

An fMRI study of morphological decomposition in the recognition of case-inflected nouns: Dissociation of inflection and case

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A study of Polish case-inflected nouns showed activation in the left perisylvian area, both for zero-inflected citation-form nouns and overtly inflected oblique-case nouns (Szlachta et al., 2012). However, because case and inflection were confounded, this made it impossible to separate the activation related to the processing of overt inflection and case. We report the results of an fMRI study that aims to dissociate the processing of inflection (overt: -a vs. zero: -ø) and case (citation form: the Nominative vs. oblique form: the Genitive) in Russian nouns. Word length was manipulated to explore its role independently from inflection and case. Eighteen adult native Russian participants without neurological disorders performed a visual lexical decision task, while their BOLD signal was recorded. Reaction times were significantly longer to oblique-case than citation-form nouns indicating additional costs for processing oblique cases. The whole-brain analyses of the changes to the BOLD signal established an increased activation for overtly compared to zero-inflected oblique-case nouns in several brain areas including the left perisylvian area (BA 44/45/47). Together with an interaction of inflection and case instantiated in an increased effect of overt inflection in the oblique case compared to the citation form, this suggests a greater involvement of morphological decomposition in the recognition of oblique-case inflected nouns. At the same time, faster reaction times and relatively small changes in the BOLD signal associated with inflection type and word length in citation forms compared to oblique-case nouns suggest that morphological decomposition may play a weaker role in the recognition of citation forms. Overall, the study supports morphological decomposition of oblique-case inflected nouns in visual word recognition by showing increased activation in the left perisylvian area for overtly inflected compared to zero-inflected nouns in the oblique case.

Primary author: GOR, Kira (University of Maryland)

Co-authors: CHRABASZCZ, Anna (Neurolinguistics Laboratory, National Research University Higher School of Economics); KIREEV, Maxim (N.P. Bechtereva Institute of the Human Brain, Russian Academy of Sciences); MEDVEDEV, Svyatoslav (N.P. Bechtereva Institute of the Human Brain, Russian Academy of Sciences)

Presenter: GOR, Kira (University of Maryland)

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