

Predictive effects of number-marked verbs and copulas in Czech 2-year-olds

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There are conflicting findings regarding the early comprehension of grammatical number marking in verbs. While some studies found limited comprehension (e. g. Johnson, de Villiers, & Seymour, 2005; Smolík & Bláhová, 2017), other others found that children comprehend verb number marking (Brandt-Kobele & Höhle, 2010), and even demonstrated that 2,5-year-olds can use the number of English copula to predict the upcoming nouns (Lukyanenko & Fisher, 2016). Predictive processing of sentences based on grammatical morphemes has also been shown for grammatical gender, but the findings could not distinguish between the facilitation of lexical search and active anticipation of upcoming words.

Two preferential studies reported here examined the predictive effects of number marking in the comprehension of Czech copulas and lexical verbs. In both studies, children saw pairs of pictures, one showing a single instance of an object, the other showing a group of two to four instances of another object. While watching the pair, children heard a phrase referring to one of the pictures. The phrase ended with a noun labeling the picture, which was preceded by a short introduction. In the informative condition, the introduction contained a copula (E1) or a lexical verb (E2) agreeing in number with the sentence-final noun.

Experiment 1

Podívej, tady je/jsou na obrázku kniha/míče.
Look there is/are in the picture book/balls.

Experiment 2

Podívej, tady skáče/skáčou na obrázku kůň/žáby
Look there jumps/jump in the picture horse/frogs.

In the uninformative condition, the phrase only contained non-agreeing attention-getters. Each experiment included 16 experimental trials and 16 uninformative control trials. Four yoked pairs of pictures were used, each 4 times in each condition.

A total of 40 27-month-olds participated in Experiment 1, and 40 30-month-olds in Experiment 2. Children's faces were recorded and their gaze direction coded, focusing on the effect of the number-marked copula/verb on the proportion of looks towards the target picture. Differences were tested using random permutation analysis. In addition to the experiment, receptive grammar and vocabulary tasks were given to children.

In Experiment 1, children looked towards the target picture as early as 1000 ms after the copula onset, demonstrating predictive looks towards target due to copula. In Experiment 2, similar effect of main verbs was found, but only in children who were above the median according to the grammar and vocabulary tasks. Overall, the results confirm that Czech 2-year-olds understand number marking of verbs and its meaning, and can use it for predictive processing. Contrary to existing research, the findings were made in a language with often ambiguous morphological marking and flexible word order, confirming that predictive processing is not limited to fixed sequences of units. Predictive effects of number were observed for lexical verbs, suggesting that the comprehension of number is not lexically specific.

Figure 1. Proportions of looks towards target for all participants in Exp. 1. The vertical shaded bar shows the range of onsets of the target nouns.

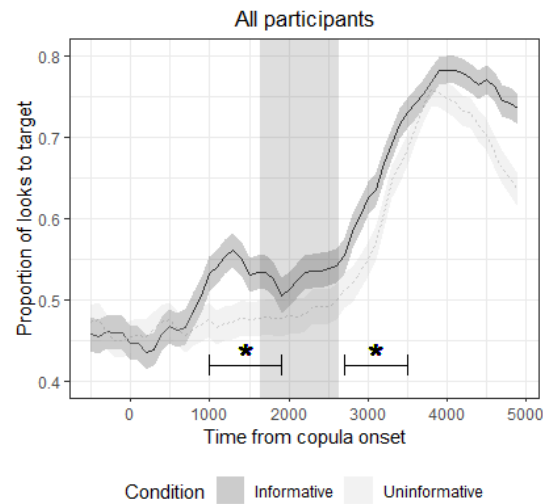
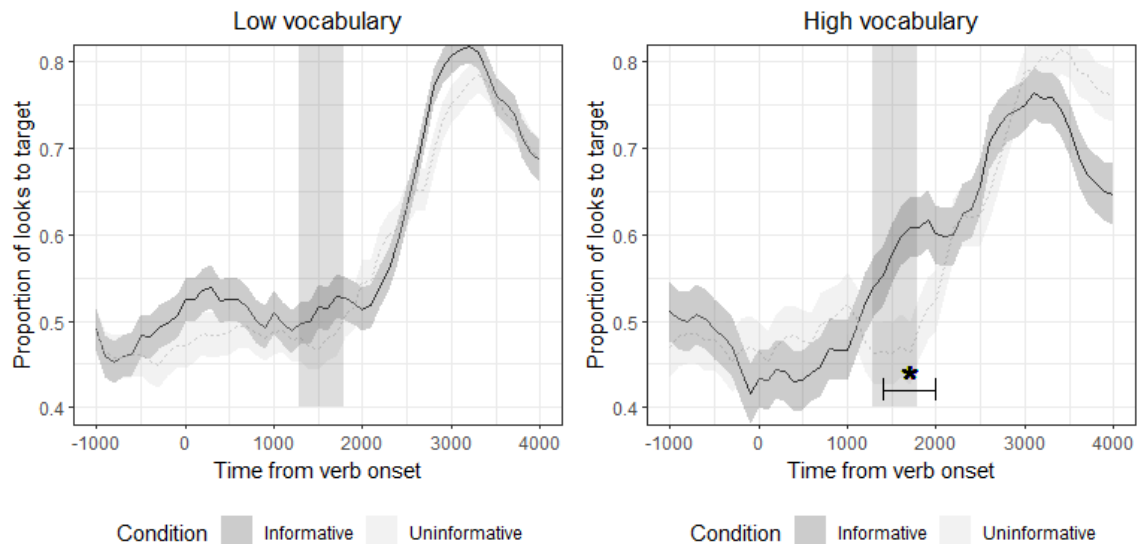


Figure 2. Proportions of looks towards target in Experiment 2, separately for children with vocabulary below/at the median and above median in Experiment 2. The vertical shaded bar shows the range of onsets of the target nouns.



References

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