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INTRODUCTION

Jacoby & Whitehouse (1989) have shown that, during a word recognition memory task, prior and brief word presentation (e.g. cat-CAT) enhanced participants' propensity to say "old"(1). Increased endorsement of words has also been described when the prime is conceptually-related to the test words, but this was mainly observed for hits (2). Some studies associated this effect with an increased contribution of familiarity during recognition (i.e. item recognition without recall of contextual elements present at encoding), while others showed increased recollection instead (i.e. retrieval of associated details from encoding). Of note, the semantic relation between words could be very broad (taxonomic category, attributes or functions, context, part-whole relationships or synonyms). The present study contrasts thematic (concepts sharing a spatio-temporal context without belonging to the same category - e.g. plane-SKY) and taxonomic (concepts belonging to the same category - e.g. dog-CAT) conceptual prime in a Jacoby-Whitehouse paradigm. Studies suggest that thematic and taxonomic relationships may be differentially processed (3) with a dominance for thematic relationships over taxonomic ones in adulthood (4). The goal of the study was to assess whether taxonomic versus thematic primes lead to enhanced old responses in a recognition memory task, whether this is true for hits and/or false recognitions, and whether this affects recollection or familiarity (measured with the Remember/Know paradigm).

METHOD

For this purpose, 30 young adults (24 ± 4 yo; 23 female) performed a Jacoby-Whitehouse word recognition task in 3 different prime conditions (repetition, conceptual thematic, conceptual taxonomic).

In the encoding phase, 32 words were presented one by one for 2 seconds. In the recognition task, the 32 OLD words were presented among 32 NEW ones.

Subjects were instructed to recognize the OLD words by specifying if the word was remembered, known or guessed. Each target-word was preceded by a 33ms flashed word that be perceptually (repetition), thematically or could taxonomically related or not to the target-word. All the subjects started with the perceptually linked task, after which the order tasks with taxonomic and thematic links was of counterbalanced between them.



Fig. 1. The schematic of trial procedure at study and test phases.

	Repetition				Taxonomical				Thematical			
	NEW		OLD		NEW		OLD		NEW		OLD	
	Unprimed	Primed	Unprimed	Primed	Unprimed	Primed	Unprimed	Primed	Unprimed	Primed	Unprimed	Primed
Remember	0,01	0,03	0,68	0,68	0,00	0,01	0,67	0,70	0,01	0,01	0,71	0,73
Know	0,02	0,06	0,13	0,16	0,03	0,05	0,16	0,15	0,04	0,06	0,15	0,11
Guess	0,04	0,03	0,05	0,04	0,03	0,05	0,03	0,03	0,03	0,05	0,02	0,03

Tab.1 Mean proportions of responses to studied or unstudied words that were given each type of memory judgement (R, K, G) for each prime type (Repetition, Taxonomical, Thematical) and prime status (primed, unprimed).

Data analysis

RESULTS



SCUSSION

ROBUST ANOVA on proportions of « Yes », R, K and G responses 3 priming conditions (repetition; taxonomic; thematic) x 2 type of words (new; old)

x 2 priming context (unrelated; related)

Results

Significant interaction type of words X type of priming context for Yes (Ft = 7,22, p < .007) and K responses (Ft = 4,18, p < .04) Planned comparisons paired t-test with Bonferroni correction





Fig.2 Proportion of « yes » responses as a function of prime type (repetition, taxonomical, thematical), word status (old, new) and prime link (unrelated, related)

Our design was based on Li et al. (2017), but with distinction of conceptual primes between thematic and taxonomic. They concluded that conceptual priming increased correct recollection but did not affect familiarity whereas repetition priming showed the opposite pattern. In our experiment, we found a significant interaction between the type of words and the priming context for the proportion of "yes" responses and "know" responses. Furthermore, more old responses following a related prime compared to an unrelated prime occurred for false alarms only. Moreover, we showed no such interaction for the "remember" responses. Finally, no main effect of condition was found, meaning that we do not have a different pattern of responses according to the priming condition. We also did not find any significant effect in the "guess" responses. These findings suggest that strictly taxonomic and thematic semantic relationships between the prime and the test word lead to the same effect as repetition primes, namely enhanced familiarity for new words. Previous studies may have found an impact of conceptual priming on recollection of hits because the variety in the nature of the semantic relationships made it more likely that the primes matches some associations generated at encoding.

(1) Jacoby, L. L., & Whitehouse, K. (1989). An Illusion of Memory : False Recognition Influenced by Unconscious Perception, Journal of Experimental Psychology: General 118(2), 126–135 (2) Taylor, J. R., & Henson, R. N. (2012). Could masked conceptual primes increase recollection? The subtleties of measuring recollection and familiarity in recognition memory. *Neuropsychologia*, *50*(13), 3027–3040. https://doi.org/10.1016/j.neuropsychologia.2012.07.029" \t "_top

(2) Li, B., Taylor, J. R., Wang, W., Gao, C., & Guo, C. (2017). Electrophysiological signals associated with fluency of different levels of processing reveal multiple contributions to recognition memory. *Consciousness and Cognition*, 53(May), 1–13. https://doi.org/10.1016/j.concog.2017.05.001" \t "_top

(3) Maguire, M. J., Brier, M. R., & Ferree, T. C. (2010). EEG theta and alpha responses reveal qualitative differences in processing taxonomic versus thematic semantic relationships. Brain and Language, 114(1), 16–25. https://doi.org/10.1016/j.bandl.2010.03.005

(4) Lin, E. L., & Murphy, G. L. (2001). Thematic relations in adults' concepts. Journal of Experimental Psychology general, 130(1), 3–28. doi:10.1037//0096-3445.I30.1.3

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