A CASE AGAINST NEURAL MATURATION: GERMAN-SPEAKING CHILDREN CAN USE CASE MARKERS FOR THEMATIC INTERPRETATION

Duygu Özge,[1,2] Katja Münster,[3] Jaklin Kornfilt,[4] Pia Knoeferle,[3] Aylin Küntay,[2] Jesse Snedeker[1]

Harvard University,[1] Koç University,[2] University of Bielefeld,[3] University of Syracuse[4]

Offline studies of young German speakers suggest that children have great difficulty interpreting case markers and rely instead on the verb and canonical word order (Dittmar, et al., 2008). A series of ERP and fMRI studies manipulated the case marking in German transitive sentences and found that children were unable to use case during online processing until age seven (Knoll, et al., 2012; Schipke, et al., 2012). Friederici and colleagues have suggested that this inability to interpret case is due to the slow maturation of the dorsal connection between superior temporal gyrus and the dorsal inferior frontal gyrus (BA44). (Brauer, et al., 2013; Friederici, 2012). They propose that this pathway is responsible for complex syntactic processing and was central in the evolution of language.

This radical claim about language acquisition rests on a handful of experimental studies using a limited set of methods (ERP violation and picture choice). The present study used an eye-tracking paradigm (adapted from Kamide, et al., 2003) to explore whether four-year-old German-speaking children (N=20; 4;0-4;12) can use case markers to make incremental thematic predictions. Our study used SOV and OSV constructions, to disentangle case from word order. The scenes depicted an object labeled by NP1 (rabbit), a potential Theme (cabbage), and a potential Agent (fox). This was accompanied by a spoken sentence in a verb-final order, where the first argument was either in nominative (SOV,1) or accusative case (OSV,2). To explore the processing of case, independent of the verb, we focused our analysis on predictive looks in the adverbial-region preceding NP2 (underlined).

(1) Der Hase   wird   im nächsten Moment   den Kohl   aufspüren.
    Nom rabbit   will   in   next moment   Acc Cabbage   hunt
    'The rabbit will shortly hunt out the cabbage.'
(2) Den Hase   wird   im nächsten Moment   der Fuchs   aufspüren.
    Acc rabbit   will   in   next moment   Nom fox   hunt
    'The fox will shortly will hunt out the cabbage.'

Our dependent variable was Agent-Preference (Agent% - Patient%). If children are interpreting case incrementally, Agent-Preference should be greater in the accusative condition (where NP2 should be an agent), than in the nominative condition (where NP2 should be patient). This is precisely what we found [W=163, z=2.2, p=.02, r=4.5].

Thus, when a simple, implicit task is used, German-speaking children, as young as four, interpret case marking incrementally, and independent of the verb or word order, to predict upcoming arguments. This finding is hard to reconcile with the hypothesis that German case comprehension is subserved by a neural system that matures around 7 (Friederici, 2012). These results, however, are consistent with constraint-based theories of comprehension and acquisition (Trueswell & Gleitman, 2007) and with prior work demonstrating the incremental interpretation of case in Turkish-speaking children (Özge, et al., 2013).