

Grammatical gender processing in Slovak: An ERP study

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During language production, speakers regularly need to retrieve relevant lexico-syntactic features like grammatical gender. It is still unclear, however, whether grammatical gender is always processed during language production even when gender information is not needed for the speech output [1, 2]. Furthermore, it remains debated whether gender-marked bound morphemes are selected by competition, like free-standing gender-marked morphemes [3, 4, 5]. The present study addresses these research gaps by examining grammatical gender processing in Slovak speech production. In two picture-word interference tasks, 34 Slovak speakers named 60 pictures with bare nouns (e.g., *ruka* - 'hand') and noun phrases containing gender-marked ordinal numbers (e.g., *prvá ruka* - 'first hand') while ignoring a superimposed gender-congruent or incongruent distractor word. During both experiments, we recorded naming latencies and the electroencephalogram of participants. All data were analysed using mixed-effects models.

In line with our predictions, naming latencies only differed between gender-congruency conditions during noun phrase naming (but not during bare-noun naming). However, this difference was restricted to noun phrases containing the ordinal *druhý* ('second'), suggesting that grammatical gender processing was influenced by an unpredicted factor during noun phrase production. On the electrophysiological level, the gender-incongruent condition evoked larger voltage amplitudes than the congruent condition during both tasks. We observed a P300-like effect for bare-noun production (Figure 1) and an N400-like effect for noun-phrase production (Figure 2); both effects were modulated by gender congruency.

Taken together, these results suggest that grammatical gender is always processed during Slovak production, as indicated by the modulation of the EEG signal, but that its selection can either be bypassed or is not detected by naming latencies when gender information is not required for the utterance format. Moreover, the emergence of distinct ERP components for both experiments might be linked to the gender feature of the distractor interfering at different processing stages during bare noun and noun phrase production in Slovak. Lastly, gender-marked bound morphemes seem to be selected by a competitive processing mechanism, similar to free-standing gender-marked morphemes in other Slavic and Germanic languages.

References

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Figures

Figure 1: Mean voltage amplitudes depicted by condition over time during bare noun production (Experiment 1). The main time window of interest from 200 to 500 ms is highlighted in grey. Negative voltage amplitudes are plotted up.

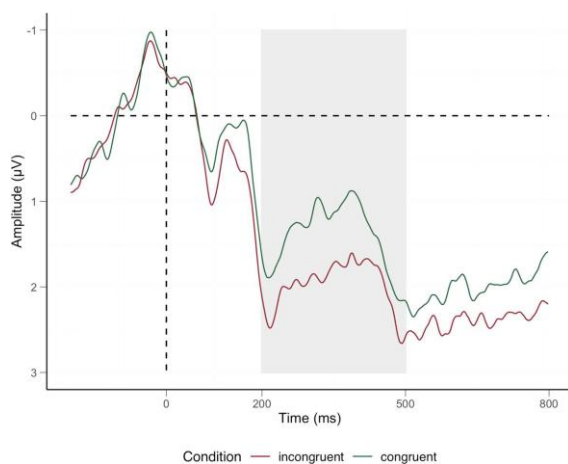
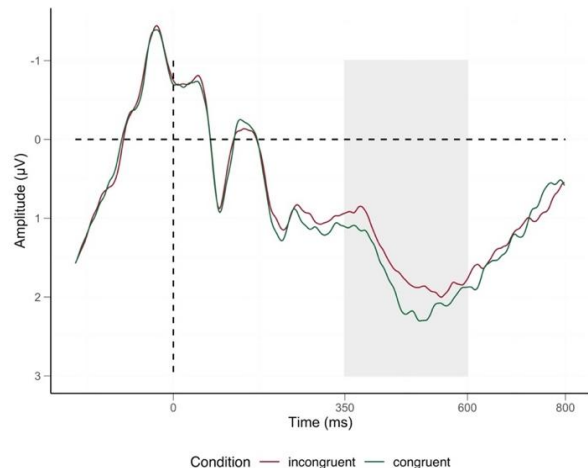


Figure 2: Mean voltage amplitudes depicted by condition over time during noun phrase production (Experiment 2). The main time window of interest from 350 to 600 ms is highlighted in grey. Negative voltage amplitudes are plotted up.



Optional Supplemental Information

Slovak distinguishes three gender classes (masculine, feminine, and neuter) which encompass all nouns of the language. The allocation of nouns to a gender class can be seen as rather opaque, as there are at least four declensional paradigms for each class that include various exceptions [6]. Agreement targets such as demonstratives, interrogatives, possessive determiners, adjectives or numerals are declined according to the gender of the head noun. Since the agreement marking does not only include grammatical gender but also other features such as number and case, the syntactic relation of dependent elements with their nouns is rather complex [7]. Agreement is marked via suffixes and occurs both within the noun phrase as well as in predicative constructions (e.g., *moje_{neu} auto_{neu} je nové_{neu}* – ‘my car is new’). For the present study it is important to remark that ordinal numbers are declined like adjectives (e.g., *prvý_{mas} kvet_{mas}* – ‘first flower’, *prvá_{fem} ruka_{fem}* – ‘first hand’, *prvé_{neu} jablko_{neu}* – ‘first apple’).

References

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