



Honorable buddy: Electrophysiological effect of the change in functional language style

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Research question: How does the brain process the information about functional language style?
Applying the method of **event-related potentials (ERPs)** we can analyze brain responses related to language processing.

ERP studies on discourse processing

Van Berkum et al. 1999 (an experiment on Dutch)

Semantic violations

Zoals afgesproken zou Jane om vijf uur 's ochtends haar zus en haar broertje wakker maken. Maar de zus had zich al gewassen, en het broertje had zich reeds aangekleed.

As agreed upon, Jane was to wake her sister and her brother at five o'clock in the morning. But the sister had already washed herself, and the brother had even got dressed.

Jane vertelde het broertje dat hij bijzonder **vlot/traag was**.

*Jane told the brother that he was exceptionally **quick/slow**.*



An **N400** effect (a **negativity** peaking at **400 ms** post stimulus that reflects the cost of semantic or thematic integration (Kutas & Hillyard, 1980)). Global semantic manipulations at the level of the discourse also affect the N400

Pijnacker et al. 2009 (an experiment on Dutch)

Defeasible reasoning

Lisa probably **lost** a contact lens / Lisa has recently **bought** contact lenses.

If Lisa is going to play hockey, then she will wear contact lenses.

Lisa is going to play hockey.

Lisa will wear contact **lenses**.



The disabling condition elicited a widely distributed **sustained negativity** relative to its congruent counterpart. This negativity started around **250 ms** after onset of the final word of the conclusion and was persistent throughout the entire epoch.

Politzer-Ahles et al. 2013 (an experiment on Mandarin)

Picture-sentence verification

scalar implicatures – **some of** and **all of** vs. pictures



Pragmatically inconsistent quantifiers elicited a **sustained posterior negativity (500-1000 ms)** that also appeared earlier in the epoch

Present study (on functional style changes in Russian)

Methods

Materials: 80 experimental items both in formal style and slang in two conditions (with and without style violation), 2 experimental lists, 40 fillers in each list

1. Formal style

(1a) На торжественном празднике у орнитолога его **коллеги** ни в чем себе не отказывали.

*At the grand party organized by the ornithologist his **colleagues** did not deny themselves anything.*

(1b) * На торжественном празднике у орнитолога его **кореша** ни в чем себе не отказывали.

*At the grand party organized by the ornithologist his **buddies** did not deny themselves anything.*

2. Slang

(2a) На улётной тусовке у ханыги его **кореша** отрывались по полной.

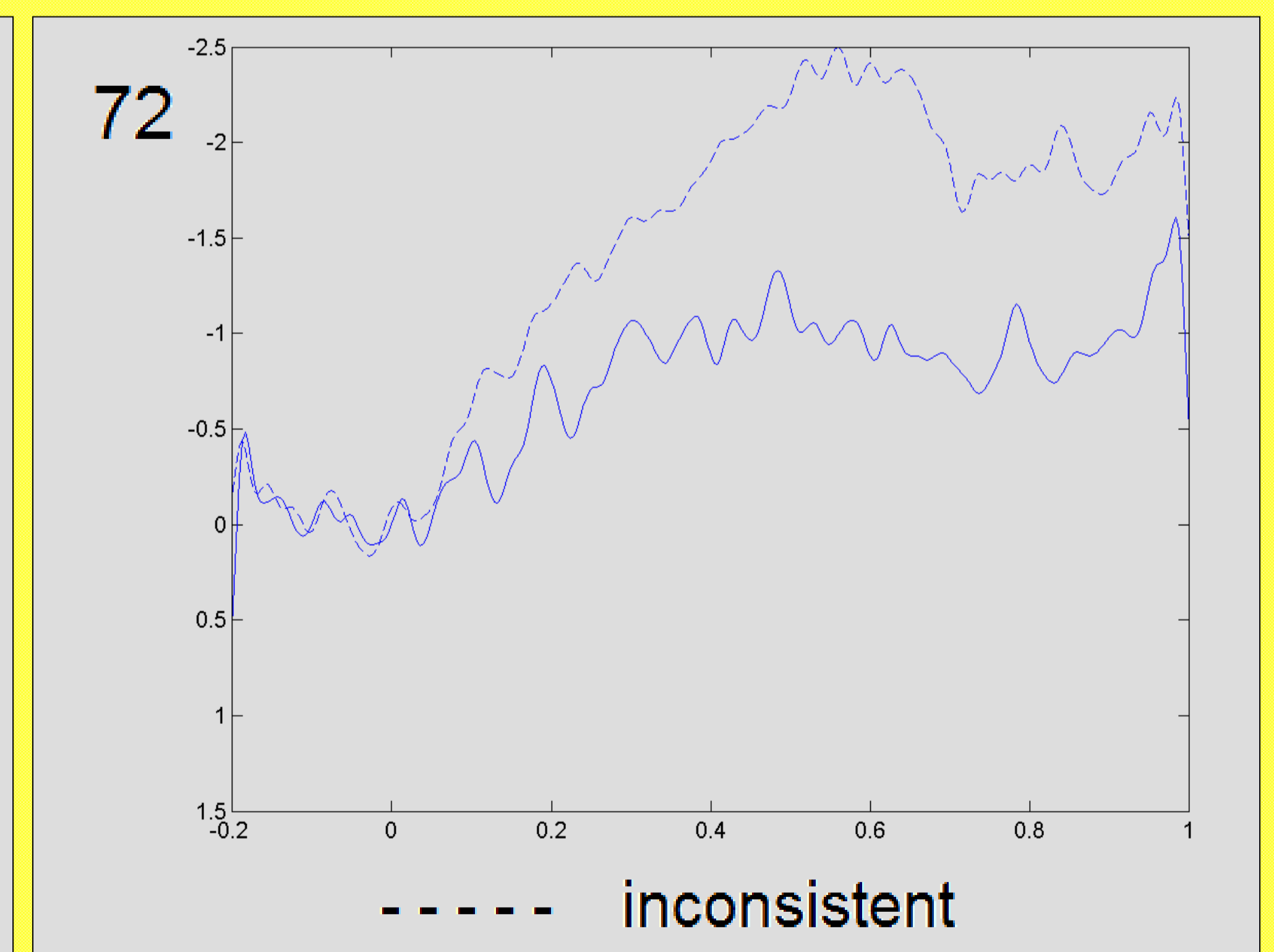
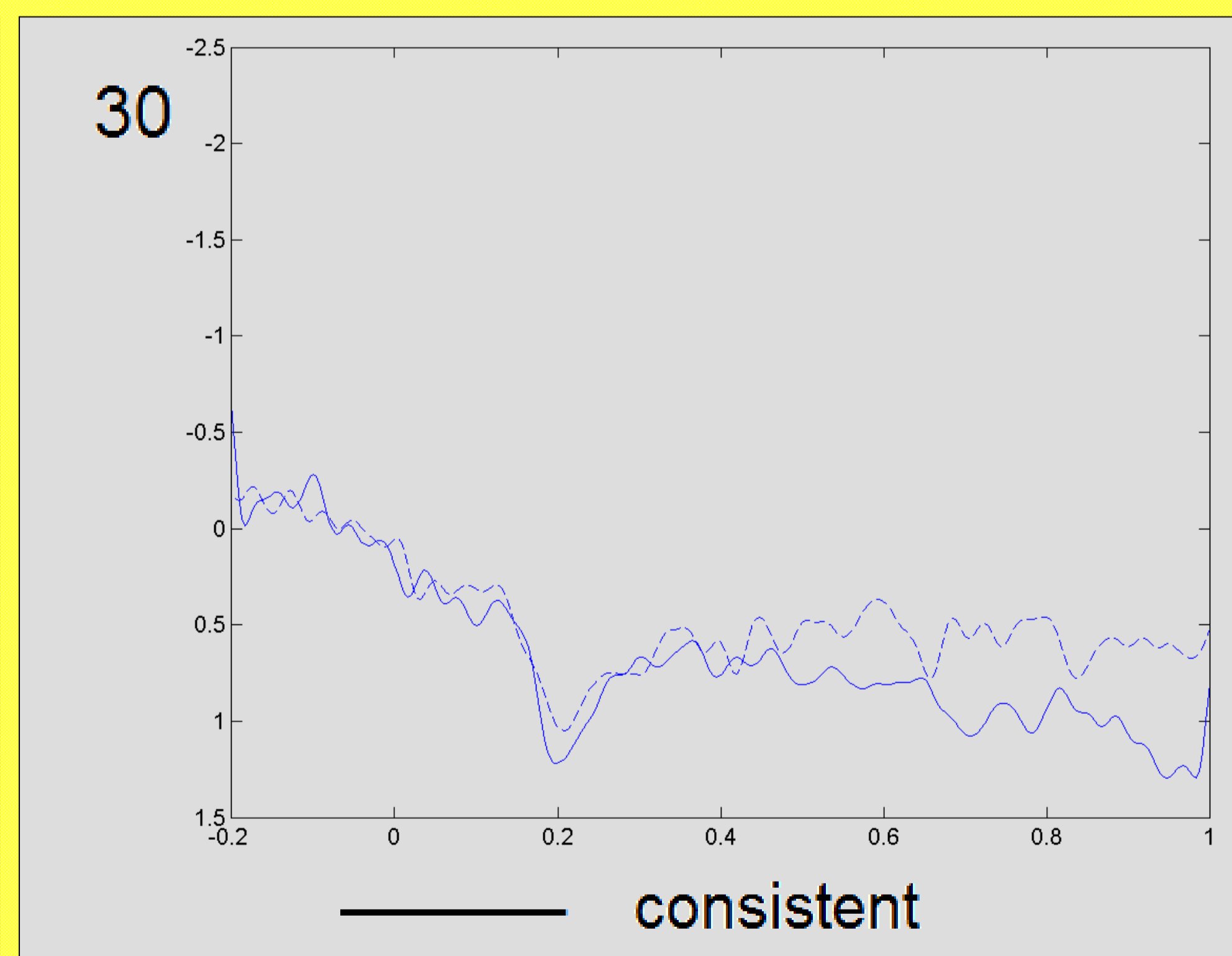
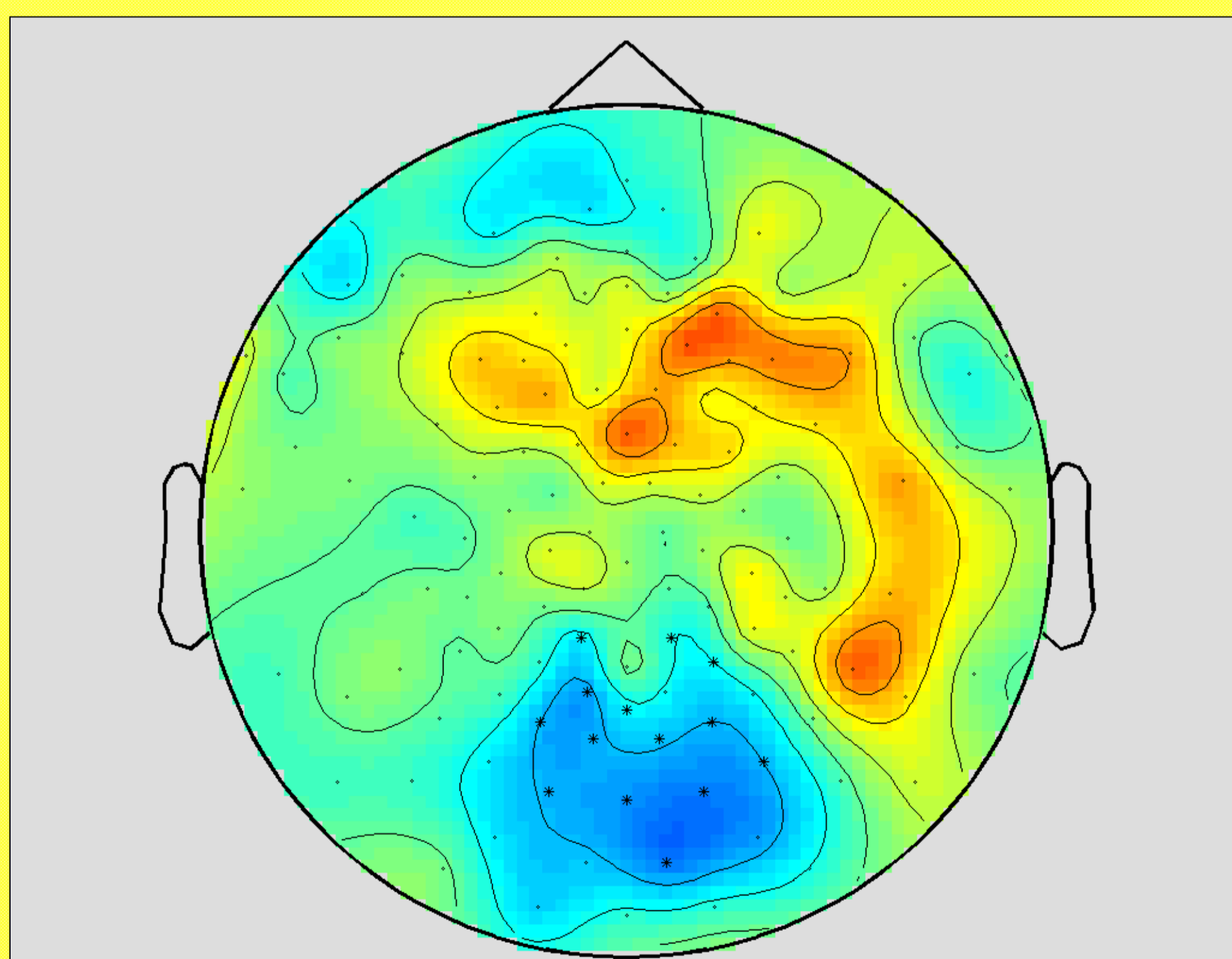
(2b) * На улётной тусовке у ханыги его **коллеги** отрывались по полной.

Participants: 35 native Russian speakers (29 female, 6 male, mean age 22)

Procedure: The sentences were presented auditorily. Participants were instructed to listen sentences for comprehension. 33% of sentences were followed by questions: participants had to say whether the word presented had been mentioned in the previous sentence.

EEG recordings: EEG was recorded using 128 electrodes mounted in an elastic net (Electrical Geodesics Inc.). Impedance was kept below 50 kΩ.

Results



Discussion

The effect accompanying functional style changes is different from the N400 effect, the standard marker of semantic integration difficulties.

The observed negativity has similar to N400 scalp distribution while it is statistically significant within 550-1000 ms.

The negativity caused by functional style change resembles the sustained posterior negativity described in Politzer-Ahles et al. (2013).

References

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