



# Alpha power decreases during situation model construction: Neural evidence for the structure building framework

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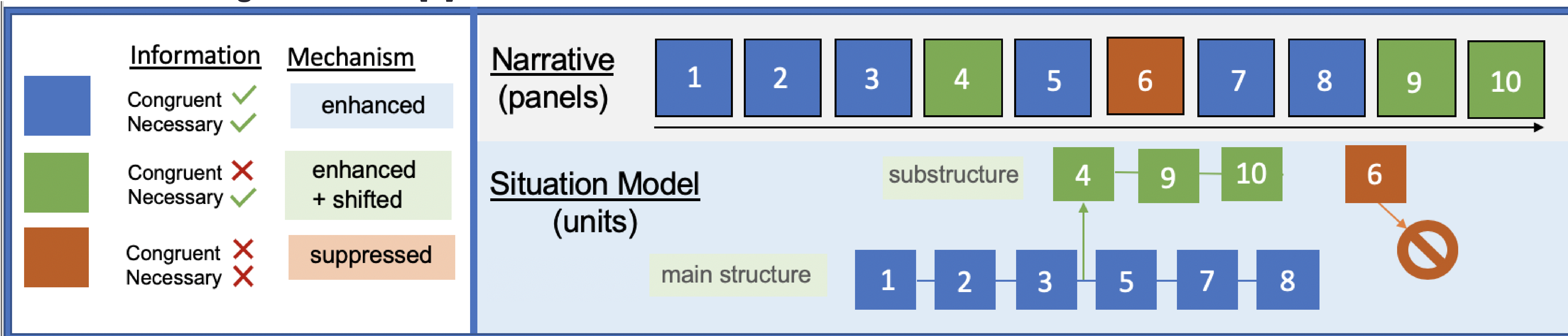
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## THEORY

## Alpha power in attentional control literature

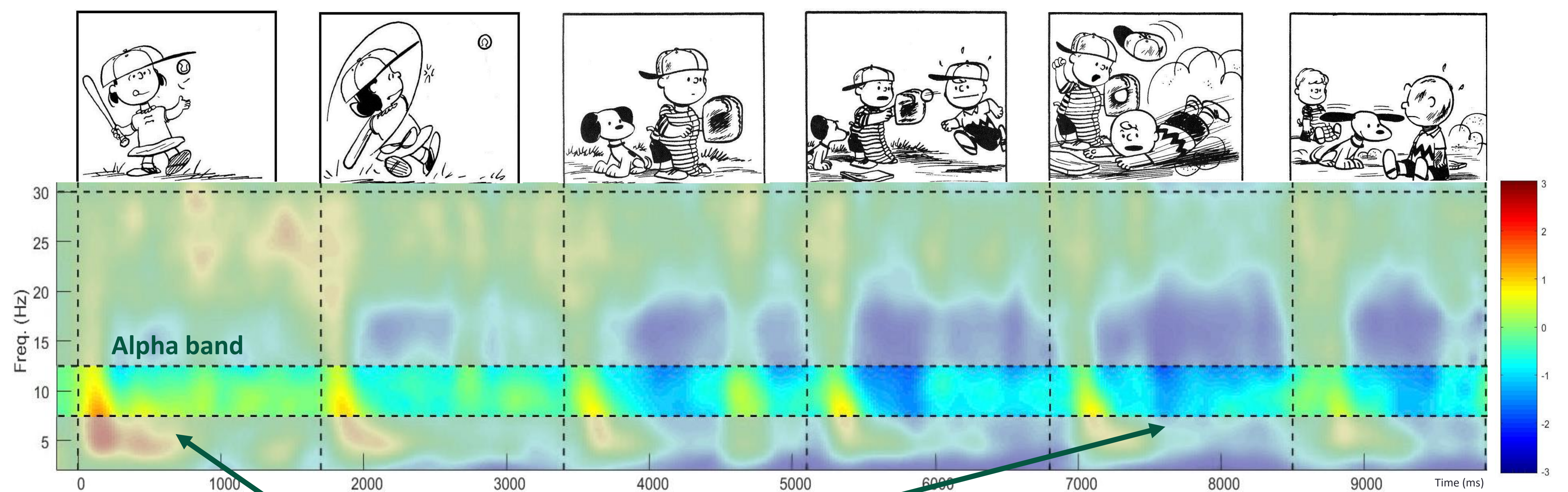
This study sought to **apply alpha power as a neural measure of shifting** in narrative comprehension.

### Structure Building Framework [1]



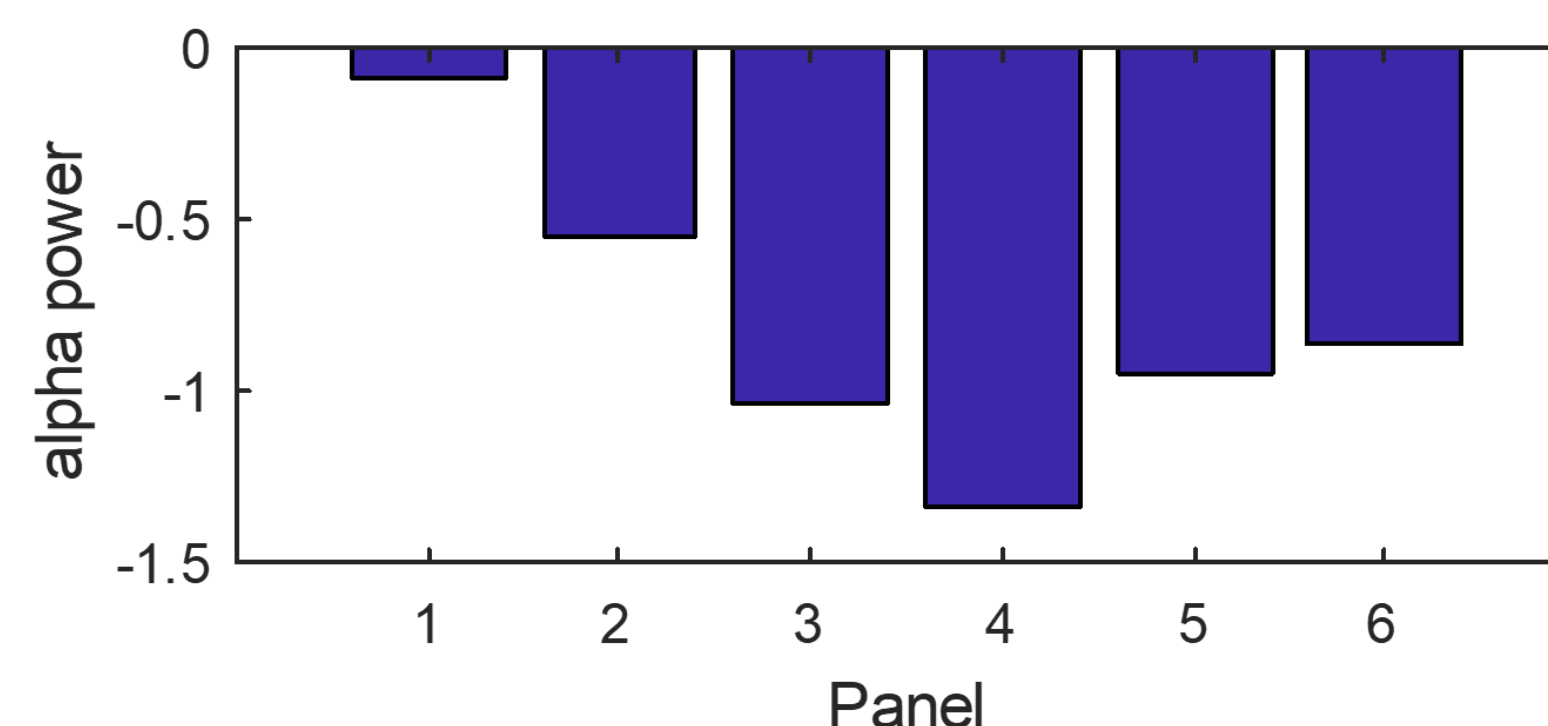
- Alpha power is correlated with attentional suppression in inter- and intra-sensory tasks [2].
- *Event-related synchrony (ERS)* = increased alpha; *event-related desynchrony (ERD)* = decreased alpha.
- The modulations in alpha power depend on the band (upper band vs. lower band [3]) & timing after stimulus (encoding vs retention [4]).

## PRELIMINARY RESULTS



At the presentation of the first panel, alpha power was high, but decreased with each subsequent panel

Peak alpha power was more delayed in later panels



Peak alpha power at the Cz electrode, averaged over 400-800 ms after each panel

## DISCUSSION

- Decrease in alpha power across the narrative supports a role of alpha in narrative comprehension
- Direction of effect and possible indications are still unclear:
  - Suppression of unnecessary information or enhancement of necessary information?
- **Future analyses:** Further explorations of these multi-dimensional data
  - Timing of ERP, retinotopic location of ERS/ERD, and frequency band (upper vs. lower)
  - Predictability of panel sequences (separate high and low predictability sequences)

## REFERENCES

[1] Gernsbacher, M. A. (1990). *Language Comprehension as Structure Building*. Hillsdale, NJ: Lawrence Erlbaum.  
 [2] Foxe, J. J., & Snyder, A. C. (2011). The role of alpha-band brain oscillations as a sensory suppression mechanism during selective attention. *Frontiers in Psychology*, 2, 1–13.  
 [3] Klimesch, W., Doppelmayr, M., Pachinger, T., & Russegger, H. (1997). Event-related desynchronization in the alpha band and the processing of semantic information. *Brain Research. Cognitive Brain Research*, 6(2), 83-94.  
 [4] Wianda, E., & Ross, B. (2019). The role of alpha oscillation in working memory retention. *Brain and Behavior*, 9.