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

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Background

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


Outstanding questions

Does learning affect the speed of encoding?

Part I. Learning Phase

Stimuli

High Probability

Low Probability

Part II. Rapid Perception

Stimuli

High Probability

Low Probability

Results

Observers learn.

Learning increases encoding rate.

Experiment I. Color pairs

Part I. Learning Phase

Experiment II. Chinese characters

Part I. Learning Phase

Part II. Rapid Perception

Design

Experiment I. Color pairs

Part I. Learning Phase

Stimuli

High Probability

Low Probability

Part II. Rapid Perception

Stimuli

High Probability

Low Probability

Results

Observers learn.

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.

References


As people learn, do they extract that information faster?

Observe the graph:

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.