The processing of Polish compounds: Evidence from a priming experiment

Krzysztof Hwaszcz, University of Wrocław

The last four decades have witnessed an increasing number of studies addressing the issue of morphological processing of complex words. Although a vast amount of data has been collected, there still remain questions as to whether complex words are decomposed into their constituents and then reassembled to arrive at the constructed meaning, or whether they are stored as whole-word representations and activated as such. This issue sparks a number of controversies due to many factors that influence the processing of morphologically complex words, such as the input modality (auditory vs. visual), the type of language tested, the individual user's familiarity of complex words, the degree of semantic transparency or the type of morphological complexity (compounding, inflection, derivation).

Although a substantial amount of evidence proposes explicit models of morphological processing, they are primarily based on inflected or derived words. Compound words, however, show different properties and processing patterns from the two aforementioned types of complex words. Thus, explaining their processing with regard to some of these models remains equivocal (Libben, 1998). Compound words are formed by joining two (usually) independent roots, in contrast to adjoining one or more affixes to a single root, as is the case with inflection or derivation.

The majority of the data come from English (e.g., El-Bialy, Gagné and Spalding, 2013; Fiorentino and Poeppel, 2007; Rastle, Davis and New, 2004; Rastle and Davis, 2008). Other languages exhibit different fashions (e.g., see Bertram and Hyöna, 2003 for Finnish; Dronjic, 2011 for Chinese; Jarema, Busson, Nikolova, Tsapkini and Libben, 1999 for French and Bulgarian). Therefore, it is important to find further data from different languages (e.g., Polish, for which the data is extremely scarce) to verify the existing accounts and theories.

In the study reported here, I tested current models of morphological processing with data from my cross-modal (auditory and visual) lexical decision experiment with semantic priming using Polish compounds and monomorphemic words. The compounds used in my experiment had a nominal head and were either semantically opaque (e.g., pędzi∙wiatr ‘roadrunner’) or semantically transparent (e.g., ręko∙dzieło ‘handicraft’); the monomorphemic words were the head nouns taken from the compounds, either from the transparent ones (wiatr ‘wind’) or from the opaque ones (dzieło ‘work’). All experimental items were matched for full-form frequency, length and the number of word formation processes (within the three conditions). The frequency of compounds’ heads was also matched and was always higher than the compound full-form frequency. It is known that the frequency of a word determines the speed of its identification and activation (Andrews, 1986).

Dual-route approaches, among which are the Augmented Addressed Morphology Model (AAM) by Caramazza, Laudanna and Romani (1988) and the Morphological Race Model (MRM) by Schreuder and Baayen (1995) assume that both the access via parsing into constituents and the lexical access to full-form are possible. The AAM assumes that the selection depends on word-familiarity with the restriction that full-form access is the default and faster route for familiar compounds, while constituent decomposition is faster only for novel compounds. The MRM assumes that the way compound words are accessed is selected on the basis of factors such as surface frequency or semantic transparency.

I addressed the following questions: To what extent does morphological internal structure play a role when accessing compound words? Are semantically opaque compounds processed differently than semantically transparent ones? If decomposition occurs, does it entail some additional processing costs?
The studies conducted by Ji, Gagné and Spaling (2011) and by Bronk, Zwitserlood and Bölte (2013), which are closely related to my own, investigated English and German compounds, respectively. Ji et al. assume that early morphological decomposition must be followed by the necessary constituent integration to access the word’s meaning. Bronk et al.’s results provide strong evidence for decomposition and support the existence of a reassembly stage (when the constituent representations are integrated into a unitary representation).

The results of my experiment, which corroborate with those reported by Ji et al. and Bronk et al., demonstrate that reactions were faster to semantically opaque compounds than to semantically transparent ones, and the difference was statistically significant. There was no significant difference between the two types of monomorphemic nouns (heads of semantically opaque and transparent compounds), which indicates that they were processed equally fast, but in most cases faster than compound words. This finding strongly speaks in favour of decomposition because otherwise there would be no statistical differences between mono- and multimorphemic words if they were all accessed via listing.

Even though dual-route models might explain the obtained data, the results provide evidence for additional processing costs for transparent compounds, which can be accounted for by the necessary integration of morphemes to arrive at the constructed meaning. The results contribute to the current experimental research agenda on language processing of Polish compounds and point to the conclusion that the processing costs are dependent on semantic transparency.

References


