

**The Recursive Set-Subset Ordering Restriction Overrides Adjective Ordering Restrictions.
Evidence from Romanian 4-year-olds and Adults.
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The paper brings experimental evidence from Romanian 4-year-olds and adults that orderings of adjectives which reflect hierarchical structure and entail the recursive set-subset relation are stronger than universal crosslinguistic adjectival orderings.

Background: Multiple Adjective Ordering Restrictions (AORs) have been proposed (QUALITY > SIZE > SHAPE > COLOR > PROVENANCE, Sproat & Shih 1991, Dixon 1982, Scott 2002, SUBJECTIVE > NON-SUBJECTIVE, Scontras et al. 2017). Such constraints have been argued to be universal (Cinque 1995, 2010, 2015), though their crosslinguistic validity has recently been under debate (Cornilescu & Nicolae 2017, Leivada & Westergaard 2019). In acquisition, CHILDES corpus studies show that children exhibit more consistent adjective orderings starting with the age of 5 (Lee et al., 2018). However, set-subset constraints (leading to *green small leaves* rather than *small green leaves*) in a context going against AORs have been overlooked.

Aim: Our experiment tests whether Romanian children and adults observe a Recursive Set-Subset Ordering (RSSO) even when in conflict with the AOR.

Predictions: If AOR is stronger than contextual considerations, then we expect participants to always choose the same orderings regardless of whether the context requires an adjectival ordering opposite to AOR ($N A_{Color} A_{Size}$). If, on the other hand, RSSO is primary, then AOR cannot be respected in case of conflict.

Participants: a group of 17 Romanian monolingual TD children (Age range: 3;2-5, Mean age: 4;35, M=8, F=9) and a control group of 17 adults.

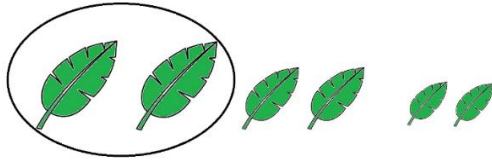
Procedure: Participants were administered a forced choice preferential naming task. They were randomly presented with 8 picture sets, 2 picture sets for flowers, leaves, giraffes, squirrels. The picture sets involved a) three groups having the same color, but a different size, and b) three groups having the same size, but a different color. Each picture set contained one circled group. Children saw one picture set at a time, and they had to choose from two options how they would name the circled group (Table 1, Figure 1). The options involved noun and color and size adjectives occurring in two different orders.

The **results** from a logistic regression show that children's behavior was significantly similar to adults (Figure 2, Table 2), revealing sensitivity to properties identifying the set-subset hierarchy. Regardless of whether the adjectives named color or size, participants chose to place set adjectives closer to the noun than subset ones. For instance, in a context where they identify green leaves out of a set of big leaves of various colors, children and adults preferred to name them *frunze mari verzi* 'green big leaves', even if the natural order would be *frunze verzi mari* 'big green leaves'.

Account: Romanian children and adults are more sensitive to whether an adjective helps pick a set/subset rather than to what the adjective denotes (color, size). We argue that RSSO reflects the core structure-building capacity of Merge, taking priority over the AOR. We hypothesize the RSSO to be both a cognitive/semantic constraint, as well as a syntactic constraint requiring set adjectives to be closer to N than subset adjectives (Figure 3).

Figure 1. Examples of picture sets used in the experiment

“Let’s look at these leaves! They are all green. Some are big, some are medium size, and some are small.
The circled leaves are: *big green leaves* or *green big leaves*?”



“Let’s look at these leaves! They are all big. Some are green, some are orange, and some are yellow.
The circled leaves are: *green big leaves* or *big green leaves*?”

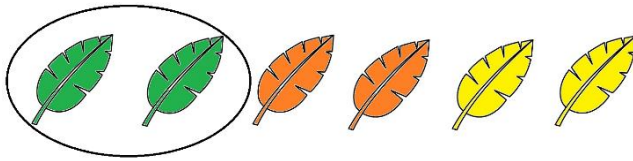


Table 1. Linguistic items used

Items	N SizeA ColorA	N ColorA SizeA
<i>frunze</i> ‘leaves’	<i>frunze mari verzi</i> ‘leaves big green’	<i>frunze verzi mari</i> ‘leaves green big’
<i>flori</i> ‘flowers’	<i>flori mici roșii</i> ‘flowers small red’	<i>flori roșii mici</i> ‘flowers red small’
<i>veverițe</i> ‘squirrels’	<i>veverițe slabe portocalii</i> ‘squirrels thin orange’	<i>veverite portocalii slabe</i> ‘squirrels orange thin’
<i>girafe</i> ‘giraffes’	<i>girafe înalte maronii</i> ‘giraffes tall brown’	<i>girafe maronii înalte</i> ‘giraffes brown tall’

Table 2. Results of a glmer performed on the data

Formula: `setidentif_model <- glmer(Codedanswer ~ Group*Expectedanswer + (1+ Group*Expectedanswer|Items) + (1+Group*Expectedanswer|Participant), family="binomial", data=setidentif)`

Parameter	Estimate	SE	z	p
Intercept	6.846	2.84	2.41	0.0159 *
Group	-6.333	2.88	-2.199	0.0279 *
Expectedanswer	2.0256	3.281	0.617	0.537
Group: Expectedanswer	-0.839	3.402	-0.247	0.8051

⇒ There was no interaction between Group and Expected answer (NAColorASize/NASizeAColor)!

Figure 2. Accuracy per adjectival sequence

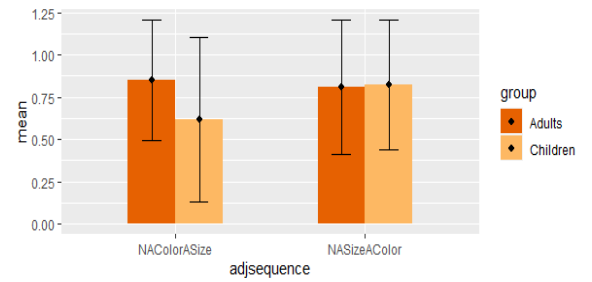


Figure 3. Possible syntactic implementations of the Recursive Set-Subset Ordering (RSSO)

