

Physics and the Absolute Conception

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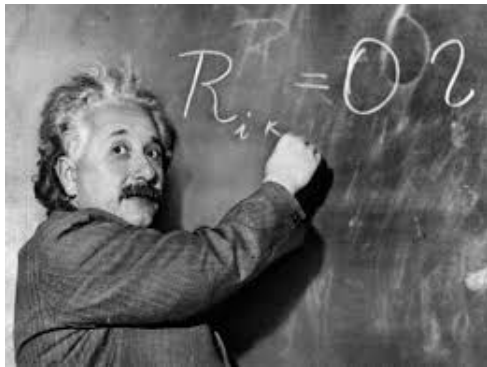
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September 6, 2019

- Physics is held up as the paradigm of objective knowledge
 - ① In public discourse
 - ② In analytic metaphysics and ethics
- Objectivity should be a concretely implementable intellectual virtue
- Objectivity is a norm for choice of theory and/or research program
- Two pictures of objectivity
 - ① Einstein: absolute conception, god's eye view
 - ② Bohr: unambiguous communication

Outline

- 1 Einstein's divine aspiration
- 2 Bohr on objective description
- 3 Who is the realist about quantum theory?



“I want to know God’s thoughts, the rest are details.”

Bernard Williams: the absolute conception

“What God has given us, according to Descartes, is an insight into the nature of the world as it seems to God, and the world as it seems to God must be the world as it really is.”

“... a conception of reality as it is independently of our thought, and to which all representations of reality can be related.”

“... there must be some coherent way of understanding why these representations differ, and how they are related to one another.”



North Atlantic Metaphysical Madness theory without convention



$$T_1 \quad \forall x \exists y Rxy$$

$$T_2 \quad \forall y \exists x Rxy$$

$$T^+ \quad \text{there is a serial relation}$$

coordinate free description

science liberated from language

“The semantic view of theories makes language irrelevant to the subject”
(Bas van Fraassen)

“In our discussion, a model is not such an interpretation [i.e., not an Σ -structure], matching statements to a set of objects which bear certain relations among themselves, but the set of objects itself.” (Lisa Lloyd)

$$\{\{a, b, \langle a, a \rangle\}, \{\langle a, a \rangle\}\}$$

Summary: the Einstein view of objectivity

- 1 The absolute conception (Williams) / view from nowhere (Nagel) / god's eye view (Putnam)
- 2 Theory without conventions
- 3 Spacetime description without coordinates
- 4 Theory without language
No need for coordinative definitions
- 5 Perfectly natural properties and relations (Lewis, Sider)
Don't depend on our interests (as Nelson Goodman suggested)

Summary: why the Einstein view fails

In the limit, objective description would be:

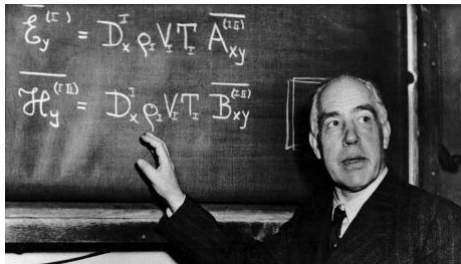
- ① empirically ambiguous (description without a describer)
- ② impossible in principle (speech without a language)

And yet, objectivity is a concrete intellectual virtue

Proposal: objectivity adds form to truth, where the substance is provided by our individual subjective perspectives

Proposal: objectivity is a virtue, and like other virtues, one has to be wary about maximization

objectivity as univocity



Bohr “Every scientist is constantly confronted with the problem of objective description of experience by which we mean **unambiguous communication**.”

Bohr: “We must strive continually to extend the scope of our description, but in such a way that our messages do not thereby lose their **objective or unambiguous** character.”

objectivity as univocity

Bohr: "...the account of the experimental arrangement and of the results of the observations must be expressed in **unambiguous language** with suitable application of the terminology of classical physics."

Bohr: "...our task must be to account for such experience in a manner independent of individual subjective judgment and therefore objective in the sense that it can be **unambiguously communicated in ordinary human language.**"

objectivity via intertranslatability

Bohr: “The relativistic description is also **objective** inasmuch as every observer can deduce by calculation what the other observer will perceive or has perceived. For all that, we have come a long way from the classical ideal of objective descriptions.”

⇒ the formalism of relativity theory doesn't provide a system of subject-free truths, but a scheme for coordinating subject-relative truths

objectivity via intertranslatability

When are two first-order theories T_1 and T_2 equivalent?

- ① (Montague) If the relation symbols of T_1 can be reinterpreted as relations in T_2 , and the relation symbols of T_2 can be reinterpreted as relations in T_1 such that ...
- ② (Morita) If the quantifier phrases of T_1 can be reinterpreted as ...

⇒ we express how we understand our theories through the claims of equivalence we accept

⇒ we do *not* base claims of equivalence on some theory (which is supposed not to require any interpretation)

claims of equivalence between theories cannot be substantiated by a third theory

- A third theory wouldn't help
 - ▶ would be yet another competitor
 - ▶ infinite regress of meta-questions
- We don't need a third theory
 - ▶ we already have intuitions about equivalence
 - ▶ empirical reality is our friend

Summary: what kind of objectivity can we aspire to?

- ① A good scientific theory enables coordination of diverse subjectivities
- ② Coordination is enabled by:
 - ① the existence of common experiential reference points
 - ② a subject's being able to make an object of itself
- ③ We are ineliminably subjective

The old new story

The Copenhagen interpretation of quantum theory is bad because it involves “observer” or “measurement” as primitives.

The many-worlds interpretation is good because it says what the universe would be like, even if nobody was there to observe it.

The new old story

The many-worlds interpretation is bad if it says nothing more than that the world is like some mathematical model.

The Copenhagen interpretation is good because it gives rules that subjects can follow for using mathematical models to say true things about the concrete reality that they exist in. (cf. Richard Healey)

Lessons

- 1 The search for the absolute conception is a fool's errand
- 2 An absolute conception would be empirically ambiguous
 - "The world is modelled by the number 42!"
 - "The world is a four-dimensional Lorentzian manifold!"
 - "The world is a wavefunction!"
- 3 The phrase "objective description" is misleadingly used for a *scheme* that coordinates various subjective viewpoints
- 4 Such a scheme provides a description of reality only by means of a *realization* in a subjective viewpoint