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BACKGROUND

Directed attention encourages prioritisation of specific items in a sequence (Atkinson et al., 2021).

- Prioritisation encouraged by making some items more 'valuable'.
- Improved recall accuracy is consistently demonstrated for prioritised items (i.e., 'Prioritisation effects'), to the detriment of non-prioritised items, suggesting resources are finite.
- Demonstrated with visual and recently for the first time cross-modally with verbal stimuli (Atkinson et al., 2021).

The present study examined serial order prioritisation effects cross-modally, using tactile stimuli.

- Tactile memory produces effects analogous to other modalities; ISR serial position effects (e.g., Johnson et al., 2016); Error distributions (Johnson et al., 2016); Hebb repetition effect (Johnson et al., 2016); repetition inhibition and the Ranschburg effect, Roe et al., 2017).
- Prediction: We predict that recall will be improved for prioritised items. We further predict that the recall improvement will be to the recall detriment of the non-prioritised items.

METHOD

PARTICIPANTS: 48

- 11 males, 35 females, 2 non-binary (Mean age = 21.29, SD = 4.89)



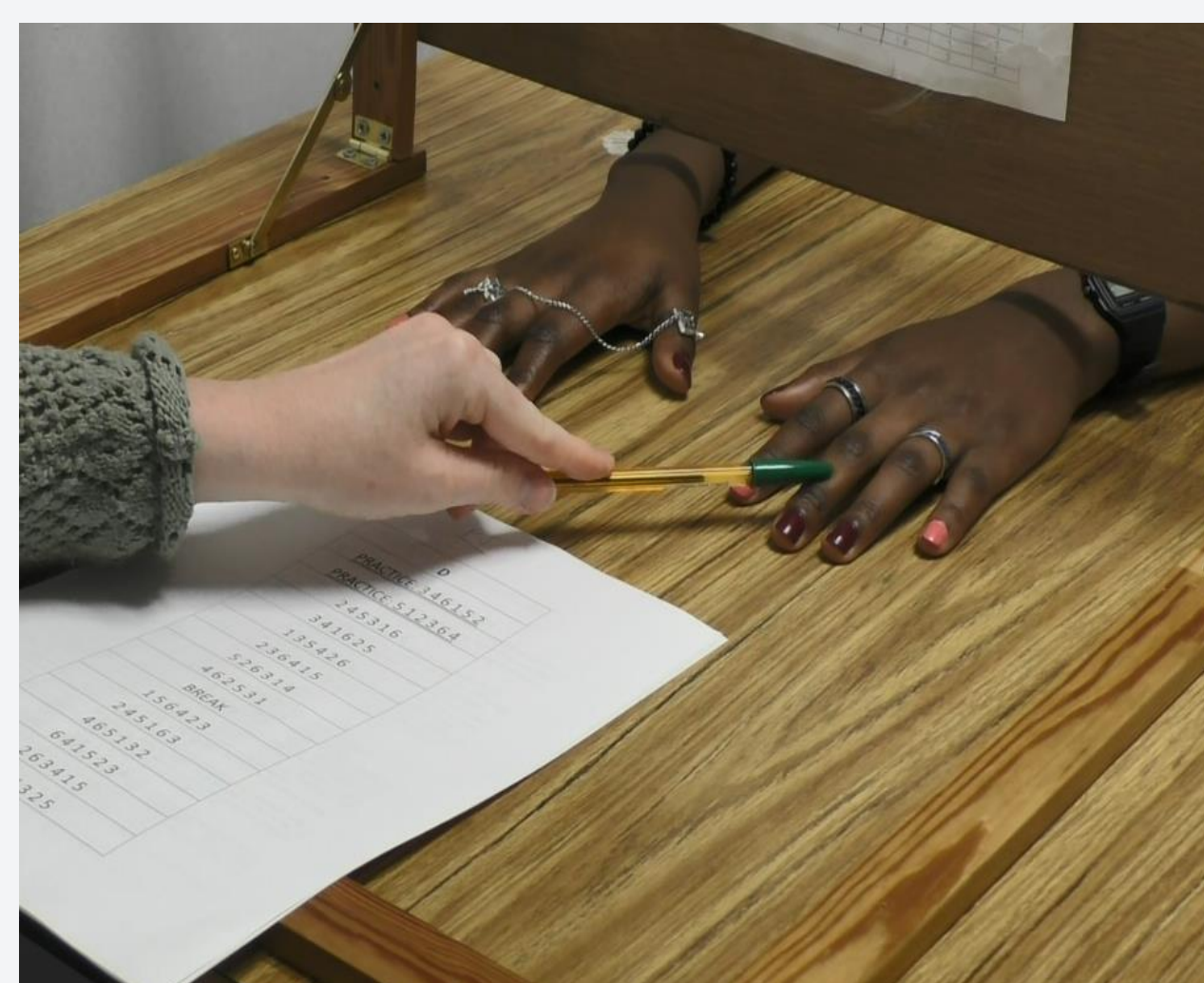
DESIGN: Within-participant 4 (prioritisation condition) x 6 (serial position) design

- Prioritisation condition (prioritise serial position (SP) 3, prioritise SP4, prioritise SP5 or no prioritisation control).
- Serial positions (1-6).

STIMULI

- 48 trials (4 blocks of 12 trials, fully counterbalanced).
- Participants instructed that 3 points would be awarded for prioritised positions, and 1 point for non-prioritised positions.
- Tactile sequences administered to the fingers using a pen probe, with views blocked by an obfuscation screen (Roe et al., 2017).

- After the sixth stimulation, participants reconstruct the sequence by lifting each finger in the order of original stimulation.
- Finger movements were recorded throughout the experiment and coded offline.



RESULTS

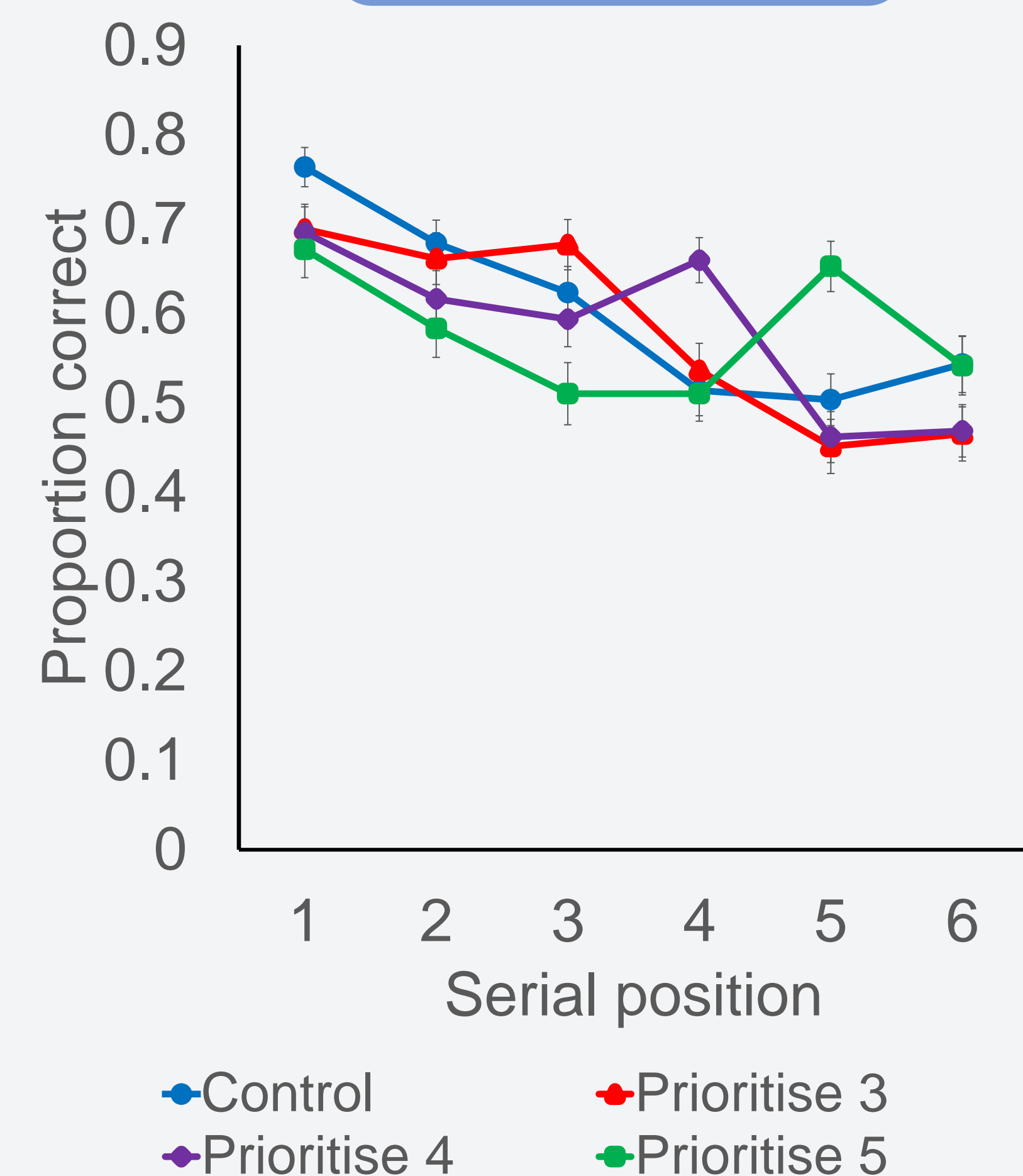


Figure 1. Mean proportion serial recall accuracy for the no prioritisation, prioritise position 3, prioritise position 4, and prioritise position 5 conditions, as a function of serial position. Errors bars denote mean standard error.

- 4 (prioritised item) x 6 (serial position) ANOVA indicated a significant interaction between serial position and prioritisation ($p < .001$).
- Interaction explained by facilitation of performance on prioritise position 4 ($p < .001$) and position 5 ($p < .001$) compared to control trials (See Figure 1).

Effects on less valuable items

- Prioritisation effects come at a cost to recall of the less valuable items.
- Evidenced by a T-test showing significant difference between the composite scores (average performance on non-prioritised serial positions) for control group and composite scores for prioritise position 4 group ($p = .002$) and prioritise position 5 ($p = .003$).

DISCUSSION

- The findings demonstrate that analogous prioritisation effects occur in tactile memory to that found in verbal and visual memory.
- Supports growing evidence that tactile memory might operate in a functionally analogous manner to other stimuli (see Roe et al., 2017).

References:

- Atkinson, A. L., Allen, R. J., Baddeley, A. D., Hitch, G. J., & Waterman, A. H. (2021). Can valuable information be prioritized in verbal working memory? *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 47(5), 747.
- Johnson, A. J., Shaw, J. and Miles, C., 2016. Tactile order memory: evidence for sequence learning phenomena found with other stimulus types. *Journal of Cognitive Psychology*, 28 (6), 718-725.
- Roe, D., Miles, C., & Johnson, A. J. (2017). Tactile Ranschburg effects: facilitation and inhibitory repetition effects analogous to verbal memory. *Memory*, 25(6), 793-799.