

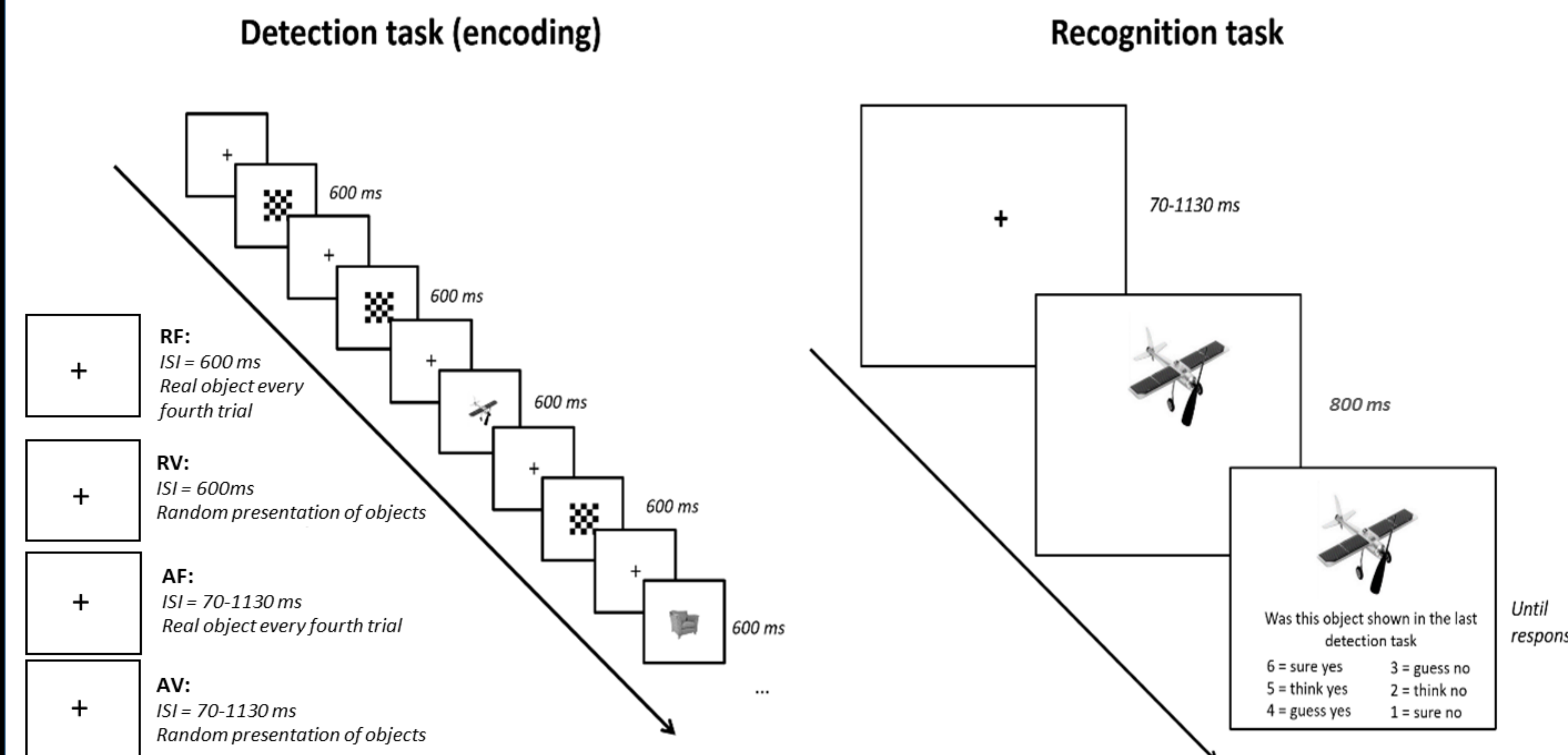
HIGHLIGHTS

- A registered report (in *Cortex*) exploring the effects of temporal prediction and rhythmicity on memory
- We find no effect of temporal manipulation at encoding on recognition memory
- ERP component analysis did show early (N1) a cumulative interaction effect of temporal position and rhythm and later (N2 and Dm) effects driven by temporal position only.
- Effects of temporal prediction on recognition are less robust than previously thought.

BACKGROUND

The way in which information is processed during encoding influences subsequent memory. New evidence suggests that temporal prediction – the anticipation that an event will occur at a particular point in time – plays a key role in memory formation (see Jones & Ward, 2019; Jones et al., 2022; Thavabalasingam et al., 2016), but little is known about the conditions under which this occurs, or the underlying mechanisms. Temporal prediction has been shown to provide a benefit to memory following encoding of stimuli presented with both isochronous rhythm and aperiodic temporal regularities. Therefore, this study's aim was to test whether these factors independently or collectively enhance memory.

METHODS

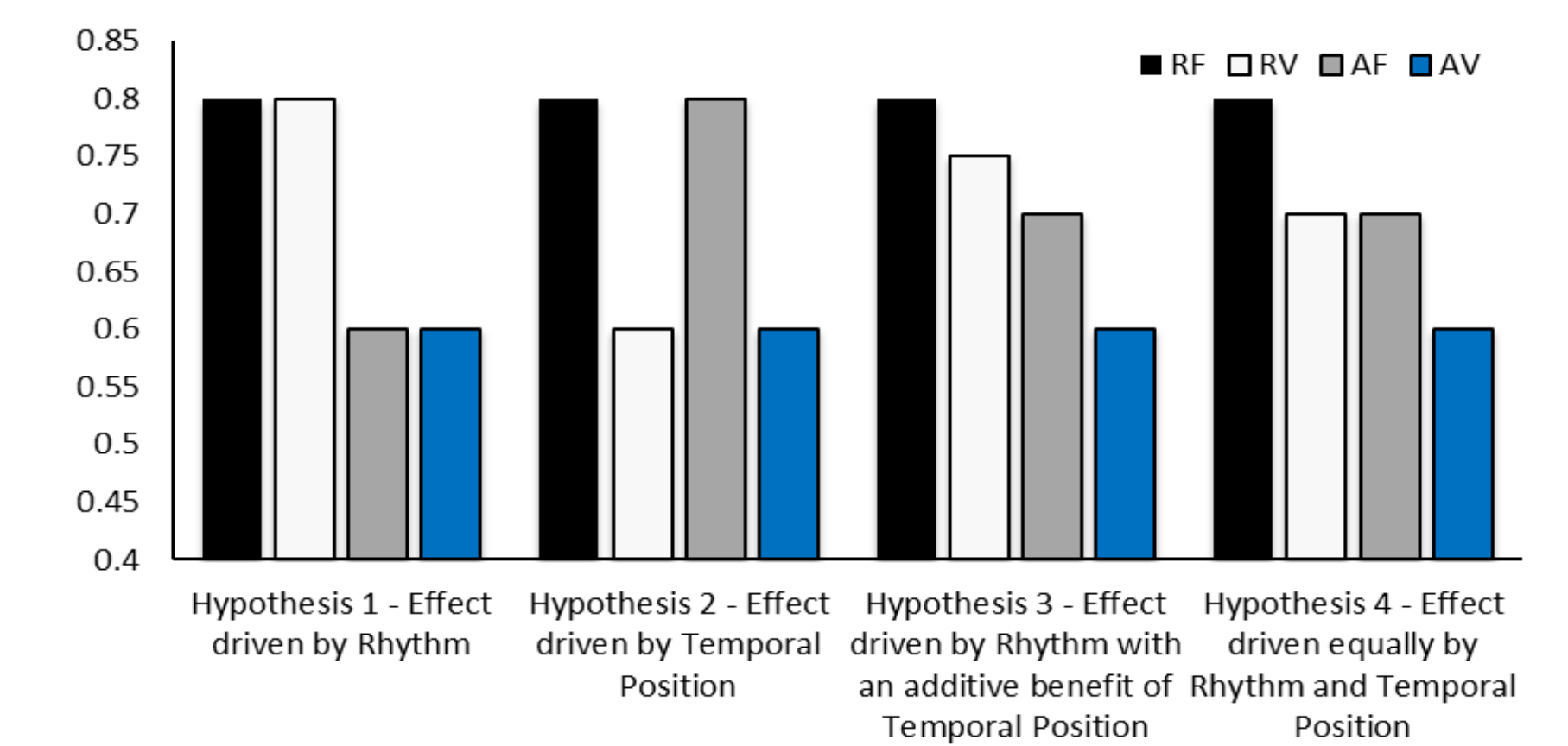


Participants (N=54) were exposed to eight encoding-test blocks, two of each condition

RF - Rhythmic fixed
RV - Rhythmic variable
AR - Arrhythmic fixed
AV - Arrhythmic variable

EEG recorded using Brain Products 64 electrodes.

Registered report predictions



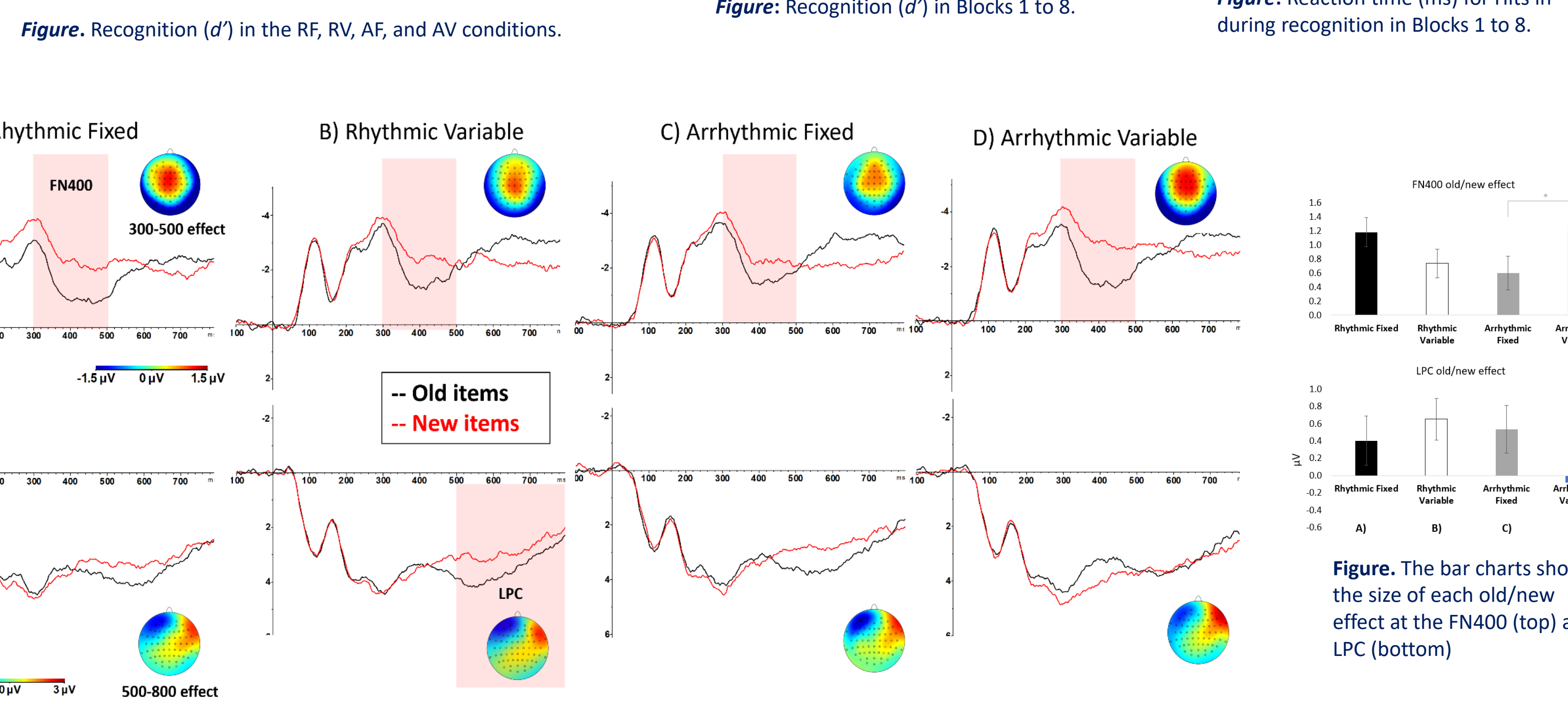
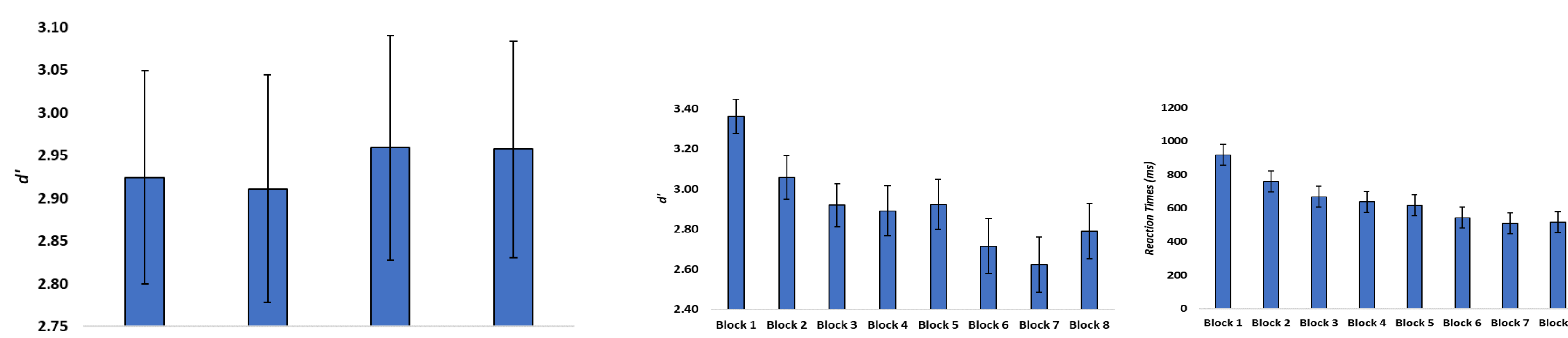
RESULTS

Performance in the detection task

	RF	RV	AF	AV
	M (SD)	M (SD)	M (SD)	M (SD)
Correct detection (%)	94.18 (9.63)	94.65 (8.52)	93.52 (8.82)	92.95 (10.52)
Erroneous keypresses (%)	0.10 (0.37)	0.46 (0.89)	0.23 (0.52)	0.46 (0.81)
RT (correct)	557 (88)	567 (83)	568 (101)	580 (94)

Detection task

Recognition task



CONCLUSION

Our behavioural results did not replicate previous findings that show a difference in recognition memory based on temporal predictability at encoding. However, ERP component analysis did show early (N1) a cumulative interaction effect of temporal position and rhythm and later (N2 and Dm) effects driven by temporal position only. Taken together, we observed effects of temporal prediction at encoding, but these differences did not translate to later effects of memory, suggesting that effects of temporal prediction on recognition are less robust than previously thought.

References

- Jones, A., & Ward, E. V. (2019). Rhythmic Temporal Structure at Encoding Enhances Recognition Memory. *Journal of Cognitive Neuroscience*, 31(10), 1549–1562.
- Jones, A., Ward, E. V., Csiszer, E. L., & Szymczak, J. (2022). Temporal expectation improves recognition memory for spatially attended objects. *Journal of Cognitive Neuroscience*, 34(9), 1616-1629.
- Thavabalasingam, S., O'Neil, E. B., Zeng, Z., & Lee, A. C. H. (2016). Recognition Memory is Improved by a Structured Temporal Framework During Encoding. *Frontiers in Psychology*, 6(January), 1–11.

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