LEARNING THE QUALITY OF LATVIAN VOWELS

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INtroDUCTion

Almost 20 years ago, Latvian once again became the official language of the Republic of Latvia. Since then, a great many ethnic Russians have studied Latvian and attained various levels of language proficiency. This article presents some findings on how ethnic Russians perform in learning the quality of Latvian vowels.

According to the traditional analysis, Russian has five vowels, /i, e, a, o, u/, with significantly different vowel allophones found with palatalized consonants and in stressed vs. unstressed syllables. Acoustically, allophonic differences primarily affect the second formant, correlated with tongue advancement (Jones 1971; Padgett 2005). In contrast, Latvian has six short and six long vowels; five are similar to the Russian vowels in stressed syllables while the sixth is the low front /ae/. Latvian vowel quality in stressed vs. unstressed syllables differs very little, and there are no significant vowel allophones associated with consonants (Laua 1969).

In his influential Speech Learning Model (SLM), Flege (1995; forthcoming) argues that the sounds of learners’ language exist in a common phonological space. He suggests that learners are able to add a new phonetic category to a phonological inventory if they discern some differences between a first and a second language sounds. However, when sounds are similar in the two languages, learners tend to classify them as equivalent and treat them as the same when it comes to production.

For Russians learning Latvian, this model predicts that learners should acquire the novel vowel /æ/ given appropriate motivation and opportunity. However, because the other Latvian vowels are similar to the Russian ones, learners usually treat them as equivalent and consequently tend to maintain the vowel allophones found in Russian stressed vs. unstressed syllables (on the acquisition of vowel quantity, see Bond, Markus, and Stockmal 2003).

In addition, the changing social and political relationships between the two
languages allow us to examine the speech of language learners with quite different personal histories, motivation, and opportunity for learning Latvian.

METHOD

Participants. Almost 100 learners/ participants read a set of words and a short story designed to reflect the inventory of the consonants and vowels of Latvian. The recordings were made in 2001. Having analyzed the recordings, twelve female participants were selected, two from each three age groups of Russian speakers, and two from each equivalent age group of Latvians, who provided a native speaker baseline. All participants were from Riga, so they were exposed to the same range of dialect variation.

Because the participants had experienced different relationships between the two languages over time, they were classified by age. The oldest participants, identified as Latvian group 2 (L2) or Russian group 2 (R2), were young professionals in their thirties; they have received their education and established themselves professionally while Russian was still the dominant language in Latvia. Although there were social circumstances in which ethnic Latvians could use their native language as the primary means of communication, it was almost impossible to function in a society without some knowledge of Russian. Russians of this generation have been learning Latvian, but their attempts to master the language tend to be quite recent because they had little need to study Latvian while at school.

The middle generation, represented by Latvian group 1 (L1) and Russian group 1 (R1), were university students in their early twenties. They had experienced the change in the political status of Latvian and Russian. The youngest generation, Latvian group 0 (L0) and Russian group 0 (R0), were college students, 15 or 16 years of age, who had received their education in an environment where Latvian was the official language. Although Russian students were not immersed in Latvian while at school, they are expected to use Latvian in their future careers.

The Russian participants filled out a short background questionnaire where they estimated their proficiency in Latvian and the proportion of time they spent using the language. Regarding the factors which can be examined as predicting the strength of a foreign accent (Piske, MacKay and Flege 2001), the Russian participants differed on two: age and the proportion of time that they used Latvian. In addition, one could argue that motivation to master Latvian should be higher for younger than for older learners.

Table 1 gives the proportion of time the Russian speakers claimed to use Latvian and their own estimate of their average proficiency in the language on a scale where the extreme value 1 represents no knowledge and 7 represents native-like proficiency.

Acoustical measures describing the pronunciation of the speakers can be examined
from the point of view of their age and the proportion of time they have used the target language.

Table 1. Self-reported proficiency and use of Latvian by Russian speakers (listed by age group and by an arbitrary participant identification number)

<table>
<thead>
<tr>
<th>Participant</th>
<th>%Latvian</th>
<th>Proficiency</th>
<th>Age group</th>
</tr>
</thead>
<tbody>
<tr>
<td>R0-84</td>
<td>10</td>
<td>2</td>
<td>College</td>
</tr>
<tr>
<td>R0-77</td>
<td>60</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>R1-8</td>
<td>38</td>
<td>4</td>
<td>University</td>
</tr>
<tr>
<td>R1-12</td>
<td>80</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>R2-19</td>
<td>50</td>
<td>6.5</td>
<td>Young profess</td>
</tr>
<tr>
<td>R2-56</td>
<td>30</td>
<td>4</td>
<td></td>
</tr>
</tbody>
</table>

Acoustic measurements. Acoustic measurements were made of the first two formants at the midpoint of vowels in stressed and unstressed syllables, using either Praat (Boersma and Weenink 2010) or the Kay Elemetrics Computer Laboratory System (CLS). The data were examined for the formant values of /ae/ as an indication of learning a novel vowel, and for differences in formant values between vowels in stressed vs. unstressed syllables as an estimate of the speaker’s tendency to use Russian vowel allophones.

RESULTS

Novel vowel. The Speech Learning Model predicts that learners will tend to produce a novel vowel reasonably accurately because they will not equate it with any native language vowel. The prediction seems to be supported by the acoustic measurements when the vowel appears in a stressed position. The formant values of all tokens of the stressed variant of the novel vowel /ae/ are given in Figure 1, in comparison with the formants of /e/, chosen for the comparison because some Russian speakers are said to substitute this vowel for /æel/.

The difference in the second formant (F2) values for the two vowels is quite significant (t = 5.7, p < .01), suggesting that for some speakers the two vowels are distinct. However, as can be seen from the figure, tokens of the vowels /e/ and /ae/ also show considerable overlap in the acoustic vowel space.

Figure 1 shows all tokens of the novel vowel /ae/ and the familiar vowel /e/ as produced by the Russian speakers plotted according to the values of the first formant (F1)
along the x-axis and the second formant (F2) along the y-axis. The vowels are distinct for some but not for all Russian participants when they speak Latvian.

In comparison, the same two vowels from two clusters indicate that they are quite distinct in the speech of native Latvians (see Figure 2). According to the formant values, the two vowels form distinctive clusters with no overlapping values.

Figure 1. Tokens of the novel vowel /æ/ and the familiar vowel /e/ as produced by the Russian speakers

Figure 2. Tokens of the vowel /æ/ and /e/ as produced by native Latvians
Position effects for novel vowel. Figure 3 demonstrates average formant values for the two vowels /e/ and /ae/ for each Russian speaker. The data are displayed from the youngest to the oldest participant and allow us to compare vowel quality in a stressed vs. unstressed position. As can be seen from the values of the second formant in a stressed position, only three of the Russian speakers exhibit differences which suggest that the vowels were distinguished consistently. These are the participants who reported that they used Latvian more than half of the time in their daily lives. When the vowels appear in an unstressed position, none of the participants appear to produce different vowel qualities for /e/ vs. /ae/ distinctly.

Position effect on shared vowels. The Speech Learning Model, allows us to predict that the Russian learners will consider five of the Latvian vowels as equivalent to their native vowels. Consequently, they will tend to employ similar articulatory gestures in producing Latvian and Russian vowels in unstressed positions. Russian vowels undergo vowel reduction, reflected in raised values of the second formant (F2) (cf. Jones 1971), whereas Latvian stressed and unstressed vowels are quite similar in quality. In order to obtain an estimate of the effects of vowel reduction, the differences in the values of F2 for corresponding vowels in a stressed vs. unstressed position were established: the difference in the values is an estimate of the scope of vowel reduction. The greater the difference, the more vowels in stressed and unstressed positions differ from each other. The data for both Russian and Latvian speakers are given in Figure 4. The Russian speakers are subdivided according to their reported use of Latvian: the
high-use group claimed to use the language more than half of the time while the low-use group used the language less than half of the time.

As indicated by negligible differences in the second formant, the Latvian speakers produce qualitatively very similar vowels in both stressed and unstressed positions. For both groups of Russians, the differences in the second formant are much greater. However, the speakers who claimed to use Latvian more than half of the time in their vowel production were much closer to the Latvians than is the case with Russian speakers who did not use Latvian that often.

CONCLUSION

The analysis of the data has shown that the speakers of Russian clearly differed in the accuracy with which they pronounced Latvian vowels. The characteristic feature which best predicted the accuracy of their pronunciation was their claim about the amount of time they used the language. Russian participants who said that they used Latvian more than half of the time demonstrated a more accurate production of vowels. The age of the participants was not detected as an influencing factor in the accurate pronunciation of vowels; moreover, if motivation was related to age, then it did not affect pronunciation accuracy either.
The Russian participants were quite sensitive to the stress pattern. First, the production of novel vowel /ae/ for three participants tended to be accurate in stressed syllables but not a single Russian speaker produced the vowel accurately in unstressed syllables. Secondly, the vowel quality found in unstressed syllables tended to be quite different from the vowel quality in stressed syllables. Vowel allophones in unstressed positions apparently tended to follow Russian articulatory patterns, both for the new vowel /ae/ and for unstressed variants of the other vowels. Both the relative accuracy of the Russian speakers’ production of the novel vowel and their tendency to employ Russian-like allophones for the shared vowels are consistent with the predictions of the Speech Learning Model.

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REFERENCES


