

ASSESSMENT REPORT

Assessor: **Professor Katya Georgieva Stoycheva, PhD**

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Professional area: 3.2. Psychology

Evaluation of the doctoral dissertation entitled “*Critical conditions for observing the inverse base-rate effect*” submitted under the procedure for awarding the scientific degree "doctor" in the professional area: 3.2. Psychology

Doctoral candidate: **Yolina Atanasova Petrova**

The questions to be answered by this assessment report are discussed below.

1. Significance of the researched problem in scientific and scientific-applied terms

Yolina Petrova's dissertation explores an interesting problem related to how we organize and use our knowledge. This problem is considered in the context of several scientific questions related to learning and categorization processes. Its practical relevance is related to the way in which people use some information (about the frequency of occurrence of a certain category) in making decisions. This is especially important to the field of medicine, for example, regarding the way in which the diagnostics considers the frequency of diseases' occurrence.

The relevance of the problem is demonstrated in the light of the scientific debate aiming to understand the relationship between how information is learned and how it will be used. The two alternative explanations that make up the theoretical framework of the dissertation are well outlined. The discrepancy between empirical data and theoretical propositions stimulated the conduct of the present research.

2. Justification of the objectives and tasks in the dissertation work

The objectives of Yolina Petrova's dissertation are well grounded. They are supported by convincing theoretical arguments (the content of the current debate in the scientific field) and other arguments of an empirical nature (lack of sufficient results to propose explanation of the open questions). The author uses a variety of scientific data that motivate the need to investigate this problem; her propositions are clear stated and well-supported.

The research tasks adequately operationalize the aim of the study to compare the main and alternative explanations of the phenomenon called inverse base-rate effect, and its manifestations are systematically investigated under different experimental conditions. The choice of the research questions is supported by the points of discussion in the scientific field. The connection between the experiments is explained. The inclusion of new conditions in the experiments is well-substantiated with existing data in favor of the various explanations.

3. Correspondence between the chosen research methodology and the adopted objectives of the dissertation work

The dissertation presents a well-organized and coherently structured research. The text reveals a very good knowledge of the subject area and of the possibilities and limitations of the experimental settings. The conducted six experiments and one computer simulation are characterized by internal consistency. The results are presented clearly and their synthesis is convincing.

The work of Yolina Petrova shows a good command of the scientific methods and knowledge and witnesses the development of original approaches. I highly appreciate the balanced rendition of theoretical and empirical material, the systematic realization of the research tasks and the consistency of the analyzes performed, the clear presentation of the results and the quality of the summaries, and the systematic connection of the findings with the explanatory models.

4. Scientific and applied scientific contributions of the dissertation

I accept the methodological, empirical, and theoretical contributions made by the doctoral student in the dissertation work. A complex and efficient methodology has been successfully applied. Thus, the impact of different experimental conditions on the inverse base-rate effect was systematically examined. Original experiments were conducted that tested several conditions for the first time, used specially designed stimulus material, and included new, complementary procedures such as measuring participants' representations of learned categories.

The chosen methodology allows Yolina Petrova to generate new high-quality data in a field of empirical knowledge, where the available data are unclear and do not allow reliable conclusions. I would like to underline the inventiveness in using new technologies such as GPT-3 in a computer simulation aimed at verifying whether learning is a critical factor in observing the inverse base-rate effect.

5. Evaluation of the publications from the dissertation work: number, nature of the editions in which they were published

Since 2018 the doctoral student has co-authored five publications in English-language peer-reviewed scientific journals and collections. One of them is an article in *Frontiers in Psychology* - an indexed and refereed scientific journal.

The number and nature of Yolina Petrova's publications meet the minimum national requirements under the RSASR and PPZRASRB.

6. Citation by other authors, reviews in the scientific press, etc.

The high quality of the doctoral student's research work is also reflected in the interest in and recognition of her work. According to the publisher of the *International Journal of Computer and Information Engineering*, the two articles co-authored by Yolina Petrova have been downloaded 665 times since their publication. The publication in *Frontiers in Psychology* has been viewed and/or downloaded 3951 times, which is more than 68% of publications in *Frontiers*.

I also identified two citations of the doctoral student's publications in an international peer-reviewed journal.

Jolina Petrova's participation in the *20th International Conference on Cognitive Modeling (Barcelona, Spain, 2018)* was prized as the best article and presentation.

7. Recommendations and comments

The dissertation work of Yolina Petrova is of very high quality. In this sense, my comments outline directions for the further development of the work and its contributions. I recommend the doctoral student to elaborate the theoretical implications of the conducted research. Pointing to their contribution to the current scientific debate in the field is justified, but this contribution can and should be elaborated and explained more fully. The same applies to the conclusions that can be

drawn from the research findings - what promising lines of future research they outline, and in what areas of practice they could be implemented.

CONCLUSION

The thesis submitted by Yolina Petrova perfectly meets all the requirements for a doctoral dissertation for obtaining the scientific degree "doctor." Based on the merits of the research work, I give a **positive evaluation** to the doctoral thesis of Yolina Atanasova Petrova and propose that she **be awarded the scientific degree "doctor" in professional direction 3.2. Psychology.**

Sofia, 15 August 2023

Signature: *Professor Katya Stoycheva, PhD*