Occipitotemporal Representations Transforms from Visual Codes during Encoding to Language Codes during Retrieval

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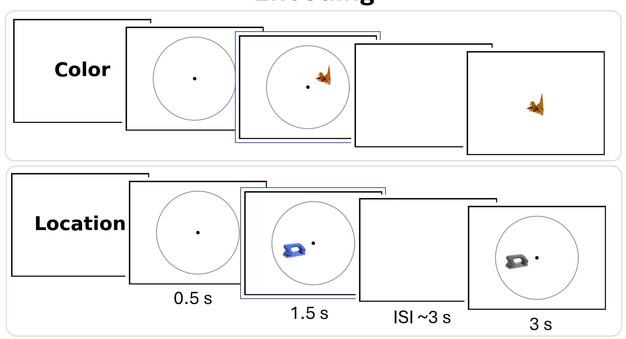
Introduction

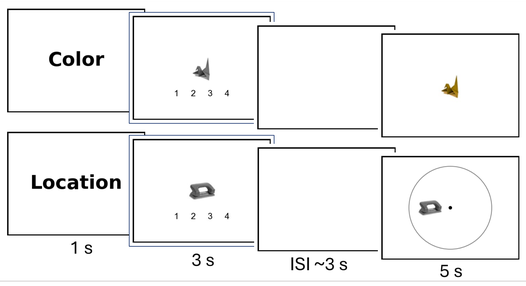
- Language is a product of human cognition and influences human cognition reciprocally
- The precision of memory for continuous feature depends on the scaffold of language as well
- We hypothesize that while visual feature is represented visually during perception, feature memory will be represented in a language/category-based way, especially for feature readily verbalizable such as color

fMRI experiment

Encoding

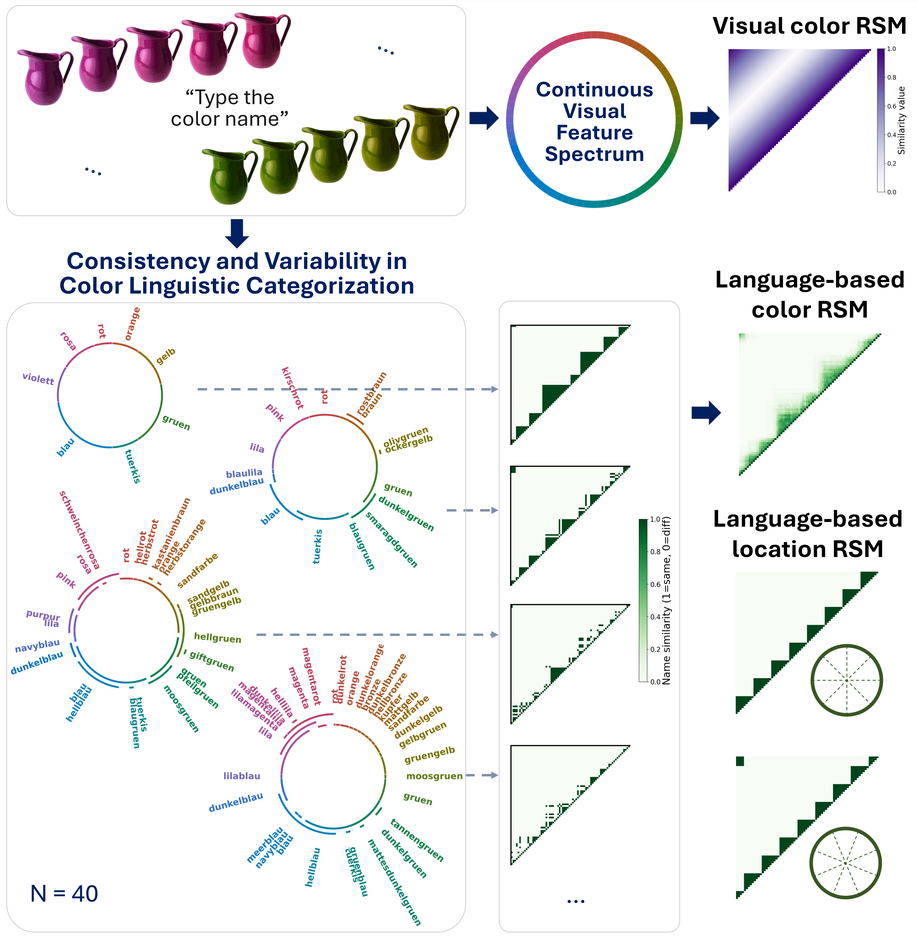


Retrieval

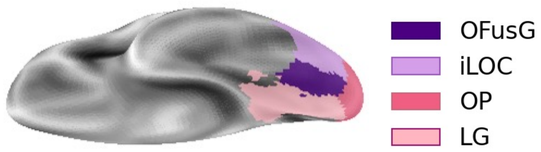


- 40 subjects, 168 stimuli objects
- Encoding : report target feature as precise as possible
- Retrieval : rate target feature memory vividness & report target feature as precise as possible

Color Naming Task and Representational Modeling



ROI definition

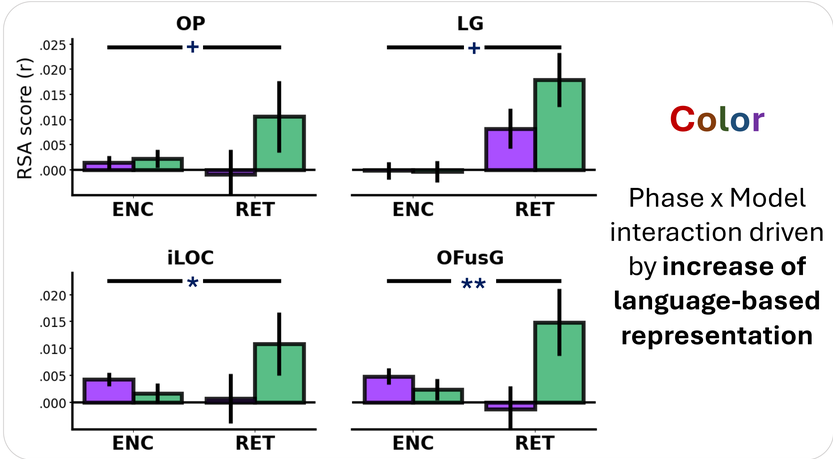


References

Bae, G.Y., Olkkonen, M., Allred, S.R. and Flombaum, J.I., 2015. Why some colors appear more memorable than others: A model combining categories and particulars in color working memory. *Journal of Experimental Psychology: General*, *144*(4), p.744.

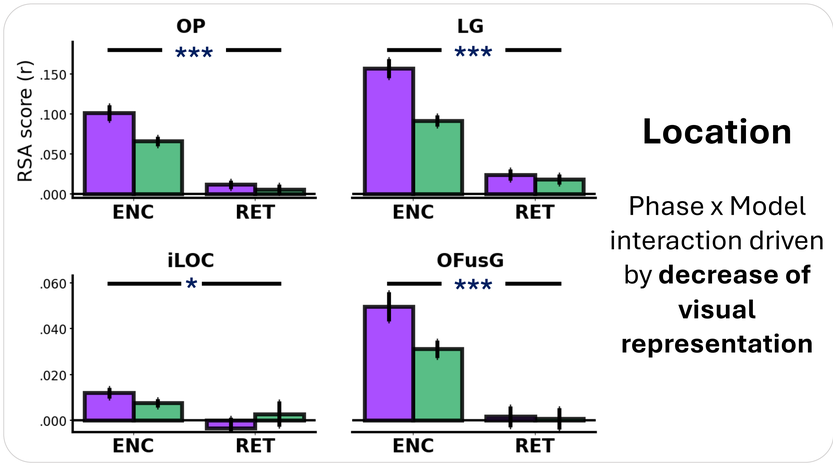
Seabra, J.P., Chopurian, V., Souza, A.S. and Christophel, T.B., 2025. Verbal encoding strategies in visuo-spatial working memory. Journal of Cognition, 8(1), p.2.

Representational Flip for Color in Left OTC



Color

Phase x Model interaction driven by **increase of language-based representation**



Location

Phase x Model interaction driven by **decrease of visual representation**

Conclusion

- Color representations were transformed towards language-based structure during episodic retrieval, but not location.
- Language may act as a reconstructive scaffold, especially for features that are readily verbalizable.

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