The acquisition of NP recursion in English-speaking children

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Recursion, the ability to iterate syntactic constituents inside constituents, seems to present substantial difficulties for children. In spontaneous interactions children show difficulties understanding and using recursive genitives, such as *daddy's daddy's name* (Snyder & Roeper 2005). Comprehension studies indicate that children provide flat, non-recursive interpretations to recursive possessives in English and Japanese (Limbach & Adone 2010; Roeper 2011). What is the source of these acquisition difficulties? Recursion is the outcome of the application of the basic operation of merge, which should be unrestricted, but its use depends on language-specific knowledge of phrasal labeling and selection. In second-level genitive recursion a case head selects another case head; thus, its selectional demands are more complex than in the general cases of phrasal stacking, such as in prepositional modification. Do children have specific difficulty with genitive recursion, or a general problem with syntactic complexity?

Our study examines children's acquisition of first and second-degree nominal recursion for genitive and prepositional phrases. Nominal recursion is ideal for the study of the development of syntactic complexity, since the relations involved, possession and modification, are among the earliest semantic primitives available to young children. If the problem is specific to the selectional demands of the genitive construction, we expect children to be substantially delayed with genitive as compared to PP recursion. If the problem is specific to phrasal complexity, we predict no differences between types, and first and second-degree recursion to be two separate developmental steps. Children were prompted to produce recursive NPs by means of a question whose answer involved identifying an object that could only be uniquely identified with a recursive NP structure. A control task was used to elicit coordination of three NPs.

(1) Who is crying?   The baby with the woman with the flowers
(2) What is flat?   Elmo's sister's ball
(3) What is he carrying? A ball, a bicycle and some flowers.

Participants were monolingual English-speaking preschoolers and adults (younger, *n*=25*,* mean age= 3;07; older, *n*= 21; mean age= 5;01; adults, n=11). We measured mean number of NP produced and mean number of recursion strategies (including *'s*, PPs, relative clauses, etc.). Children approximated adults' ability to coordinate three NPs, but we observed substantial development in children's performance with the recursion task. Group differences were found in the number of noun phrases expressed [and the number of mixed recursion strategies used (Figures 1 & 2). However, we found no difference in the development for genitive vs. PP recursion, and, generally, children who produced recursive genitives were also able to produce recursive PPs. Finally, one level recursion (of either type) did not make second level recursion directly accessible (Tables 1 & 2). The striking difference between coordination and recursion shows that the difficulty is not simply NP recall, but structural complexity. Further, the distribution of genitive vs. PP, and one vs. two-level recursion suggest that complexity rather than selection is the source of acquisition difficulty. Our results have implications about the independence of syntactic (phrasal) development from lexical (selectional) development.

Word count = 496

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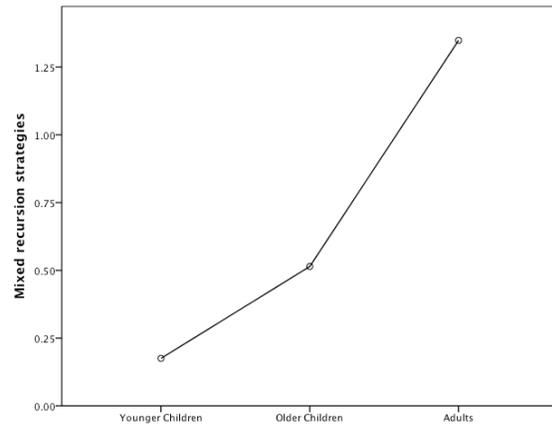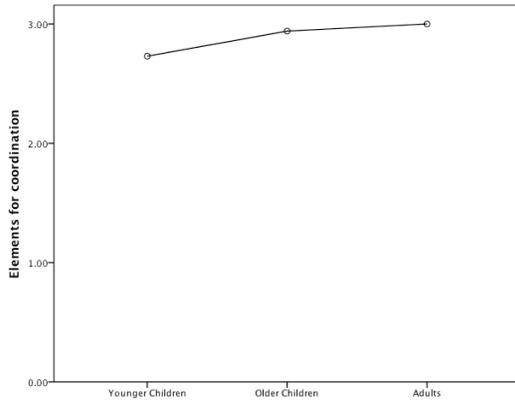

Figure 1. Mean number of coordinated NPs Group [$F(2,54)= 2.75, p= .073$

Figure 2. Mean number of recursion strategies Group [$F(2,54)= 44.87, p< .001$].

Table 1. Children classified according to whether they produced or not PP and genitive recursion

	PP recursion	
Genitive recursion	No	Yes
No	23	6
Yes	4	13

Table 2. Number of recursion strategies employed by type for each group. There were no significant differences in the distribution of nominal recursion strategies (pp vs. genitives, children vs. adults)(χ^2 test, $p=.366$).

Group	Genitive	PP-linking	Relatives
Younger	8	8	0
Older	22	31	3
Adults	29	44	15