

Background

It sometimes happens that when someone asks a question, the addressee does not give an adequate answer, for instance by leaving out information. The person who posed the question may wonder why the information was omitted, and engage in extensive processing to find out what the partial answer means. In an ERP experiment (measuring Event Related brain Potentials), we looked at the neural correlates of the pragmatic processes invoked by partial answers.

Experiment

Materials (translated from Dutch)

Neutral

Q: "What happened?"

A: "The mayor praised the councilor."

Violation

Q: "What did the mayor and the alderman do?"

A: "The mayor praised the councilor."

Procedure

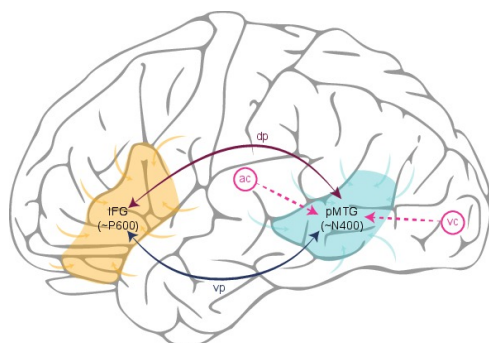
Visual presentation, word-by-word in the center of a computer screen (240 ms on, 240 ms off).

Participants read for comprehension, and judged semantic relatedness of an occasional probe word to the preceding sentence by means of yes/no keys on a computer keyboard.

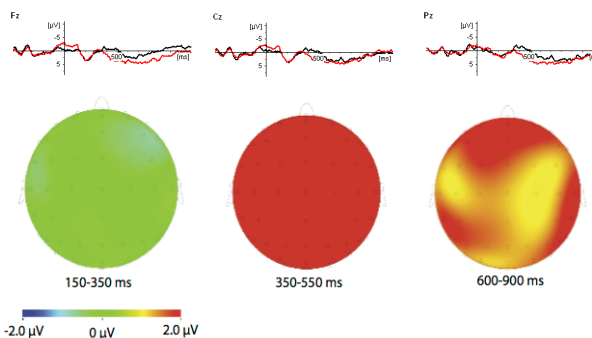
Hypotheses

Retrieval-Integration view (Brouwer, Fitz, & Hoeks, 2013; Brouwer & Hoeks, submitted; Hoeks & Brouwer, to appear):

- **N400** amplitude reflects lexical retrieval
- **P600** amplitude reflects (re-)construction of MRC: Mental Representation of What is Communicated



Results



Early Time-Window (150–350 ms)

No significant effects.

N400 Time-Window (350–550 ms)

Significant effect of Violation at all electrode sites: Violation condition more *positive* than Neutral condition.

P600 Time-Window (600–900 ms)

Significant effect of Violation at frontal electrode sites: Violation condition more *positive* than Neutral condition.

Conclusion

Violating the strong dependency between questions and answers invoked **pragmatic** processes that modulate the amplitude of the P600 component.

We interpret this P600-effect as reflecting the increased effort in creating a coherent Mental Representation of what is being Communicated.

Our study is one of the first investigating **language processing in conversation**, be it that participants were 'eavesdroppers' instead of real interactants.

Our results contribute to the as of yet small range of **pragmatic** phenomena that modulate the processes underlying the P600 component (e.g., Regel, Gunter, & Friederici, 2011; Schumacher, 2011).

References:

- Brouwer, H., Fitz, H., & Hoeks, J.C.J. (2012). Getting Real about Semantic Illusions: Rethinking the Functional Role of the P600 in Language Comprehension. *Brain Research*, 1448, 127-143.
- Brouwer, H., & Hoeks, J.C.J. (submitted). A time and place for language comprehension: Mapping the N400 and the P600 to a minimal cortical network. *Frontiers in Human Neuroscience*.
- Hoeks, J.C.J., & Brouwer, H. (to appear). The electrophysiology of discourse and conversation. In: T. Holtgraves (Ed.), *Oxford University Handbook of Language and Social Cognition*. Oxford University Press: Oxford.
- Regel, S., Gunter, T., & Friederici, A. (2011). Isn't it ironic? An electrophysiological exploration of figurative language processing. *Journal of Cognitive Neuroscience*, 23, 277-293.
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