

Body-Gödel-Mind: The unsolvability of the hard problem of consciousness.

Benjamin Gregor Aas
University of Amsterdam
aasbenjamin@gmail.com

Abstract

Mathematica as a science has always been an attempt to produce a formal and objective language – implicitly since Euclid and explicitly since Peano and the *Principia Mathematica*. The working space of math are formal systems, in which variables are set in relation to each other according to a priori defined rules, forming basic axioms. Following clear grammatical rules, formal systems have the capability to produce theorems and prove whether these statements are true. As such, formal systems use the axiomatic method and supposedly provide truths on the deeper structure of logic, and even reality.

Complex systems are a fruitful way of reflecting and understanding natural phenomena of different fields in an empirical and objective way. Similar to formal systems, they are built up from basic, interrelating agents. These agents can form a systemic entity, which eventually has new phenomenological qualities, on a new level. In that way, unpredictability, non-linearity and emergence can be conceptualized by complex systems theory. These features give complex systems the flexibility to represent reality in a very broad and process-like manner. In that view, empirical science functions, in congruence with formal systems, as an axiomatic method (Suppe, 1977).

Comparing formal systems with complex systems, one finds that both can be understood as two realms that try to reflect reality, similar to ideas of Leibniz (1714) or Wolfram (2002). This does not a priori mean that all phenomena of formal systems will be represented by complex systems, or vice versa; but it appears to be an appealing approach to take a phenomenon of one system and check, whether there exists a correspondent phenomenon in another systemic realm as well. Thereby, transcending the borders of the respective system – and scientific disciplines – a solution for a problem in one system might be used as a signpost for the solution of a problem in another system.

There are strong arguments that not only human behavior can be understood well (or even best) using a complex systems approach, when it comes to group behavior (Barabási, 2002), psychopathology (Haken & Schiepek, 2006) and psychodiagnosis (Cramer, Waldorp, van der Maas & Borsboom, 2010), but also the human mind and consciousness as such might be conceptualized as a strong, synchronic emergent property of the complex system brain (according to Stephan's definition of emergence, 2006; Murphy & Brown, 2007). When accepting formal systems and complex systems to be abstract representations of the same reality, one can argue twofold:

First, Kurt Gödel proved with his incompleteness theorem (1931) that any formal system – if capable to represent the Peano axioms and possessing self-referential capacity – always produces statements the system as such cannot solve. To my understanding, that proof reflects itself in the realm of complex systems as well, namely when the human mind raises questions about itself (= being self-referent). That occurs, when we ask why it is that each human being has a qualitative experience – the hard problem of consciousness (Chalmers, 1995); a question that is tangled up in a strange, paradoxical loop (Hofstadter, 1979). In this view, the incompleteness theorem of Gödel and the hard problem of consciousness resemble in their respective fields the same structural problem that arises, whenever a system tries to reveal structures of logic and reality: A paradoxical, gap-like problem, Gödel 'meta-proved' to be unsolvable.

Second, if e.g. empirical science can be conceptualized as a system that uses a 'quasi' axiomatic method, then, according to Gödel's proof, this system must be incomplete. Therefore I think that neither the empirical method, nor any other scientific approach can claim to have a superior position to the other, but that 'Naturwissenschaften', 'Geisteswissenschaften' and other realms must be viewed as equally valid attempts, using separate methods, through which reality can be accessed.

Or, as Dilthey (1877-1897) put it: "The paradox is a characteristic of truth".

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