

Predicting Who Did What to Whom: Case Marking and Semantic Cues in Czech Preschoolers

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Background: Languages provide various cues to the interpretation of thematic roles of agents and patients, including word order, case marking or agreement. It is well known that children are sensitive to word order from early on but there is limited research on how readily children use case marking to guide sentence interpretation, and how this interacts with word order or semantic plausibility. Evidence is mixed: some studies report prolonged reliance on canonical word order in German-learning preschoolers [1], others suggest that children can use sentence-initial case marking predictively [2,3]. Czech combines rich case morphology with relatively flexible constituent order, and Czech four-year-olds both subject-first and object-first sentences in offline and predictive online tasks [4, 5]. However, it is not clear if they can predict the upcoming nouns based on the combination of case marking and real-world knowledge. **Method:** We examined this in 25 Czech children (data collection continues) aged 3;3–5;7 (mean 4;3) and 40 adults in a visual-world experiment that showed displays with three semantically related pictures (Fig. 1). Participants listened to transitive sentences (Tab. 1) that started with the nominative or accusative noun labeling the top object/character, resulting in canonical SVO or noncanonical OVS sentences. Additional two pictures showed the potential sentence-final agent or patient noun referents. **Results:** Figure 2 indicates that after the last noun, children and adults looked to the referent of the sentence-final noun, i. e. the agent picture in OVS and patient picture in SVO. Crucially, in children, this tendency is already present after the offset of the first noun. Mixed-model analyses confirmed this: the proportion of looks to the agent or patient picture 2 seconds before and after the offset of the initial noun showed significant interactions between period (pre/post) and condition (SVO, OVS). Children thus use case-marking information to anticipate sentence-final nouns immediately after it is presented. Surprisingly, adults seem to show weaker response immediately after the first noun. **Conclusions:** We show that Czech children around 4 use nominal case markers immediately in predictive processing, even in noncanonical OVS sentences, even if this requires background semantic knowledge of who is the likely agent or patient given a set of three entities. This indicates mastery of the abstract relations between morphology and semantic roles. The lack of immediate predictive behavior in adults might be due to their more strategic and less exploratory approach towards the simple, child-focused task.

References

- [1] Kröger, J. M., Münster, K., & Knoeferle, P. (2017). The influence of prosody and case marking on thematic role assignment in ambiguous action scenes: Adults versus children. In *Proceedings of the 39th annual meeting of the cognitive science society*, 2463–2468.
- [2] Özge, D., Küntay, A., & Snedeker, J. (2019). Why wait for the verb? Turkish speaking children use case markers *Cognition*, 183, 152–180.
- [3] Özge, D., Kornfilt, J., Maquate, K., Küntay, A. C., & Snedeker, J. (2022). German-speaking children use sentence-initial case marking *Cognition*, 221, 104988.
- [4] Smolík, F. (2015). Word order and information structure in Czech 3- and 4-year-olds' comprehension. *First Language*, 35(3), 237–253.
- [5] Authors (under review). Czech toddlers use noun case predictively in sentences with canonical and noncanonical word orders.

Table 1: Sample stimuli for the SVO and OVS conditions

Condi- tion	Czech sentence
SVO	Slepice na obrázku brzy sežere zrní. chicken _{NOM} in picture soon will_eat the grain _{ACC} .
OVS	Slepici na obrázku brzy sežere liška. chicken _{ACC} in the picture soon will_eat fox _{NOM} .

Figure 1 Sample picture

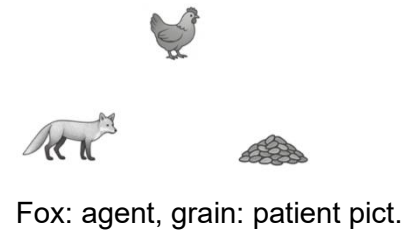
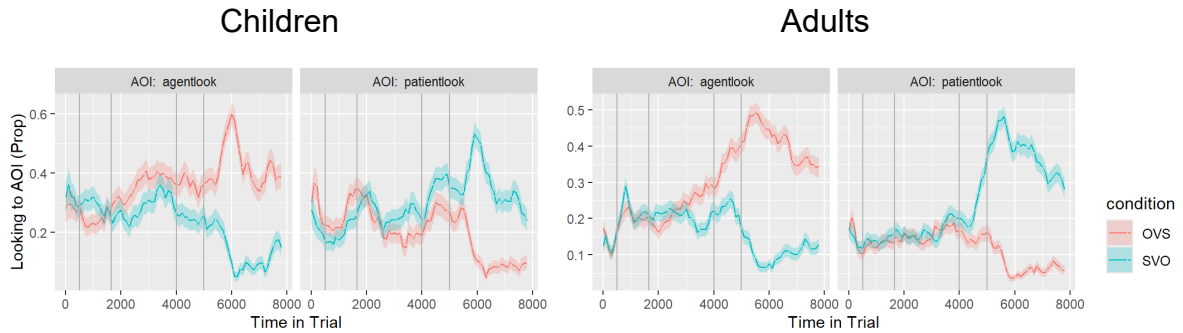


Figure 2 Looks to the agent and patient pictures across conditions for children and adults



Note: The vertical lines show the starting times for the key segments of the sentence: the onset of the first noun, the onset of the modifiers before the verb, the verb, and the onset of the sentence-final noun.

Table 2 Fixed effects from model of children's looks before and after the first noun offset

	Children						Adults					
	Looks to agent			Looks to patient			Looks to agent			Looks to patient		
Predictors	<i>b</i>	β	<i>p</i>	<i>b</i>	β	<i>p</i>	<i>b</i>	β	<i>p</i>	<i>b</i>	β	<i>p</i>
Cond. [SVO]	0.03	0.12	0.219	-0.04	-0.14	0.129	0.01	0.05	0.526	0.01	0.06	0.440
Period [Post]	0.11	0.37	<0.001	-0.04	-0.16	0.087	0.05	0.26	0.001	0.02	0.14	0.072
Cond. x period	-0.12	-0.40	0.003	0.08	0.30	0.029	-0.04	-0.21	0.052	-0.00	-0.01	0.956

Czech case marking and word order

Czech is a morphologically rich language with seven case categories and multiple nominal declension classes. Grammatical relations between sentence constituents are primarily signaled by case marking rather than by word order, which is relatively flexible. In simple transitive sentences, the crucial distinction concerns nominative marking of the subject and accusative marking of the object. When at least one argument bears a distinctive case form, nominative–accusative marking typically allows unambiguous identification of agent and patient regardless of constituent order (e.g., *Pes_{NOM} honí kočku_{ACC}* vs. *Kočku_{ACC} honí pes_{NOM}* ‘The dog chases the cat’).

Czech nominal morphology is characterized by considerable paradigmatic variability and syncretism: a single suffix may encode gender, number, and case, and identical endings can mark different case categories across nouns. For example, the suffix *-a* marks nominative singular in the feminine noun *sova* ‘owl’ but accusative singular in the masculine noun *kluka* ‘boy’. Some nouns also have identical nominative and accusative forms (e.g., *kuře_{NOM/ACC}* ‘chicken’). In the present study, only nouns with unambiguous nominative and accusative forms were used, ensuring that case marking functioned as a reliable cue to thematic roles.