

REVIEW STATEMENT

by Assoc. Prof. Antoaneta Stefanova Dzhelyova, PhD,
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on the materials submitted
for the acquisition of the educational and scientific degree of *doctor*
in the Sphere of higher education 2. *Humanities*
Area of professional qualification 2.1. *Philology*
Doctoral Programme: *Romance Languages*

Author: Rossina Alexieva Kakova

Dissertation Topic: *Vowels in French and Bulgarian – an Acoustic Description with Regard to the Perceptual Integration of Their Frequency Components.*

Supervisor: Assoc. Prof. Rusi Nikolov Nikolov, PhD (Department of Romance and German Studies, Faculty of Philology, *Paisii Hilendarski University of Plovdiv*)

1. General overview of the submitted materials

Following Order № ПД-22-282 from 06.02.2025 of the Rector of the *Paisii Hilendarski University of Plovdiv (PU)* I have been appointed a member of the scientific jury participating in the defense procedure of a doctoral thesis on the subject *Vowels in French and Bulgarian – an Acoustic Description with Regard to the Perceptual Integration of Their Frequency Components* for the acquisition of the educational and scientific degree of *doctor*, sphere of higher education 2. *Humanities*, area of professional qualification 2.1. *Philology*, Doctoral Programme: *Romance Languages*.

The set of documents submitted on paper and digitally is in accordance with art. 36 (1) of the Rulebook for Development of the Academic Staff of Plovdiv University and comprises the following documents:

1. an application to the Rector of the University of Plovdiv;
2. a Europass CV;
3. preliminary defense minutes from the extended Department meeting;
4. doctoral dissertation abstract;
5. a declaration for originality and authenticity of the attached documents;
6. a reference form concerning the fulfillment of the minimal national requirements;
7. a list of scientific publications on the subject of the doctoral dissertation;
8. a doctoral dissertation;

9. copies of the scientific publications;
10. statement of the research supervisor's opinion.

2. Brief autobiographical data concerning the doctoral candidate

Rossina Alexieva Kakova was born on 12.09.1972. She finished the Language High School in the town of Lovech in 1991. In 1996 she graduated from the *Paisii Hilendarski* University of Plovdiv with a major in Bulgarian and French. In 2018 she obtained a Master's degree in English Language and Teaching Methods at the University of Plovdiv. From 01.03.2020 to 01.03.2023 she was a full-time PhD student at the Department of Romance and German Studies of the Faculty of Philology of the University of Plovdiv.

She has worked as a French teacher at the *Peyo Kracholov Yavorov* Secondary School, *Dobrin Petkov* Secondary School and *Raina Knyaginya* Primary School in Plovdiv.

Since 2014 she has been a senior lecturer of French at the University of Food Technologies in Plovdiv.

3. Relevance of the topic

The chosen topic – creating a model for the acoustic-phonetic description of vowel sounds – has theoretical and applied significance. The focus of the study is on the problematic articulation of front vowels in French when French is studied by Bulgarians. The model enables the correction of pronunciation errors and the realization of control and self-control in the acquisition of new articulation habits. The acoustic-phonetic comparative description of front vowels in French and Bulgarian optimizes the methods of teaching foreign languages and their acquisition in the modern multi-cultural environment. The use of the proposed acoustic-phonetic model is innovative for foreign language teaching.

4. Knowledge of the problem

The subject, aims, objectives and methods are clearly stated. The emphasis is on the vowels in French, with Bulgarian vowels needed only in a comparative aspect. This also determines the corresponding correlation in the theoretical review. The author concisely and purposefully notes the main stages and achievements in the fields of both French and Bulgarian experimental phonetics. The bibliography lists 175 cited sources in French and English and 20 in Bulgarian plus one digital source. The PhD student's focus is on modern methods of phonetic research and methods for teaching French phonetically to foreigners. Different programs of experimental phonetics are presented (Win Pitch, Speech Analyzer, Praat, Speech Filing System, Real-time Spectrum, Real-time Spectrogram). The capabilities of the Speech Analyzer program used in this research and the phonetic module of TREFL – Translation REference Library, designed and created by Assoc. Prof. Rusi Nikolov, research supervisor of the PhD student, are thoroughly discussed.

The main methods of teaching foreign languages are competently commented upon with their advantages and disadvantages depending on various factors: the age at which the training begins, the learners' basic knowledge, the time for acquisition and the stages of mastering the phonetic system, the type of training – oral or written, the learners' motivation, etc.

The PhD student's ability to critically analyse and synthesise information is undeniable.

5. Research methods

The dissertation presents *a comparative analysis* of the unrounded French front vowels [i], [e] and the Bulgarian front vowels [ɪ], [e] in stressed positions based on their articulatory, acoustic and perceptual characteristics. In their acoustic description, *two methods are compared*: 1) the traditional acoustic two-formant method and 2) the innovative three-formant acoustic-phonetic method taking into account the perceptual significance of the third formant. The developed acoustic-phonetic method for the comparative description of vowels is based on auditory and computer acoustic analysis with the phonetic module of TREFL coupled with the Speech Analyzer software system.

The results of the comparison between the two methods are graphically illustrated by the different colour designations in the diagrams and by the data in the tables.

The analysis is based on material extracted from journalists' radio interviews with male speakers and then processed. Both the differences in the frequency of the basic tone in male and female voices and the need for clear pronunciation and compliance with linguistic norms in both languages were taken into account. The monitored speech segments in WAV format are front vowels in strong positions where their differentiation is at its maximum.

6. Characteristics and evaluation of the dissertation and the dissertation contributions

The text of the dissertation has a high informative value; it is presented in the average standard volume of 162 pages including the appendices and the bibliography.

R. Kakova has sound knowledge in the field of acoustic phonetics. The used terms and concepts (spectrum, formant, formant frequency, formant structure, frequency of the fundamental tone (F0), amplitude, duration, timbre, spectrogram) are clearly defined and explained.

The achievements of the classical two-formant model (F1 and F2) are further developed by the experimentally verified acoustic-phonetic model presented in this work. It takes into account the inseparable connection between the acoustic and the corresponding perceptual image of sound. The optimized acoustic-phonetic description places the third formant (F3) at the centre, which accounts for acoustic parameters with perceptual importance in vowel acquisition. The third formant (F3) and lip configuration in French are indicated as a disambiguating feature for front rounded and unrounded French vowels.

The effectiveness of the acoustic-phonetic model is evident precisely when the Bulgarian and French vowels are compared due to acoustic matches of the F1 and F2 formants in the complete absence of a match at the perceptual level.

The parallel use of the phonetic module of the TREFL program with the Speech Analyzer software system guarantees speed and precision of the study.

The model for acoustic vowel description taking into account perceptual integration is an innovative method for acquiring good pronunciation in foreign language learning. The method enables the prediction and correction of vowel pronunciation errors.

R. Kakova's rich professional experience and research skills allow her to convincingly bring out the obvious advantages of acoustic-phonetic modelling and its importance for theoretical and practical phonetics, which is the main aim of the presented work.

7. Assessment of the publications and personal contributions of the doctoral candidate

Two of the listed publications are clearly related to the topic of the PhD thesis, which is their natural continuation. The third article (*An Acoustic Description of Nasal Vowels as an Aid for Students Learning French as a Foreign Language*) broadens the PhD student's research perspective.

The realization of a successful research experiment with the help of mastered modern technologies and the possibility of applying the innovative acoustic-phonetic model to the study of French as a foreign language is a contribution to the field of phonetics. It can, moreover, be seen as part of future larger projects.

8. Dissertation Abstract

The abstract accurately summarises the content of the dissertation and conforms to the standards.

A check for plagiarism in the text of the dissertation and in the submitted articles did not reveal any signs of plagiarism.

9. Recommendations for future use of the dissertation contributions and results

When the text is published, it is necessary to correct the mistakes regarding the use of commas, dashes and articles with masculine singular nouns.

I recommend that upon publication the text be expanded to include the research of I. Gaydazhieva and N. Chocheva, who have worked with the SARP5 program in acoustic analysis and modelling of Bulgarian vowels and French vowels (see *Paisiy Hilendarsky University of Plovdiv – Bulgaria Research Papers*, Vol. 49, Book 1, Part A, 2011, pp. 406 – 417 and *Paisiy Hilendarsky University of Plovdiv – Bulgaria Research Papers*, Vol. 50, Book 1, Part B, 2012, pp. 179 – 186, etc.).

The section on the evolution of technology tools in Chapter Two, the reflections on artificial intelligence and the quotes by A. Turing from his book *Computing Machinery and Intelligence* and by A. Samuel have no direct relevance to the topic at hand (pp. 50 – 51) and are to some extent self-serving. In my opinion, it is necessary to shorten them as much as possible.

In view of the literary norm of the contemporary Bulgarian literary language, I think that the term *хармонични* ‘harmonic’, given as a variant of *обертони* ‘overtones’, is not appropriate.

CONCLUSION

In the presented work, the set tasks and objectives are successfully fulfilled. The dissertation exhibits the necessary scholarly merits – solid theoretical preparation of the author, ability to conduct a scientific experiment using modern technologies and to create a product of practical value. The dissertation meets all the requirements of the Law for the Development of Academic Staff in the Republic of Bulgaria (LDASRB), the Rulebook for the Application of LDASRB and the corresponding Rulebook of *Paisii Hilendarski* University of Plovdiv.

Due to the aforesaid, I hereby confidently give my **positive assessment** of the conducted research presented in Rossina Kakova’s dissertation thesis *Vowels in French and Bulgarian – an Acoustic Description with Regard to the Perceptual Integration of Their Frequency Components* and I recommend to the honourable scientific jury **to award Rossina Alexieva Kakova the educational and scientific degree “doctor”** in the sphere of higher education 2. *Humanities*, area of professional qualification 2.1. *Philology*, doctoral programme: *Romance Languages*.

31.04.2025

Plovdiv

Reviewer:

(Assoc. Prof. A. Dzhelyova, PhD)