Resistance-to-interference: domain-general or domain-specific? An aging study

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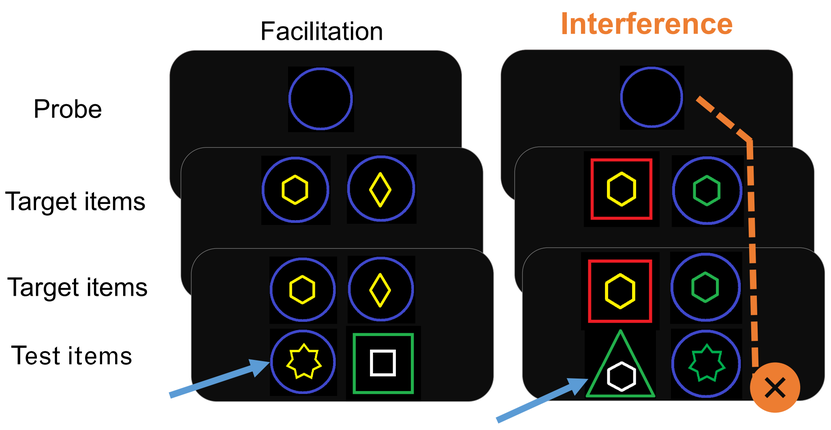
We tested the nature of Resistance-to-Interference (RI) impairment in healthy aging by studying RI abilities across **three domains (semantic, phonological, visual)** by using two tasks carefully matched regarding their structure and processing requirements in **111 young adults and 99 older adults**

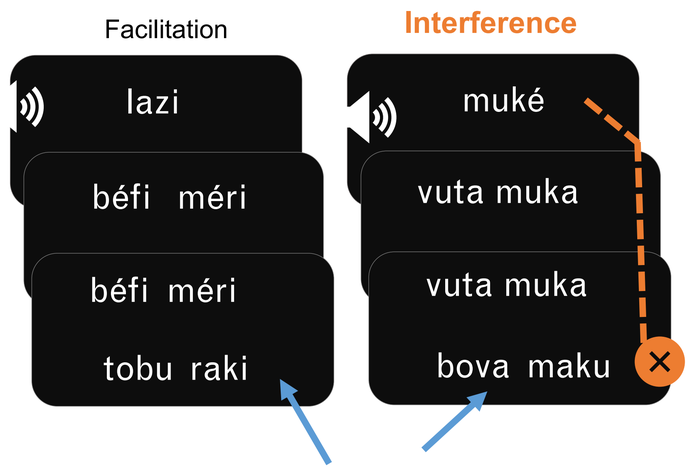
JUDGMENT SIMILARITY TASK

VISUAL
criteria: form, color

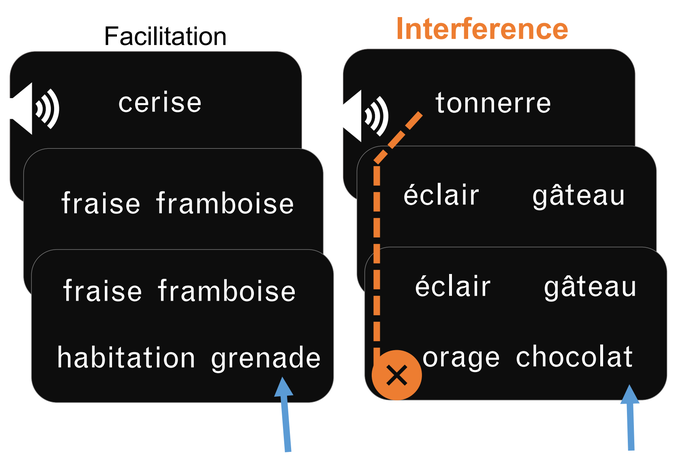


"Which item at the bottom of the screen has the best association with the two items (the pair) at the top of the screen?"

PHONOLOGICAL
criteria: sound, position



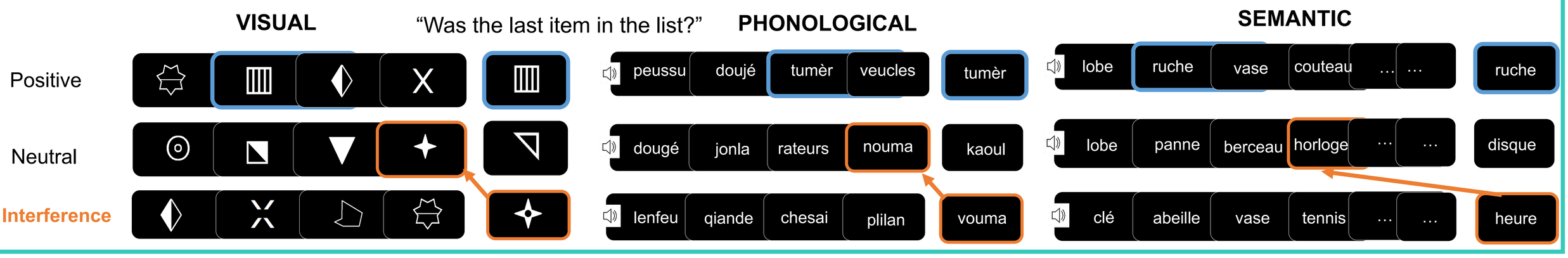
SEMANTIC
criteria: same category



Correct answers

RI: the probe primes the item to resist to

RECENT-NEGATIVE TASK

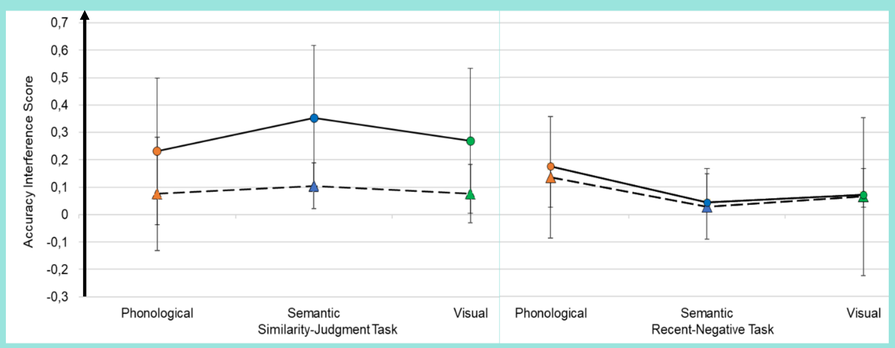


MAIN RESULTS

2 (Groups) **x 3** (Domains) **x 2** (Tasks) **Bayesian Repeated Measures ANOVA on Interference Scores**

ACCURACY

full model: BF_{10} = 4.54e40



✓ **Groups**
older adults more interfered > younger adults

✓ **Domains**
semantic = visual > phonological

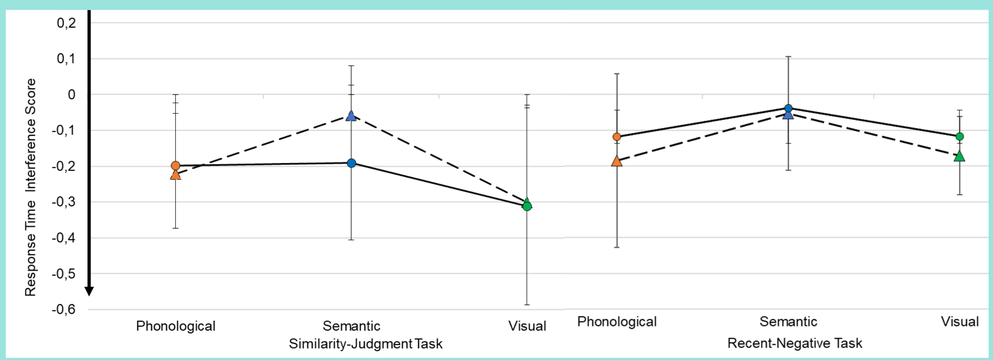
✓ **Tasks**
similarity-judgement > recent-negative

Older adults

Younger adults

RESPONSE TIME

full model: BF_{10} = 2.72e30



✓ **Groups**
older adults more interfered > younger adults

✓ **Domains**
semantic < visual < phonological

✓ **Tasks**
similarity-judgement > recent-negative

✓ **Groups x Domains**
older > younger in the semantic domain

CORRELATIONS

Positive evidence for an absence of between-domain and within-domain correlation in young and older adults

$BF_{01} > 3$
for most correlations

CONCLUSIONS

For both tasks, we observed **a Domain effect, a Task effect and at least one Group x Domain interaction**, which align with a domain-specific view. Correlational analysis overwhelmingly supported evidence for an **absence of both within-domain and between-domain associations of RI abilities**.

Overall, the results support a view in which RI processes are highly specific. We argue that the cross-domain age effect on RI abilities alone cannot be taken as evidence for domain-general RI abilities.

Attout, L., Grégoire, C., Querella, P., & Majerus, S. (2022). Neural evidence for a separation of semantic and phonological control processes. *Neuropsychologia*, *176*, 108377. https://doi.org/10.1016/j.neuropsychologia.2022.108377
Grégoire, C., & Majerus, S. (2023). *Resisting Visual, Phonological, and Semantic Interference – Same or Different Processes? A Focused Mini-Review*(1). *63*(1), Article 1. https://doi.org/10.5334/pb.1184
Hamilton, A. C., & Martin, R. C. (2007). Proactive interference in a semantic short-term memory deficit: Role of semantic and phonological relatedness. *Cortex*, 43(1), 112-123.