

REVIEW

by Vladimir Lyubenov Zhobov, PhD, professor at Sofia University “St. Kliment Ohridski”

on the PhD dissertation for the acquisition of the educational and scholarly degree “**Doctor**”

in: field of higher education 2. Humanities

Professional field 2.1. Philology

Post-graduate program Romance Languages

Author: Rosina Aleksieva Kakova

Title: “The Vowels in French and Bulgarian – Acoustic Description with Account of the Perceptual Integration of Their Pitch Components”

Supervisor: Assoc. Prof. Rusi Nikolov Nikolov, PhD – Plovdiv University “Paisii Hilendarski” (PU)

1. General presentation of the materials received

By order No. DR-22-282 of 6.02.2025 of the Rector of Plovdiv University “Paisii Hilendarski” I have been appointed as a member of the scientific jury for the procedure of defense of PhD dissertation entitled “The Vowels in French and Bulgarian – Acoustic Description with Account of the Perceptual Integration of Their Pitch Components” for the acquisition of the educational and scholarly degree “Doctor” in the field of higher education 2. Humanities, professional field 2.1. Philology, post-graduate program Romance Languages. The author of the dissertation is Rosina Aleksieva Kakova – post-graduate student in the Department of Romance and Germanic Studies, with supervisor Assoc. Prof. Rusi Nikolov from PU.

The set of materials submitted by Rosina Kakova is in accordance with Art. 36 (1) of the Regulations for the Development of the Academic Staff of the Plovdiv University, and includes the following documents:

1. application form to the Rector for opening of the procedure for defense of dissertation;
2. CV in European format;
3. record of the proceedings of the department council with statement of readiness for the opening of the procedure and discussion of the dissertation;
4. dissertation;
5. author’s summary of her dissertation;
6. list of publications on the topic of the dissertation;
7. copies of the publications;
8. declaration of originality and authenticity of the attached documents;

9. statement of the fulfilment of the minimum national requirements for the acquisition of the educational and scholarly degree “Doctor”;
10. statement of the supervisor.

2. Short biographical notes on the author

In the period 1.03.2020 – 1.03.2023 Rosina Kakova was a post-graduate student in the Philological Faculty of Plovdiv University “Paisii Hilenfarski”.

3. Relevance of the topic and appropriateness of the goals pursued in the dissertation

The problems studied in this dissertation are undoubtedly relevant and important from scientific point of view and with regard to their practical application. The acoustic data about French and Bulgarian vowels have been enlarged by applying an innovative approach that takes into account the non-linear response of the human auditory system to changes in parameters of the sound wave. The method for visualization propounded in this work can be effectively applied in foreign language teaching and even in improving the pronunciation of people with hearing difficulties.

4. Acquaintance with the problem

The author has extensive knowledge about the important publications in the field and gives adequate evaluation of the contribution of foreign and Bulgarian scholars.

5. Methods applied in the investigation

The question for the method is in the center of this dissertation. One of its basic goals is to prove the advantages of a method of acoustic analysis which takes into account the perceptual integration of formants that are close to each other. It is important that such closeness is judged not by the values of the formants in Hz but by their position in the psychoacoustic Bark scale. In view of the goal of this investigation, the choice of the two languages compared is especially successful. The topic of the dissertation is not an exhaustive comparison of the vocalic systems of French and Bulgarian. (This would require special attention to a number of problems, of which I will mention only the nasalized vowels in French.) The comparison of the two languages reveals examples where analysis restricted to the first two formants leads to results that contradict both the perception and the phonological intuition: full merging of the French vowel /i/ with the Bulgarian /и/; great proximity of the Bulgarian /и/ to the French /e/ and /y/. The method applied in this work offers a solution to these problems.

The selection of sample of French and Bulgarian speech from radio stations which take special care to follow the received standard pronunciation is also adequate to the goals of the investigation.

6. Review and assessment of the dissertation

The dissertation (162 pages) consists of Introduction, three chapters, Conclusion, appendices, and bibliography. The theoretical overview in the first chapter is concerned primarily with milestone contributions in the development of acoustic phonetics, with special emphasis on Gunar Fant's seminal book "Acoustic Theory of Speech Production". Unlike many similar overviews this one pays attention to another ground-breaking work – "The Vowel: Its Nature and Structure" by Chiba and Kajiyama, though their perturbation theory has not been used in the following pages.

There is also an overview of the comparative studies on French and Bulgarian with special emphasis on the works by Bozhil Nikolov.

Central to the dissertation is the second chapter, in which the author presents the software used for the acoustic analysis: the phonetic module of the software TREFL, created by Assoc. Prof. Rusi Nikolov, and Speech Analyzer. The theoretical model of the investigation, as well as the empirical material used in the analysis, is presented succinctly, with consideration of what is most important. The third chapter is devoted for the most part to the foreseen applications of the results of the study, primarily in foreign language teaching.

7. Contributions and significance of the study from scientific and practical point of view

The basic achievements in the dissertation are in full correspondence with the goals set at the beginning. The importance of the third formant for the recognition of certain vowels, specifically its perceptual integration with the second one, has been proven convincingly. The classical model also accounts for the importance of the third formant, connecting its lower position for example to retroflex articulations and to rhotic vowels, but fails to visualize it in the conventional triangle of vowels. Rosina Kakova demonstrates the potential of the software used in the study in several directions: firstly, the vowels can be objectively categorized as demanding and not demanding consideration of the perceptual integration. Especially for the first group the author demonstrates that the method she has chosen, originally developed by Chistovich and Lublinskaya, has greater explanatory potential than the analysis of the first two formants, including in dealing with the paradoxes mentioned in the end of section 5. The analysis also comprises vowels without perceptual integration. The innovation here is the objective discrimination of the two groups of vowels, indicated visually on the spectrum with the value of the distance between the second and the third formant on the Bark scale (>3.5).

8. Assessment of publications related to the dissertation

Rosina Kakova has published three papers on the topic of the dissertation. The papers numbered 2. and 3. in the list to a great extent are integrated in the dissertation. The paper “Acoustic Description of Nasal Vowels Helping Students Learning French as a Foreign Language” deserves special attention. In this publication the author proves that she can take on a complete comparison of the vowels in French and Bulgarian. All the papers are written single-handedly.

9. Author’s summary

The author’s summary (in French and in Bulgarian) is written in accordance with the Regulations for the Development of the Academic Staff of the Plovdiv University and represents adequately the content of the dissertation. The self-assessment of the contributions is a fair estimation of the achievements in the dissertation.

10. Critical remarks and recommendations

Whatever the goal of the study is, the French open and close vowels /ε, ɔ; e, o/ and their relation to the Bulgarian vowels /e, o/ deserve more attention, including in the experimental part.

Comparative studies presuppose common set of features and uniform terminology if possible, and this is not always the case. The French vowels are defined as closed, half-closed and so on (p. 31), and Bulgarian vowels as high, mid and low (p. 39). Only the Bulgarian vowels are described with acoustic features as well. I could not find explanation for the terms “monotimbre” and “two-timbre” vowels, used on p. 31.

I find some of the terminological innovations unjustified. „Апертура“ (used repeatedly) is at least understandable, but „трайна артикулация“ (p. 23), „гласни гънки“ (p. 32), „остри гласни“ (p. 35), „гласен триъгълник“ (p. 37) look like mistranslations.

The project UPSID was developed in UCLA, not in Stanford University.

If this study is to be published (which I recommend because of its innovative character) it will have to be edited for punctuation and some minor mistakes.

The shortcomings mentioned above are of technical nature and do not concern the contributions in the dissertation.

11. Recommendations for the future use

The sound files used for some of the spectrograms (f. 31, 33, 35) are too long and the formants cannot be seen clearly. The words used in the acoustic analysis of vowels without perceptual integration are missing. I think it would be beneficial to the reader if for these vowels a third, dif-

ferent from red and blue, color is used in the optimized acoustic-phonetic method. This would make it clear that there is no perceptual integration, but this fact has been objectively established through acoustic analysis.

CONCLUSION

The dissertation contains scientific and applied result that constitute original contribution in science and meet all the requirements of the Law for the Development of Academic Staff in the Republic of Bulgaria (LDASRB), the regulations for the implementation of the LDASRB and the relevant regulations of the Plovdiv University "Paisii Hilendarski".

The dissertation is evidence for the author's extensive theoretical knowledge and practical skills in the chosen field of science, and for her ability and competence to commit scientific research on her own.

In view of the stated above, I give with full conviction my **positive estimation** for the dissertation reviewed here and **propose to the scientific jury to award the educational and scholarly degree "Doctor"** to Rosina Aleksieva Kakova in the field of higher education 2. Humanities, professional field 2.1. Philology, post-graduate program Romance Languages.

28.03.2025 г.

Reviewer:

Prof. Vladimir Zhobov