Learning Statistical Regularities Can Speed the Encoding Of Information Into Working Memory

[1]Harvard University

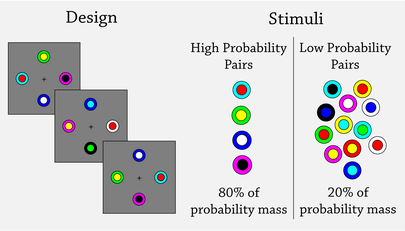
Juliana Rhee[1], Talia Konkle[2], Timothy Brady[2], & George Alvarez[1]

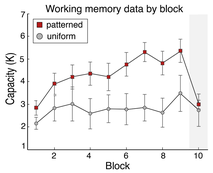
[2]Massachussets Institute of Technology

Background

People automatically detect and learn statistical regularities, which can improve working memory performance.

Brady, Konkle, & Alvarez (2009)





Observers can learn regularities and use them to increase the number of colors they remember.

Not explained by guessing: When errors are made, observers do not tend to report the associated high-probability colors.

Learned regularities are used to form compressed, efficient representations.

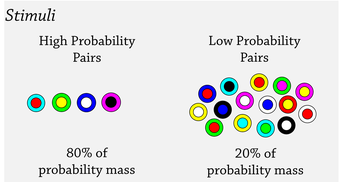
As people learn, do they extract that information faster?

Does learning affect the speed of encoding?

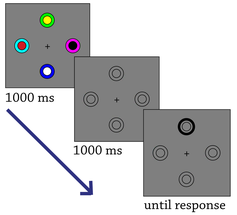
Experiment I. Color pairs

Part I. Learning Phase

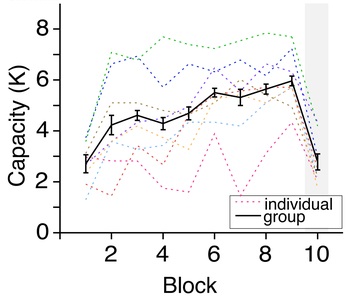
Stimuli



Trial design



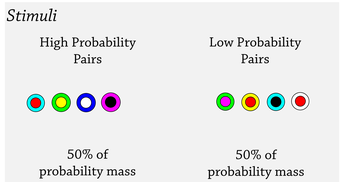
Results



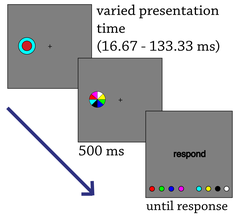
Observers learn.

Part II. Rapid Perception

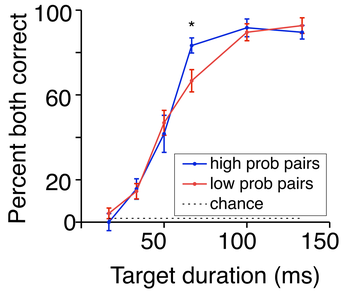
Stimuli



Trial design



Results

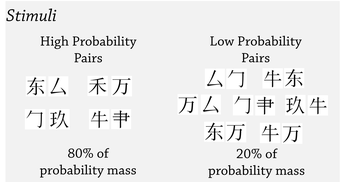


Learning increases encoding rate.

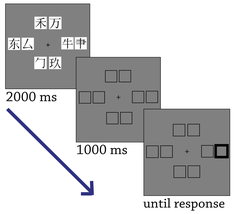
Experiment II. Chinese characters

Part I. Learning Phase

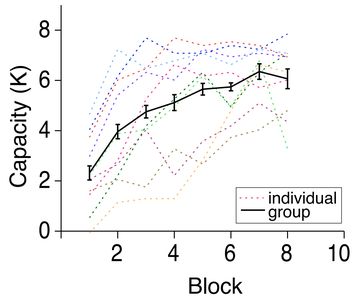
Stimuli



Trial design



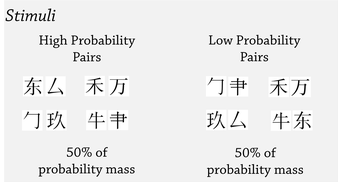
Results



Observers learn.

Part II. Rapid Perception

Stimuli



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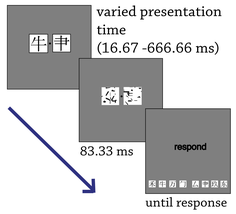
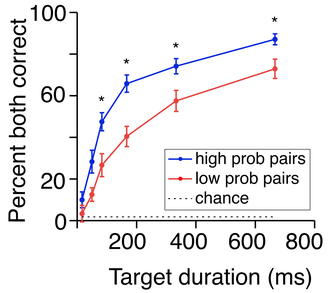


Results



Learning increases encoding rate.

Conclusions

Observers learn regularities and use them to store more content in working memory.

This learning enables more rapid encoding.

Learned associations are flexibly and quickly acquired, within only 1 hour of exposure.

Outstanding questions

Faster perception, or faster consolidation?

Does learning affect processing speed in a task that does not require memory consoldiation?

Search for the target pair:

References

Brady, Konkle, & Alvarez (2009). Compression in visual working memory: Using statistical regularities to form more efficient memory represntations. *JEP: General*, 138(4), 487-502.

Alvarez & Cavangh (2004). The capacity of visual short-term memory is set both by visual information load and by number of objects. *Psychological Science*, 15(2), 106-111.