

# Vocalism of the Russian Language: Gender Differences

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## ABSTRACT

The quantitative characteristics of Russian vowels in male and female speech were investigated. It was shown that the prosodic center (pretonic and stressed syllable) of a phonetic word in Russian is formed according to the principle of quantitative dissimilation of the vowel in the first pretonic syllable to the vowel in the stressed syllable. This principle manifests itself more noticeably in female than in male speech. Some gender differences have been found in the intonation of utterances with specific semantics or communicative goals. For emotional female speech, together with the accent on the stressed vowel, the appearance of an additional tone accent on the vowel of the first pretonic syllable is typical (double accentuation). In emotional male speech, the accent in such cases is put only on the stressed vowel.

## 1. INTRODUCTION

Durations of unstressed vowels in Russian, including the vowels of the first pretonic syllable, were considered in [1; 2; 3]. At the same time, no studies of gender differences between the quantitative characteristics of vowels based on statistically representative material have been carried out so far. The study was aimed at finding 1) how quantitative characteristics of vowels [a], [i], [y], [u] in the first pretonic syllables depend on the quality of stressed vowels; 2) how these characteristics depend on the gender of speakers.

The published data on the quantitative characteristics of vowels from the first pretonic syllable do not provide the exhaustive answer to the first question since previous studies did not take into account that vowels can be realized in various positions. The second question, which is central in this presentation, has been studied so far only in the framework of Russian conversational speech and only using the auditive method. In [4], some pronunciation differences in male and female conversational speech were considered. The discussion did not take into account position differences in the pronunciation of vowels. The authors came to the conclusion that in the speech of men, all vowels have much stronger qualitative reduction than in the speech of women. Therefore, it was important to obtain data on the quantitative characteristics of vowels in male and female pronunciation in various word and phrase positions using statistically representative material relating to a different kind of speech, such as reading of prepared texts.

## 2. MATERIAL, INFORMANTS, METHODS

In the prepared texts, disyllable logo toms like *tatán, tafín, tatón, taén, titán, tytán, tután, tufín* and so on were included into frame constructions where these quasi-words occupied various positions. The differences between the phrase positions were linear (the beginning, the middle, the end of the phrase, for instance, *???? – eto slovo. Slovo tatán povtori. Eto slovo – tatán. Slovo tatán uzhe bylo.*) and prosodic, i.e., either prominent or not prominent: *Tatán – eto slovo* and *Tatán – eto slovo; Slovo tatán povtori* and *Slovo tatán povtori*. Variations concerned stressed vowels, vowels in the first pretonic syllable, phrase positions. Only the consonant skeleton of logo toms was constant: *t, t', n*.

We have made computer records of speech in .wav format for twenty Moscow informants, ten women and ten men, aged from 18 to 65 years.

Using the oscillograms obtained with the Speech Analyzer program, we measured durations of vowels. The number of vowels studied this way was 2240. Whenever needed, the spectrograms were obtained using PRAAT [8].

## 3. RESULTS

The average values for the whole set of records, as well as for each group of informants are presented in Tables 1, 2.

pretonic vowel			stressed vowel	
vowel	duration (ms)	ratio to the duration of the stressed vowel, %	vowel	duration (ms)
a	85	61	a	113
a	101	121	i	83
i	50	40	a	122
i	67	53	u	108
y	55	46	a	114
y	65	63	u	102

**Table 1:** Average durations of vowels in the first pretonic and stressed syllables.

women					men				
pretonic vowel			stressed vowel		pretonic vowel			stressed vowel	
1	2	3	4	5	1	2	3	4	5
a	83	64	A	130	a	87	92	A	95
i	50	38	A	130	i	50	43	A	115
a	110	122	I	90	a	92	123	I	75
i	63	57	U	107	i	49	47	U	102

**Table 2:** Average durations of vowels in the first pretonic and stressed syllables in female and male speech. Columns 1,4 contain vowels, columns 2,5 contain their durations in ms, column 3 shows the ratio between the durations of the pretonic vowel and the stressed one in %.

#### 4. DISCUSSION

Among the four possible vowels in the first pretonic syllable, the most short and intensive are [i] and [y]. According to the obtained data, the duration of [i] in the first pretonic syllable in different context and phrase position varies from 33 to 65 ms (short realizations prevail). Its average value for the whole set of data is 50 ms, which is 40 % of the duration of stressed [a]. This result should be compared with the data for [a] in the first pretonic syllable: duration of this vowel varies from 80 ms to 150 ms and corresponds to 85 - 125 % of the stressed vowel duration. The vowel [y] has somewhat longer duration than [i].

Shortness of pretonic vowels [i] and [y] in the stream of speech explains some other phonetic effects in the vocalism of Standard Russian. First of all, this quantitative characteristic of [i] and [y] causes numerous cases of ellipsis of these vowels registered in the transcriptions of Russian conversational speech from the beginning of the 20th century till our days [see 5], as well as in Standard Russian.

The same quantitative characteristic of pretonic [i] and [y] is related to the possibility of vowel dieresis in vocal complexes in cases where these vowels are the first components of a vocal complex while *á*, *ó* are the second component of the same complex. Pronunciation of such pairs as *L'ána - liána*, *León - l'on*, *idiót - id'ot*, *or'ól - or'eól* and so on can coincide in many phrase positions, which causes homophony. Realization of vocal combinations *-yá-*, *-yó-*, *iá-*, *-iô-* with the dieresis of the first component often registered in modern conversational speech, also arises due to the shortness of [i] and [y] in the first pretonic syllable. For short vowels [i] and [y] in many positions, quantitative characteristics do not differ from the characteristics of formant transitions connecting the preceding soft consonants with the vowels *á*, *ó*.

The study of positional characteristics of vowels has shown that the duration and intensity of vowels in the first pretonic

syllable is determined by the quality of the stressed vowel: the vowel [a] before a stressed *a* is slightly shortened and weakened, while realizations of *a* before other vowels are longer and more intensive. The strongest and longest realizations of *a* occur before stressed narrow vowels. Hence, here we see a manifestation of the quantitative dissimilation principle. This is true not only with respect to pretonic [a] but also to other pretonic vowels: [i], [y], [u] are also shortened and weakened before *á*, as we have shown above. More long and intensive realizations of these vowels can be observed before narrow vowels. This result shows that the *prosodic center* of a word in standard Russian is formed according to the balance principle: the larger the “weight” (duration and intensity) of a stressed vowel, the “lighter” (shorter and weaker) is the vowel of the first pretonic syllable, and vice versa. According to our data, the dissimilative principle of the prosodic word center construction manifests itself more consistently in the speech of women. In male speech, the duration and intensity of the pretonic vowel have much weaker dependence on the quality of the stressed vowel (see Table 2). More distinct manifestation of the dissimilative principle in the structure of the word prosodic center for the speech of women compared to the speech of men is not due to long pretonic vowels in women’s speech but rather due to short stressed vowels in the speech of men.

The beginning of a phrase presents a favorable position for the realization of all vowels, both stressed and unstressed. Hence, in this case the influence of a stressed vowel on the vowel of the pretonic syllable is more noticeable. In accent-free positions in the middle of a phrase, quantitative relations between pretonic and stressed vowels are more smoothed out. In the end of a phrase, durations of both kinds of vowels increase.

To these observations the following consideration should be added. In the recorded examples, accentuation of words was usually accompanied by a super long pretonic vowel, like [a:] – from 120 to 150 ms, [i:] – from 80 to 100 ms. Duration of the pretonic vowel in such examples could exceed the duration of a stressed vowel. This could be accompanied by breaking of the usual rhythmic scheme of a phonetic word realization, together with the dissimilative principle of quantitative relations between the pretonic and stressed vowels. This was usually accompanied by tone raising on the pretonic vowel and tone lowering on the stressed vowel.

Connection between the pretonic vowel prolongation and the increase of its tone was described by N.N.Rozanova [6, 214]. She also pointed out that this feature is more characteristic of female speech than of male speech [*ibid*, 213] and that it mostly occurs at the end of a syntagm or a phrase. Our material confirms this observation. Breaking of the phonetic word rhythmic scheme with the prolongation of the pretonic vowel in such phrase positions is observed in emotionally neutral texts such as, for instance, radio news programs: In all these cases, prolongation of the pretonic vowel was observed together with the tone

increase. Not only [a] can be prolonged in such a position, but also narrow vowels.

The tone-temporal accentuation of the first pretonic syllable is not connected with semantic but rather with rhythmic organization of the text. A different situation is observed in emotional speech. According to the observation by E.A. Bryzgunova, "emotional realizations regularly change the rhythmic structure of the word", which manifests itself in the duration of vowels and in the melody [7: 28]. Accent organization of such phrases as *Ona s[a:]vsem ne umeet gotovit'! Eto [a:]kaja umnica! On t[i:]pichnyj bezdel'nik!* indicates that tone and temporal prominence of the first pretonic syllable in such cases is related to semantics. An accent shows the increase of a feature, which is also expressed lexically. After listening to texts of spontaneous speech, one gets the impression that semantically caused accentuation of the first pretonic syllable is more typical of the emotional speech of women than of emotional male speech.

For female speech, together with the accent on the stressed vowel, the appearance of an additional tone accent on the vowel of the first pretonic syllable is typical (double accentuation). In male speech, the accent in such cases is put only on the stressed vowel.

## 5. CONCLUSION

After analyzing the records of informants reading the prepared text, we came to the conclusion that in Standard Russian, the prosodic center of a phonetic word is formed according to the principle of quantitative dissimilation of the vowel in the first pretonic syllable to the vowel in the stressed syllable.

This principle manifests itself more noticeably in female than in male speech.

In addition, some gender differences have been found in the intonation of utterances with certain semantics or certain communicative goals.

## REFERENCES

- [1] Zlatoustova, L.V. et al. "Issledovanie dlitel'nosti neudarnyx glasnyx v zavisimosti ot frazovyx uslovij". In V.A. Zvegincev (ed.) *Semanticheskie i fonologicheskie problemy prikladnoj lingvistiki*. MGU Press, 1968, pp. 74-134.
- [2] Bolla, K. "Nekotorye voprosy sootnoshenija dlitel'nosti glasnyx zvukov russkoj rechi". *Vestnik MGU*, ? 3, 1968, pp. 73-95.
- [3] de Silva, V. *Quantity and Quality as Universal and Specific Features of Sound Systems: Experimental Phonetic Research on Interaction of Russian and Finnish Sound Systems*. Jyväskylä University Press, 1999.
- [4] Zemskaya, E.A., M.V. Kitaygorodskaya, N.N. Rozanova "Osobennosti muzhskoj i zhenskoj rechi". In E.A. Zemskaja and D.N. Shmel'ov (eds.) *Russkij jazyk v ego funkcionirovanii: kommunikativno-pragmaticheskij aspekt*. Moskva, Nauka, 1993, pp. 90-136.
- [5] Kitaygorodskaya, M.V., N.N. Rozanova *Rech Moskvicej: kommunikativno-kul'turologicheskij aspekt*. Moskva, Russkie slovari, 1999.
- [6] Rozanova N.N. "Ob odnoj osobennosti staromoskovskogo proiznoshenija v sovremennoj rechi moskvicej". In D.N. Shmel'ov and E.A. Zemskaja (eds.), *Raznovidnosti gorodskoj ustnoj rechi*. Moskva, Nauka, 1988, pp. 208-223.
- [7] Bryzgunova E.A. *Emocional'no-stilisticheskie razlichija russkoj zvuchascej rechi*. Moskva, MGU Press, 1984.
- [8] Boersma, P. PRAAT, version 4.0.28. <http://www.fon.hum.nl/praat>.

