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Misconceptions of positivism and five unnecessary science theoretic mistakes they bring in their train

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Abstract:
Background
Positivism is sometimes rejected for the wrong reasons. Influential textbooks on nursing research and in other disciplines tend to reinforce the misconceptions underlying these rejections. This is problematic, since it provides students of these disciplines with a poor basis for reflecting on epistemological and methodological perspectives. It is particularly common for positivist views on reality and causation to be obscured.
Objectives and design
The first part of this discussion paper identifies and explains the misconceptions about positivism as they appear in two influential textbooks. The second part pinpoints five mistakes these misconceptions easily result in when the researcher adopts an epistemological and methodological standpoint.

Keywords:
Epistemology; Methodology; Positivism; Ontology; Cause; Reality; Explanation; Metaphysics

1. Two misleading conceptions

The sixth edition of *Essentials of Nursing Research* is a trusted resource. It has influenced many nurses and nursing researchers. It promises to provide "the guidance you need to effectively critique every aspect of nursing research" (Polit and Beck, 2006: 14). It is a good book that covers a great deal. Like many similar books, it opens with a few characteristic and fundamentally misleading passages on positivism. Here is what it says:

> A fundamental assumption of positivists is that there is a reality *out there* that can be studied and known. Adherents of the positivist approach assume that nature is basically ordered and regular and that an objective reality exists independent of human observation, awaiting discovery. […] Within the positivist paradigm much research activity is directed at understanding the underlying causes of natural phenomena. (Polit and Beck,

2006: 14)

I shall explain why this characterization of the way positivism relates to causation and claims about reality is confusing, later (Sections 3, 4, 5 and 6). First I want to demonstrate that the mistakes Polit and Beck tempt their readers to commit occur in other textbooks as well.

Lincoln and Guba's (1985) book *Naturalistic inquiry* is the second textbook I want to draw attention to. A number of years after its first appearance this book is still guiding research in several fields—including research involving nurses, targeting nurses or carried out by nurses. (It was referred to by more than 30 articles published in *International journal of nursing studies* between 2003 and 2009). In this book, rich in quotations from various sources, many different and partly inconsistent conceptions of positivism are referred to. However, among the so-called "axioms" summarizing positivism are the following:

> There is a single tangible reality 'out there' fragmentable into independent variables and processes, any of which can be studied independently of the others; inquiry can converge onto that reality until, finally, it can be predicted and controlled. […] Every action can be explained as the result (effect) of a real cause that precedes the effect temporally (or is at least simultaneous with it). (Lincoln and Guba, 1985: 37–38)

Lincoln and Guba's (1985) axioms are strongly reminiscent of the characterization of positivism in the passage from Polit and Beck (2006). From now on, for the sake of economy, I will occasionally refer to these books as 'the two textbooks'. But I should stress that they are examples: as I have mentioned, the pair of misconceptions about the positivist attitude to causation and metaphysics they harbour are widespread.[1]

2. A straw man?

Positivism is often introduced as an unsatisfactory starting point from which the exploration of alternative and improved views, better suited to deal with the research problems and opportunities at hand, can begin. That Lincoln and Guba present positivism in order to motivate an alternative view of science is evident from their observation that:

> […] the positivist picture, while discredited by vanguard thinkers in every known discipline, continues to this day to guide the efforts of practitioners of inquiry, particularly in the social or human sciences. […] it is imperative that inquiry itself be shifted from a positivist to a postpositivist stance. *For, if a new paradigm of thought and belief is emerging, it is necessary to construct a parallel new paradigm of inquiry*. (Lincoln and Guba, 1985: 15)

In this way of presenting matters, there is always a risk that one will make a 'straw man' of positivism—that is, characterize positivism in such a way that it is easily shown to be inadequate. This may be what Lincoln and Guba (1985) do, but it is not my intention to accuse these or other authors of using doubtful argumentative techniques. My sole concern is with the effect that these books may have on readers, particularly the less experienced ones. Is it plausible to

assume that these readers get the wrong picture of positivism from their reading of the above passages? And do they, as a result of this, run a higher risk of misunderstanding the nature of their own research? In brief, the worry concerns the negative impact misleading pictures of positivism may have on the thinking of students of nursing research (or any other area of research). This worry extends, moreover, to textbooks that avoid any literally inaccurate expressions, or scholarly mistakes, but nevertheless present a picture of positivism that their readers are likely to misinterpret. This problem could eventually be researched, in part, at least, empirically.[2] But first the confusions and riddles must be clearly identified, and of course an explanation of their occurrence would also be helpful. It is this conceptual first step that the present article seeks to take.

3. Hacking on positivism – the formulation of the First and Second Riddle

It is time to introduce a depiction of positivism that does more justice to it.[3] Ian Hacking has a long-standing interest in positivist philosophers. Hacking (1983: 41–42) refers to six positivist instincts. I list these in slightly adapted form below. According to Hacking, positivists can be identified by (a combination of all or most of) the following instincts:

(a) Emphasize verification (or in some cases falsification)
(b) Pro-observation in comparison with other means of justifying scientific claims
(c) Anti-cause
(d) Downplay explanations
(e) Anti-theoretical entities
(f) Against metaphysics

Instinct (a) can be elaborated as claiming that significant propositions are those whose truth or falsity can be settled by enquiry. Instinct (b) expresses the idea that the deliverances of sight, hearing and touch provide the best basis for scientific inference. Instinct (c) is the 'metaphysical' conviction that there is no causality in nature if by 'causality' we mean something more than regularities; and (d) says that explanations cannot be used to provide an understanding of nature that is deeper than the sort we obtain by, for example, organizing the natural phenomena we experience. Hacking expands on (e) in the following way:

> Positivists tend to be non-realists, not only because they restrict reality to the observable but also because they are against causes and are dubious about explanations. (Hacking, 1983: 42)

Finally, (f) sums up (a)–(e) by expressing the frequently observed fact that positivists are against metaphysics.

Note that (c) and (d) on this list are clearly incompatible with the causal views attributed to the positivist by Polit and Beck (2006) and Lincoln and Guba (1985).[4] This incompatibility constitutes

our First Riddle. Instincts (e) and (f) are also very hard to combine with what these authors report positivists as saying about reality and other potentially metaphysical issues. This is our Second Riddle. In fact, of the items on the above list, only (a) and (b) appear to be compatible with what the two textbooks say about positivism.

4. First Riddle: positivism and causation

Let us begin with the First Riddle. According to Polit and Beck (2006) and Lincoln and Guba (1985), causal inference and causal explanation are central to positivism. Hacking claims, on the other hand, that the very idea of causation is anathema to positivists, and that explanation is much downplayed by positivists.

Is there any reason to doubt Hacking's characterization? In the first pages of Auguste Comte's *The Positive Philosophy*, where the transition from earlier theological and metaphysical states to a "positive state" is discussed, the founder of positivism endorses closely resembling counterparts of (c) and (e):

> In the final, the positive, state, the mind has given over the vain search after Absolute notions, the origin and destination of the universe, and the causes of phenomena […] (Comte, 1855/1974: 26)

Hence, the positivist attitude to causation depicted in Polit and Beck (2006) and Lincoln and Guba (1985) is, to say the least, surprising and problematic. We find ourselves in an apparent paradox when we view the positivist take on causation through the lenses of the two textbooks. But it may be too quick to conclude that they make a simple mistake. Is it not an exaggeration to construe positivists as being anti-cause in the way Hacking does?

I will argue that there is reason to modify not only the textbook perspective on positivism here but also Hacking's view. Here is one way to slightly modify Hacking's (c):

(c*) positivists downplay causal claims, just as they downplay explanations, by robbing those claims of their metaphysical implications.

There are two independent reasons for this modification. The first follows directly from a requirement of consistency. There is an obvious tension in Hacking's (a)–(f). Saying that the world is *not* in a certain way, for instance, by claiming, as in (c), that there are no causes in it, is to speak metaphysically. But (f) states that positivism is anti-metaphysics. (c*) would be much more in line with the claim in (f).

5. How the 'positivist' attitude to causal explanation may have evolved

Between this revised claim that positivists downplay causation and the textbook view that causation is central to positivism there is still a significant discrepancy. This brings us to the second reason for modifying the two textbook's depiction of the positivist's view of causation—and for modifying Hacking's (c) into (c*) as well.

Note that the 'straw man' hypothesis presented before cannot explain why the same problematic and easily attacked causal features recur in several independent presentations of positivism. It is conceivable that two instances of a rare disease have independent sources, but a more plausible conjecture would seem to be that they stem from the same source. Does an earlier, intermediate view generate the belief that causation is central to positivism? Much of First Riddle would be resolved if this were the case. Shadish (1995: 66) suspects that "Educating clients about philosophy is, with a few exceptions, probably not the best use of our time or theirs", but this may be one of those occasions where such a pedagogic aim is helpful. In this section, therefore, I try to sketch a modern history of the philosophy of explanation.

Here is a more precise conjecture about how the view that causation is central to positivism emerged. Several discussions of the nature of scientific explanation in the twentieth century expressed views about positivism and its relation to causation that were rather similar to the views taken in Polit and Beck (2006) and Lincoln and Guba (1985). These may have given rise to the misleading conceptions of positivism in present-day textbooks. One example of an intermediate, informed, accessible and well-argued view can be found in William Dray's *Laws and explanation in history*. Published in 1957, as a slightly expanded version of a dissertation in philosophy examined at Oxford University, this text is more directly acquainted with the positivism that it, too, criticizes than any of the books mentioned above; and it would not be at all surprising if a book such as this served as part of the intellectual background to the formation of the present-day understanding of positivism.

Dray begins his critique, not by presenting positivism as the 'status quo' against the background of which his alternative conception will be formulated, but by presenting a view of explanation advocated by several of his contemporaries. The authors Dray is concerned with were occupied in various ways with the legacy of positivism. The model of explanation they advocated has a long history—one that I shall briefly return to in the next section of this paper. At any rate, the constitutive idea behind this model is that explanation is achieved by *subsuming whatever is to be explained (e.g. an event) under a general law*.

It is plausible to suggest that nursing researchers sometimes deploy a similar concept of explanation. For instance, in studies of the effect of the practical experience of nurses on their decision-making it has been suggested that assessed pain intensity decreases with rising levels of practical experience. A potential explanation of this has been suggested: nurses may become de-sensitized to the patient's suffering by repeated exposure to it. The following test of this explanation assumes a general law conception of explanation:

> If this is a valid explanation one might expect that novices would assess more pain than experts. The first aim of the present study is to investigate whether the pattern of decreasing levels of assessed pain intensity with an increasing level of expertise will stand up to replication in a controlled study. (Hamers et al., 1997: 326)

Today this view of explanation is often labelled the covering-law theory; it is strongly associated with the works of Carl Hempel. Hempel made the covering-law theory precise in a series of influential articles published in 1948–1965, and in his widely used introductory book *The philosophy of natural science*, first published in 1966. He is often counted among the (logical) [5] positivists. Another philosopher advocating this view of explanation—claiming, in fact, to have developed it—is Karl Popper. Popper's view, although less detailed than Hempel's, is for obvious reasons interesting in this context. To see why, look at the following passage from Popper's work:

> To give a causal explanation of a certain event means to derive deductively a statement (it will be called a *prognosis*) which describes that event, using as premises of the deduction some *universal laws* together with certain singular or specific sentences which we may call *initial conditions*. […] The initial conditions (or more precisely, the situation described by them) are usually spoken of as the *cause* of the event in question, and the prognosis (or rather, the event described by the prognosis) as the effect. (Popper, 1952: 262)

What makes Popper's view interesting, in the present context, is the way it explicitly mentions causal explanation in connection with the view that something to be explained should be subsumed under a general law. It is easy to conclude indeed that Popper's view on causal explanation overlaps to a considerable extent the description of positivism given in the two textbooks. The version of positivism they present may, therefore, understandably have an origin in something like Popper's covering-law model of explanation rather than positivism itself.[6] In fact, I do not regard this as a far-fetched conjecture. Dray, for instance, quotes the same passage from Popper and then describes the account it presents as broadly positivist:

> Popper's account of explanation would, I think, generally be spoken of as 'positivist'. It appears in various guises in the writings of analytical philosophers influenced by the logical positivist movement of the twenties and thirties. (Dray, 1957: 2–3)

Note that I am not claiming that Popper should be counted as a positivist. He would have resisted that. He explicitly argued against several theses asserted by the *logical* positivists—e.g. the thesis that hypothetico-deductive confirmation is effective. Nursing researchers often place Popper among the 'postpositivists', but perhaps the fact that he so readily engaged in debate with positivists shows that he and they took a similar approach to science and science theory. At any rate, we have identified a possible source that might have given rise to the surprising situation in the First Riddle. It is worth stressing that this preliminary how-possibly explanation can, I think, be considerably strengthened by the observation that more clearly positivist-inclined philosophers than Popper—e.g. J. S. Mill—saw no problem with causal explanations. However, I want to save some of these positions to use as illustrations in connection with the more general, metaphysical Second Riddle. They will therefore be dealt with shortly. The point I

want to make here is simply that if we interpret causal claims in the way indicated in (c*), part of the First Riddle dissolves.

6. Second Riddle: positivism and metaphysics

Only part of the First Riddle can be resolved by the intermediate position offered in Section 5: a residual aspect of the causal claim should still worry us. The two textbooks claim that positivists try to understand "the *underlying* causes of natural phenomena" (Polit and Beck, 2006: 14, emphasis added). It is asserted that these causes are "*real*" (Lincoln and Guba, 1985: 38, emphasis added), i.e. roughly speaking, that causal relations are *part of the world as it is independent of us*. In other words, neither textbook seems to agree that positivists downplay causation—or, more generally, metaphysical claims—in the way (c*) and (d) suggest. Indeed some students, using these textbooks, absorb the view that positivism attempts to remove what only appears to be the case in order to 'unveil' nature and see not only what is true but what there really is. Further, recollect the less causal but clearly metaphysical views attributed to positivists in the textbooks: "A fundamental assumption of positivists is that there is a reality *out there* that can be studied and known" (Polit and Beck, 2006: 14); "There is a single tangible reality 'out there' fragmentable into independent variables and processes, any of which can be studied independently of the others" (Lincoln and Guba, 1985: 36). Understanding the explanatory ambitions in this way makes nursing researchers (and others) doubt the viability of the project:

> It is thought that the conceptual scheme of science provides a language that allows us to describe and explain reality as it is, a description of the world that transcends any local point of view. We might characterise this as the 'objectivity' myth. (Avis, 1998: 142)

Explanation certainly *can* have exactly this metaphysical goal of letting us know what the world is really like, but it is vital to appreciate that this explanatory goal is neither necessary nor particularly common—even among non-positivists. We should therefore distinguish carefully between causal and other explanations that do have such metaphysical ambitions, on the one hand, and more modest explanations, on the other. To illustrate this distinction, let us consider what the physicist Pierre Duhem and the philosopher J. S. Mill have to say about the notion of explanation:

> To explain (explicate, *explicare)* is to strip reality of the appearances covering it like a veil, in order to see the bare reality itself. (Duhem, 1906/1991: 7)

> […] what is called explaining one law of nature by another, is but substituting one mystery for another, and does nothing to render the general course of nature other than mysterious. (Mill, 1891/2002, Ch11§6: 310)

Duhem clearly deploys a metaphysical concept of explanation[7]; Mill equally clearly denies that his explanations have any bearing on the metaphysical issue of what really exists. It seems that

Mill is right that one is entitled to claim that one has probed nature's mysteries and discovered what really exists only if one succeeds explaining something in the metaphysical, Duhemian sense. Mill's more modest concept of explanation does not license this sort of claim, and therefore it has no metaphysical implications. This much should be conceded by anyone.

In point of fact Mill was influenced by positivism, and his concept of explanation is rather similar to Comte's. After describing how, in the "positive state", we give up our search for the causes of phenomena, Comte tells us what the human mind studies instead:

> [It] applies itself to the study of their laws—that is, their invariable relations of succession and resemblance. Reasoning and observation, duly combined, are the means of this knowledge. What is now understood when we speak of an explanation of facts is simply the establishment of a connection between single phenomena and some general facts, the number of which continually diminishes with the progress of science. (Comte, 1855/1974: 26)

Now compare the quotations of Mill and Comte. They concur in their basic view of explanation. The only difference seems to be that whereas Comte held that such explanations had little to do with causation, Mill chose to follow his British forerunners, notably David Hume,[8] in recommending a transformed, non-metaphysical concept of cause:

> The Law of Causation […] is but the familiar truth that invariability of succession is found by observation to obtain between every fact in nature and some other fact which has preceded it, independently of all considerations respecting the ultimate mode of production of phenomena, and of every other question regarding the nature of 'Things in themselves'. (Mill, 1891/2002, Ch5§2: 213)

This apparent shift in the notion of cause seems to be the crux of the matter. Causation is often conceived as a relation that holds between entities in the world independently of our conception of it. It hardly needs saying that causal claims grounded in that kind of causal concept have implications vis-à-vis questions about what there really is. Positivists often understand causation in this way; and when they do, inevitably, they conclude that causation is beyond their ken. Real causative relations of this kind challenge their anti-metaphysical instincts. But, as we have seen, causation may also be understood otherwise, and much less metaphysically. The causal concept relied on by Mill (and Popper perhaps) is a good example. It remains unclear why any careful positivist would not rely on that kind of causal concept; any positivist could consistently do so.

Now over to the Second Riddle. We have already seen that the two textbooks attribute a causal notion with a metaphysical residue to the positivists, and we have had a brief look at the non-causal, explanatory, metaphysical talk to be found in the works of Polit and Beck (2006) and Lincoln and Guba (1985) on the views of positivists. How is it possible that these two textbooks do not even comment on this apparent paradox?

7. Non-commital metaphysics?

There is one more possibility to ponder. Just as the term 'cause' can be used to label several causal concepts (and similarly just as 'explanation' can point to both metaphysical and non-metaphysical concepts), terms like 'reality' and 'the world out there' can express radically different metaphysical claims. Consider the passage from Hacking (1983: 42) that was quoted above: "Positivists tend to […] restrict reality to the observable […]." This may express the idea that positivists firmly believe that the world as it is independently of us consists exclusively of observable entities. More plausibly, however, it expresses the idea that positivists are only interested in theorizing about observable aspects of the world. There is a small chance that the two textbooks deploy the terms like 'reality' and 'the world out there' in this second, non-commital metaphysical sense. Perhaps they think of reality and being out there in the same relatively modest way that, as we have already seen, they view cause and explanation. That is certainly possible.

On the assumption that scientists aim to discover truth there is some link between what scientists say and what they claim about the world. But it can be elaborated in several ways. The first option is imperialist. It adds that there is nothing more 'out there' than what our scientific interests and theories commit us to. This surely *seems* to be the way our two textbooks interpret the metaphysical claims of positivists. A second option is more irenic. It consists in *bracketing* other beliefs about what may exist out there. Reality, on this latter view, may contain much more than our theories say it does, but the researcher *qua* researcher does not (currently) have anything to say about those other parts of what really exists. Despite first appearences, this may be the way our two textbooks interpret the metaphysical claims of positivists.

Ignaz Semmelweis's well-known investigation of childbed fever provides an illustration of the two metaphysical standpoints. In the 1840s Semmelweis was one of the first in his field to adopt a necessitarian concept of cause (see Codell Carter, 1983: pp. xlix-l; and Gillies, 2005: 175–176). In his view, there was a unique cause of childbed fever. For example: "In order for childbed fever to occur, it is a *condition sine qua non* that decaying matter is introduced into the genitals" (Semmelweis, 1983: 149). Now, quite *which* causal concept a discipline adopts might be assumed at first to be a purely scientific matter—something to be settled by scientific enquiry. In truth, however, nothing internal to scientific enquiry is likely to settle the issue. It requires more 'external' or practical evaluations to prefer a necessitarian concept over, say, a probabilistic one. [9] It makes sense to assume that Semmelweis's decision was guided both by practical concerns—he wanted to find a reliable cure—and the more internal aim of categorizing diseases in a more systematic way (see Persson, 2009: 208–209). It is possible, but would be utterly strange, if such considerations motivated the first, imperialistic claim that nothing but causation in the form of necessary causes exists in the world. It is much easier to understand Semmelweis's decision in light of the second, bracketing position that only these aspects of the world, i.e. necessary causes, are currently fruitful objects of enquiry.

However, more cautious positions than these two are available. A third metaphysical standpoint should also be identified. We may note the danger of conflating what the world is with what our

theories imply; we might, for instance, conceive of theories more instrumentally. Then we can choose to emphasize the difference between theories and the world. Mach (1883/1902: 505) takes this path. He explicitly warns us that we "should beware lest the intellectual machinery employed in the representation of the world on the stage of thought be regarded as the basis of the real world". Mach is sometimes counted among the more important positivist philosophers of science (e.g. see Pojman, 2009); he certainly influenced many fellow theorists.

These three standpoints affect the way we tend to understand 'reality' and related terms. According to the first, imperialistic perspective our scientific interests and theories determine our metaphysics. Reality coincides with what our interests and theories assume. Had this view been adopted by Semmelweis, he would have thought that there could be no causes that are not necessary for their effects in reality. In the hands of a positivist the view implies that there can be no unobservable entities in the world. According to the second, bracketing position, our scientific interests and theories partly determine our metaphysics. Reality partly coincides with what our interests and theories entail. If that had been accepted by Semmelweis, he would have thought that there are causes that are necessary for their effects in reality; and in the hands of a positivist this view implies that there are observable entities in the world. The third option advices us not to assume any straightforward links between scientific interests and theories, on the one hand, and metaphysics, on the other. This third standpoint (and to some extent the second standpoint also) is a metaphysical counterpart to the non-commital conception of causation and explanation discussed above. It is possible, I think, to find positivists of both these later varieties but not of the first one.

The reason why standpoint two may be favoured by some positivists—despite Mach's genuinely positivistic warning above—is the following. It is probably not uncommon for epistemological concerns to shape one's metaphysical position. It has been argued that, intentionally or not, such calibration has taken place in evidence-based medicine, where it has helped to determine the concept of cause employed there (Persson, 2009). Similar calibrations may abound in science. By analogy, one possible interpretation of certain positivists would be that, inspired by their epistemological convictions, they banished from their metaphysics (most) non-observables and other kinds of element that were difficult to control epistemically. It seems that some positivists did indeed do this. Otto Neurath, for instance, attended many of the meetings of the Vienna Circle in which the early twentieth-century version of positivism was discussed, and he often interrupted when he spotted that the discussion was leading to metaphysical talk. Cartwright et al. (1996: 5–6) report that during a meeting Neurath was told not to keep calling out 'Metaphysics!' and asked to hum 'M-m-m-m' instead. He responded that it would be easier if he said 'not-M' whenever they were not misled into talking metaphysics. One has to remember here that this happened in a context where the other participants were also against metaphysics!

It is conceivable therefore that some positivists would admit that their theories imply a metaphysics—a metaphysics accommodating elements that are epistemically accessible. Given such a conception one might even say—albeit with a high risk of misleading one's listeners—that positivists are naïve realists. In this particular setting that claim would amount to little more

than the assertion that positivists have calibrated their scientific interest in the world in accordance with what they can in principle know something about for sure. Note, however, that this construal presupposes the second standpoint. Hence it does not imply that everything in reality is observable, i.e. the first standpoint, but only the more modest position that there are observable things in reality.

It should be noted, moreover, that nothing more than the second or third standpoint is needed to claim that positivistic science is about facts (and nothing but the facts). Something that many positivistically inclined scientistists have been interested in is to distinguish between facts and values. For instance, Keynes (1891: 34) distinguishes between a positive science concerning what is and a normative science discussing what ought to be. Being committed to what is in this sense requires little of one's metaphysics. The non-committal metaphysics reflected in the third or second standpoint would serve Keynes and his colleagues perfectly well.

Be that as it may, the important point here is that a non-commital metaphysics tailored for positivist use, would not suffice to meet the requirements of the two textbooks. It could not be used to deal with the Second Riddle. The reason is that our textbooks are interested in comparing the metaphysical implications of various science-theoretic positions in a way that denies them access to non-commital concepts of reality and other metaphysical items which they use to characterize positivism. Positivism, according to their comparisons, must have more in common with the 'naïve realism' of the first standpoint than, say, naturalism has. For instance, our textbooks set up the following two comparisons:

> Positivist paradigm: Reality exists; there is a real world driven by real natural causes.
> Naturalistic paradigm: Reality is multiple, subjective, and mentally constructed by individuals. (Polit and Beck, 2006: 14)

> Positivist paradigm: Reality is single, tangible, and fragmentable.
> Naturalist paradigm: Realities are multiple, constructed, and holistic. (Lincoln and Guba, 1985: 37)

These conceptions of the positivist paradigm effectively make it impossible to resolve the riddle by downplaying the positivist's concept of reality in the way indicated above. On the contrary, both books seem to amplify the imperialistic, metaphysically committed element in the alleged positivist position. They do so in order to enhance the difference between it and the naturalistic paradigm. This, we should finally conclude, plainly amounts to a wrong turning.

8. Five unnecessary mistakes

I will now continue with five illustrations, and by noting a few implications of particular kinds of mistake. In the light of the preceding discussion, a few relatively common mistakes can be identified. Some mistakes made by nursing researchers and others in discussions of positivism have their roots in the two misconceptions dealt with in this article.

Mistake 1: You do not agree that the world out there can be unproblematically discovered. Therefore you reject positivism.

The mistake is obvious. In point of fact, however, you and the positivist are of the same opinion, so this cannot be a valid reason to reject positivism (see Shadish, 1995: 67, for a related comment on the rejection of logical positivism). Though obvious, this mistake is sometimes committed, and our two textbooks might sometimes be to blame. For instance, O'Byrne (2007) presents a graphic claimed to be adapted from Lincoln and Guba (1985) according to which the ontological position of positivists is: "Naive realism; ultimate reality".

Such an understanding is clearly risky. It invites the imperialistic and metaphysically committed reading discussed earlier. That view is useless as a basis for rejecting positivism. No positivist is likely to have held anything more than the bracketing view. Hence the approach quickly threatens to introduce substantial misunderstandings of the way positivists understand the nature of scientific enquiry and the growth of knowledge. The author continues:

> Ethnographers who undertake research from a classical (positivist) perspective believe that there is only one reality, which is self-apparent and can be described and reported with objectivity […] The ontology of this approach is a naive realism in which an ultimate reality is believed to be capable of capture by scientific observation in the same way that a camera 'captures' a picture. (O'Byrne, 2007: 1384)

I doubt any ethnographer or other researcher should think of knowledge acquisition in this way. The main point, however, is that whether or not one believes that scientific observations resemble photographs, or that photographic material can be fruitfully used as scientific evidence, the positivistic idea of objectivity that may arise from such notions has little to do with the alleged fact that the camera captures 'ultimate reality'.

Two other features of photographic material are more likely to inspire the positivist. First, photographic material records the observable, which according to positivists should enjoy epistemic priority. Second, the photograph makes the momentarily observable accessible (to some extent) on later occasions. This facilitates enquiry into the truth-values of observation reports. In view of the positivists' focus on truth and falsity, and because of the privileged role observation reports have in the search for truth, the second feature has central importance. The aims these features serve are not unique to the positivist, of course. Nor is the idea that photographic material could promote them. For instance, Götell et al. (2009) work with video recordings in order to study the influence of caregiver singing and background music on vocally expressed emotions and moods in dementia care. They, too, use recorded material for this purpose:

> In order to ensure the reliability of the data, the last author did a co-assessment of the videos. Her analyses agreed quite strongly with those of the first author. (Götell et al., 2009: 435)

To sum up, Mistake 1 highlights the fact that positivism is sometimes rejected in the mistaken belief that positivists take the world to be easily accessible. Arguably, the positivistic instinct that reliable knowledge has its sources in the observable is distorted here. There may be several implications of this mistake, but one of the more important is that one fails to take notice of the joint interest to promote scientific growth and intersubjectivity in a world which is, ultimately thought to be inaccessible. Certainly, authors like Mach, Duhem, Mill, Neurath, Carnap, and many, many others are not the only to have discussed these problems in depth. But their contributions are relevant—especially, perhaps, for those who commit this particular mistake and want to understand the problems and opportunities of their epistemological perspective.

Mistake 2: The naïve realism of positivists leads to a view of the way knowledge grows according to which dynamicity of co-created world views is not acknowledged.

A slightly more twisted version of the first mistake ends up rejecting positivism on the grounds that it does not acknowledge the importance of mutual efforts in the creation of our sometimes rather unstable world views. The argument proceeds from the same mistaken premise as before—namely, that according to the positivists naïve realism is true. From this it is inferred that positivists believe that, necessarily, the truth is easy to uncover by observation. The presumably true premise that, as a matter of fact, our world views are the outcome of joint (and by no means only cumulative) efforts is then added, which creates a tension between, on the one hand, naïve realism and, on the other hand, the evident truths that world views are co-created and dynamical. And the conclusion then follows that the positivist understanding of reality is flawed and should be replaced by a more contructivist conception.

In effect, this way of thinking—based on one faulty premise—is likely to yield *three* mistaken conclusions. The first is that the tension at issue needs to be relieved by adapting one's metaphysics in the direction of adopting a constructivist view. That this is not a valid conclusion can be seen at once: constructivism is by no means the only alternative to naïve realism, and virtually any metaphysics will ease the tension the argument trades on.

The second mistaken inference is to the conclusion that positivists fail to acknowledge the value of collaborative efforts in the construction of world views. This is certainly wrong. On the contrary, the positivists' denial that what is 'out there' can be the object of productive scientific enquiry is followed by a strong emphasis on intersubjectivity as an instrument to validate truth-claims. Indeed this is often precisely what positivists aim for when they insist on intersubjectively testable 'protocol' statements and integrative efforts within 'unity of science' programmes. By stark contrast, some constructivist arguments assume that both intersubjectivity and objectivity are ruled out by the rejection of naïve realism; but positivists should not agree to this. One way of framing the positivist idea is to say that intersubjectivity can be retained even if objectivity, in any stronger sense, is found to be impossible.

The third mistaken inference is that positivism inevitably results in stable world views. Several arguments in favour of "a truly humanistic perspective of research" (e.g. see Speziale and Carpenter, 2004: 3–4) receive support from these and similar mistakes. For instance: *only if*

reality were fully apprehended by everyone who cares to look would stable world views be the natural outcome. Why else, but by believing this, should the positivist not point to the dynamic nature of world views? First, we must realize that the positivists never believed in naïve realism. Second, the intellectual distance between people like Thomas Kuhn, with his dynamic views on the construction of world views, and the positivists may have been considerable, but a clear kinship remains. This kinship is reflected in many ways. One is that Kuhn's most well-known work, *The Structure of Scientific Revolutions* (1970), was published in a book series intended to make up the *International Encyclopedia of Unified Science*—a publication in whose preparation many of the positivistically inclined philosophers we have mentioned were involved, and whose first editor in chief was Neurath. Another way in which the kinship becomes plain is that Rudolf Carnap—who happened to be editor in chief of the *Encyclopedia* when Kuhn's book was published—noted the similarity between his own views on language planning and Kuhn's. For a discussion, see Reisch (1991).

To sum up, Mistake 2 highlights the fact that positivism is sometimes rejected in the mistaken belief that positivists do not acknowledge the value of intersubjectivity and the possibility of very different ways to systematize knowledge. The source of the mistake is the conception of positivists as naïve realists (i.e. as defending standpoint one above). As before, there may be several implications following from this mistake. In this case I want to point to the possible failure to notice the relevance of the distinction between internal/external perspectives (in, for instance, Carnap's and Kuhn's writings) and the problems of 'protocol sentences' and 'observation reports' (in, for instance, Popper's and Neurath's writings). The starting-points of these discussions are in line with the convictions of those who commit this mistake, and may—plausibly—promote reflection on these issues.

Mistake 3: You do not agree that your task is to identify causes and effects. Therefore you reject positivism.

In one sense the mistake here is, once again, completely obvious. Positivism is adequately characterized as anti-cause, so this inference cannot represent a cogent reason for rejecting it.

Having said this, however, we must return to the intermediate position. The term 'causation' is associated with several conceptions of causation. Some of these conceptions are compatible with positivism, but the majority of them are not. Broadly speaking, causal accounts that descend from the Humean regularity theory of causation are compatible with positivism. These accounts equate the relationship between cause and effect with regularities between types of cause and effect. Hume speaks of what he calls constant conjunction. Popper—as we have seen—needs universal laws, as he calls them, to do the same job. So long as the concept of law does not introduce further problematic characteristics, Popper's account of causation may also be compatible with positivism proper. That is, to the extent that you deny that your task is to identify Humean causes, you may have a valid reason to reject positivism, but not in other cases.

Part of this mistake can, therefore, in fact be elaborated to yield two good reasons to diverge from positivism. First, if for some reason or other you find that the non-commital concept of

causation offered by the positivist is not metaphysically 'real' enough for your interests, or your scientific needs, positivism is not the right position for you. In effect you should reject positivism because it operates with too non-commital a causal concept. Second, if law-like generalizations, however complicated the patterns they occur in, are not interesting (or obtainable), positivism must once again be abandoned. Here, in effect, you are obliged to eschew positivism because it operates with a causal concept that is too strong. Often a generalized version of this second problem has been the focus of discussion. For instance, it has often been claimed that certain phenomena are so complex that there can be no science, in the positivistic sense, of them.[10]

To sum up, Mistake 3 points to the fact that positivism is sometimes rejected on the basis of the mistaken belief that positivists attempt primarily to discover causes and effects. Arguably, it is the positivistic instinct to systematize observable data into law-like generalizations (of which cause-effect relations can be a special kind) that is distorted here. The implications of this mistake are not considerable for those who accepts neither causality nor generalization as research goals. However, those who are exclusively against examining causal relationships may have something to gain from positivistic attempts at explicating scientific enquiry and growth.

Mistake 4: You reject positivism. Therefore you should accept one of its acknowledged competitors.

In nursing research, and in many other disciplines, students are often given the impression that there is a list of epistemologies or methodologies to choose from. If positivism does not seem attractive, one should move on to something else on the list. Our two textbooks invite that response. Research stereotypes have emerged in many places (see Bonell, 1999). Arguments such as the one in this fourth mistake enforce that tendency. The notion that the rejection of one candidate implies the acceptance of one of its acknowledged competitors might be defensible where those lists are exhaustive; but of course in the present case they are not. There is always room to develop a slighter or more substantial variation of an existing view. Consider Neurath's epistemological concerns. Today most of us would be unable to distinguish between the competing schools of *logical positivism* (Vienna) and *logical empiricism* (Berlin) in which he was interested (Neurath, 1946/1983: 234–235). To amplify this point further, it may be added that he was also interested in *radical empiricism* (promoted by William James) and *empirical rationalism* (advanced by Gregorius Itelson). However, most of the time there is no reason to label a specific position, let alone to remember the details. Lincoln and Guba (1985), Speziale and Carpenter (2004), and many other writers, seem to assume that we are entitled to make largish leaps between well-defined science-theoretic alternatives, and to overlook the countless—often as yet unnamed—middle positions.

Perhaps this comment should be qualified. From the perspective of epistemology, or methodology, it does not follow that rejection of one 'ism' implies the acceptance of another. For *political* reasons, of course, the rejection might oblige us to accept an alternative, well-defined position. But these two sorts of reason should be kept apart. It seems to me that they are properly separated in academic writing on methodology less often than they should be. For what it is worth, I think that a totally different take on this issue is preferable. The important

thing is never that we undertake this or that particular kind of research, but rather that we perform the kinds of study we need to perform to obtain the knowledge we hope to acquire. And when we do so we should also reflect carefully on the knowledge these kinds of study cannot provide access to (see also Persson and Sahlin, 2009: 555). It may just be that the study objects are unique, or that the link with implementation is of special significance in nursing research:

> Nursing theory must be tried, tested and substantiated *in practice,* i.e. the messy, idiosyncratic *real* world of the wards and community, and not some artificial approximation to them. (Greenwood, 1984: 80)

(Note again that the word 'real' can be used in many ways. J. Greenwood's use has no metaphysical implications of the kind with which we have been preoccupied in this article).

Mistake 5: Each of Hacking's instincts is sufficient for positivism.

The last mistake recapitulates and generalizes the previous four. Frequently, a position is rejected because one of its components is considered unacceptable. If this happens for the right reasons, and not as the result of a misconception of some sort, there need be no disquiet. Many good reasons have been given for deeming positivism inadequate in certain scientific contexts; and any such reason may be sufficient in itself to warrrant rejection of positivism as a generally preferable account.

Mistake 5 occurs when, as a result of this rejection (which, recall, is based on one feature of the relevant position), *other* features of the position are rejected as well. Positivism is just one case of an account whose rejection—sometimes for the right reasons and sometimes for the wrong ones—has, on occasion, led to the rejection of perspectives similar to it. For instance, attacks on positivism have, by implication and quite unfairly, been taken to be attacks on quantitative social science methods in general, or measurement, or hypothesis testing (Shadish, 1995).

This mistake may seem too obviously mistaken ever to occur. But in my view it is made frequently when we argue against a position because it fails in certain respects and, as a consequence of this elimination, adopt another, more promising position. For such a strategy to be warranted, each of the components—or instincts, in Hacking's terminology—has to be sufficient for positivism. Of course, however, they are not. Positivism seems to share the idea of the epistemic priority of the observable with research teams like Götell and colleagues, but this does not make the latter positivists. The very idea of collecting several components, or instincts, in an effort to characterize a position reveals only that these components are individually necessary and jointly sufficient for the position.

The implications of this mistake are, potentially far-reaching. Depending on one's other reflective interests concerning scientific enquiry the consequences of this mistake include all the other implications we have discussed. To these implications we have to add a number of consequences that we have *not* discussed (for instance, consequences following from rejecting

(a) and (b) on Hacking's list).

9. So what is positivism?

Today positivism is often characterized negatively. No, it is not naïve realism! It is against metaphysics! And so on and so forth. Such characterizations help us see where certain interpretations have taken a wrong turning.

Implicitly, however, several of these charges involve positive characterizations. Two salient features of positivism are the epistemic priority given to observations and the scientifically prioritized goal of finding regularities that can be generalized. These features are by no means trivial. Observation and the search for generalizable regularities are far from incompatible with alternative scientific values such as understanding, insight, intuition, explanation or expertise. However, presumably, only a limited subset of the processes or achievements we ordinarily refer to when we speak of understanding, insight, and so on, is strongly linked with observation and regularity.

If our aim is to understand positivism, I think Hacking's list of positivist instincts is a good point of departure. I have argued that one of the instincts should be slightly revised (c*). I also think that an instinct should be added—namely, that of prioritizing knowledge concerning generalizable regularities. (True, this is really in Hacking's list already, but it is disguised in the form of a remark on explanation. It deserves a separate entry.)

In another context, Friedman (1994), and his fellow economists, talk about positive economics. This discussion emphasizes systematisation and generalizable regularities. These features should characterize positivism in many of its various disguises. Perhaps the fact-value distinction empasized in that discussion (e.g. see Keynes, 1891: 34) should also be included in an updated list.

The compilation of this new list may be a tiny achievement. It may, nevertheless, be of real value to those involved in the search for an improved understanding of the fascinating, problematic and admittedly rather divergent thoughts collected under the heading ‘positivism’.

Acknowledgements

Although I have spent this entire paper worrying about the way positivism can and has been misconceived, it is a healthy sign, and I am very happy to see, that there are so many science-theoretical discussions in nursing and nursing research. From a philosopher's point of view, the interpretations of ‘practitioners’ probably teach us more about scientifically relevant concepts and their interrelations than philosophical debate does. I want to thank the editors and several of IJNS’ anonymous referees for constructive comments. Finally, I want to thank Staffan Angere, Ingalill Rahm Hallberg, Paul Robinson, Nils-Eric Sahlin, Lena Wahlberg, Annika Wallin, and Frank

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Endnotes

1

I do not claim that these misconceptions are peculiar to any specific discipline. An illustration from a totally different field would be Groat and Wang's (2002) *Architectural Research Methods*. In this book, the reader is not introduced to positivism as much as to "positive theory". Positive theories, it is claimed, "are descriptive and explanatory systems that, because they can identify causal links, can predict future behaviours of the objects in question." (Groat and Wang, 2002: 78).

2

In the manner of, for instance, Beckstead and Beckstead (2006) or Mantzoukas (2009).

3

One enthusiastic reviewer on the back cover of Lincoln and Guba's book wishes that “this [book] would be sufficient to put the nails in the coffin of positivism once and for all.” That would be fine if the nailing was based on the right reasons—positivism has a number of acknowledged difficulties. Obviously, it is not fine if the nailing is based on a misconstrual of positivism.

4
And with the views, cited in the first footnote, of Groat and Wang (2002), too.

5
There is a distinction to be drawn between positivism and logical positivism, but I suggest that it is not relevant for the purposes of this discussion. Positivists and logical positivists are similar enough in their views on causation and metaphysics to be handled together here as ‘positivists’ *simpliciter*. In other words: logical positivists are much like other positivists when it comes to these two features; they all have the same instincts.

6
Certainly, if that were true, it would not be entirely fair to charge the authors of the two textbooks with setting up a ‘straw man’. Plainly, also, Hacking's view that positivists are anti-cause would have to be viewed as inaccurate to the extent that Popper is counted among the positivists.

7
However, Duhem continues to argue that physics should not aim to explain, so in this sense he may be said to deploy a ‘straw man’ conception of explanation.

8
Comte, too, was influenced by Hume's analysis of causation, but he let the concept of law replace that of cause. Scottish philosophy is perhaps what brought Comte and Mill together (see Haac, 1995: 6).

9
Carnap (1950) makes a similar distinction, and points to the metaphysical character of “external” problems.

10
Several important discussions shed further light on this issue. The link between (logical) positivism and (analytical) behaviourism in psychology (see Smith, 1986) is one interesting case. The complexity of social phenomena is another much-debated case, and one, of course, that was of central importance to Comte as well as to Dilthey. For an introduction to the issues, see Bourdeau (2008).