Refining Intervention: The Acquisition of Featural Relations in Object A’-dependencies
Anamaria Bentea\textsuperscript{1} and Stephanie Durrleman\textsuperscript{2,1}
\textsuperscript{1}University of Geneva, \textsuperscript{2}CNRS, Lyon

Cross-linguistic studies reveal that headed object A’-dependencies are difficult for young children to process [1-4]. Grammatical accounts explain children’s difficulties in terms of structural intervention effects due to moving the A’-object across a subject sharing similar features [1-2]. In this study, we seek to deepen our understanding of the features triggering intervention effects: Is their impact on a par across structures and age groups? Is the computation of featural relations linked to working memory (WM) abilities? As a first step to addressing these issues we investigate the comprehension of object wh-questions and relative clauses (RCs) in French-speaking children aged 5 to 11. We focus on the moved object by manipulating two sets of features (+/- NP; +/- Animate), while the intervener (i.e. the subject) is invariably +NP +Animate. We also investigate the link between WM and comprehension of these structures.

61 French-speaking children (5yo: N=14; 7yo: N=17; 9yo: N=16; 11yo: N=14) were prompted to choose the correct character as identified by a wh-question (1-2) or RC (3-4). Each test sentence was associated with two pictures in which the same action was depicted with reversed Agent-Patient roles. Verbal short-term memory was assessed through digit-span tasks.

The data show a significant interaction between structure type, object type and object animacy (F(1,60)=32.77, p<.001). In +NP questions and RCs, the mismatch in animacy between the A’-moved object and the subject did not improve comprehension in the 5yo (p>.05), whereas it yielded a significant difference in all the older groups (all ps<.001). The +Animate/-Animate object asymmetry did not extend to –NP questions (p>.05), but was present in –NP RCs (t=-7.35, p<.001) due to the fact that RCs headed by a –NP –Animate object (i.e. ce) led to robustly higher accuracy than –NP +Animate object RCs (i.e. celui, celle). We also found a significant correlation between accuracy and age (r=.698, p<.001), as well as verbal short-term memory as measured by digit-span tasks (r=.660, p<.001).

The results illustrate that the most problematic configurations are those in which the features +NP, +Animate on the intervener are included in the set of features on the A’-moved object. That intervention effects do not disappear in ‘free’ RCs in the +Animate condition follows from the internal structure of celui/celle, which consists of ce and the pronominal form lui/elle [5]. These elements share morphosyntactic features (gender and number) with the intervening subject, leading to an inclusion relation between the corresponding sets of features. The presence of an animacy mismatch improves performance in older children (7 – 11yo) showing that they can draw on the featural distinction between the intervener and the A’-object. The mismatch in animacy creates an intersection relation between the features entering the computation [6]. That 5yo children do not perform better with A’-dependencies headed by a +NP –Animate object shows that they cannot exploit the mismatch in animacy. Animacy, being a subfeature of NP, is too deeply embedded to be computed by younger systems. This argues in favour of a structured view of the feature hierarchy. Moreover, an animacy mismatch does not significantly improve comprehension at any age in –NP questions. The animacy effect thus depends on the locus where the feature is expressed (whether it is associated with a +NP or a –NP feature). It is the +NP feature that plays a crucial role in the comprehension of A’-dependencies: children perform best with structures in which there is a disjunction between the A’-moved element and the intervener with respect to this feature. Featural intervention across the board increases cognitive load, as shown by the link between accuracy of performance and WM scores, suggesting that limitations of computational resources impact the processing of A’-dependencies in children.
Examples
1. Quelle dame / Qui est-ce que la fille embrasse?
   “Which lady/Who ESK the girl is kissing?”
2. Quelle balle / Qu’est-ce que la fille frappe?
   “Which ball/What ESK the girl is hitting?”
3. Montre-moi la dame/celle que la fille embrasse.
   “Show me the lady/the one that the girl is kissing.”
4. Montre-moi la balle/ce que la fille frappe.
   “Show me the ball/what the girl is hitting.”

Graphs for Mean Correct Answers per Structure and Age Group