The role of the functional heads in Hungarian PP recursion

Agnes Toth

This paper aims to prove that the more salient the functional heads are in Hungarian recursive PPs, the easier children can understand them. The two main hypotheses of the analysis are as follows:
(i) if the salient functional heads help Hungarian children acquire embedded structures, and (ii) because of the salience of the functional elements they tend to interpret recursive PPs correctly at an early age.
Chomsky–Hauser–Fitch (2002) stated that recursion is the core property of the faculty of language in a narrow sense; thus it is the basis of human communication. Accordingly, children must also bear this faculty; recursion must appear in their command of language as well. Roeper (2011) and Hollebrandse–Roeper (2014) found that Japanese children can acquire recursion earlier than English children. As for younger children there is a possible default interpretation for recursive, embedded structures, and this is conjunction. The question arises what enables this difference. DiSciullo (2015) claimed that in recursive structures there has to be a functional element between two constituents, that means they cannot *merge* directly [X [F X]].
In English there are no overt functional elements in recursive PPs:

(1) *There is a giraffe next to the lion above the bear.*

In Japanese there are overt functional elements in such sentences:

(2) *Kuma-**no** ue-**no** Raion-**no** tonari-**ni** Kirin-ga iru-yo*
Bear on Lion next Giraffe is
'There is a giraffe next to the lion above the bear.'

One of the possible reasons for the different timing of the acquisition of recursive PPs in Japanese and English can be the salience of the functional elements. The next arising question is whether Hungarian kindergarteners learn to interpret embedded structures correctly, or they still interpret them conjunctively. In other words, the question is whether the interpretation of Hungarian children is similar to the English or the Japanese data. In a previous experiment Tóth–É.Kiss–Roeper (2016) tested two kinds of PP structures in Hungarian:

(3) (a) the embedded PP adjectivalized by *-i*
A krokodil [$_{PP}$ [$_{AdjP}$[$_{PP}$*a zsiráf* előtt]-**i**] *oroszlán*] *előtt*] áll
the crocodile the giraffe before-ADJ lion before stands
'The crocodile stands before the lion before the giraffe.'

(b) there is embedded PP in a *lévő* participle phrase
A krokodil [$_{PP}$ [$_{PartP}$ [$_{PP}$ *a zsiráf előtt*] ***lévő***] *oroszlán*] *előtt*] *áll*
the crocodile the giraffe before being lion before stands
'The crocodile stands before the lion (being) before the giraffe'

In the case of (3a,b) both of the functional heads are overt, but *lévő* in (3b) is more salient than *-i*. They found that for first graders (7 year-olds) it was easier to interpret recursive PPs by *lévő* than by *-i*, whereas there was no such difference found at older age (9-11 year-olds).
In the course of this experiment I have tested 20 kindergarteners (age 5-6), 20 second graders (age 8-9) and 20 adults. There were three kinds of test sentences they had to act out:

(4) *A krokodil a majom alatt az oroszlán előtt a medve fölött áll.*
The crocodile the monkey under the lion before the bear above stands
'The crocodile stands above the bear before the lion under the monkey.'

(5) *A krokodil a majom alatt-i oroszlán előtt-i medve fölött áll.*
The crocodile the monkey under-ADJ lion before-ADJ bear above stands
'The crocodile stands above the bear before the lion under the monkey.'

(6) *A krokodil a majom alatt lévő oroszlán előtt lévő medve fölött áll.*
The crocodile the monkey under being lion before being bear above stands
'The crocodile stands above the bear before the lion under the monkey.'

The preliminary data show that sentence (4) was interpreted by all the three age groups conjunctively. Both structures (5) and (6) were interpreted recursively by older children and adults, while younger children gave conjunctive interpretation for these sentences as well. There was only a slight difference between the interpretation of the two functional elements (*-i* and *levő*) in the case of the younger group ($p<0.05$), but they tend to miss out one or two PPs.

I propose that structure (4) cannot be interpreted recursively in Hungarian, as there are no functional elements in this construction. Structures (5) and (6) were interpreted recursively by all the three groups, we can see important differences between the two functional elements in the case of the kindergarteners. I claim that when embedded recursion is not acquired properly yet, the salience of the functional heads helps children to interpret recursive structures correctly. In the case of the older group, there is no such difference between the interpretations of the two functional elements since they tend to understand recursive structures with more than 80% success rate.

In this study I have found that the appearance of functional elements help 5-6 year-old children interpret structures (5)-(6) recursively, whereas structure (4) was interpreted conjunctively by adults and children as well.

References:

Di Sciullo, A. M. 2015. On the Domain Specificity of The Human Language Faculty and the Effects of Principles of Computational Efficiency: Contrasting Language And Mathematics. *Revista Linguística* 11/1: 28-53.

Hollebrandse, B.–Roeper, Tom 2014. Empirical Results and Formal Approaches to Recursion in Acquisition In:Tom Roeper – Margaret Spears(eds.) *Recursion: Complexity in Cognition*. Springer. Berlin. 179-220.

Roeper, T. 2011. The Acquisition of Recursion: How Formalism Articulates the Child's Path, *Biolinguistics* 5/1–2: 57–86.

Tóth Ágnes – É. Kiss Katalin – Roeper, Tom 2016. *The role of the visible functional head in the interpretation of recursion* GALANA conference