

Into the cage: Frequency effects and fluency in aphasia

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Linguistic research of aphasia has been traditionally dominated by structuralist, rule-based approaches. However, recent studies have shown that usage-based, constructionist approaches may be better suited for the description and analysis of language processing in aphasia (Bruns et al. 2021; Hatchard 2021). In this paper, I focus on the relationship between frequency and fluency in the production of prepositional phrases by Czech speakers with aphasia to demonstrate how usage-based linguistics and aphasiology can be combined for the benefit of both.

Frequent disfluencies are one of the hallmark features of language in aphasia. Disfluencies are associated with increased processing load and various factors have been investigated that may influence the occurrence of disfluencies, including strength of association between words (Goldman-Eisler 1961; Schneider 2016). From a usage-based perspective, high transitional probability can be connected to chunkhood and entrenchment. It can be expected that the probability of disfluent production will be lower between words that are represented and retrieved as chunks.

I analyzed a total of 663 PPs with nominal complements extracted from a corpus of discourse production of 10 Czech speakers with aphasia. The PPs were coded as completely fluent or as containing pre-phrasal or phrase-internal disfluencies. Furthermore, frequency characteristics (lemma and word form frequencies and forward and backward transitional probabilities between the preposition and the complement) were extracted from corpora of written and spoken Czech. The distribution of disfluencies was analyzed using descriptive, exploratory data analysis with focus on the role of frequency and transitional probability.

As expected, the analysis has shown that speakers with higher levels of fluency produced more fluent PPs overall. However, even participants with nonfluent aphasia produced some fluent PP tokens. PPs containing an adnominal modifier were generally produced less fluently than bare P N constructs, suggesting increased processing load associated with a more complex internal structure of the PP construction. Crucially, the data also suggests that fluency is modulated by frequency. Fully fluent production is associated with complements with high lemma frequency (e.g. *za babičkou* 'to grandma') and with lexicalized PPs with reduced compositionality (*v pohodě* 'alright'). Furthermore, PPs that are parts of larger constructions such as *prosil o pomoc* 'was begging for help' also tend to be fluent. The data also shows an interesting difference between pre-phrasally and phrase-internally disfluent production. PPs with high backward transitional probability have a higher proportion of pre-phrasal disfluencies compared to PPs where the association between the preposition and the complement is weaker, suggesting that more frequent PPs are retrieved as wholes. For instance, *do klece* 'into (the) cage' (backward transitional probability .105) occurs several times with phrase-internal disfluencies in the corpus, while *v kleci* 'in (the) cage' (.298) was produced fluently or with a pre-phrasal disfluency.

The data can thus be interpreted as supporting evidence for the usage-based construction grammatical view of language representation. Simultaneously, the observed patterns could be used for the development of novel strategies in aphasia assessment and therapy, based on item-specific distributional characteristics.

References

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