

The role of animacy violation in bilingual figurative language processing: ERP studies mgr Patrycja Kakuba (Adam Mickiewicz University, Poznań)

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OBJECTIVE

The PhD project aims to investigate novel metaphor comprehension with and without animacy violation (a combination of an adjective that suggests animacy with an inanimate noun e.g., *healthy bike*) in the native (Polish) and non-native language (English) using the electroencephalogram (EEG).

Keywords: novel metaphors, animacy violation, bilingualism, ERPs

BACKGROUND

- ✓ We use figurative language every day and we convey our thoughts through it.
- ✓ Electrophysiological research shows that novel metaphors require increased cognitive effort in comparison to literal sentences, resulting in increased N400 amplitudes (Rataj, 2014; Pynte et al. 1996; Jankowiak et al. 2017; Rataj et al. 2018; Lai et al. 2009; Coulson and Van Petten 2002).
- ✓ Studies outside the context of figurative language comprehension have shown that animacy evokes increased LPC amplitudes (Szweczyk and Schriefers 2011).
- ✓ **There is still a gap in research on the aspect of animacy violation in figurative language comprehension and the role of bilingualism in figurative language processing.**

HYPOTHESES

1. Novel metaphors are expected to evoke increased N400 amplitudes in the native language (L1: Polish) and the non-native language (L2: English)
2. The results are expected to show a graded N400 effect with the largest N400 amplitudes for anomalous sentences, followed by moderate amplitudes for novel metaphors, and the smallest for literal sentences
3. We predict that the LPC amplitudes will be increased for novel metaphors with animacy violation as compared to novel metaphors without animacy violation.
4. The LPC amplitudes are expected to be larger for anomalous sentences than for literal sentences.
5. In terms of the language component of the study, the N400 amplitudes are expected to be smaller and delayed for the English stimuli in comparison to the Polish stimuli.

BIBLIOGRAPHY



SCAN ME

PARTICIPANTS

•NORMATIVE STUDIES:

30 native speakers of Polish, English, and proficient English L2 speakers per questionnaire

•EEG STUDY:

40 Polish-English bilinguals

LANGUAGE PROFICIENCY: highly proficient speakers of English (non-dominant L2) as evaluated using LexTALE (Lemhöfer and Broersma 2012) and Language History Questionnaire 3.0 (LHQ; Li et al. 2014).

HANDEDNESS: right-handed as checked using the Edinburgh Handedness Questionnaire (EHQ; Oldfield 1971).

ADDITIONAL EXCLUSION CRITERIA: no language difficulties (e.g. dyslexia), no neurological disorders, no alcohol and drug abuse.

ETHICS: AMU ethics committee approval, informed consent, data anonymity, debriefing, compensation for devoted time

NORMATIVE STUDIES

Before the EEG study a series of questionnaires with a 7-point Likert scale will be conducted.

CONCRETENESS QUESTIONNAIRES (1- very concrete; 7- very abstract) for the target nouns.

METAPHORICITY (1- very literal; 7-very metaphorical) to ensure that the novel metaphors will be comprehended as expected.

MEANINGFULNESS QUESTIONNAIRES (1- very meaningless; 7- very meaningful), to ensure that the meaning of literal sentences and metaphors is clear for the participants. Additionally, in another questionnaire 10 participants will be asked to explain the meaning of the novel metaphors.

FAMILIARITY QUESTIONNAIRE (1- very unfamiliar, 7- very familiar) to ensure the novelty of metaphors.

VALENCE QUESTIONNAIRE (1- very negative; 7- very positive) to ensure that the sentences are neutral or leaning towards positive.

CLOZE PROBABILITY, where the participants are given the sentences without the target word and are asked to fill in the blank. Probability of sentences influences the N400.

EEG STUDY

QUESTIONNAIRES

(LHQ, LexTALE, Handedness)

PRACTICE BLOCK

BLOCK 1 (PL/EN)

BLOCK 2 (PL/EN)

SENTENCES

TYPES OF SENTENCES:

- 100 Polish and 100 English novel metaphors with animacy violation
- 100 Polish and 100 English novel metaphors without animacy violation
- 100 Polish and 100 English literal sentences
- 100 Polish and 100 English anomalous sentences

• **READABILITY** of the sentences will be checked using Gunning Fog Index (Gunning 1964) for English stimuli and Jasnopis (Gruszczynski and Ogrodniczuk 2015) for Polish stimuli to ensure that the sentences are not too complex or simple.

TARGETS

GENERATED from Subtlex-PL (Mandera et al. 2014) and Subtlex-UK (Van Heuven et al. 2014).

- **LENGTH:** (5-13 letters): longer words (8-13 letters) cause inhibition in language processing, whereas short words (3-5 letters) result in facilitation (Balota et al. 2006)
- **FREQUENCY:** (3-5,5 Zipf scale): high-frequency are processed faster in comparison to low-frequency words, which are processed slower (McNamara 2005)
- **CONCRETENESS:** concrete words (e.g., *car*) are easier to visualize, whereas abstract words (e.g., *truth*) are hard to imagine. Concreteness influences language processing speed (Balota et al. 2006). Therefore, selected nouns are concrete.
- **ANIMACY:** to create animacy violation target nouns needed to be inanimate (e.g., *chair*),
- **VALENCE:** negative words influence the event-related components resulting in larger amplitudes (Delaney-Busch et al. 2016). Therefore, neutral, or slightly positive nouns were chosen.
- Compound nouns, proper names, Polish-English cognates and Polish-English interlingual homographs were excluded.

ADJECTIVES

- **GENERATED** from Subtlex-PL (Mandera et al. 2014) and Subtlex-UK (Van Heuven et al. 2014).
- **LENGTH:** (5-13 letters)
- **FREQUENCY:** (2,5-5 Zipf scale)
- **ANIMACY:** in the animacy violation condition adjectives needed to suggest animacy (e.g., *honest*). In other conditions, the adjectives do not suggest animacy.
- **VALENCE:** neutral, or slightly positive adjectives were chosen

EEG TASK

SEMANTIC DECISION TASK

Decide if a given sentence is meaningful or meaningless.

This was a tasty sandwich

NO

YES