

Review of: "14-channel neurofeedback with Auto Train Brain improves the left lateralization of the brain in dyslexia: A pilot study"

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Potential competing interests: No potential competing interests to declare.

14-channel neurofeedback with Auto Train Brain improves the left lateralization of the brain in dyslexia: A pilot study.

I read the study with interest. While I am positive with regard to the goal of the study, I have some concerns. I have found myself with some remarks after reading the paper. I will outline this in more detail below. In general, the writing of the article can be considered acceptable according to **English grammar, style, and syntax**.

Regarding the Abstract, the author states the hypothesis and method used and omits background information, a literature review, and a detailed description of methods as it turns out to be suitable. I wonder how the study results prove an improvement in cognition. I don't see that cognition has been tested. It proves an increase in the variance of the gamma band entropy which does not automatically prove an improvement in cognition. He/she identifies the major results from the results section. The abstract conveys only the essential information. No extra words and phrases.

Concerning the Introduction, the author excessively focuses his theoretical framework on knowledge of dyslexia established by the literature without direct relation to the study carried out. Information deemed unnecessary must be little. In any case, the author should focus on ... "Previous research investigated the long-term effects of 14-channel neurofeedback" ... "The development of the brain and left lateralization of the brain is not completed in dyslexia" "functional asymmetry" ... interhemispheric connectivity, and so on and supports it with references. It would be more enlightening and useful to contribute existing knowledge about neurofeedback, neurofeedback in relation to dyslexia, the meaning of brain waves, particularly slow waves, and support it with references. The hypothesis tested is clear.

Regarding Material & Methods, the author describes the experimental design clearly, including the variables measured. We can start by looking quickly at the figures to determine if the manuscript is worth considering. He/she identifies the source of any specific type of equipment, which is critical to the success of the experiment. The sample size can be considered acceptable as it is a pilot study. We did not observe a significant biased sample to rule out scientific flaws in the study. Experimental design is acceptable. Procedures are described. Ordinary statistical methods are used. Details are sufficient to repeat the results. This section mentions the approval of the study by the ethics committee and the informed consent of the subjects.

Concerning Results, the report presents those that are relevant to the question presented in the Introduction. The data are presented in the form of text and figures. They are accurate and consistent throughout the manuscript. The report of p values is highly desirable, regardless of the R2 value. Figures appear consecutively in the same sequence they are first mentioned in the text. They could stand on their own, separate from the text.

As for the Discussion, it begins by re-stating the hypothesis you were testing and answering the questions posed in the introduction. It supports the answers with the results. I don't see clearly how the results relate to expectations and to the literature, clearly stating why they are acceptable and how they are consistent or fit in with previously published knowledge on the topic. The sequencing of providing this information is important; first state the answer, then the relevant results, then cite the work of others. The author defends the answers, if necessary, by explaining both why the answer is satisfactory and why others are not. Only by giving both sides to the argument can you make your explanation convincing. It is important to discuss and evaluate conflicting explanations of the results. This is the sign of a good discussion. I gather there were no unexpected findings. It is relevant to discuss any unexpected findings. The author identifies limitations and weaknesses and comment on the relative importance of these to the interpretation of the results and how they may affect the validity of the findings. It should be made clear that the study does not prove cognitive outcomes or improvement in dyslexia. The study tests electrophysiological effects. Provide recommendations (no more than two) for further research. Explain how the results and conclusions of this study are important and how they influence our knowledge or understanding of the problem being examined. Be sure to provide alternative explanations. Sometimes it is not clear what is evidence and what speculation.

Concerning Conclusions, I don't see a conclusion paragraph. This statement conveys enough information to cause the reader to carry on reading State your conclusions clearly and concisely. Be brief and stick to the point. Explain why your study is important to the reader. You should instill in the reader a sense of relevance. Prove to the reader, and the scientific community, that your findings are worthy of note. This means setting your

paper in the context of previous work. The implications of your findings should be discussed within a realistic framework. If your hypothesis is similar to previous papers, you must establish why your study and your results are original. By the time you reach the end of your conclusion, there should be no question in the reader's mind as to the validity of your claims. Do not introduce new arguments, evidence, new ideas, or information unrelated to the topic. Do not include evidence (quotations, statistics, etc.) that should be in the body of the paper. Strive for accuracy and originality in your conclusion.

As for References, I allow myself to suggest the consideration of the following references:

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*Terrasa, J.L.; Barros-Loscertales, A.; Montoya, P. & Muñoz, M. A. (2020). «Self-Regulation of SMR Power Led to

an Enhancement of Functional Connectivity of Somatomotor Cortices in Fibromyalgia Patients». *Frontiers in Neuroscience*. 14:236. doi: 10.3389/fnins.2020.00236

Finally, I think the study is to be commended because it promotes new studies in an area with many uncertainties.

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