



The influences of selection history on working memory: An EEG study

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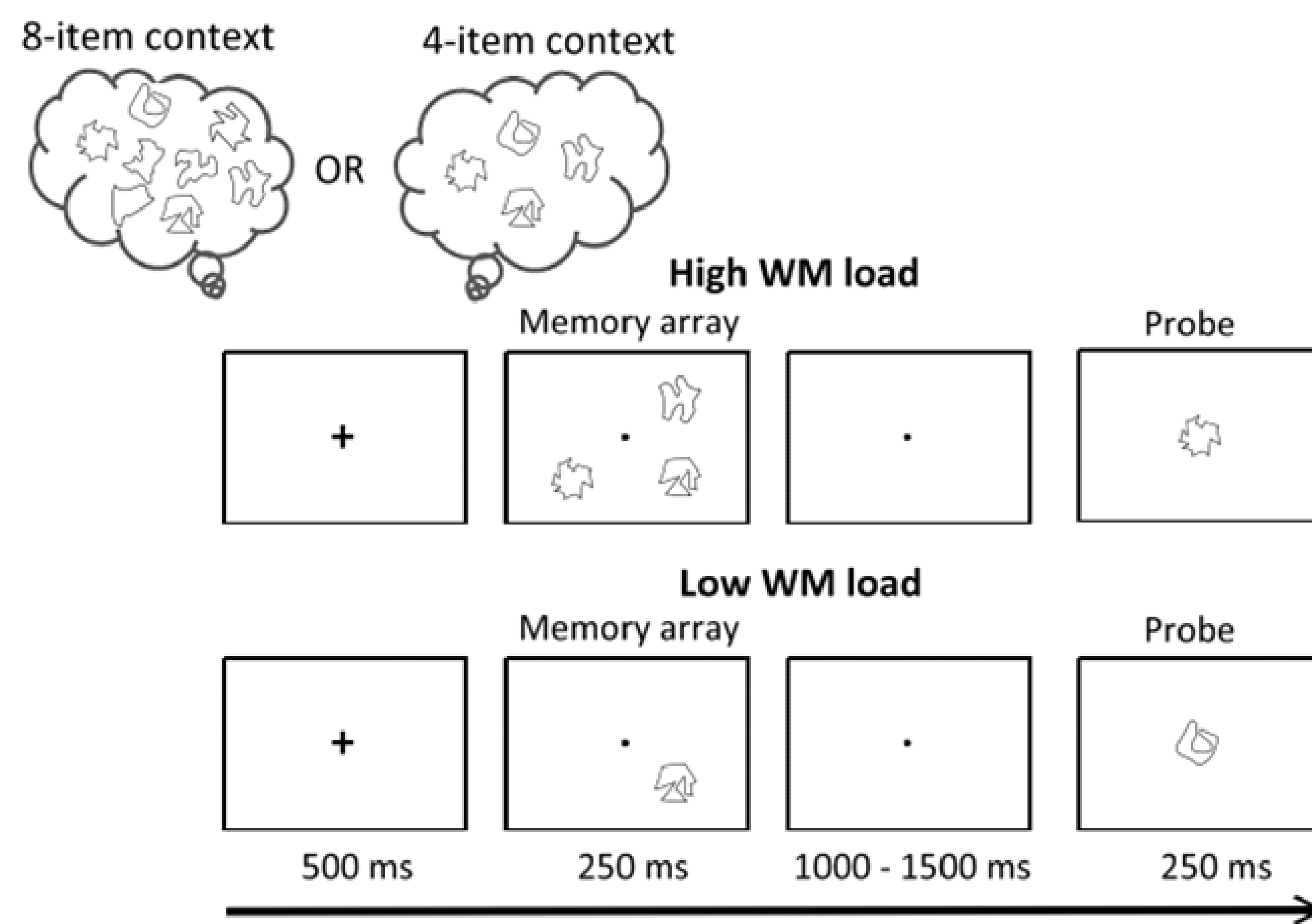
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Background and Aims

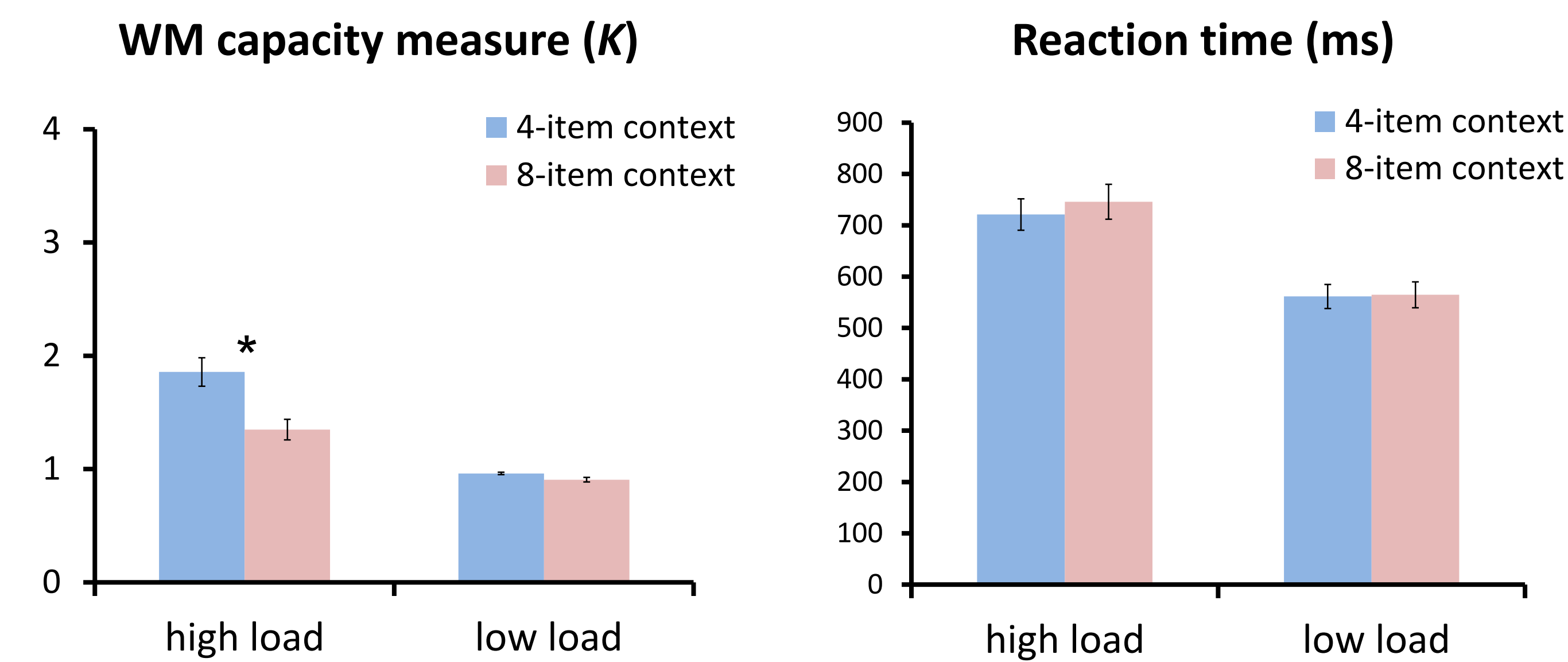
- Previous studies have revealed that context-driven selection history can influence the allocation of attention on target selection (Awh et al., 2012).
- Recent behavioural evidence has also shown that selection history can modulate the efficacy of attention allocation on working memory (WM) representations (Kuo, 2016).
- However, the neural correlates of the influences of selection history on WM remain largely unknown.
- In this study, we used EEG to investigate whether oscillatory activity can be modulated by the selection history in a delayed response task.

Task

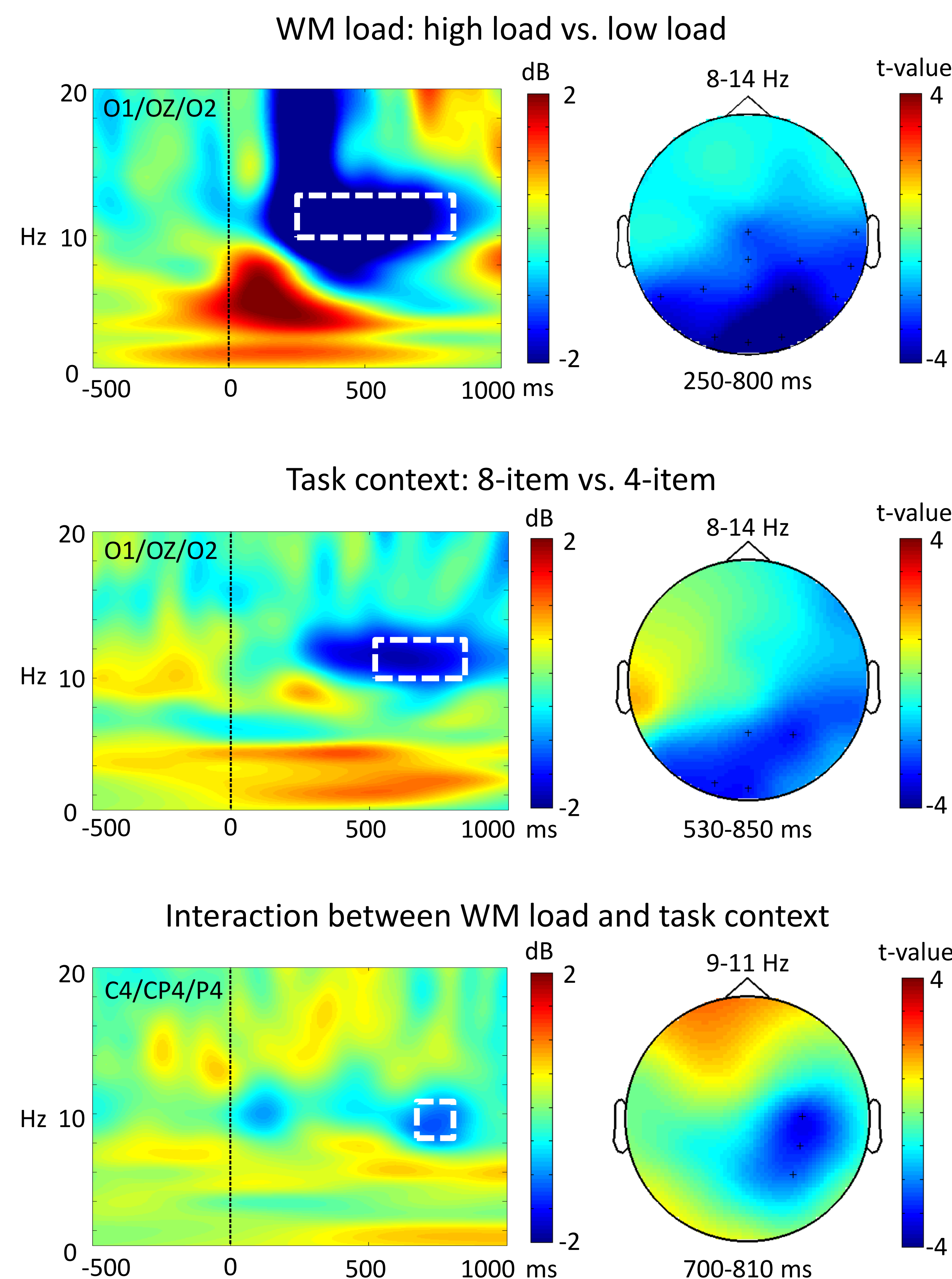


- Participants (N=14) performed a task followed 2 (task context: 8-item and 4-item) x 2 (WM load: high load and low load) x 2 (response type: target present and target absent) within-subjects factorial design.
- These two task contexts were presented in a blocked design and not acknowledged to the participants.
- Selection history was operationally defined as the number of items that had been attended across trials in a block, manipulated by the stimulus set-size (e.g. 4-item and 8-item contexts) from which the memorized content was selected.

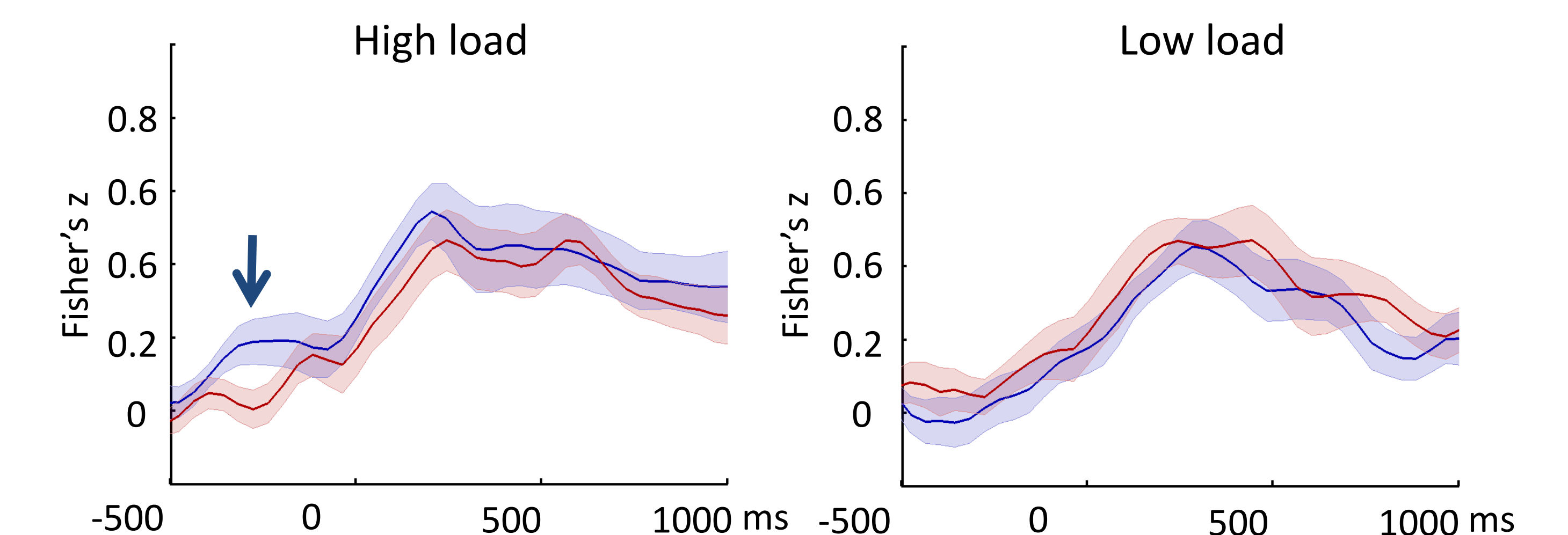
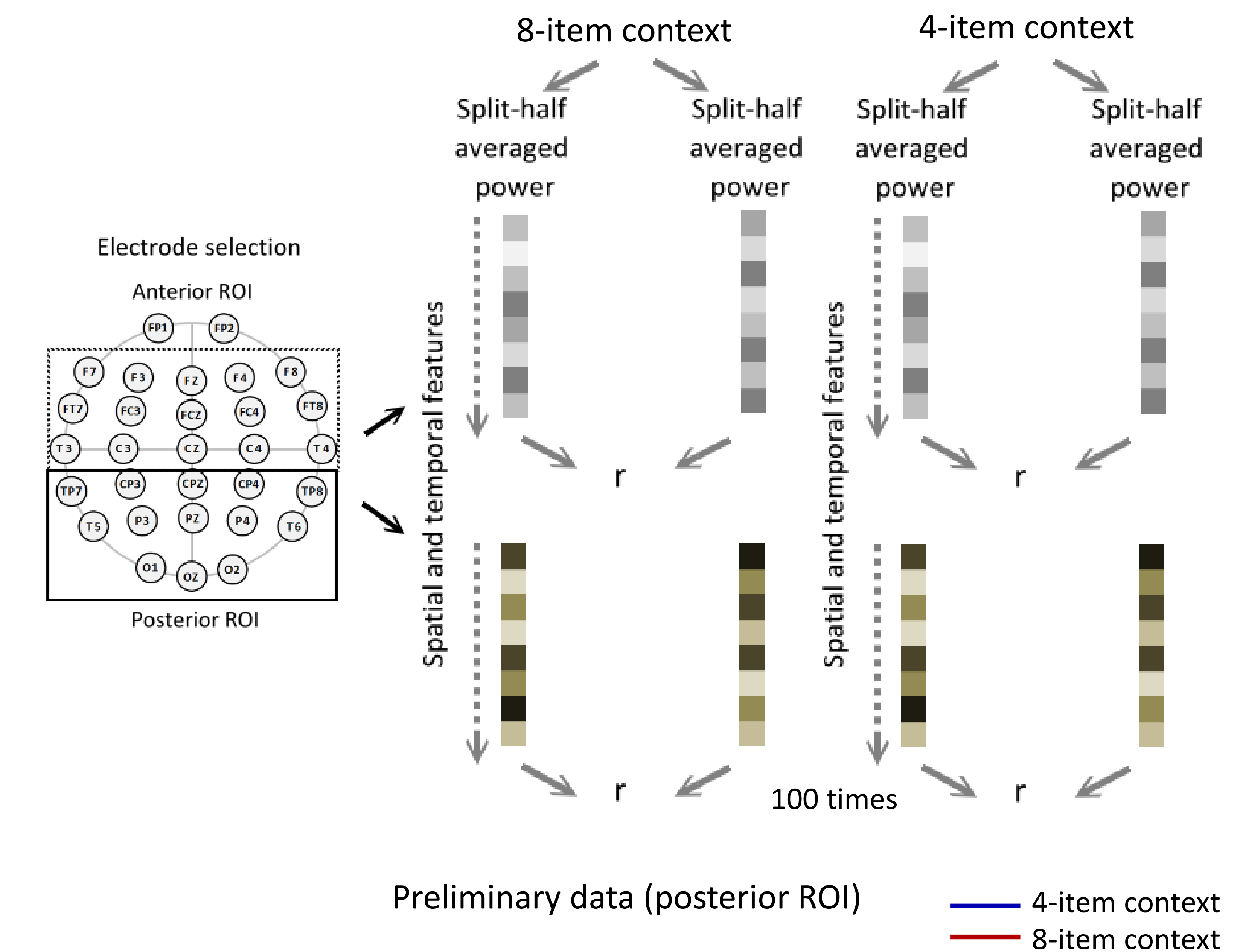
Behavioural Performance



EEG Results



Pattern Similarity Analysis and Results



Conclusions

- The lingering effects of selection history for recently attended stimuli can cause strong interferences with currently relevant WM targets and reduce WM capacity.
- Our EEG results showed that posterior alpha activity can be modulated by the context-driven selection history in WM.
- We found that WM representations are highly flexible and susceptible to different task contexts.

References:

Awh, E., Belopolsky, A.V., and Theeuwes, J. (2012). Top-down versus bottom-up attentional control: a failed theoretical dichotomy. *Trends Cogn. Sci.* 16, 437-443.
 Kuo, B.-C. (2016). Selection history modulates working memory capacity. *Front. Psychol.* 7:1564.