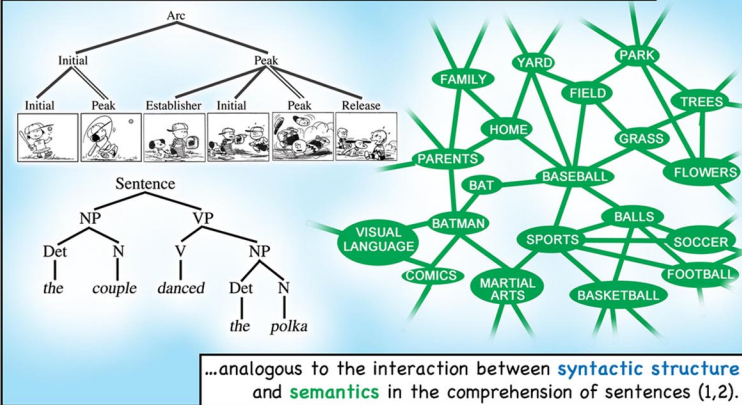


# CLIMAXING UNEXPECTEDLY

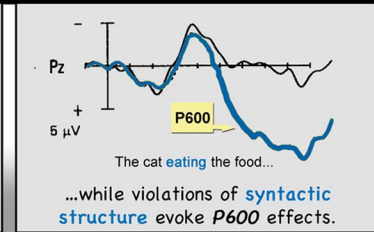
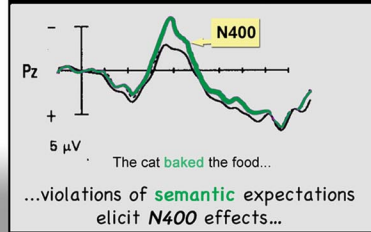
## EVENT-RELATED POTENTIALS TO STRUCTURAL & SEMANTIC VIOLATIONS IN SEQUENTIAL IMAGE PROCESSING

Neil Cohn<sup>1</sup>, Phil Holcomb<sup>2</sup>, Ray Jackendoff<sup>2</sup>, & Gina Kuperberg<sup>2</sup> <sup>1</sup>UC San Diego, <sup>2</sup>Tufts University

Recent evidence suggests that sequential image comprehension relies on an interaction between **narrative structure** and **semantic content**...



Research (3) on sentences using event-related potentials (ERPs) has shown that...



Thus, in this study, we used ERPs to determine whether the brain responds differently to violations of **narrative structure** and violations of general **semantic theme** as participants viewed visual sequences one panel at a time.

32 comic readers (15 male, 17 female, mean age: 20)

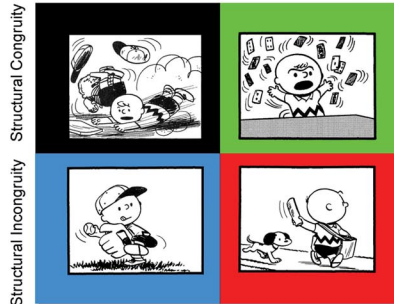
### Normal

The critical panel was semantically related to its context and depicted a narrative climax.

### Structural Violations

The critical panel violated structural expectations by introducing a narrative initiation rather than a climax, but was semantically related to the context.

Semantic Congruity    Semantic Incongruity



### Semantic Violations

The critical panel was semantically unexpected (content was unrelated to its context), but structurally expected (still a narrative climax).

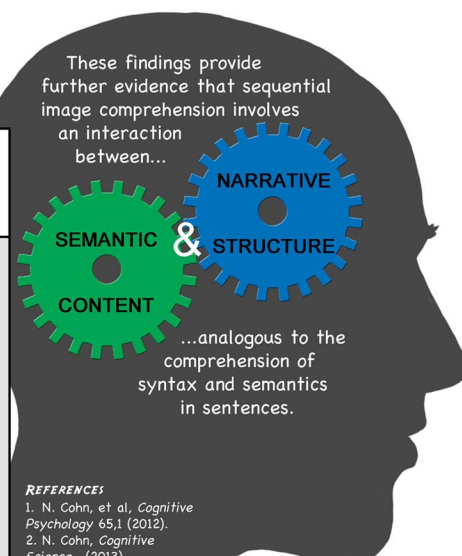
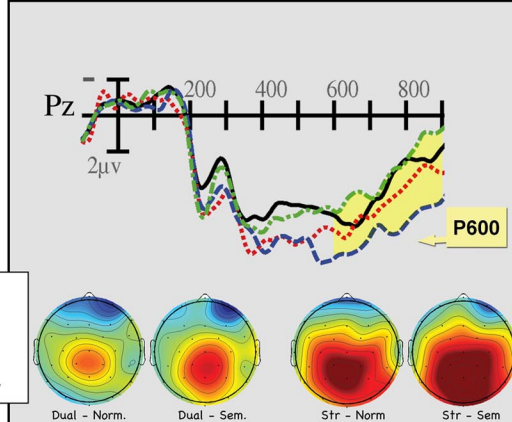
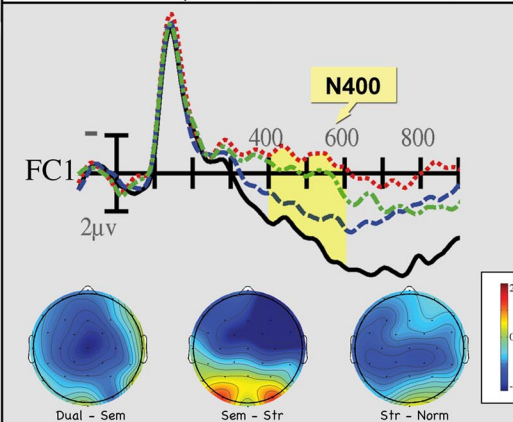
### Dual Violation

The critical panel was both structurally and semantically unexpected (a semantically unrelated narrative initiation).



The **N400** evoked by **critical panels** was smaller when the content was semantically expected (**Normal, Structural Violations**) than unexpected (**Semantic and Dual**).

At the **subsequent panel**, the **P600** was larger following structural violations (**Structural and Dual**) than following a coherent structure (**Normal, Semantic Violations**).



#### REFERENCES

1. N. Cohn, et al, *Cognitive Psychology* 65,1 (2012).
2. N. Cohn, *Cognitive Science*, (2013).
3. L. Osterhout & J. Nicol. *Language and Cognitive Processes* 14,3 (1999).

#### ACKNOWLEDGEMENTS

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