

# Acquisition of Russian comparison constructions

## Semantics meets first language acquisition

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This paper brings together insights from cross-linguistic research on grammatical variation in comparison constructions (Beck et al. 2009), first language acquisition and the ‘standard analysis’ of comparison constructions based on von Stechow (1984), Heim (2001) and Beck (2011). The cross-linguistic parameters make predictions for the acquisition of Russian comparison constructions. I worked out the order of their acquisition based on predictions made by the theory and specific characteristics of Russian degree constructions. I tested the predictions against a longitudinal corpus of two bilingual children. An unexpected result is the late acquisition of all evaluative degree constructions but the positive.<sup>1</sup>

### *1. Introduction*

‘...the study of grammatical variation, like the study of grammatical universals is a “deep” domain of scientific inquiry, one where we can expect to discover richly explanatory principles. Child language provides a unique window into this aspect of human language’ (Snyder 2007:3). Snyder shows that interdependent syntactic parameters can be traced back through first language acquisition. But we will see that the gain is mutual: the cross-linguistic parameters of degree constructions as proposed by Beck et al. (2009) provide guidelines as to how the child is going to acquire degree constructions. The parameter setting in Russian is different from that of German and English. This changes the evidence available to the child during the acquisition process and thus also the order in which comparison constructions are acquired. Acquisitional studies by Tiemann et al. (2012) and Hohaus et al. (to appear) have already shed light on how English and German speaking children acquire degree constructions. Russian has not yet been investigated from this perspective.

This paper is structured as follows: Section 2 provides the necessary theoretical background. In section 3, I will point out special features of Russian comparison constructions, provide analyses and finally, outline the predictions for the order of acquisition

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<sup>1</sup> This paper presents the results of the corpus study conducted within the frame of my Staatsexamen thesis: Acquisition of Russian comparison constructions by bilingual children: A corpus based study (2012).

of degree constructions in Russian. The corpus study and methodology are presented in section 4. In section 5, I will discuss the results and finish the paper with some concluding remarks in section 6.

## *2. Theoretical background*

Two theoretical components that I used are the Beck et al. (2009) parameters and Snyder's (2007) parametric theory of language acquisition. I will now briefly present these two components before proceeding to the predictions.

### *2.1. Parameters of cross-linguistic variation in comparison constructions (Beck et al. 2009)*

Beck et al. (2009) identified three dependent parameters of cross-linguistic variation based on data from 17 different languages from different language families. Data were collected for the constructions (1-7), among others.

- (1) **Difference Comparative (DiffC)**  
Naomi is 2cm taller than Sandra.
- (2) **Comparison with a Degree (CompDeg)**  
Naomi is taller than 1.50m.
- (3) **Degree Question (DegQ)**  
How tall is Naomi?
- (4) **Measure Phrase (MP)**  
Naomi is 1.70m tall.
- (5) **Subcomparative (SubC)**  
The shelf is wider than the drawer is deep.
- (6) **Negative Island Effect (NegIs):**  
\*Mary bought a more expensive book than nobody did.
- (7) **Scope Interactions (Scope):**  
The draft is ten pages long. The paper is required to be exactly five pages longer than that.<sup>2</sup>

After examining the collected data, the following cluster patterns were found with the help of the Fisher Exact test and the method described in Maslova (2003) for the 17 languages: {DiffC, CompDeg} cluster together, {Scope, NegIs} also cluster together, where applicable, {DegQ, MP, SubC} also generally behave in a parallel way. The clusters were found to be dependent of one another, e.g. no language was found which had {DegQ, MP, SubC}, but

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<sup>2</sup> This example goes back to Heim (2001:224).

lacked {DiffC, CompDeg}. The parameters make clear predictions for the availability or non-availability of certain constructions in different languages.

Some of the core results of the study are summarized in Table 1.

Language example	CompDeg & DiffComp	Scope & NegIs	MP, DegQ & SubC
Motu	no	n.a <sup>3</sup>	no / n.a.
Chinese, Mooré	yes	no / n.a	no / n.a.
Russian, Guaraní	yes	yes	no
English, German, Thai	yes	yes	yes

Table 1: Some of the results of the cross-linguistic study by Beck et al. (2009)

Table 1 shows which constructions were taken to be diagnostics for a parameter setting, e.g. CompDeg constructions were taken to be indicators of degree ontology, while scope interactions between the comparative operator and a modal operator were applied as diagnostics for degree abstraction in a language. And finally, the availability of measure phrases, degree questions and subcomparatives indicated a positive setting of the so-called Degree Phrase Parameter.

The parameters are summarized and explained in (8-10).

- (8) **Degree Semantics Parameter (DSP)** (Beck et al. 2009:19): A language {does/does not} have gradable predicates (type <d,<e,t>>) and related, i.e. lexical items that introduce degree arguments.
- (9) **Degree Abstraction Parameter (DAP)** (Beck et al. 2004:325): A language {does/does not} have binding of degree variables in the syntax.
- (10) **Degree Phrase Parameter (DegPP)** (Beck et al. 2009:24): The degree argument position of a gradable predicate {may/may not} be overtly filled.

Russian is a language with the parameter setting: [+DSP], [+DAP], [-DegPP]. Russian shares this parameter setting with Turkish, Romanian, Spanish and Guaraní. Except in the case of DegPP, Russian seems to pattern well with languages such as English and German which have the positive parameter setting of all the three parameters. However, the [DegPP] is set to negative. Neither MPs, nor DegQs or SubCs of the English type can be found in Russian. In order to express a Degree Question, for example, Russian uses a nominalization strategy as in (11) thus avoiding the English construction:.

- (11) Kakogo rosta Oleg?  
 Which-GEN height-GEN Oleg  
 ‘How tall is Oleg?’ (Lit. ‘Of which height is Oleg?’)

<sup>3</sup> N.a stands for ‘not applicable’. This can be due to different factors, for example the non-availability of clausal structures which, in turn, leads to non-availability of scope effects.

Why should this be the case? All three constructions, namely MPs, DegQs and SubCs require an adjective to combine with a syntactic element known as a Degree Phrase (DegP). In English, the Spec,AP position is filled in overt syntax in every construction, either by a trace as in (12a), by a *wh*-word as in (12b) or by a measure expression as in (12c).

- (12) a. Helo's shoes are longer than the cupboard is deep.  
       [than [how<sub>1</sub> [the cupboard is [AP t<sub>1</sub> [A deep]]]]]  
       b. How deep is the cupboard?  
       [AP how [A deep]]  
       c. The cupboard is exactly 35 cm deep.  
       [the cupboard is [AP [exactly 35 cm] [deep]]]

(Beck et al. 2009:24)

In Russian, on the other hand, this position cannot be filled overtly. Therefore, none of those three constructions can be found in Russian.

This parameter setting makes clear predictions for the order of acquisition, to be elaborated in section 3.4. of this paper.

## 2.2. Snyder's parametric approach to language acquisition

I will now briefly introduce the relevant parts of Snyder's theory in order to show the link between the parameters from 2.1. and first language acquisition.

Snyder's central claim is that the time course of language acquisition is in itself a rich source of evidence about the nature of what and when the child is acquiring. For any parameter, he proposes the acquisitional predictions presented in (13) and (14).

- (13) If the grammatical knowledge (including parameter setting and lexical information) required for construction A, in a given language, is **identical** to the knowledge required for construction B, then any child learning the language is predicted to **acquire A and B at the same time**.
- (14) If the grammatical knowledge (including parameter settings and lexical information) required for construction A, in a given language, is a **proper subset** of the knowledge required for construction B, then the age of acquisition for A should always be **less than or equal to** the age of acquisition for B. (No child should acquire B significantly earlier than A.)

(Snyder 2007:7)

The theoretical implication drawn from this is that the predictions in (13) and (14) can be directly applied to Beck et al.'s parameters to yield (15) and (16).

- (15) **[+DSP] before [+DAP]:** No child should acquire constructions indicative of [+DAP] before [+DSP].
- (16) **[+DAP] before [+DegPP]:** No child should acquire constructions indicative of [+DegPP] before [+DAP].

### 3. Specific characteristics of Russian comparison constructions and implications for acquisition

So far I have not addressed what else, besides the parameter setting, distinguishes Russian from languages such as English and German which dispose of a fully-fledged degree semantics. Composition in the *than*-clause, analytic and synthetic comparatives, and evaluativity are the three pertinent issues that will be addressed in the next subsections.

#### 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 (or copula) indicate that (17) involves a reduced clause. In (18), on the other hand, the standard of comparison is genitive-marked, and no reduced clause seems to be involved, cf. Pancheva (2006).

(17) Katya byla vyshe **chem** Masha  
 Katya was tall-COMP what-INSTR Masha  
 ‘Katya was taller than Masha.’

(18) Katya byla vyshe **Mashi**  
 Katya was tall-COMP Masha-GEN  
 ‘Katya was taller than Masha.’

The lexical entry for the comparative operator found in (18), where there seems to be no silent structure in the standard phrase is found in (19).<sup>4</sup>

(19)  $[[\text{er}_{\text{GEN}}]] = \lambda \text{Adj}_{\langle \langle d, \langle e, t \rangle \rangle}. \lambda y. \lambda x. \max(\lambda d. \text{Adj}(d)(x)) > \max(\lambda d'. \text{Adj}(d')(y))$

This is a comparative operator that compares two individuals along the dimension provided by the adjective. This operator is limited to predicative uses only, cf. Tiemann et al. (2012)<sup>5</sup>.

The Logical Form (LF) of (18) is in (18'a), the composition is illustrated in (18'b.- d.) and the truth conditions are spelt out in (18'e).

<sup>4</sup> The discussion is presented in the general framework of the Heim & Kratzer (1998) textbook.

<sup>5</sup> There are adverbial cases of comparatives which can also take the genitive-marked standard of comparison:

Masha ljubit Vanyu bol'she Ziny  
 Masha loves Vanya-ACC more Zina-GEN  
 ‘Masha loves Vanya more than Zina.’

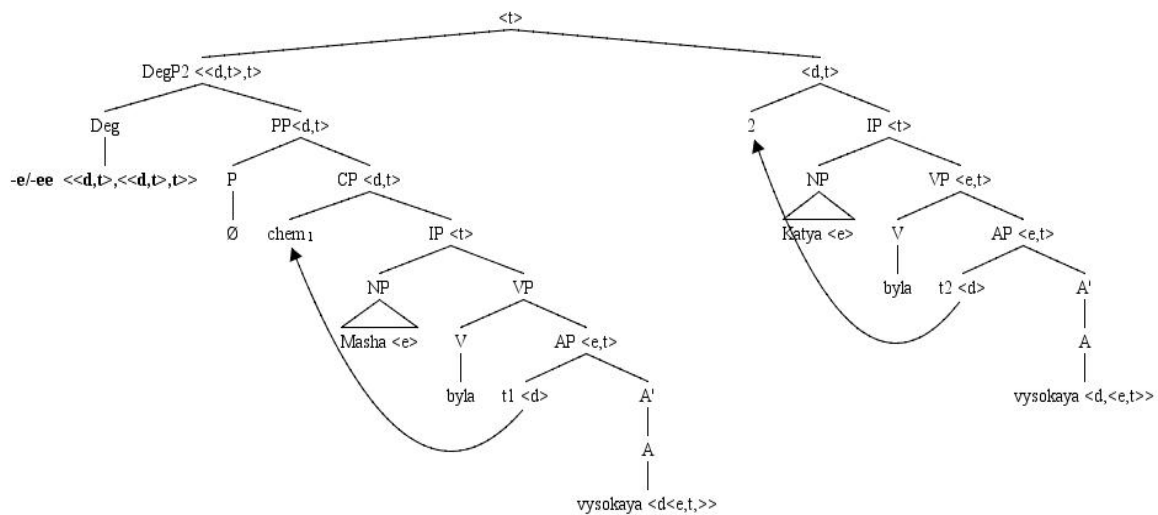
This would not be expected under the assumption that genitive-marked Russian comparatives always employ the *er<sub>GEN</sub>* in (19). I have not included these cases in the present paper. However, such adverbial uses should not be ignored in future work. I thank Roumyana Pancheva (p.c.) for bringing this point to my attention.

- (18') a. [Katya [byla [-*er*  $\langle\langle d, \langle e, t \rangle \rangle, \langle e, \langle e, t \rangle \rangle \rangle$  vysokaya $\langle d, \langle e, t \rangle \rangle$ ] Mashii]] (LF)  
 b. [[vysokaya]] =  $\lambda d. \lambda x. x$  is  $d$ -tall  
 c. [[*er*<sub>GEN</sub>]] =  $\lambda \text{Adj} \langle\langle d, \langle e, t \rangle \rangle \rangle. \lambda y. \lambda x. \max(\lambda d. \text{Adj}(d)(x)) > \max(\lambda d'. \text{Adj}(d')(y))$   
 d. [[Mashi<sub>GEN</sub>]] = Masha  
 e. [[(18)]] =  $\max(\lambda d. \text{Katya was } d\text{-tall}) > \max(\lambda d'. \text{Masha was } d'\text{-tall})$

Note that here we do not need to move anything, rather we apply an *in situ* analysis.

The Logical Form of the clausal counterpart from (17) illustrated in (20) looks similar to the analysis of English *than*-clauses, except that there is no overt preposition *than* in Russian and that we have an overt *wh*-phrase, namely *chem* under Spec,CP.

(20)



Truth conditions: 'The maximal degree of height that Katya reaches is larger than the maximal degree of height that Masha reaches.'

The lexical entry for the clausal degree morpheme required here looks as in (21).

- (21) [[*er*<sub>CLAUSAL</sub>]] =  $\lambda D_1 \langle d, t \rangle. \lambda D_2 \langle d, t \rangle. \max(D_2) > \max(D_1)$ <sup>6</sup>

The composition of (20) works, as just mentioned, very much as it would for English clausal comparatives. We apply the clausal comparative operator in (21) and arrive at the semantic composition in (17').

- (17') a. [[vysokaya]] =  $\lambda d. \lambda x. x$  is  $d$ -tall  
 b. [[ [2 [Katya byla [t<sub>2</sub> vysokaya]] ] ] ] = [ $\lambda d. \text{Katya was } d\text{-tall}$ ]  
 c. [[ chem<sub>1</sub> Masha byla t<sub>1</sub> vysokaya ] ] = [ $\lambda d'. \text{Masha was } d'\text{-tall}$ ]  
 d. [[(20)]] =  $\max(\lambda d. \text{Katya was } d\text{-tall}) > \max(\lambda d'. \text{Masha was } d'\text{-tall})$

<sup>6</sup> The specific morphological representation of this operator in Russian is *-e/-ee*, which is the same as in the genitive-marked case. In order to distinguish those two I resort to metalanguage and use *er*<sub>GEN</sub> and *er*<sub>CLAUSAL</sub>.

Note that the Degree Phrase Parameter 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. Since the semantics of the clausal case is more difficult than that of the non-clausal, genitive counterpart, I assume that the acquisition of the genitive-marked standard will precede the acquisition of the cases with the *chem*-clause.

### 3.2. Analytic and synthetic comparatives (AnC & SynC)

Another important property of Russian degree constructions is the synthetic-analytic distinction. Example (22) demonstrates a synthetic comparison (SynC). Here, the comparative morphology *-ee* is directly suffixed onto the gradable adjective *sil'nyj* ('strong'), as in English when *-er* is suffixed to the unmarked form of the adjective.

- (22) Vanya sil'nee chem Oleg  
 Vanya strong-COMP what-INSTR Oleg  
 'Vanya is stronger than Oleg.'

Example (23), on the other hand, is an instance of an analytic comparison (AnC).

- (23) Vanya bolee sil'nyj chem Oleg  
 Vanya more strong what-INSTR Oleg  
 'Vanya is stronger than Oleg.' (Lit. 'Vanya is more strong than Oleg.')

In (23), the adjective is combined with the overt comparative operator *bolee* which consists of the morpheme *bol-* and comparative morphology expressed by the suffix *-ee*. I take *bolee* to be an overt degree operator which is morphologically detached from the gradable adjective. That means that (23) should work semantically like the LF in (20), but instead of the discontinuous morpheme *-ee/-e* the overt degree operator *bolee* should be found in the degree head position.

However, there is more to say about the analytic case in (23). A remarkable feature of analytic comparatives like (23) in Russian is that another meaning component, namely 'evaluativity' is involved<sup>7</sup>. That means that in addition to the fact that Vanya from (23) has to be stronger than Petya, both Vanya and Petya have to exceed the contextually salient standard for strength in order for the sentence to be true. I will distinguish SynC (synthetic comparatives) and AnC (analytic comparatives) in the course of acquisition, so far as SynC should precede AnC because of evaluativity. This will be explained in more detail in the next section.

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<sup>7</sup> I use the term 'evaluativity' from Rett's dissertation (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 a contextually salient standard, as in the positive.

### 3.3. Evaluativity in Russian degree constructions

Bierwisch (1989) introduced the term ‘norm-relatedness’ to refer to comparisons with a contextually determined standard of the relevant gradable property. Evaluativity is operative in the positive in English. I am providing an example of a positive construction in (24), since the positive is inherently evaluative.

- (24) a. Peter is tall.  
 b. Peter is  $[_{AP} POS_s \text{ tall}]$ .  
 c.  $[[POS_s]] = [\lambda Adj. \lambda x. \max (\lambda d. Adj (d)(x)) \geq s]$  (Hohaus et al. (to appear):5)  
 d.  $[[[_{AP} POS_s \text{ tall}]]] = \lambda x. \max (\lambda d. x \text{ is } d\text{-tall}) \geq s$  (type  $\langle e, t \rangle$ )

Example (24a) states that Peter’s height lies above the given standard of tallness. As a result of composing the POS-operator defined in (24c) and the adjective I arrive at the meaning in (24d): the set of all  $x$  such that  $x$ ’s height reaches  $s$ , where the  $s$ -variable stands for a contextually salient threshold for tallness. Importantly, after the abstract POS operator has been inserted on top of the relational adjective, the degree argument slot is closed off, so that the adjective now has type  $\langle e, t \rangle$ .

Rett (2008) examines the connection between the polarity of the adjective and evaluativity. She shows that in the English equative, negative polar adjectives (A-), as in (25a), obligatorily trigger evaluative readings, whereas positive polar adjectives do not, as shown in (25b).

- (25) a. Gemma is as short as Judy.  
 b. Tony is as tall as Pat.

In Russian this is different. The equative, as well as many other degree constructions including the AnC in (23) are evaluative regardless of the polarity of the adjective. Krasikova (2009) investigates the distribution of norm-related readings with dimensional adjectives across various degree constructions in Russian and English. She shows that in Russian the lack of degree morphology on the predicate triggers evaluative readings, while the comparative morpheme on a gradable predicate makes the norm-related reading disappear.

How can evaluativity be encoded into the semantics? Rett (2008) proposes to encode evaluativity in the morpheme ‘EVAL’ in (26) which can occur freely and optionally in any degree construction.

- (26)  $[[EVAL_i]] = \lambda D. \lambda d. D(d) \wedge d > s_i$

EVAL is a function from a set of degrees to a subset of those degrees, namely the ones above the standard. The variable ‘ $s_i$ ’ is a pragmatic variable, which means that it is left unbound in the semantics. Each instance of EVAL introduces a possibly different pragmatic variable ‘ $s_i$ ’ which necessitates the indexing.

The positive, the equative, the AnC, the superlative, as well as *enough/too*-comparatives in Russian are all evaluative as illustrated in Table 2.



Comp Deg	Diff Comp	SynC with <i>chem</i> clause	SynC with genitive	Positive	AnC	Equative	Superlative	Enough /too
-E	-E	-E	-E	+E	+E	+E	+E	+E

Table 2: Evaluative degree constructions in Russian

Using Rett's evaluativity operator in (26) in conjunction with Krasikova's morphological constraint I assign the LF in (27a) to the example of the AnC in (23). The semantic composition with the truth conditions is in (27b-e):

- (27) a.  $[[[_{\text{DegP}} \text{bolee}_{\langle\langle d, t \rangle, \langle\langle d, t \rangle, t \rangle\rangle} [\text{EVAL}_{\langle\langle d, t \rangle, \langle d, t \rangle\rangle} [\text{chem}_1 \text{Oleg } t_1 \text{ sil'nyj}]]] [2[\text{Vanya } t_2 \text{ sil'nyj}]]]]]$   
 b.  $[[ [2 [\text{Vanya } [ t_2 \text{ sil'nyj } ]]] ] ] = [\lambda d. \text{Vanya is } d\text{-strong}]$   
 c.  $[[ [\text{chem}_1 \text{Oleg } t_1 \text{ sil'nyj} ] ] ] = [\lambda d'. \text{Oleg is } d'\text{-strong}]$   
 d.  $[[ \text{EVAL} [\text{chem}_1 \text{Oleg } t_1 \text{ sil'nyj} ] ] ] = [\lambda d'. \text{Oleg is } d'\text{-strong} \wedge d' >_{\text{strong}}]$   
 e.  $[[[_{\text{DegP}} \text{bolee}_{\langle\langle d, t \rangle, \langle\langle d, t \rangle, t \rangle\rangle} [\text{EVAL}_{\langle\langle d, t \rangle, \langle d, t \rangle\rangle} [\text{chem}_1 \text{Oleg } t_1 \text{ sil'nyj}]]] [[\text{Vanya } t_2 \text{ sil'nyj}]]]]]$   
 $= \text{liff } \max(\lambda d. \text{Vanya is } d\text{-strong}) > \max(\lambda d'. \text{Oleg is } d'\text{-strong} \wedge d' >_{\text{strong}})$

Note that it suffices to insert the EVAL only once in the *chem*-clause, because it is entailed that if Oleg is above the standard for strength, Vanya also has to be above it, since he has to be taller than Oleg in order for the sentence to be true. The truth conditions, namely that Vanya's maximal degree of strength is larger than Oleg's maximal degree of strength and their degree of strength exceeds the height standard, are borne out.

This way of encoding evaluativity into the semantics has the consequence that evaluativity is understood as an extra component. It contributes to meaning by adding information about the context. The repercussion for L1 acquisition is that evaluative constructions are harder to acquire than non-evaluative ones because of this extra meaning component in the grammar.

### 3.4. Theoretical predictions of the order of acquisition

Based on Snyder's acquisitional predictions in (13) and (14) from section 2.2., I spell out the general predictions about the time course of acquisition of Russian comparison constructions in (28).

- (28) **[+DSP] before [+DAP]:** No child should acquire 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.

Drawing on results from studies by Tiemann et al. (2012) and Hohaus et al. (to appear), I expect the following first steps in the acquisition of Russian degree constructions:

### I. Unmarked adjective < contextual comparative<sup>8</sup>

First, there is the simple and uncomposed meaning of the adjectives, which only requires <e,t> type lexical entry in (29) (cf. Tiemann et al. 2012:136).

$$(29) \text{ [[vysokij]]}^c = \lambda x. x \text{ counts as tall in } c \quad (\text{type } \langle e, t \rangle)$$

It is followed by a contextual comparative in (30) which still has type <e,t> (cf. Tiemann et al. 2012).

$$(30) \text{ [[vyshe]]} = \lambda x. \text{HEIGHT}(x) > d_c \quad (\text{type } \langle e, t \rangle)$$

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.

Based on (28) and specific characteristics of Russian degree constructions, I expect the following further acquisitional steps:

### II. Synthetic comparative (SynC) + genitive-marked standard (GEN) < SynC + chem-clause (acquiring degree abstraction (DA))

This is predicted by (28b). Since the synthetic comparative that uses  $er_{GEN}$  from (18'c) 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 (31).

$$(31) \text{ [[vysokij]]} = \lambda d_{\langle d \rangle}. \lambda x_{\langle e \rangle}. x \text{ is } d\text{-tall} \quad (\text{type } \langle d, \langle e, t \rangle \rangle)$$

SynC with a *chem*-clause follows the SynC with a genitive-marked standard, because the child needs to acquire  $er_{CLAUSAL}$  in (21) repeated in (32) for *chem*-clauses.

$$(32) \text{ [[er}_{CLAUSAL}\text{]]} = \lambda D1_{\langle d, t \rangle}. \lambda D2_{\langle d, t \rangle}. \max(D2) > \max(D1) \quad (\text{type } \langle \langle d, t \rangle, \langle \langle d, t \rangle, t \rangle \rangle)$$

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

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

How does the child manage to acquire evaluativity? Here is a possible scenario: To be able to produce an AnC, a superlative or an equative, the Russian child needs to acquire not only degree abstraction, but also the EVAL operator. She first encodes evaluativity as part of the lexical entry of the comparison operator, as in (33).

$$(33) \text{ [[more}_{EVAL}\text{]]} = \lambda D_{\langle d, t \rangle}. \lambda D'_{\langle d, t \rangle}. \max(D') > \max(D) \ \& \ \mathbf{\max(D)} > s$$

Evaluativity is expressed here in ' $\mathbf{\max(D)} > s$ '. This lexical entry is uncomposed with respect to evaluativity.

<sup>8</sup> A minor notational remark: < means that construction A precedes another construction B, write A<B.

The second thing that the child realizes is that the superlative also comes with an evaluative meaning in Russian. So the child also learns an uncomposed meaning of the superlative operator in (34).

$$(34) \quad [[C\text{-est}_{\text{EVAL}}]] = \lambda D_{\langle d, t \rangle}. \forall D' [D' \neq D \ \& \ C(D') \rightarrow \max(D) > \max(D') \ \& \ \mathbf{\max(D) > s}]^9$$

In (34) evaluativity is again encoded as part of the lexical entry.

The knowledge just sketched leads the child to evidence number one, namely that there is shared meaning component of the uncomposed *more<sub>EVAL</sub>* with *C-est<sub>EVAL</sub>*. With this knowledge the child can decompose (33) with respect to EVAL into (35).

$$(35) \quad [[\mathbf{more}_{\text{EVAL}}]] = \lambda D_{\langle d, t \rangle}. \lambda D'_{\langle d, t \rangle}. \max(D') > \max(D) \\ + \\ [[\text{EVAL}_i]] = \lambda D. \lambda d. D(d) \ \& \ d > s_i + \text{Licensing Condition (Krasikova 2009)}$$

Now the child arrives at evidence number two, namely that *more<sub>EVAL</sub>* in (33) also has the operator EVAL in it as a meaning component. Now, the child can decompose (34) into (36).

$$(36) \quad [[C\text{-est}_{\text{EVAL}}]] = \lambda D_{\langle d, t \rangle}. \forall D' [D' \neq D \ \& \ C(D') \rightarrow \max(D) > \max(D')] \\ + \\ [[\text{EVAL}_i]] = \lambda D. \lambda d. D(d) \ \& \ d > s_i + \text{Licensing Condition (Krasikova 2009)}$$

This is one possible way of capturing how the child could arrive at an adult-like representation of the superlative and of AnC.

### 3.5. Interim Summary

In this section, I summarize the predictions discussed in 3.4. In Figure 1 the numbers 1-5 indicate the order in which the constructions are acquired (in bold), with the lexical entries indicated underneath as a reminder. I also indicate important transitions, namely the acquisition of degree abstraction and evaluativity by arrows.

<sup>9</sup> This is a lexical entry for the superlative morpheme adopted from Heim (1999:21).

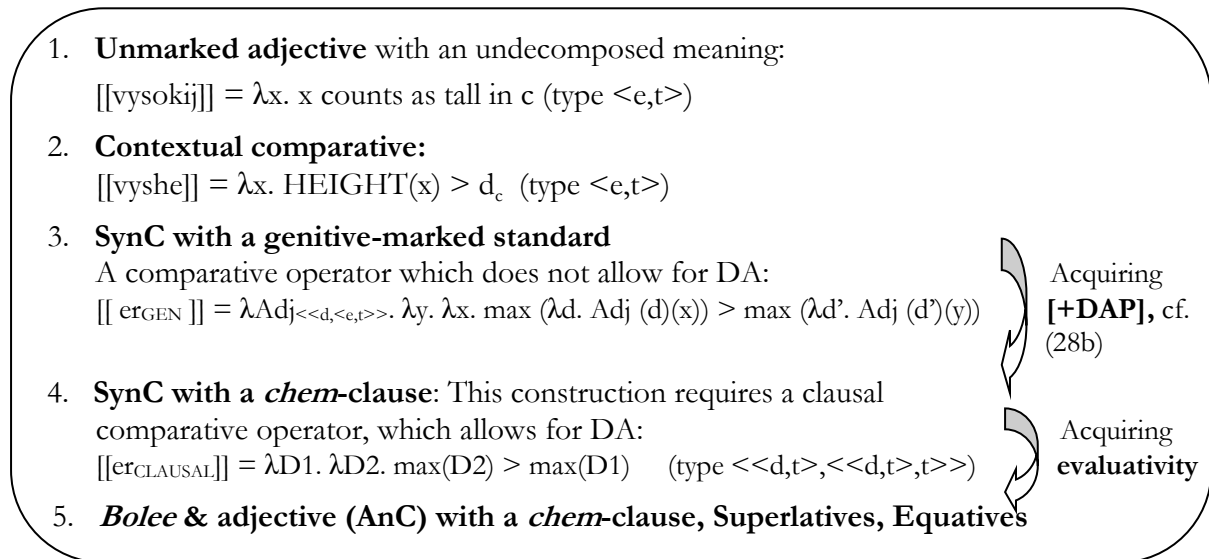


Figure 1: Order of acquisition for Russian

For illustrative purposes, I also include the following graph to show the different stages of acquisition for Russian.

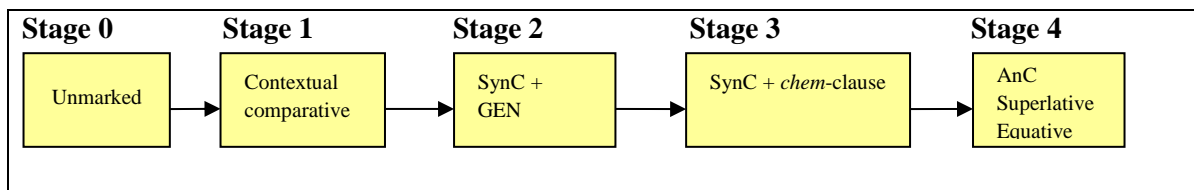


Figure 2: Stages of acquisition for Russian

Figures 1 and 2 illustrate that the unmarked form of the gradable adjective requires the least acquisitional effort. All types of comparatives start later, in stage 1 of Figure 2. The division between Stage 2 and 3 is necessary in Russian, because this is when the child acquires the ability to abstract over degrees, in other words, where she sets the [DAP] to positive. And finally, all the evaluative constructions should be acquired at the very end, at stage 4 in Figure 2 or at point 5 from Figure 1.

#### 4. Corpus and methodology

In this section, I present the corpus and the methodology used in the study.

#### 4.1. Corpus<sup>10</sup>

I tested the above predictions against a longitudinal corpus of spontaneous child speech. The corpus contains long-term recordings of two bilingual children: Max and David<sup>11</sup>. They were raised with Russian as their L1, but experienced German socialization early in their lives. Although I am aware of the fact that Max and David are bilingual children, I only look at the Russian part of the corpus and leave aside the German data.

The first child, Max, was recorded from age 2;3 (2 years, 3 months) to 6;1. In total 260 video recordings of approximately 60 minutes were made of him, but only parts of the recordings were put into corpus format. Unfortunately, the transcripts contain a considerable number of gaps. The total average number of utterances per transcript for Max is 187,6 (defined by the MLU-command from CLAN). An utterance is defined as exactly one line in the transcript, which can contain from just a word to a sentence. David's transcripts stretch from the age of 2;10 until 6;1. There are also some gaps at the ages of, for example 3;5, 3;7, 3;11, 4;0-4;3, 4;7, 4;8. The total average number of utterances per transcript for David is 447,8, so considerably higher than for Max.

#### 4.2. Methodology

According to Snyder (2007), in order for results to be accurate it is important to exclude material that is mumbled, unclear or overlapping with another person's utterance in the transcript. Repeated material, e.g. utterances that contained the same words in the same order as produced by the respective adults in the same context was also excluded from the results. Memorized routine, such as poems, nursery rhymes, songs and fairy tale names was not taken into account. Novel utterances (Tiemann 2009:34) and finally, German words were excluded from the count, as well.

A suitable measure in determining the age of acquisition in longitudinal studies of spontaneous speech is the First of Repeated Uses (FRU). FRU goes back to Stromswold (1990). She argues that researchers who work with longitudinal corpora should credit the child with knowledge of a grammatical construction not immediately after its first clear use, but rather after one can determine that it is followed soon afterwards by regular use with a variety of different lexical items. Tiemann (2009) refined this formulation by establishing that 'soon afterwards' should be at least within the next two months after the first use (Tiemann 2009:35). The First of Repeated Uses has to be clearly distinguished from the very first use. The FRU is the crucial measure for determining the age of acquisition.

I used the program CLAN (Computerized Language Analysis) that is available on CHILDES<sup>12</sup> (MacWhinney, 2000), identifying relevant child utterances with the search command 'FREQ' which returns all of the child's utterances from one transcript in a separate

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<sup>10</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 especially thank Nathalie Mai-Deines who took the time to meet me on several occasions to exchange information on the corpus.

<sup>11</sup> These are pseudonyms which are used throughout. Information concerning the children is mainly drawn from Anstatt (2007).

<sup>12</sup> The CHILDES data base is freely accessible under the following web address: <http://childes.psy.cmu.edu/>

list. These lists were then searched ‘manually’ for the relevant constructions and checked against the original transcripts in order to exclude imitations, repetitions and formulaic expressions. Tables with the categories adjectives, comparatives (subdivided into different sub-categories: contextual comparatives, synthetic forms, analytic forms, *chem*-clauses), superlatives and equatives helped to order the different constructions counted in the list.

Going back to the transcripts for every single item proved indispensable during the search, because irregular occurrences of comparatives, as well as repetitions, memorized routine, etc. occurred very frequently and had to be excluded from the final results. For instance, irregular or totally lexicalized forms of comparatives, such as *dal'she* (‘go on’), *bol'she* used with a negative element and meaning ‘anymore’, or *luchshe* ‘better’ meaning ‘rather’ had to be excluded. This could only be done by going back to the context for every single occurrence and by checking the use. I also excluded (as already mentioned in a previous footnote) adverbial uses of the comparatives. These special uses were, however, included for superlatives.

In Russian, as compared to English or German, it is much harder to use CLAN for systematic searches, for example in comparative forms of gradable adjectives: the typical endings of those are *-ee*, *-e*, or *-ey* in Russian. However there are too many words that possess these endings, so it would not be possible to control the output of the search command in the desired way.

Having considered all this, I developed the following method: First, I applied the CLAN command ‘FREQ @ +t\*CHI +f’ to every single transcript that I had. This command operates only on the child tier (t\*CHI) and yields all the words uttered by the child within one separate transcript file. Second, I went through the lists thus yielded and copied every relevant expression into an excel file, where I had different columns for the different kinds of degree constructions: gradable adjectives, comparatives, superlatives, equatives, etc. I also went back to the respective transcript every time, read up the context and copied the context next to the item in the excel file. Third, I determined the use of the construction in the context by categorizing it as ‘adverbial’, ‘attributive’, ‘lexicalized’ etc. An example for the third step taken out of my excel lists is given in Figure 3, where the first shaded area indicates a case of repetition which, of course, had to be excluded from the results and the second shaded area indicates a case of a contextual comparative.

3;08	bofshe ('more'), repetition!	*CHI: <ich habe drei Autos> [@g]. %err: ich habe drei Autos = u menja tri mashinki \$MIX \$CSW *MOT: e'to tri mashinki? *CHI: &da, mama, jetzt [@g] tri mashinki. *MOT: ili chut' chut' bofshe? *CHI: chut' chut' bol'she.
	bofshe ('anymore')	*MOT: a v domike igrat' xochesh'? *CHI: &da, tam netu <b>bol'she</b> dozhdja. %pho: d'ozhdja = dozhd'ja
3;09	luchshe ('rather'/'better')	*MOT: kakuju ty xochesh' smotret' knizhku? *CHI: ja xochu, mama, po+moemu, e'tu, mama. %com: sucht *CHI: xxx ja xochu <b>luchshe</b> e'tu knizhku.
	men'she ('contextual') (4x) --> als 1. gezählt!	*FAT: a e'tot pomestilsja by, on men'she, no drugoe +... *CHI: on tozhe <u>men'she</u> . %com: zeigt *FAT: on tozhe men'she, no e'tot kit est tol'ko plankton.

Figure 3: Excerpt of a final excel file

## 5. Discussion of the results

Table 3 shows the very first use of the constructions of interest for both children.

First Use	Max (2;3-6;10)	David (2;10-6;01)
Unmarked Form	2;6	2;10
<b>Comparatives:</b>		
Contextual Comparative	4;3	2;11
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, Max and David

Remember that according to the definition of FRU the child can only be credited with the acquisition of a construction if she uses it regularly with a variety of different lexical items within the next two months after the very first use. Determining the FRU introduced by Stromswold (1990) and thereby the age of acquisition turned out to be impossible for most of the constructions in the corpus due to too few data points and too low absolute numbers of the constructions in question.<sup>13</sup> However, the data points in Table 3 and concrete examples from the corpus are also telling and can be used for a qualitative analysis of the data.

### 5.1. Results for Max

For Max, the contextual comparative follows the unmarked form of the adjective and precedes the SynC with a genitive-marked standard, just as predicted. Like the English and German children of Tiemann's et al.'s (2012) study, Max uses contextual comparatives as his first comparatives.

- (37) \*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**.'

(Max, age: 4;3, file: Max\_4\_03\_01\_r\_kod.cha)

Interestingly, the contextual comparative is the one construction Max uses quite regularly until the very end of the transcripts, namely at 5;4, 5;8, 5;9, 6;1, 6;6 and in the last transcript at 6;10. Because of this consistent use, I could at least tentatively conclude that Max acquires these forms, even without being able to determine the precise time of acquisition.

SynC with genitive-marked standards appears seemingly simultaneously with SynC plus *chem*-clauses for the very first and only time at 5;4. But there is a big gap of ten months (between the ages 4;6 and 5;4) before the first use of both constructions. This means that we can neither conclude that SynC plus genitive-marked standards was acquired before SynC plus *chem*-clauses nor that it was acquired after SynC plus *chem*-clauses. Remember that I hypothesized that SynC plus genitive-marked standards should be acquired before *chem*-clauses because of the different comparative operators, namely *er<sub>GEN</sub>* and *er<sub>CLAUSAL</sub>*. It should be mentioned at this point that *chem*-clauses are our only diagnostics for degree abstraction in a corpus of child language, as we cannot expect to find scope interactions, which are too complicated or negative island effects, which are ungrammatical. Max uses the comparative with a *chem*-clause ten times at age 5;4. This is a large number considering the fact that degree constructions are normally quite rare in the transcripts. That said, out of these ten occurrences, nine are of the kind found in (38).

<sup>13</sup> An anonymous reviewer points out that given the arguments by Stromswold (1990) and Tiemann et al. (2012), it is hard to interpret the very first ages relative to the acquisition predictions of what counts as an acquired construction and what does not. The reviewer suggests that a larger corpus would not necessarily be the only way to test the predictions. As an alternative, a comprehension experiment could be conducted which would test whether the children have reliable knowledge of the relevant degree constructions, e.g. evaluative analytic comparatives at a certain age. It would be interesting to see how a child understands SynC *chem*-clauses compared to AnC, for instance. The reviewer also emphasizes that a comprehension experiment could provide an answer to the question of what the age of acquisition is for evaluative constructions. Importantly, this method would test for comprehension rather than production. It is a very interesting suggestion which, however, cannot be implemented in the scope of this paper and must be left to future research.



- (38) \*MOT: chto ty skazal, synochek?  
 ‘What did you say, dear?’  
 \*CHI: dinozavr Reks sil'nee, **chem** mama shimpanze?  
 ‘Is the dinosaur Reks stronger than the mum-chimpanzee?’

It becomes clear in the other eight examples that Max tries to order different animals according to their strength. But he is always using the same adjective *sil'nee* (‘stronger’). As such, the FRU cannot be determined for Max’s SynC+GEN construction, nor for his *chem*-clauses, since there is only one transcript in which they appear (at age 5;4); no subsequent uses can be found in the corpus. My predictions on this point can therefore neither be falsified nor verified.

Moving on to Max’s superlatives and equatives, it can be said that the first superlative is used by Max at age 5;4.

- (39) \*MOT: a chto ljudi delali?  
 ‘What did the people do?’  
 \*CHI: oni ja dumaju...  
 ‘I think they...’  
 \*CHI: [...] vot odin chelovek govoril na [\*] radio tam chto  
 ‘[...] there was one person on the radio who said that...’  
**samyj sil'nyj chelovek** dolzhen podnjat' takuju shtangu bol'shuju.  
 ...the **strongest** (lit. most strong) **person** must pick up such a big barbell.’  
 (Max, age: 5;4, file: Max\_5\_04\_05\_r\_kod.cha)

This is an attributive use of the superlative. Unfortunately, the FRU again cannot be determined for Max’s superlatives, because there is always a gap of more than two months between all the occurrences of his superlatives.

In Table 3 ‘none’ is recorded for instances of Max’s equatives, because there are only three potential candidates, all of which had to be rejected due to the fact that the meaning the child is intending to convey is not clear in the context.

- (40) \*CHI: aga, xa+xa, ja budu sejchas <tozhe domik stroit> [/] tozhe  
 domik stroit', tol'ko malen'kij.  
 After his mother told him that she is going to build a house, CHI says:  
 ‘yes, hehe, I am also going to build a house [in the diminutive], but a small one.’  
 \*CHI: takoj dom, &gde [/] &gde [/] gde...  
 ‘such a house, where, where...’  
 \*CHI: ja delaju **takoj domik bol'shoj, kak u tebjja**.  
 ‘I am making **such a big house, as you have.**’  
 (Max, age: 4;3, file: Max\_4\_03\_01\_r\_kod.cha)

There is a contradiction in (40): Max wants to build a small house, at least smaller than his mother’s. But he ends up using the adjective *bol'shoj* (‘big’) which results in the slightly strange ‘I am building a house as big as yours’. This construction is evaluative in Russian and says that the house exceeds the standard for big houses. This erroneous use could be due to an interference with German, where the equative with positive polar adjectives like *groß* (‘big’)

is not evaluative, as was shown in (25b). It might also be the case that Max just has not mastered the evaluativity component of the Russian equative at this point of time and resorts to an equative-like construction.

Summing up Max's results, only his gradable adjectives and contextual comparatives come close to what appears to be actual acquisition of these constructions.

### 5.2. Results for David

As was the case with Max, the first comparative construction that appears in these data is a contextual comparative at age 2;11, just as predicted.

There is only one occurrence of a SynC with a genitive-marked standard and only two SynC with *chem*-clauses, which means that again there is insufficient data to draw any conclusions about the acquisition of these constructions. Nonetheless, they appear in the predicted order for the very first time (see Table 3).

There are two interesting instances of what seem special uses of superlatives. One of them is in (41).

(41) \*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.'

(David, age: 3;2, file: David\_3\_02\_r14\_kod.cha)

But since these are not the instances that I am looking for, both for superlatives and equatives, I do not include them.

Note that neither of the children produced any analytic comparatives, i.e. evaluative constructions such as those in (23). Interestingly, there are several cases of analytic comparatives in the adult input yet still no such cases in the speech of the children.

Summarizing the results for David, it is not possible to draw any conclusions about the acquisition of anything but the gradable adjectives. The positive result that seems to verify my initial predictions is that the crucial comparative cases, i.e. the contextual comparative, SynC with a genitive-marked standard and SynC with a *chem*-clause first appear in the predicted order.

### 5.3. Interim Summary

It is worth underlining the point that adverbial cases of degree constructions might be good candidates for investigation in future acquisitional research. Including them might, on the one hand, yield more data points for the comparative cases and, on the other hand, provide valuable results for the analysis of adverbial comparatives in general.

A serious drawback of the corpora presented here is obviously the very small number of data points for the relevant constructions. That said, the results obtained do not falsify my predictions. Even without being able to determine the FRU, I can say that Max's and David's gradable adjectives, as well as Max's contextual comparative and SynC with a *chem*-clause come close to what looks like actual acquisition of these constructions.

A clear result for future studies is that the first uses of degree constructions happen after the age of 3;5. This is a solid finding, since the recordings are without gaps until the age of

3;5 and no comparison constructions are recorded until then. This result confirms the findings for English and German by Tiemann et al. (2012) and Hohaus et al. (to appear).

#### 5.4. 'Surprising' result: late acquisition of evaluative constructions

A very clear result is that all the constructions that are evaluative in Russian, namely the analytic comparative, the equative and the superlative cannot be said to be acquired in the course of the recordings. In fact, except for Max's superlatives, none of the evaluative constructions even occur in the recordings. The superlative and equative cases that occur in the transcripts are different from the ones I am interested in. One could now object that maybe there are too few data altogether and that is why these rather complex evaluative constructions have not been encountered. How, then, can one explain the clear cases of synthetic comparatives with a *chem*-clause, for instance, which are also very complex constructions that require degree abstraction? It seems to be no coincidence after all. The prediction that the evaluative component of grammar is acquired late seems to be borne out.

An alternative view to the one I propose in this paper would be that children start out with the positive, which is inherently evaluative. The positive is clearly acquired early (see Table 3: 'unmarked form'). From this it could be assumed that children use a positive-based semantics for all comparative constructions. However, children do not first decompose the comparative constructions that they acquire, i.e. everything stays evaluative. Later, the children realize that they have to move away from their positive-based view, because many constructions, such as the SynC with a genitive-marked standard or with a *chem*-clause, are not evaluative. Under this view, all the non-evaluative constructions would be acquired late.<sup>14</sup> This is the other scenario under which the results of the present study would be surprising. But the absence of the evaluative degree constructions in the corpus has demonstrated that this is not the case. Evaluative constructions seem to be acquired late, probably even after the age of seven. More data would definitely be required in order to further test these predictions.

In my scenario, then, one question that remains is: What is the difference between the positive, which is inherently evaluative, and other evaluative constructions such as analytic comparatives and superlatives (cf. Table 2)? Why do they seem to be acquired so much later than the positive itself? There might be some fundamental difference between the positive and other evaluative constructions. This issue will have to remain an open question for the time being.

### 6. Concluding remarks

This paper combines insights from the formal semantics of degree constructions (cf. von Stechow 1984; Heim 2001; Beck 2011), cross-linguistic investigations of comparison constructions (cf. Beck et al. 2009) and a parametric approach to language acquisition (Snyder 2007). The acquisition data from Russian confirm the predictions made by the cross-linguistic parameters, namely that no child acquires *chem*-clauses before degree morphology and that no child acquires *chem*-clauses before genitive-marked comparisons. This study thus

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<sup>14</sup> I am thankful to Sigrid Beck (p.c.) for bringing this possible alternative view to my attention.

proves to be a good example of how formal semantic theory and research in child language acquisition can profit from each other. A theory of systematic cross-linguistic variation can make clear predictions for language acquisition and vice versa, insights from acquisition can refine semantic theory. Explicitly, a refinement of the parametric picture is certainly evaluativity in Russian, which I indicated to be an extra component in the children's grammar and encoded in Rett's EVAL-operator. According to my design of the semantics of the evaluative constructions, they were supposed to be acquired later than non-evaluative degree constructions. The absence of most of the evaluative constructions from the transcripts indeed points to a late acquisition of evaluativity.

New questions for future research have been opened up in the course of this study. An unresolved issue remains the early acquisition of the positive, which is in itself evaluative. Also, the acquisition of EVAL is logically possible, as sketched out in the prediction section, but one could question this way of encoding evaluativity by suggesting it be encoded in a presupposition, for instance.

What can be stated with certainty, however, is that much can be learned from a longitudinal study such as the present one and, methodologically, this kind of study is on the right track. Spontaneous speech production is captured here in the most natural way. The need for new corpora which are bigger and also longer becomes pressing if further testing of such semantic and acquisitional theories is to take place.

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