

# TOWARDS A UNIFIED FRAMEWORK OF RUSSIAN INTONATION

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## ABSTRACT

A generative framework of Russian intonation is proposed that incorporates both semantically significant pitch contours and so-called sentential stress, two phenomena usually treated separately in existing accounts of Russian intonation.

The proposed framework involves at least two levels: a phonemic level consisting of both pitch level and contour tone sequences, and a phonetic level accessible to perceptual and instrumental analysis. The phonetic level is generated as a result of intertonal level mapping processes and general implementation processes like downstep, upstep, or declination. The descriptive data include those observed by previous researchers, as well as the author's own instrumental measurements of fundamental frequency.

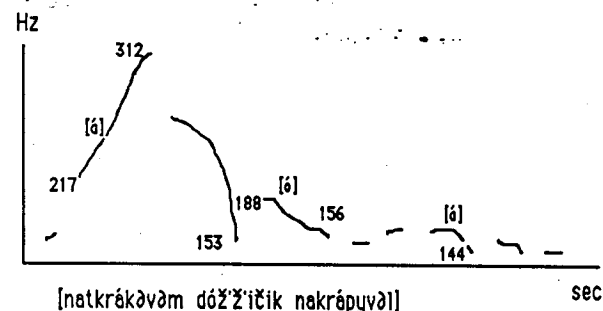
§0. In this paper I outline some basic considerations for a framework of Russian intonation that incorporates both semantically significant pitch contours and so-called sentential stress (SS). In existing accounts of Russian intonation, the two intonational phenomena are usually treated separately. Some accounts of intonation do not mention SS (usually called "logical stress" in the Russian scholarly tradition) at all, as is the case with the authoritative description of Russian intonation in the 1982 Academy Grammar [3]; under this approach, intonation is limited to a taxonomy of meaningful pitch contours, i. e., to a lexicon of Russian intonational meanings. Other accounts (e.g. [12]) treat SS together with other types of stress (e.g. word stress, phrase stress); such accounts generally do not examine pitch contours associated with SS, but define SS in terms of intensity and length. Finally, in accounts of speech melody that examine pitch contours of utterance types both with and without SS (e.g. [1] and [7]), no attempt is made to construct a unified intonational system.

In the following presentation, I consider both SS and certain melodic contours within an intonational system that involves (at least) two levels: a phonemic level that consists of both pitch level and contour tone sequences, and a phonetic level accessible to perceptual and instrumental analysis. The phonetic level is produced as a result of intertonal level mapping processes, as well as general implementation processes like downstep, upstep, or declination. Specifically, I concentrate below on the following three points: (§1) characterization of SS in terms of the direction of the pitch in the stressed syllables of post-SS segmental material; (§2) accounting by means of downstep for iterated sequences of rising contours in non-utterance-final syntagms; and (§3) positing separate phonemic pitch level boundary tones (BTs) not associated with lexical stress.

§1. As is well known, the concept of SS is indispensable for a comprehensive description of Slavic word order. In the absence of an explicit phonetic or phonological definition of this concept, however, it has been taken as a primitive by all scholars dealing with word order. In the actual process of investigation, this amounts to relying on an ill-defined introspective criterion, which has led to some misguided analyses of word order data. It is clear that neither absolute amplitude nor absolute pitch signals SS in Russian, since SS can be placed toward the end of the sentence, where both absolute amplitude and absolute pitch are always lower than they are at the beginning. Also, the duration of the syllable carrying SS is often shorter than that of some other intonational centers in the same sentence, especially the stressed vowel of the sentence-initial rising syntagm (*neokončennaja sintagma* 'incomplete syntagm' in [1], or *načínatel'naja melodema* 'initial melodeme' in [4]). The direction of the pitch in the stressed syllable of the SS itself is not distinctive either, since SS can have either a rising or a falling pitch contour (cf. [1] and [7]). I suggest that the SS site is determined without reference to its own prosody, intensity, or duration, but rather relatively and

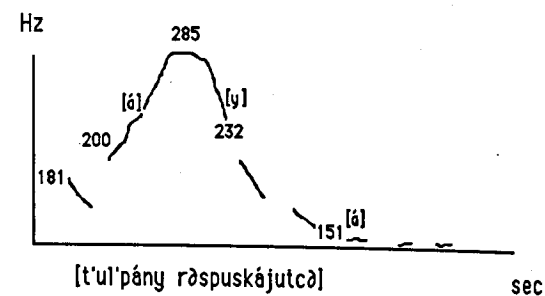
negatively, as the leftmost intonational center after which no syntagms and no rising contours occur. Thus in (1), SS is on the word *doždiček* 'rain', on whose stressed syllable [ǫ] a falling accent HL is implemented; the first syntagm has a rising intonation LH on its stressed vowel [ǫ], while the other stressed syllable in the same syntagm with *doždiček* 'rain', i. e., the post-SS stressed [ǫ], has falling pitch.<sup>1</sup>

- (1) Nad Krakovom doždiček nakrapyval.  
'It was drizzling over Krakow.'



When the direction of the pitch in SS is rising or rising-falling (which happens mostly in interrogatory and exclamatory utterances), the pitch contour of the post-SS stressed vowels is still falling; consider (2), where the SS is on *tjul'pany* 'tulips', a word with a rising-falling pitch on its stressed [ǫ], and the stressed [ǫ] after the SS has falling pitch again:

- (2) Tjul'pany raspuskajutsja!  
'The tulips are opening!' (with stress on 'tulips')



When SS occurs in a monosyntagmatic utterance, it can be found anywhere in its syntagm. In monosyntagmatic utterances where SS falls on the first stressed syllable, no rising stresses occur at all. In such cases, however, when the post-SS segmental material is too extensive, and the pitch cannot continue falling due to the limits imposed by the base line [9], upstep is implemented [5]. When SS appears in non-initial

position within its syntagm, the pitch level before SS is generated by a phonemic pitch level accent, which may or may not generate phonetically rising word stresses. When SS occurs in a multisyntagmatic utterance, on the other hand, it is always preceded by a syntagm with rising intonational center; significantly, segmentation into syntagms is not possible after SS.

The definition of SS as formulated above connects certain previously made observations concerning logical stress [10], with Bryzgunova's IK inventory. It becomes clear, for example, that when the intonational center in Wh-questions uttered with IK-2 is found on the Wh-word, the Wh-word is the SS; or that the intonational center in IK-3 also turns out to be the SS. Moreover, since the function of SS is to mark that piece of information which is not part of the addressee's knowledge and/or current concern [11], this definition of SS sheds light on the functional dichotomy of certain utterance types. Thus, while the SS on the Wh-word of IK-2 marks the rheme, the rest of the information can automatically be judged to be part of the addressee's current concern. Similarly, in questions with IK-3, the SS marks the disjunctive information (i. e. *x* or *y*?) that is outside the speaker's knowledge, and the rest of the proposition is also part of the addressee's current concern. In both cases, the SS status of the intonational center is not only consistent with the fact that the pitch contour of SS itself can be either rising or falling, but it is also corroborated by the contour of the tail, which lacks rising stresses and forms no syntagms.

These considerations indicate that some of the more abstract meanings of IKs, specifically those associated with the structure of the discourse (such as theme/rheme) as opposed to attitudinal factors (cf. some IK meanings like skepticism, disapproval, enthusiasm) constitute on the one hand a separate group within the intonational lexicon, while on the other, they must be considered as an intergal part of the framework of Russian intonation as a whole.

§2. As suggested by Ščerba and repeated by most subsequent scholars, some utterances do not have SS at all; they are composed of one or more syntagms, each of which has its own syntagmatic (or phrasal) stress. Consider (3):

- (3) V našu komnatu / vošla požilaja ženščina /  
v bol'six / mužskix / sapogax.  
'A middle-aged woman in big men's boots walked into our room.'

In (3), which can easily be uttered with as many as 5 syntagms, each of which but the last has a rising center, the only falling stress is realized on the final syntagm *sapogax* 'boots', which is nevertheless clearly not the carrier of SS. I will call this utterance intonation "Type I".

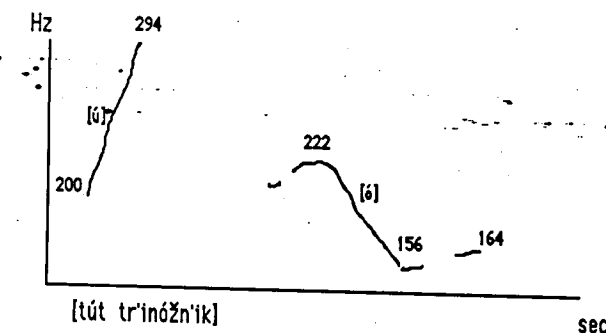
Type I intonation brings us to the second problem, that of downstep. The intonational contour described for (3) is essentially that of *Moskovskoe vremja / četyrnadcat' časov / pjatnadcat' minut* 'Moscow time is fourteen hours and fifteen minutes', which is analyzed as IK-6 / IK-4 / IK-1 [2:195]. Note that the number of rising stresses (like those in IK-6 and IK-4) in sentences with Type I intonation can easily be increased; in (3), for example, four rising stresses are quite possible, depending on the rhythm of the speaker, and this number can be increased by lengthening the sentence. Attributing each rise to a separate phonemic IK that differs from the preceding one only in having a slightly lower rise misses the generalization that such iteratively rising "slopes" call for. I suggest that this pattern of Type I intonation can be accounted for in terms of downstep.<sup>2</sup> If downstep is accepted as part of the Russian intonational system, the invariable core of Type I intonation can be described as  $[LH]_n HL$ , where  $n$  is the number of non-final syntagms, and [ ] indicates the implementation of downstep. The surface pitch level is then generated as a result of a combination of downstep, intertonal pitch mapping between adjacent phonemic tones, and the general declination of the utterance.<sup>3</sup>

This solution eliminates the *ad hoc* assignment of different phonemic rising IKs that gradually decrease in height to an open set of syntagms, which runs counter to the obvious fact that the number and height of the intermediate pitch levels is nothing more than a function of the length of the sentence and its division into syntagms. This solution accounts, moreover, for numerous redundancies observed in the current system of IKs, such as the otherwise unexplained synonymy of IK-3, IK-4, and IK-6, all three of which are said to signify "incompleteness", among other things. An additional benefit of such a deep structure is the fact that it also accounts for our intuition that sentential Type I intonation and so-called "citation intonation" for single words (cf. also Bryzgunova's observation that IK-1 is used as "title" intonation [3]) are quite similar. Thus one can posit a core phonemic representation for both Type I and citation intonation as  $[LH]_n HL$ , where  $n = 0$  in citation intonation.<sup>4</sup>

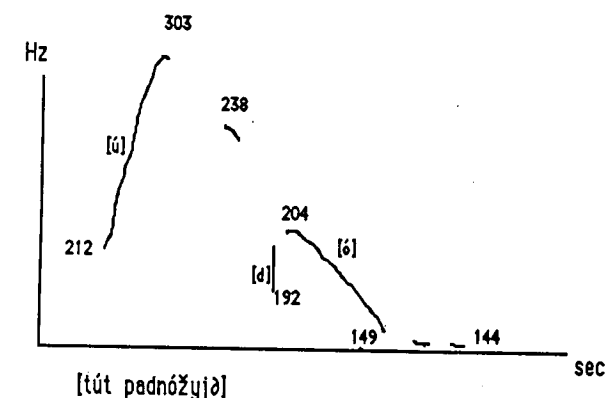
§3. I suggested in §2 that the underlying sequence of contour tones  $[LH]_n$  and HL constitutes the core of Type I

intonation. This core, however, is not entirely sufficient for generating all utterances that should be considered Type I. Consider the contrast between (4) and (5):

- (4) Tut trenožnik. 'There is a tripod here.'



- (5) Tut podnožie. 'There is a pedestal here.'



Both (4) and (5) have Type I intonation LH HL. But the post-tonic pitch levels in the final syntagms of (4) and (5) differ significantly. To account for this, as well as other phonemic differences realized on unstressed material, I propose phonemic pitch level boundary tones (BTs).<sup>5</sup> Thus, if we posit utterance-final BTs H# for (4) and L# for (5), we can capture both the Type I intonation that (4) and (5) clearly share, as well as the non-finite nature of (4), as expressed by the H#. The phonetic realization of BTs is of course affected by the adjacent tone level, as well as by the overall declination of the base line.

BTs can also account for similarities and differences between several other contours that must otherwise be distinguished as a whole. For example, the difference between the first and the second type of syntagmatic stress as described in [1] can be reduced to LH for the first type, versus LH H# for the second. Similarly, the difference between "qualificational"

IK-3 and IK-6 (as in *Kakoj sup vkusnyj!* 'What a yummy soup!') can be reduced to that of the BT, which is L# in IK-3 and H# in IK-6.

The specific points discussed above do not of course exhaust the theoretical questions associated with the description of Russian intonation. Among remaining problems, the problem of the definition of a syntagm is crucial for the understanding of the generative process of utterance intonation. Of the many suggestions for defining a syntagm, at least the intonational definition, as the domain of a single intonational center, appears to be generally valid (with the exception of the "bicentral" IK-5, cf. fn. 4). But this leaves at least two important questions unanswered: (a) how the boundaries of syntagms are determined (cf. e. g. [8]), and (b) what determines the position of the intonational center within the syntagm itself. Although various authors have offered speculations on both questions, no rules have yet been proposed that would generate a correct segmentation in a given context. There are also general descriptive issues to be addressed, such as whether or not Russian intonation is best represented by a sequence of pitch level and/or contour tones (as assumed in this paper) or by head-nucleus-tail configurations (this is essentially the approach taken by Soviet scholars), or how many basic tone levels can be posited for Russian, or which tones, if any, can spread. The answers to these questions would enable us to determine the underlying tones for various IKs, and to incorporate *all* of the items of the intonational lexicon, including discourse features marked by SS, into a unified framework of Russian intonation.

#### NOTES

1. The graphs given in (1), (2), (4), and (5) were produced by a computerized analysis of changes in fundamental frequency over time. The informant was an ethnic Russian female from Leningrad in her thirties; the graphs use a regular (i.e. not a logarithmic) scale. This instrumental research was supported by NSF Grant BNS 8206064.

2. Downstep, which is an important feature of the tonal systems of many African and native American languages (see e.g. [5]), has also been proposed for English [9].

3. For declination, see [9].

4. The only bicentral in the system, namely IK-5, may also be essentially represented by the same phonemic sequence, where it is perhaps the intonational meaning of this IK that

obligatorily requires  $n=1$ , along with some other peculiarities in the underlying structure of this contour.

5. For boundary tone, see [6].

#### REFERENCES

- [1] Bryzgunova, E. A. 1963. *Praktičeskaja fonetika i intonacija ruskogo jazyka*. Moskva: Moskovskij universitet.
- [2] ———. 1977. *Zvuki i intonacija ruskoj reči*. Moskva: Russkij jazyk.
- [3] ———. 1982. 'Intonacija', in N. Ju. Švedova (ed.), *Russkaja grammatika*, 96-122. Moskva: Nauka.
- [4] Čeremisina, N. V. 1976. 'Melodika i sintaksis ruskoj sintagmy', in G. A. Zolotova (ed.), *Sintaksis i stilistika*, 65-85. Moskva: Nauka.
- [5] Clements, George N. 1979. 'The description of terraced-level tone languages', *Language* 55:536-58.
- [6] Liberman, Mark. 1978. *The Intonational System of English*. MIT Dissertation.
- [7] Matusevič, M. I. 1976. *Sovremennij russkij jazyk: fonetika*. Moskva: Prosveščenie.
- [8] Nikolaeva, T. M. 1973. 'Smyslovoe členenie teksta, ego individual'nye varianty', in M. Mayenowa (ed.), *Semiotyka i struktura tekstu*, 71-80. Wrocław: Wydawnictwo Polskiej Akademii Nauk.
- [9] Pierrehumbert, Janet B. 1980. *The Phonology and Phonetics of English Intonation*. MIT Dissertation.
- [10] Raspopov, I. P. 1957. 'Smyslovyje i stilističeskie funkcii logičeskogo udarenija', in *Russkij jazyk v škole* 1957, 4:18-22.
- [11] Yokoyama, Olga T. 1986. *Discourse and Word Order*. Amsterdam: John Benjamins.
- [12] Zinder, L. R. 1960. *Obščaja fonetika*. Leningrad: Leningradskij universitet.