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Conference Paper · May 2020

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INTONATION OF YES-NO QUESTIONS BY HERITAGE SPEAKERS OF RUSSIAN

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Abstract

Heritage speakers' grammars are known to differ in systematic ways from the grammars of monolingual speakers. The present study focuses on the properties of the to-date poorly understood variability in intonational phonology of heritage speakers. This paper investigates the intonation patterns of yes-no questions produced by twelve Russian heritage speakers residing in the USA and Germany, and compares them to productions by six monolingual Russian speakers from Saint Petersburg. The results of the study reveal significant differences between the three speaker groups. In contrast to the monolinguals, heritage speakers generally produced more pitch accents on syntactic constituents and showed a strong preference for an upstepped nuclear pitch accent which was infrequent in the monolingual data. Moreover, we observed differences between the two groups of heritage speakers. Similar to the monolinguals, heritage speakers from Germany did not show a clear preference for a high or a low final boundary tone in utterances with Subject-Verb structure while heritage speakers from the US group showed a tendency to produce a low boundary tone. The results are discussed with the reference to the previous findings.

Index Terms: yes-no questions, Russian intonation, heritage speakers

1. Introduction

Heritage speakers (HSs) offer a fascinating area for research on bilingualism. These are speakers who grew up with a language at home (heritage language, henceforth HL) that was different from the majority language (language of the surrounding community, henceforth ML) and who are often more proficient in their ML than the HL [1]. In this population, HL is often the first language that is acquired in the family, while ML usually becomes dominant later in speakers' lives. Previous studies have shown that linguistic performance of HSs in their HL is close to monolingual speakers in some aspects. For example, HSs often have good overall comprehension [1]. In other domains, however, HSs tend to show non-canonical patterns. For example, they prefer overt structures in both syntax and morphology to those that are covert [1]. Studies on phonetics and phonology in HL have often demonstrated that HSs are more monolingual-like in terms of segmental production and perception in their HL compared to L2 learners (e.g. [2]). However, HSs might show non-standard variation in their intonation patterns (see e.g. [1] on the "heritage accent" of Russian HSs in the USA).

1.1. Intonation in heritage languages

Intonation of heritage speakers has to date received far less

attention compared to other domains of HL grammar. A case study by [3] found that intonational features that are typical of a ML can be transferred to a HL. Specifically, two HSs of French in the USA placed high pitch accents to express focus, which is usually expressed through syntactic dislocation and phrasing in Standard French.

A study by [4] suggested that the influence can be bidirectional and that the ML might also be influenced by the HL in HS intonation. The study investigated focus prosody of speakers with HL Turkish and ML Dutch. The results revealed prominent differences in the pitch range of sentences produced by monolinguals vs. HSs of Dutch. Specifically, Dutch monolinguals demonstrated F0 declination in broad focus, whereas HSs did not. Instead, they had the same F0 level throughout the whole sentence. The findings of the study were interpreted as a potential transfer from Turkish into Dutch.

A study by [5] has shown further evidence that bidirectional influence might exist between a HL and a ML. Specifically, heritage speakers of North American heritage Icelandic had a lower percentage of rising terminals in yes-no questions in English compared to English monolinguals and a lower percentage of falling terminals in Icelandic compared to Icelandic monolinguals [5].

The present study seeks to provide additional evidence on the nature of the relationship between intonational phonologies of HL and ML, by comparing productions of Yes-No Questions (henceforth YNQ) in HSs of Russian with different MLs - German vs. English. Intonation of YNQs in Russian shows considerable phonological differences compared to both English and German. Given that in Russian, these questions lack a grammatical marker and are demarcated as such exclusively by means of intonation (specifically, the nuclear pitch accent type and the final boundary tone), their productions seem particularly informative for the understanding of cross-linguistic influences in HL intonation.

Taking aforementioned findings on heritage intonation into account, this paper seeks to answer the following research questions: (1) Are the intonation patterns of YNQs produced by Russian HSs residing in the US differ from those residing in Germany and those of monolingual Russian speakers with respect to pitch accent placement, pitch accent type and final boundary tone? (2) If they are not similar, which differences can be found, and can they be attributed to ML influence, or do they form a unique HL grammar that is different from both HL and ML phonologies? [6].

1.2. Intonation of yes-no questions

The most frequent way of forming a YNQ in Standard monolingual Russian is through intonation, i.e., declarative clauses and YNQs do not differ in their morphosyntax, but only in their prosodic realization ([7, 8]).

The intonation of Russian YNQs is traditionally described as follows: “a sharply rising high tone at the beginning of the stressed syllable of the word receiving main stress, and an obligatory deep lowering of tone on the syllables following main stress” ([8, p. 271]). In a non-contrastive context, the finite verb of the YNQ receives the main prominence, regardless of whether or not it is followed by a noun [9, p. 224]. Moreover, prenuclear and postnuclear constituents are expected to be deaccented [8]. Declarative sentences were reported to differ from YNQs by having an early peak alignment of the accented vowel and a more gradual rise [7].

Studies on Russian intonation which adopt the autosegmental-metrical approach to intonation (e.g., [10, 11]) analyze YNQs as having a bitonal rising (L*+H [7] or L+H* [10]) nuclear pitch accent followed by a low boundary tone (L%). This intonation pattern is generally reported for YNQs whose nuclear accent falls on a syllable which is not final in the utterance. If the nuclear accent is to be realized on the final syllable of an utterance, the intonation contour ends on a rise, which has been analyzed as truncation [8, 10, 11]. In contrast, the unmarked intonation contour of German YNQs is reported to have a low nuclear pitch accent on the object if there is one, a high phrase accent and an ‘upstepped’ high boundary tone: L* H-^H% [12]. The intonation pattern of English YNQs was reported to be similar to the German one, namely L* H-H% [13] (after “H-” an automatic “upstep rule” is required) [9].

2. Method

2.1. Data collection

The data were collected as part of a larger study conducted within the research project “*Emerging Grammars in Language Contact Situations*” that investigates linguistic systems of HSs of different languages in the USA and Germany [14]. Germany and the USA were chosen as focus for investigation due to the large populations of Russian-speaking immigrants in both countries.

2.2. Participants

The data of three teenager groups will be presented in this paper: (1) six HSs of Russian with ML American English (mean age=16.4, SD=1.35, 3 f), (2) six HSs of Russian with ML German (mean age=17.1, SD=0.92, 4 f), and (3) six Russian monolingual speakers (mean age=17.1, SD=0.6, 4 f). Based on the background questionnaires, all HSs of this study were exposed to Russian from birth and used it on a regular basis with at least one of the parents. Moreover, all HSs in Germany learned Russian as a foreign language in a formal school setting, and three HSs in the USA learned Russian in Sunday schools. As for the MLs, two HSs in the USA and Germany started learning them from birth and four HSs of both groups started acquiring their ML in the kindergarten before the age of five. The data were collected in the greater Washington area (Virginia, Maryland, DC), Berlin and Saint Petersburg, respectively.

2.3. Stimuli

The stimuli for the study were comprised of ten YNQs with different syntactic structures: Subject Verb Object (SVO) and Subject Verb (SV, see Table 1). All questions asked about the selected events of a fictional car accident that the participants had seen in a video. Five sentences truthfully corresponded to what was shown on the video while in other five sentences, either the verb (3, 8, 9, 10) or the object (2) had to be corrected.

In four SVO sentences (Table 1, 1-4), the nuclear pitch accent was expected to fall on the penultimate syllable of the finite verb (in the table, capital letters mark the lexically stressed syllable, apostrophes mark palatalization in Russian). The low phrase-final target of the L% boundary tone was predicted to be reached without truncation in all SVO sentences, given that their nuclear pitch accent on the verb was followed by at least two, maximally five, syllables ([11]). The verb “podn’al” (English: 1SG.M “picked up”) in sentence 5 can have two stress placements, on the penultimate and the ultimate syllable ([15]). Most participants of the study placed lexical stress on the ultimate syllable (except for one participant from the US group and two monolingual speakers).

As far as the SV condition is concerned, four questions were expected to receive a nuclear pitch accent on the penultimate syllable of the verb followed by L% on the final syllable. In question 10, the nuclear pitch accent fell on the ultimate syllable, and was therefore expected to end with a H% tone.

Table 1 Linguistic materials used in the experiment

Yes-no questions in Russian	English translation
(1) SVO sentences	
1.KTO-nibud’ VIdel aVAriju?	Did anyone see the accident?
2. ŽENščina uroNila LUK?	Did the woman drop onions?
3.MaŠIna SBila koLJAŠku?	Did the car hit the stroller?
4.ŽENščina uderŽAla soBAku?	Did the woman hold the dog?
5.MuŽČIna PODN’AL buTYLku?	Did the man pick up the bottle?
(2) SV sentences	
6.MJAčik ukaTILsja?	Did the ball roll away?
7.ProDUKty uPALi?	Did the groceries fall?
8.ReBĖnok PLAkal?	Did the baby cry?
9.VoDiteli poruGAlis’?	Did the drivers argue?
10.VoDA proliLAS’?	Was the water spilled?

2.4 Procedure

The participants were asked to read out loud the YNQs, after familiarizing themselves with each question. The materials were presented using PowerPoint and spelled in the Russian Cyrillic script. A confidant was involved as a dialogue partner and read the answers to the questions produced by participants. If participants were distracted during the experiment (e.g. by laughing or coughing), they were asked to repeat the question again. Only their last production was chosen for the analyses. The order of SV and SVO sentences was randomized such that sentences of the same condition did not follow each other more than twice.

3. Data analysis

Sentence productions were manually annotated for pitch accent placement and type as well as boundary tone. Intonation was analyzed within the autosegmental-metrical framework (e.g. [9]). A combined phonetic and auditory approach to labelling the HL and monolingual intonation was implemented. That is, presence of pitch accent was detected auditorily and further examined with respect to local F0 trajectories and changes (high and low turning points).

Five types of pitch accents (L*, H*, L*+H, L+H*, H+L*) and two phrase-final boundary tones (L% and H%) were

identified in these data. All H tones were additionally marked for an upstep (pitch range expansion compared to a preceding high tone) or a downstep (pitch range compression). Praat was used for phonetic annotation of the audio files [16].

4. Results

4.1. Pitch accent placement

4.1.1 SVO condition

Table 2 Distribution of pitch accents in SVO sentences.

	accented S	accented V	accented O
US	77	90	67
Germany	90	93	70
Monolingual	67	93	40

Table 2 displays the distribution of pitch accents (%) in the SVO sentences across the three speaker groups. The maximum number of pitch accents was 30 for each constituent in each condition (5 sentences x 6 speakers). All speaker groups placed a similar number of pitch accents on the verb.

As far as accented subject nouns are concerned, both HS groups did not differ significantly from each other. However, the HS groups differed in their relation to the monolingual group: The US group behaved similar to the monolingual group while the German group placed significantly more accents on the subject than the Russian monolingual group ($X^2(1, N = 6) = 4.81, p = .028$).

As for the accented objects, HSs of both groups showed a comparable number of accents which was significantly higher than the ones produced by the monolinguals (US HSs vs. Monolinguals, $X^2(1, N = 6) = 4.29, p = .038$; German HSs vs. Monolinguals, $X^2(1, N = 6) = 5.45, p = .020$).

4.1.2 SV condition

Table 3 Distribution of pitch accents SV sentences.

	accented S	accented V
US	83	100
Germany	93	100
Monolingual	67	100

In SV sentences, the verb was always accented by all speakers. The distribution of pitch accents on the subject did not differ significantly between HSs of both groups. However, in their relation to the monolinguals, both groups differed in a parallel fashion: the US group was again similar to the monolingual group, and the German group produced significantly more accents on the subject than the monolingual group, $X^2(1, N = 6) = 6.67, p = .010$.

4.2. Pitch accent type and boundary tone

4.2.1 SVO condition

Table 4 Nuclear pitch accents in SVO sentences.

	L*+^H	L*+H	L+^H*	L+H*	Other
US	13	6	4	3	4
Germany	16	5	4	2	3
Monolingual	7	19	-	2	2

The most frequent nuclear pitch accents in the SVO condition are summarized in Table 4. Accordingly, HSs produced L*+^H in nuclear positions and did not differ in this respect, while the monolingual speakers predominantly used

L*+H in nuclear positions, and differed significantly from both HS groups: $X^2(1, N = 6) = 11.6, p = .0007$ (compared to the US group); $X^2(1, N = 6) = 13.6, p = .0002$ (compared to the German group).

As for other pitch accents, nearly all pitch accents on the subject were H* in both HS groups: 95, 6% in the US group and 96, 3% in the German group. In contrast, Russian monolinguals were more or less equally likely to place H* (55%) or L* (45%) accents on the subject.

As for the accent on the object, H+L* was the most frequent one among speakers of all groups (US group: 60, German group: 66, 7%, monolingual group: 50%). None of the groups differed significantly from each other.

The final boundary tone was primarily low (L%) across all speaker groups (US group: 80%, German group: 73,3%, monolinguals: 76,7%).

Figure 1 shows the frequent pitch contour of an SVO utterance produced by one speaker of each group.

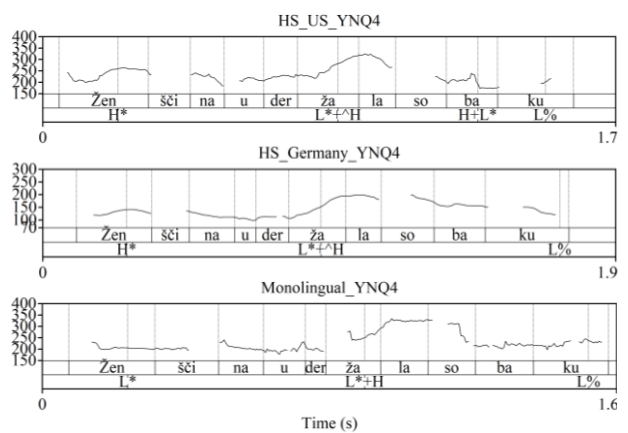


Fig.1. Frequent pitch contours found in SVO sentences.

4.2.2 SV condition

Table 5 Nuclear pitch accents in SV sentences.

	L*+^H	H*	L*+H	L+^H*	Other
US	6	-	4	16	4
Germany	14	5	4	3	4
Monolingual	-	4	20	1	5

The most frequent nuclear pitch accents on the verb in the SV condition are summarized in Table 5 above. They were the following: L+^H* (53, 3%) for the US group, L*+^H (46,7%) for the German group, and L*+H (66,7%) for the monolingual group.

Nearly all pitch accents in subject position were H* for both bilingual groups (US group: 100%, German group: 92, 8%). As for the Russian monolinguals, the most frequent pitch accent was L*: 70%.

Table 6 The total number of final boundary tone in SV sentences

Group	Expected L%	Found L%	Expected H%	Found H%
US	24	19	6	11
Germany	24	11	6	19
Mono-lingual	24	11	6	19

As far as the final boundary tone is concerned, the results are summarized in Table 6 above. All high boundary tones are summarized as H%, however, some of them were additionally upstepped or downstepped.

There was no significant difference between the US HSs and the predicted values. The German and the monolingual group was found to differ from both the US group and the predicted values, US Group: $X^2(1, N = 6) = 4.27, p = .039$. Predicted values: $X^2(1, N = 6) = 11.6, p = .001$.

Question 10 should be discussed separately since a high final boundary tone was expected there. This tone was produced by four speakers from both the German and the US group and by all monolingual speakers.

Figure 2 displays examples of pitch contours frequently observed in SV utterances across the three groups.

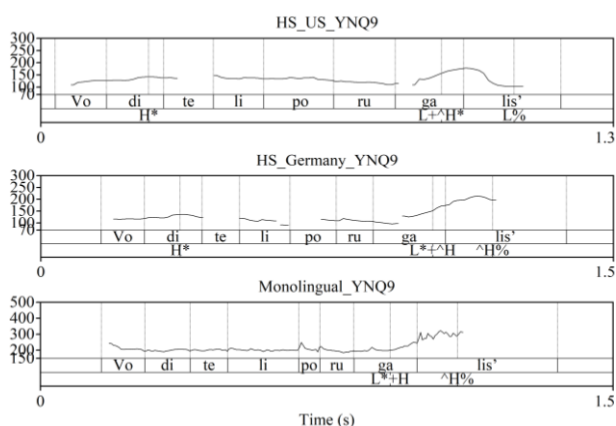


Fig.2. Frequent pitch contours found in SV sentences.

5. Discussion

The results of the current study give valuable insights into the production of YNQs by both HSs and monolinguals. As expected, both monolingual and HSs placed a pitch accent on the verb in nearly all instances, a pattern that is mandatory for YNQ in Russian. Additionally, we found that Russian monolingual speakers placed pitch accents on subjects and objects. As expected, objects were accented less than subjects. Monolinguals also placed roughly the same number of high or low boundary tones in the SV condition.

The HSs in Germany placed more pitch accents on both subjects and objects than the monolinguals in both SVO and SV conditions. The HSs in the US placed more object pitch accents than the monolinguals. The object pitch accents were not nuclear pitch accents, but postnuclear ones and their deaccentuation was expected due to structural reasons. HSs of both groups had a lower tendency to deaccent objects compared to monolingual speakers.

One possible reason for the frequent accentuation could be due to the transfer from ML. HSs may distribute pitch accents following both the rules of their ML (according to which the nuclear pitch accent falls on the object) and the rules of their HL (according to which the nuclear pitch accent falls on the verb). This mixed pattern is in line with some previous findings on segmental phonetics of early bilinguals [6]. Another possible reason for the high number of pitch accents found in this study can be connected to the linguistic insecurity of HSs in their HL and their attempts to clearly pronounce each word to be better understood [19]. Another explanation of the results might be

connected to what was reported for L2 learners as another group of bilinguals. L2 learners were found to accent adjacent syntactic constituents more often than monolingual speakers (e.g. [17]). The amount of exposure to L2 and the frequency of L2 use were often reported to play a role in L2 speech production with monolingual-like performance usually being linked to the greater exposure to the L2 (e.g. [18]). It is difficult, however, to draw a parallel between the amount of exposure, frequency of the HL use and number of pitch accents in this study from the meta data of HSs.

As for the nuclear pitch accent type in the SVO and SV condition, all speaker groups showed a bitonal rising pitch accent. However, HSs of both groups, unlike monolinguals, tended to expand the pitch range of the rise by means of an upstep (possibly because there was a preceding accent in HL but not monolingual productions).

As far as final boundary tones are concerned, all groups produced predominantly L% in the SVO condition. In SV condition, the US group showed a preference for L%, whereas the German and monolingual groups equally used both H% and L%. In question 10, truncation was expected. Russian and German have been found to show phrase-final truncation [20] whereas English is known to be a compression language [9]. Thus, we expected the HSs from the US to compress fall to L% in question 10. However, they produced the same number of H% as the HSs in Germany did, namely four.

Interestingly, the HSs in Germany and Russian monolinguals show a similar intonation pattern in the SV for final boundary tones compared to the HSs in the USA. One possible explanation could be transfer of the H% from German since the German YNQs were reported to have L* H-^H% pattern [12]. However, transfer was not found in the SVO condition, thus, it cannot account for the performance of HSs in Germany in SV questions.

All in all, HSs of both groups differed from the monolinguals with respect to the overall intonation contour. On the one hand, HSs show the intonation pattern of YNQs that is close to the monolinguals (e.g., rising bitonal nuclear pitch accent). On the other hand, it seems that HSs differ from the monolingual speakers in terms of some phonetic features (i.e., upstep). It needs to be further investigated whether upstepped accents refer to two different phonological categories or whether they are phonetic alternatives.

6. Conclusions

In conclusion, the current study showed that HSs in the US and Germany produced more pitch accents on different constituents than monolingual speakers. Additionally, HSs of both groups demonstrated upstepped nuclear pitch accents that were rare in monolingual productions.

HSs in Germany and monolinguals differed from the HSs in the US with respect to the boundary tones in SV sentences in that they produced L% and H% similarly frequently as opposed to the HSs in the US who showed preference for L%.

7. Acknowledgements

This research was funded by a grant from the Deutsche Forschungsgemeinschaft (DFG, German Research Foundation) to the Research Unit "Emerging Grammars in Language Contact Situations: A Comparative Approach" (FOR 2537), project number: ZE 940/2-1 (PI: Sabine Zerbán).

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