **False Alarms** controlling for age showed :

- a significant group effect (F=15.98; $\mathbf{p < .001}$)
- a significant group × condition × relation interaction (F=3.3; $\mathbf{p = .04}$)*

Repeated measures ANCOVA on proportions of **Hits** controlling for age showed :

- a significant group effect (F=4.78; $\mathbf{p = .04}$)
- a significant condition effect (rep/tax/thema) (F=3.92; $\mathbf{p = .03}$)

* characterized by a significant group × relation interaction only in the **thematic condition** (F=4.99; p=.03), indicating a priming effect on FA in the thematic condition for AD patients only

DISCUSSION

Contrary to our expectations, the taxonomic hyperpriming effect was not found, as well as others priming effects on neither hits nor false alarms. Based on the rationale that priming effects on false alarms only occur if the prime-target link exists (showed in young adults using our paradigm[4]), the lack of taxonomic priming effect could still confirm the impairment of these links, but such impairment does not translate into hyperpriming as it does in semantic recognition tasks. However, the apparent lack of difference between the two groups for priming effects could indicate a preservation of all these links and processes in AD. Nonetheless, our results are preliminary and do not enable us to reach a satisfactory effect size; therefore, we still expect a priming effect to be found for false alarms in both groups and to a greater extent in patients due to differences in the use of recollection and familiarity in that group, as we can already see for thematic priming.

References :

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