

Positive transfer from the heritage language? The case of VOT in German/Turkish and German/Russian learners of L3 French, Russian, and English

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L3 WORKSHOP
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- 2 Our empirical study
 - 2.1 What is VOT?
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1 MEZ and the phonological subproject

- part of a larger project on multilingual development (educational context in Germany)

Multilingual Development: A Longitudinal Perspective

<https://www.mez.uni-hamburg.de/en.html>

- a. **German** (language of environment)
 - b. heritage languages (HL) **Turkish** and **Russian**
 - c. foreign languages (FL) **English, French, and Russian**
- subproject on (prosodic and segmental) **phonology**

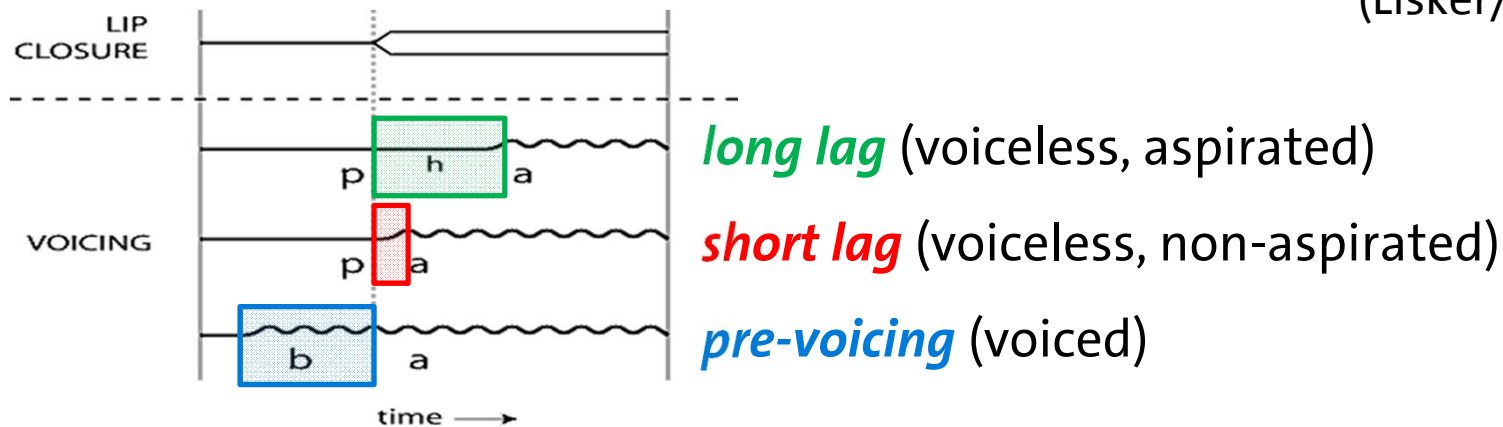
Our focus today

- cross-linguistic influence (CLI)
- Voice Onset Time (VOT) of voiceless stops

2.1 What is Voice Onset Time (VOT)?

Time span between the burst of a stop consonant and onset of voicing

(Lisker/Abramson 1964)



Our languages: different phonetic realization of [\pm voiced] contrast

| | pre-voicing | short lag | long lag |
|--------------------|-------------------------------|----------------------------------|--|
| French, Russian | [b d g] <b d g> <i>voiced</i> | [p t k] <p t k> <i>voiceless</i> | |
| Turkish | [b d g] <b d g> <i>voiced</i> | | [p t k] <p t k> <i>voiceless</i> |
| German, English | | [b d g] <b d g> <i>voiced</i> | [p ^h t ^h k ^h] <p t k> <i>voiceless</i> |

2.2 Hypotheses

- H1** German VOT values are lower for Russian/German and Turkish/German bilinguals as compared to German monolinguals.
- H2** Russian/German and Turkish/German learners of FL **English** produce /p t k/ less target-like than monolingual German learners do.
- H3** Russian/German and Turkish/German learners of FL **French** produce /p t k/ more target-like than monolingual German learners do.
- H4** Monolingual German learners of **Russian** produce /p t k/ less target-like than Russian/German bilinguals attending Russian courses and German/Russian speakers do.

2.3 Methods and data

Data collection

- Germany (different federal states), May – Nov 2016
- Picture naming task

Test items: /p t k/ + /a i u/

| | | |
|---------|---|------|
| German | <i>Park</i> [pæ:k], <i>Tisch</i> [tɪʃ], <i>Kuchen</i> ['ku:xn] ... | n=11 |
| English | <i>pumpkin</i> ['pʌmpkɪn], <i>tea</i> [ti:], <i>cooker</i> ['kʊkəʳ] ... | n=9 |
| French | <i>parc</i> [pɑ:k], <i>tigre</i> [tigʁə], <i>cou</i> [ku] ... | n=10 |
| Turkish | <i>park</i> [pa:k], <i>pil</i> [pil], <i>kuş</i> [kuʃ] ... | n=9 |
| Russian | <i>палец</i> [pʲaˈlʲɪt͡s], <i>тыфли</i> [tʲɪˈfʲlʲɪ] ... | n=7 |



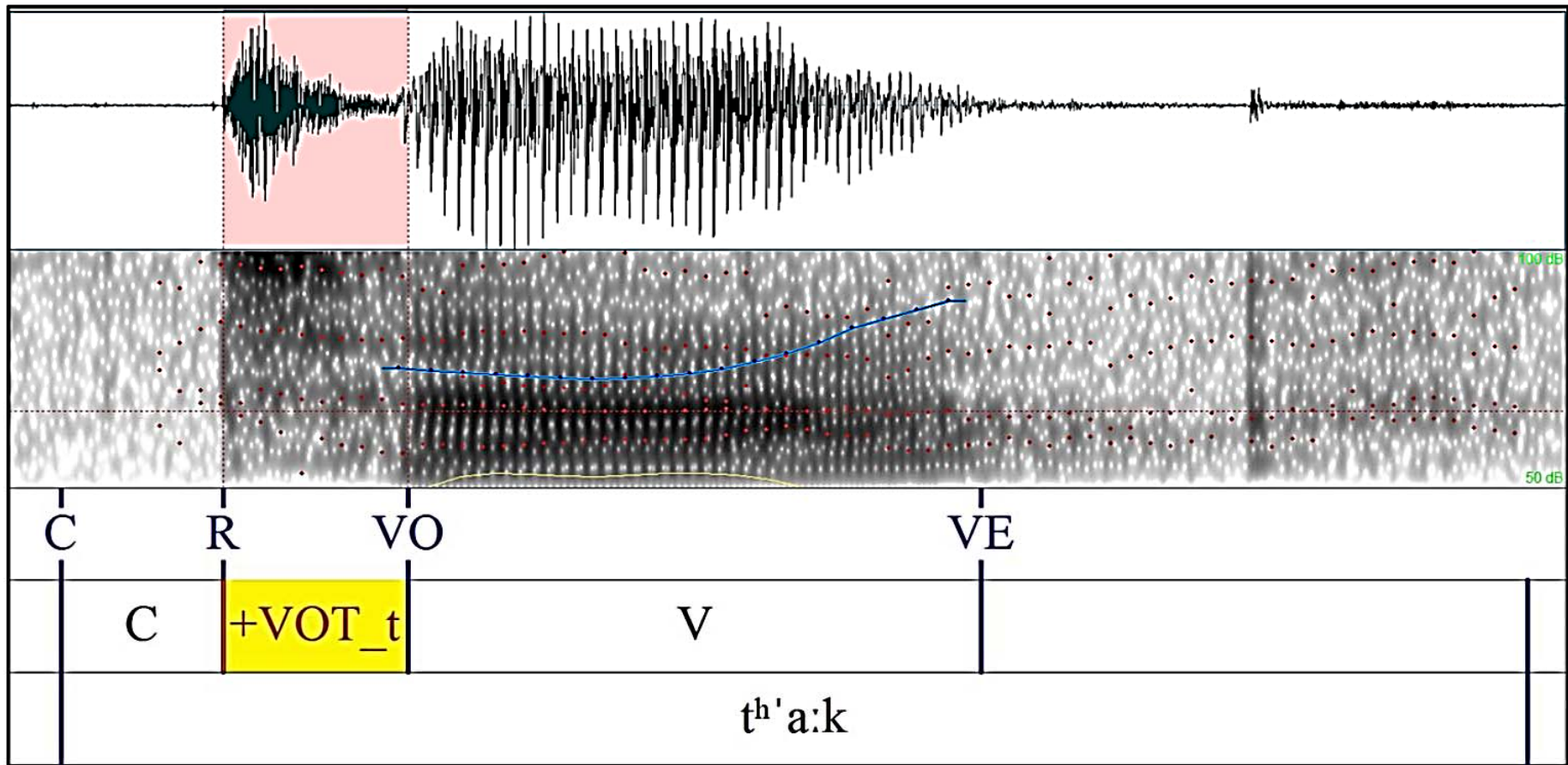
2.3 Methods and data

Participants (ages: 15–16, two subjects: 17)

| Learner groups | English (first FL), French (second FL) | English (first FL), Russian (second FL) |
|--------------------------|--|--|
| monolingual German | 10 (recorded in German, English and French) | 9 (recorded in German, English and Russian) |
| bilingual Russian/German | 10 (recorded in German, Russian, English and French) | 10 (recorded in German, Russian and English) |
| bilingual Turkish/German | 10 (recorded in German, Turkish, English and French) | |

2.3 Methods and data

VOT measurements using Praat (Boersma/Weenink 2011)



2.4 Results: German

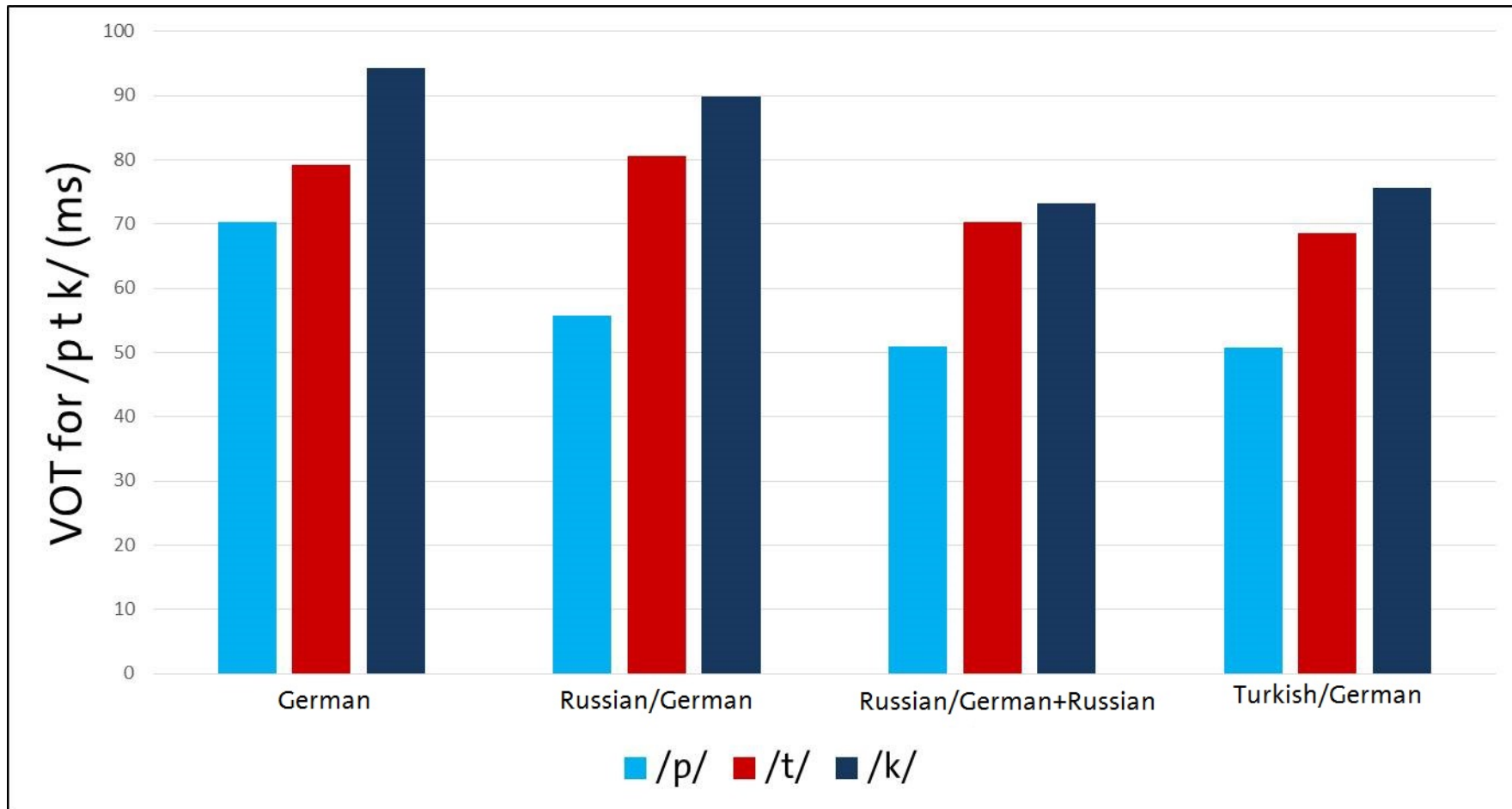


Fig. 1 VOT values for **German /p t k/** (median) in four groups of speakers: German, Russ/Ger with and without formal instruction in Russian, Turkish/German.

Bilinguals produce German stops with lower VOTs → H1 confirmed

2.4 Results: German

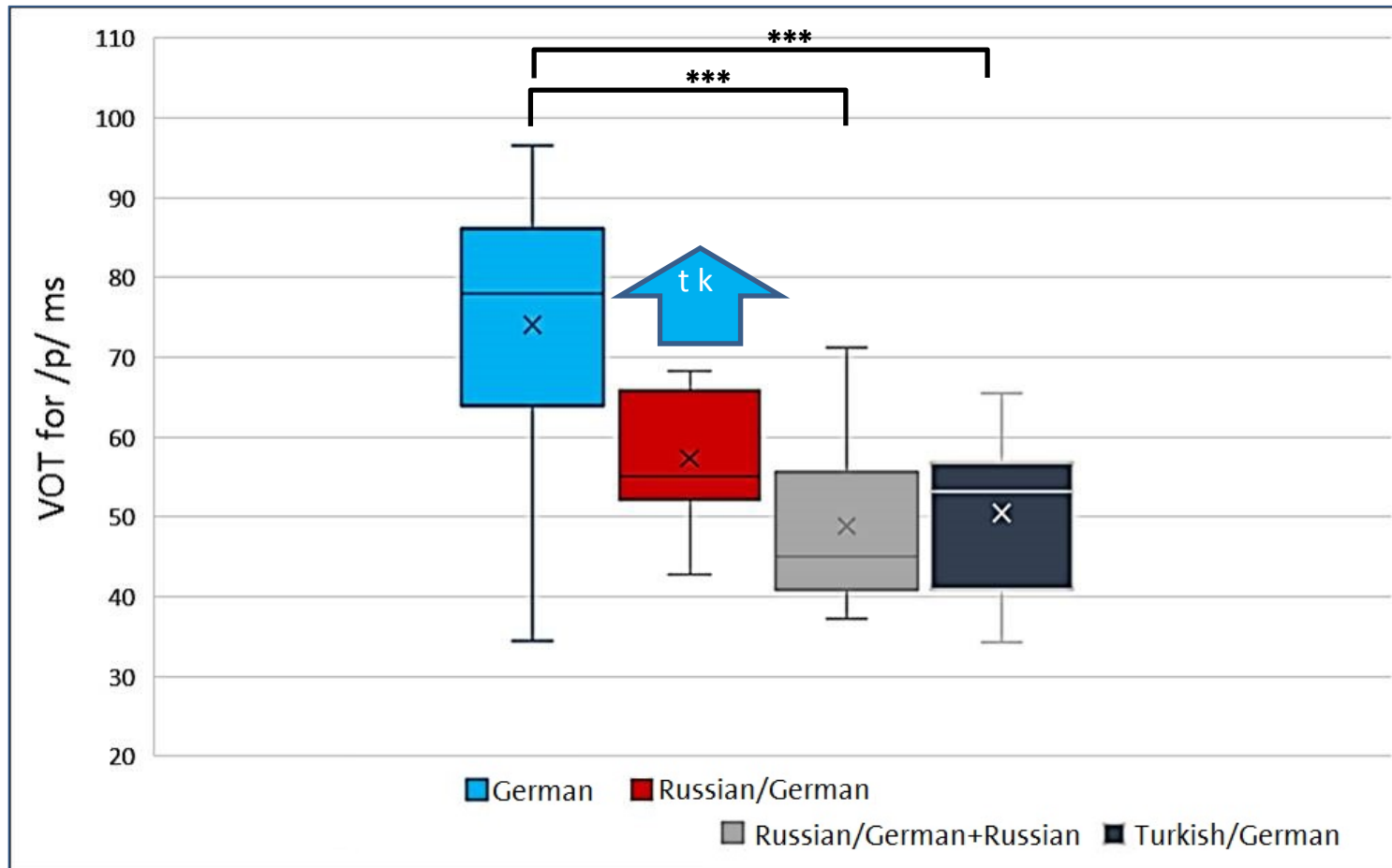


Fig. 2 VOT values for German /p/ in four groups of speakers: German, Russian/German with and without formal instruction in Russian, Turkish/German.

The difference between the groups is highly significant for /p/ ($p_{/p/}=0,000$). Results for /k/ show a similar tendency ($p_{/k/}=0,010$) and are nearly significant for /t/ ($p_{/t/}=0,055$).

2.4 Results: FL English

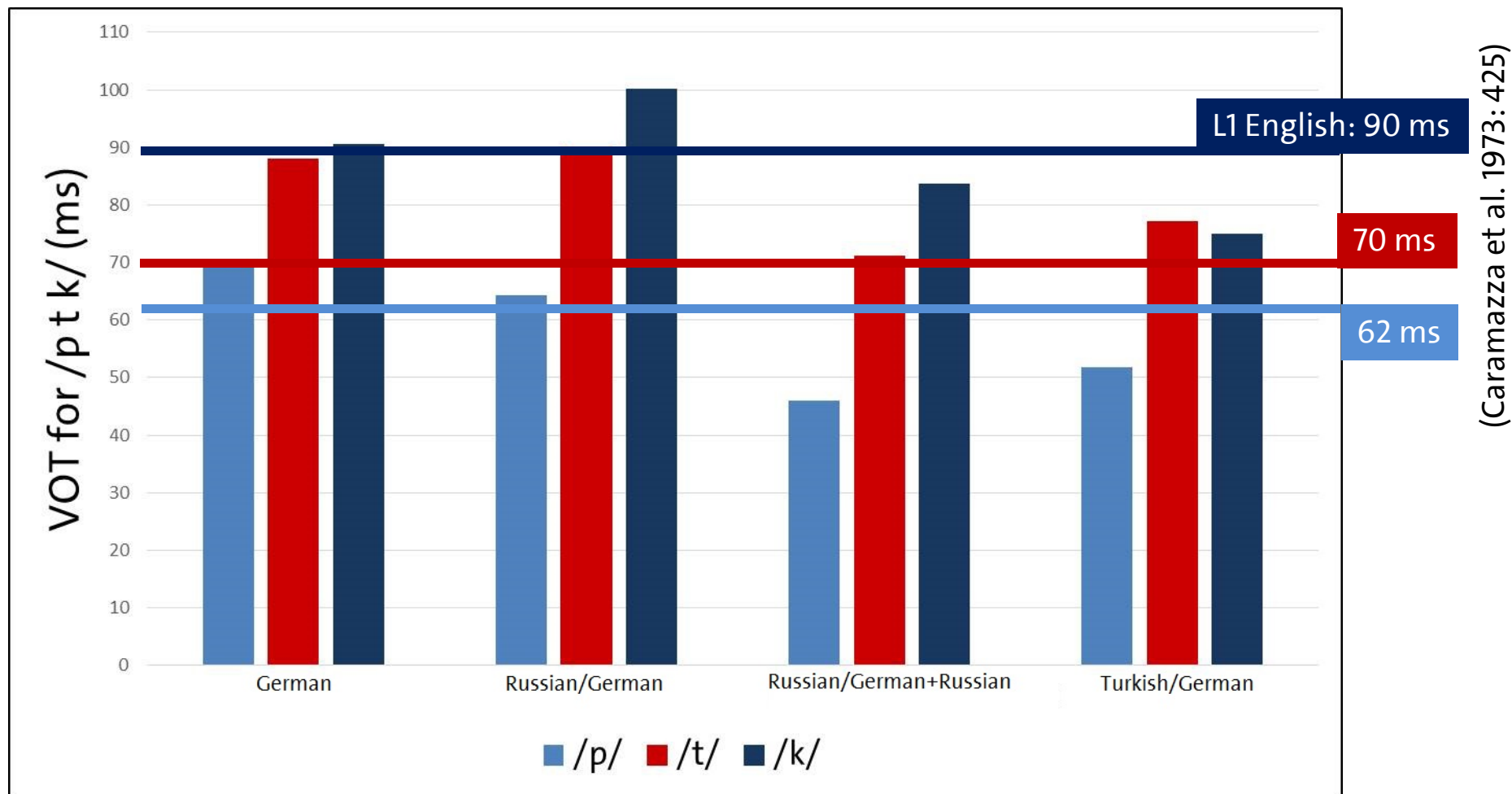
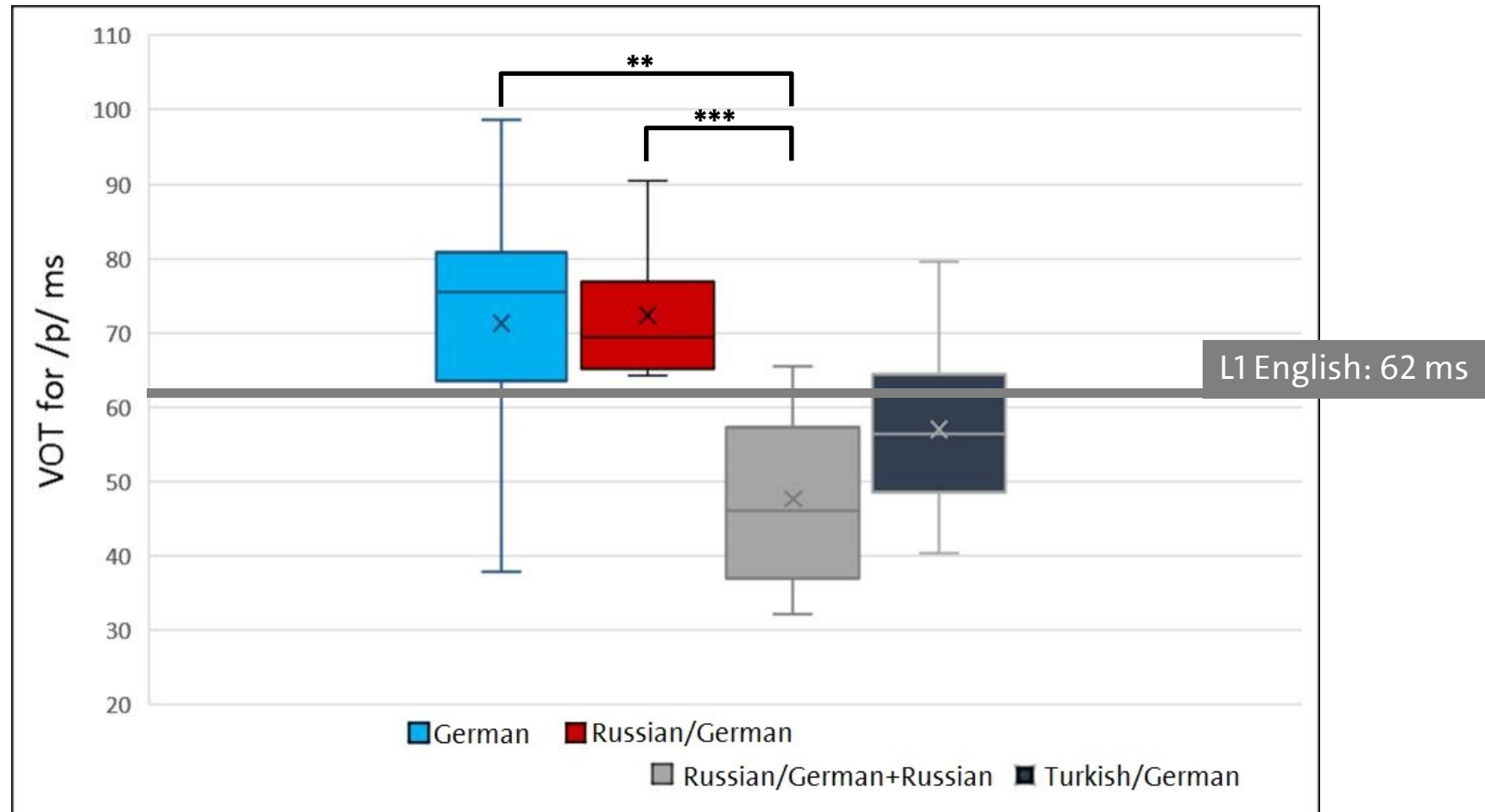


Fig. 3 VOT values for FL English /p t k/ (median) in four groups of speakers: German, Russian/German with and without formal instruction in Russian, Turkish/German.

Russ/Ger+Russ and Tur/Ger learners show lower VOTs

→ H2 partially confirmed

2.4 Results: FL English

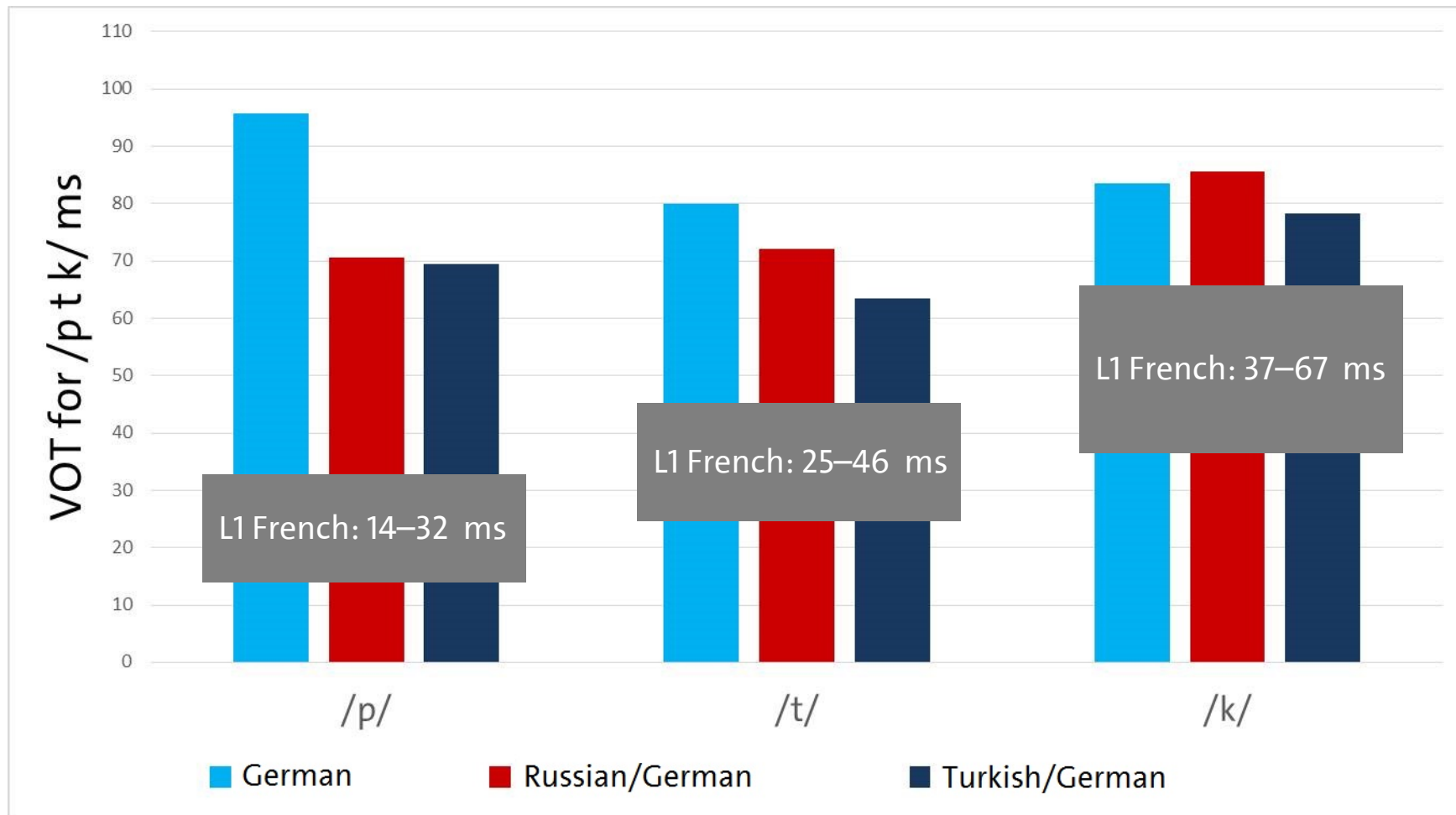


(Caramazza et al. 1973: 425)

Fig. 4 VOT values for **FL English /p/** in four groups of speakers: German, Russian/German and without formal instruction in Russian, Turkish/German.

The difference between the groups is highly significant for **/p/** ($p_{/p/}=0,000$). Results for **/t k/** show a similar tendency ($p_{/t/}=0,045$, $p_{/k/}=0,003$).

2.4 Results: FL French

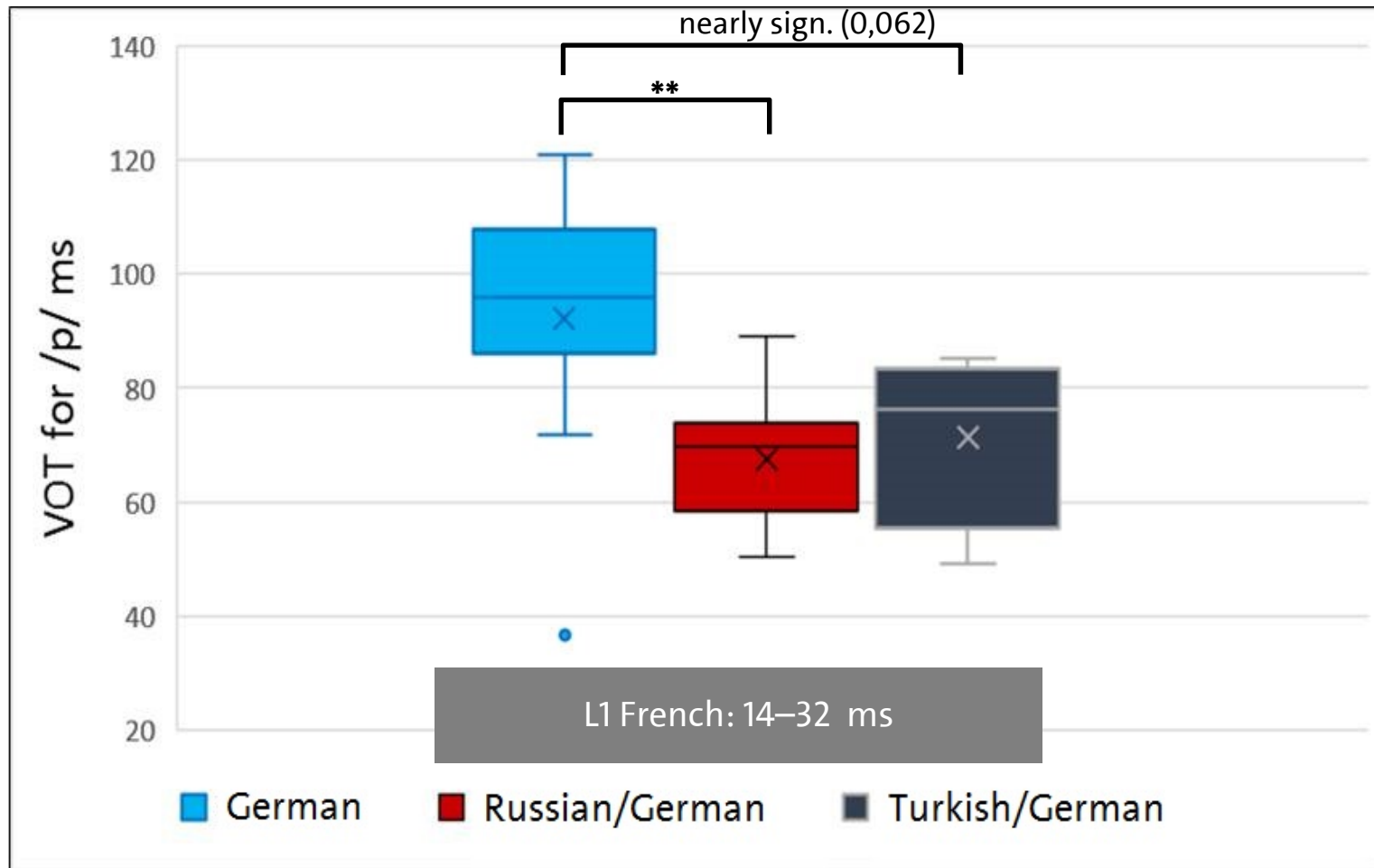


(ranges from 10 studies; Lein et al. 2016: 735)

Fig. 5 VOT values **FL French /p t k/** (median) in four groups of speakers: German, Russian/German, Turkish/German.

All learner data exceed the target values, only a slight advantage for the bilinguals → H3 partially confirmed

2.4 Results: FL French



(Lein et al. 2016: 735)

Fig. 6 VOT values for **FL French /p/** in three groups of speakers: German, Russian/German, Turkish/German.

The difference between the groups is highly significant for **/p/** ($p_{/p/}=0,002$). Results for **/t k/** show no significant differences ($p_{/t/}=0,123$ and $p_{/k/}=0,776$).

2.4 Results: FL/HL Russian

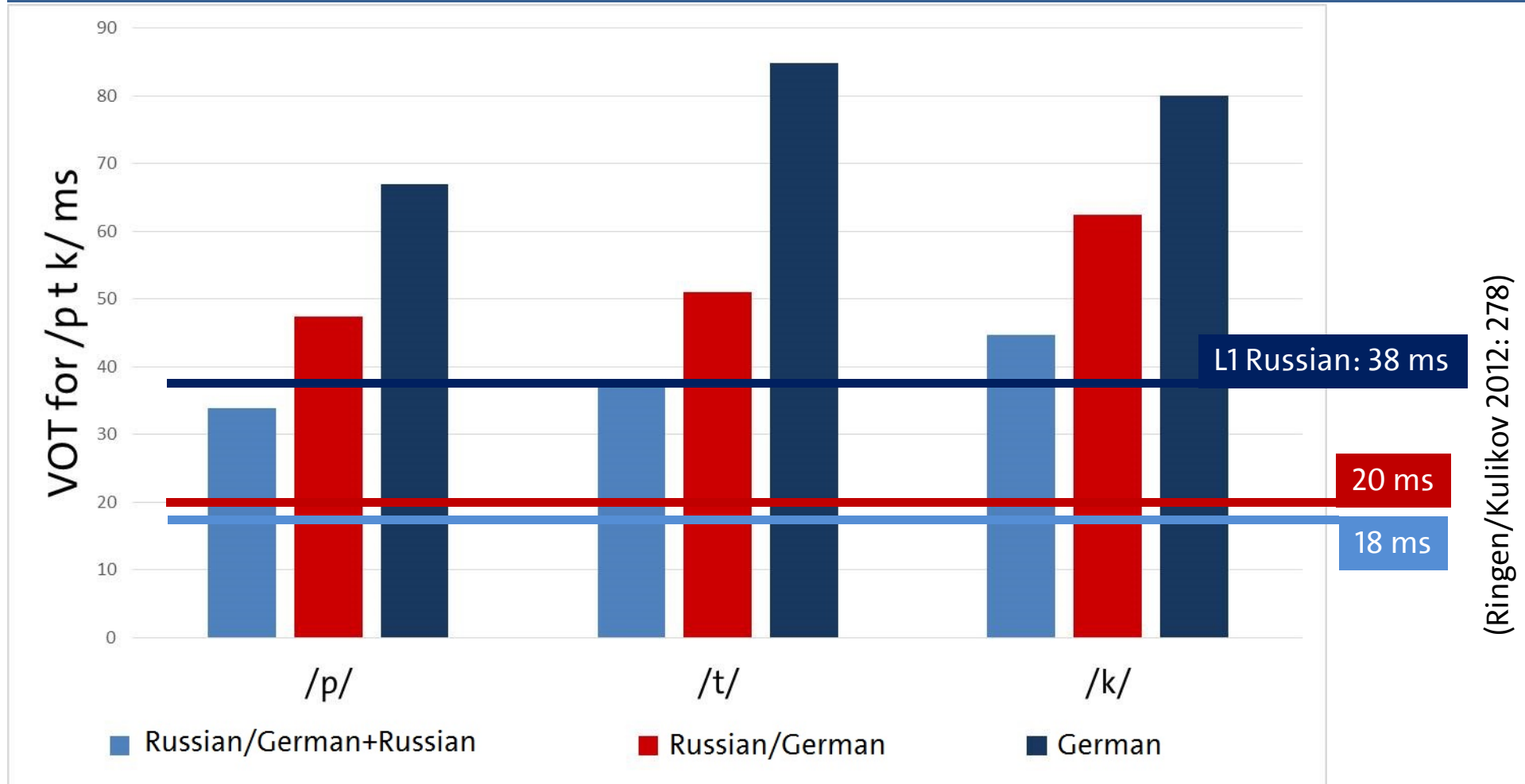


Fig. 7 VOT values for **Russian /p t k/** (median) in three groups of speakers: German, Russian/German with and without formal instruction in Russian.

Monolingual Ger learners produce less target-like VOTs. → H4 confirmed.
But: Difference between Rus/Ger with and without formal instruction.

2.4 Results: FL/HL Russian

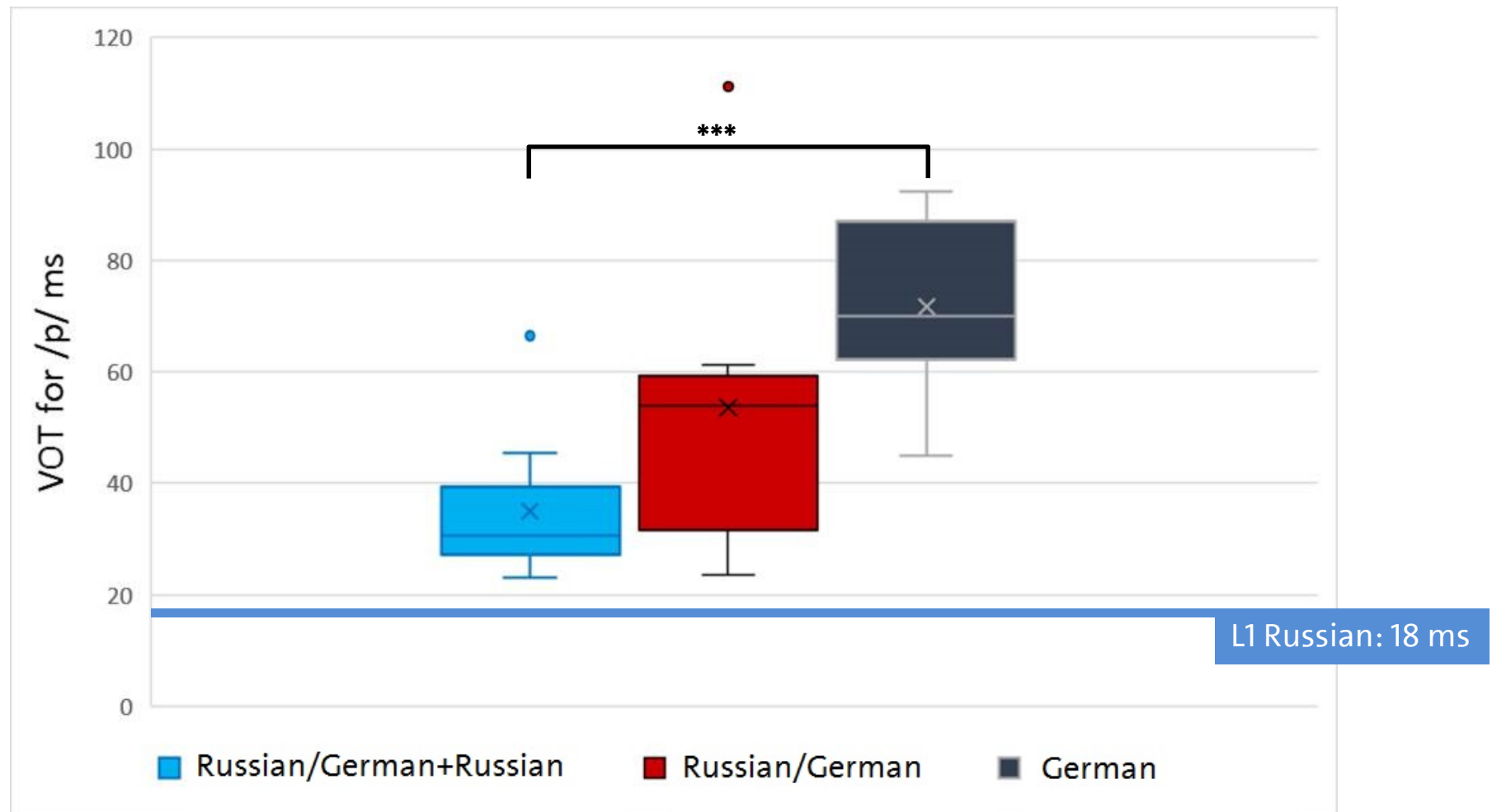


Fig. 8 VOT values for **Russian /p/** in three groups of speakers: German, Russian/German with and without formal instruction in Russian. The difference between the groups is highly significant for /p/ ($p_{/p/}=0,001$). Results for /t k/ show a similar tendency ($p_{/t/}=0,001$ and $p_{/k/}=0,003$).

2.4 Results: HL Turkish

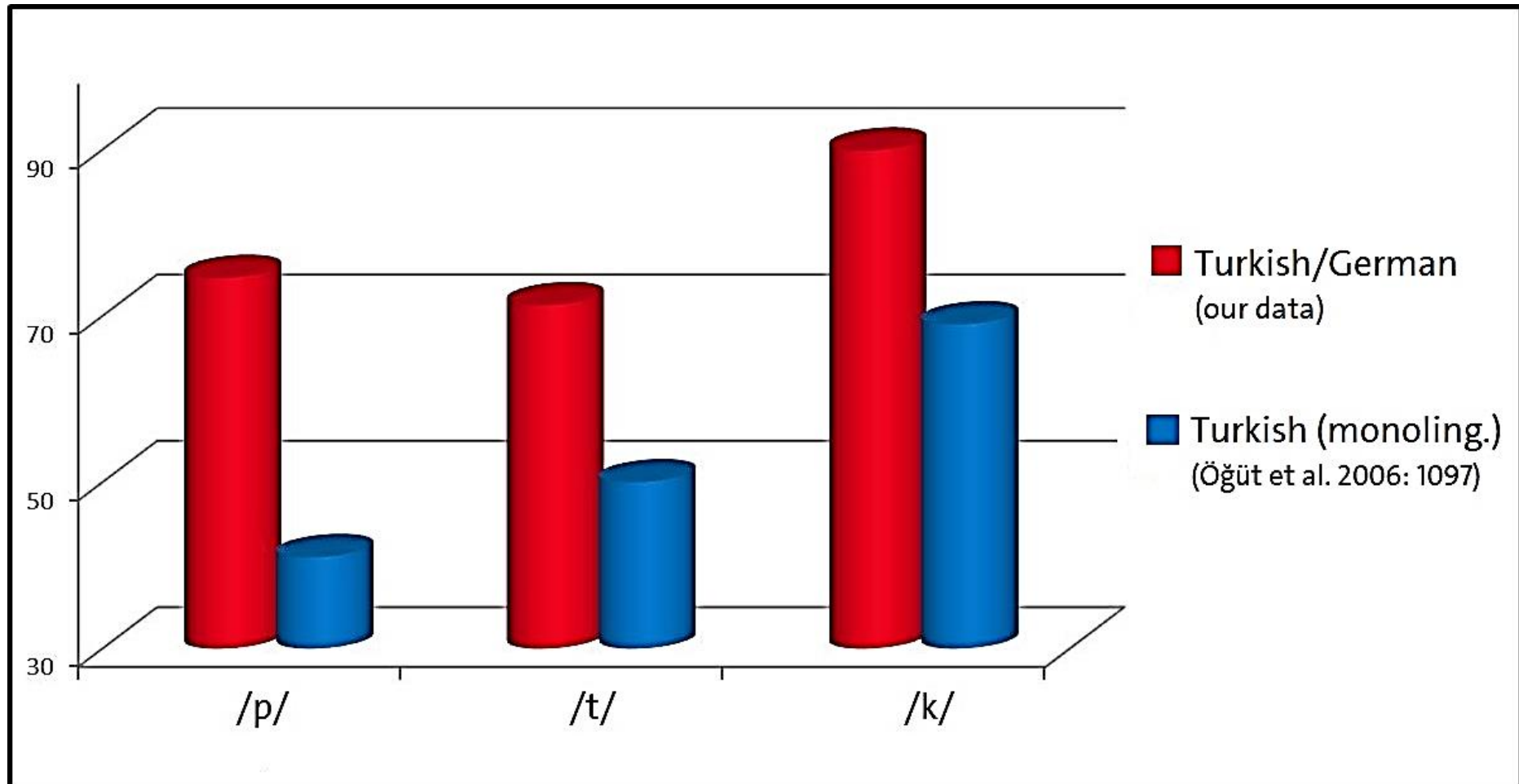


Fig. 9 VOT values for /p t k/ produced by Turkish/German bilinguals (red) and Turkish monolinguals (blue).

Turkish/German bilinguals produce longer VOTs than Turkish monolinguals.

2.5 Discussion

- Speech Learning Model (Flege 1995): phonetically different realizations of the two-way phonological contrast ([±voiced])
 - *similar sounds*
 - challenge for **learners**, source of negative transfer convergence of categories in **heritage** speakers
- Differences between /p t k/ are quite stable across **all languages**.
- **Heritage languages**: Both Russian/German and Turkish/German bilinguals produce longer VOT values than monolingual Russian and monolingual Turkish speakers do, presumably under the **influence of German**.
- **FL/HL Russian**: Russian/German bilinguals who receive formal instruction in Russian produce VOT values closer to the L1 Russian reference values than Russian/German bilinguals without **formal instruction in Russian** do.

2.5 Discussion

- **FL French:** Positive transfer from HL Russian and HL Turkish is less than expected: L2 status (influence from English, see Llama et al. 2010, Wrembel 2014)?
→ Effect of the **German influence** on the heritage languages (intermediate values: Russian/Turkish ~ German).
- **FL English:** The lower VOT values produced by the Russian/German learners with formal instruction in Russian and the Turkish/German learners does not constitute a disadvantage for the bilinguals, their English VOT values still being in the target range.
- Results speak in favor of a **slight multilingual advantage** (more target-like values in FL French, produced by Russian/German and Turkish/German learners).
- Results speak in favor of a **positive effect of formal language instruction:** More “Russian” VOT values in the Russian/German+Russian group (for French: see Gabriel et al. 2016).

3 Outlook and concluding remarks

Our next steps

- include voiced stops /b d g/
- run statistical tests: correlations with **quantitative extra-linguistic data and other linguistic data**
(e.g. to check our findings for the two different groups of Russian/German bilinguals against the backdrop of other factors, such as language use, proficiency on other linguistic levels)
- interdependencies between speech data and **qualitative extra-linguistic data**
 - phonological awareness test (Osburne 2003)
 - semi-guided interviews (→)(to determine the factors that **might favor positive transfer** from the heritage languages; see Gabriel et al. 2015)

3 Extra-linguistic data: example from a semi-guided interview

1400459124 (♂), 2L1 Russian/German, no formal instruction in Russian, high VOT values in Russian, near target-like production in English

P: Ähm, **meine Eltern sprechen zwar sehr viel Russisch** (.) auch zu Hause, (--) aber (--) eigentlich seit Kind auf **mag ich diese Sprache überhaupt nicht**. 00:05:00

negative attitude
towards HL
Russian

I: [Warum

P: Also], **habe ich diese so weit wie möglich vom Kopf weggemalt** 00:05:03-9

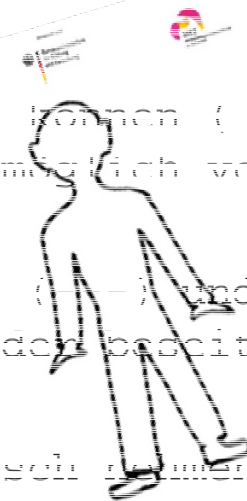
I: Naja, wenn du jetzt (vor der Wahl gestellt wirst) (---) und dich für eine einzige Sprache entscheiden musst? ((blättert oder besichtigt die Papiere)) 00:06:02-7

P: (6s) Ich glaub, **das wäre Englisch**. Ich würd Englisch nehmen. 00:06:11-0

I: Okay, warum würdest du dann Englisch nehmen? 00:06:16-0

P: (---) **Weil** (--) **ich mit Englisch einfach viel mehr erreichen kann**, als mit Deutsch. (--) Ich kann **reisen**. (--) Und Englisch ist auch unglaublich [ein lautes **Wort**], das, was ich später mal machen will. 00:06:27-5

clear preference
for English



3 Outlook and concluding remarks

Our next steps

- run **perception tests** with native listeners and non-native listeners (foreign language instructors from the German school system)
- analyze **further phonological aspects** (e.g. intonation, speech rhythm)

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References

- Boersma, P.; Weenink, D.** 2011. Praat. Doing phonetics by computer (Version 5.4.11). <http://www.praat.org>.
- Caramazza, A.; Yeni-Komshian, G. H.; Zurif, E. B.; Carbone E.** 1973. The acquisition of a new phonological contrast: The case of stop consonants in French-English bilinguals. *Journal of the Acoustical Society of America* 54, 421–428.
- Flege, J. E.** 1995. Second language speech learning. Theory, findings, and problems. In W. Strange, W. Ed. *Speech perception and linguistic experience: Issues in cross-language research*. Timonium, MD: York Press, 233–277.
- Gabriel, C.; Stahnke, J.; Thulke, Jeanette** 2015. Acquiring English and French speech rhythm in a multilingual classroom: A comparison with Asian Englishes. In: Gut, U.; Fuchs, R.; Wunder, E.-M. Eds. *Universal or diverse paths to English phonology?* Berlin: De Gruyter, 135–163.
- Gabriel, C.; Kupisch, T.; Seoudy, J.** 2016. VOT in French as a foreign language. A production and perception study with mono- and multilingual learners (German/Mandarin-Chinese). In: Neveu, F.; Bergounioux, G.; Côté, M.-H.; Fournier, J.-M.; Osu, S.; Planchon, P.; Hriba, L.; Prévost, S. Eds. *Actes du 5^e Congrès Mondial de Linguistique Française. Tours, 4-8 juillet 2016. Recueil des résumés CD-ROM des actes*. Paris: EDP Sciences, 1–14.

References

- Lein, T.;** Kupisch, T.; van de Weijer, J. 2016. Voice onset time and global foreign accent in German–French simultaneous bilinguals during adulthood. *International Journal of Bilingualism*. 20, 732–749.
- Lisker, L.;** Abramson, A. S. 1964. A cross-language study of voicing in initial stops: Acoustical measurements. *Word* 20, 384–422.
- Llama, R.;** Cardoso, W; Collins, L. 2010. The influence of language distance and language status on the acquisition of L3 phonology. *International Journal of Multilingualism* 7, 39–57.
- Öğüt, F. Kiliç, M. A.;** Engin, E. Z.; Midilli, R. 2006. Voice onset times for Turkish stop consonants. *Speech Communication* 48, 1094–1099.
- Osburne, A.** 2003. Pronunciation strategies of advanced ESOL learners. *International Review of Applied Linguistics in Language Teaching* 41, 131–141.
- Ringen, C.;** Kulikov, V. 2012. Voicing in Russian stops. Cross-linguistic implications. *Journal of Slavic Linguistics* 20, 269–286.
- Wrembel M.** 2014. VOT patterns in the acquisition of third language phonology. *Concordia Working Papers in Applied Linguistics (COPAL)* 5, 750–770.

Thank you very much!

Merci de votre attention !

İlginiz için teşekkür ederiz!

Сердечное спасибо!

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