REVIEW

from Assoc. Prof. Milena Mutafchieva, PhD

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of a dissertation for obtaining of PhD in the professional field 3. 2 . Psychology,

scientific specialty General Psychology

Dissertation topic: „ Critical conditions for observing the inverse base-rate effect"

PhD student: Yolina Atanasova Petrova

Supervisor: Assoc. Prof. Penka Hristova, PhD

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

The dissertation discusses an interesting phenomenon in the field of category formation, namely the inverse base-rate effect (*IBRE*), which poses a challenge to classical theories of categorization. The scientific significance of the study is undisputed because it tests the existence of the phenomenon in new settings such as decision-making tasks and challenges classical theoretical explanations of the effect such as association-based approach and rule-based approach. The scientific-applied contributions of the study lie in the fact that discovering the mechanisms underlying such interesting effects in category formation and decision-making would help in understanding one of the interesting biases in medical diagnosis.

This dissertation is 97 pages long and is structured into an introduction, eleven chapters, a conclusion, and appendices. The literature used comprises 120 sources, all in English. Although the text is not very long (which I think is even an advantage), I would like to note that it is much focused, clear, discusses theoretical and empirical challenges and explanations of the *IBRE*, and describes a remarkable number of six experiments and one simulation. The correct citation of sources in the text itself is excellent, as is the lack of errors. The entire text is written at a highly professional level.

2. Justification of the goals and tasks in the dissertation

The aims of the dissertation are 1) to systematically investigate the role of the learning process in the occurrence of the *IBRE* under different conditions and the extent to which this effect is observed solely in the learning phase; 2) to explore alternative explanations of the effect; 3) and to test the validity of the dominant theoretical explanation in the literature (based on the idea of the existence of asymmetry in representations) in conditions where categories are learned symmetrically.

I believe that Yolina Petrova has excellently justified the aims and objectives of the research and they logically follow from the critical literature review.

3. Correspondence between the chosen methodology and research methodology and the set goal and tasks of the dissertation

The chosen methodology is fully suitable for the objectives of the thesis. It is a combination of classical experiments, qualitative research (analysis of participants' verbal reports) and computer simulation and its choice clearly shows the high methodological culture of Yolina Petrova.

4. Scientific and scientific-applied contributions of the dissertation

The scientific and applied contributions of the dissertation are divided into three main groups - methodological, empirical and theoretical. They are clearly described and justified. I would like to highlight only some of them that made an impression on me, namely:

- Evidence on the presence of the effect in the formation of symmetric representations. These data cannot be accounted for by the dominant theoretical explanation of the effect via associative learning.
- Evidence that the effect is not specific and does not occur only in the learning phase. These results were confirmed by computer simulation with the GPT-3 language model.
- Evidence that the effect is not specific to classification tasks, but is also observed in inference learning tasks.

5. Evaluation of dissertation publications

There are three publications on the topic of the thesis, all in English and co-authored. Two of the publications are *SCOPUS* refereed. It is a very good achievement that one of the publications is in a journal with a good impact factor (*Frontiers of Psychology*).

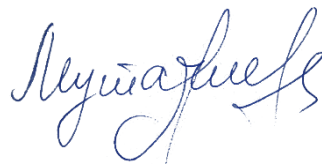### 6. Opinions, recommendations and notes

The abstract adequately reflects the content of the dissertation. I agree with the contributions described in the dissertation.

My assessment of the quality of the dissertation is high. I believe that Yolina Petrova has found and presented an interesting discussion in the field of categorization and has managed to verify the presence of the *IBRE* in multiple conditions and tasks using the same stimuli, which allows for the comparison of results from different experiments. Additionally, the objectives and hypotheses of the study have been tested with an extremely well thought out methodology, making the conclusions more impressive. Yolina Petrova's research results question the dominant explanations of the *IBRE* and raise a discussion of its alternative explanations on a global level.

I believe that the content of this dissertation has the merit to be published in a journal indexed in world databases.

In conclusion, I believe that the dissertation entitled *"Critical conditions for observing the inverse base-rate effect"* meets the requirements formulated in the Development of Academic Staff of the Republic of Bulgaria Act and the Regulation on the Development of Academic Staff of the NBU. The text is at a very high professional level and reflects an interesting from a scientific and practical point of view problem of the conditions under which the *IBRE* is observed. The PhD student shows excellent abilities to make a thorough theoretical review, to plan and carry out an independent research, to analyse the data with a wide range of appropriate methods, to present and summarize the results adequately. The study has clearly and correctly outlined contributions.

Referring to these arguments, I can recommend with full conviction and justification to the members of the esteemed jury to award to Yolina Atanasova Petrova the educational and scientific degree "Doctor" in the professional field 3.2. Psychology, scientific specialty General Psychology.

Sofia   Assoc. Prof. Milena Mutafchieva, PhD

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