Review of: "Free will and the paradox of predictability"

Thomas Dittrich[1]

1 Universidad Nacional de Colombia

Potential competing interests: No potential competing interests to declare.

The discussion around the dichotomy spirit vs. matter, epitomized in free will vs. determinism, goes back to antiquity. More recently, it has been complemented by the concept of predictability. Even today, it is refueled by external input in particular from the sciences, such as physics (deterministic chaos) or neuroscience (Libet experiments), but also by new impulses from inside philosophy, such as the paradox of predictability.

I understand the motivation of this manuscript as an attempt to analyze and clarify the mutual relations in this conceptual triad, determinism, predictability, and free will, and to substantiate the author's main conclusion, that the paradox of predictability does neither imply nor prevent free will. Refusing this paradox as a relevant argument pro or contra free will is an inspiring and thought-provoking endeavour.

I largely agree with the author's conclusion, but would like to contrast it with a brief summary of those relations from my personal point of view:

Determinism vs. predictability:
According to the state of the art in the natural sciences, determinism is a necessary, but not a sufficient condition for predictability.

Following the author, distinguish prediction from outside (external) from prediction from inside (internal) –

External prediction: In this case, a counterpredictive device or agent can be included as part of the predicted system in a sufficiently sophisticated prediction, even if this is revealed to the predicted subject. A classic example is the Oedipus saga: The Delphi oracle is crafted so masterly that the counterpredictive action (by king Laios)

precisely induces the causal chain that infallibly steers the events into the foretold disaster. External prediction may be restricted, however, by epistemic limitations, such as sensitive dependence on initial conditions in chaotic systems.

Internal prediction: Information theoretical arguments imply that a predicting system B must possess a strictly larger computation capacity than the predicted system A, C(B) > C(A). "Computation capacity" may refer to specific technical measures, such as memory size or CPU performance, but also, on a fundamental level, to the "power" of a formal system, such as arithmetic vs. formal logic. Clearly, C(A) > C(A) is not possible, which prevents self-prediction. This is even true if the nominal (functionally relevant) states of the predicted system only comprise a fraction of its physical (e.g., "atomistic") state space. A very convincing account of this argument, even illustrated by the surprisingly realistic portrayal of a bank robber, is owed to Max Planck (my ref. [1} below). In this way, self-preditions can at best be understood as statements of intent or warnings.

Free will vs. determinism and prediction:
Also for free will, determinism is a necessary condition, or else it would reduce to arbitrariness.

In the context of free will, it is important to distinguish different levels of determinism. Far above determinism on the microscopic (atomistic) level hoovers the determinism of rational argument, with several intermediate layers, such as the statistical determinism of neuronal activity and interaction. The situation is closely analogous to the distinction of hardware and software, again with an entire hierarchy of structural levels within the software range. High-level determinism can be interpreted as an emergent phenomenon: The concepts governing decision-making do not exist in physics, yet they emerge from neural, thus physical processes. In this context, the topic of downward causation ("How can the program flow determine the dynamics of charge carriers in the hardware?"), discussed in recent literature (my ref. [2]) is of central relevance.

As concerns decision-making, self-prediction is not incompatible with

free will, it rather coincides with it (see above). From inside, we cannot perceive any underlying determinism as restricting force, or else we could already transcend it (e.g., Flatland habitants do not feel that they cannot access a third dimension), we are condemned to develop our decisions as an open process.

Regarding actions to implement our will, we are of course not free. On the level of basic physical law, no free will can surmount energy conservation and the Second Law of Thermodynamics to construct a perpetuum mobile. On the highest level, the coexistence of at least two "free wills", let alone six billions, restricts the freedom of each of them. Incompatibility of individual free wills leads to fight, that of communities to war.

I hope to demonstrate with this survey that the relations in the triad determinism, predictability, and free will can be reduced to a manageable number of principal arguments. Compared to that, the present paper appears far too circumstancial. In view of the huge body of existing literature on the free-will issue, accumulated over the centuries, any new publication must strive to create order in the readers' heads, not adding to confusion. Having said this, I urge the author to cut down undergrowth and eliminate all details that are not absolutely essential. In particular, I do not find the examples provided for an external demon interfering with its own prediction (section 4) very helpful. in all these cases, the interaction with the predicted system renders the demon internal. That here, the paradox of predictability is not paradoxical is overly obvious, but I guess that its advocates had less trivial situations in mind. The elaborate details of these examples lead to confusion rather than clarifying matters.

In general, the manuscript is written in good scholarly English, but I found a number of orthographical errors. They could be detected and eliminated running the text through a spell-checker.

I recommend giving the author the opportunity to revise his manuscript along the lines indicated above.

[1] Max Planck: “Vom Wesen der Willensfreiheit” (in German), in “Vorträge und Erinnerungen”, 5th ed., S. Hirzel (Stuttgart, 1949), pp. 301-317.

[2] George Ellis, Barbara Drossel, Foundations of Physics 49, 1253 (2019).