**Do early Turkish-Dutch bilingual children use case-marking cues predictively?**

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Previous studies on bilingual predictive processing have mainly focused on adult second language learners, whereas research on early bilinguals who acquired their two languages simultaneously is scarce (Karaca et al., 2021). The limited number of studies have shown that bilingual children generate predictions using verb-semantics (e.g., Brouwer et al., 2017) and morphosyntactic cues that overlap in their two languages (e.g., Meir et al., 2020; Lemmerth & Hopp, 2018). Less is known about bilingual children's prediction skills when their two languages do not support the same type of cues (Bosch et al., 2022). To this end, the present study investigated to what extent early Turkish-Dutch bilingual children use case-marking cues predictively in their heritage language under the influence of Dutch, a non-case-marking language.

In a visual world eye-tracking paradigm, 49 monolingual children ($M_{age}$=7;1, $SD$=0;5) and 25 Turkish-Dutch bilingual children ($M_{age}$=7;7, $SD$=1;0) listened to Turkish sentences in which case-marking on the first noun (NP1) (accusative, nominative) and the verb position (sentence-medial, sentence-final) were manipulated (e.g., Speedy rabbit$_{ACC/NOM}$ soon there fox$_{NOM}$/carrot$_{ACC}$ eat vs. Speedy rabbit$_{ACC/NOM}$ soon eat there fox$_{NOM}$/carrot$_{ACC}$). The sentences were coupled with a visual display of three images: NP1, an agent and a patient (e.g., rabbit, fox, carrot) (c.f. Özge et al., 2019). The fixations to the agent versus patient image between the NP1 and NP2 (i.e., the predictive time window) were analyzed using mixed effect logistic regressions. In the verb-final sentences, only the case-marking on the NP1 was available as a cue in the predictive time window, whereas in the verb-medial sentences, both case-marking on the NP1 and verb-semantics were available.

The results showed a significant interaction between Time (in the predictive window), Condition (accusative, nominative), and Group (monolingual, bilingual) in the verb-final sentences ($\beta$=-0.34, $SE$=0.03, $z$=-11.64, $p$<.001) and in the verb-medial sentences ($\beta$=-0.14, $SE$=0.03, $z$=-5.38, $p$<.001). When the prediction effect was examined separately in each group, a significant interaction between Time and Condition was found for both groups in the verb-final (monolinguals: $\beta$=0.45, $SE$=0.16, $z$=28.20, $p$<.001; bilinguals: $\beta$=0.10, $SE$=0.02, $z$=4.19, $p$<.001) and in the verb-medial sentences (monolinguals: $\beta$=0.41, $SE$=0.01, $z$=1.10, $p$<.001; bilinguals: $\beta$=0.27, $SE$=0.02, $z$=12.05, $p$<.001) (see Figure 1).

These results suggest that Turkish-Dutch bilingual children are sensitive to case-marking information which is transparent and acquired early, in their heritage language but to a smaller extent than monolingual children. Bilingual children are thus able to utilize these morphosyntactic cues in predictive processing in their heritage language under the influence of a non-case-marking language and with reduced experience in their heritage language.

**Selected References**

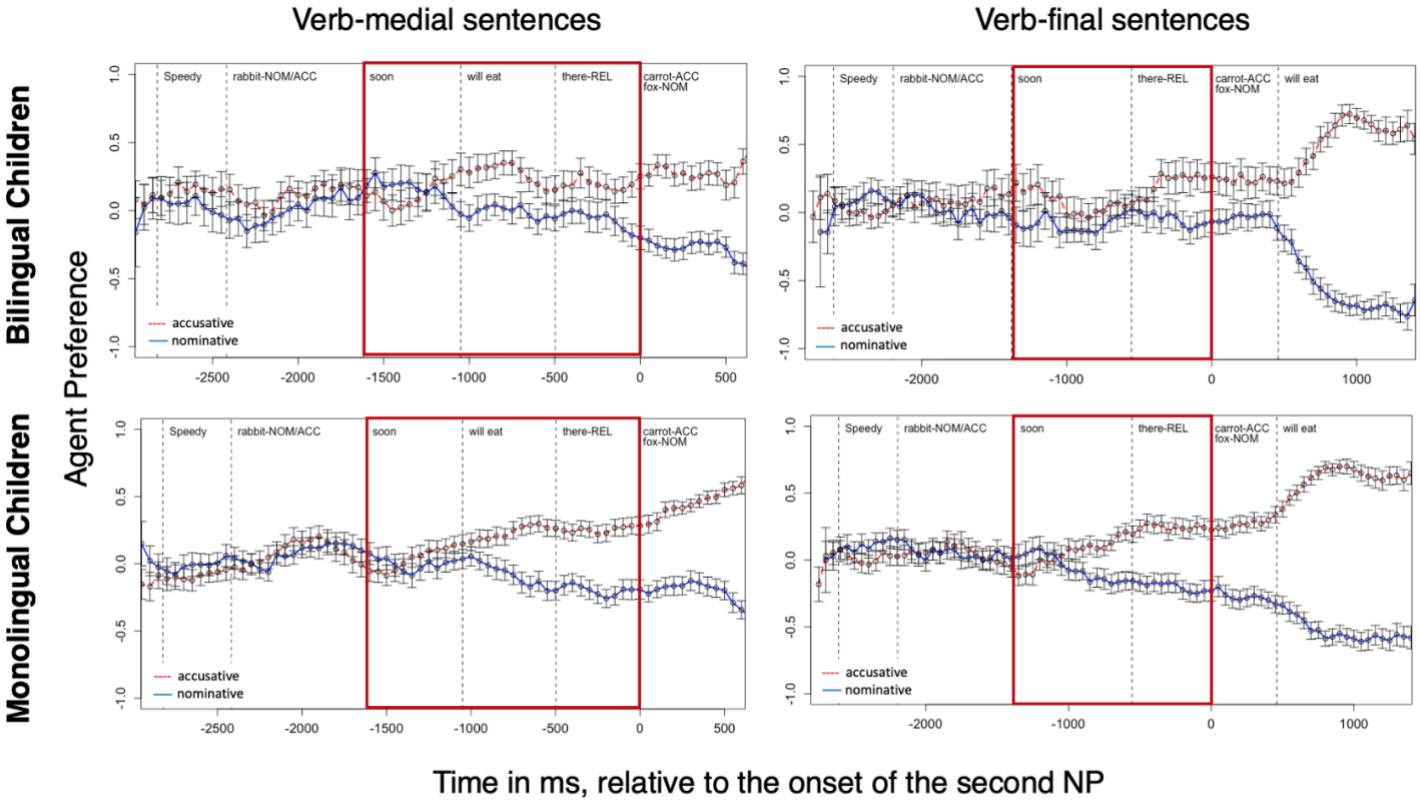

Brouwer, S., Özkan, D., & Küntay, A. C. (2017). Semantic prediction in monolingual and bilingual children. In E. Blom, L. Cornips, & J. Schaeffer (Eds.), *Cross-linguistic Influence in Bilingualism* (pp. 48-73).

Karaca, F., Brouwer, S., Unsworth, S., & Huettig, F. (2021) Prediction in bilingual children: The missing piece of the puzzle. In E. Kaan & T. Grüter (Eds.), *Prediction in second language processing and learning* (pp. 116–137).

Meir, N., Parshina, O., & Sekerina, I. A. (2020). The interaction of morphological cues in bilingual sentence processing: An eye-tracking study. In M. Brown & A. Kohut (Eds.), *Proceedings of the 44th Annual Boston University Conference on Language Development* (pp. 376–389).

Özge, D., Küntay, A., & Snedeker, J. (2019). Why wait for the verb? Turkish speaking children use case markers for incremental language comprehension. *Cognition, 183*, 152–180.


Figure 1: Agent preference of bilingual and monolingual children in verb-medial and verb-final sentences




*Note: Agent preference in 50 ms time bins averaged across participants and across trials. The error bars indicate the standard error of the mean across participants. The red line is for the accusative condition and the blue line is for the nominative condition. Positive values on the y-axis indicate preference for the agent image and negative values indicate preference for the patient image, while 0 indicates no preference for either image.*