

## Acquisition of Russian Comparison Constructions – Semantics meets First Language Acquisition

### 1. SUMMARY

Using a longitudinal corpus study of two bilingual (Russian-German speaking) children, I investigated the acquisition of comparison constructions of Russian. The differing parameter setting of cross-linguistic variation of degree constructions (Beck, Oda and Sugisaki (2004), Beck et al. (2009)) changes the evidence available to the Russian speaking child as compared to the evidence that the German or English speaking child has during the acquisition process. Russian-specific features of degree constructions, namely genitive marked vs. clausal structures in the embedded clause of comparatives, the synthetic vs. analytic distinction, and evaluativity in certain degree constructions, influence the order of acquisition of Russian degree constructions in a non-trivial way.

### 2. PARAMETERS

- Beck et al. (2009) suggest three dependent parameters in variation across comparison constructions based on evidence from 17 languages. *Figure 1* shows that Russian is a language with the parameter setting: [+DSP], [+DAP], [-DegPP], to be explained below.

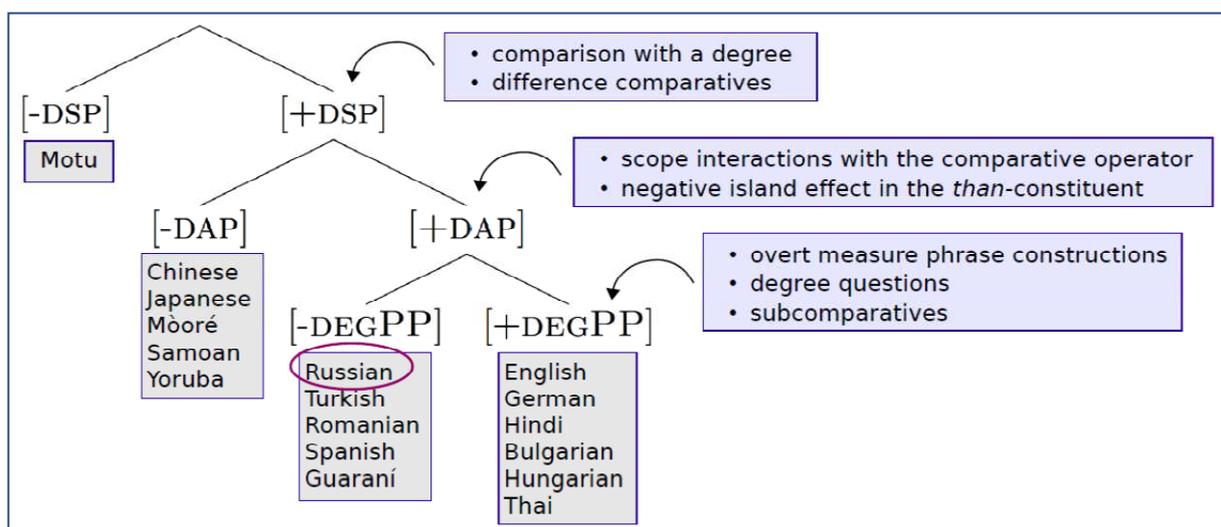


Figure 1: (cf. Hohaus (2010): 67) Parametric Variation in Comparison Constructions across Languages)

- I. Degree Semantics Parameter (DSP):** A language {does/does not} have gradable predicates (type  $\langle d \langle e, t \rangle \rangle$ ) and related, i.e. lexical items that introduce degree arguments.

**II. Degree Abstraction Parameter (DAP):** A language {does/does not} have binding of degree variables in the syntax.

**III. Degree Phrase Parameter (DegPP):** The degree argument position of a gradable predicate {may/may not} be overtly filled.

The parameters make predictions for the (non-)availability of certain constructions in different languages.

### 3. SPECIAL PROPERTIES OF RUSSIAN DEGREE CONSTRUCTIONS

- Composition in the *than*-clause, analytic and synthetic comparatives, and finally, evaluativity are three pertinent points in Russian comparison constructions.

#### 3.1. Comparatives with *chem*-clauses vs. genitive-marked comparatives

- In Russian, the *chem*-clause is a *wh*-element in the instrumental case. The presence of the *wh*-element and the possibility of having an overt tensed verb indicate that (1) involves a reduced clause.
- In (2), on the other hand, the standard of comparison is genitive marked, and there seems to be no reduced clause involved (cf. Pancheva (2006)).

(1) Katya byla vyshe **chem** Masha  
 Katya was tall<sub>COMP</sub> **what**<sub>INSTR</sub> Masha  
 “Katya is taller than Masha.”

(2) Katya vyshe **Mashi**  
 Katya tall<sub>COMP</sub> **Masha**<sub>GEN</sub>  
 “Katya is taller than Masha.”

- The lexical entry for the comparative operator used in (2) (where there is no silent structure in the standard phrase) looks as follows:

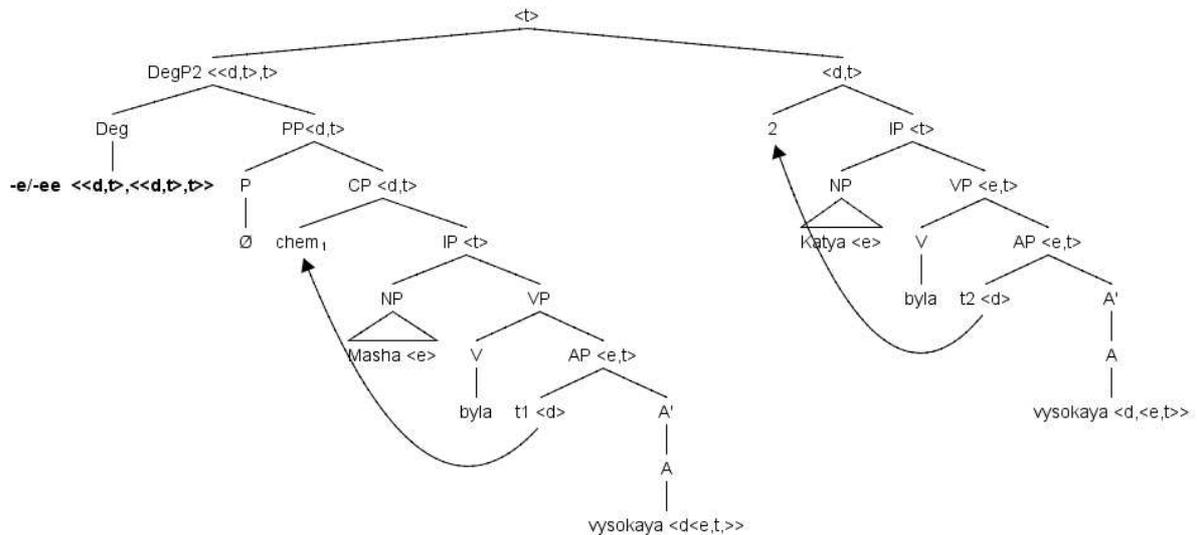
(3)  $[[ -er_{GEN} ]] = \lambda Adj_{\langle\langle d, \langle e, t \rangle \rangle}. \lambda y. \lambda x. \max(\lambda d. Adj(d)(x)) > \max(\lambda d. Adj(d)(y))$

- This lexical entry is limited to predicative uses only, cf. Tiemann et. al. (2012).
- You can see the composition of (2) in (2’):

(2’) a.  $[[vysokaya ('tall')]] = \lambda d. \lambda x. x \text{ is } d\text{-}vysokaya$   
 b.  $[[er_{GEN}]] = \lambda Adj_{\langle\langle d, \langle e, t \rangle \rangle}. \lambda y. \lambda x. \max(\lambda d. Adj(d)(x)) > \max(\lambda d. Adj(d)(y))$   
 c.  $[[Mashi_{GEN}]] = Masha$   
 d.  $[[ (2) ]] = \max(\lambda d. Katya \text{ byla } d\text{-}vysokaya) > \max(\lambda d. Masha \text{ byla } d\text{-}vysokaya)$

- The LF of the clausal counterpart from (1) looks similar to the English *than*-clause, except for the fact that there is no overt preposition *than*. Note that the DegPP is not violated in the *chem*-clause, because the Spec,AP position of the AP embedded under *chem* is taken care of by ellipsis. Importantly, degree abstraction (DA) is needed here:

(1')



→ the acquisition of genitive-marked standards and *chem*-clauses have to be distinguished in the time course of acquisition.

### 3.2. Analytic and synthetic comparatives

- Another Russian-specific property is the synthetic-analytic distinction.
- (4) is an example of a synthetic comparison (SynC). Here, the comparative morphology is suffixed onto the unmarked adjective.
- (5) is an example of an analytic comparison (AnC). The adjective, which doesn't carry any comparative morphology, is combined with the overt comparative operator *bolee*. I take *bolee* to be an overt degree operator which is morphologically detached from the gradable adjective.

(4) Vanya sil'nee chem Oleg  
 Vanya strong<sub>COMP</sub> what<sub>INSTR</sub> Oleg<sub>NOM</sub>  
 "Vanya is stronger than Oleg."

(5) Vanya bolee sil'nyj chem Oleg  
 Vanya more strong what<sub>INSTR</sub> Oleg<sub>NOM</sub>  
 "Vanya is stronger than Oleg."

- What makes (5) interesting is that it is evaluative<sup>1</sup>
- So, in addition to the fact that Vanya has to be stronger than Oleg, both Vanya and Oleg have to exceed the standard for strength in order for the sentence to be true. In 3.3. we will see how an LF for (5) could look like.
- For semantic reasons, SynC and AnC have to be distinguished in the time line of language acquisition.

<sup>1</sup> I use the term 'evaluativity' from Rett (2008) in the sense of Bierwisch (1989) who originally introduced the term 'norm-relatedness'. A construction is evaluative if it refers to a degree that exceeds the standard, as in the positive.

### 3.3. Evaluativity

- The last important characteristic of Russian comparison constructions is evaluativity.
  - Rett (2008) examines the connection between the polarity of the adjective and evaluativity. She shows that in the English equative, negative polar adjectives (A-) obligatorily trigger norm-related readings, whereas positive polar adjectives do not:
- (6) a. Gemma is as short as Judy.  
b. Tony is as tall as Pat.
- Rett proposes to encode evaluativity in the morpheme “EVAL”, which can occur freely and optionally in any degree construction:
- (7)  $[[\text{EVAL}_i]] = \lambda D. \lambda d. D(d) \wedge d > s_i$   
 $\rightarrow$  EVAL is a function from a set of degrees to a subset of those degrees, namely the ones above the standard.
- Krasikova (2009) introduces a morphological constraint for Russian which states that the absence of degree morphology on the adjective triggers evaluative readings in comparison constructions. The positive, the equative, the AnC, the superlative, as well as *enough/too*-comparatives in Russian are all evaluative, see *Table 1*:

Comp Deg	Diff Comp	synth. comp. with <i>chem</i> clause	synth. comp. with genitive	Positive	Analyt. Comp. with <i>chem</i> -clause	Equative	Superlat.	Enough /too
-E	-E	-E	-E	+E	+E	+E	+E	+E

*Table 1: Evaluative Degree Constructions in Russian*

- Using Rett’s (2008) evaluativity operator in (7) in conjunction with Krasikova’s morphological constraint we can assign the Logical Form in (8a) to the example of the AnC in (5). The semantic composition is in (8b-f):
- (8) a.  $[ [\text{DegP} \text{ bolee}_{\langle\langle d,t \rangle, \langle\langle d,t \rangle, t \rangle\rangle} [\text{EVAL}_{\langle\langle d,t \rangle, \langle\langle d,t \rangle, t \rangle\rangle} [\text{chem}_1 \text{Oleg } t_1 \text{ sil'nyj}]]] [\text{EVAL} [2 [ \text{Vanya } t_2 \text{sil'nyj}]]] ]$   
b.  $[[ [2 [ \text{Vanya} \text{byl} [ t_2 \text{sil'nyj}]]]] ] = [\lambda d. \text{Vanya} \text{byl} d\text{-sil'nyj}]$   
c.  $[[ [\text{EVAL} [2 [ \text{Vanya} \text{byl} [ t_2 \text{sil'nyj} ]]]]] ] = [\lambda d. \text{Vanya} \text{byl} d\text{-sil'nyj} \wedge d > s_{\text{strong}}]$   
d.  $[[ [\text{chem}_1 \text{Oleg} \text{byl} t_1 \text{sil'nyj} ]]] = [\lambda d. \text{Oleg} \text{byl} d\text{-sil'nyj}]$   
e.  $[[ [\text{EVAL} [\text{chem}_1 \text{Oleg} \text{byl} t_1 \text{sil'nyj} ]]] ] = [\lambda d. \text{Oleg} \text{byl} d\text{-sil'nyj} \wedge d > s_{\text{strong}}]$   
f.  $[\text{DegP} \text{ bolee} [\text{EVAL} [\text{chem}_1 \text{Oleg} \text{byl} t_1 \text{sil'nyj} ]]] [\text{EVAL} [2 [ \text{Vanya} \text{byl} [t_2 \text{sil'nyj} ]]]] ] = 1$  iff  $\max (\lambda d. \text{Vanya} \text{byl} d\text{-sil'nyj} \wedge d > s_{\text{strong}}) > \max (\lambda d. \text{Oleg} \text{byl} d\text{-sil'nyj} \wedge d > s_{\text{strong}})$

The truth conditions, namely that Vanya’s maximal degree of strength is larger than Oleg’s degree of strength, are borne out.

- Encoding evaluativity in the EVAL operator has the following consequence for L1 acquisition: evaluative constructions are harder to learn for the child than other constructions, because they require an extra component in the grammar.

#### 4. PREDICTIONS

- The research questions I asked were:
  - ❖ What is the difference between the acquisition of Russian as compared to the acquisition of German and English degree constructions?
  - ❖ How does the different parameter setting of Russian change the evidence available to the child?
  - ❖ How does the distinction between the synthetic and analytic forms, as well as evaluativity fit into the acquisitional picture and how does it change the course of acquisition?
  - ❖ The overarching question to ask is in which order degree constructions are learned in Russian, i.e. what is the time line for the course of acquisition for Russian?
- General observations about the time course of acquisition of Russian comparison constructions are spelt out in (9):

(9) **[+DSP] before [+DAP]:** No child should learn constructions indicative of [+DAP] before [+DSP], specifically:

- a. No child acquires *chem*-clauses significantly before degree morphology
- b. No child acquires *chem*-clauses significantly before genitive marked comparison constructions

- For the order of acquisition, I expect that:

##### **I. Unmarked adjective < contextual Synthetic Comparative (SynC)<sup>2</sup>**

First, there is the simple and uncomposed meaning of the adjectives, which only requires <e,t> type lexical entry in (10a) (cf. Tiemann et al. (2012)). It is followed by a contextual comparative, cf. (10b), which still has type <e,t> (cf. Tiemann et al. (2012)):

- (10) a.  $[[\text{tall}]]^c = \lambda x. x \text{ counts as tall in } c \text{ (type } \langle e, t \rangle)$   
b.  $[[\text{vyshe}]] = \lambda x. \text{vysota}(x) > d_c \text{ (type } \langle e, t \rangle)$   
 $([[\text{taller}]] = \lambda x. \text{height}(x) > d_c)$

Here, the child has probably not learned yet that the meaning arises from the combination of a relational lexical entry for the adjective plus the comparative operator.

##### **II. Synthetic comparative (SynC) + genitive-marked standard (GEN) < SynC + *chem*-clause (learning DA)**

... as predicted by (9b). For the synthetic comparative that uses  $er_{GEN}$  from (2'b) does not require degree quantification, no QR takes place. Everything can be interpreted in situ. By the time the child produces SynC with a genitive marked standard, her adjective is no longer of type <e,t>, but already of the relational type <d,<e,t>> in (11), because the  $er_{GEN}$  takes the relational adjective meaning as its first argument.

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<sup>2</sup> A minor notational remark: “<” merely means that construction A precedes another construction B, write A<B.

(11)  $[[\text{tall}]] = \lambda d. \lambda x. x \text{ is } d\text{-tall}$

SynC with a *chem*-clause follow the SynC with a genitive-marked standard, because the child needs to acquire the clausal  $er_{CLAUSAL}$  in (12):

(12)  $[[\text{-er}_{CLAUSAL}]] = \lambda D1. \lambda D2. \max(D2) > \max(D1)$  (type  $\langle\langle d,t \rangle, \langle\langle d,t \rangle, t \rangle\rangle$ )

Note that the child needs to have assigned the DAP the value positive by the time she uses *chem*-clauses.

### III. SynC + *chem*-clause < Analytic Comparative (AnC) + *chem*-clause (Learning evaluativity)

How does a Russian child acquire degree constructions which are evaluative?

To be able to produce an AnC, a superlative or an equative, the Russian child needs to acquire not only DA, but also the EVAL operator. These constructions should be hardest to acquire because they need EVAL!

- 1.) The learner first encodes evaluativity as part of the lexical entry of the comparison operator, as in (13):

(13)  $[[\text{more}_{EVAL}]] = \lambda D_{\langle d,t \rangle}. \lambda D'_{\langle d,t \rangle}. \max(D') > \max(D) \ \& \ \mathbf{\max(D')} > s \ \& \ \mathbf{\max(D)} > s$

Evaluativity is expressed here in “**max (D) > s**”. This lexical entry is undecomposed with respect to evaluativity.

- 2.) The second thing that the child realizes is that the superlative also comes with an evaluative meaning. So the child also learns an undecomposed meaning of the superlative operator:

(14)  $[[\text{C-est}_{EVAL}]] = \lambda D_{\langle d,t \rangle}. \forall D' [D' \neq D \ \& \ C(D') \rightarrow \max(D) > \max(D') \ \& \ \mathbf{\max(D)} > s]$

In (14) evaluativity is encoded as part of the lexical entry.

→ Evidence NR.1 that the child has: there is a shared meaning component of the undecomposed  $more_{EVAL}$  with  $er_{CLAUSAL}$ . Now the child decomposes (13) with respect to EVAL into:

(15)  $[[\text{more}_{EVAL}]] = \lambda D_{\langle d,t \rangle}. \lambda D'_{\langle d,t \rangle}. \max(D') > \max(D)$   
 $+$   
 $[[\text{EVAL}_i]] = \lambda D. \lambda d. D(d) \ \& \ d > s_i + \text{Licensing Condition}$   
(inserted twice) (by Krasikova (2009))

→ Evidence NR. 2 is that (14) and EVAL have a shared meaning component. Now, the child decomposes (14) into:

(16)  $[[\text{C-est}_{EVAL}]] = \lambda D_{\langle d,t \rangle}. \forall D' [D' \neq D \ \& \ C(D') \rightarrow \max(D) > \max(D')]$   
 $+$   
 $[[\text{EVAL}_i]] = \lambda D. \lambda d. D(d) \ \& \ d > s_i + \text{Licensing Condition}$   
(by Krasikova (2009))

- That is how the child arrives at an adult-like representation of the superlative and of AnC.

Summing up, the pattern described here leads me to assume the following order of acquisition:

1. <b>Unmarked adjective</b> with the uncomposed meaning: [[tall]] = $\lambda x. x$ counts as tall in $c$ (type $\langle e, t \rangle$ )	
2. Comparative marked adjective (SynC) without a standard of comparison <b>(contextual comparative)</b> : [[vyshe ('taller')]] = $\lambda x. \text{HEIGHT}(x) > d_c$ (type $\langle e, t \rangle$ )	
3. Comparative marked adjective (SynC) <b>with a genitive marked standard</b> . This only needs a comparative operator which does not require DA: [[ -er <sub>GEN</sub> ]] = $\lambda \text{Adj}_{\langle \langle d, \langle e, t \rangle \rangle}. \lambda y. \lambda x. \max(\lambda d. \text{Adj}(d)(x)) > \max(\lambda d. \text{Adj}(d)(y))$	Acquiring the DAP (cf. (9b))
4. Comparative marked adjective (SynC) with a <b>chem-clause</b> : This construction requires a clausal comparative operator, which needs DA: [[ -er <sub>CLAUSAL</sub> ]] = $\lambda D1. \lambda D2. \max(D2) > \max(D1)$ (type $\langle \langle d, t \rangle, \langle \langle d, t \rangle, t \rangle \rangle$ )	
5. <i>Bolee</i> & adjective (AnC) with a <i>chem</i> -clause, Superlatives, Equatives	Acquiring evaluativity

Table 2: Order of acquisition

In order to be able to check the predicted order of acquisition, I have looked for the following constructions in the corpus:

- all gradable adjectives
- gradable adjectives with the comparative morphology on them (SynC)
  - a.) without a standard (for contextual comparatives)
  - b.) with a standard (for SynC + GEN)
- *chem*-clauses
- *bolee* + adjective (AnC)
- *samyj/samaya/samoye* ('most' with gender marking) + adjective (superlative)
- *takoy/takaya/takoye* ('that')+ adjective (equative)

## 5. THE CORPUS & RESULTS

These predictions were confirmed by the corpus study that I conducted.

### 5.1. The corpus<sup>3</sup>

The corpus contains long-term recordings of two bilingual children: Max and David<sup>4</sup>. They were raised with Russian as their L1, but they experience German socialization early in their lives.

- Max was recorded from age 2;3 until the age of 6;1. 260 video recordings of approximately 60 minutes were made, but only parts of the recordings were put into corpus format. Besides, there are many gaps in the recordings. The total average number of utterances for Max is 187,6 (defined by the MLU-command).

<sup>3</sup> The corpora were kindly provided to me by Prof. Dr. Tilman Berger and his colleagues from the Slavic Department of the University of Tübingen. I thank Nathalie Mai-Deines who took the time to meet me and hand over the data to me.

<sup>4</sup> These are pseudonyms which are used throughout.

- David’s transcripts stretch from the age of 2;10 until the age of 6;1. There are also some gaps at the ages of 3;5, 3;7, 3;11, 4;0-4;3, 4;7, 4;8, etc. Unfortunately, the number of gaps here is also considerable and constituted a problem for various data points. The total average number of utterances for David is 447,8.

## 5.2. Procedure in a nutshell

- First, I applied the CLAN<sup>5</sup> command “FREQ @ +t\*CHI +f“ for every single transcript. This command operates only on the child tier (t\*CHI) and gives us a separate file with all the words uttered by the child within one transcript.
- The lists thus yielded were then searched by hand for the relevant constructions and checked against the original transcripts in order to exclude imitations, repetitions, formulaic expressions.
- Excel files with the categories adjectives, comparatives (again subdivided in: contextual comparatives, SynC, AnC, *chem*-clauses), superlatives and equatives helped to order the different constructions counted in the list. An example is given below in *Figure 2*:

II. Comparatives		DAVID
2;10	luchshe (adverbial)	*MOT: a ja ne umeju risovat' xorosho. *MOT: papa, navernoje, luchshe risuet. *CHI: &net, ne luchshe. *CHI: papa ploxo. (Line 518)
	luchshe (used as "rather")	*CHI: ja luchshe voz'mu drugoj karandash. *CHI: gde eshchjo odin &kar +//? (1211)
	luchshe (used as "rather")	*INV: David, davaj teper' poigraem vo chto+nibud'. *CHI: davaj luchshe frukty e'ti &poe +//. %com: steht auf und holt Spielzeugobst und Gemuese
	3x luchshe (used as "rather")	
2;11	bol'she (Contextual), repetition!	*INV: posmotri, razve ono &s bol'she, chem &e't +//? *INV: kakoe iz nix bol'she &iz +//? [...] *INV: razve ono bol'she? *CHI: &ne [?] ono ne bol'she. (l. 633)

Figure 2: Excerpt from Excel File

## 5.3. Results

*Table 3* shows the very first use of the constructions we are interested in for both children:

<sup>5</sup> This is a tool provided by the CHILDES database founded by MacWhinney.

First Use	Max (2;3-6;10)	David (2;10-6;01)
Unmarked Form	2;6	2;10
<b>Comparatives:</b>		
Contextual comparative		
Contextual Comparative	4; 3	5;0
SynC with genitive marked standard	5;4	3;6
SynC with a <i>chem</i> -clause	5;4	4;6
AnC	none	none
<b>Superlative</b>	5;4	none
<b>Equative</b>	none	none

Table 3: Very first use, all constructions

- None of the children produced any analytic comparatives whatsoever!
- determining the FRU (first of repeated uses) introduced by Stromswold (1990), and thereby the age of acquisition turned out to be not possible for many constructions due to too few data points

#### Max:

- As predicted by our theory, namely that the contextual comparative follows the unmarked form of the adjective and precedes the SynC with a genitive-marked standard, Max uses contextual comparatives as his first comparatives.

(17) \*MOT: &nu, kakaja zmeja dlinnee?

(‘Well, which of the snakes is longer?’)

\*CHI: moja anakonda, moj [//] moja anakonda **dlinnee**.

(‘My anaconda, my anaconda is **longer**.’)

- SynC with genitive-marked standards appear seemingly simultaneously with SynC+chem-clauses for the very first time, namely at 5;4. But there is a huge gap between the ages 4;6 and 5;4 → we cannot conclude that “SynC + GEN” were acquired before “SynC+chem”
- As to superlatives, there are instances at 5;4, 6;1 and 6;10. However, the child cannot be said to have acquired those constructions due to lack of data in between. Again, the FRU cannot be determined.
- Equatives in the required form also did not appear.

#### David:

- Contextual comparatives appear only twice, at 5;0 and at 5;2 → no conclusion possible!
- There is only one occurrence of “SynC+GEN” and only two “SynC+chem-clause” → too few data points to make any conclusion about the acquisition of comparative constructions
- Two interesting instances of superlatives, one of which is in (18):

(18) \*CHI: &a naverx, **do samogo verxa**, &e ego ne dostanesh'.  
(‘To the top, to the very top, you cannot get it.’)

\*LIZ: ja dostanu.

(Another child named Liza: ‘I will get it.’)

→ Since these are not the instances that we are after, we cannot make any conclusions about David acquiring superlatives in the relevant time span

- David only elicits particular uses of the equatives that we are not after → Again, no conclusion can be made concerning the acquisition of the equative.
- A serious drawback of the corpora is the very small number of data points and gaps!
- But the results don’t falsify the predictions!
- It might be helpful to loosen the definition of FRU and to extend the time span from two to four months.
- Only Max’s and David’s gradable adjectives, as well as Max’s contextual comparative and SynC+*chem* come close to what looks like acquisition of these constructions.
- One clear result for future studies: the very first uses of degree constructions happen after the age of 3;5. This is a solid conclusion, because the recordings are without gaps until the age of 3;5 and no degree construction can be found until there.
- Important result: Evaluative constructions can be said to have not been acquired during the recordings! This might point to a very late acquisition of these constructions, maybe even after the age of 6.

## 6. CONCLUSIONS

- The constructions described in 1.- 4. (*Table 2*) first appeared in the predicted order. The constructions in 5., on the other hand, did not occur in the frequency, form and meaning in question in the corpus data. These results show that evaluativity is acquired late and not early, as one might expect from the early acquisition of the positive which is inherently evaluative.
- An important repercussion of my study is that not only can semantic theory make predictions for acquisition, but that acquisition research can also be of great importance for semantic theories: A challenge from language acquisition for Rett’s EVAL operator is that the evidence that the child has for such a covert operator as EVAL is rather weak. Still, the child manages to acquire evaluativity.

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