Constructivism and truth.


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The book and its claims

John Mingers’ book presents the main characteristics of the notion of autopoiesis and illustrates the phenomenon in the domains of biology and sociology (law and family therapy). In addition, he places the theory in a philosophical setting.

Chapter 2 presents a definition of autopoiesis and sets up 6 criteria that must be fulfilled in order for a system to be autopoietic:

1. It must be an entity with a clear boundary,
2. it must be analysable into components,
3. and must operate in a mechanistic way.
4. Its modus operandi must be a dynamic network of interacting processes of production,
5. contained within and producing a boundary,
6. that is maintained by preferential interactions of its components.

Chapter 3 illustrates the implications of this notion mainly in the domain of biology, and Chapter 4 contains a somewhat sceptical discussion of Spencer Brown’s Laws of Form and cellular automata as possible mathematical models of autopoiesis.

Chapter 5 - 7 are concerned with cognition and places the theory in a philosophical setting, in particular in the phenomenological tradition of Husserl and Heidegger. Mingers rejects Maturana’s radical constructivism because of its inherent contradictions:
Such positions [relativist theories] make an epistemological claim that all knowledge is relative to the knower (or community of knowers), that is, that no theory can claim objective truth. However, since such a theory if self-referential, it must equally apply to itself. If this is accepted, then the theory is not consistent. This problem is clearly exemplified in Maturana’s work. On the basis of a study of the biology of the observer, he claims that we have no access to independent reality and that different explanatory domains are equally valid. He must either accept that his whole theory has no special claim to validity or exempt his own particular theory from his stipulations, which would be inconsistent. (p. 112).

and suggests a reinterpretation within the paradigm of critical realism.

Chapter 8 - 10 discuss attempts to use autopoietic theory in the domain of social systems. Mingers regards these attempts as “a highly debatable possibility, no more”. Strict application of autopoiesis is rejected, whereas the more general idea of closure seems promising:

I agree with Varela that applying autopoiesis in a strict sense, to include notions of production and boundaries, to social systems cannot be sustained, but that some more general idea of closure may well be applicable. (p. 152)

A main problem is that although social systems have boundaries, they do not possess a boundary consisting of particular boundary elements, as required in condition 5-6. In addition, social systems seem to be able to interact with each other in a more integrated way than autopoiesis allows (the legal system is “infilttrated” by extralegal norms and expectations). The alleged influence of the environment upon the social system is also one of the main criticisms of the autopoietic tradition within family therapy: the tradition tends to ignore social and political factors, and to contain reasons for malfunctioning within the family itself.

The book is very well written and presents a difficult subject in a clear and succinct way. Mingers has critical remarks on the theory of autopoiesis, but carefully separates his own criticisms from the presentation of the theory, so that the reader gets a chance to judge for himself. After most chapters there is a conclusion that summarises the main points and criticisms.

Mingers has pointed to two issues which I feel are crucial, namely the inherent contradiction of radical constructivism, and use of autopoiesis as a model of social systems.

In the following I offer some brief comments on the alleged self-contradiction of autopoietic theory.

Inconsistencies of self-referential theories
I agree with Mingers that the inherent inconsistencies in radical relativist positions are not acceptable. My position is however, that instead of using the contradiction as a prima facie reason for rejecting radical relativism, we may consider the possibility of generalising the concept of truth so that at least certain kinds of contradictions can be accommodated. My argument is that if we are to completely avoid inconsistencies, we have to curtail our means of expression to such a degree that they become dissociated from our daily life.

I axiomatise radical relativism by the statement that “All sentences may be false”, i.e. there are no necessary truths. If we let $Mp = \text{it is possible that } p$, and $Np = \text{it is necessary that } p$ then from “All sentences may be false” we can infer that “Possibly a necessary sentence exists”, which — depending upon the modal logic we use— borders to self-contradiction:

(a) $\forall p, M\neg p$  
Axiom: All sentences may be false, there are no necessary sentences.

(b) $M\neg(\forall p, M\neg p)$  
Since (a) is a sentence, (a) is possibly wrong. We substitute (a) for $p$ in (a).

(c) $M(\exists p, \neg M\neg p)$  
By $\neg \forall \equiv \exists \neg$.

(d) $M(\exists p, Np)$  
So possibly a necessary sentence exists ($\neg M\neg \equiv N$).

My point is however that such instabilities can be found in many other theories. For example, critical philosophers of many schools claim that members of capitalist societies suffer from false consciousness, which must mean that their assertions are false or at least perverted. But critical philosophers are members of a capitalist society so they must suffer from false consciousness too. So the theory they have just asserted must be false, which again means that there must be at least one member of a capitalist society that does not have false consciousness.

(a) $\forall x, x \in CSociety \rightarrow \text{FalseConsciousness}(x)$  
All members of capitalist society have a false consciousness.

(b) $\forall xy, \text{FalseConsciousness}(x) \land \text{Assert}(x, y) \rightarrow \neg y$  
What a person with false consciousness utters is false.

(c) $I \in CSociety$  
I, the author, is a member of a capitalist society.

(d) $\text{FalseConsciousness}(I)$  
Therefore, by (a) and (c) I suffer from false consciousness.
I assert $a$, namely that all members of capitalist society have a false consciousness.

Therefore, by b, d and e, $a$ must be false.

Substituting the proposition for its name we learn that

there is at least one member of a capitalist society that does not have false consciousness

($\neg\forall p \equiv \exists p \neg p$).

This pattern is not surprising: if a general rule about society negates itself, the negation must assert that there exist at least one member that is excepted from the rule.

Thus, the problem may not reside in autopoietic theory as such, but may be a characteristic of the class of theories of which it is a member, namely theories that include themselves in their domain, cf. Tarski (1944). This class of theories is quite large, encompassing sociology (since sociological theories are a part of a society), the humanities (since humanists use language, are part of a culture and have a history), economics (since economists are economic agents).

In both cases, the original thesis changes itself, in the latter case even into its own contradiction. My feeling is that the costs of avoiding self-modifying theories totally is too high, since it requires us to remove all self-referential expressions of the theories (cf. again Tarski 1944), which leaves us with a very poor and irrelevant set of theories.

I would recommend a more cautious way course of action, which starts by trying to understand the nature of the dynamics. This again necessitates a revision of our concept of truth that can make sense of changing truth-values, as exemplified by the old liar-paradox.

Gupta and Belnap (1993) offers one possible way of dealing with such phenomena, their main point being that truth should be seen as a process of continual revision. This process can have attractors, i.e. sets of states to which truth moves given sufficiently long time. The attractor can consist of exactly one state (a fixed point) which corresponds to a normal positivist point of view. Orderly sentences must be either true or false, and they stay in this state. But
some sentences end in a limit-cycle attractor; the liar for example ends in a two-period limit cycle, oscillating between true and false. Could the “eternal oppositions” (life is a state (Parmenides) versus life is a flux (Heraclitus), life is spiritual versus life is material, concepts are real (realism) versus concepts are constructions (nominalism)) be caught in similar limit-cycle?

If we delve into the theory of non-linear dynamic systems, we discover a wealth of possible attractors, some of which may be useful for understanding the behaviour of self-referential theories. We can distinguish between global and local attractors (global: we will end at the same truth no matter where we start; local: the kind of truth we reach depends upon our stating point). Stability is an interesting subject too: what happens to a theory if a new piece of information jolts the theory a little away from its current equilibrium? If it still stays in the vicinity, we call the conversation stable; if it drifts away to completely new claims it is unstable. And if it returns to the self-same claims after some time then the theory is asymptotically stable.

Attractors can also be chaotic: although the theory stays within a finite, closed region of a property space, each new elaboration yields a new value not encountered before.

Gupta & Belnap use a traditional set-model semantics, where predicates are represented as sets of objects. In particular, truth has an extension T consisting of sentences-objets. A sentence s is a member of T at iteration i iff s holds in the model M at iteration i-1 (Rule of Revision). Thus if snow is a member of the class white things at iteration i-1, then the sentence “Snow is white” is member of T at iteration i, and it stays that way forever.

However, (p) is different: if p is outside T at iteration i-1, the p holds at this time. Therefore, according to the rule of revision, p must be inside T at iteration i. Since p is now inside T at iteration i, it does not hold at this stage, and therefore must move outside T at iteration i+1, etc. etc.

Sentences thus fall into two classes, unproblematic cases (Snow is white) which stay inside or outside T once they have got there, and problematic cases (This sentence is false) that keep moving in and out according to some cycle.

Model

Translation into “autopoiese”, we may see the Rule of Revision and T, the extension of the truth predicate, as a closed system that perpetually reproduces
itself. The system is perturbed by the model which acts as environment for the system.

In summary, although I am as uncomfortable with the inherent contradictions of autopoietic theory as Mingers is, I would like to understand a little more of the dynamics of self-referential theories before passing judgement.

References
