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’.

What about ‘spatial structure’?
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.

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

‘Spatial Structure’

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

- Trials consist of 6-7 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

Different trial types are explained below:

- Space-structured
- Color-structured
- Unstructured

VSS

Accuracy (space - color)
Set size
Condition
Space v. Color v. Unstructured

Accuracy (space - audio)
Set size
Condition
Space v. Audio v. Unstructured

What kind of structure matters?

‘Separated’ Condition
‘Overlapping’ Condition

Accuracy (over. - sep.)
Set size
Condition
Space v. Audio v. Unstructured

Accuracy (space - audio)
Set size
Condition
Space v. Audio v. Unstructured

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, audio) 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:
Or email for a preprint:
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Task-irrelevant spatial structure benefits working memory
Sami Yousif & Frank Keil (Yale University)