# The Effect of Temporal Attention on Visual Discrimination and Subjective Visibility Across Different Temporal Regularities

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## BACKGROUND

### How does temporal attention affect visual perception?

Temporal attention has been shown to robustly improve discrimination performance.

Fewer studies have investigated the effect of temporal attention on subjective perception.

Either rhythm hypothesis here or non-commitant statement that obj and subj do not always overlap (e.g. in spatial attention?)

**Does temporal attention affect individual aspects of perception differently?**

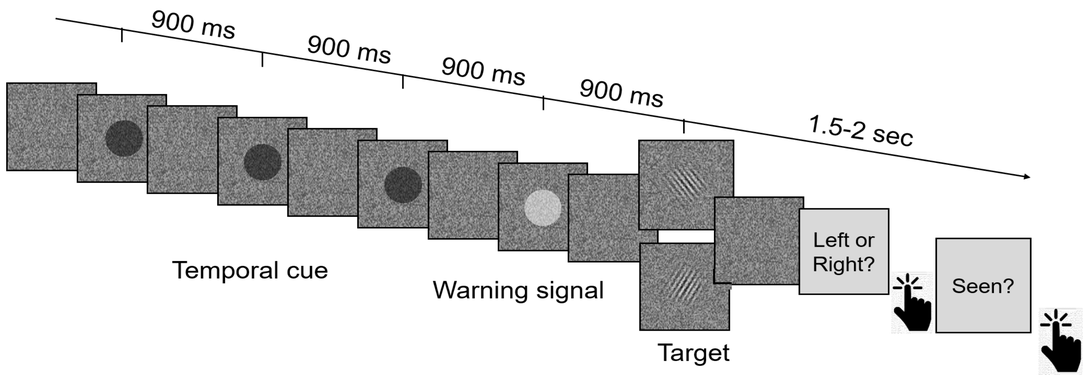
### Are rhythms special in driving temporal expectations?

Neural entrainment models suggests that rhythms uniquely drive temporal attention.

However, in a motor task, the behavioral and neural effects of temporal attention guided by rhythms and aperiodic predictable streams are comparable. (Breska & Deouell, 2017).

**Do rhythms have a unique effect on perceptual attention by driving low level oscillations?**

## METHOD

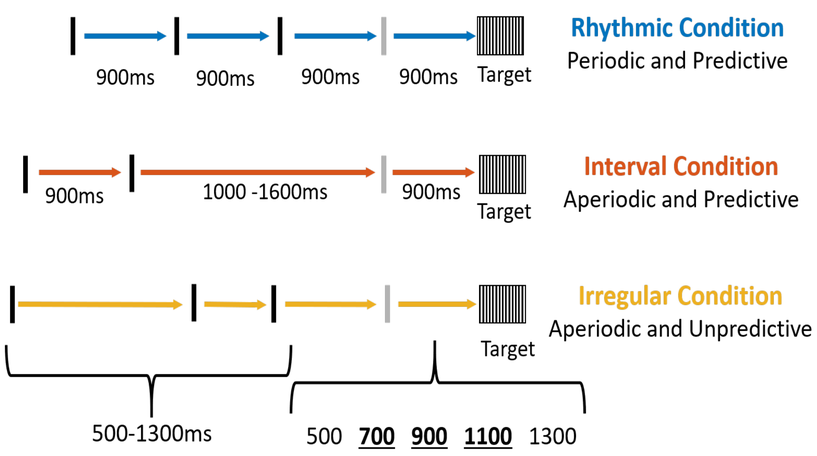



N=31

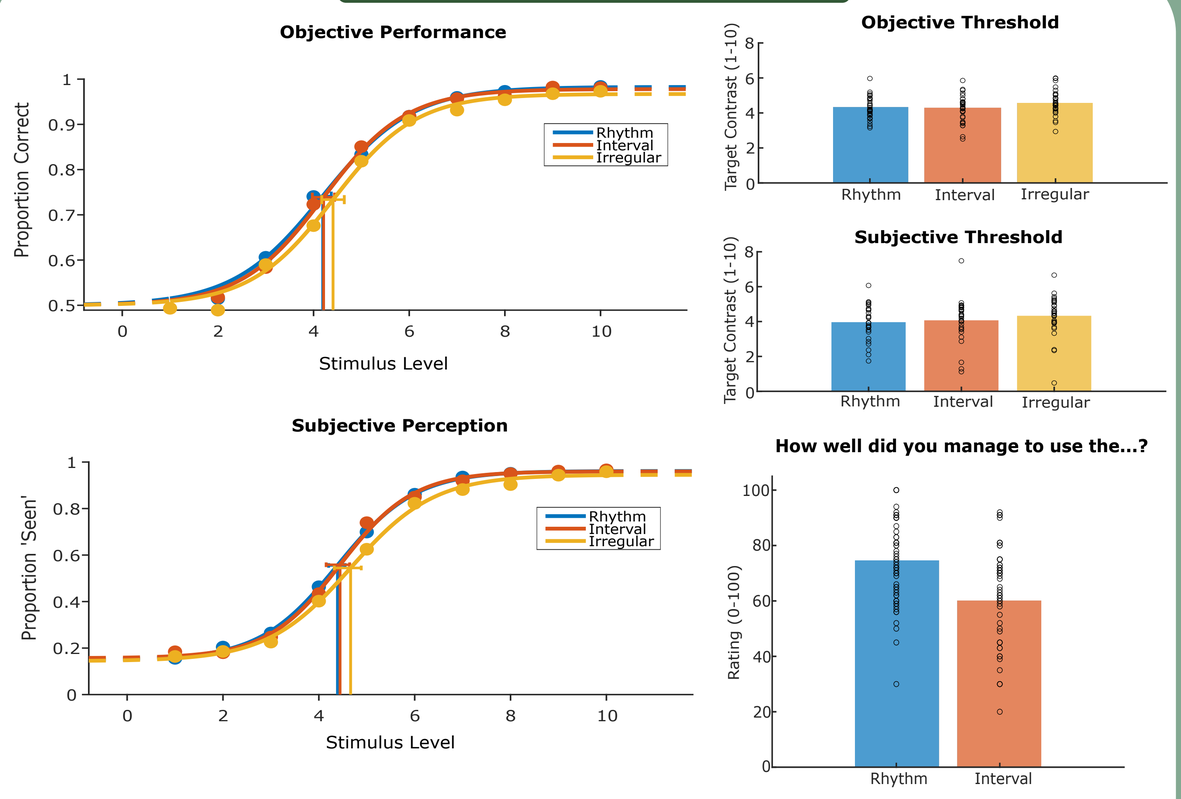
Two Sessions
(1 Behavioural & 1 EEG)

Total trials per Condition:
240 + 36 catch trials

10 Target Contrast Levels




## BEHAVIOURAL RESULTS

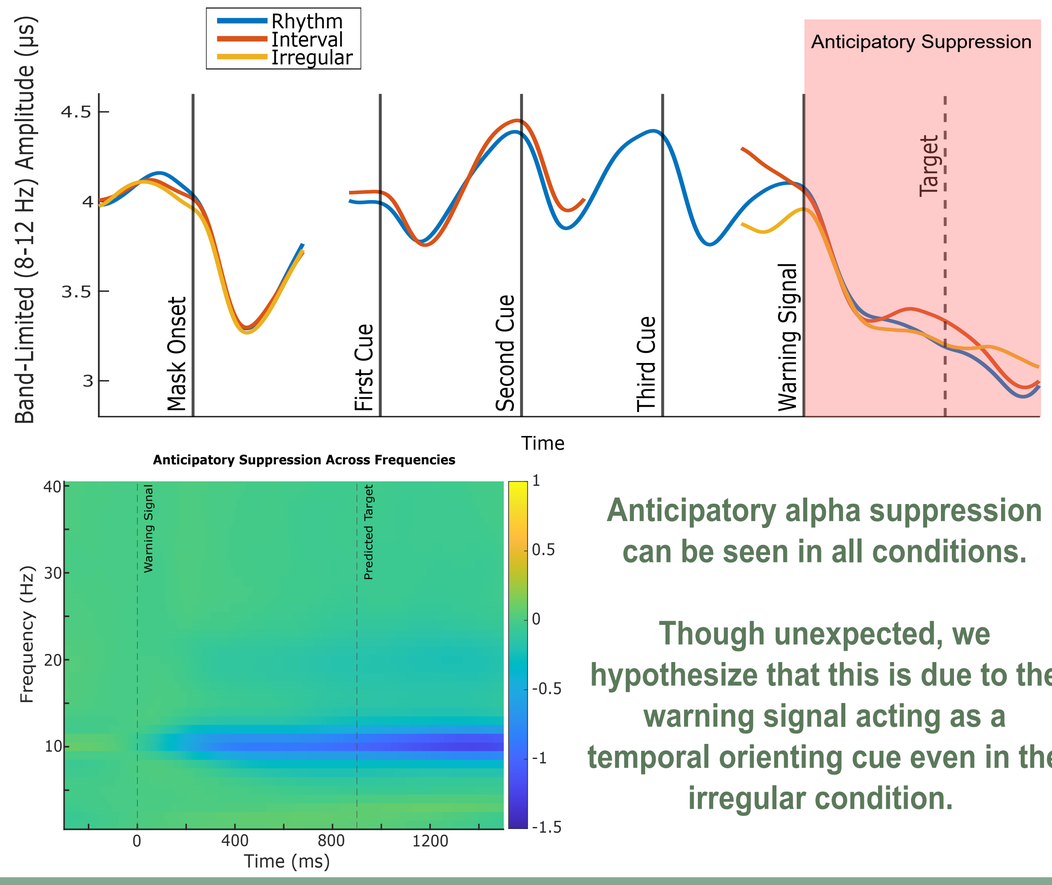



**Temporal predictability improves both objective and subjective performance**

**No difference between rhythm and interval**

## EEG RESULTS

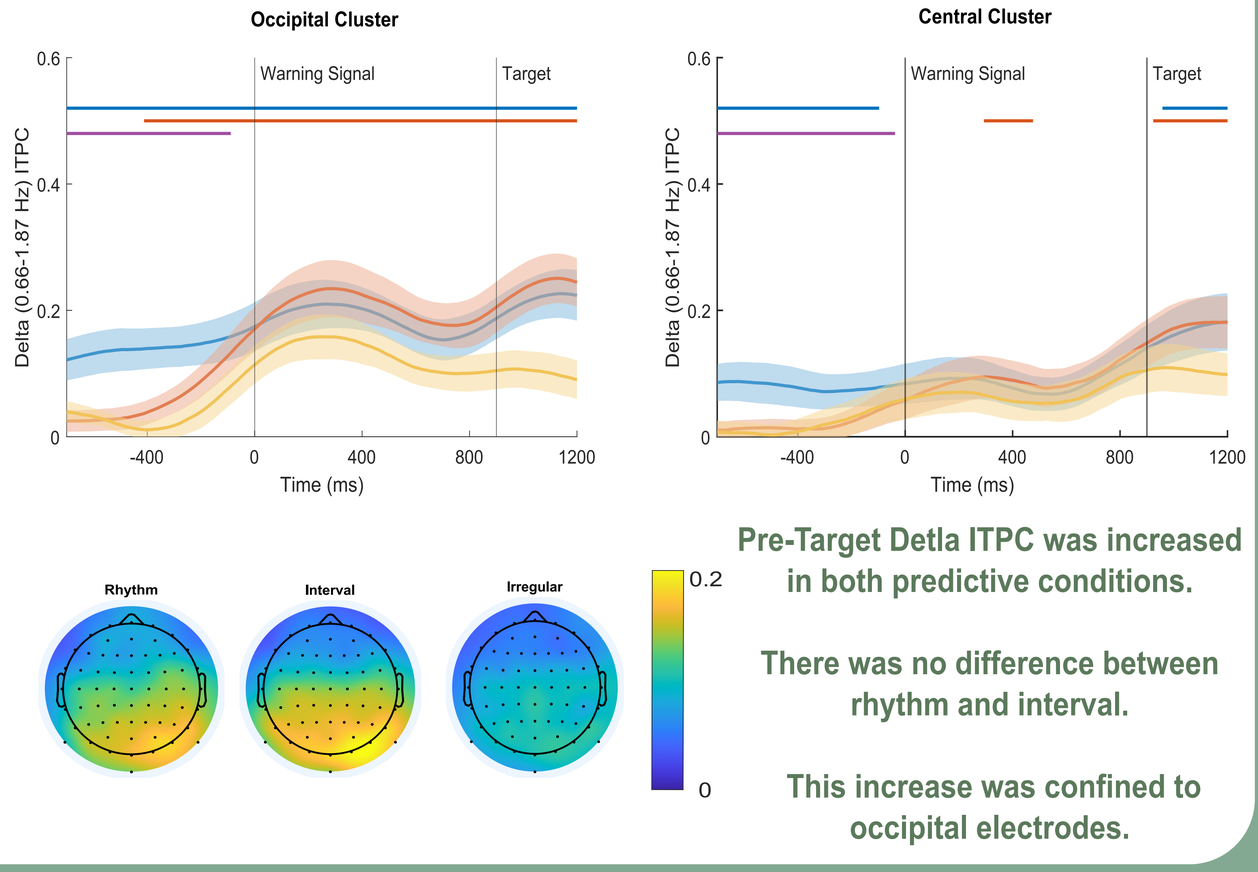
### Anticipatory Alpha Band (8-12 Hz) Amplitude Suppression




**Anticipatory alpha suppression can be seen in all conditions.**

**Though unexpected, we hypothesize that this is due to the warning signal acting as a temporal orienting cue even in the irregular condition.**

### Delta Band (0.88-1.77 Hz) Intertrial Phase Coherence




**Pre-Target Detla ITPC was increased in both predictive conditions.**

**There was no difference between rhythm and interval.**

**This increase was confined to occipital electrodes.**

## SUMMARY

### How does temporal attention affect visual perception?

- Temporal attention led to lower thresholds for both objective performance and subjective visibility.
- We found no effect on the slope of the psychometric function of either measure.
- There was no difference between rhythm and interval in their effect on perception, though participants reported that following the rhythmic cues was easier.

### Are rhythms special in driving temporal expectations?

- Temporal attention improved perception to a similar degree, regardless of cue type.
- Alpha power is suppressed in all conditions in anticipation of the target. This effect seems to be primarily driven by the warning signal, rather than by precise temporal prediction.
- Rhythm and interval both lead to a significant increase of delta ITPC compared to the irregular condition. However, we found no difference in magnitude of these effects. This suggests that delta ITPC is not specific to neural entrainment.