Phonoprosodic effects of Russian-German language contact on Russian heritage speakers: VOT of voiceless plosives

Marion Krause, Tetyana Pron, Igor Fischer, Tatjana Kurbangulova*, Nataliya Nesterova*

*Material Gathering

Introduction

German and Russian differ with respect to the voicing and aspiration of plosives, both in a two-way laryngeal contrast. German belongs to the so-called aspirating languages [1]. It differs phonetically between voiceless unaspirated and voiceless aspirated consonants. In contrast, Russian is a true voice language [2]. There exists a distinction between voiced plosives and voiceless unaspirated ones; the same holds true for fricatives. **VOT (voice onset time)** in the word initial position before vowel and the duration of voicing into the closure of plosives in intervocalic position are regarded as important acoustic correlates of these distinctions. VOT is negative in case of voiced plosives, obtains a short-lag positive value in case of voiceless unspirated and a long-lag positive value for voiceless aspirated stops.

Facing the situation of language contact, which we can observe for Russian heritage speakers in Germany, we expect transfer phenomena in voicing and aspiration in both languages [3]. In the present study, the realisation of voiceless plosives in Russian will be examined. We assume a contact-induced extension of lag for voiceless plosives which we interpret as transfer phenomenon from German. Generally speaking, this feature is considered one of the most strong indicators of German accent in Russian [4,5].

Hypothesis

1. The **contact-induced change** in VOT is stronger for the second generation heritage speakers than for the first generation adults.

2.The **mean VOT values for the adults** correspond with the data of Russian monolinguals in Russian.

3. Within the **heritage speakers' groups, mean VOT values** for /p/, /t/, and /k/ lie between the reference values for Russian and German [3].

4. The older the **heritage speaker** the more they **drift towards German** long-lag VOT.

Material

The material consisted of a little story by M. Zoščenko named "Interesno pridumala" (Thought up something clever). The story was slightly modified to match the vocabulary of the children. The presented story has 172 tokens and ideally 365 syllables.

For the present study we recorded 56 children with one parent for each within the framework of LiMA LiPS. Not all children were able to read. For this reason, we limited our scope to 10 11-year- and 10 15-year-olds.

Inside the age groups we balanced the gender to have 5 boys and 5 girls. The parents' group consisted only of mothers. Our sample is based on the apparent-time method.

Acknowledgements

We thank the LiMA Network for funding data gathering, processing and analysis within the LiPS Project.

Methods

In our investigation, we measured VOT in Praat 5.3.17. The following figures illustrate VOT, e.g. the interval between stop release (R) and the beginning of voicing (VB) of the following vocal. Fig.1 shows a short lag VOT, Fig. 2 a long-lag VOT.

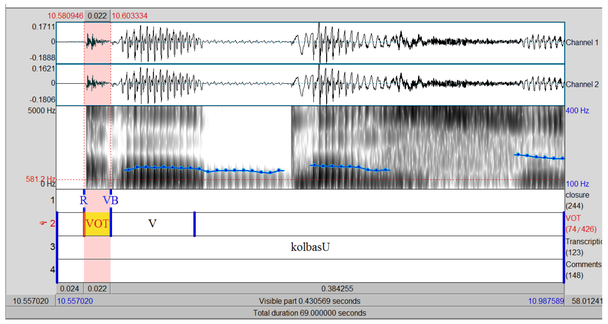

Figure 1: Example of annotating an unaspirated VOT segment in Praat

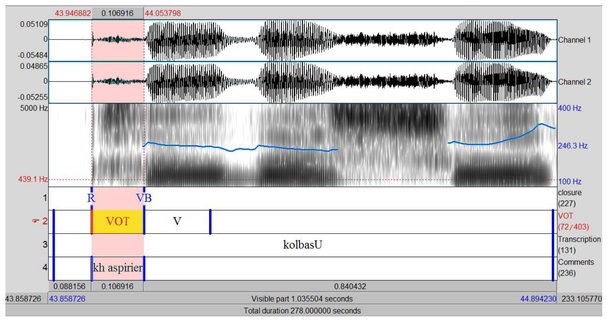

Figure 2: Example of annotating an aspirated VOT segment in Praat

The definition of plosives as aspirated/ non aspirated bases on tow parameters: VOT > 30 ms + perceptional impression.

Conclusion

The VOT values of voiceless plosives /p/, /t/, and /k/ in Russian reflect:

1. There is **no contact-induced influence for the adult Russian speakers**. The mean VOT values for adults indeed correspond with Russian reference data.
2. We observed strong i**nfluence of German long-lag VOT for heritage speakers** resulting in **intermediate VOT values** in nearly all positions under investigation.
3. Against our expectations, these results don't show correlation with age. The **11-year-olds produce the strongest drift towards German** long-lag **VOT** whereas **it decreases** in average for **persons aged 15**.

At a first glance, there seems to be no evidence for attrition being reinforced with age. But as far as the group of heritage speakers is considered to be very heterogenious, further research on the basis of controlled background variables is needed, as well as a more detailed view on individual VOT realizations.

Results

Mean VOT values

- VOT mean values for /p/, /t/, and /k/ in word initial position for first generation adults are nearly the same as for Russian monolingual speakers (Fig. 3, black lines - Russian ref. data [2], red lines - German ref. data [6]).
- VOT mean values for /p/, /t/, and /k/ for 11-year-old children drift to the German standard values [6,7] stronger than the values observed for 15-year-olds (Fig. 3).
- In some cases, 11 year-olds realize VOT even longer than in German used to be (/k/ initial, /p/ intervocalic), hyperbolyzing the feature - compare generalized data between 60-70 ms in [6]. Such tendency could not be observed for the group of 15-year-olds.
- Within the age groups, gender depending variation is observed. VOT mean values for /p/, /t/, and /k/ for 15-year-old female children correspond with those of the parents wheras the boys' realizations drift more towards the German target.

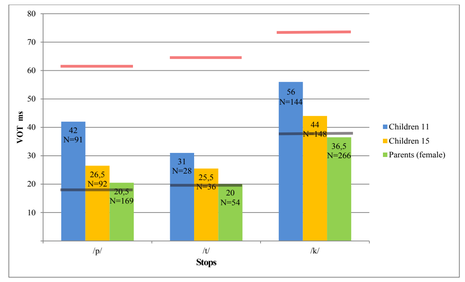

Figure 3: Mean VOT values (in ms) for **word initial** /p/,/t/, and /k/ for three age groups

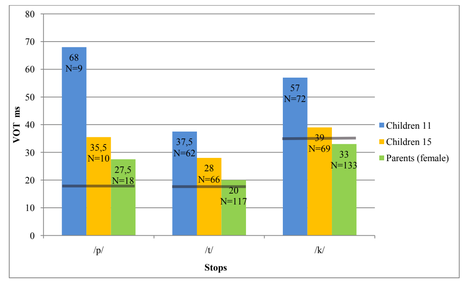

Figure 4: Mean VOT values (in ms) for **intervocalic** /p/,/t/, and /k/ for three age groups

Perception of Aspiration

- Aspiration of voiceless plosives has been observed in both analyzed consonant positions with the following frequency: 11-year-olds > 15-year-olds > adults. That is, within our sample the younger group of heritage speakers deviate more from the norms of their heritage language than the older does (Fig. 5). In word initial position, /k/ turns out to be aspirated most frequently, even by adult speakers of the first generation; /t/ shows aspiration in the most rare cases in all age groups. For 11-year-olds this holds true also for intervocalic positions.
- The same result has been observed by [2] who explained it by the different nature of /t/ in Russian (alveolar stop) and German (dental stop). So we can consider the less aspiration of /t/ as an effect of Russian articulation basis.

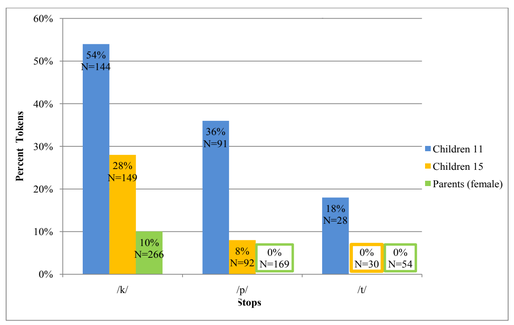

Figure 5: Percentage of aspirated realization for **word-initial** /p/,/t/, and /k/ for three age groups

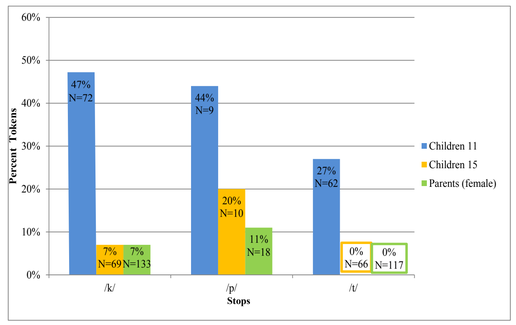

Figure 6: Percentage of aspirated realization for **intervocalic** /k/, /t/ and /p/ for three age groups

References

1. Lisker, L.; Abramson, A.S. 1964. A cross-language study of voicing in initial stops: acoustical measurements, in: Word Vol. 20, №3, 384-422.
2. Ringen, C.; Kulikov, V. 2012. Voicing in Russian stops: Cross-linguistic implications, in: Journal of Slavic Linguistics 20(2), 269-286. Benmamoun (eds.). Perspectives on Arabic linguistics, 1-38. Amsterdam: John Benjamins.
3. Nagy, N.; Kochetov, A. 2013. Voice onset time across the generations: A cross-linguistic study of contact-induced change. In: Siemund, P. et al. (eds.), Multilingualism and Language Diversity in Urban Areas. Amsterdam: Benjamins, 19–38.
4. Antonova, D.N. 1988. Fonetika i intonacija : korrektirovočnyj kurs dlja zarubežnych prepodavatelej. Moskva
5. Wiede, E.. 1981. Phonologie und Artikulationsweise im Russischen und Deutschen : eine konfrontierende Darstellung. Leipzig
6. Jessen, M. 1998. Phonetics and Phonology of the tense and lax obstruents in German. Amsterdam: John Benjamins.
7. Meyer, J. 1994. Phon.-phonetische Überspezifizierung bei Sprechtherapie. M.A. Thesis, University of Bielefeld.