

Recall of temporal references at the sentence level

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Experiments on sentence comprehension have so far answered many questions about argument structure and argument recall. These findings were sometimes compared with adjunct recall. For example, Kennison (2002) has shown that arguments are processed faster than adjuncts when following transitive verbs. Moreover, information structure and prominence also tend to affect the success rate of the recall (Gotzner & Spalek, 2019). The question is how information structure affects formally different elements: arguments and adjuncts. We tried to resolve the question by testing the sentence level recall in Czech language which is ideal for testing these questions because of its relatively free word-order.

We present two experiments, in which we were focusing on success rate of temporal references recall. In both experiments we used references determining the time point at the extended simple sentence level. This rate was being compared with object recall. The main hypothesis stated that object recall is more successful than temporal reference recall, but we also expected recall to be influenced by sentence position of the given element (irrespective of its syntactic function). Experiments employed 4×2 and 2×3 within-subject design. As independent variables we set word-order and question type (see example items below). In Exp1, we used comprehension questions targeting the sentence object and temporal adjunct, whereas in Exp2 we also used a question targeting the spatial adjunct.

For presentation of stimuli, Ibex Farm was used (self-paced reading with sentences presented as a whole). The sample consisted of undergraduate students of Faculty of Arts, Charles University (84 in the first and 91 in the second experiment). In both experiments, participants were presented 24 experimental sentences, combined with 96 filler sentences. Response accuracy and reaction times were measured. The answers were coded manually.

In both experiments, object recall was more successful than temporal reference recall in both experiments (1.79% vs. 16% of false answers in Exp1 and 1.51% vs. 13.87% in Exp2). Second, temporal references were better recalled if they stood in the sentence-final position (6.75% vs. 19.1% of false answers in Exp1 and 7.14% vs. 20.6% in Exp2). Third, spatial references were recalled worse than objects but better than temporal references in Exp2 (8.79% of false answers on questions targeting spatial references) and the recall was better if they stood in the sentence-final position (3.85% vs. 13.74% of false answers in Exp2). Analysis of response accuracy was done using logit-mixed models with question type and sentence position as fixed effects and with item as a random effect. Both experiments yielded significant effects for question types (questions targeting objects were answered significantly better) and the second experiment yielded also significant interaction between question and position (response accuracy was higher for adverbs in the sentence final position).

The effects of sentence position may be possibly due to a confound of information recency. This will be also discussed in the paper and will be addressed in planned experiments.

Altogether, the results indicate a clear difference in the recall rate for different sentence constituents. This finding thus indicates that we store various sentential information with a different precision based on their syntactic position which may be a reflection of their general importance for the message conveyed by the sentence.

Item examples: Experiment 1:

(1) V neděli v knihovně velmi pečlivě přečetl noviny starší důchodce. 'On Sunday - at the library - very carefully - read the newspaper - an older retiree.'

(2) Noviny velmi pečlivě přečetl v neděli v knihovně starší důchodce. 'The newspaper - very carefully - read - on Sunday - at the library - an older retiree.'

(3) Starší důchodce v neděli v knihovně velmi pečlivě přečetl noviny. 'An older retiree - on Sunday - at the library - very carefully - read the newspaper.'

(4) Starší důchodce přečetl noviny velmi pečlivě v neděli v knihovně. 'An older retiree - read the newspaper - very carefully - on Sunday - at the library.'

Q1: Co přečetl důchodce? 'What did the older retiree read?' Q2: Kdy přečetl důchodce noviny? 'When did the older retiree read the newspaper?'

Experiment 2: Here we used word orders 3 and 4 from the first experiment and 3 question types:

(1) What-question: Co přečetl důchodce? 'What did the older retiree read?'

(2) When-question: Kdy přečetl důchodce noviny? 'When did the older retiree read the newspaper?'

(3) Where-question: Na jakém místě přečetl důchodce noviny? 'Where did the older retiree read the newspaper?'

References:

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