Epistemic and semantic commitments of foundational theories
project synopsis

Project participants:

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- Bartosz Wcisło, Polish Academy of Science

Research project objectives

The principal objective of the project is to provide a deep conceptual and formal analysis of the notion of commitments of a foundational theory, where the latter expression stands for a theory that can develop a significant portion of mathematics. The notion of a commitment is essentially involved in many discussions in contemporary formal philosophy. The project focuses on the following two types of commitments.

- Epistemic commitments of a theory *Th*: sentences of the language of *Th* (possibly with the truth predicate added) that should be accepted once we accept the axioms and the inference rules of *Th*.
- Semantic commitments of a theory *Th*: restrictions on possible interpretations of *Th* imposed by the axioms and the deductive machinery of *Th*.

A typical example of an epistemic commitment of a theory *Th* is the consistency statement: it has been claimed that when you accept *Th*, you should also accept that *Th* is consistent, even though by Gödel's second incompleteness theorem, the consistency of *Th* cannot be proved in *Th* itself. Another example is the statement that all theorems of *Th* are true.

Semantic commitments differ from the epistemic ones in that we do not require that they can be described in the language of *Th* (even enriched with the truth predicate). A description of such commitments involves explaining how our specific choice of axioms restricts the class of possible interpretations (or models) of *Th*.

The project consists of the following main three tasks.

- *Task 1:* Providing a general characterisation of the scope and the source of epistemic commitments.
- *Task 2:* Analyzing the truth axioms and the epistemic commitments they generate.
- *Task 3:* Analyzing the truth axioms and the semantic commitments they generate.

Research project methodology

This is an interdisciplinary research project, engaging both philosophy and formal disciplines. Accordingly, apart from the methods of philosophical analysis, the techniques of modern logic will be extensively employed. In particular, the tools and techniques of arithmetic, model theory, set theory, recursion theory, and proof theory will be of crucial importance.

Expected impact of the research project

The results of the project will be important for the international communities of philosophers, logicians and researchers working on the foundations of mathematics. Commitments of theories have been central to many philosophical discussions (for example, they have been crucial in the debates about deflationary truth theories and in discussions concerning the choice of logic). There is a growing awareness (views expressed both in print and at international conferences) that the topic of commitments of theories is not sufficiently explored and is worthy of substantive investigation. Moreover, this assessment applies both to the philosophical and to the logical aspects of the proposed area of research. In particular, asking fundamental questions about the nature and justification of implicit commitments of our theory will connect work on formal truth theories with broader issues in the philosophy of mathematics.

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