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Toward transforming neuropsychology into the “hard” science

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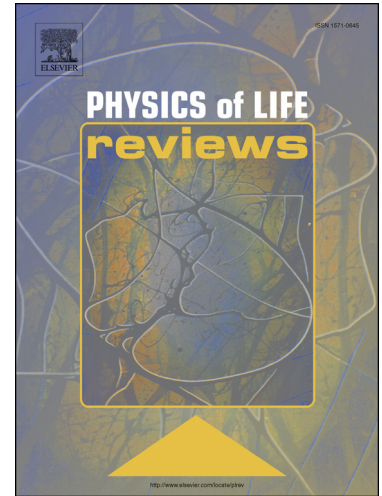
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## Comment

Toward transforming neuropsychology into the “hard” science  
 Comments on ““ Physics of mind: experimental  
 confirmations of theoretical predictions”  
 by Felix, Schoeller, Leonid Perlovsky, Dmitry Arseniev

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In the target paper [12] the authors raise fundamental issues with transforming psychology into a “hard” science. They start with defining the basic notions related to the functioning of the mind. They follow the line of the great scientists of the past century. Einstein (in his obituary for Mach) pointed out the necessity of clear notions for giving psychology a status equal to physics [1]. Winner and von Neumann demanded the same at the gathering with top neurologists and psychologists while discussing the possibility of interdisciplinary work. In both cases the advice was ignored. Perhaps the attempt can now succeed. The reason for my optimism is that the past advice was passive, i. e. the physicists and mathematicians indicated the problem which has to be resolved by the psychologists before the common work can begin. The history of relations between soft and hard sciences, namely, between geology, medicine, and psychology on one side, and mathematics and computer science on the other side, demonstrates very little success. The main cause of the failures was the scenario of interaction between sides: the former defines the problem, the model, and the parameters, and the latter applies the mathematics or computer programs. First of all it turns out that the models and notions are mostly ill-defined and can't be explained either to the mathematician or to the computer. When it occasionally happens that the resulting product (for instant, the diagnostic decision rule) comes to the working place (to the hospital), it always turns out that the chosen problem makes no sense, the parameters are not complete, and the learning data are biased. The correct approach for achievement of the goal (to bring psychology closer to the standards of physics) is to involve mathematicians, and programmers in psychological researches. They have to begin analyzing psychological problems, reformulating psychological "laws" and finding new ones according to the high standards of "hard" science. The article shows that the authors are not only skilled in mathematics and physics, but also deeply understand psychological problems, and this gives hope for real progress in the transformation of psychology.

The paper introduces a small number of well-defined principles. These initial principles include instincts, concepts, emotions, behavior, perception, and cognitive hierarchy.

“**Instincts** are mechanisms of survival controlling for vital parameters (e.g., temperature, energy, sleep, reproduction)”. They define often the unconscious activity of the mind.

“**Concepts** are a mechanism allowing humans to understand”. They define often the conscious activity of the mind.

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