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The eco-cognitive model of abduction II

Irrelevance and implausibility exculpated

Lorenzo Magnani

Department of Humanities, Philosophy Section and Computational Philosophy Laboratory, University of Pavia, Pavia, Italy

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ABSTRACT

In the companion article "The eco-cognitive model of abduction" [66] I illustrated the main features of my eco-cognitive model of abduction (EC-Model). With the aim of delineating further aspects of that "naturalization of logic" recently urged by John Woods [94] I will now set out to further analyze some properties of abduction that are essential from a logical standpoint. When dealing with the so-called "inferential problem", I will opt for the more general concepts of input and output instead of those of premisses and conclusions, and show that in this framework two consequences can be derived that help clarify basic logical aspects of abductive reasoning: 1) it is more natural to accept the "multimodal" and "context-dependent" character of the inferences involved, 2) inferences are not merely conceived of in the terms of the process leading to the "generation of an output" or to the proof of it, as in the traditional and standard view of deductive proofs, but rather, from this perspective abductive inferences can be seen as related to logical processes in which input and output fail to hold each other in an expected relation, with the solution involving the modification of inputs, not that of outputs. The chance of finding an abductive solution still appears to depend on the Aristotelian concept of "leading away" (ἀπαγωγή) I dealt with in the companion article, that is, on the starting of the application of a supplementary logic implementing an appropriate formal inference engine. An important result I will emphasize is that irrelevance and implausibility are not always offensive to reason. In addition, we cannot be sure, more broadly, that our guessed hypotheses are plausible (even if we know that looking – in advance – for plausibility is a human good and wise heuristic), indeed an implausible hypothesis can later on result plausible. In the last part of the article I will describe that if we wish to naturalize the logic of the abductive processes and its special consequence relation, we should refer to the following main aspects: "optimization of situatedness", "maximization of changeability" of both input and output, and high "information-sensitiveness". Furthermore, I will point out that a logic of abduction must acknowledge the importance of keeping record of the "past life" of abductive inferential praxes, contrarily to the fact that traditional demonstrative ideal systems are prototypically characterized by what I call "maximization of memorylessness".

E-mail address: lmagnani@unipv.it.

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When there aren't particular reasons to the contrary, it is typically the case that how we reason from premisses to conclusions in real life circumstances is either *accurate* or *apt* or both.

[J. Woods, *Errors of Reasoning. Naturalizing the Logic of Inference*, 2013]

1. Introduction

1.1. Ignorance-preserving and knowledge enhancing abduction

In the companion paper [66] I have illustrated that abduction (ἀπαγωγή, in ancient Greek, often translated as "leading away" or "reduction") is a procedure in which something that lacks classical explanatory epistemic virtue can be accepted because it has virtue of another kind: Gabbay and Woods [32] contend (GW-Schema, cf. Appendix A and the companion article [66]) that abduction presents an *ignorance-preserving* or (ignorance-mitigating) character. From this perspective abductive reasoning is a *response* to an ignorance-problem; through abduction the basic ignorance – that does not have to be considered a total "ignorance" – is neither solved nor left intact. Abductive reasoning is an ignorance-preserving accommodation of the problem at hand.

An important question arose: is abduction really ignorance-preserving? To better answer this question I have introduced (and took advantage of) an *eco-cognitive model* (EC-Model) of abduction. I have illustrated that through abduction, knowledge can be enhanced, even when abduction is not considered an inference to the best explanation in the classical sense of the expression, that is an inference necessarily characterized by an empirical evaluation phase, or an inductive phase, as Peirce called it. To further deepen the eco-cognitive character of abduction I have also provided a simple genealogy of logic: Aristotle clearly states that in syllogistic theory local/environmental cognitive factors – external to that peculiar inferential process, for example regarding users/reasoners, are given up.

1.2. Eco-cognitive immunization: de-moralizing truth

Indeed, to define syllogism Aristotle first of all insists that all syllogisms are valid[1] and contends that the *necessity* of this kind of reasoning is related to the circumstance that "no further term from outside (ἔξωθεν) is needed", in sum syllogism is the fruit of a kind of eco-cognitive *immunization*:

> A deduction (συλλογισμὸσ) is a discourse (λόγοσ) in which, certain things having been supposed, something different from the things supposed results of necessity because these things are so. By "because these things are so", I mean "resulting through them," and by "resulting through them" I mean "needing no further term from outside (ἔξωθεν) in order for the necessity to come about" [6, A1 24, 20-25, p. 2].

Woods clearly notes that an important Aristotelian step regards the premiss-admissibility measures on arguments expressible in the usual canonical/categorical notation. These are the ones noted in the definition of syllogism I have just quoted, concerning the absence of terms that come from "outside". Close on their heel come two further reducibility claims. One, about which Aristotle is somewhat equivocal, is that all deductively correct reasoning is syllogistically expressible or is – as I have already anticipated above – otherwise transparently valid as it stands (e.g. conversion). The other is the perfectibility thesis: an imperfect

[1] Aristotle insists that all syllogisms are valid (by definition) [95, p. 150], there is no such thing as an invalid syllogism. We know the syllogistic tradition began to relax this requirement quite early on. In the following sections, I will use the term syllogism in this modern not strictly Aristotelian sense. Furthermore, no argument that is not a syllogism is in canonical notation, and is beyond the reach of Aristotle's decision procedure for validity. This is not to deny that some non-syllogisms are recognizably invalid. It only shows that it cannot be made so by Aristotle's decision procedure. If we liken that procedure as a function, we could say that the function is undefined for invalid inputs.