

LEXICAL STRESSES AND INTENSITY PEAKS IN RUSSIAN NOMINAL PHRASES: VARIABILITY AND ITS CAUSES

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ABSTRACT

The problem is what are the causes for coinciding-non-coinciding of intensity peaks and lexical stresses in Russian nominal phrases are.

At the stage 1 33 two-element Russian nominal phrases were read by 5 native Russian speakers. Varying grammatical factors were: the part of speech of a word governed. (Nominal phrases under consideration were with preposition included or without preposition).

Varying phonetic factors were: accents place distances in word combinations and absence-presence of vowel contact in the adjacent words. At the second stage of the experiment the same speakers read 990 sentences with these nominal phrases in six different syntactic positions. WINCECIL technique was used.

Two main factors that we established: the presence of two contact vowels at the centre of collocation and / or the part of speech of a word determining.

1. INTRODUCTION

In Russian speech there are many cases when lexical stress places and intensity peaks are in conflict. This non-coincidence is connected with the more important problem: how Russian speaker divides his speech into prosodic units and much more important – what hierarchy of factors: phonetic ones? rhythmic? syntactic? grammatic? exists in this utterance splitting in communication. The specific Russian speech unit is a nominal phrase existing in the language system between the word and the sentence. This unit is still a mystery for Russian language prosodic evolution investigations. Our own material were Russian nominal phrases with substantives as word determined (déterminée). By Russian syntactic rule the second place of a nominal phrase can be occupied only by a noun, but the first place is more volative: it can be here pronoun, adjective and noun. For example.

Moja kniga (My book), *Krasivaja kniga* (Beautiful book), *Kniga Tatiany* (Tatiana's book).

2. EXPERIMENT. 1 STAGE

2.1. The choice of material. Determining factors

1. All types of nominal phrases have in the structure the noun as the main word (determined word).

But in the experiment all such phrases were divided in accord with a part of speech of a word determining: an adjective, a pronoun or a noun. For example, *Dorogaja gitara* (Very expensive guitar), *Moja kniga* (My book), *Mechta otca* (My father's dream).

2. The second factor under consideration was the position of determining word in the nominal phrase: the first or the second one. I. e. *Moja kniga*, but *Kniga otca*.

3. In Russian there can be some kinds of prepositions between the first and the second components (only between the substantives). These prepositions may be ended by a vowel or by a consonant. For example, *Stakan s risunkom* (a glass with design), *Stakan iz shkafa* (a glass from dresser), *Stakan so stola* (a glass from the table) and so on. Such division – with and without a preposition – was another factor in the choice of material.

4. The next factor determining the choice of material was

the place of lexical stress in words – both in words determined and in words determining. We were choosing the two-syllable words with initial and final lexical stresses and a type of three-syllable words with the central place of the stress – *Tamara* (a Russian proper name). Examples: *KNIGA* (a book), *MECHTA* (a dream), *GITARA* (a guitar), *NASHA* (our – fem.), *MOJA* (my – fem.).

5. The fifth factor was the type of phoneme juncture between the words in the nominal phrases. These may be such combinations: a) lexical stresses situated close to each other: *MECHTA PAPY* (a daddy's dream), b) lexical stress + unaccented next vowel: *MECHTA OTCA* (a father's dream) [A+a], c) vowel clusters irrespective of any lexical stress: *KNIGA OT OTCA* (the book from my father) [ə+α+α]. In some nominal phrases there were lexical stresses very distant from each other: *SIN'AJA GITARA* (a blue guitar), *KNIGA SO STOLA* (a book from the table) etc.

2.2. The total list of our nominal phrases (word combinations).

Thus 33 nominal phrases ought to be read (taking into account all the above factors). Let us enumerate them:

A. 1. *Kniga papy*, 2. *Kniga otca*, 3. *Kniga Tamary*, 4. *Kniga ot papy*, 5. *Kniga ot otca*, 6. *Kniga ot Tamary*, 7. *Mechta papy*, 8. *Mechta otca*, 9. *Mechta Tamary*, 10. *Stakan iz shkafa*, 11. *Stakan so stola*, 12. *Stakan s risunkom*, 13. *Gitara papy*, 14. *Gitara otca*, 15. *Gitara Tamary*, 16. *Gitara dl'a papy*, 17. *Gitara dl'a otca*, 18. *Gitara dl'a Tamary*.

B. 19. *Sin'aja kniga*, 20. *Rodnaja kniga*, 21. *Golubaja kniga*, 22. *Nasha kniga*, 23. *Moja kniga*, 24. *Nashe dit'a*, 25. *Moje dit'a*, 26. *Miloje dit'a*, 27. *Rodnoje dit'a*, 28. *Dorogaje dit'a*, 29. *Nasha gitara*, 30. *Moja gitara*, 31. *Sin'aja gitara*, 32. *Rodnaja gitara*, 33. *Golubaja gitara*.

2.3. Speakers and informants. Type of technique used.

All the nominal phrases listed above were read as isolated word combinations and in random order by 5 native Russians speakers of three generations (Russians by origin). Namely: D.A., fem., 64; D.B., fem., 42; D.C., fem., 14; D.D., masc., 68; D.E., masc. 40. Some data were received from the speaker G., fem., 14.

WINCECIL technique was used. The following graphs: 1) oscillogramme, 2) accent curve (dynamic curve), 3) melodic curve, 4) speech duration time. Speakers used the possibility to hear themselves but not each other.

2.4. The analysis parameters (experimental phonetic and numerical data)

We have chosen such purely phonetic indexes:

1. Absolute intensity of the first word in nominal phrase vs. absolute intensity of the second one.

2. Absolute intensity of the syllable on lexical stress of the first word vs. the same qualifier of the second one.

3. The type of configuration of intensity curve in the nominal phrase as a whole.

4. The coincidence of intensity marked lexical stress and melodic peak.

5. The figure of melodic curve in the nominal phrase.

Some quantitative data were taking into account:

For the first word in a nominal phrase:

1) The whole number of by intensity marked lexical stresses in relation to unmarked ones.

And – looking back to the part of speech of the first word – the relations were further subdivided:

- a) The first word is an adjective,
- b) The first word is a pronoun,
- c) The first word in the combination is a noun.

For the second word in a nominal phrase:

1) The whole number of by intensity marked lexical stresses in relation to unmarked ones.

But we should remind here that in Russian the second place in nominal phrases can occupy only a noun: *Rodnoje dit'a* (My own child), or *Dit'a l'ubvi* (a child of love). But in the first example the noun is a governing word, and in the second example the noun is the governed one.

That is why for the second word we made two kinds of calculations:

a) The whole number of marked by intensity lexical stresses vs. the number of unmarked ones,

b) The number of intensity marked governing nouns vs. intensity marked governed nouns. This calculation was of interest for determining a preference: what is more important: the place of a word or its syntactic function?

For the nominal phrase as a whole:

We listed the cases when intensity marked both lexical stresses in a two word combination (i. e. +|+), only one of them – the first (+|-), the second only (-|+), both lexical stresses were unmarked (-|-). Of course, we paid attention to the part of speech of the word under consideration.

Thus the goal of our experiment was to determine the reasons for intensity peaks and lexical stresses in Russian nominal phrases not coinciding. We would like to compose a system of rules for intensity curves of synthesizing.

But for all that we shall analyze all these deviations above. And to reconstruct the hierarchy of these deviations was for us thus the main goal.

2.5. The results (The 1st stage of experiment)

1. Melodic figures and intensity configurations were very often diverging and melodic peaks and intensity peaks didn't coincide.

2. We have two models of intensity configuration in Russian nominal phrases.

a) according to the first one, the beginning of the phrase is very high and after that we observe a slow declination. And this model gives maximum coincidence of lexical stresses and intensity peaks.

b) according to the second one, the central part of intensity curve is the highest.

But when this striking and unexpected model appears?

A. When we are dealing with two contact lexical stresses: MECHTA+PAPY (a dream of [my] father).

B. When a lexical stress at the end of the first word adjoins the standing in the beginning vowel of the second word:

MECHTA+OTCA (SEE FIG. 1).

C. By accumulation of vowels in the adjacent words (irrespective of lexical stresses): KNIGA-OT-OTCA [A+O+O] (the book of [my] father).

3. The absolute intensity of the second word when the first word was a pronoun or an adjective was half as much than when the first word was a substantive. (It is very interesting that R. Jakobson understood it just in 1922 when he wrote about "avoiding" of adjectives and pronouns by V. Majakovskij).

4. The total relation of words with intensity peaks coinciding with lexical stresses to words with intensity peaks non-coinciding with lexical stresses was 54,6% : 45,4%. It is an evident contradiction with still by some phoneticians shared the opinion of obligatory coincidence of lexical stress and intensity

peak in a Russian word.

For words in initial position ("the first word") such relation was 59,3% : 40,7%.

For the "second" words – 47,5% : 52,5%.

5. The first word intensity markedness data. We demonstrate our results in %. This is the relation of marked by intensity peaks words in relation to unmarked ones.

When the first word is a PRONOUN – 328%. (SEE FIG. 2)

When the first word is an ADJECTIVE – 48%.

When the first word is a NOUN – 206%.

6. The second word intensity markedness data.

Here we see the different syntactic models connected with the second word in Russian nominal phrases.

The second word is a determining one: KNIGA TAMARY (The book of Tamara). Lexical stresses are marked in such instances in 79%.

The second word is determined one (the governing word) and the first word in the word combination is the PRONOUN. Lexical stresses are marked in such cases in 130%.

The second word is determined one and the first word in the word combination is an ADJECTIVE. Lexical stresses are marked by intensity peaks then in 91%.

7. The whole number of marked by intensity peaks lexical stresses in relation to unmarked ones in determined nouns (it could be *Moja mechta*, *Mechta papy*) versus such situations in determining ones (*Kniga papy*). The number is 124%.

8. It is necessary to explicate the role of preposition inserted between nouns. The role of preposition was not only phonetic one: to create the centre of intensity curve arisen. Very often a word after preposition began pronounce without intensity peak on lexical stress but with a declination intensity line, i. e. a word began to realize as isolated one.

9. Structures +|+, +|- , -|+, -|-, its distribution and types of nominal phrases.

The more frequent is the structure +|+. The second place is occupied by the structure +|-. I. e. these are the structures when in the first word the intensity peak and the lexical stress coincide. At the third place is situated the structure -|-. It is very interesting because just this structure appears when we have accent curve rising in the centre of word combination.

How are connected these four models and parts of speech of the first word in nominal phrases? Structure +|+ and +|- are favourable for the first placed pronouns. The initially placed nouns avoid the structure -|+. But initially placed adjectives as it seems have no preferences at all: we can meet them everywhere.

9. Thus, the most significant (according to all available data) is the PHONETIC factor. We understand here such situations as stresses in contact, clustering of vowels, stressed vowel+unstressed one in adjacent words and so on (SEE FIG. 1).

The second place occupies LEXICO-GRAMMATICAL factor (pronoun > noun > adjective).

But it is necessary to mention that some sorts of personal preferences of speakers have taken place too. And besides that, there were prosodic manifestations not easy to be explained and these understandable instances were not strictly individual but quite regular for all (or almost all) speakers. For example, it was a set of phrases with the first word an adjective RODNOJ (dear, native, own, loved by me) – RODNAJA KNIGA, RODNOJE DIT'A, RODNAJA GITARA. In all cases intensity peak marked the first syllable of an adjective. It is very provocative because of old Russian and folk Russian pronunciation when namely the first syllable of this word is stressed: *Mama rodnaja!* (O my mother!). It is interesting that all speakers didn't observe any deviation in their own reading of this word.

And – further – I am not able to interpret some deviations, such as regular intensity peak on the final syllable of the word KNIGA (a book) – KNIGA PAPY, KNIGA OTCA, KNIGA TAMARY and so on.

3. EXPERIMENT. 2 STAGE

3.1. Russian and Finnish manifestation: a comparison.

I have studied during many years the undoubtedly coincidence between Russian melodic figures and some Finno-Ugric melodic models. (It should be noted that Russian North is in contact with Finnish people lands). In my publications (from 1989 and later) I have proved that the famous and specific Russian model of *yes / no* question melodic: with falling-not-rising end and with bright rising on the last stressed vowel (so-called IK-3 by E. Bryzgunova's notation) is quite similar to Finno-Ugric melodic models. And that is why it was very interesting to me to get realizations of all these Russian nominal phrases by Finnish speakers. What did I want to know? a) what is the nucleus of Russian model and how large is the peripheral zone, which is open for interference? b) what factor – phonetic or lexico-grammatical is more significant for Russian speaking non-native Russians?

The speakers were the professors of Slavistics from the Tampere University and Juvaaskula University.

D.A., fem., 37. D.B. fem., 45. They have read the same list of Russian nominal phrases under the same conditions as Russian speakers did it.

3.1.1. Data obtained

The first word in nominal phrases

1. The first word in the word combination was marked by intensity peaks in the following ways:

a) The first word is a PRONOUN. Then the markedness by intensity peaks is 450% in relation to unmarked instances.

b) The first word is an ADJECTIVE. The relation of marked instances to unmarked ones is 157%.

c) The first word is a NOUN. The relation of marked by intensity peaks lexical stresses to unmarked ones is 140%.

The second word in nominal phrases.

The relation intensity peaks in substantives determined (*Moja kniga*) to the same parameter in the substantives determining (*Kniga otca*) is 1, i. e. 100%.

Structures +|+, +|- , -|+, -|- and its distribution.

The first place for Finnish speakers preference was occupied by the structure +|+, i. e. the both lexical stresses were marked by intensity peaks. After that's followed by the structure +|- . The structures -|+ and -|- were represented by minimal number of instances. Meanwhile namely these structures were for native Russian speakers marked by intensity curves with high elevated centre. It is to explain for Russian speakers – as we have just spoken – by purely phonetic factors.

The structure +|+ domination means that for Finnish speakers the tendency to underline each lexical stress through intensity peak is prevailing over phonetic tendencies.

Finnish speakers underlined by intensity peaks very brightly the first word – possessive pronoun (*Nasha kniga*) In percentage it is 450%. How can we explain it? Perhaps, the explanation is very simple. The possessive pronoun, may be, has for non-native Russian speakers the more evident meaning of contrast: *Moja kniga* (It is my book, not yours!) than for native Russians.

And how can we still speak about phonetic factors by Finnish speakers' pronunciation? Yes, it exists, but not always. Thus, the rising centre of intensity curve was fixed by Finnish speakers only in such situations when the lexical stress in the end of the first word was in contact with an open vowel of the adjacent word: MECHT/A+O/TCA.

As a whole the Finnish mode to pronounce Russian nominal phrases seems to be prognosticated. It realized the extreme poles: as in phonetic, so as in lexico-grammatical spheres. We believe that this Finnish mode of Russian phrases manifestation demonstrates a certain simplified scheme of Russian real pronunciation. That is why – I suppose – we can speak in this

case on a sort of language pidginization.

4. EXPERIMENT. 3 STAGE

4.1. The material analysed

In order to formulate the invariant model of Russian nominal phrases prosodic structure it was necessary to reveal all types of its variants in broader contexts – namely in the limits of utterances of different types. We have selected a set of six basic syntactic structures to be the fundamental frames. And here they are:

1) Declarative sentence with initial position of nominal phrase under consideration. For instance – *Kniga papy lezhala na stole*.

2) Yes/no question with initial position of nominal phrase: *Kniga papy uzhe zdes'?*

3) Declarative sentence with final position of nominal phrase: *Na stole lezhala kniga papy*.

4) Wh-question with nominal phrase in final position – *Gde kniga papy?*

5) Yes/no question with final position of nominal phrase analysed: *Razve eto kniga papy?*

6) Compound sentence with medial position of nominal phrase: before one of its clauses: *Vot eto ta kniga papy, kotoruju ja l'ubl'u*.

And so nominal phrases analysed were inserted into 6 different positions (Beginning – Centre – End) of an utterance with (Rising – Falling) melodic. The whole material compiled were 990 sentences. These sentences were read by the same speakers as in Experiment 1. It were 3 women (64, 42, 14) and 2 men (68, 14). They read these sentence in randomized order. The time interval between 1st and 2-d reading was 5 months.

Technique WINCECIL was also used.

4.2. Analysis parameters

1. The place of intensity peak in nominal phrase in each sentence position (6 positions for each phrase).

2. Absolute intensity of syllables on lexical stress in all these positions.

3. The number of marked by intensity peaks lexical stresses in relation to unmarked ones.

4. The number of marked by intensity peaks lexical stresses in relation to unmarked ones in the 1st word of the nominal phrase:

a) when the 1st word is a SUBSTANTIVE,

b) when the 1st word is an ADJECTIVE,

c) when the 1st word is a PRONOUN.

5. The data calculation for the 2nd word:

a) the relation of by intensity peaks marked lexical stresses to unmarked ones when the word in the second position is a determined one (*Moe dit'a, Nasha gitara, Dorogaja kniga*) and when the word in the second position is a determining one (*Gitara papy, kniga Tamary*).

b) the differences of part of speech of words in preposition were fixed.

7. The distribution of 4 rhythmic structures: +|+, +|- , -|+, -|- was calculated.

4.3. Results of experiment (3 stage-1). Global observations

1. Absolute intensity of all analysed nominal phrases was in such broad contexts less than in the same phrases taken isolated.

2. 56.9% of words in nominal phrases (the 1st word and the 2nd words including) were marked by intensity peaks on the lexical stresses. Thus 43,1% words were unmarked.

3. 1st word data. The number of marked by intensity peaks lexical stresses was 58.8%. Thus the relation of marked stresses to unmarked ones was 143%.

a) When the first word was a SUBSTANTIVE – 123%.

b) When the first word was a PRONOUN – 266%.

c) When the first word was a NOUN – 133%.

4. 2nd word data. The total number of lexical stresses

marked by intensity peaks was 53.2%.

The total relation of marked by intensity lexical stresses to unmarked ones was 115%.

If the second word was a substantive determining, the relation was 123%.

If the second word of a nominal phrase was a substantive determined and the first word in the phrase was an adjective – the relation was 176%.

But if the first word in the phrase was a pronoun, the relation of marked by intensity peaks lexical stresses to unmarked ones in the second words in nominal phrases was 293%.

5. The most preferable was the rhythmic structure +|+, i. e. about 25% from totality. The least widespread structure was the rhythmic structure –|–: about 12%.

4.4. Results of experiment (3 stage - 2). Intensity and syntactic positions. Is there any influence?

The fact should be noted that each nominal phrase was inserted into 6 syntactic frames. It means 3 “positions”: Beginning – Middle – End and two types of sentence melodics: Rising and Falling. Thus we had 6 situations: 1) falling beginning, 2) falling middle, 3) falling end, 4) rising beginning, 5) rising middle, 6) rising end.

The results of our calculations.

A. The relation of marked by intensity lexical stresses to unmarked ones for the 1-t words in nominal phrases:

Falling beginning – 152%.	Rising beginning – 183%.
Falling middle – 163%.	Rising middle – 132%
Falling end – 127%.	Rising end – 105%.

B. The relation of marked by intensity lexical stresses to unmarked ones for the 2-d words in nominal phrases:

Falling beginning – 188%	Rising beginning – 138%.
Falling middle – 153%	Rising middle – 192%
Falling end – 127%	Rising end – 122%.

What can we conclude from these data?

a) The rising melody suppresses lexical stresses in final position.

b) In reality, the rising middle is always the position preceding the adjacent clause juncture. That means that it is a **strong** intonation position and all lexical stresses there shall be underlined, especially in the “second” words which always are closer to the juncture than the “first” ones. For instance, *Stakan s risunkom / – eto staromodno* or *Vot gitara Tamary, / kotoruju my tak dolgo iskali.*

c) It is obvious too that the rising ends for the “second” words must be underlined also because of their closeness to the end of *yes / no* question and – because of that – they are also in the strong intonational position. See – *Razve eto kniga papy?*

5. CONCLUSIONS

1. There are many cases in Russian nominal phrases pronunciation when lexical stress is not accompanied by intensity peak.

2. Melodic curve peak and accent curve peak of the same phrase may dispersed rather significantly. The number of accent curve variations was in our material much greater than the number of melodic curve variations.

3. The absolute size of intensity of the “first” words in nominal phrases in relation to the second ones which demonstrates the calculation means that the size of intensity of the first word grows when this word is an adjective or a pronoun (it was a brilliant guess-work of R. Jakobson in 1922).

4. The markedness / unmarkedness of lexical stresses by intensity peaks is determined by a number of factors which hierarchy we succeeded (to a certain degree) to establish.

A. Phonetic factor is prevailing one. Two lexical stresses in closeness very often attracts intensity peak: *Mehta Ani* [A+A]. Peak of intensity is also attracted by vowel clustering (preposition including): *Kniga ot tca* [a+a+a] and by the combina-

tion: stressed vowel in the end of the first word + initial vowel of adjacent word: *Mehta tca*. [A+a].

B. The second factor of importance is the part of speech of the first word. Namely – a pronoun as the first word as usual attracts the intensity peak to lexical stress (*Nasha gitara*). The second place by significance occupies the substantive (noun) in determining function (*Gitara Tamary*). When an adjective occupies the first place, its lexical stress very often exists without intensity markedness (*Rodnoje dit'a*).

Thus there are two factors of contradictory origin: pure phonetic and pure lexico-semantic.

C. But these factors are not always active: there exist a lot of intermediate cases very difficult to interpret. Some of them remain for us inexplicable: *Kniga Tamary, Kniga papy* (the sudden rising of intensity in the centre of phrases) and so on. Some of them can be understood knowing the history of the Russian language and Russian dialects (*ROdnoje dit'a*) etc.

5. A slightly different model has demonstrated the reading of the same Russian phrases by Finnish speakers. Pure lexico-grammatical factor (the part of speech belonging) was underlined, emphasized, more evidently than by native Russian speakers. But phonetic factor was active only by joint of stressed syllables.

There was observed in Finnish speakers reading a tendency to accompany by intensity peak each lexical stress, i. e. not create from nominal phrase a speech unit.

6. How can we describe the difference of intensity manifestation in isolated nominal phrases and its manifestation in limits of utterances?

a) In utterances the difference between absolute intensity of 1 and 2 words was less than in the same nominal phrases read isolated.

b) when the melodics was rising, the markedness by intensity of the second word in the end of utterance was strengthened.

When the melodics was falling, the markedness by intensity of the first word was strengthened in the beginning of utterance.

c) The both leading factors – pure phonetic and pure lexico-grammatical – played the lesser part in utterances than in isolated nominal phrases.

For what reasons? I believe that one of the reasons is the great role of melodic component in utterance intonation. This sentence melodic component is polifunctional and it is melodics that can resolve all semantic and attitude difficulties. But by reading of nominal phrases isolated melodic figures are monotonous and its communicative functions were limited.

As I believe and hope, my results of all experiments described above can be regarded as the initial step for discussion of language prosodic evolution.

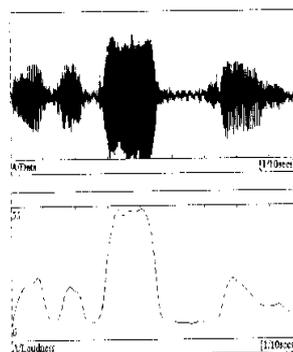


Figure 1. The stressed and unstressed vowels in contact (*Mecht/a+o/tca*)

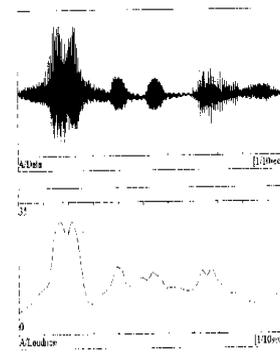


Figure 2. The first word is a possessive pronoun (*Nasha gitara*)