

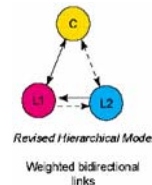
Evoked gamma-band oscillations in single-word translation

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Introduction

Cognate words are usually recognized and translated faster/easier than non-cognate words. Is this facilitated processing based on a common set of form-based representations in both languages only or word semantics is involved in the processing? At what point the concreteness effect emerges during word recognition? Are evoked gamma oscillations sensitive to psycholinguistic characteristics?

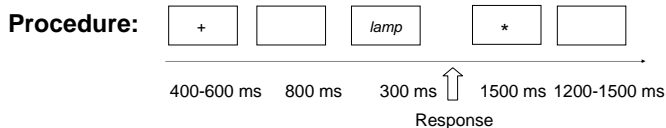


Method

Participants: 22 right-handed Bulgarian-English bilinguals (19 females; mean age=22, SD=3.1 years).

Stimuli: N=52 per condition

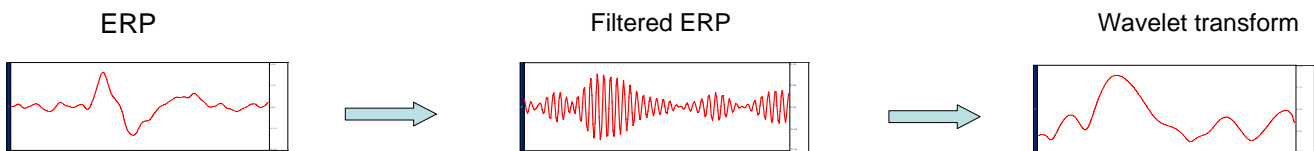
	Cognate	Non-Cognate
Concrete	<i>lamp</i>	<i>elephant</i>
Abstract	<i>method</i>	<i>freedom</i>



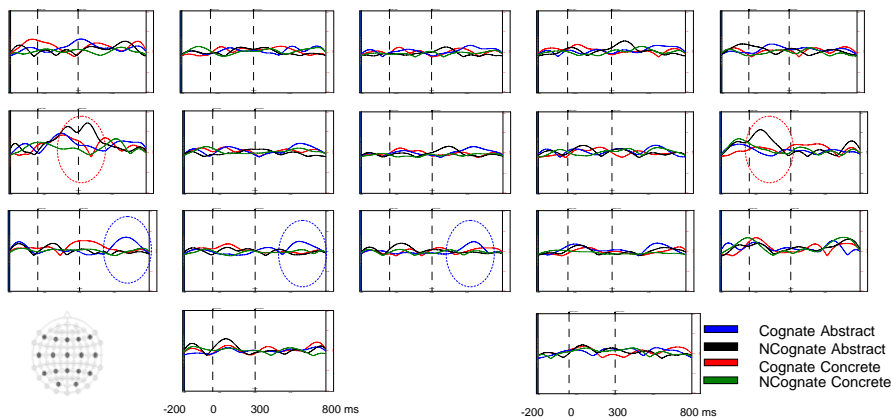
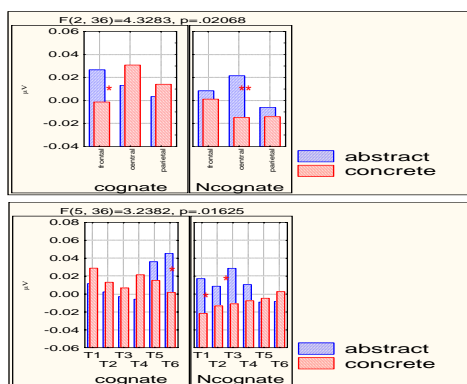
Task: to translate aloud words from English into Bulgarian as quickly and accurately as possible, avoid hesitation markers and remain silent if the word translation is unknown.

Results

analyses on evoked gamma oscillations (35-40 Hz)



Repeated measures ANOVA on mean amplitude : Cognate x Concreteness x Topography x Region x Time window (T1=100-200, T2=200-300, T3=300-400, T4=400-500, T5=500-600, T6=600-700 ms after the stimulus onset).



Conclusion

- Evoked gamma-band oscillation was sensitive to the manipulation of psycholinguistic characteristics;
- Cognate processing is not based solely on a lexical level - it involves semantics although the semantics was activated much later than in non-cognates;
- The patterns of brain activity suggest differential processing of cognates and non-cognates in terms of temporal and spatial distribution and access to semantics;
- Semantic effect in non-cognates in temporal region fits the neuroimaging data of L1 single word processing (e.g., Wise et al, 2000) suggesting that L2 processing of non-cognates resembles L1 processing of words with similar characteristics.

References

Wise, R.J.C., Howard, D., Mummery, C.J., Fletcher, P., Leff, A., Büchel, C., Scott, S.K. (2000). Noun imageability and the temporal lobes. *Neuropsychologia*, 38, 985-994.