

Cross-Linguistic Influence in Interrogative Intonation Patterns

A Case of Russophones in Brazil

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Abstract: Cross-linguistic influence may be traced in two directions: from L1 to L2, and vice versa. This paper is focused on the second type: the aim of the research is to describe how the native intonation system may change after emigration. The research uses recordings of Russophones residing in São Paulo, Brazil: 39 first-generation immigrants, and 15 heritage Russian speakers. During the production experiment, the speakers read a set of target utterances embedded in broad contexts provoking particular intonation patterns. This paper analyzes three types of interrogative sentences: contrastive (elliptical) questions, yes/no questions, and echo wh-questions. The results are based on expert analysis of the recordings. Our data have proved that Russian speech (L1) of first-generation Russophone immigrants is influenced by the Brazilian Portuguese (L2) intonation system: on average, around 25 % of interrogatives differed in intonation from the control group. Heritage Russian speakers showed stronger influence of L2, with the number of intonational changes over 70 %, reaching 87 % for yes/no questions and echo wh-questions.

Keywords: language contact, cross-linguistic influence, speech prosody, Russian intonation, Brazilian Portuguese intonation

I. INTRODUCTION

In language contact situations, we may observe some influence of one language on the other, or both languages on each other [1]. More often, the attention of linguists has been drawn to the influence of L1 on L2 – the underlying cause of foreign accent. At the same time, the other direction – L2 onto L1 – is also observed, mainly in immigrants' speech. When a person moves to another language environment, L2 may become the main language of everyday communication, causing some changes in L1. We assume that in such cases prosodic changes are the first to occur. In this paper we present an analysis of how the speech of Russophone immigrants living in São Paulo differs from Standard Russian speech; in particular, we address intonational patterns of interrogative sentences. We studied two groups of Russophone speakers: first-generation immigrants and heritage Russian speakers that were born or grew in Brazil.

¹ Dr. Smirnova Henriques is supported by postdoctoral fellowship PNPd/CAPES (Programa Nacional de Pós-Doutorado da Coordenação de Aperfeiçoamento de Pessoal de Nível Superior).

II. THEORETICAL BACKGROUND

A. *Melodic Patterns of Russian Interrogatives*

In Russian intonation system there are distinct melodic patterns for various types of questions [2]. Some of them are universal in the sense that they share common characteristics with a great number of other languages – e.g. wh-questions (with an HL* contour on the wh-word). Here we only observe the types of interrogatives with specific intonation in Russian: yes/no questions, echo wh-questions, and contrastive (elliptical) questions. The latter group is specific to Slavic languages [3]; this type will be discussed just below.

A.1. Contrastive (elliptical) questions

Contrastive questions, or elliptical questions², begin with an adversative conjunction “a” with an expression such as a noun phrase referring to a usually shortened version of a previous sentence. E.g., a contrastive question “And Anna?” may follow an utterance “I went to the theatre yesterday”; in this case, the question aims to find out whether Anna went there as well. Typically, the main word is the next word after conjunction. The melodic pattern is a low rise (L*H), sometimes preceded by a slight fall; the maximum occurs somewhere within the post-tonic syllables. The final boundary tone is H.

A.2. Yes/no questions

Yes/no questions, or general questions, are syntactically identical to declaratives; by default, the word order is SVO. Being syntactically non-marked, they require a distinctive melodic pattern. In neutral contexts the main melodic movement occurs within the finite verb, which is often non-final. The melodic pattern is a rise-fall (H*L), with the maximum occurring late in the stressed vowel (or even later). That is, a Russian yes/no question ends in a low boundary tone. Such a pattern seems to be rare in world languages [5]; as a result, learners of Russian require specific training to produce such sentences correctly.

A.3. Echo wh-questions

Echo wh-questions, or repeated wh-questions, are syntactically based on wh-questions, but the wh-word is reduplicated. The main melodic movement occurs on the second (repeated) occurrence of the wh-word. The melodic pattern is a high rise (H*H); after the nucleus, tone remains on relatively the same high level, and the final boundary tone is H.

B. *Melodic Patterns of Brazilian Portuguese Interrogatives*

In Brazilian Portuguese, the intonation phrases (IP) bear a nuclear accent in its final position. Nuclear accents are formed by varied configurations of pitch accents associated with stressed syllables and two kinds of boundary tones L% or H% which are usually associated with the last syllable in the intonation phrase. Moraes [6] proposes 11 nuclear contours for describing 18 contexts in Brazilian Portuguese. To signal narrow focus in Brazilian Portuguese spontaneous speech the rising LH and the late rising >LH are the most common pitch contours. They occur not only in final position of interrogative utterances, but in initial and medial position in declarative utterances as well [7].

B.1. Contrastive (elliptical) questions

² or “non-first elliptic questions” – in terms of Cecilia Odé [4]

Contrastive (elliptical) corresponding the so-called contradictory/confirmative yes/no questions by Moraes [6] involves a high fall pitch movement and a $\uparrow H+L^*L\%$ contour.

B.2. Yes/no questions

In yes/no questions the nucleus is placed in the last word of the sentence. These boundary tones are realized either on the final post-stressed syllable, or on the offset of the last stressed syllable, if there aren't post-stressed ones.

Neutral yes/no questions involve a rising-falling ($L+H^*L\%$) pitch pattern [8]. Rising contours are less spread, usually found in the North region [9]. They contrast with other types of yes/no questions such as the incredulous yes/no questions involving fall-delayed rise fall with a $H+[LH]^*L\%$ contour and rhetorical yes/no questions involving an early rise-fall with $L+\>H^*L\%$ contours [6].

B.3. Echo wh-questions

Echo wh-questions, as neutral yes/questions involve a rise-fall pitch movement with $L+\<H^*L\%$ contours. They contrast with neutral wh-questions which involve a low fall pitch movement with a $H+L^*L\%$ contour.

Although both neutral yes/no questions and echo wh-questions are characterized by the same pitch contour, two hypotheses are raised by Miranda, Moraes and Rilliard [10]: echo questions might bear a low pre-nuclear pitch onset and a wider F0 peak range in the nuclear accented syllable.

III. METHODS

A. Material

The recordings of Russian-Brazilian Portuguese bilinguals were extracted from two corpora previously collected by our group: RusIm-Bra1 (first-generation Russophone immigrants in Brazil) [11] and BraPoRus (Brazilian Portuguese-heritage Russian) [12]. The RusIm-Bra1 corpus contains the audio recordings obtained from 40 first-generation Russophone immigrants who came to Brazil as adults and resided in São Paulo [11]. Their mean age was 34 years ($SD \pm 9$), the mean age of arrival was 27 years ($SD \pm 6$). These participants were recorded in the laboratory conditions in a soundproof studio. The BraPoRus corpus contains audio recordings from 26 heritage Russian speakers that grown or were born in Brazil [12]. As the intonation tasks were reading tasks, only 15 participants were able to record this part of the protocol. Their mean age was 75 years ($SD \pm 7$). Three out of 15 were born in Brazil, the mean age of arrival of the others was 9 years ($SD \pm 6$). The elderly heritage Russian speakers were recorded through the Zoom videoconference software or by phone call during the Covid-19 pandemics.

In addition, the same material was recorded in a soundproof studio by two speakers of Brazilian Portuguese as L1 proficient in Russian L2 at the B2 level. They dedicated much time to self-education but had not had any formal instruction on the use of Russian intonation patterns. The control group were six native Russian speakers, aged 24 to 74, residing in Saint Petersburg, Russia.

For intonational research, we constructed a set of 17 Russian phrases or short dialogues. Each of them contained a target phrase where a particular Russian melodic pattern was expected. The material was translated into Brazilian Portuguese, and each bilingual speaker recorded both sets. For the present study, we analyzed 4 of the 17 contexts; they are presented in Table I.

TABLE I. PHRASES AND SHORT DIALOGUES FOR PRODUCTION EXPERIMENT

id	Contexts containing the target utterances (in bold)		
	<i>Russian</i>	<i>Translation into English, word-by word</i>	<i>Brazilian Portuguese</i>
9	– Сосчитайте от 10 до 15. – Десять, одиннадцать, двенадцать, четырнадцать, пятнадцать... – А тринадцать?	– Count from 10 to 15. – Ten, eleven, twelve, fourteen, fifteen... – And thirteen?	– Conte de 10 até 15. – Dez, onze, doze, quatorze, quinze... – E o treze?
10	– Назовите времена года. – Зима, весна, лето. – А осень?	– Name seasons [of the] year. – Winter, spring, summer. – And autumn?	– Me fale as estações do ano. – Inverno, primavera, verão. – E o outono?
12	– Вы видели Петину новую квартиру? – Да. Она маленькая, но очень удобная.	– You [have] seen Peter’s new apartment? – Yes. It [is] small, but very comfortable.	– Você viu o apartamento novo do Pedro? – Sim. É pequeno, mas bem confortável.
15	– Аня с Мишей живут теперь на Шри-Ланке. – Где-где они теперь живут?	– Anya with Misha live now in Sri-Lanka. – Where-where [do] they now live?	– A Ana e o Michel moram agora no Sri Lanka. – Onde é que eles moram?

B. Auditory analysis

All the target utterances were analyzed and annotated by three experts in Russian phonetics. The experts’ task was formulated as follows: (1) to estimate whether the target utterance was produced according to the rules of Russian intonation; (2) if possible, to describe its intonation in terms of nucleus placement and melodic pattern. If the experts disagreed, a discussion followed where they came to a joint decision.

C. Comparison with “the other side”: native Brazilian Portuguese speakers learning Russian

In order to investigate the causes of these intonational changes, we also analyzed the same four Russian target utterances recorded from two speakers of Brazilian Portuguese as L1 proficient in Russian L2 at the B2 level. So far, they used their native intonation patterns in their L2. Thus, we assumed the following: if intonational changes observed in Russophone immigrants’ Russian speech are “mirrored” in the Russian speech of those learning Russian, then those changes are probably the result of Brazilian Portuguese influence.

IV. RESULTS AND DISCUSSION

Table II summarizes the intonation differences in the speech of Russophones who reside in Brazil. The two groups of Russophone immigrants (39 first-generation immigrants and 15 heritage speakers) are compared with the control group of 6 native Russian speakers residing in Saint Petersburg, Russia. In the immigrants’ speech, there are three main types of intonational interference from L2: (A) non-standard choice of melodic pattern; (B) misplacement of the nucleus; (C) non-standard productions of the expected melodic patterns. The latter type, C, is beyond the present study, as tracing these changes would require a different methodology. In table II, the intonational descriptions are grouped according to nucleus placement.

Of the 39 first-generation immigrants, only 13 read all the four target utterances in a standard way – the same as the control group. From the rest 26, every speaker had at least one utterance produced with a different intonation pattern; however, none of the speakers produced all the four target utterances in a non-standard way.

Within the group of 15 heritage speakers, no one produced all the target utterances in the same way as the control group, and 7 speakers used different intonation patterns in all of them.

TABLE II. INTONATION PATTERNS IN THE TARGET UTTERANCES IN THREE GROUPS OF RUSSIAN SPEAKERS

Target phrase	Intonation in the target phrases		
	<i>Control: Standard Russian (N=6)</i>	<i>First-generation immigrants in Brazil (N=39)</i>	<i>Heritage Russian speakers (N=15)</i>
9 А тринадцать? (And thirteen?)	Melodic pattern: low fall-rise (100 %)	Melodic pattern: low fall-rise (72 %) fall or high fall (23 %) rise+level high (5 %)	Melodic pattern: low fall-rise (27 %) fall or high fall (73 %)
10 А осень? (And autumn?)	Melodic pattern: low fall-rise (100 %)	Melodic pattern: low fall-rise (72 %) fall or high fall (26 %) rise+level high (2 %)	Melodic pattern: low fall-rise (27 %) fall or high fall (73 %)
12 Вы видели Петину новую квартиру? (You [have] seen Peter's new apartment?)	Nucleus: "видели" ("seen") Melodic pattern: rise-fall (67 %) Nucleus: "квартиру" ("apartment") Melodic pattern: low fall-rise (33 %)	Nucleus: "видели" ("seen") Melodic pattern: rise-fall (77 %) Nucleus: "квартиру" ("apartment") Melodic pattern: rise-fall (19 %) high fall (2 %) rise+level high (2 %)	Nucleus: "видели" ("seen") Melodic pattern: rise-fall (13 %) Nucleus: "квартиру" ("apartment") Melodic pattern: rise-fall or high fall (87 %)
15 Где-где они теперь живут? (Where-where [do] they now live?)	Nucleus: "где-где" ("where-where") Melodic pattern: rise+level high (100 %)	Nucleus: "где-где" ("where-where") Melodic pattern: rise+level high (75 %) +extra rise on "живут" ("live") (21 %) Nucleus: "живут" ("live") Melodic pattern: rise (2 %) Misreading (2 %)	Nucleus: "где-где" ("where-where") Melodic pattern: rise+level high (13 %) fall or high fall (13 %) +extra rise on "живут" ("live") (33 %) Nucleus: "живут" ("live") Melodic pattern: rise (34 %) Misreading (7 %)

A. Cross-linguistic influence on Russian L1

A.1. Contrastive (elliptical) questions

This type of question is presented in contexts 9 and 10. The expected melodic pattern was produced in 72 % cases in recent immigrants, and only in 27 % cases in heritage speakers. A common replacement to the low fall-rise is a high fall, which may sound to a Russian ear as non-neutral and too emotional.

A.2. Yes/no questions

This type of question is presented in context 12. Apart from the expected rise-fall with the nucleus placed on the finite verb, the control group provided another possible reading: with a low rise on the final word. The latter intonation is rather frequent and may convey interest and sounds livelier; this variant, though, was never used by the immigrants. The expected rise-fall was very frequent among first-generation immigrants (77 %), but rare for heritage speakers (13 %). A common replacement is shifting the nucleus to the last word, where a rising-falling melodic pattern is observed. In first-generation immigrants' speech such non-standard productions may sound as narrow focus (i.e., asking specifically about the apartment, but not the event in general), although the context requires broad focus. In heritage speakers' productions, the melodic pattern is often between the rise-fall and a high fall, which makes an impression of a rather strong foreign accent.

A.3. Echo wh-questions

This type of question is presented in contexts 15. The expected melodic pattern was produced in 75 % cases in first-generation immigrants, and only in 13 % cases in heritage speakers. A common strategy used was producing an extra rise-fall within the final word, or even shifting the nucleus to the end. For a Russian ear, such productions are perceived as bearing a strong foreign accent.

B. Cross-linguistic influence on Russian L2

A comparison of Russian L1 material with the recordings of Brazilian learners of Russian enabled to trace similar tendencies in interrogative intonation patterns. Figure 1 illustrates similarities between melodic contours for the echo wh-question (context 15) in a first-generation immigrant’s speech (Figure 1b) and a Brazilian learner of Russian (Figure 1c). The top contour (Figure 1a) is a standard contour recorded from speaker of Russian as L1 residing in Russia. Both middle and bottom contours represent Russian accented intonation patterns and reveal similar features: a rise on the repetition of the wh-word (“где”, /gdʲe/) and an extra rise on the stressed syllable of the final word (/vut/ in “живут”).

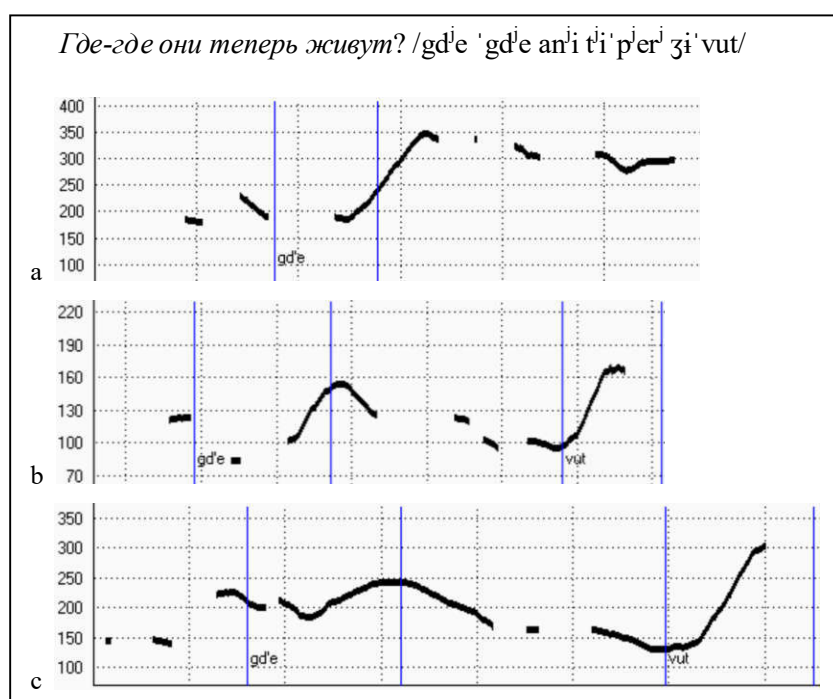


Figure 1. *Melodic contours (Hz) of the echo wh-question (context 15) for a resident of Russia (top, a), a first-generation Russophone immigrant to Brazil (middle, b), and a Brazilian learner of Russian as a foreign language (bottom, c). Blue lines mark the boundaries of the nuclear syllables.*

Other question types were also “mirrored” in the recordings of Russian L2 speakers. Contrastive (elliptical) questions were produced with the same high fall instead of a low fall-rise, and in yes/no questions there was an extra rise on the final word (“квартира”, “apartment”).

V. CONCLUSIONS

Our data have shown that in Russophone immigrants’ speech we often observe interference from L1 intonation patterns. In general, first-generation immigrants produce around 25 % of interrogatives introducing melodic changes, as

compared with the control group. Within the group of heritage Russian speakers, a large number of utterances were produced with intonational changes – over 70 %, reaching 87 % for yes/no questions and echo wh-questions. We may assume that this is the result of longer Brazilian Portuguese influence. However, we should bear in mind that the ancestors of these speakers had moved from Russia at the beginning of the 20th century – and we do not have much data on the Russian intonation system at that time. The interrogative sentences, studied in the present work, are quite rare in everyday speech, which makes it almost impossible to find them in the archive speech recordings. At the same time, the changes observed in heritage speakers' intonation are similar to those found in the first-generation immigrants' recordings – which can be interpreted as caused by Brazilian Portuguese influence. In addition, the hypothesis of Brazilian Portuguese influence is supported by the other result of this paper: similar intonational changes were found in the speech of Brazilian learners of Russian.

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