

## 1-EDITORIAL

## Experimental model. Historic and conceptual revision<sup>1</sup>

Lydia Masako Ferreira<sup>2</sup>  
Luiz Roberto Kobuti Ferreira<sup>3</sup>

The qualification of the new knowledge is one of the oldest problems in experimental science. For this reason, one of Science's priorities has been the search for experimental model, in order to produce knowledge in a more standardized way.

The importance of inferring a knowledge generation's model has derived from the need to exactly understand the mechanisms that generate these data. The greatest advantage of the experimental model is to allow understanding predictions and controlling of the results and the method and, at same time, keep the bioethical principles concerning the *ánima nobile* .”

To define Experimental Model has been controversial in the different areas. The difficulties in its definition comes from each area complexity and from the fact that a term demand other terms that are ambiguous or used in a different sense.

Individually, each definition is not sufficient to clearly describe its meaning. Thus, in general, one definition comprehend a little facet inside its own approach.

Historically, the term *modulus* (from latin, derived from *modus* ,”little measure) is used since 23 B.C. throughout the eighteenth century. From the eleventh to fourteenth century, the used term was *standard* and *modul* ;”from the fourteenth to sixteenth century, *measure* ” and from then on, *model* .”

From the seventh to nineteenth century, the model definition were mainly aimed at abstract models. For example, the philosopher Blaise Pascal, around 1650, described model as an act of spirit in which we can inspire ourselves (*ouvrage d'ésprit dont on peut s'inspirer*). In the eighteenth century, the French encyclopedia, dated 1765 defines model as a generic sense, an original pattern, proposed to be copied or imitated by anyone. Horst Koller, in 1969, defined model as a simplified representation of reality derived only from abstraction and Brockhaus, in 1971, defined it, as a pattern, ideal, reproduction or graphic of things (enlarged, reduced or at natural size). At that time, model was a simplified representation of a part of reality, that could be material or idealistic, concrete or abstract and would describe a future or present state.<sup>1</sup>

The English language dictionaires describe model as a three dimensions representation in a reduced scale; a simplified description of a system; figure to be reproduced in any material; specific design or style of a structure or convenience; exemplary person, thing or ideal; example of person or thing to be copied or imitated; person to pose or be shown; its piece or copy.<sup>2</sup>

The profusion of meanings for model makes it difficult to conciliate and specify the term. The Oxford Dictionary<sup>2</sup> inscribes about 40 meanings (with subsections). William de Humboldt e Ludwig Wittgenstein justified this amount because, for them, the language dwells in its use.

On the other hand, Wolfgang Brezinska<sup>3</sup>, Pedagogy teacher of Konstanz University, accomplished a 20 pages extensive work about 15 meanings of model, concluding that only one meaning was most useful to pedagogy: *teaching material for illustration or exposition of an original* .”

1. This research was developed at UNIFESP-EPM

2. Chairwoman and Head of Plastic Surgery Division - UNIFESP-EPM

3. Student of Medicine - FMUSP

Historically, the importance of model has been stressed . In 1868, the pragmatism founder, Charles Sanders Peirce, conceived: "We are not able to think without symbols ." This theory of symbols also became a model of theory. Percy W. Bridgman, em 1927, wrote in his famous book *The Modern Physics Logic* : " I believe that model is an useful and inevitable thinking tool, that allow us to think about the non-familiar starting from the familiar ." Em 1949, Karl W. Deutsch<sup>4,5,6</sup>, political and social scientist, formulated: " Men think in terms of model . "

Herbert Stachowiak, in 1973, mathematician and philosopher, went further and postulated: " All cognition is cognition in models and for models " and Christian Wissel, in 1989, declared: " The human spirit is not able to think in any way but in models . "

In every case, the models are analyzed concerning to its pertinence. That is, if they are capable of representing the aspects of the determined empirical process and present, with sufficient precision, so as to satisfy the purpose. The correspondence or lack of correlation between a model and reality must be established.

In 1969, a russian philosopher, Viltor A Stoff described five functions for model related to Science: experimental research; something specific of reflection; abstraction of a specific thing; scientific interpretation and explication; experiments. And, finally, Stachowiak, in 1973, distinguished the scientific models between: didactical model (demonstrational); experimental model (or heuristic model) for research and exam of hypothesis; theoretical model for knowledge transmission and operational model.<sup>1</sup>

Since then, the literature concerning the topic has been scant. There are not recent articles that deal with more modern model concepts, such as, in the psychodynamics, through archetypes, and in the neurolinguistic area, through paradigms.

In Portuguese language there are many Health area applicable definitions of model described in the dictionaires: " Figure produced in clay, wax or gypsum, destined to be reproduced in stone, marble or bronze (rubric: sculpture); three dimensional reproduction, enlarged or reduced, of any real thing, used as didactic appeal (e.g. human body parts, universe...); logical system constructed on basis of direct observation accessible data, that tries to describe and explain the linguistic system functioning, inclusively its unapproachable aspects through direct observation . " " Drawing or image that represents what is being reproduced, drawn, painted or sculptured ; " " everything that serves to be imitated . " " Object destined to be reproduced by imitation ; " " little scale reproduction of something that will be executed in large ; " " rifold ; " " that which serves as an example or norm . "

And the experimental definition have been described in the Portuguese language dictionaires as " related to experience; founded or based on experience; empirical; only derived from experience; that uses experimentation (research, study, method, ...) ." " Related to experience; experimental ." " Experience (from latin *experientia* , from the verb *experiri* , " experiment ); " as " act or effect of experimenting; experiment ; " " life practice ; " " proof, demonstration, attempt, assay . "

Independently of area and several definitions, the meaning of " Experimental Model , " which expresses its functional and descriptive form, remains being the 1973 Stachowiak s, which is the heuristic model, that is, which defines as any example that uses the analytical method for research and hypothesis inquiry.

## References

1. Mueller Science. The concept of model: Definitions and types. Available from: URL: <http://www.muellerscience.com/ENGLISH/Theconceptofmodel.definitions.htm> Accessed on June 15, 2003.
2. The Oxford Dictionary and Thesaurus. 3<sup>rd</sup> ed. New York: Oxford University Press 1996. Model; p. 960.
3. Brezinka W. Modelle in den Erziehungstheorien. Zeitschrift fur Padagogik 1984; 30:834-58.
4. Deutsch KW. Some notes on research on the role of models in the natural and social sciences. In: Deutsch KW. Synthese. Dordrecht, Holland: D. Reidel Publishing Company. 1948-1949, p 506-33.
5. Deutsch KW. Mecanism, organism and society. Some models in natural and social sicente. Philosophy of Science 1951(reprint 1967); 18:230-52.
6. Deutsch KW. Análise de Modelos de Comunicação e do Controle Político. In: Deutsch KW. Os Nervos do Governo. Rio de Janeiro. Edições Bloch 1969; p 27-48.
7. Dicionário Houaiss da língua portuguesa. 1<sup>a</sup>ed. Rio de Janeiro: Ed.Objetiva Ltda; 2001. Modelo; p. 1941.
8. Michaelis Moderno Dicionário da Língua Portuguesa. Cia. Melhoramentos de São Paulo. 2000. Modelo; p. 410.
9. Ferreira BH. Novo Dicionário da Língua Portuguesa. 11<sup>a</sup> edição. Rio de Janeiro: Editora Nova Fronteira; 1975. Modelo; p.934.
10. Dicionário Houaiss da língua portuguesa. 1<sup>a</sup>ed. Rio de Janeiro: Ed.Objetiva Ltda; 2001. Experimental; p. 1287
11. Ferreira BH. Novo Dicionário da Língua Portuguesa. 11<sup>a</sup> edição. Rio de Janeiro: Editora Nova Fronteira; 1975. Experimental; p. 599.

### Correspondence:

Lydia Masako Ferreira MD, PhD  
UNIFESP-EPM, Plastic Surgery Division, Surgery Division  
Rua Napoleão de Barros, 715, 4<sup>o</sup> andar  
04024-900 São Paulo SP  
Tel: (11)557604118 FAX: (11) 55716579  
sandra.dcir@epm.br lydia.dcir@epm.br