Acquisition of Russian Degree Constructions:
A Corpus-Based Study[*]

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In this paper, I propose a time course of acquisition for Russian degree constructions. I empirically test the predictions against a corpus that contains data by two Russian children. The predictions are based on the parameters of cross-linguistic variation in comparison constructions (Beck et al. (2009)), Snyder's (2007) parametric approach to first language acquisition and the "standard" theory of comparison constructions (e.g. von Stechow (1984), Beck (2011)). The paper is structured as follows: the first two chapters introduce the theoretical background. Subsequently, I provide an analysis of Russian degree constructions and propose a time course of their acquisition. Finally, I present and discuss the results of my corpus study.

1 Degree Semantics

In my study, I use what is often referred to as the "standard analysis" of comparison constructions advocated, for instance, by von Stechow (1984) and Heim (2001). On the technical side, I work within the general framework of the

Heim & Kratzer (1998) textbook.

The core features of the standard theory of comparisons are the following: A new semantic type, $<d>$, is introduced for degrees (abstract elements of scales). The basic meaning of the gradable predicate is that it relates individuals to sets of degrees. Gradable predicates are of type $<d,<e,t>>$ and introduce degrees into the semantics. Comparison is not between individuals, but between degrees. The matrix and the standard clause each provide a set of degrees via abstraction over a degree variable.

A basic lexical entry for a gradable adjective looks as in (1a) or, simpler, as in (1b). In (1a), 'height' is a measure function of type $<e,d>$. Measure functions assign a unique degree to individuals. An example of a comparative where parts of the degree description have been elided is given in (2). The lexical entry for the degree morpheme is in (3). And finally, The Logical Form (LF) and the semantic composition of (2) are presented in (4).

(1)   a. $[[tall]] = \lambda d : d \in D_d.\ \lambda x : x \in D_e.\ HEIGHT(x) \geq d$
         b. $[[tall]] = \lambda d.\ \lambda x.\ x$ is d-tall

(2)   Katya is taller than Masha.

(3) $[[er_{CLAUSAL}]] = \lambda D1_{<d,t>}.\ \lambda D2_{<d,t>}.\ max(D2) > max(D1)$

(4)   a. $[[_{DegP}$ -er [than how$_1$ Masha is t$_1$ tall]] [2 [Katya is [$_{AP}$ t$_2$ tall]]]]
         b. $[[\ [2\ [Katya\ is\ [_{AP}\ t_2\ tall]]]\ ]]^g = [\lambda d.\ Katya\ is\ d\text{-}tall]$
         c. $[[\ [how_1\ Masha\ is\ t_1\ tall]\ ]]^g = [\lambda d'.\ Masha\ is\ d'\text{-}tall]$
         d. $[[(2)]]^g = 1$ iff $max(\lambda d.Katya\ is\ d\text{-}tall) > max(\lambda d'.\ Masha\ is\ d'\text{-}tall)$

Quantifier Raising (QR) of the DegP in the matrix clause creates predicate abstraction over a degree variable. The comparative morpheme and the *than*-clause form a constituent at LF. The *than*-clause is a *wh*-clause with a degree gap which is created by *wh*-movement.

The semantics of other relevant constructions like superlatives, measure phrases and degree questions is briefly illustrated below.

(5)   a. Katya is the tallest.   (Superlative)
         b. $[[\ C$ -est]] $= \lambda D_{<d,t>}.\forall D'[D' \neq D\ \&\ C(D') \rightarrow max(D) > max(D')]$ [1]

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[1] This is a lexical entry for the superlative morpheme adopted from Heim (1999:21) which is not uncontroversial in the semantic literature. A widespread lexical entry for the superlative is one

c.[[-est $_{<d,t>,t>}$] [1 [Katya is t_1 tall]]]   (LF)
d. "The maximal degree of height that Katya reaches exceeds the maximal degree of height that any other relevant person reaches."

(6)   a. Masha is exactly 1,60m tall.   (Overt Measure Phrase)
b. $[_{DegP<<d,t>,t>}$ exactly 1,60m] $[_{<d,t>}$ 1 [Masha is t_1 tall]]   (LF)
c. "The maximal degree of height that Masha reaches is 1,60m."

(7)   a. How clever is Tanya?   (Degree Question)
b. [Q [$[_{DegP<d,t>}$ how$_1$] [Tanya is t_1 clever]]] [2]   (LF)
c. "For which degree d: Tanya is d-clever?"

These are the basics of the standard analysis.

2   More Theoretical Background

Two further theoretical components that I used are parameters proposed in Beck et al. (2009), which I will henceforth refer to as B17 parameters, and Snyder's parametric theory of language acquisition. I will now briefly present these two components before we proceed to the predictions[3].

2.1   Parameters
The question of cross-linguistic variation in the semantics of degree constructions has recently enjoyed considerable attention from formal semanticists. On attempt of finding underlying generalizations is by Beck et al. (2004) and Beck et al. (2009). Beck et al. (2009) suggest three dependent parameters in variation across comparison constructions based on evidence from 17 languages. The key degree constructions that the authors collected data for are in (8)-(14).

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that takes a relation between an individual and a degree plus an individual as its arguments and then returns a truth value: [[-est]] = $\lambda R_{<d,<e,t>>}$. λx. max ($\lambda d.R(d)(x)$) > max ($\lambda d. \exists y$ [y$\neq$x & R(d)(y)]) (from Beck (2011)).

[2] cf. Hohaus et al. (to appear:4-5).

[3] The report of the acquisition study is divided between this paper and Berezovskaya (to appear). The present paper gives a more thorough picture of special characteristics of Russian comparison constructions and a more complete overview over the corpus data than the latter. There is some overlap between the two papers concerning background discussion and description of basic results.

(8)   Naomi is 2 cm taller than Sandra. (**Difference Comparative (DiffC)**)

(9)   Naomi is taller than 1,50m.   (**Comparison to Degree (CompDeg)**)

(10)   How tall is Naomi?   (**Degree Question (DegQ)**)

(11)   Naomi is 1,70m tall.   (**Measure Phrase (MP)**)

(12)   The shelf is wider than the drawer is deep. (**Subcomparative (SubC)**)

(13)   *Mary bought a more expensive book than nobody did.
                                     (**Negative Island Effect (NegIs)**)

(14)   The draft is ten pages long. The paper is required to be exactly five
        pages longer than that.[4]   (**Scope Interactions (Scope)**)

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 fashion.
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.[5]	no / n.a.
Chinese, Mooré	yes	no / n.a.	no / n.a.
Russian, Guaraní,	yes	yes	no
English, German, Thaí	yes	yes	yes

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

Table 1 shows which languages allow for which constructions. The constructions are ordered in clusters: CompDeg and DiffComp are taken to be indicators of degree ontology, scope interaction between the

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[4] This example goes back to Heim (2001:224).
[5] 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.

comparative operator and a modal operator and NegIs are applied as diagnostics for degree abstraction in a language. And finally, the availability of MPs, DegQs and SubCs indicate a positive setting of the so-called Degree Phrase Parameter. The parameters are summarized in I-III:

I. **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.
II. **Degree Abstraction Parameter (DAP) (Beck, Oda & Sugisaki (2004):325).** A language {does/does not} have binding of degree variables in the syntax.
III. **Degree Phrase Parameter (DegPP) (Beck et al. (2009):24).** The degree argument position of a gradable predicate {may/may not} be overtly filled.

The parameters make predictions for the (non-)availability of certain degree constructions in different languages. Russian is a language with the parameter setting [+DSP],[+DAP],[-DegPP]. Except for the last parameter, Russian patterns well with languages such as English and German which have the positive setting of all three parameters, i.e. dispose of a full-fledged degree semantics. However, neither MPs, nor DegQs or SubCs of the English type can be found in Russian. This is because all three constructions require an adjective to combine with a syntactic element known as Degree Phrase (DegP). In English, the Spec,AP position is filled in overt syntax in every construction. In Russian, on the other hand, this position cannot be filled overtly thus precluding the existence of these constructions.

2.2 *Snyder's Parametric Predictions*
I will now briefly introduce the pertinent parts of Snyder's theory that illustrate the link between the B17 parameters and acquisition.
Snyder (2007:7) claims that the time course of language acquisition is evidence for the nature of what and when the child is acquiring. For any parameter, the following acquisitional predictions apply:

(15) 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**.

(16) 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.)

The predictions in (15) and (16) can be directly applied to Beck et al.'s parameters to yield (17) and (18):

(17) **[+DSP] before [+DAP]:** No child should acquire constructions indicative of [+DAP] before [+DSP].

(18) **[+DAP] before [+DegPP]:** No child should acquire constructions indicative of [+DegPP] before [+DAP][6].

These assumptions make clear predictions for the time course of acquisition.

3   Russian Degree Constructions and Predictions for Acquisition

In this section I provide an analysis of the composition in the Russian *than*-constituent, of synthetic vs. analytic comparatives and evaluativity. I also link the analysis to the predictions of the time course of acquisition.

3.1 Composition in the than-constituent
In Russian, the standard of comparison can be expressed in two ways:

(19) Tanya   byla   bystree   **Vani**
      Tanya   be$_{PAST,FEM}$ fast$_{COMP}$ Vanya$_{GEN}$
      'Tanya was faster than Vanya.'

(20) Tanya   byla   bystree   **chem   Vanya**
      Tanya   be$_{PAST,FEM}$ fast$_{COMP}$ what$_{INSTR}$ Vanya$_{NOM}$
      'Tanya was faster than Vanya.'

If we look at the English translation of both (19) and (20), we don't see

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[6] Tiemann et al. (2012) carry out a cross-linguistic study that suggests that the DegPP might no longer be seen as dependent from DAP. This will be not problematic for me since Russian has a negative setting of the DegPP parameter and I will only need the prediction in (17).

any difference. However, a closer look at the bold-faced part shows that in (20), the standard *Vanya* is preceded by *chem*, a *wh*-word in the instrumental case. Pancheva (2005) treats standards of the kind in (20) as reduced clauses because of the *wh*-word that causes movement and because of the possibility of having an overt tensed verb, *byla* in our example. I assign the following LF to example (20):

(20') $[[_{DegP}$ *-ee* $_{<<d,t>,<<d,t>,t>>}$ [chem$_1$ Vanya byl [t$_1$-bystryj]]] [2 [Tanya byla [t$_2$-bystraya]]]]

In (20'), the *wh*-word *chem* performs a syntactic *wh*-movement out of the argument position of the adjective *bystryj* creating a degree predicate. Note that in our LF there is no overt preposition *than* like in English. And here we do not need to worry about the Spec,AP position of the AP embedded under *chem* being filled by a trace, because it is taken care of by ellipsis. So, no violation of the DegPP arises.

Example (19), on the other hand, requires a different LF. In this case, the standard of comparison in the genitive case follows the gradable predicate directly. According to Pancheva (2005), the Reduced Clause Analysis is unlikely for cases like (19), because the *wh*-element is absent and because there is the genitive case marking on the standard of comparison. I thus analyse (20) applying the so-called Direct Analysis without assuming any silent structure in the standard phrase. The LF for (19) is given in (19').

(19') [Tanya [byla [[-er $_{<<d,<e,t>>,<e,<e,t>>>}$ bystraya$_{<d,<e,t>>}$] Vani]]]

Note that in (19'), we do not need to move anything, rather we apply an *in situ* analysis. Importantly, this LF requires a different comparative morpheme *-er*, which I will call the *er*$_{GEN}$. illustrated in (21)[7].

(21) $[[er_{GEN}]] = \lambda Adj_{<d,<e,t>>}.\ \lambda y.\ \lambda x.\ max(\lambda d.\ Adj\ (d)(x)) >$
$$max(\lambda d'.\ Adj\ (d')(y))$$

This comparative operator compares two individuals along the dimension provided by the adjective. The adjective meaning is the basic relational meaning from (1) and the meaning of the standard of the genitive is the denotation of its overt material. The tensed copular verb *byla* is taken to be

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[7] This *-er* corresponds to the comparative operator suggested by Kennedy (1997).

semantically vacuous, which is, admittedly, a major simplification, but will not matter for my purposes. We thus get the truth conditions in (22).

(22) $[[(19)]]^g = \max(\lambda d.\text{Tanya was d-fast}) > \max(\lambda d'.\text{Vanya was d'-fast})$

This analysis has the following implications: the Russian genitive-marked comparatives should always employ the er_{GEN} which is scopally not mobile and has only limited applicability. As Beck et al. (2012) point out, such an *-er* doesn't, for instance, allow for clausal standards. Besides, this *-er* shouldn't allow for attributive comparatives. This is indeed the case as illustrated in the following example.

(23) *Katya byla   bystree   devochka Mashi
       Katya be_PAST,FEM fast_COMP girl   Masha_GEN
       Intended: 'Katya was a faster girl than Masha.'

A potential problem for the hypothesis sketched above is constituted by Russian adverbial comparatives that are genitive-marked[8]:

(24) Katya bezhit   bystree   Mashi
       Katya run_PRES,3.SG fast_COMP Masha_GEN
       'Katya runs faster than Masha.'

Rather than rejecting the initial hypothesis that genitive-marked standards employ the immobile er_{GEN}, I want to highlight the need to investigate the syntax and semantics of adverbial comparatives in more detail, especially with respect to the question whether an *in situ* analysis would be possible. Since I cannot tackle this problem in the scope of the present paper, I will for now assume with Pancheva (2005,2010) that adverbial comparatives need a clausal *-er* and should be acquired around the same time as *chem*-clauses, and that both constructions require Degree Abstraction (abbreviated as DA).

Let us now think about the order of acquisition of genitive-marked standards vs. *chem*-clauses. General observations about the time course of the acquisition of comparison constructions for Russian on the basis of the B17 parameters in conjunction with Snyder (2007), cf. (17), are spelt out in (25):

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[8] I am grateful to Roumyana Pancheva (p.c.) for bringing this point to my attention.

(25) **[+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.

(25b) predicts that the acquisition of genitive-marked comparisons should precede the acquisition of *chem*-clauses. Remember that er_{GEN} does not require degree quantification, no QR takes place and everything can be interpreted *in situ*, cf. (19'). Therefore, the synthetic comparative (SynC) with a genitive-marked standard can be expected at a point where the child has acquired the [+DSP]-setting, but not yet the [+DAP]-setting. *Chem*-clauses, on the other hand, require DA and a different *-er*, namely the clausal one in (3). Only this $er_{CLAUSAL}$ can take the *chem*-clause as its first argument. Since it requires DA, the child needs to have set the DAP to positive by the time she uses *chem*-clauses.

3.2 Synthetic/Analytic Forms and Evaluativity
A well-known distinction in Russian (and not only in Russian) is the synthetic/analytic division. Consider examples (26) and (27).

(26) Vanya   byl   sil'**nee**   chem   Petya
      Vanya $be_{PAST,MASC}$ $strong_{COMP}$ $what_{INSTR}$ Petya
      'Vanya was stronger than Petya.'   **(synthetic)**

(27) Vanya   byl   **bolee**   sil'nyj   chem   Petya[9]
      Vanya $be_{PAST,MASC}$ more   strong $what_{INSTR}$ Petya
      Literally: 'Vanya was more strong than Petya.'   **(analytic)**

In (26), the comparative morphology *-ee* is stuck onto the gradable adjective *sil'nyj* ('strong'), just like the *-er* in English is suffixed directly to the unmarked form of the adjective. Some descriptive grammars of Russian claim that it is more common to use the comparative in its synthetic form, i.e. with the suffixes *-ee*, *-ey* as in *novee, novey* ('newer')

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[9] A puzzling fact about Russian is the so-called synthetic-analytic alternation: Pancheva (2005) draws our attention to the fact that the *chem*-clause can be used with the analytic form of comparative. When the standard of comparison is genitive-marked, using the analytic form produces ungrammaticality.

and *-e* as in *vyshe*, *shire* ('higher', 'broader'), cf. Semeonoff (1962:188-189). Although the synthetic formation of the comparative seems to be the more productive strategy, there are many adjectives that can only have the analytic form (cf. Barnetova et al. (1979:346) and Borras (1971:89)).

Example (27), on the other hand, is an instance of an analytic comparative (AnC). Here, the adjective is combined with the overt comparative operator *bolee* which consists of the morpheme *bol-* and the comparative morphology expressed by the suffix *ee*. I take *bolee* to be an overt degree operator which is morphologically detached from the adjective. Basically, (27) should semantically work like the LF in (20'), but instead of the discontinuous morpheme *-ee/-e,* there will be the overt degree operator *bolee* in the degree head position. However, this is not the end of the story for (27). In addition to the fact that Vanya has to be stronger than Petya, both of them also need to exceed the contextually salient standard for strength in order for the sentence to be felicitous. This phenomenon has been called "norm-relatedness" by Bierwisch (1989). He used this term to refer to comparisons with a contextually determined standard of the relevant gradable property. I will rather use the term "evaluativity" (cf. Rett (2008)).

In her dissertation, Rett (2008) examines the connection between the polarity of the adjective and evaluativity. She shows that in the English equative, negative polar adjectives obligatorily trigger the norm-related reading, cf. (28a), whereas positive polar ones do not, cf. (28b).

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

In Russian, on the other hand, the equative, as well as many other degree constructions including the AnC in (27) 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.

In sum then, there are different factors which are responsible for whether a degree construction has the direct comparison interpretation or must be reinterpreted by reference to the contextual norm. In English, this question

is partly determined by the polarity of the adjective, and in Russian the norm-related interpretation is triggered by the lack of degree morphology on the adjective. Degree constructions which involve evaluativity (+E) in Russian and which don't (-E) are listed in Table 2.

CompDeg	Diff Comp	synth. comp. with *chem*-clause	synth. comp. with genitive	Positive	AnC with *chem*-clause	Equative	Superlative	Enough /too
-E	-E	-E	-E	+E	+E	+E	+E	+E

Table 2: Evaluativity in Russian degree constructions

I opt for the following analysis of evaluativity in Russian degree constructions: I leave the relational adjective meaning as in (1) and pursue a synthesis of the Krasikova and the Rett approaches, in that I assume the morphological constraint of Krasikova (that the lack of morphology on the gradable adjective triggers evaluativity in Russian) and use Rett's EVAL operator, which is introduced in (29)[10]. Rett (2008) proposes to encode evaluativity in a morpheme called "EVAL" which can occur freely and optionally in any degree construction:

(29) $[[EVAL_i]] = \lambda D_{<d,t>}. \lambda d_{<d>}. D(d) \wedge d >s_i$

EVAL is a function from a set of degrees and a degree 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. Let us apply (29) to our analytic comparison example from (27). The LF is in (30a), the detailed composition in (30b-f).

(30)   a. $[[_{DegP}\ bolee_{<<d,t>,<<d,t>,t>>}\ [EVAL_{<<d,t>,<d,t>>}\ [chem_1\ Petya\ byl$
       $t_1\ sil'nyj\ ]]]\ [[2\ [Vanya\ byl\ [t_2\ sil'nyj\ ]]]]]$

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[10]   Another interesting alternative analysis of evaluativity can be found in Hofstetter (2012). He suggests that Russian adjectives are generally born into the lexicon as non-evaluative adjectives. The analytic comparison operator is responsible for the introduction of evaluativity, whereas the synthetic *–ee/-e* doesn't introduce evaluativity (cf. Hofstetter (2012): 30). This would mean that we need different lexical entries for the analytic and synthetic degree operators.
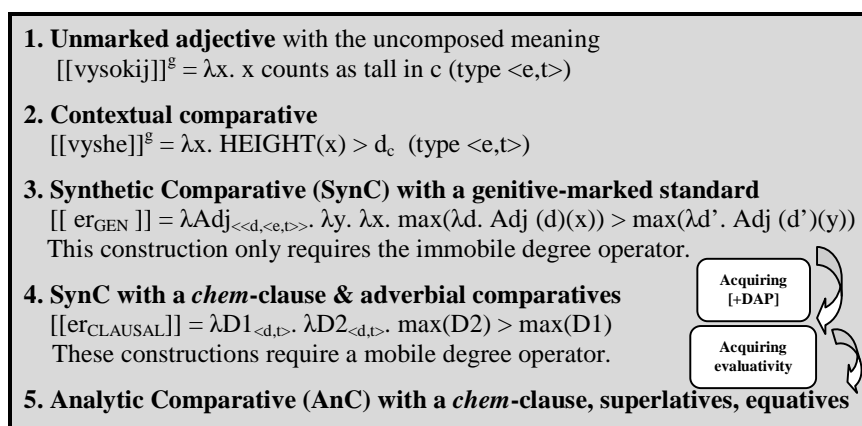
b. [[[2 [Vanya byl [t_2 sil'nyj]]]]]^g = [λd. Vanya was d-strong]
c. [[[chem$_1$ Petya byl t_1 sil'nyj]]]^g = [λd'. Petya was d'-strong]
d. [[[EVAL [chem$_1$ Petya byl t_1 sil'nyj]]]]^g
    = [λd. Petya was d'- strong ∧d >s_{strong}]
e. [[(27)]]^g = 1 iff max (λd. Vanya was d-strong) > max (λd'. Petya was d'-strong ∧d >s_{strong})

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

This approach of encoding evaluativity into our semantics has the consequence that it is understood as an extra component in the child's grammar. Evaluativity contributes to the standard meaning by adding information about the context. It is clear that evaluative constructions not only need a comparative, superlative or equative quantifier over degrees, but also the EVAL-operator on top of it. Hence, analytic comparatives, superlatives or equatives should be acquired latest.

A possible scenario how the child could acquire EVAL is discussed in Berezovskaya (to appear).

Let me now sum up the pattern I described in this section. I predict the following order of acquisition for Russian degree constructions:

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1. Unmarked adjective with the uncomposed meaning
   [[vysokij]]^g = λx. x counts as tall in c (type <e,t>)

2. Contextual comparative
   [[vyshe]]^g = λx. HEIGHT(x) > d_c (type <e,t>)

3. Synthetic Comparative (SynC) with a genitive-marked standard
   [[er$_{GEN}$]] = λAdj$_{<<d,<e,t>>}$. λy. λx. max(λd. Adj (d)(x)) > max(λd'. Adj (d')(y))
   This construction only requires the immobile degree operator.

         Acquiring [+DAP]

4. SynC with a *chem*-clause & adverbial comparatives
   [[er$_{CLAUSAL}$]] = λD1$_{<d,t>}$. λD2$_{<d,t>}$. max(D2) > max(D1)
   These constructions require a mobile degree operator.

         Acquiring evaluativity

5. Analytic Comparative (AnC) with a *chem*-clause, superlatives, equatives

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Figure 1: Order of acquisition of Russian degree constructions

Figure 1 shows the following steps of acquisition: First, there will be the uncomposed meaning of the gradable adjective, which only requires the <e,t> type lexical entry. This is followed by a contextual comparative, which still has type <e,t> (cf. Tiemann et al. (2012) & Hohaus et al. (to appear)). Here, the child probably has not yet learned that the meaning arises from the combination of a relational lexical entry for the adjective plus the comparative operator. In step 3, the child acquires the genitive-marked comparatives which are followed by *chem*-clauses. The [DAP] is set to positive, as soon as the child produces *chem*-clauses, because these require DA. Finally, in the last step, the child acquires evaluativity, i.e. all the constructions in step 5. should come latest.

4 Results of the Corpus Study

In this section I present the results of my corpus study. The methodology used is described in Berezovskaya (to appear).

4.1 The Corpora

Max was recorded from age 2;3[11] until the age of 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, there are many gaps in the recordings. The average number of utterances per transcript for Max is 187,6. David's Russian recordings were conducted exclusively by the child's mother. They stretch from the age of 2;10 until the age of 6;1 and there is, unfortunately, also a considerable number of gaps here. The average number of utterances per transcript for David is 443,6 which is higher than for Max. Both children are raised with Russian as their L1. It should be noted, however, that they live in Germany and get in contact with German as their L2 early in their lives.

4.2 Results

4.2.1 Results for Max. The following table summarizes the results for Max. It contains the number of occurrences of the relevant construction and the age (span) in which they occur.

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[11] This is the notation for the age of the children. 2;3 means "two years and three months".

Construction	Occurrences	age (span)
contextual	9	3;9-6;10
SynC+GEN	3	5;4-6;1
SynC+*chem*-clause	10	5;4
adverbial +GEN[12]	1	5;9
superlatives	9	5;4-6;10
equatives	-	-

Table 3: Occurrences of all degree constructions (Max)

Let us now see how the predictions fare in the light of the results in the case of Max. Contextual comparatives should come first. The first instance can be found at the age of 3;9.

(31)   *FAT: a e'tot pomestilsja by, on men'she, […]...
          'This one would fit in, he is smaller, […]…
          *CHI: on tozhe **men'she**.
          'He is also **smaller**.'
          %com: The child points to the wale.
          *FAT: on tozhe men'she, no e'tot kit est tol'ko plankton.
          'He is also smaller, but this wale only eats plankton.'
                                        (transcript: Max_3_09_14_r_kod, age: 3;9)

As predicted, the contextual comparative follows the unmarked form of the adjective and precedes the SynC with a genitive-marked standard. Contextual comparatives are interestingly the one construction that Max uses quite regularly, namely at 5;4, at 5;8, 5;9, 6;1, 6;6 and finally in the last transcript at 6;10.

It seems that SynC with genitive-marked standards appear 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), i.e. I cannot conclude that the SynC+*chem*-clauses and "SynC+GEN" were really uttered simultaneously for the first time. They could have been produced in different orders during those 10 months, but we cannot know due to the lack of data in this span of time. Thus, I cannot determine the age of acquisition for Max's "SynC+GEN" and his *chem*-clauses. However, the data also don't falsify the predictions.

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[12] This is the adverbial case with a genitive-marked standard.

According to the predictions, superlative constructions, since they are evaluative, should come in last, at stage 5. from Figure 1, which seems to be the case. The fact that the superlative appears at 5;4, seemingly simultaneously with the *chem*-clauses and "SynC+GEN" is not problematic because of the gap between 4;6 and 5;4 that was already mentioned before. Although the age of acquisition cannot be determined quantitatively through First of Repeated Uses (FRU), cf. Stromswold (1990), late examples suggest that Max's superlatives solidify and are used correctly, according to the contexts in which they are uttered.

(32) *CHI: […]
      ja **samyj**   **sil'nyj**   v   mire
      I   most$_{MASC}$ strong$_{MASC}$ in world
      '…I am the strongest in the world.'
                          (transcript: Max_6_01_09_r_kod, age: 6;1)

There are no equatives of the relevant kind in Max's transcripts. There are only three potential candidates, which all have to be rejected due to the fact that the meaning that the child is intending to convey is not clear in the context.
There is one case of an adverbial comparative with a genitive-marked standard at 5;9. However, it is not a very clear use, because the child splits the sentence and the standard of comparison ends up being quite far from the verb. I can only say that it is a rather late use, occurring after the use of the *chem*-clause so that the child might have acquired DA by this time.

4.2.2 Results for David. The following table summarizes the results for David. Note that although David's average length of utterance is higher than Max's (443,6 vs. 187,6), this didn't turn out to be an advantage.

Construction	Occurrences	age (span)
contextual	3	2;11-5;2
SynC+GEN	1	3;6
SynC+*chem*-clause	3	4;6-5;11
adverbial +GEN	-	-
superlatives	-	-
equatives	-	-

Table 4: Occurrences of all degree constructions (David)

David uses plenty of lexicalized forms of comparatives, such as *dal'she* ('further' which means "continue, go on doing something"), *bol'she* used with some kind of negative element meaning 'anymore', or *luchshe* ('better') meaning 'rather', but very few of the genuine comparatives we are interested in. In David's case it is most helpful to look at the very first use of all the constructions for conclusions.

The contextual comparative is his first comparative, just as predicted. Moving on to the other comparative constructions, we only find one single instance of a genitive-marked synthetic comparative, namely at age 3;6.

(33) *INV: tjomnen'kij mal'chik?
      'The dark boy?'
      *CHI: da .
      'Yes.'
      *INV: ego zovut Azarija.
      'His name is Azarija.'
      *CHI: net drugoj   kotoryj   **postarshe**   menja.
            no   other$_{MASC}$ who$_{MASC}$ old$_{COMP}$ I$_{GEN}$
            'No, the other one who is somewhat older than me.'
                                        (David_3_06_r24_kod; age 3;6)

The SynC+*chem*-clause appears thrice with one occurrence at 4;6 and two occurrences at 5;11. The conclusion to draw for all the comparative constructions is that the age of acquisition cannot be determined. One solid observation that can be made is that the very first use of the *chem*-clause follows the very first (and only) use of the genitive-marked case thus pointing in the direction of our hypothesis, namely that the $er_{CLAUSAL}$ needed for *chem*-clauses seems harder to acquire than the er_{GEN} where no abstraction takes place.

David's transcripts do not contain any genuine superlatives or equatives. This absence is also telling and will be discussed in the next section.

4.2.3 Discussion of the Results. The results have shown that it is not possible to determine the exact age of acquisition for any of the constructions. Although Max's and David's gradable adjectives, as well as Max's contextual comparatives, his SynC +*chem* and his superlatives occur quite consistently in the corpus, the age of acquisition cannot be determined here. All the other constructions appear too rarely or do not

appear at all. A serious drawback of the corpora is obviously the small number of data points for the relevant constructions. Still, the results as they stand don't falsify my predictions. The very first occurrences of all of the investigated constructions follow the predicted order of acquisition.

A striking outcome of the present study is the fact that evaluative constructions either do not appear at all or appear late pointing to late acquisition of evaluativity. Remember that analytic comparatives, superlatives and equatives are evaluative in Russian (cf. Table 2). In the corpus, no analytic comparatives could be found either for Max or for David, although several instances are present in the adult input. As to superlatives and equatives, there were only some late superlatives for Max, but otherwise no equatives for both and no superlatives for David. Even without a quantitative analysis being possible, this absence of data is telling. It suggests that evaluative constructions are acquired late, probably after the age of the last recordings, i.e. after the age of six or even seven. This result nicely falls out of my predictions, where evaluativity is encoded in the operator EVAL which represents an additional component in the semantics.

However, we could easily have imagined a different pattern of acquisition: the children begin with the positive form of the adjective (those are clearly the first degree constructions in our corpus). Importantly, the positive is evaluative. Consider a possible semantics for the positive in (34):

(34)   a. Petya is tall.
       b. Petya is [$_{AP}$ POS$_s$ tall].
       c. $[[POS_s]] = [\lambda Adj. \lambda x. max (\lambda d. Adj (d)(x)) \geq s]$
                                        (cf. Hohaus et al. (to appear): 5)
       d. $[[[_{AP} POS_s \, tall]]] = \lambda x. max (\lambda d.x \, is \, d\text{-}tall) \geq s$ (type $<e,t>$)
                       $= \lambda x. x\text{'s height reaches s}$

(34c) shows that the operator POS is context-dependent, the variable "s" must be provided by the context. Thus, if the child knows from the very beginning that the positive form of the adjective is evaluative, she could just leave the evaluative component in her grammar throughout and first adopt it for all other degree constructions, as well.

Is there any theory that would go this path and make such predictions? As far as I can see, Ewan Klein's vague predicate approach is the one prominent theory that would be likely to make this kind of predictions.

Klein (1980) does not employ degrees or reference to degrees for the semantics of comparison. He takes the unmarked, positive form of the adjective as basic and not our abstract lexical entry in (1). This would correspond to the lexical entry in step 1. of Figure 1 repeated in (35).

(35)   [[vysokij]] = λx. x counts as tall in c (type <e,t>)

The child would assume that a context variable c is always needed for all comparative constructions. Later, the child would realize that she has to get away from her positive-based semantics, since not all constructions are evaluative. In this case, everything which is not evaluative should be acquired later. However, this is not what the corpus data suggest for Russian, but rather the opposite. In my story, then, the question remains of how exactly it is possible for the children to distinguish between the positive, which is an evaluative construction and the other evaluative degree constructions which come later. What is the nature of the evaluativity of the positive as opposed to the evaluativity of, say, the Russian superlative? An answer to this question cannot be provided within the scope of the present paper, but it is without doubt an interesting question for future research.

5   Conclusions

This paper brings together the theory of language acquisition, cross-linguistic research on comparatives and the semantics of comparative constructions.

Idiosyncrasies of Russian comparison constructions turned out to be of major importance for the predictions about acquisition. For instance, the genitive-marked cases had to be distinguished from *chem*-clauses due to their different semantics. I have shown that "SynC+GEN" should precede *chem*-clauses in the time course of acquisition. Besides, in contrast to synthetic cases, the evaluative analytic comparatives didn't even appear in the recordings, i.e. it was right to distinguish the synthetic and analytic forms in the acquisition process.

A clear result is that most of the evaluative constructions in Russian do not occur in the corpus at all. Since I showed that other degree contructions do appear during the recordings, albeit in a small number, the absence of most of the evaluative constructions is meaningful. We have seen that evaluativity contributes an additional meaning component (via the EVAL

operator) making analytic comparatives, superlatives and equatives harder to acquire for the Russian child. An alternative analysis, such as Klein's (1980) vague predicate approach would probably make the prediction that evaluative constructions should be acquired early, followed by non-evaluative ones. However, this is not what this corpus study shows thereby providing positive evidence in favor of the degree approach to comparison constructions.

Another outcome of the study is that adverbial cases should be investigated in more detail in the semantic literature and in acquisition.

Finally, I would like to emphasize the pressing need for more longitudinal corpora of child speech! We learn a lot from a longitudinal study like the one presented in this paper, and methodologically this kind of study is certainly on the right track. It would be very interesting to test the predictions demonstrated in this paper on other, bigger corpora of child speech and maybe also experimentally.

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