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The Tension between the Problem of Unconceived Alternatives and Epistemic Instrumentalism

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Abstract. In this paper, I develop a critical assessment of epistemic instrumentalism as advocated by Kyle Stanford (2006). Epistemic instrumentalism is based on the claim that the criterion for the reliability of any theory is the absence of what Stanford calls 'unconceived alternatives'. This means that the theory is reliable if and only if it does not admit of alternatives. Since most scientific theories do admit of unconceived alternatives, Stanford claims, they cannot be reliable. In contrast, 'common sense' claims are not exposed to unconceived alternatives, therefore they are reliable. Here, I analyse the definition of 'common sense' and argue that it is equally vulnerable to the 'problem of unconceived alternatives', pushing epistemic instrumentalism position to scepticism. The consequence is that the position of epistemic instrumentalist has nothing to stand on.
Keywords: realism, antirealism, common sense, Stanford, unconceived alternatives, scientific reliability

Įtampa tarp neįsivaizduojamų alternatyvų problemos ir episteminio instrumentalizmo

Santrauka. Straipsnyje analizuojamas kritinis episteminio instrumentalizmo vertinimas, kurį išplėtojo Kyle'as Stanfordas (2006). Episteminis instrumentalizmas grindžiamas teiginiu, kad bet kurios teorijos patikimumo kriterijus yra nebuvimas to, ką Stanfordas vadina „neįsivaizduojamomis alternatyvomis". Tai reiškia, kad teorija yra patikima tada ir tik tada, kai ji neleidžia alternatyvų. Pasak Stanfordo, kadangi dauguma mokslinių teorijų pripažįsta neįsivaizduojamas alternatyvas, jos negali būti patikimos; o „sveiko proto" teiginiai, priešingai, esą patikimi, kadangi jiems nesiūlomos neįsivaizduojamos alternatyvos. Straipsnyje analizuojamas „sveiko proto" apibrėžimas ir teigiama, kad jis yra lygiai taip pat pažeidžiamas „neįsivaizduojamų alternatyvų problemos", o episteminio instrumentalizmo pozicija stumiama į skepticizmo glėbį. Autorė teigia, kad episteminio instrumentalisto pozicija neturi į ką atsiremti.
Pagrindiniai žodžiai: realizmas, antirealizmas, sveikas protas, Stanfordas, neįsivaizduojamos alternatyvos, mokslinis patikimumas

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1. Introduction

As many philosophers pointed out (Wray 2018; Rowbottom 2019), the contemporary realism/antirealism debate has been reinvigorated by Stanford's "epistemic instrumentalism" (Stanford 2006, 2009). Several ways to reply to the epistemic instrumentalism's challenge have been proposed (among others: Chakravartty 2008; Enfield 2008; Roush 2010, Magnus 2006; 2010, Devitt 2011), focusing on the challenge of unconceived alternatives. Here I will not argue against the concept of unconceived alternatives: nor shall I argue against "hard" scepticism. My aim is more modest, in that I shall try to shift the burden of proof to the advocate of epistemic instrumentalism. In this spirit, I am going to isolate specifically one crucial element, that of 'common sense', and I will explain why it is problematic for epistemic instrumentalism: far from being stable as epistemic instrumentalism requires, it changes with science. The consequence is that epistemic instrumentalism does not offer any stable basis on which to build its beliefs, not even a relatively stable one.

Section 2 aims at explaining what is the "unconceived alternatives" issue developed by epistemic instrumentalism. Section 3 aims at clarifying the nature of 'epistemic stability'. Section 4 focuses on "the hypothesis of bodies of common sense". Using the terminology of Sellars (1991), when he refers to the "correlational" and the "postulational", the picture that emerges is illustrated: on the one hand there are correlations and *explananda*, which are an epistemic stability indicator; on the other hand, there are postulations and *explanantia*, which are constantly changing, volatile and unreliable. Section 5 aims at elaborating on the idea of osmosis: roughly, whenever science changes, so does 'common sense'. A crucial example is the Copernican Revolution, which highlights the consecutive transformations that 'common sense' has gone through in the past, and is still going through in the present in keeping with changes of our scientific models.

I will conclude in section 6 by summing up the main argument. My purpose here is not to defend realism, but in relation to the debate between instrumentalism and realism, my view may serve as a counter-argument against one of the strongest contemporary positions in favour of instrumentalism.

2. Unconceived Alternatives

The argument starts with an observation based on the historical record of science. This is that the theories conceived and 'on the table' at any time *t* were later on replaced by theories which were not conceived at *t.* The so-called unconceived alternatives (UA) were at least as well confirmed as those they replaced. This fact shows that Stanford thinks of a certain cognitive limitation of scientists, that is the recurrent failure of scientists to conceive of possible alternatives at time *t*. Given that these unconceived alternatives were better confirmed than the ones available, it follows, Stanford thinks, that the true theory (if there is any) has always been among the hypotheses that scientists have not conceived. Now, this is taken to be a pattern in the history of science, which is projected to the future by means of a new induction: just as being replaced by UA has been the fate of all past theories, so it will be the fate of the present and the future ones.

Stanford is careful not to overgeneralize. The new induction is applicable not to all theories across the board, but only to the so-called fundamental theories: "[...] the systematic evidence available from the historical record seems to promise to give us good reason to doubt our ability to exhaust the space of plausible alternative possibilities in the context of fundamental theoretical science quite generally, thus posing a distinctive general challenge to virtually all of those fundamental theories concerning remote domains of nature that lie at the heart of the contemporary scientific conception of the natural world" (Stanford 2006: 52).

There are two reasons for this. One is empirical and the other conceptual. The empirical reason is that it seems plainly false that facing the challenge of UA is the fate of all theories. After all, there have been many theories in various branches of science that have remained 'on the table' since their inception (the theory of evolution through natural selection, plate tectonics, Mendel's theory of inheritance, and the genetic code for instance). The conceptual reason, however, is more important. If facing the challenge of UA was the fate of all theories whatsoever, and given that there is no full-proof delineation of what counts as a theory, it seems Stanford's view would fall into mere scepticism. The reason is simple. Since all theories embody beliefs that scientists have (or even propositions that they accept), all theoretical beliefs, that is all beliefs, would be equally untrustworthy. There would simply be nothing for Stanford to stand on. Hence, he is clear that at least some beliefs are not subject to the unconceived alternatives challenge: "I will point out to a specific history of our repeated failures to exhaust the space of serious scientific alternative possibilities, and there is simply no comparable history available of failures to conceive of and therefore consider presumptively plausible alternative explanations for the evidence supporting beliefs like that I am now wearing pants or that I had eggs for breakfast" (Stanford 2006: 36).

Why, you might wonder, would scepticism be unwelcome to Stanford? The reason is that he intends to defend a species of instrumentalism, called epistemic instrumentalism, which aims to show that scientific theories do offer us some knowledge of the world, albeit low level, empirical knowledge. In fact, Stanford's epistemic instrumentalism is consistent with the view that science offers non-trivial knowledge of at least some aspects of the unobservable world, viz., those aspects which are accessed via theories not subject to the UA challenge. So, epistemic instrumentalism holds that we should have a realist approach towards some theories and an instrumentalist approach towards others (Stanford 2006: 203-204). The criterion with which epistemic instrumentalism distinguishes between realist and instrumentalist approaches is the UA challenge.

It should be clear therefore that the very viability of epistemic instrumentalism as a distinct philosophical position depends on not collapsing into scepticism. It depends on the existence of theories (or bodies of beliefs) on which Stanford can stand in order to mount his attack on the high-level theories for which he recommends an instrumentalist stance.

3. Epistemic Stability

Let's call epistemic stability the property that a theory or body of beliefs should have in order not to be subject to the UA challenge. Here is how Stanford characterizes it: "If the instrumentalist must believe at least some of what a theory says about the world in order to make effective instrumental use of it, it might seem natural enough to try to find some principled way to distinguish those claims she must believe in order to make use of a theory from those that she need not. And it would seem that our commitment to the instrumental reliability of a theory means (at least) that we trust the guidance it offers to our practical or pragmatic engagement with the world around us. That is, perhaps what it means to be an instrumentalist about any particular theory is to believe the *empirical predictions and recipes for intervention* that the theory offers, but not the description of some part of nature in which those pragmatic recommendations are grounded" (Stanford 2006: 195; emphasis in original).

The keyword here is 'the world around us'. The descriptions of this world should be epistemically stable. As I already noted, Stanford intends to extend epistemic stability to at least some beliefs about entities not given to us by means of the senses. Still, the basic element of stability is the common sense ontology. It is not of course that Stanford does not recognize that even the world around us can be challenged by the UA argument. After all, the world around us as made up of physical bodies has been challenged by phenomenalist and idealist approaches. Still, Stanford thinks that these challenges are reserché. That is, purely philosophical challenges. Here is how he put it:

> While there are certainly possible alternatives to the commonsense ontology of an external world full of physical objects (e.g., phenomenalism), the historical record does not find us continually discovering previously unconceived alternatives of this sort that are ultimately plausible enough to attract entire communities of sincere proponents, while I suggest that we do find just this historical situation in the case of theoretical science. Thus, our scientific theories share a demonstrated historical vulnerability to the problem of unconceived alternatives that Quine's hypothesis of "the bodies of common sense" simply doesn't share (Stanford 2006: 36).

Stanford is clear that the 'hypothesis of the bodies of common sense' does not suffer from the UA challenge. It is this hypothesis which being set apart from scientific theories apparently gives him something to stand on, thereby avoiding scepticism. But, is he right in this claim?

4. What Is the "Hypothesis of the Bodies of Common Sense" about?

Stanford (2006: 199) insists that "fundamental commitment to the reliability of a given theory […] commits us to the truth of whatever implications it may have for entities, events, and phenomena as they are conceived of outside of the theory itself (and indeed outside of all those theories toward which we are adopting an instrumentalist attitude)". Connecting the above statement to 'bodies of common sense', Stanford claims: "[T]he

instrumentalist will have to frame what she actually believes […] in terms of the entities, events, and phenomena familiar from our everyday experience of the middle-sized bodies of common sense" (Stanford 2006: 202).

It seems then that the 'hypothesis of the bodies of common sense' is about middle-sized bodies given to us in experience and which are 'outside of the theory itself' (Stanford 2006: 199). However, the criterion of being outside of the theory itself is a lot stricter than the criterion of being outside of the theories from which one is an instrumentalist. On the stricter criterion, the hypothesis of the bodies of common sense (HBCS) is about presumably theory-free objects, that is objects which are given to us in experience. On the criterion as used by Stanford it would seem that the range of HBCS may be enlarged. This is possible whenever in the course of scientific developments certain theories come to be regarded as trustworthy, that is immune to the challenge of UA. We are then justified in adopting a realist stand towards such theories, and, consequently, to believe in the existence of such entities as maybe suggested by theories of this kind. Entities like these may well not be given to us in experience. However, they are legitimate bodies of common sense due to the trustworthiness of the theory suggesting them. For example, amoebas, even though not given in experience, are commonsensical objects in this sense. Now, given that what theories are not subject to the UA challenge is an empirical and open-ended issue, it follows that it is no longer clear what is the range of commonsensical objects for an instrumentalist. This is because the belief in the success and the predictions of the relevant theories involves beliefs in entities or phenomena that are not quite the middle-sized bodies of common sense. Hence, the set of entities for which one is not an instrumentalist is itself open-ended. If the objects of common sense are, by default, the objects which one is not an instrumentalist about, it follows that commonsensical objects are time-indexed. Notably, the set of observable entities is not the same as the set of commonsensical objects simply because at least some observable entities are subject to theoretical beliefs which face the UA challenge. As Stanford put it: "our characterization of and beliefs about many observable entities (e.g. chemical entities, evolutionary adaptations, supernovae) would seem to be routinely grounded in and bound up with just those sorts of fundamental theoretical conceptions of the natural world that stand most forcefully challenged by the problem of unconceived alternatives" (Stanford 2006: 35). Therefore, there is no precise list of the parts of science that should deserve a genuine instrumentalist approach, and the job of the instrumentalist is to decide the circumstances in which the evidence is insufficient to rebut the historically established presumption in favour of serious UA. In other words, she has to make a choice whether the alternatives are plausible or not.

The issue is brought out in the example about the *Drosophila melanogaster* (Stanford 2006: 197–198). The *Drosophila melanogaster* is a fruit fly used in molecular genetics as a model organism because it does exemplify general genetic features. Stanford mentions it (2006: 197–98, 200) to elaborate the following point: instrumentalists can believe in claims of a theory if those can be isolated from the theory which they are connected with. In more detail, the claim that the "bithorax phenotype in *Drosophila melanogaster*

is caused by a single mutation in the HOM complex of homeobox genes" is indeed linked with the contemporary genetic theory, but some of its content can be understood independently from the theory itself: for example, that a particular pattern will be shown on the autoradiography whenever a particular material of an organism is modified in the laboratory, or that this pattern will also be shown in the successive generations after the first modified organism. The point is that, even if the contemporary genetic theory will turn out to be subject to the UA challenge in the future, and consequently the claim about the mutation in the HOM complex of homeobox genes as the cause of the bithorax in *Drosophila melanogaster* will not be accepted as true, claims about the patterns appeared of the autoradiography or the re-emergence of the bithorax in offspring of the first organism will still be approved since the UA challenge leaves them untouched. Hence concerning the very same middle-sized material object there are claims about which we are realists and claims about which we have an instrumentalist attitude. In the case of the *Drosophila,* whatever is in the background of the genetic theory is considered stable, i.e. the fact that there is an entity, that this entity can be manipulated in the laboratory and, also, the predictions about the heredity of some patterns.

This distinction between the scientific theory and the predictions derived from the body of common sense has been pointed clearly out by Sellars: "We might not have noticed that litmus paper turns red in acid, until this hypothesis had been suggested by a complex theory relating the absorption and emission of electromagnetic radiation by objects to their chemical composition; yet in principle this familiar correlation could have been, and, indeed was, discovered before any such theory was developed" (Sellars 1963: 19). Sellars's *correlation* and its relation with *postulation* is particularly instructive in understanding properly the distinction between the hypothesis of common sense and science in Stanford. Note that the link between the two authors is only terminological, not philosophical. When Sellars is characterizing the scientific image and the manifest image, he claims that the former is *postulational* or *theoretical*, and the latter is correlational: "[…] postulational hypotheses [presuppose] correlations to be explained and [suggest] possible correlations to be investigated. The notion of purely correlational scientific view of things is both a historical and methodological fiction. […] Yet it is a useful fiction for it will enable us to define a way of looking at the world which, though disciplined and, in a limited sense, scientific, contrasts sharply with an image of man-in-the world which is implicit in and can be constructed from the postulational aspects of contemporary scientific theory" (Sellars 1991: 7). Thus, on the one hand, the manifest image presents *correlations* in the sense that there is a correlation between the middle-size object and the man-in-the-world's image. On the other hand, the scientific image is *postulating*, meaning that science is speculating about phenomena and entities behind the observability of objects. Similarly, Stanford articulated his epistemic position as following: a realist approach is allowed to whatever is *correlational,* linked to the body of common sense; contrary, an instrumentalist approach is required for theories that are postulating and speculating on claims that stand to the historical challenge of UA.

But, what if the body of common sense is affected by the same changes that affect science? What if, in other words, the relation between science and the body of common sense is not only conflicting but also osmotic?

5. Osmosis

A useful metaphor to understand the relation between common sense and science is to think of it in terms of osmosis. Common sense and science are distinct bodies of belief even though they are at least partly about the same objects, viz. the bodies of common sense. Though distinct (think about the table of common sense and the table of science), they are related; it is as if there is a semi-permeable membrane around common sense which allows movement from science to common sense. In this sense, common sense changes, by incorporating parts of science into it. This osmotic process occurs until a new equilibrium is achieved; one in which beliefs about common sense objects are permeated by scientific ones until the former acquire a new stability.

Let us see this osmotic relation in the case of the Copernican revolution. The objects of common sense in this example are the Earth and the heavenly bodies around it. We can consider the presumed osmotic relation, in its development in time, as divided schematically in three different stages. The first stage corresponds to the common sense beliefs that prevailed since classical antiquity up until the Scientific Revolution. Common sense beliefs involved the motions of heavenly bodies as given in experience. Those beliefs (and the associated bodies) were independent from mathematical, proto-theoretic accounts of their motions. Therefore, they satisfy Stanford's criterion. The ingredients of common sense beliefs in that period, informed by Aristotelian or Platonic ideas as systematized by Ptolemy, were a geocentric picture of a spherical cosmos revolving about its axis with the Earth at the centre; and a qualitative difference between the Earth as the realm of the mutable and the perishable on one hand, and, on the other, the Heavens as the realm of the immutable and the eternal ones.

In the second stage of the osmosis process there was an infusion of novel scientific ideas into the sphere of common sense. The hypothetical membrane circumscribing common sense is permeable to the innovative concepts and discoveries of scientists, and allowed their penetration into the field of common sense. Indeed, with the advent of the 17th century Scientific Revolution and the birth and development of modern science, the picture described above was overturned. Copernicus placed the Sun at the centre of the Universe, claiming that the movement of the Sun is only apparent, and is due to the rotation of the Earth itself. It took more than one century for the heliocentric thesis to be completely accepted and integrated into 'common sense'. Between the 1543, year of the publication of the *De Revolutionibus* and 1687, when Newton's *Philosophiae Naturalis Principia Mathematica* appeared before the scientific community, many important intellectual modifications occurred. The ground was conceptually ready for the unification of forces in physics, a process which culminated in the formulation of the law of universal gravitation. Newton's mechanics showed how it was theoretically feasible, using the

same mathematical formulas, to explain the orbit of the moon and the fall of an apple. Nevertheless, the new picture that was emerging was independent of the details of either Newton's theory or other alternatives that competed with it at the time.

The third stage of the osmotic process appeared at this point, with the stabilisation of the new common sense beliefs. This stability did not take place only at a mathematical level, in the correspondence between intellectuals or the pages of philosophical writings; it radically transformed the general thoughts of the 'man in the street'. Irrespectively of how alternative scientific theories accounted for phenomena in terms of laws, forces, causes, etc., there emerged a minimal common view: in place of perfect, immutable circular planetary orbits, the planets were now understood to 'revolve about some centre'. When it was assumed that the Sun rotated around the Earth, this belief was justified by an interaction between a theoretical claim (Ptolemaic theory) and 'common sense'. But when another theory was accredited by the evidence, common sense was modified accordingly.

Through this brief excursion in the history of science, the concept of 'common sense' is seen to be noticeably different from the one introduced by the epistemic instrumentalist. Far from being a solid ground on which one can base one's beliefs, it is inevitably affected by scientific changes. To be sure, Stanford acknowledges the fact that elements of common sense do change over time (Stanford 2009, 2011, 2015). The point is that even relative stability will not do. Because, the elements of a body of common sense that is at a time independent from a particular theory will be based on other accepted theories, and will be therefore vulnerable to the challenge of unconceived alternatives, precisely because of osmosis. In other words, my argument does not require an atemporal kind of stability for common sense; it only challenges the epistemic instrumentalist to provide the means for judging which common sense elements are shielded from osmosis, hence immune to unconceived alternatives[1]. Although the epistemic instrumentalist claims that the problem of unconceived alternatives does not apply universally, the challenge for her/him is to circumscribe its domain of applicability in a consistent and clear way. This is what the process of osmosis achieves: scientific beliefs make UA possible for commonsensical objects and, hence, they change HBCS itself. Hence, according to his own challenge of UA, epistemic instrumentalism has nothing to stand on.

6. Conclusion

The aim of the present paper was to underline the weakness of the core of epistemic instrumentalism. I conclude that the epistemic stability of the hypothesis of the bodies of common sense is, in some important ways, problematic. I diagnosed the source of this problematic nature as the lack to recognize the osmotic process between the bodies of science and the bodies of common sense. In light of the example of the Copernican Re-

[1] I am indebted to an anonymous reviewer for pressing me to make this clarification, and for suggesting the metaphor of Neurath's boat. Indeed, if certain timbers needed to be replaced while at sea, an epistemic instrumentalist could not tell which replacements were reliable enough at that particular time. The road to full-blown scepticism would be open.

volution, I offered an explanation of how the process of osmosis works. I suggested that the deepest consequence from the osmotic process is that, in fact, the strict isolation of common sense from theories is not sustainable. I have therefore raised the challenge for the epistemic instrumentalist to consistently specify how elements in a body of common sense may be exempted from scientific influences through osmosis. As far as epistemic instrumentalism is concerned, this result provides reason to say that its philosophical position is not sufficiently stable so as not to fall into scepticism.

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