
Comprehension of complex sentences with temporal connectives: How children are led down the event-semantic kindergarten-path

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The sequence of sentences frequently reflects the order of events encoded by the clauses, resulting in iconicity (Diessel 2008), which may be overtly marked by lexical cues (e.g., *after* in (1a), *before* in (1b)). We can sidestep iconicity, however, by using temporal connectives non-iconically ((1b) for *after*, (1a) for *before*).

- (1) a. After/before he ate an apple, he read a letter.
b. He read a letter, after/before he ate an apple.

Extending previous research on children's comprehension of sentences with *before* and *after* (e.g., Clark 1971, de Ruiter et al. 2018), we tested 60 monolingual Greek-speaking children (aged 6–11) with a sentence-picture matching task manipulating Iconicity (iconic/non-iconic) and Conjunction (*before/after*), see (1). A GLMM with Iconicity and Conjunction as fixed effects revealed a main effect of Iconicity and an interaction of Iconicity*Conjunction. Tukey-adjusted pairwise comparisons showed differences between *after_ionic* and *after_nonionic* ($p=0.002$) and between *before_nonionic* and *after_nonionic* ($p<0.001$). This pattern suggests that violation of iconicity negatively affected comprehension of *after* but not of *before*. We propose that this asymmetry regarding iconicity can be accounted for by an event-semantic kindergarten-path effect: in languages with clause-initial connectives like English or Greek, non-iconic *after*-sentences (1b) are more difficult than their iconic variant (1a), because the sentence-medial connective forces the listener to integrate a subordinate event into the—already processed—main clause event and to revise the initial event order. Non-iconic *before*-sentences (1a) are not harder than their iconic variant, because sentence-initial *before* serves as an early cue of the non-iconic order, so no reanalysis of the event-representation is needed. The event-semantic kindergarten-path effect predicts that children should master non-iconic *before* earlier than non-iconic *after*. This was borne out in our results; 23 children had mastered non-iconic *before* but not non-iconic *after*, whereas no child had mastered non-iconic *after* but not non-iconic *before*. If our proposal applies to comprehension more generally, adults are expected to show an event-semantic kindergarten-path under the right conditions in reading.

References: • Clark, E. V. (1971). On the acquisition of the meaning of *before* and *after*. *J. of Verbal Learnng. a. Verbal Beh.*, 10, 266–275. • De Ruiter, L. E., Theakston, A. L., Brandt, S., & Lieven, E. V. M. (2018). Iconicity affects children's comprehension of complex sentences: The role of semantics, clause order, input and individual differences. *Cognition*. 171, 202–224. • Diessel, H. (2008). Iconicity of sequence: A corpus-based analysis of the positioning of temporal adverbial clauses in English. *Cognitive Linguistics*, 19(3), 465–490.