

SEMANTICS OF THOUGHT EXPERIMENTS AND AI (VUB Brussels, Chongqing University)

Abstract (ab. 420 words)

The research question of *Semantics of Thought Experiments* (TE) for a unified but nonreductionist theory of TE is answered by a provisional proposal involving four views, *Extended Argument View* (TE Matrix, TE Diagram), *Extended Logic View* (incl. plausibility logic, possible worlds semantics PWS), *Descriptive Semantics View* and *Progress of Science and Society View* (incl. global cross-culturalism and environmental pragmaticism).

For the skeptics there are proposed Transformation Rules or Substitution Theses to substitute TE by experiments (TR/ST1) and nonmodal arguments (TR/ST2).

The Argument View of TE is defended by extension from TE analyses (as syllogisms, hypotheticals, reductios, counterfactuals, paradoxes) to an *Extended Argument View* by exemplification of tacit, contextual or theoretical premises and presuppositions (axioms, theorems, derivations in mathematical thought experiments MTE, regularities, laws, epistemological and scientific principles in empirical sciences).

The Extended Argument View embraces *Extended Logic View* including nonclassical logics as *probability logic* and *PWS*. We can hold on to *tertium non datur* for probability logic is a cognitive apparatus and PWS involves theoretical possible worlds PW as available and accessible constituents of theories in mathematics and empirical sciences which satisfy premises and conclusions of TE arguments unto positive truth values (T) on a bivalent logic.

As the PW of TE arguments (premises and conclusions) pick out accessible possible worlds (as from axioms to principles) unto the argument is both formally and informally logically validated (i.e. logical inference is valid, premises and conclusions are true—so, argument is sound), we don't need to prescribe any forcing formal validation function. (*Descriptive Semantics View*).

On *Progress of Science and Society View* a *fallible* theory (as after e.g. Karl Popper) is proposed (including error correction in the heuristic process of picking out available and accessible PW) that defines TE as *cognitive mental tests* designed to *resolve (predefined) problems*. Subtheses of *global*

cross-culturalism and *environmental pragmatism* criticize and substitute cultural, economic, moral and scientific *biases*.

The semantic TE theory is successfully applied to over ten examples of TE from mathematics, philosophy of mind (consciousness studies) and philosophy of natural sciences (classical and relativity physics) with help of TE Matrix, a TE specific logical notation and procedure, involving bracketing of TE from $[TE]_{RS}$, $[TE]_{BS}$ to $[TE]_{EX}$ (resp. restricted, broad, extended TE arguments) until TE have been fully developed into valid and sound formal logical arguments.

In the research formal logic is applied, one of the generally acknowledged techniques of *AI (Artificial Intelligence)* since it is a simulation of human intelligence by mathematical symbolism, and (possibly after computerization) procedures outlined in this abstract may be considered *algorithms*.