

LEXICAL PRE-ACTIVATION AND POST-LEXICAL INTEGRATION ACCOUNTS OF THE N400: WHEN SEMANTIC RELATIONAL PRIMING INTERACTS WITH WORDS' SYNTACTIC CATEGORIES

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Poster and references:



WHAT MECHANISMS ELICIT THE N400 PRIMING EFFECT?

Many studies found that context influences meaning retrieval in sentences but also in priming experiments.

McKoon & Ratcliff (1995) relational priming experiment showed that related word pairs of a given semantic relation (e.g., antonyms) showed **stronger priming effects when embedded in a list with other prime-target pairs of the same semantic relation** than in a list promoting a different relation (e.g., synonyms).

Steinhauer et al. (2017) showed that this effect was reflected by **an N400 with a later onset (>400ms)**

This effect would be compatible with:

PREDICTIVE PROCESSING

Predicting the target would lead to orthographic and semantic pre-activations in long-term and working memory. They would either facilitate target processing or need to be inhibited in case of prediction error.

This approach is supported by Lau et al. (2013) who found N250 and N400 priming effects for lists with a high Relatedness Proportion (RP, 50% of related pairs) relative to lower RP levels (10%).

In Steinhauer et al. (2017), the 250ms Stimulus Onset Asynchrony (SOA) may have been too short for predictive processes to be completed before target presentation. This may have led to delayed prediction-based priming effects.

POST-LEXICAL INTEGRATION

The promoted semantic relation would be used in analogical reasoning in order to integrate the target with the preceding prime.

These integration processes would follow lexical retrieval and therefore have a late onset (Steinhauer et al., 2017).

In the current experiment, we:

- used a 450ms SOA (200ms longer than Steinhauer et al., 2017)
- promoted a syntactic category in each list (Adj., Noun, Verb)
- used the same words to create unrelated pairs
- used additional semantic relations

RESEARCH QUESTIONS

Does a longer SOA lead to consistency effects:

- reflected by an N250 and an early N400 as predicted by the expectancy-based mechanism
- a late N400 as predicted by post-lexical integration?

Does words' syntactic category interact with the semantic relational priming?

CONCLUSION

EFFECTS OF SEMANTIC AND SYNTACTIC INCONSISTENCIES

Each word-pair list promotes a **specific semantic relation** and a **syntactic category** creating three types of inconsistent related pairs

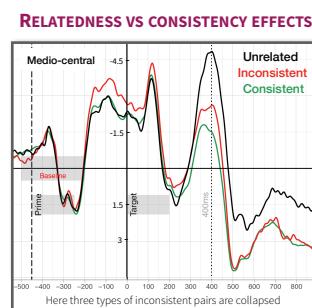
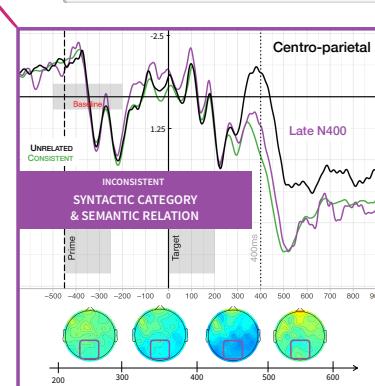
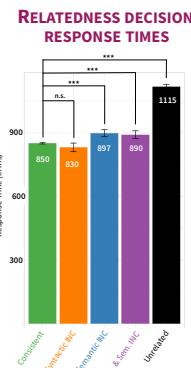
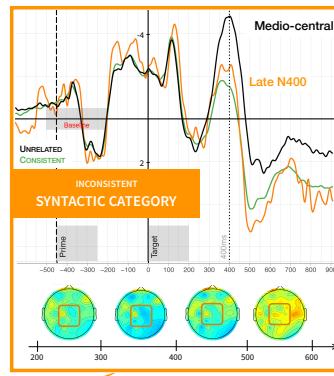
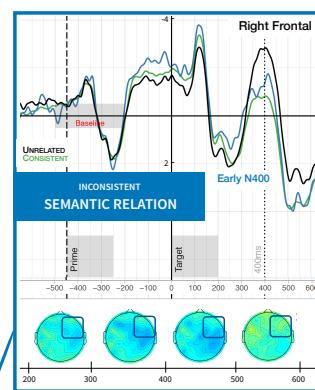
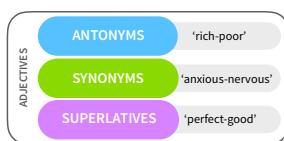


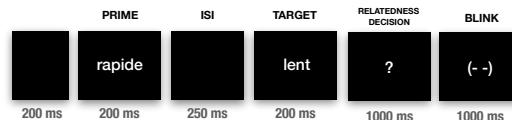
Illustration of an experimental block promoting adjectives antonyms →

The EEG of 36 right-handed native French speakers was recorded while participants **read** and subsequently judged the relatedness of 720 prime-target pairs distributed in 9 different blocks of 80 French word pairs. The 9 combinations of promoted semantic relations and syntactic categories are displayed below.



Identical words were used to create all three conditions across subjects (consistent, inconsistent, unrelated). Presentation order was pseudo-randomized and counterbalanced across experimental lists.

Stimulus Onset Asynchrony (SOA): 450 ms



METHODOLOGY

REFERENCES

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