Processing verse and prose: intonational differences

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Abstract

Does poetry have specific intonational properties? We address this debated question from a new angle asking whether verse and prose can be distinguished on the basis of intonation alone. We used delexicalized fragments of Russian verse and prose. We conducted a behavioral and a neurophysiological (EEG) experiment to reveal perception differences on both conscious and unconscious levels.

Key words: verse, prose, intonation, delexicalization, EEG, Russian

Introduction

It is debated in the literature whether poetry is characterized by specific intonational properties — see e.g. Kostyuk (2017) for the discussion on Russian material. Skulacheva and Kostyuk (2019) argue that these properties exist (in brief, intonation is significantly 'flatter' and more monotonous) and are associated with some general differences between verse and prose. In particular, verse discourages dividing information into given and new, salient and backgrounded — everything is important to evoke a certain image.

We look at this question from the perceptual angle. Are verse and prose distinguishable on the basis of intonation alone? We ran a behavioral and a neurophysiological experiment with delexicalized fragments of Russian verse and prose and found differences on both conscious and unconscious levels.

Experiment 1

Method

41 native speakers of Russian participated in Experiment 1 (30 women, 11 men aged 18–53). In both experiments, participants' education and professions were not connected to literary or music studies. All participants provided informed

consent. Experiments were conducted in accordance with local and international regulations at Saint Petersburg State University.

We selected 16 prose fragments from several 19th and 20th century Russian novels (1) and 16 fragments from poems written during the same period (2) (from some of them, several fragments were taken). Poems ranged from the most metrically regular syllabo-tonic verse (dominant in the classic Russian poetry and still the most widespread) to so called *dolnik* and *taktovik* (less regular tonic meters) and to free verse (e.g. Gasparov 2000; Skulacheva 2014).

(1) Alexander Pushkin "The Captain's Daughter", "The Lady Peasant"; Nikolai Gogol "Dead Souls"; Anton Chekhov "Anna on the Neck"; Mikhail Bulgakov "The Master and Margarita"; Valentin Rasputin "French lessons".

(2) a. *Syllabo-tonic (rhymed):* Alexander Pushkin "19th of October"; Nikolai Nekrasov "Before the rain"; Alexander Blok "Dnem veršu ja dela suety"; Osip Mandelstam "Za to, čto ja ruki tvoi ne sumel uderžat'...".

b. *Dolnik (rhymed):* Anna Akhmatova "New Year's Ballad"; Alexander Blok "Devuška pela v cerkovnom hore", "Dux prjanyj marta byl v lunnom kruge..."; Osip Mandelstam "Otčego duša tak pevuča...".

c. *Taktovik:* Mikhail Kuzmin "Alexandrian Songs" (2 fragments); Velimir Khlebnikov "Easter in Ansali", "Ja videl junošu-proroka".

d. *Free verse:* Velimir Khlebnikov "The Forefather", "Ja ne znaju, Zemlja kružitsja ili net..."; Joseph Brodsky "The play with two breaks for sax baritone", "In memory of Fedya Dobrovolsky".

All fragments were 30 s long and were delexicalized using the *Praat* software (i.e. the participants could hear only intonation). The task was to listen to them one by one and to answer whether it was verse or prose. Participants could answer before 30 s were over, so we measured both RTs and accuracy. Linear and logistic regressions with mixed effects were used for statistical analysis. The experiment was conducted online on the *PCIbex Farm* platform.

Results and discussion

The average share of correct answers was almost the same for verse and prose (59% vs. 60%). However, the recognition accuracy of the classical verse and dolnik was significantly higher than that of prose and other types of poetry (see Figure 1). Free verse was recognized the least successfully. As for RTs, no statistically significant differences were observed.

The results indicated that not only intonation is required to distinguish between verse and prose, but also rhythm, pausation, etc. As a result, only (relatively) regular meters are recognized successfully. As for prose, we noted that 'static' passages like nature descriptions had the lowest accuracy. We hypothesize that they have something in common with the poems: in 'dynamic' passages, information structure is more important, while the main purpose of 'static' passages is to create a certain mood, to evoke a certain image, like in

verse (see the introduction). Apparently, this is also reflected in prosody, which indirectly confirms Skulacheva and Kostyuk's (2019) hypothesis.

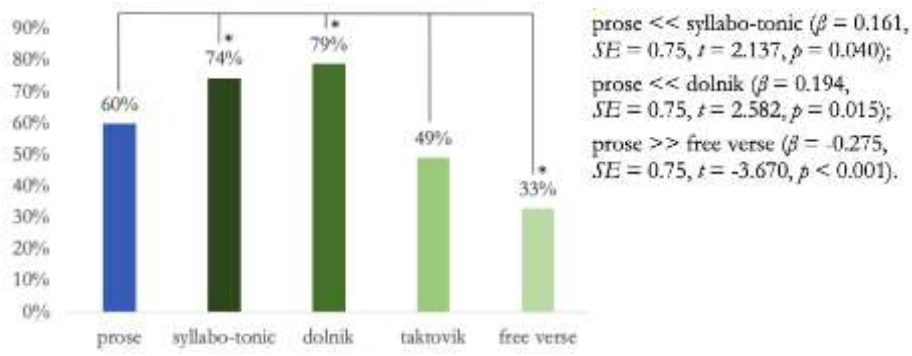

Figure 1. Experiment 1: average recognition accuracy in different conditions.

Experiment 2

Method

In Experiment 2, we focused on processing delexicalized verse and prose using electroencephalography. We selected syllabo-tonic verse and 'dynamic' prose fragments to maximize the observed differences. Participants were 19 speakers of Russian (17 women, 2 men, aged 22–27). We had 6 prose (3) and 6 verse (4) fragments. Every delexicalized fragment lasted for 30 s.

(3) Leo Tolstoy "War and peace"; Anton Chekhov "Anna on the Neck"; Mikhail Bulgakov "Master and Margarita"; Boris Zhitkov "The Mongoose".

(4) Alexander Pushki "Redeet oblakov letučaja grjada"; Valery Bryusov "Ja ležal v aromate azalij"; Alexander Blok "Sumerki, sumerki vešnie", "Mira vostorg bespredel'nyj"; Osip Mandelstam "Za to, čto ja ruki tvoi ne sumel uderžat'..."; Viktor Gofman "On the Boulevard".

The experiment had a block design: participants listened to prose fragments (all fragments were presented twice in a random order), then to verse fragments. After every fragment, they answered whether it resonated with their current emotional state. We wanted to avoid a critical analysis of the fragments as much as we could. Before every fragment, we made a background recording for 30 s.

We used the *Neurovisor BMM-52* electroencephalograph. Recordings were made in 21 leads, monopolar montage, and EOG was recorded in parallel. The spectral analysis of the EEG was done in the *EEGLAB 2022.0*. Permutation statistics with Bonferroni corrections was used for statistical analysis.

Results and discussion

When comparing spectral power in all frequency bands for all leads in the prose and verse conditions, significant differences were found in all frequency bands except delta. Interestingly, the spectral power of the alpha rhythm was significantly higher when listening to verse fragments, while the opposite was observed for other EEG frequency bands (Figure 2). Significant differences ($p < 0.05$) are shown by black dashes on the x axis.

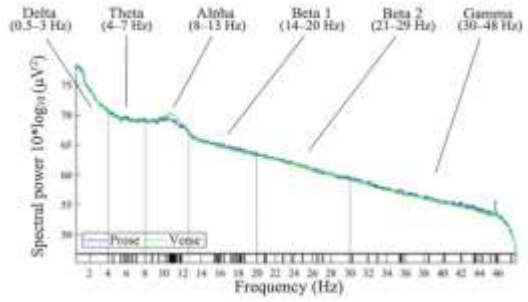

Figure 2. Experiment 2: Power spectral densities in different frequency bands in the verse and prose conditions.

We can conclude that participants' reactions to delexicalized verse and prose are different both when they consciously try to tell them apart and when they simply listen to the fragments. But this is definitely true only for the two 'poles': for regular meters and for dynamic prose passages. To interpret the differences observed in Experiment 2, further research is required to find out which prosodic and semantic distinctions play a role for different frequency bands.

Acknowledgements

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