Exploring the Interaction of Linguistic and Visual Cues in Sentence Production: The Role of Information Structure

Ágnes Lukács, Anna Babarczy, Krisztina Sára Lukics, Péter Márton Rácz, Bálint József Ugrin
(Budapest University of Technology and Economics, Department of Cognitive Science, Budapest, Hungary)
lukacs.agnes@ttk.bme.hu

Structural priming refers to the reuse of previously encountered sentence structures both in language comprehension and production (Ziegler et al., 2019). We explored the priming effects of linguistic (word order) and nonlinguistic (changes highlighting different elements in a scene) information structure in Hungarian sentences. Hungarian serves as an ideal testing ground for examining such effects. Unlike many languages in which word order marks grammar relations and changes affect the fundamental meaning of the sentence, in Hungarian, such changes serve discourse-related functions, such as the novelty or emphasis of certain sentence elements (É Kiss, 2002). We looked at two word orders: Verb Subject Object (VSO) sentences highlight the action, while Object Verb Subject (OVS) sentences highlight the patient.

(1) *Mossák a gyerekek az autót*.
wash-3pl.indef the children the car-acc
"The children are washing the car."

(2) *Az autót mossák a gyerekek*.
the car-acc wash-3pl.indef the children
"The children are washing THE CAR."

We conducted a structural priming experiment with 70 participants and 64 trials per participant. Each trial displayed a prime picture and a target picture which depicted simple transitive activities. The agent, patient, and action varied between prime and target scenes. The prime picture was accompanied by either a VSO or an OSV auditory prime. Participants had to describe the target picture. We expected visual changes involving optimal contrast in the scene (paralleling the linguistic structure: V change for VSO primes, and O change for OSV sentences) to yield highest ratios of reuse of the respective word orders. We used Generalised Linear Mixed Models to predict change in response word order from prime sentence structure and visual change.

Results showed significant priming across all conditions relative to baseline (VSO and OSV sentences nearly absent without priming, $p < 0.05$). Single element changes in the visual scene between prime and target caused the highest reuse ratios, independent of sentence structure type: V change and O change conditions exhibited the highest reuse ratios, but this was equally true for both VSO and OVS structures. Priming, though less efficient, persisted with two changes in the scene and even when all visual elements changed. Findings suggest that word order structures alone induce priming, enhanced by lexical overlap (no overlap versus any degree of overlap). Overall, information structure coded by word order had a robust priming effect, independent of discourse functions (see e.g. Goldberg 2001; Bod 2006; Linzen & Jaeger 2016). Further studies are needed to disentangle linguistic and nonlinguistic information structure effects on language production.

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