Task-irrelevant spatial structure benefits working memory

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Our question

What role does *space* play in the online maintenance of information?

Background

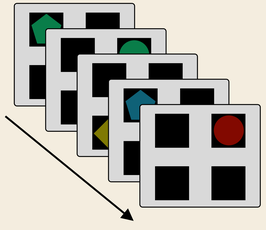
Prior work suggests that features are bound to objects via space

In practice, this results in '*spatial interference*'

In the above example, the blue and yellow lines would be confused with one another (because they are presented in the same location), but the two red lines would not interfere with each other

What about '*spatial structure*'?

'Spatial Structure'

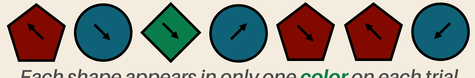


- Trials consist of 5-7 shapes total
- Trials consist of three unique shapes (circle, pentagon, diamond
- Shapes appear in one of four locations, in one of four colors
- The first three shapes are always unique
- Subjs must remember the sequence
- Different trial types are explained below!

Space-Structured Trials

*Each shape appears in only one **location** on each trial*

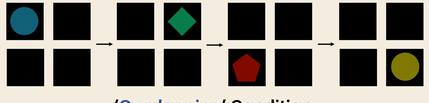
Color-Structured Trials



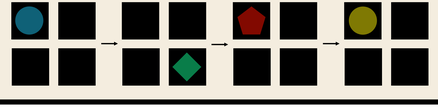
*Each shape appears in only one **color** on each trial*

Different *kinds* of structure

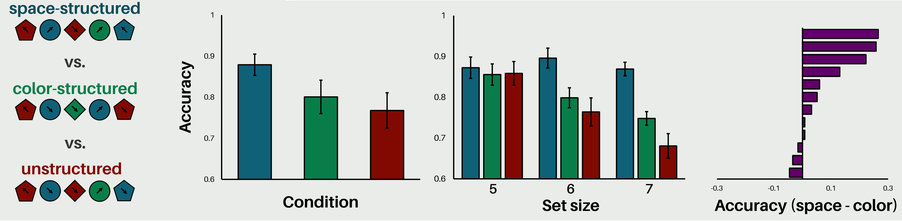
'Separated' Condition



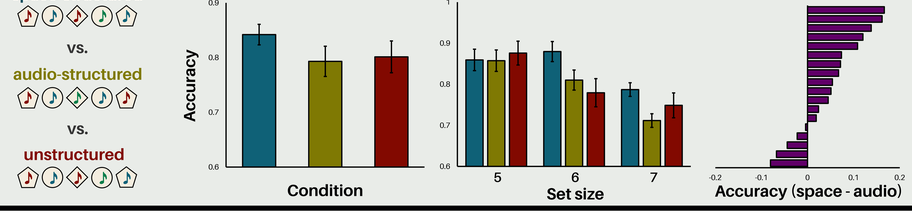
'Overlapping' Condition



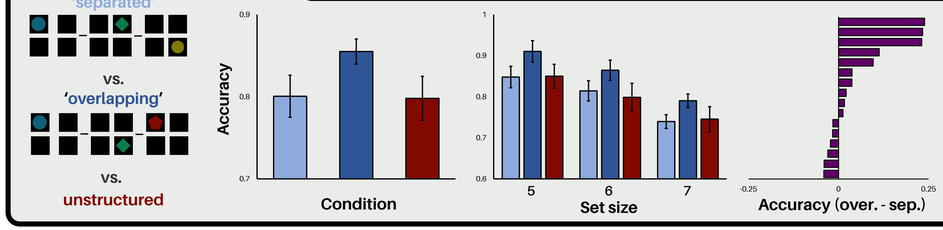
Space v. Color v. Unstructured



Space v. Audio v. Unstructured



What *kind* of structure matters?



Conclusions

Spatial structure matters...

We find a robust effect of 'spatial structure' on working memory, such that repeated objects presented in the same location are better remembered. Other kinds of structure (color, audioo) yielded no such effects

...in spite of explicit rehearsal

Vast majority of observers report a rehearsal strategy, not a spatial one -- yet still strong effects of space!

Not about absence of overlap, but *presence* of structure

Final experiment clarifies what it means to have 'spatial structure'; notably, this is the opposite pattern of results from what a strict 'spatial interference' account would predict

To find out more...

You can find a copy of this poster at the following link:

https://bit.ly/2XKucnK

Or email for a preprint:

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