

# Scientific Theories, Models, and the Semantic Approach

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## Abstract

According to the semantic view, a theory is characterized by a class of models. In this paper, we examine critically some of the assumptions that underlie this approach. First, we recall that models are models of something. Thus we cannot leave completely aside the axiomatization of the theories under consideration, nor can we ignore the metamathematics used to elaborate these models, for changes in the metamathematics often impose restrictions on the resulting models. Second, based on a parallel between van Fraassen's modal interpretation of quantum mechanics and Skolem's relativism regarding set-theoretic concepts, we introduce a distinction between relative and absolute concepts in the context of the models of a scientific theory. And we discuss the significance of that distinction. Finally, by focusing on contemporary particle physics, we raise the question: since there is no general accepted unification of the parts of the standard model (namely, QED and QCD), we have no theory, in the usual sense of the term. This poses a difficulty: if there is no theory, how can we speak of its models? What are the latter models of? We conclude by noting that it is unclear that the semantic view can be applied to contemporary physical theories.

**Keywords:** semantic view, Skolem's paradox, modal interpretation, theories, particle physics

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