# On the domain specificity of intervention effects in children's comprehension of relative clauses and coordinate clauses

Minimality-based accounts have been put forward in recent years, which can provide a principled explanation for the difficulty young/SLI children and agrammatic aphasics have in processing structures involving the movement of a DP over another one as in (1) and (2) [1-3]. The difficulty in the comprehension of object relative clauses (ORCs), traditionally ascribed to increased transient memory load (TML) due to the alteration of the canonical word order [4-6], is then viewed as a special type of minimality violation [3]. That is, given the minimal configuration in (3) [7], when the feature (+WH) that distinguishes the moved object from the intervening subject is not represented or easily accessed in sentence processing, minimality constraints apply [3]. A minimality-based account has also been extended to children's errors in the comprehension of coordinate clauses (CCs) (4) [8]. In this case, however, intervention does not involve c-command. Only precedence applies and intervention has to be calculated in linear terms [7]. Assuming that c-command is a language-specific relation and precedence is not, hierarchical intervention is likely to be domain specific whereas linear intervention is more likely not to be. The present investigation focuses on intervention effects as a means to approach the issue of the domain specificity of language processes. The questions initially addressed here are: (a) Is it possible to identify domain-specific effects in the processing of ORCs? (b) Are linear intervention errors in CCs an instance of a domain-general recency effect? (c) Is it theoretically advantageous to restrict minimality effects to hierarchical intervention or not? The aim of this study is to provide some empirical evidence regarding (a) and (b) in order to discuss (c). As for (a), Portuguese-speaking schoolchildren (40 7-10 year olds) initially tested for ORC comprehension abilities were divided in two groups: typically developing (TP) and language impaired (LI) (mean correct responses 2SD below the age standard). Both groups were submitted to a working memory test along the lines of [9] including a memory task (the Secret Number Task (SNT)) intended to simulate, in a non-linguistic domain, the TML created by ORCs (cf. (5)). LI children who could cope with the memory task (the SNT, in particular) were considered to provide evidence for a domain specific difficulty, to be accounted in terms of minimality effects. As for (b), Portuguese-speaking (40 3- 5 year olds) were presented to CCs and to sentences with restrictive centre-embedded subject RCs (SRCs) in a picture-identification task. Pictures corresponding to the 1st conjunct of CCs or to the event described by the RC were presented, followed by 3 pictures: 1.the target one, corresponding to the second conjunct of CCs, and to the main clause of sentences with SRCs (with the correct referent for the subject); 2. The critical error; 3. Another possible error. (cf. (6)). The critical error (intervention error to CCs) was characterized as *recency error* to RCs, since it does not result from any type of intervention. The results of the memory task reveal that even though the SNT was hard for the majority of the LI children, there were children in this group who could cope with it (20%). The results of the picture-identification task show the same pattern of the critical error in CCs and SRCs with a similar age effect. Given these results, it is suggested that a domain specific strict minimality effect (hierarchical intervention) can be identified in ORCs (in a subgroup of LI children) and that linear intervention in CCs can be encompassed by recency errors. The possibilities are discussed of either restricting minimality-accounts to domain specific processes or taking minimality as a particular constraint to computation with limited resources. Implications for the study of language impairments are considered.

(1) *Which student* has the teacher called ___? (WH+N question)
(2) This is the student *who* the teacher called ___. (Object Relative Clause)

(3). . . X . . . Z . . . Y . .

Y is in a Minimal Configuration with X iff there is no Z such that: (a) Z is of the same structural type as X, and (b) Z intervenes between X and Y (i.e. Z c-commands Y and Z does not c-command X) (Rizzi, 2004)

(4) The dwarf photographs the prince and ___holds an apple.

(5) The Secret Number Task: The child is engaged in a game in which he/she has to say aloud what he/she in headphones. A character is presented in a computer screen. The child is told that the character will tell him/her a secret number, followed by a sequence of numbers, including the number 7. The child has to repeat the sequence and say the secret number immediately after he/she hears the number 7.

Parallel between ORC and the Secret Number Task:

…Head noun (to be held in working memory) DP V ___ (position where the head noun must be retrieved)
… Secret number (to be held in working memory) 2 5 8 7 ___ (position where the secret number must be retrieved)

(6) a. *O macaco empurrou a vaca e pisou a flor*. [The monkey pushed the cow and stepped (on) the flower.]

Background Picture: The monkey pushes the cow.
Picture array: 1. The monkey steps on the flower; 2. The cow steps on the flower; 3. The monkey and the cow steps on the flower.

*b. O macaco que empurrou a vaca pisou a flor.* [The monkey that pushed the cow stepped (on) the flower]

Background Picture: A monkey pushes the cow and another one looks at the scene.
Picture array: 1. The correct monkey steps on the flower; 2. The cow steps on the flower 3.The other monkey steps on the flower; 3.The other monkey steps on the flower

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