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Do multimodal approaches support Alzheimer's patients with declining autonomy?

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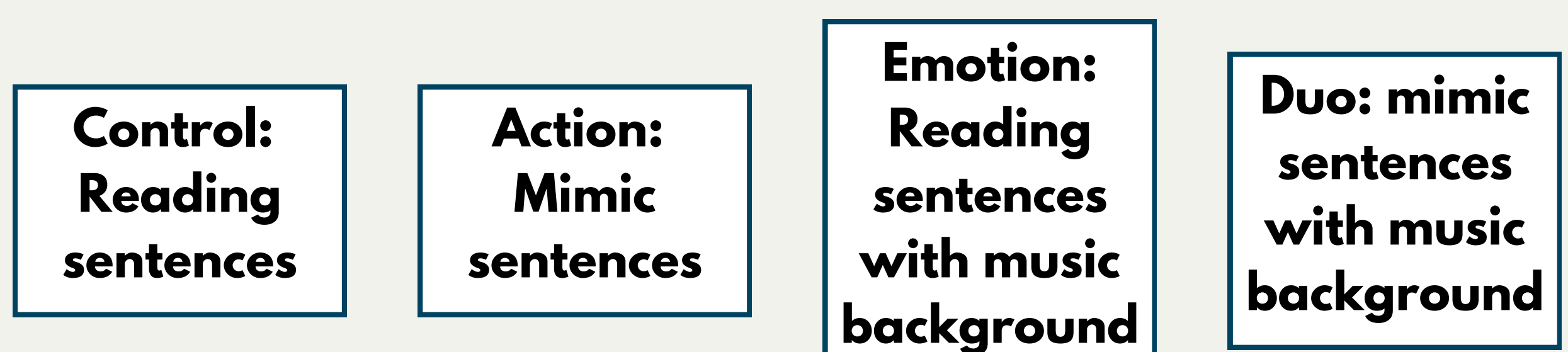
Introduction

Aging reveals cognitive disorders such as slowing of executive functions, visual disorders, and memory problems, which are essential to independent living. In Alzheimer's disease, memory impairment is more pronounced, further accelerating the loss of autonomy.

Recent insights suggest that knowledge is formed through interaction with the environment, where every sensory experience leaves a memory trace. The various cortical areas involved in encoding these experiences contribute to these traces, which are consolidated into life episodes by the hippocampus. The more traces there are, the more they reinforce each other, making memories more resistant to forgetting.

This raises the question: Can memory be enhanced by incorporating multiple sensory modalities during memory tasks?

Method



Participants complete 4 randomized experimental blocks. Inside, they need to read 15 sentences that describe everyday actions. At the end of a block, participants complete a recognition and recollection task.

Conclusion

Using body in reinforcement?

There appears to be an advantage in engaging the body to aid in memorizing everyday action sentences.

Using emotion in reinforcement?

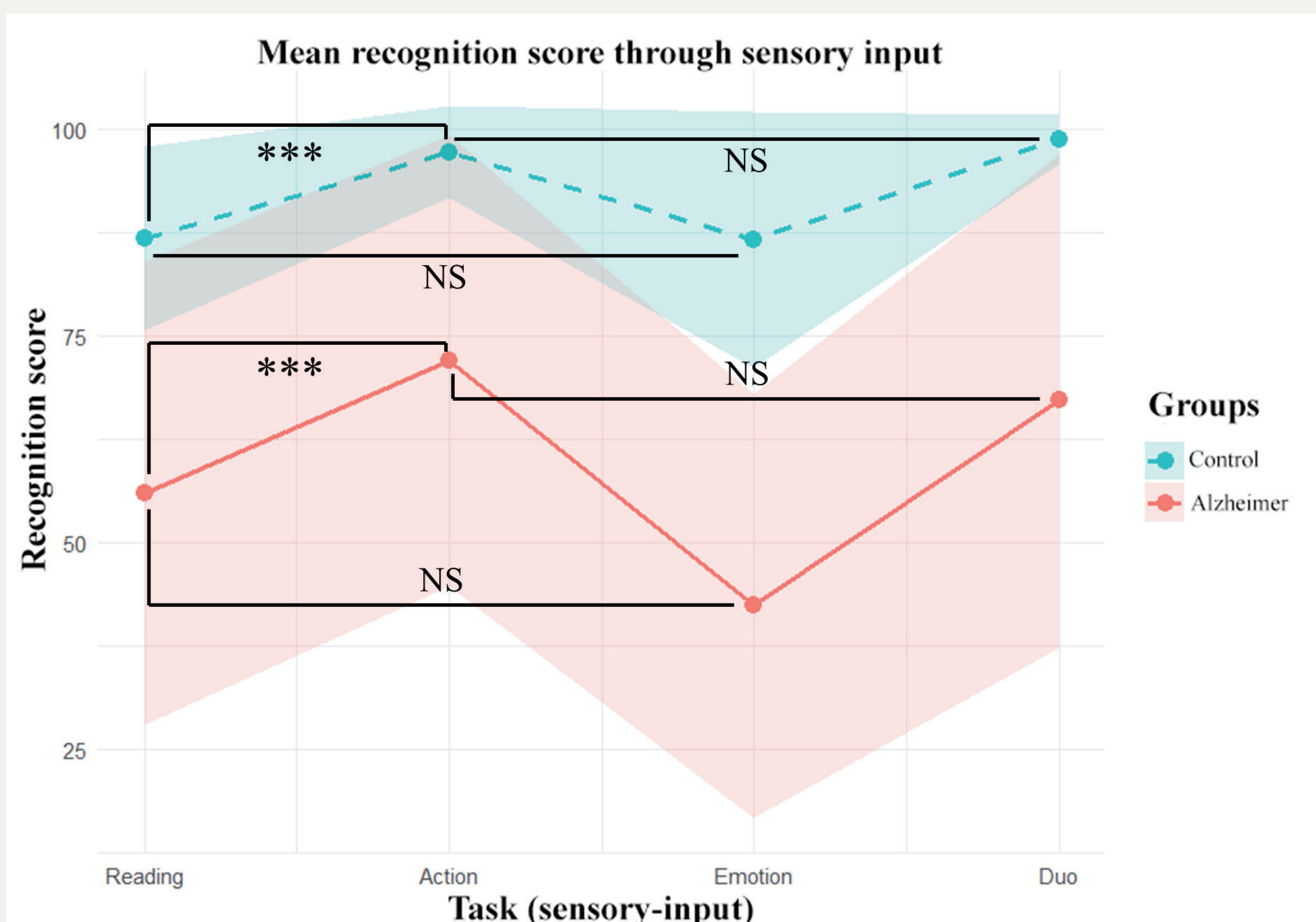
In contrast, using music to evoke physiological and emotional responses does not lead to any improvement. In fact, the average performance is even lower than in the control condition (descriptively).

Why didn't emotion have the expected effect?

Cognitive overload: Listening to music consumes cognitive resources, which interferes with processing.

Importantly: The "duo" condition leads to performances at least as good as the "action" condition, despite musical interferences!

Results



There are :

- Main effect of pathology ($F(1,24) = 25.711, p < .001$)
- Main effect of task ($F(3,72) = 15.880, p < .001$)
- Interaction effect ($F(3,72) = 2.766, p < .05$)

Importantly, the emotion condition does not differ from the reading one, in any group, but the action condition is significantly different from both the reading and emotion conditions.

References

- Collier, L., McPherson, K., Ellis-Hill, C., Staal, J., & Bucks, R. (2010). Multisensory Stimulation to Improve Functional Performance in Moderate to Severe Dementia—Interim Results. *American Journal of Alzheimer's Disease & Other Dementias*, 25(8), 698-703. <https://doi.org/10.1177/1533317510387582>
- Versace, R., Vallet, G. T., Riou, B., Lesourd, M., Labeye, É., & Brunel, L. (2014). Act-In: An integrated view of memory mechanisms. *Journal of Cognitive Psychology*, 26(3), 280-306. <https://doi.org/10.1080/20445911.2014.892113>
- Yonelinas, A. P., Aly, M., Wang, W., & Koen, J. D. (2010). Recollection and familiarity: Examining controversial assumptions and new directions. *Hippocampus*, 20(11), 1178-1194. <https://doi.org/10.1002/hipo.20864>