Decoding Grapheme-Color Synesthesia using Multivariate Pattern Analysis
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Background
Synesthesia is a condition in which stimulation of one sensory modality evokes experiences in a second, unstimulated modality.

Grapheme-Color Synesthesia
Is the subjective experience of synesthetic color generated by the same, or different, neural processes from those that support the perception of veridical color?

Experimental Design

Feature Selection
Top 1000 activated voxels within downstream extrastriate areas are included in the Anterolateral ROI (Orange). Top 1000 activated voxels within V1-V4 are included in the Posteromedial ROI (Blue).

Training Set

Hypothesis Test

Results: Classifier Evidence

Anterolateral ROI
Synesthetes
Non-Synesthetes

Posteromedial ROI
Synesthetes
Non-Synesthetes

Results: Classifier Accuracy

Anterolateral ROI

Posteromedial ROI

Conclusions
• Cross-category decoding was only successful for synesthetes, and only in the anterolateral ROI.
• Grapheme-color synesthesia may result from connectivity between relatively high-level graphemic representations and non symbolic information.