INTERFERENCE OF A QUANTITY LANGUAGE IN RHYTHMIC STRUCTURE OF A STRESS LANGUAGE

Viola de Silva
University of Jyväskylä, Jyväskylä, Finland

ABSTRACT

Finnish is a Fenno-ugric language whose phonological system includes the opposition of short/long both in consonant and in vowel quantity which is not an indication of stress as both stressed and unstressed vowels can be long and short. In Russian duration is a parameter of stress and vowels have three different stages of duration. The results of our analysis proved that the three-leveled hierarchy of vowel duration exists in the normative Russian pronunciation, but the interference of Finnish leads to two stages: (very) long and (very) short. The vowel duration together with durational differences in consonants whose durational distribution is greater in the pronunciation of Finns disturb the rhythmic structure of single words in Russian.

1. INTRODUCTION

This study tries to solve some problems which occur on the word level when Finnish speaking people learn Russian as a target language. The main focus of our attention are single words and their rhythmic organization which we call *rhythmic structure*.

Finnish is a language where durational differences in sound segments, in vowels as well as consonants, appear in two different meaningful time dimensions, short and long. Particularly, where vowels are concerned the question is about phonological length (phonological quantity) [5, 10, 15] although it is in phonological terms interpreted as the opposition between single and double vowels and consonants or identity groups of them [4, 6, 8, 13]. Durational differences between the Finnish single and double vowels, as well as, duration of diphthongs have been measured [6, 13, 14]. The duration of vowels in Finnish is not dependent on the word stress, i.e. V [-stress] can be short or long as well as V [+stress].

In Russian language the durational differences of vowels are due to the word stress. The main parameter of Russian stress is the duration of the stressed vowels, all unstressed vowels are reduced and the durational reduction has a two-leveled hierarchy [1, 2, 9, 11, 15].. The first stage of reduction, V [-stress1], concerns the vowels in syllables preceding V [+stress] and in the open word final syllables as well as in word initial syllables starting with V. The second stage of reduction, [-stress2], appears in all other [-stress] positions. Thus when a Finn studies the Russian rhythmic structure, he has to learn three stages of duration instead of two.

The purpose of this research is to compare two basic and, at the same time, most common rhythmic structures, CVCV(C) and CVCVCV(C), in Russian of normative Russian pronunciation and in pronunciation of Finnish learners of Russian where interference of the mother tongue is unavoidable. The field of our investigation includes, inter alia, whether other factors like palatalization and other quality differences of consonants as well as vowel quality are involved in the durational ratio of rhythmic structure of single words. The fundamental frequency patterns are also taken into consideration as they can also be involved with the durational ratio.

The question about segmental duration and phonological length has become recently a current topic on interest since Finnish is being taught far more widely as a foreign language, especially to Russians. The rhythmic structure of words is one of the major difficulties for foreigners in Finnish phonetics. Russian phonetics, on the contrary, has been taught to Finns for decades but problems dealing with word prosody, namely the rhythmic structure of words, have not been satisfactorily solved. And the interference of the phonetic system of the mother tongue on this field exists.

2. MATERIAL

The data consists of words representing word structures CVCV(C) and CVCV(C). The Russian acoustically analyzed data consisted of isolated Russian disyllables (137 words) and trisyllables (110 words) in which vowel phonemes /a/ and /i/ were analyzed in all positions and environments. All the material was recorded on DAT tape in laboratory conditions and analyzed with SoundScope program in Power Mac Intosh computer.

The Russian subject (RUS) was a Moscovite postgraduate student, 27 years, who was born in Moscow and had lived and studied there before he came to Finland two months before the taping. His pronunciation represented the literary norm of Russian Moscovite pronunciation [11] not only because of his background but also in auditive analysis of native Russian phoneticians. Apart from that our results prove his normative pronunciation. Other subjects were three Finnish male students, FIN1 (30 years), FIN2 (22 years) and FIN3 (23 years), who studied Russian in Finnish Universities. All the subjects were born and spent their whole life in Finland. One of them (FIN2) had spent 10 months in Russia while the others for a very short duration only. According to native Russian teachers their knowledge of Russian was satisfactory and good.

3. RESULTS

3.1. Durational Hierarchy of Russian Vowels

3.1.1. Pronunciation of the Russian Subject

The three leveled hierarchy of Russian words can be tested most clearly in trisyllabic words where the stress falls on the

third syllable. In that case the first syllable vowel represents V [-stress2] and the second syllable vowel V [-stress1]. The data proved that in the pronunciation of the Russian normative speaker the two different stages of reduction are clearly different in duration. The relative duration of V [-stress2] counted from the duration of all sounds was 0,6 - 0,7, i.e. 60 - 70 % of the duration of an average sound segment, and the relative duration of V [-stress1] 0,9 - 1, i.e. it was equal or almost equal to an average segment. The relative duration of V [+stress] was 1,4 - 1,6. In Figure 1 the columns of RUS show the comparison of the average values in trisyllabic words in which V3 [+stress] is in open syllables.

According to the values of relative duration, V [+stress1] is 34-37 % longer than V [-stress1] and 55-56 % longer than V [-stress2]. The values of relative duration of V1 and V2 in disyllabic words show that the same hierarchy remains between V [+stress] and V [-stress], which in this case means V [-stress1]. The relative duration of V1 [+stress] was 1,4 and of V1 [-stress1] 0,9. In the disyllabic words the relative duration of V2 [+stress] was comparatively shorter (1,1).

The above values were counted for both vowels /a/ and /i/. In the comparison between them /i/ appeared to be shorter in all positions except one, V3 [-stress1].

3.1.2. Finnish Interference in Russian Vowel Duration

In the Finnish language the double (long) vowels are about twice as long in duration as single (short) vowels in the same position in a word, i.e. the Finnish system divides vowels into two categories where duration is concerned. This data proved the same point. Anyhow, the Finnish phonetical system also includes so called 'half long' vowels which appear in the second syllable instead of a short vowel when the first syllable has a short vowel [6]. This phenomenon did not appear in this data as the situation does not arise before a Russian [+stress] syllable.

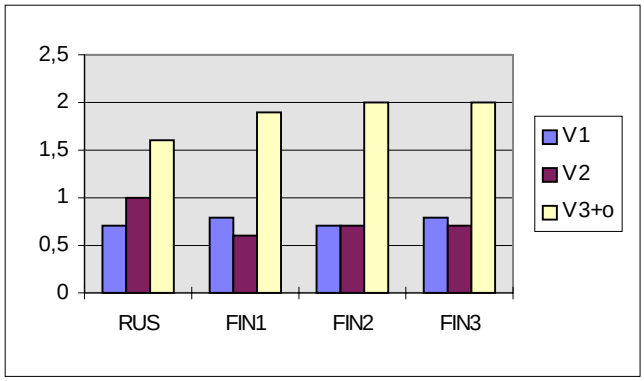

Figure 1. Relative duration of vowels in different stress positions with V1 [-stress2], V2 [-stress1] and V3 [+stress] in Russian words pronounced by a Russian (RUS) and three Finns.

Figure 1 shows that position V [-stress1] with longer duration compared with V [-stress2] is completely missing in the pronunciation of the Finnish subjects (FIN1, FIN2, FIN3). Both [-stress] vowels are pronounced by the Finns rather short. Their duration is similar to the duration of V [-stress2] in the pronunciation of the native. And, furthermore, V1 is slightly longer than V2 in the pronunciation of FIN1 and FIN3. These results are similar to the ratio in disyllables (1:2) in this study as well as in an earlier investigation about disyllables [7].

The Finnish subjects also pronounced V [+stress] longer than the Russian. This is due to the fact that the pronunciation of long vowels in Finnish is very long. The ratio between single and double vowels in Finnish is average wise 1:2,2 [6, 13]. Our data proved that the ratio V [-stress2] : V [+stress] in Russian is also 1:2,2, i.e. both are the same. Apart from that, in the Finnish language long segments are very common as there are diphthongs, geminate consonants and clusters of different consonants, not to mention the long vowels. And when the different intrinsic durations of sounds are taken into consideration diphthongs and long vowels, as well as geminate consonants and clusters are equal in their phonetic duration [6].

3.2. Durational Distribution of Consonants

3.2.1. Consonantal Duration in Different Positions

Where the average of all consonants was counted the values of the native subject proved that in Russian consents have similar duration in different positions of a word, C1, C2, C3, C4, as

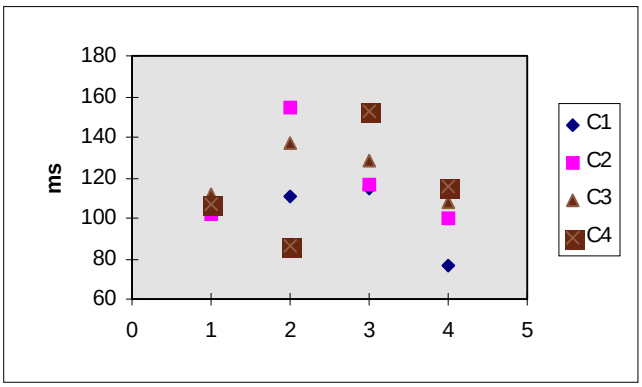

Figure 2. The distribution in duration of consonants according to the position in the word: 1 - the Russian subject, 2-4 - the Finnish subjects.

Figure 2 shows. The duration of consonants in all positions is also the same or very close to the average value of all the sounds in trisyllables pronounced by the Russian subject.

In the pronunciation of the Finns, on the contrary, the duration of consonants varied significantly. Each Finnish subject had their own distribution, which was vastest in the pronunciation of FIN1. The distribution of duration in different positions does not give any unique idea as the orders are different, for example, C4 is the shortest of all consonants in the pronunciation of FIN1 but the longest in the pronunciation of FIN2 (see Figure2).

The investigation of the consonantal duration in pronunciation of the Finnish subjects also substantiated that the voiceless [-pal] plosives /p/, /t/, /k/ and the dental affricate

/ts/ were longer by 10-35 % after V [+stress] than in other positions . It was seen in the pronunciation of all the Finnish subjects regularly. The [+pal] plosives as well as other consonants were not that regularly longer in this position. This phenomenon can be due to a common Finnish rhythmic structure -CVVCC- where a long vowel is followed by a geminate. Voiceless plosives are common sounds in Finnish.

3.2.2. Duration of [-pal] and [+pal] Consonants

In the pronunciation of the Russian subject the consonant pairs C [-pal] and C [+pal] did not have significant difference in duration where the position is concerned. Only C1 [+pal] was longer than C1 [-pal] by about as 1,2:2. On the basis of this it is possible to suggest that average wise the palatalization does not lengthen the duration of Russian consonants. Even though C1 [+pal] was longer it is not enough to disprove this as, for example, duration of voiceless plosives cannot be measured in the word initial as well as in the word final position.

Where individual consonant pairs, C [-pal] and C [+pal] are concerned there were a few examples, where C [+pal] was longer. They were /p^j/, /b^j/, /t^j/, /d^j/, /g^j/ (/k^j/ only in disyllabic words) and /n^j/ i.e. mostly plosives. An opposite change was seen in /r^j/ which was 32 % longer than /r/. This can explain the fact that /r^j/ is often pronounced as a flap which is possible in VCV position. The longest Russian vowel was /$ʃ^j$:/ with relative duration value of 2, i.e. it is twice as long as an average sound segment. Its long duration is most probably due to palatalization, at least partly. It also has a long historical background of being longer than other single sound segments.

In the pronunciation of the Finns the [+pal] consonants were more often longer than C [-pal]. In many cases such consonants as /p^j/, /t^j/,/z^j/, /n^j/ C [+pal] can be longer because of the incorrect palatalization where instead of palatalizing the consonant concerned Finns pronounce /j/ between the vowel and consonant, for example, [pja], [tja], [dja] instead of [p^ja], [t^ja], [d^ja]. It happens commonly before [a] [+stress]. This type of pronunciation was typical to FIN1, and his [+pal] consonants were longest, sometimes over 300 ms even in trisyllables.

3.3. Some Comments about the Fundamental Frequency

Phoneticians who have studied quantity languages such as Finnish and Estonian suggest that the F_0 pattern has significance to segmental duration [3, 5, 12]. A descending pattern should mean a longer vowel than a level pattern. In our data which consisted of isolated words each word formed one intonation unit. The subjects were told to read every word separately, but, doubtlessly, some final syllables showed a rising tone instead of falling as a sign of incompleteness.

The F_0 patterns were measured in 2-4 places depending on the peaks and average patterns were made. They showed that in the pronunciation of the Russian subjects the only level patterns were in positions V [-stress2]. In position V [-stress1] before V [+stress] F_0 pattern was ascending and in position after C [+stress] it was descending, but sometimes first slightly ascending and then descending. When the vowel was in [+stress] position the pattern first ascended significantly and then descended.

The F_0 patterns in the pronunciation of the Finnish subjects were generally more level compared with the Russian subject. In position V [+stress] the pattern was at first level and then descending or slowly descending from the beginning to the end. In other positions F_0 patterns were level or, generally at the end of a word slowly descending. The most level F_0 patterns were in the pronunciation of FIN3.

4. CONCLUSIONS

Russian words as rhythmic structures present a very complicated system for foreign learners of the Russian language. Firstly, because the Russian word stress is not fixed to a certain syllable and it changes place even within the same lexical word. Secondly, the stress changes the vowel system and the rhythmic structure of the word can be predicted only after finding the stressed syllable. The hierarchy of V [+stress] v.s. reduction V [-stress] together with the consonantal environment starts thereafter. And this is where we can influence and help in the second language aquisition.

This investigation which was done on the basis of comparing pronunciation of Finnish learners of Russian to Russian normative pronunciation gives some clues to teaching Russian rhythmic structure of words in a Finnish auditorium. In this respect, we have reached four conclusions: 1) to emphasise on the medium duration of V [-stress1]; 2) to make the duration of V [+stress] comparatively less than the Finnish double vowels; 3) to pronounce the Russian consonants as long in all positions within a word and 4) to pay attention to correct palatalization.

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