CAMBRIDGE COGNITION

Reliability of VPA Learning Over Repeat Exposures Across an Extended Interval Using Automated Remote Method

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Background

12 validated stimulus sets make possible up to twelve 5-day 'bursts' of VPA-LORE.

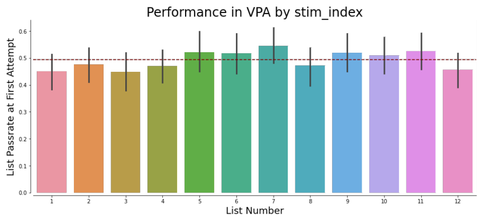
Preliminary work shows VPA LORE has potential to be a sensitive and rich task for repeated high-frequency memory assessment.

VPA-LORE captures a variety of aspects of memory: immediate recall, forgetting (overnight extinction), and gradual learning (LORE), with very low participant burden.

Elements of the VPA paradigm

Presentation	Cued recall
NeuroVocalix: Text-to-Speech module "Here are a set of word pairs, please listen carefully and try to learn them: Baby, Cries Obey, Inch Rose, Flower School, Grocery Metal, Iron Crush, Dark Fruit, Apple Cabbage, Pen"	NeuroVocalix Text-to-Speech module with Automatic Speech Recognition "Ok, what word went with… Crush?... and, School?... Fruit?... Baby?... Metal?... and Cabbage?... and Obey?... …Rose?"

12 Validated VPA Stimuli Sets

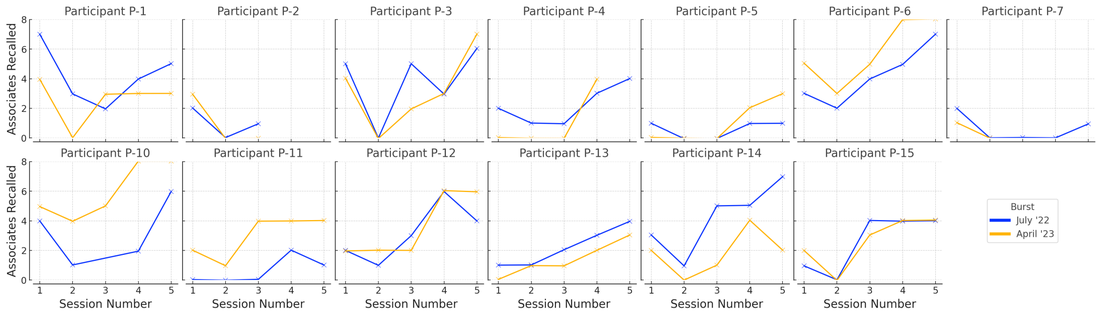


Objective

To explore the stability of LORE, we invited our preliminary-study cohort (N=20) of previous volunteers for a 2nd 5-Day follow-up burst of LORE to explore stability of learning patterns and reliability of the LORE measures after a 9-month delay.

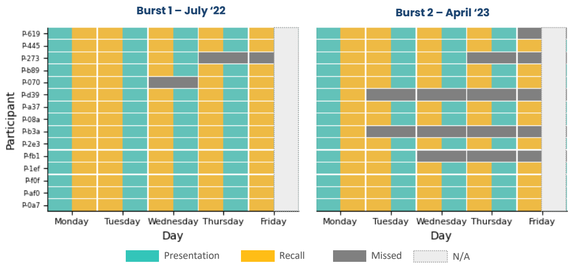
Results of Follow-up to Preliminary Study

Burst 1 (July '22) and Burst 2 (April '23) recall scores in 13 Returning Participants



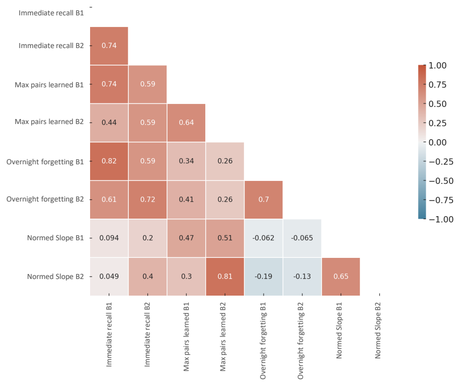
Above: VPA LORE cued-recall scores for returning participants show remarkable consistency of performance between bursts that were 9 months apart.

Adherence of 15 returning participants



Left: Adherence was generally very good, and although two participants reported dropping out on the second day because of poor performance, those who continued generally completed all sessions.

Measure Correlations (r_s)



Above: good reliability of ranked performance among a number of measures between Bursts 1 and 2. Notably:

Session 1 immediate recall, r_s = .74

Max Pairs Learned, r_s = .64

LORE Slope, r_s = .65

1st Day Overnight Forgetting, r_s =.70

Conclusion

Individual VPA-LORE learning appears extremely stable, supporting use of this paradigm to measure change due to disease or intervention.

Future work will look to develop outcome measures to characterise learning behaviour, collect data over multiple repeated bursts in larger samples, and will explore relationships with other cognitive tasks.

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