ON THE HERMENEUTIC ALTERNATIVE TO NORMATIVE NATURALISM

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ABSTRACT: What I hope to do in this paper is to see whether Laudan's normative naturalism may suggest a third alternative to normativism-naturalism dilemma in the analytical philosophy of science. In criticizing the view that all methodological rules are to be specified in the form of hypothetical imperatives, I offer the idea that a theory of scientific rationality (including its normative dimension) must go beyond the usual analytical format of "rational reconstruction". It is precisely this idea that opens the door for a hermeneutic alternative to normative naturalism. On this alternative, one has to pay attention to the contextual normativity of doing scientific research, if one wants to give an account of the articulation of methodological rules and norms.

Keywords: scientific community's research everydayness, fore-structure of scientific research, proto-normativity, hermeneutic contextualism.

CONTENTS

1. "Classical Naturalism", Normative Epistemology, and Normative Naturalism

The temptations of naturalizing philosophy of science are pervasive. To be sure, there is no epistemic procedure (representing supposedly a constitutive moment of scientific rationality) that is not liable to analysis and explanation in terms of a given scientific theory. Perhaps not the whole body of the philosophy of science would fall into "place as a chapter of psychology" (Quine), but all cognitive aspects of doing scientific research can be thematized empirically. It seems as if there is no (serious) alterna-

tive to naturalism. Nevertheless, the project of naturalized philosophy of science (as part of the project of naturalized epistemology) is seriously challenged by the lack of a cogent solution to the problem of "translating" the normative dimension (of scientific rationality) into scientific terms. Feyerabend's epistemological anarchism and the Wittgensteinian approach of the cognitive sociology of science are rather bypassing the problem than providing a solution to it. Thus, for those who are not willing to ignore the specific status of the methodological norms, rules, standards, and criteria, there remains an irreducible (to scientific knowledge) "residiuum" in philosophy of science, regardless how radical and effective the program of naturalization could be. The place of this residiuum has to be taken by normative epistemology that aims at a "rational reconstruction" of science's normative dimension. Laudan's normative naturalism is an ambitious attempt at naturalizing philosophy of science by coping with (i.e. not reducing or ignoring) the normative dimension. More specifically, normative naturalism is a meta-methodological view that epistemology (and philosophy of science) can be thoroughly naturalized whilst retaining a prescriptive dimension. It states that normative methodological theories have the same empirical status as the theories of natural science. Before starting my critical discussion of Laudan's conception, I should like to stress that in contrast to many other programs normative naturalism does not search for a sort of complementarity between psychology (and other empirical theories) and epistemology. Notoriously, the guiding principle of naturalizing philosophy of science is the so-called "replacemen. thesis". On its strong version, all epistemological questions may be replaced by natural-scientific questions. By contrast, the advocates of the weak version concede that there are legitimate epistemological questions that are distinct from the questions of cognitive psychology, AI-theories, linguistics, evolutionary biology, and so on. As a consequence, they believe that a complementarity between an empirical account of belief acquisition and a normative-epistemological reconstruction of the same process of acquisition may come into being. Hilary Kornblith (1985, p. 8) rightly criticizes the ineffectiveness of this weak version: "The upshot is that even if the weak replacement thesis is true, no actual replacement can occur until each field has completed its work."

The most essential peculiarity of normative naturalism is that it does not make use of the replacement thesis at all. Laudan's (1987, 1990a, 1990b) central claim is that all methodological rules are hypothetical imperatives asserting empirical links between following rules and realiz-

ing the associated cognitive aims. Hence, from the very beginning the normative-empirical dichotomy is surmounted. The normative dimension is distinguished by an empirical status. By implication, one need not reduce the methodological rules and norms to empirical facts obtained by natural-scientific research.

In the analytical philosophy of science normative naturalism is under attack for different reasons. The authors (like Leplin 1990) who follow "classical naturalism" display an agreement with the tenets of Laudan's view but are not satisfied with his "naturalist axiology" that makes axiological constraints undercut epistemic realism. On the other hand, traditional philosophers of science like Gerald Doppelt (1990) criticize normative naturalism for ignoring the fact that at least some methodological rules are foundational standards, and for this reason, they can not be expressed by empirical claims. This line of critique goes back to the kernel of non-naturalist epistemology where the criteria of scientific truth, theory, proof, explanation, etc. are considered to be inexpressible in the empirical terms of scientific knowledge. Another critical argument of this author says that the naturalization of methodology by means of hypothetical imperatives is an inconsistent version of naturalism because it leaves open the question of how to gain a naturalistic mode of interpretation and evaluation of the cognitive aims. Doppelt (1990, p. 5) states that

> Laudan's naturalism presupposes a prior axiological inquiry into the cognitive aims of science to which this naturalism is largely irrelevant. To my mind, this diminishes the interest of his naturalism -for at the outset it withdraws from any attempt to interpret what he himself admits is a fundamental aspect of scientific life.

In the same vein, John Worrall (1988) indicates that even if it were correct that the formulation of methodological rules is dependent on empirical considerations, Laudan's way of naturalizing methodology would have failed to retain the traditional normative force of methodological criteria unless supplemented by some non-naturalist ("axiological") account of what acceptable aims for science are. On this view, Laudan's normative naturalism is incomplete without employing traditional epistemological (i.e. non-naturalist) considerations. In order to complete the program of normative naturalism (by specifying which of the cognitive values of scientific knowledge are really values) one has to acknowledge such restrictions on the class of permissible cognitive values that lead one to surrendering naturalism.

While accepting such "axiological arguments" against normative natural-
ism, I reject any rehabilitation of methodological or epistemic apriorism
(even a minimal apriorism as it is defended from completely different
positions by John Worrall, Karl-Otto Apel (1997), or Roderick Chisholm
(1982)). To the traditional *a priori* justification of methodological rules
and norms I oppose the view of hermeneutic contextualism. Furthermore, I
will claim that the critique of normative naturalism concerning the way of
construing methodological rules provides a welcome opportunity for tak-
ing a further step in clarifying the complementarity between non-
foundational epistemology and hermeneutic ontology. I will criticize
Laudan's view for neglecting the holistic nature of scientific methodology,
and thereby, instrumentalizing the rationality of science. It is my conten-
tion that a contextual approach to methodological standards, norms and
rules precludes the possibility of formulating hypothetical imperatives. A
task of prime importance of the hermeneutic philosophy of science is to
provide a contextual interpretation of the genesis of methodological rules,
and not to search for a way of their justification.

In defending his meta-methodological view Laudan rejects the interpre-
tation of methodological rules as categorical imperatives. According to
him, methodological rules must be construed in a manner that allows ref-
erence to the values which bring the rules into existence. The formulation of
a methodological rule has to include an antecedent-statement that is the
elliptical expression of the mandated action. Thus, suppose we have a
methodological rule that is formulated by means of the following cate-
gorical imperative:

(R_0) "Do not accept a mathematical formalism which by imposing re-
strictions on the applicability of classical logic requires a change of
the empirical content of the basic concepts of the theory."

Its reinterpretation in the form of a hypothetical imperative says:

(HI_1) "If one wants to develop theories which are resistant to the changes
of the empirical contents of their basic concepts, then one ought to
avoid mathematical formalisms that impose restrictions on the ap-
plicability of classical logic."

Laudan's claim is that in recasting methodological rules as hypothetical
imperatives one is "naturalizing" the methodological enterprise because in
so doing the rules are interpreted as a part of empirical knowledge. They

can be tested in a way similar to the way statements expressing statistical laws can be tested. Now, I will claim that no philosophically significant methodological rules of science can be specified in the form of hypothetical imperatives. I would like to clarify my claim by referring to a methodological rule that plays an important role in quantum mechanics. The rule states:

(R_1) "In constructing a physical theory look for a mathematical formalism with a surplus structure, for only such a formalism can provide the means most suitable for modifying or adjusting the physical theory."

Which is the cognitive value that should be associated with (R_1) in order to formulate a hypothetical imperative? Obviously, it must be expressed by the statement,

(S_1) "The best physical theories are those that can be modified and adjusted."

Yet, if one formulates a hypothetical imperative whose antecedent is (S_1), one would not specify (R_1) but would rather trivialize it. A genuine specification of (R_1) would rather require a step-by-step relativization of it to a contextual network of cognitive values, goals, standards, criteria and other rules.

To begin with, in a first step one should ask about the rationale for supporting the "surplus structure" that has no physical interpretation. One can realize that this structure makes the theory more "flexible" in explaining new phenomena without introducing ad hoc hypotheses. The analytical S-matrix theory in elementary particle physics is an appropriate example in this respect. Thus, in a first step (R_1) is to be specified in connection with another methodological rule which says,

(R_2) "Prefer physical theories that explain new phenomena through internal mathematical transformations and not by *ad hoc* hypotheses."

By following this line of reasoning one will discover that (R_2) is interconnected with the metatheoretical standard (M_1) for a non-direct axiomatization of the physical concepts, which tolerates all methodological rules governing the procedures of adaptation of these concepts to the respective class of mathematical structures. In this second step of specifying

(R_1) one realizes that the interconnection between (R_2) and (M_1) is, in its turn, interconnected with a certain criterion for completeness of the empirical theory (C_1). Obviously, it is a criterion which opposes the criterion of the Einstein-Podolsky-Rosen argument that every element of the physical theory must have a counterpart in physical reality. A positive formulation of (C_1) has to be provided in terms of the specific mathematical apparatus of the theory. (Thus, the completeness of quantum mechanics is provided by the algorithm that involves the representation of the statistical states of the theory by a certain class of operators in Hilbert space. A tacit assumption of formulating such (C_1) is that the working logic of quantum mechanics is a non-Boolean logic. This assumption is intimately associated with the belief that quantum mechanics is an irreducibly statistical theory.) Advocation of (C_1) is not to be detached from the whole framework of a certain Kantian epistemic position characterized by the claim that the logical structure of the mathematical apparatus governs the process of empirical knowledge. Furthermore, the reticulated configuration between (R_2), (M_1) and (C_1) is partially determined by the whole cognitive axiology (and not by a particular cognitive value) of instrumentalism. Revealing this partial determination will be the next step in the specification of (R_1).

Against the background of these interconnected methodological and axiological elements, the view that each methodological rule ought to be formulated as a hypothetical imperative sounds like an extreme simplification, which cannot be justified. Behind the program of normative naturalism lies the wrong idea that there is a one-to-one correspondence between the set of methodological rules and the set of cognitive values. The normative naturalist is right in stressing that the methodological norms and rules do not emerge in a vacuum but are always specified with respect to cognitive aims and goals. Yet he is wrong in figuring out how to fill this vacuum. Every methodological rule has presuppositions (which are not to be reduced to one cognitive aim) that it does not express. To understand these presuppositions requires reflection upon the contextual network already mentioned. By contrast, the demand to formulate particular empirical claims about the connections between the rules and values of scientific inquiry means to "smash to pieces" the contextual network of methodological and axiological elements that is effective in real scientific life. Moreover, this contextual network is not a "purely cognitive entity". It "exists" only through its application to different research situations. Thus, it is the

holistic application (or, the *phronesis*) of methodology and cognitive axiology that promotes the emergence of particular connections between rules and aims. The isolation of these connections by formulating hypothetical imperatives precludes the possibility of studying (1) the genetic articulation of methodological rules within the research activities of a scientific community, and (2) how these rules become established in the life of this community. Without such a study it is impossible to defeat Fries' trilemma. Moreover, the isolation in question does violence to the holistic nature of science's cognitive organization. (Laudan himself subscribes to epistemological holism, when he emphasizes the mutual dependency of axiological and methodological complexities. To be sure, the holism of his reticulated model contradicts the search for isolated hypothetical imperatives in his normative naturalism.)

2. Methodological Rules and Norms from the Perspective of Hermeneutic Contextualism

I am going to spell out three basic aspects of a hermeneutic alternative to normative naturalism. These are the non-foundationalist view of the totality of discursive practices characterizing a scientific community's "research everydayness"; the conception of proto-normativity; and the hermeneutic view of scientific rationality's normative dimension. In discussing these aspects, I shall try to reveal some perspectives for further hermeneutic studies of science.

In my view, before setting out to study this contextual network in an empirically objectifying way we should investigate its holistic nature in hermeneutic terms. To put it differently, we should specify the particular relationships between the elements by figuring out the hermeneutic circles between these elements and the whole contextual network that is projected as a "fore-structure" of a given scientific inquiry. "Fore" designates the "processuality" of all cognitive structures articulated in scientific research. In other words, the contextual network as a projected fore-structure is not something that chronologically precedes science's articulated cognitive structures. It is rather "the structure of the process" of their articulation. The notion of fore-structure can be also elucidated with respect to the function the contextual network serves as a horizon embracing all interconnected rule- and value-governed (theoretical and empirical) practices of a scientific community. Although this totality of discursive practices is "impregnated" with normative elements, *qua* totality it has an ontologi-

cally pre-normative (or better, proto-normative) character. What is onto-
logically proto-normative is the being in itself of the totality of a scien-
tific community's rule and value-governed research practices. This being in
itself is neither the "common world" shared by all community's members
nor the "subjective world" as a manifestation of the communal presupposi-
tions of scientific community. As a non-subjective and non-psychological
concept the world of scientific community's discursive practices stands for
that type of "research everydayness" which allows the constitution of a spe-
cific "theoretical world" (e.g., the world of quantum-mechanical objects,
the world of geomorphologic process, the world of non-equilibrium ther-
modynamics, and so on). Scientific community's research everydayness is
the only "empirical reality" whose analysis discloses the fore-structure of
science's cognitive structures. By means of this analysis one should also gain
the way of articulating the methodological norms and rules. Now, to ana-
lyze the research everydayness amounts to thematize the hermeneutic cir-
cles I mentioned above. In other words, the analysis I am referring to is
not to be conceived of as purely empirical analysis (as this is illustrated by
the case studies in the cognitive sociology of science). It is rather a herme-
neutico-constitutive analysis, since its theme is the constitution of cognitive
and normative structure within the research everydayness.

The view of hermeneutic contextualism implies not only that the ex-
plicit normative elements of scientific research are interconnected in an
"indecomposable" network, but that this network is in an ongoing *status
nascendi*. By the expression "proto-normativity" I mean the inclinations,
preferences, orientations, and anticipations embedded in research every-
dayness' discursive practices. Roughly speaking, proto-normativity is the
"starting-point" of constituting the contextual network of explicit norma-
tive elements. This is why all methodological rules, norms, standards, and
criteria are grounded upon proto-normativity. Accordingly, the latter be-
longs also to the fore-structure of science's cognitive and normative struc-
tures.

To reiterate one more, the research everydayness as "being" of all rule
and value-governed practices of a community is neither an outcome of the
interconnections of these practices, nor it is pre-given (as an atemporal
"pattern" or "paradigm") to each particular practice, or, a particular con-
figuration of such practices. This everydayness plays the role of a horizon
of the community's life not as a "static structure" but as a dynamics of dif-
ferent hermeneutic circles (in particular, the circle between proto-
normativity and explicit methodological elements). Following this line

of reasoning, one is to state in a neo-Aristotelian manner that the instrumentality of rule-following (the behavior guided by normative epistemology) has a secondary character with respect to the practical creating of rules and norms (the ethos of *phronesis*). Furthermore, what I am trying to invoke is the hermeneutic thesis that before a particular methodological rule of a rule-governed discourse stands a totality of discursive practices. The range of the possible use of each particular methodological rule is determined by this totality. Since the totality varies from one research situation to another, the study of the genesis of methodological rules is to be attributed to a "hermeneutics of the research situations." Against the background of these considerations, one is to recall the idea for a non-propositional "hermeneutic logic" (Georg Misch 1994, Hans Lipps 1959), or, the idea for a "dialogical logic of question and answer" (Gadamer 1975). In both cases, the aim is a study of the pre-instrumental ethos of *phronesis* that lays down the foundations of the community's rationality.

My final critical remark against Laudan's program concerns the issue of scientific rationality. To be sure, the formulation of methodological rules as hypothetical imperatives becomes possible within the framework of an instrumentalist conception of scientific rationality. Laudan's normative naturalism is one that travels with the paradigm of means-ends analysis. Doppelt points out several difficulties in applying this paradigm to the methodology of science. In my opinion, the major difficulty is that the instrumentalist paradigm ignores the non-instrumentalist (and proto-normative) horizon of articulating particular means-ends connections. Without this horizon, the instrumental efficiency of the ends-oriented conduct will be meaningless. Instrumental rationality (of normative epistemology) can only take place, when the research everydayness' rationality (i.e. the rationality of *phronesis*) is established.

To stress the derivability of instrumental rationality from the "ethos of *phronesis*" is a crucial argument for the view that the instrumentalist aspect of scientific rationality presupposes a kind of rationality of science, which is not to be conceptualized in terms of means-ends analysis. Seeing this point helps one to overcome meta-methodological instrumentalism. Yet, the insistence on the non-instrumental aspects of scientific rationality does not imply a justification of the foundationalist view that there is a "substantive epistemic rationality" which is essentially normative and can only be studied by logic and probability theory. There is no *a priori* normative structure of knowledge, which lays down the foundations of a "substantive rationality of science."

Yet, the contextual and holistic character of the pre-instrumental rationality of science is to be spelled out not only in hermeneutic terms. There are other aspects of this rationality that should be studied in terms of a non-foundational and non-normative epistemology. There are a lot of research programs in different branches of science, which are based upon such a type of epistemology. An appropriate framework for studying the pre-instrumental aspects of scientific rationality are the epistemological schemes suggested by the heuristic programs in AI. These programs are preeminent in that they represent a radical break with the Cartesian approach to rationality. They make an essential use of Herbert Simon's (1957) notion of "bounded rationality." The latter connotes particular non-guaranteed strategies for guiding problem-solving when the behavior of the problem-solving system is strongly influenced by the limits of its adaptive capacity. These strategies are non-algorithmic and non-instrumental. The design of such a strategy is achieved through a "dialogue" with all relevant factors in the environment. Case studies of important historical episodes in different branches of science show that discoveries are accomplished without having to run normative-instrumental strategies. The central use to which these strategies are put in heuristic scientific behaviour is the "changing communicative structure of the environment," in which the research work takes place.

Possibly the "rational reconstruction" of scientific knowledge's structure and dynamics is enough to explain the "codex of rational scientific behavior". But the concept of scientific rationality is richer. And this can be seen when one takes up the "classical issue" of the context-distinction (the distinction between the context of discovery and the context of justification). It follows from my preceding considerations that scientific rationality is neither to be illuminated in a radically empirical fashion (because of its unavoidable normative dimension), nor can it be reduced (because of the fact that this dimension is rooted in the proto-normative totality of scientific research's discursive practices) to the normativity of science's cognitive structure. The studies in both contexts do not suffice to come to grips with the intrinsic constitution of methodological norms and rules of scientific research. In view of this conclusion, Laudan's normative naturalism is to be seen as an attempt to match a requirement of the context of discovery (the empirical verifiability of all studies of science) with a requirement of the context of justification (the unavoidability of normative epistemology in reflecting upon science). On the hermeneutic alternative I am suggesting, the task of developing a theory of scientific rationality demands not to

combine, but to transcend the context-distinction. More specifically, this task amounts to drawing the contours of an autonomous context of science, which can be called a "context of constitution". Its main subjects of (hermeneutic) analysis are the fore-structure and proto-normativity of scientific research.

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