

# The semiotics of models

Winfried Nöth

Programa de Estudos Pós-Graduados em  
Tecnologias da Inteligência e Design Digital  
Pontifícia Universidade Católica de São Paulo  
Rua Caio Prado, 102 – Consolação  
CEP 01303-000 São Paulo, Brazil  
e-mail: wnoth@pucsp.br

**Abstract.** The paper sheds light on the concept of model in ordinary language and in scientific discourse from the perspective of C. S. Peirce's semiotics. It proposes a general Peircean framework for the definition of models of all kinds, including mental models. A survey of definitions of scientific models that have been influential in the philosophy of science and of the typologies proposed in this context is given. The author criticizes the heterogeneity of the criteria applied in these typologies and the lack of a semiotic foundation in typological distinctions between formal, symbolic, theoretical, metaphorical, and iconic models, among others. The paper argues that the application of Peirce's subdivision of signs into the trichotomies of the sign itself, its object, and its interpretant can offer a deeper understanding of the nature of models. Semiotic topics in the focus of the paper are (1) the distinction between models as signs and (mental) models as the interpretants of signs; (2) models considered as a type (or legisign) and models considered as tokens (or replicas) of a type; (3) the iconicity of models, including diagrammatic and metaphorical icons; (4) the contribution of indices and symbols to the informativity of models; and (5) the rhetorical qualities of models in scientific discourse. The paper argues in conclusion that informative models are hybrid signs in which a diagram incorporates indices and symbols in a rhetorically efficient way.

**Key words:** model; diagram; metaphor; icon; legisign; type; token; C. S. Peirce

Concepts such as 'representation', 'likeness', 'icon', 'metaphor', or 'symbol' in the diverse descriptions of models in general and scientific models in particular are key notions of Peirce's semiotics, but few philosophers of science have acknowledged their debt to Peircean semiotics. Max Black mentions Peirce only briefly in *Models and Metaphors* (1962), restricting his reference to Peirce's concept of icon in its most rudimentary