

Does rhythm enhance recognition memory? Evidence from behaviour and electroencephalology

ABSTRACT:

Background

This project investigated how the rhythmic presentation of stimuli (temporal expectation) affects memory. Temporal expectation enhances various cognitive processes, yet little research has examined how this affects memory.

Aims

We aimed to examine the effect of temporal expectation on behavioural recognition, with EEG recording to investigate the underlying neural mechanisms.

Method

In three experiments participants were presented with images of objects during encoding (with either rhythmic or arrhythmic onset timings) prior to a recognition test. Experiment 1 also manipulated spatial attention. Experiment 2 included a temporal sequence condition in which participants learned when to expect the next item to appear based on a repeating sequence of presentation timings, and Experiment 3 examined whether presenting items out of synchrony with an entrained rhythm would be particularly detrimental to memory.

Results

In Experiment 1 rhythmic presentation benefited memory for spatially attended objects and was associated with differential neural activity compared with when stimuli were presented in an arrhythmic manner. However, in Experiment 2 there was no effect of rhythm or temporal position, and no evidence from Experiment 3 that presenting items out of synchrony with rhythm was detrimental to memory.

Conclusions

Initial findings suggested that rhythmic presentation of stimuli in the attended field leads to enhanced recognition and distinct neural processing. However, subsequent experiments revealed no effect of temporal structure on memory, suggesting that the effect is likely very small.

Keywords

Temporal expectation, Recognition memory, EEG, Rhythmic encoding

Published Work:

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