Chapter 42

On three morphological classes of Russian adjectives

Anonymized for submission

This paper discusses three classes of adjectival paradigms in Russian language: regular adjectives with comparative and superlative affixes, adjectives with zero-derived comparatives, and adjectives that display an *ABA pattern (the suffix *-(o)k-* is present in positive and superlative forms only). The analysis is done in the Nanosyntax framework and makes use of a novel development in the theory, the Movement-Containing Trees of Blix 2022.

Keywords: morphology, adjectives, Russian, Nanosyntax

1 Introduction

1.1 Three classes of Russian adjectives

This paper discusses paradigms of Russian adjectives, namely, their positive, comparative, and superlative forms. More narrowly, the discussion will concern three classes of Russian adjectives: regular adjectives (with affixal comparative and superlative forms), adjectives with zero-derived comparatives, and *ABA-violating adjectives (where an augment affix *-(o)k-* is present in positive and superlative form, but absent in comparative). An example for each of the three classes is given in the table 1.

Assuming that the morphology is exactly as presented, the adjectives with zero-dervied comparatives present an interesting question: although they do not have a comparative affix in their comparative forms, they do have one in their superlative forms. The *ABA-violating adjectives present a puzzling distribution of

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Table 1: Three classes of Russian adjectives

Strategy	Positive	Comparative	Superlative
Regular	*xitr-yj*	*xitr-ej-e*	*xitr-ej-š-yj*
	sly-AGR	sly-CMPR-AGR	sly-CMPR-SPRL-AGR
Zero-comparative	*strog-ij*	*strož-e*	*strož-aj-š-yj*
	strict-AGR	strict-AGR	strict-CMPR-SPRL-AGR
*ABA-violating	*vys-ok-yj*	*vyš-e*	*vys-oč-aj-š-yj*
	high-AUG-AGR	high-AGR	high-AUG-CMPR-SPRL-AGR

the *-(o)k-* affix: it is present in the positive and superlative forms and is absent in the comparative, making it an ABA pattern (the property of having *-(o)k-* is found in non-contiguous part of the paradigm). Given that adjectival paradigms are the poster child of *ABA-focused research in theoretical morphology (Bobaljik 2012), such distribution calls for an analysis, which will generate the observed forms without giving up the generalizations and theoretical machinery built upon the generalizations.

I should note that the picture is a bit more complicated: there are adjectives with *-(o)k-* affix, which belong to the second class, like *rezkyj* (contrasted with *redkyj* in table 2). The presented minimal pair shows that the *ABA-violation cannot be the property of the affix *-(o)k-* itself, but should be regarded as a property of the adjectival stem.

Table 2: Affix *-(o)k-* is found in two classes

Positive	Comparative	Superlative
red-k-ij	*rež-e*	*red-ch-aj-š-yj*
rare-AUG-AGR	rare-AGR	rare-AUG-CMPR-SPRL-AGR
rez-k-ij	*rez-ch-e*	*rez-ch-aj-š-yj*
harš-AUG-AGR	harš-AUG-AGR	harš-AUG-CMPR-SPRL-AGR

There are also some questions regarding the morphological decomposition that need to be addressed before we go into theoretical exploration of the three classes. The first question concerns the decomposition of *-ajsh-* into *-aj-* and *-sh-*. The evidence for this decomposition comes from the adjective *krut-oj*, which has a zero-derived comparative, just like *strogij* and a superlative with a *-ej-* affix in it, as shown in table 3.

The second question to the morphological decomposition concerns the palatalization of segments in the comparative form: should we consider *strog-*/*strozh-* alternation to be phonologically conditioned or can we decompose *strozh-* into

Table 3: Zero-comparative with *-ej-* in the superlative

Positive	Comparative	Superlative
krut-oj	*kruch-e*	*krut-ej-š-yj*
cool-AGR	cool-AGR	cool-CMPR-SPRL-AGR

strog- and an palatal autosegment? To be honest, I do not have convincing arguments for either view, hence, my reasoning will be pragmatic: I have been able to account for the data with an assumption that decomposing *strozh-* is unnecessary. Hence, I will assume that in the rest of the paper.

To recap, we have two major puzzles: (a) the appearance of comparative affix in the superlative forms of adjectives with zero-comparatives; (b) the *ABA-violating distribution of the *-(o)k-* affix. The next two subsections will present the basics of Nanosyntax and the work on adjectival paradigms done in syntax-centered models of morphology.

1.2 Nanosyntax: the basics

Nanosyntax (Starke 2010; Baunaz & Lander 2018) a syntax-all-the-way-down theory of morphology: all complex morphological units are composed in syntax. The key feature of Nanosyntax is phrasal spell-out: whole constituents are subject to morphological realization.

So, the logic is that for every morpheme there is a constituent, which it realizes. The necessary constituents are created via spellout-driven movement, specified in the 'classic' Nanosyntax algorithm.

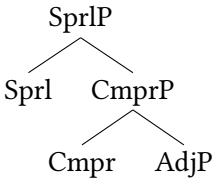
(1) Spell-Out algorithm
   a. Merge F to XP and spell-out
   b. If (a) fails, move Spec,XP to Spec,FP and spell-out
   c. If (b) fails, move XP to Spec,FP and spell-out
   d. If (c) fails, attempt the next option of the last cycle

The spell-out is done via refernce to lexical items called L-trees (pairs of phonological and syntactic structure). The matching of L-trees to actual constituents is subject to two principles: (a) Superset Principle (an L-tree can realize any of its substructures); (b) Elsewhere Principle (pick the L-tree with least superflous information). In the following sections of the paper, I will show the precise derivations, which will show these principles in action.

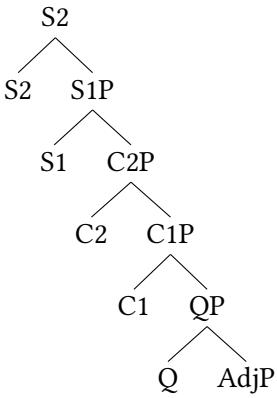
1.3 Nanosyntax and adjectival morphology

To start discussing the presented puzzles, it is necessary to introduce the relevant background. This paper builds upon nanosyntactic work on adjectival paradigms, namely Caha et al. (2019) and De Clercq et al. (2022). One of the ideas behind work on adjectival paradigms is the split comparative and superlative projections. Unlike Bobaljik (2012), who has proposed a containment structure presented in (2), De Clercq et al. (2022) provide arguments for splitting both CMPR and SPRL into two heads, as presented in (3).

(2) Bobajik's containment structure:



(3) Nanosyntactic containment structure:



The arguments come from Czech comparatives and Latin superlatives: in Czech, there are two possible comparative affixes *-ejš-* and *-š-*, with one contained in the other, which may be considered an evidence for there being two CMPR heads (one is realized by *-ej-*, the other by *-š-*). Additional evidence for this comes from the fact that there are adjectives with zero-derived comparatives (in a certain dialect of Czech), with *-š-* comparatives, with *-ejš-* comparatives, but, crucially, not *-ej-* comparatives. This gap is easily accounted for if we assume a split CMPR head. The examples are given below in a lexicalisation table.

(4) Lexicalisation table for Czech comparatives

Stem	C1	C2	AGR
červen	*ěj*	*š*	*í*
bohat		*š*	*í*
ostř			*í*

The same logic applied to superlatives, where the data comes from Latin. There are, yet again, two possible affixes, *-issim-* and *-im-*. And, again, there are superlatives only with *-im-*, but there are none superlatives with *-iss-*only (there

are no zero-derived superlatives, but the argument can be made without them). The examples are given below in a lexicalisation table.

(5) Lexicalisation table for Latin superlatives

Stem	S1	S2	AGR
pe	*ss*	*im*	*us*
opt		*im*	*us*

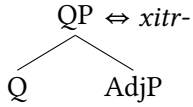
The Czech and Latin data suffice to show the motivation behind the split head structures, which I will assume in this paper and use throughout the current discussion of Russian superlatives.

2 Regular adjectives: giving preliminary L-trees

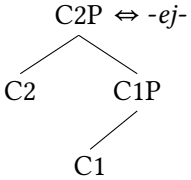
The building blocks of regular adjectives are simple: we need to provide L-trees for adjectival stems, for *-ej/aj-* affix, and for the *-sh-* affix. The proposed L-trees are given in (6). The choice of *-š-* lexicalizing the C2 head in addition to superlative structure appears arbitrary now but will become crucial in our account of irregular adjectives.[1]

(6) L-trees for regular class

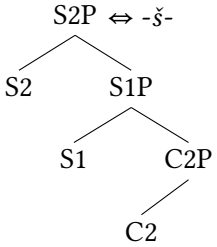
a. L-tree for stem:



b. L-tree for *ej*:



c. L-tree for *sh*:



The derivation is rather straighforward. Let's start with QP, which is realized by *xitr-*. When C1 is merged, the C1P cannot be realized by any L-tree. QP does not have a specifier and, hence, the whole QP moves to the Spec,C1P. When C2 is merged, in C2P cannot be realized by any L-tree. Spec,C1P (namely, QP) moves to Spec,C2P. When S1 is merged, S1P cannot be realized by any L-tree. Movement of Spec,C2P does not help. Neither does movement of the whole C2P to

[1] I should also note that the *š* spelling out both C1 and C2 heads may also appear arbitrary, but is motivated by there being an additonal prefixal strategy (*nai-xitr-ej-š-yj*), which I will not scrutinize in this paper, however.

Spec,S1P. Hence, we need to backtrack and move the whole C1P to the Spec,C2P. The lexicalization table for the regular class of adjectives is given in (7). There is nothing substantial going on here (due to there being nothing interesting going on in regular adjectives).

(7) Lexicalization table for regular adjecitves

QP	C1	C2	S1	S2
xitr	ej			
xitr	ej	š		

We have achieved the bare minimum: the presented L-trees suffice to account for regular class of Russian adjectives. In the next subsections, we will leave the L-trees in (6) intact but we will need to expand our representational abilities for adjectival stems, as will be argued in the next section and implemented in the following sections.

3 Zero-comparatives: the need for more tools

In this section, we will show that the 'classic' Nanosyntax model cannot account for zero-comparatives without enriching the theoretical apparatus. The logic of the argument is simple: the 'classic' Nanosyntax model cannot account for the fact that there are two additional affixes in the superlative form, compared to the comparative.

Let's start with a fairly obvious point: *strozhe* realizes the whole C2P structure. After S1 is merged, there are two analytical possibilities: if there is an affix α which had [S1P [S1]] structure at its bottom, then the resulting from will be *strozh*+α. Given that we observe two additional affixes, there should not be any such α. Then, it follows that backtracking will be necessary, since all affixes, which lexicalize the superlative structure (call it β) need to lexicalize some part of the comparative structure as well. However, the backtracking steps will be movement of C1P to Spec,C2P or movement of QP to Spec, C1P (depending on the assumed L-tree, which lexicalizes the superlative structure). After such a step, the derivation will proceed without any backtracking, since the structure will contain a subconstituent realized by *strog*- and a subconstituent realized by β. There is no way for two additional affixes to arise, given the usual representations employed in the Nanosyntactic research.

Therefore, we need something else. Luckily, the same idea that more intricate L-trees are necessary have occurred to other researchers as well, the recap of whose work is going to be presented in the next section. The whole point of the

remaining part of the paper is to introduce the so-called Movement-Containing Trees and show that they suffice to account for irregular classes of adjectives in Russian.

4 Interlude: Movement-Containing Trees

Movement-Containing Trees (Blix 2022) come from the idea that lexical entries (L-trees) may encode the movement that happened for spell-out related reasons. A case study from Blix 2022 will be employed as an introduction to the mechanism. Consider three classes of nominals in LANGUAGE: some nominals require an additional affix in singular (singular-marking class), some nominals require an additional affix in plural (plural-marking class), and some require it in both (both-marking class).

Table 4: Endo-Marakwet nominal classes (per Blix 2022)

	SG	PL
a.	*kipaw*	*kipaw-tiin*
	rhino	rhino-PL
b.	*peel-yaan*	*peel*
	elephant-SG	elephant
c.	*pata-yaan*	*pata-tiin*
	duck-SG	duck-PL

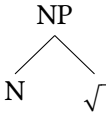
The plural-marking and both-marking nominal classes are easily accounted for in the 'vanilla' version of Nanosyntax: both-marking nominals lexicalize the NP structure and plural-marking nominals lexicalize the SgP structure, which results in both-marking nominals requiring a singulative affix.

(8) Regular L-trees:

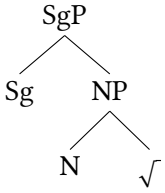
a. L-tree for *tiin*:

b. L-tree for *yeen*:

c. L-tree for *pata*:



d. L-tree for *kipaw*:

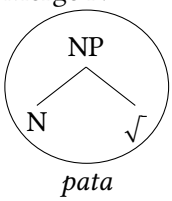


Let us go through the derivations that result in the observed forms. They are rather straightforward and crucially depend on the fact that some nominal stems

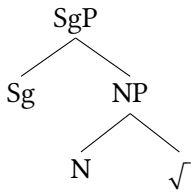
are big enough to realize the Sg feature and some are not. The double exclamation mark acts as a sign that the structure cannot be lexicalized.

(9) Derivation for *pata*

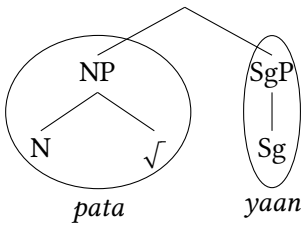
a. Merge N:



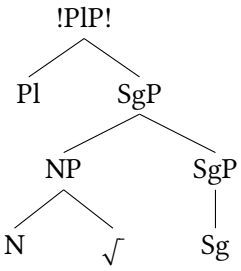
b. Merge Sg:



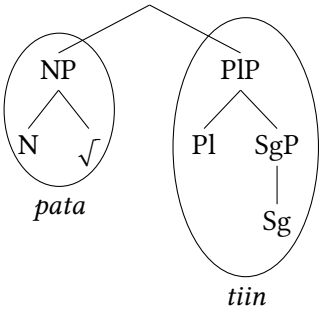
c. Move NP to Spec,SgP:



d. Merge Pl:

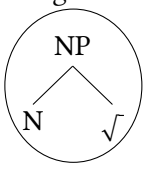


e. Move Spec,SgP to Spec,PlP:

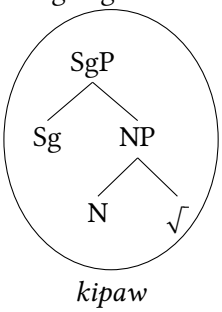


(10) Derivation for *kipaw*

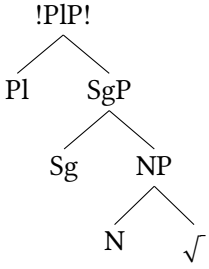
a. Merge N:



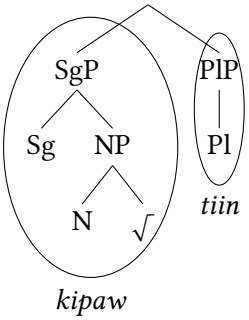
b. Merge Sg:



c. Merge Pl:



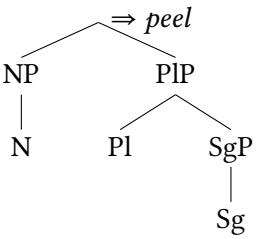
d. Move SgP to Spec,PlP:



The problem for a more 'classic' version of Nanosyntax comes from the singular-marking class. It appears that the nominal stem cannot realize the SgP, so, maybe, it is the same structure as nominal stems in both-marking class. This is, however, wrong, because the nominal stems in the singular-marking class lexicalize the plural structure. So, it appears that a SgP structure is not a subconstituent of L-tree for *peel*, but the L-tree for *peel* still realizes the Sg head.

The configurational solution by Blix (2022) achieves exactly that: it gives such a lexical entry for *peel* that it contains a Sg feature but does not contain a [Sg NP] substructure. The structure in 11 is an innovation in representational power of Nanosyntactic L-trees because it contains more information than the features realized by the entry: it also 'contains movement', which makes it possible for *peel* to arise after a *peel-yaan* lexicalization. I also diverge from Blix by not labelling the result of the Spell-Out driven movement. The reasons will become clear in the next section where the novel Spell-Out algorithm will be introduced.

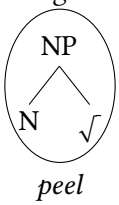
(11) L-tree for *peel*:



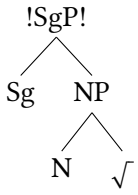
The derivation using the Movement-Containing L-tree is also provided. Note that it consists of the same steps, which are found in the derivations for *pata* – the only difference is the shape of the L-tree for *peel* and its ability to lexicalize a complex, movement-containing structure.

(12) Derivation for *peel*

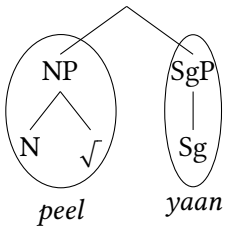
a. Merge N:



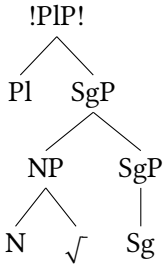
b. Merge Sg:



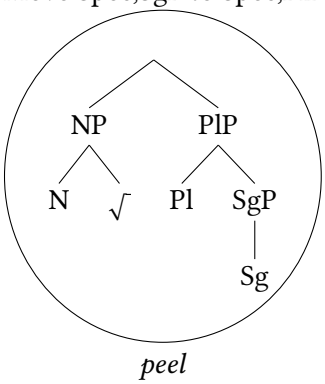
c. Move NP to Spec,SgP:



d. Merge Pl:



e. Move Spec,SgP to Spec,PlP:



In the next section I will show how the Movement-Containing Trees allow us to derive zero-comparatives in a straightforward fashion. My account for *-(o)k-* adjectives (both subclasses) will require an additional mechanical novelty, in addition to the Movement-Containing Trees, however, so it is not the case that expanding the representational power solves all issues presented by Russian adjectives.

5 MTCs and Russian adjectives

The general purpose of this section is going to provide the necessary MTCs for adjectival stems of zero-comparatives and *ABA-violating adjectives. This achieves two important things: firstly, it derives the problematic patterns. Secondly, it formalizes the intuition that the irregular behaviour is the adjective's property. Additionally, this section introduces a novel Nanosyntactic algorithm, which allows subextraction out of complex left branches (I should cautiously note that the precise formulation of the algorithm is a topic of current research, so I do not

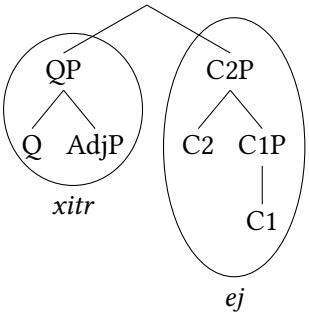
commit to it word-by-word – the main point is to allow subextraction, one way or another).

5.1 Accounting for zero-comparatives

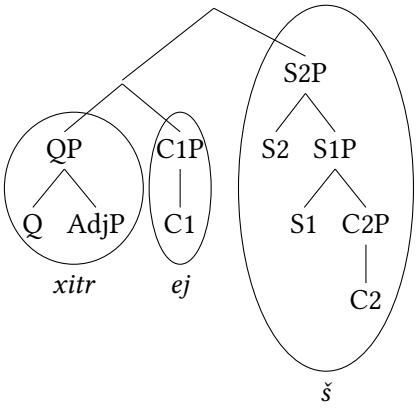
Recall our derivation for regular comparatives and superlatives (the resulting structure are given below).

(13) Structures for regular comparatives and superlatives

a. Comparative structure:

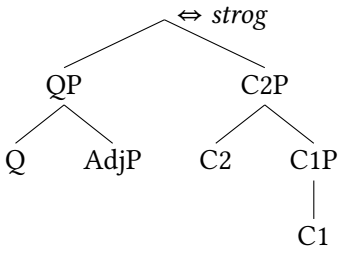


b. Superlative structure:



My proposal for zero-comparatives, in line with the already proposed structures, is really simple and reminiscent of Blix' solution of singular-marking nominals: zero-comparatives have the comparative structure as their L-trees. The derivations will be the exact copy of the derivations for regular adjectives with the sole divergence being that the final comparative structure is realized in a different fashion.

(14) L-tree for *strog-*:

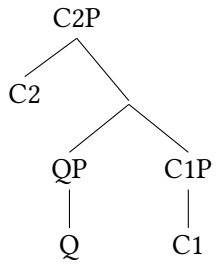


There is an important point I should address, which concerns the Superset Principle: as the Superset Principle states, an L-tree can realize any of its substructure. In principle, we could predict that a Movement-Containing L-tree realizes a C2P subconstituent, which consists purely of functional features. For the L-tree for *strog-*, however, there is no such problem: (a) we want it to realize the QP; (b) there is another L-tree that realizes [C2P [C2] [C1P [C1]]] structure with less junk. So, for zero-comparatives, we end up with a neat picture: the lexicalized structure is the same as with the regular comparatives. The only difference is that the structure can undergo lexicalization as a whole due to the adjectival stem's L-tree.

5.2 Accounting for zero-comparatives with *-(o)k-*

Unfortunately, the logic for zero-comparatives as outlined in the previous subsection is inapplicable to zero-comparatives with an augment affix *(o)k* (like *rezkyj*). The reason is that it is not the adjectival stem, which realizes the comparative structure, but the augment affix. My proposal for L-tree corresponding to *-(o)k-* is provided in (15).

(15) L-tree for *(o)k*:



Now I will show the derivation leading to such a constituent resulting from spell-out driven movement. However, before that, a reformulation of the spell-out algorithm is necessary together with the assumption that the result of spell-out driven movement ends up unlabelled. The whole idea of it is the possibility of the subextraction of constituents, which are contained in the highest specifier. It should be noted that the new algorithm is equivalent to the 'classic' one in cases where the specifier of FP is labelled. Thus, the empirical coverage is widened without losing old analyses.

(16) New spell-out algorithm (Caha & Taraldsen Medová 2022)

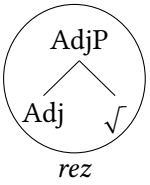
a. Merge F and spell-out

b. If (a) fails, move the closest labelled non-remnant constituent to Spec,FP
c. If (b) fails, move the dominating labelled node to Spec,FP (recursive)
d. If (c) fails, try the next option in the previous cycle

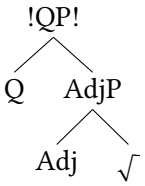
The full derivation is given below. It is rather long but I believe it is necessary to show all the steps leading to the observed forms.

(17) Derivation for *rezk*

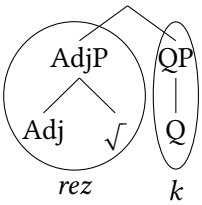
a. Start with AdjP:



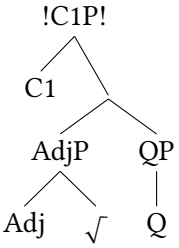
b. Merge Q:



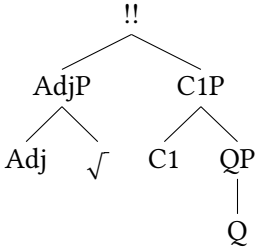
c. Move AdjP to Spec,QP:



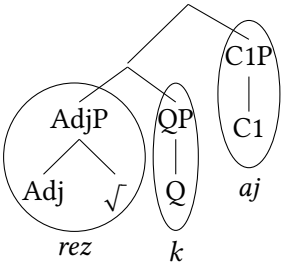
d. Merge C1:



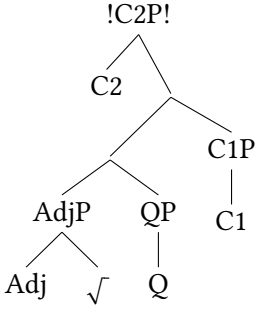
e. Move the closest labelled non-remnant (AdjP) to Spec,C1P:



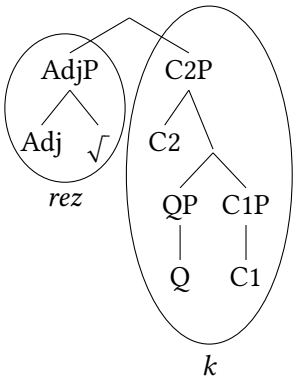
f. Move the dominating constituent to Spec,C1P:



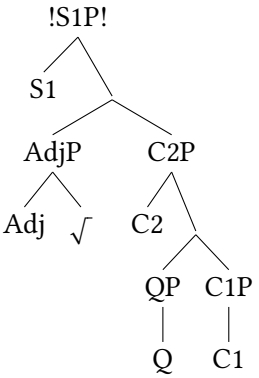
g. Merge C2:



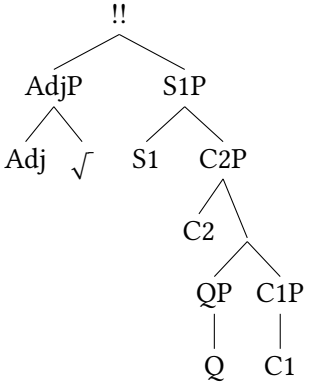
h. Move the closest labelled non-remnant (AdjP) to Spec,C2P:



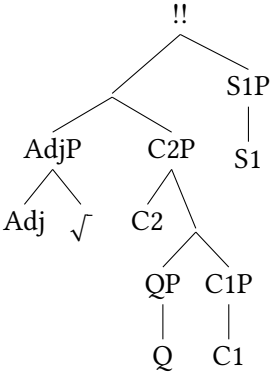
i. Merge S1:



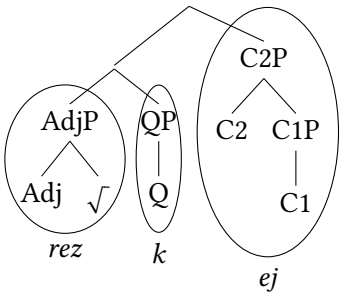
j. Move the closest labelled non-remnant (AdjP) to Spec,S1P:



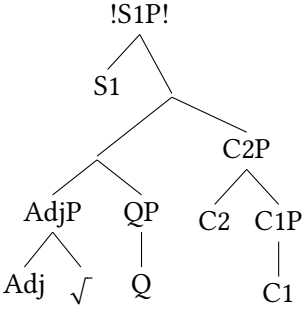
k. Move the dominating constituent to Spec,S1P:



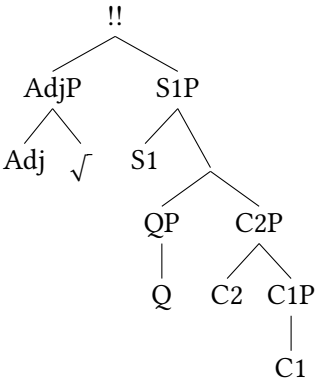
l. Backtrack. Move the dominating constituent to Spec,C2P:



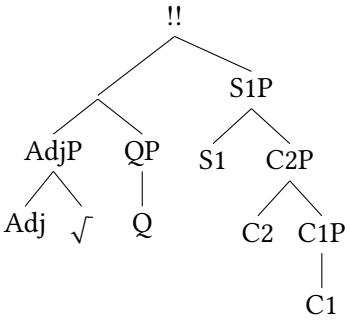
m. Merge S1:



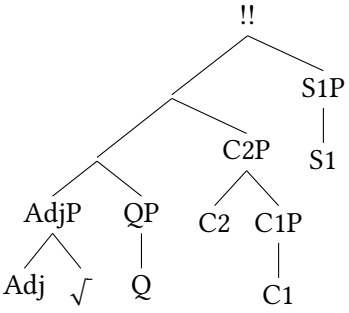
n. Move the closest labelled non-remnant (AdjP) to Spec,S1P:



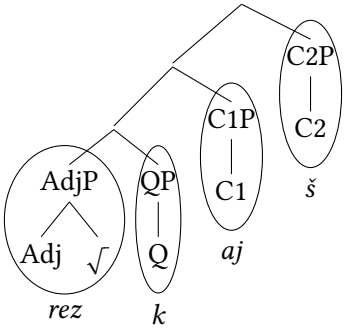
o. Move the dominating constituent to Spec,S1P:



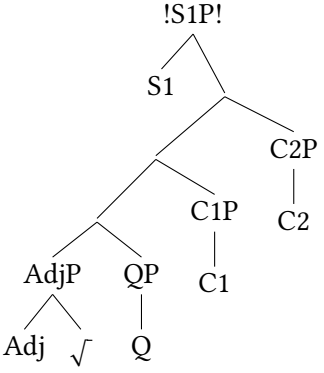
p. Move the dominating constituent to Spec,S1P:



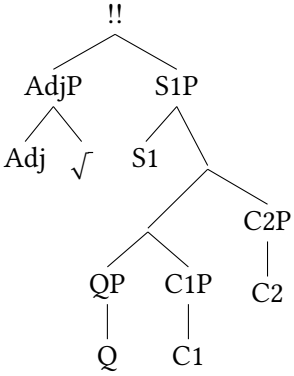
q. Backtrack. Move the dominating constituent to Spec,C2P:



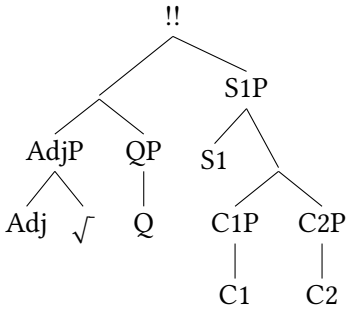
r. Merge S1:



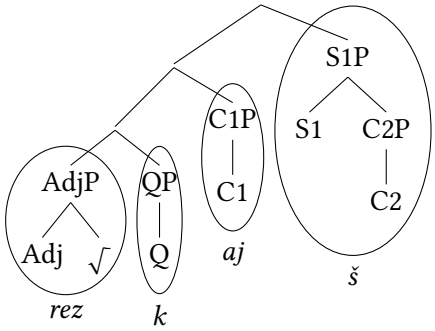
s. Move the closest labelled non-remnant (AdjP) to Spec,S1P:



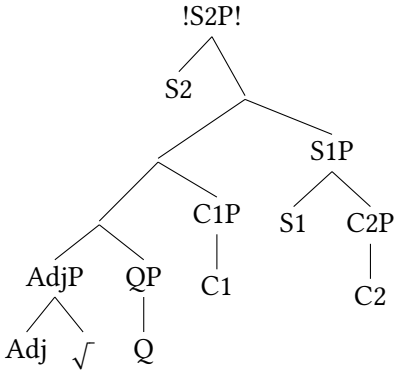
t. Move the dominating constituent to Spec,S1P:



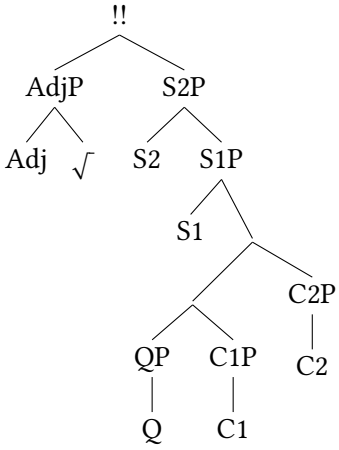
u. Move the dominating constituent to Spec,S1P:



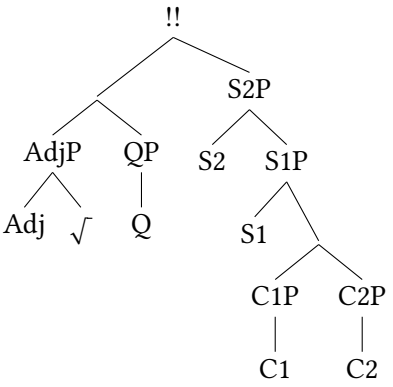
v. Merge S2:



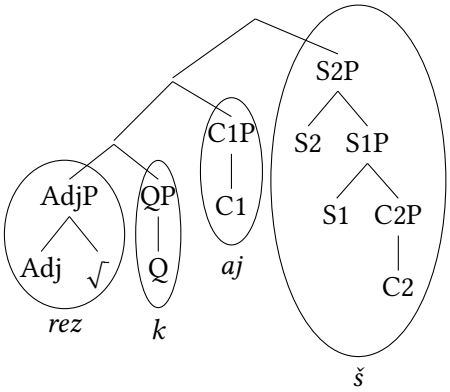
w. Move the closest labelled non-remnant (AdjP) to Spec,S2P:



x. Move the dominating constituent to Spec,S2P:



y. Move the dominating constituent to Spec,S2P:

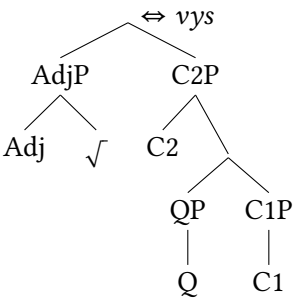


Hopefully, the derivation above has shown that the L-tree for *-(o)k-* provided in (15), paired with a subextraction algrorithm, does the job and accounts for zero-derived comparatives with *-(o)k-*.

5.3 Accounting for *ABA-violating adjectives

My solution to the *ABA violating adjectives consists of a simple modification to the *rezkij*-type adjectives. I propose that the structure in (17h) can be realized by a single morpheme (namely, the stem) in the *ABA-violating adjectives like *vysokyj*, as shown in the L-tree below, which allows *vys* to realize the structure for *ok* in comparatives.

(18) L-tree for the stem of adjectives like *vys-ok-yj*



I believe that the thorough examination of Russian adjectives has allowed us to break up the apparent ABA pattern into two parts. The characterization of adjectives like *vys-ok-yj* as surface ABA misses the grammar-internal characterization

of the pattern as the combination of two properties: the adjectival stem overriding the lexicalization of the comparative structure via Movement-Containing L-tree (like in zero-comparatives, such as *strogij*) and the *-(o)k-* affix being able to realize the comparative structure, which is independently attested. Thus, when accounts for both these phenomena are available, the solution of the surface ABA pattern is a matter of simple combination.

6 Conclusion

In this paper, I have provided a Nanosyntactic account for three classes of Russian adjectives. It has been shown that they cannot be accounted for without using a novel Nanosyntactic mechanism: Movement-Containing trees (Blix 2022), which makes for an additional argument in favour of such mechanism. From a more general point of view, this paper has contributed an analysis of *ABA-violating Russian adjectives, which are problematic for the theory presented in Bobaljik 2012.

Abbreviations

AGR	agreement affix
AUG	augment affix
CMPR	comparative
PL	plural
SG	singular
SPRL	superlative

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