

# Methods of investigating vowel interferences of French learners of German

Frank Zimmerer, Jürgen Trouvain, Anne Bonneau

► **To cite this version:**

Frank Zimmerer, Jürgen Trouvain, Anne Bonneau. Methods of investigating vowel interferences of French learners of German. *New Sounds 2016*, Jun 2016, Aarhus, Denmark. <<http://conferences.au.dk/newsounds2016/>>. <hal-01400005>

**HAL Id: hal-01400005**

**<https://hal.inria.fr/hal-01400005>**

Submitted on 23 Nov 2016

**HAL** is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

## Methods of investigating vowel interferences of French learners of German

Frank Zimmerer<sup>1</sup>, Jürgen Trouvain<sup>1</sup>, Anne Bonneau<sup>2</sup>

<sup>1</sup>Computational Linguistics & Phonetics, Saarland University, Saarbrücken, Germany

<sup>2</sup>Speech Group, LORIA, Inria, Villers-lès-Nancy, F-54600, France

Université de Lorraine, LORIA, UMR 7503, Villers-lès-Nancy, F-54600, France

CNRS, LORIA, UMR 7503, Villers-lès-Nancy, F-54600, France

The French and German vowel inventories (Fougeron & Smith, 1999; Kohler, 1999) show many similarities, for instance, both have the front rounded vowels [y, ø, œ]. Contrary to German, French has no vowel length contrast. Although specialized teaching materials for German consider the problem of vowel length/tenseness (e.g. Hirschfeld, 2014; Hirschfeld et al., 2007), it is still unclear how frequently vowel errors occur in L2 speech and which pairs of long/tense and short/lax vowels create the most serious difficulties for French learners of German. We present three methods to analyze the interference processes occurring in read speech of French learners of German (Trouvain et al., 2014). The investigated material covers all monophthongal full vowels from 60 sentences read by 30 beginners and 20 advanced learners as well as 40 native speakers.

First, we analyzed phone confusion matrices of the non-native speech that was hand labeled by German annotators. The lowest scores of correctness were shown for /œ/ (57%), /ʏ/ (63%), and /ɛ:/ (68%), with /ø:/, /y:/, and /e:/ as the main substitutions. Second, in a perception study based on the investigated material, German native speakers listened to words belonging to minimal pairs like *Miete* /'mi:tə/ - *Mitte* /'mɪtə/ ('rent-middle') differing in length/tenseness. Correct identification of native speech was 98%. The results for the learners indicate that, overall, short vowels were identified correctly less often (64%) than long vowels (77%), but with great inter-individual differences. The vowels with the lowest perception score were /ɔ, œ, ʏ/ with wrong identifications of 65% (beginners) and 47% (advanced). Although most problems occur in the beginner group, every second advanced learner shows for short vowels an identification rate lower than chance, which means they were perceived as long by German native listeners. Finally, acoustic measurements of the minimal pair words revealed different strategies: some learners tend to lengthen while others tend to shorten vowels.

The results of these three investigations help to create a more detailed account of the transfer of vowel contrasts, extending prior research on vowel perception (Kingston, 2003; Flege & MacKay, 2004), with orthography as a possible source of interference. Furthermore, the results of the studies can be used to create individualized training and feedback for foreign language learners.

### References

- Flege, J. & MacKay, I. 2004. Perceiving vowels in a second language. *Studies in Second Lang Acquisition* 26, 1-34.
- Fougeron, C. & Smith, C. 1999) French – Illustrations of the IPA. *Handbook of the IPA*. CUP, 78-81.
- Kohler, K. 1999. German – Illustrations of the IPA. *Handbook of the IPA*. CUP, 86-89.
- Hirschfeld, U. 2014. *Bewegte Phonetik. Ausspracheübungen mit französischen Schülern im Deutsch- und Englischunterricht (classes bilangues)*. Paris: Goethe Institut ([www.goethe.de/ins/fr/lp/prj/clb/unt/pho/deindex.htm](http://www.goethe.de/ins/fr/lp/prj/clb/unt/pho/deindex.htm)).
- Hirschfeld, U., Reinke, K., Stock, E. (eds) 2007. *Phonothek intensiv. Aussprachetraining*. München: Langenscheidt.
- Kingston, J. 2003. Learning foreign vowels. *Language and Speech* 46, 295-349.
- Trouvain, J., Bonneau, A., Colotte, V., Fauth, C., Fohr, D., Jouvét, D., Jügler, J., Laprie, Y., Mella, O., Möbius, B. & Zimmerer, F. 2016. The IFCASL corpus of French and German non-native and native read speech. *Proceedings 10th Language Resources and Evaluation Conference (LREC)*, Portorož.

Acknowledgements: This research is part of the project IFCASL supported by DFG and ANR ([www.ifcasl.org](http://www.ifcasl.org)).