Organization Theory and Philosophy: dissolving the realism-constructivism debate.

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Abstract

The topic of this paper is the constructivism-realism debate, construed as an example of the intrusion of philosophy into science. Against this intrusion I maintain that philosophical problems are not only different from scientific and practical ones. They are also problematic in themselves. That is why their import into our scientific and practical work only creates confusions that hinder us in our work. The aim of the paper is to show that the philosophical problems that create those confusions need a Wittgensteinian therapeutic treatment. The method of the paper consists in comparing what philosophers (or philosophising scientists) say we do with what we actually do. After giving an example of what happens when a rightly respected scientist starts philosophizing, the method is applied, first, to the relation between language and the world and, second, to the relation between theories and the world. In the first application a story about three umpires is used to distinguish language and discourse, between questions of meaning (of the words we use) and questions of truth (of the things we say). In the second application a comparison between maps and theories is used to show the difference between assessing the truth of descriptive statements and explanatory theories. The examples of the umpires and maps are introduced by Weick and in both cases I show that neither constructivist nor metaphysical realist conclusions follow.

Key words: constructivism, realism, philosophy of science, Wittgenstein, therapy.

1. Introduction

The *topic* of this paper is the constructivism-realism debate, construed as an example of the intrusion of philosophy into science. By intrusion I mean such things as philosophers telling scientific researchers to get their 'ontology' and 'epistemology' right before starting their conceptual, theoretical or empirical research. It is similar to what Barber (1988) calls 'the conquest of politics' (by philosophy). Against this intrusion or conquest, I maintain, first, that philosophical problems should not be confused with and should be kept apart from scientific and practical problems. For example, both Quine's problem of translation and Goodman's problem of the identity of musical works are not problems of field linguists, musicologists and musicians. Quine and Goodman know. They explicitly stress that they are not doing linguistics or musicology: they are making a philosophical point (Quine 1969: 34) or solving a philosophical problem (Goodman 1976: 120). They both recommend the field linguist and musician to go on as before and not to be bothered by their philosophical work. That, I think, is as it should be. The relationship is one of mutual irrelevance. Against this intrusion I maintain, second, that philosophical problems are not only different from scientific and practical ones. They are also problematic in themselves. That is why their import into our scientific and practical work only creates confusions that hinder us in our work.

The *aim* of the paper is to show that the philosophical problems that create those confusions need a therapeutic treatment. Philosophical problems arise when we forget things (when we are philosophising) we all know (when we are not philosophising). What we then need are reminders of the things we tend to forget. The primary example of such a therapeutic conception of philosophy is of course Wittgenstein. It is a form of scepticism *about* philosophy. But the history of philosophy is full of examples of such a therapeutic conception. According to Fogelin (1994), the Pyrrhonian sceptics would be an early example and

Wittgenstein a later one. And Nussbaum (1988) stresses the therapeutic similarities between Aristotle and Wittgenstein. Moreover, in the course of this paper I will make the claim that Bhaskar's transcendental arguments are best interpreted as Wittgensteinian therapeutic arguments: they both try to remind us of what we already (but implicitly) know, for example by making "explicit what is presupposed by the activities in which we engage" (Bhaskar 1975/1997: 257).

The *method* of the paper consists in comparing what philosophers (or philosophising scientists) say we do with what we actually do. A short and straightforward example is the way Wittgenstein handles the realism-idealism debate by comparing what ordinary (that is, non-philosophical) parents do with what realist and idealist parents do. Ordinary parents don't teach their children that physical objects like books and chairs exist and neither that they do not exist. They teach them to fetch books and sit in chairs, the existence of which is presupposed in their teaching. Explicit questions of existence come later: fairies and unicorns as against books and chairs do not exist. They are creations of our imagination or fantasy (Wittgenstein On Certainty, par 476). Now enter the idealist and realist parents. Will they tell their children 'fetch that book, but don't think it really exists' and 'fetch that book and notice that it really exists'? They may think so as philosophers, but as parents they will probably (and hopefully) behave as ordinary parents: they will tell their children to fetch that book period. But then, what is the use of their views outside philosophy? In the words of Wittgenstein:

> 'One man is a convinced realist, another a convinced idealist and teaches his children accordingly. In such an important matter as the existence or non-existence of the external world they don't want to teach their children anything wrong.
> What will the children be taught? To include in what they say: 'There are physical objects' or the opposite? (Wittgenstein Zettel, par. 413)
> But the idealist will teach his children the word 'chair' after all, for of course he wants to teach them to do this and that, e.g. to fetch a chair. Then where will be the difference between the idealist-educated children and the realist ones? Won't the difference only be one of battle cry?' (Wittgenstein Zettel, par. 414)

Whether the *result* of the paper amounts to much, depends on how you look at it. If dissolving confusions is considered as a great accomplishment, much is achieved. But, therapeutic philosophy still is a form of philosophy. It helps us in our battle against the intrusion of philosophy into science. It clears the ground (Wittgenstein) in order to get the real work started. But the real work is science not philosophy.

The paper has the following *structure*. The realism-constructivism debate is a debate about the relation between language, discourse and the world: do or don't we speak (and think) about language (and mind) independent things in the world? We need a language in order to be able to say things about the world. This means, first, that we have to distinguish between language and discourse, between the meaning of the words we use and the truth of the statements we make. Questions of meaning (what determines the meaning of the words we use?) antecede questions of truth and refer to the relation between language and the world. Questions of truth (what determines the truth of the things we say?) refer to the relation between discourse and the world. The statements we make can be descriptive or explanatory. When explanatory, they presuppose a theory. This means, second, that we have to distinguish between the way we assess the truth of descriptive statements and the truth of explanatory theories.

Given this structure, I proceed as follows. To set the stage I start in the second section with an example of what happens when a rightly respected scientist starts philosophizing. Mintzberg will be my example. In the third section, I move on to the problem of the relation between

language and the world. I start this section with the famous story of the three umpires that use the language of baseball to call balls and strikes. The story is introduced by Weick (1979) and used to elucidate his notion of sensemaking and enacted environments. With the help of a pair wise comparison I first show that, against Weick, the second umpire is the cleverest one: no constructivist conclusions follow from the story. Second, I make explicit some of the presuppositions of the practice of umpires. Third, I compare these presuppositions with Weick's notion of sensemaking and enacted environments and show that those notions don't make sense. In the fourth section, I turn to the relation between theory and the world. First, I introduce a fourth umpire who uses a theory to interpret the puzzling things she saw. Second, I show that the way we assess the truth of descriptive statements cannot be applied to theories. Third, I confront the way Weick (1993) compares sensemaking with cartography and theories with maps, with what map makers actually do and show that no constructivist conclusions follow. At last, I draw some general conclusions on the different ways we assess the truth of theories. No theory of truth is needed here. In the concluding section I point to similarities between a therapeutic conception of philosophy and Bhaskar's use of transcendental arguments. I end by formulating an answer to those readers who are thinking 'with all your talk about intrusion and therapy, in the constructivism-realism debate you clearly come out as a realist.'

I want to stress that the paper is not an assessment of the substantive work of Mintzberg and Weick, but of what happens when they start philosophizing. As such its method resembles Bennett and Hacker (2003) on neuroscience. Moreover, my interest is in the philosophical moves made, not in the players: these are pretty standard moves, used by many players.

2. Philosophising scientists: a first example

Mintzberg is a scientist who is highly respected for his work on among other things the nature of organizational strategy. His strategy approach belongs to the configuration school. When criticised by Donaldson, who works from a contingency perspective, instead of an answer to Donaldson's critique, we get this piece of philosophizing:

'Donaldson's criticism is based on the one criterion of accuracy: if theories are true or not. But all theories are false; they are just words or pictures on pieces of paper. Reality is always more complex. (The world may not be flat, for example, but neither is it round. It bulges at the equator and has all kinds of bumps, called mountains.) So usefulness becomes a key criterion, especially for practicing managers. (The flat earth theory is particularly useful for building airport runways in Holland).' (Mintzberg et al. 2001: 209)

I will take this sentence by sentence (and please keep in mind that I admire his non-philosophical work). To start with, and as a minor point, I would say that truth claims are not the same as claims of accuracy. To name the date of an event is more accurate than telling which year the event took place, but both statements can be true or false. According to Weick (1979: 35), theories always involve a trade off between generality, accuracy and simplicity. Hirschman (1970) on exit, voice, and loyalty, for example, scores high on generality and simplicity and low on accuracy. But that does not mean it scores low on truth. At best it means that we assess its truth differently from theories with different scores

More important are the next two sentences: "But all theories are false; they are just words or pictures on pieces of paper. Reality is always more complex." Whether all theories are false depends, first, on what you think theories are and second, on what you mean by 'being false.' According to Mintzberg, theories are just words and pictures on paper. That is a silly thing to say. Compare 'Is theory making a difficult thing to do?' 'No, it is easily done. You just pick

some words and pictures and put them on paper.' We need a theory when we make causal, explanatory statements. Because a theory is not exhausted by the statements in which it is formulated (we can deduce an indefinite number of new statements from a theory), many authors conceive of theories as models (that can be compared with maps).
According to Mintzberg, theories are false because they are not as complex as reality. That necessarily means that theories would be true when they are as complex as reality. So, Mintzberg introduces an absolute distinction between complete and incomplete theories and then proudly proclaims that theories cannot be complete: they are all false. But the contrast is a nonsensical one. Making theories as complex as reality (or the world) is something we cannot do because it is a nonsense thing, an unintelligible thing. The complexity of reality is infinite, the world is an ever yielding horizon (Husserl) and both reality and the world are infinite information loads (Luhmann). There is no such thing as a complete representation of infinity, just as there is no such thing as counting all natural numbers. To ask for a full description or representation of reality or the world is either elliptical for things in or aspects of reality/the world or nonsense. In practice, completeness is a purpose and context dependent affair, as we will see when we compare theories with maps. A London subway map is complete if it contains all relevant topological information and incomplete if it doesn't. It makes sense to complain about a subway map that does not represent all subway stations, but only a philosopher would ask for a better subway map because it doesn't represent London 'in its full complexity.'
To say both that all theories are false and that the earth is neither flat nor round but bulges and has bumps is, first, self contradictory, for it claims to be true. And second, it evades the discussion which is not about bulges and bumps but about whether the earth is flat with bumps or round with bumps. Nowadays that matter is settled: the world is not flat but round (or roughly spherical). Astronauts can see so. So, saying that the earth is flat is first of all false. Second, it is not stating a theory let alone a useful theory. The engineers and workmen that designed and build our airport runways would be surprised to hear that they use the flat earth theory. Of course they don't. Their job is engineering, not philosophising.
Such are the confusions, produced by a philosophizing scientist. From a nonsensical distinction between complete and incomplete theories, Mintzberg draws the nonsensical conclusion that we cannot assess the truth of theories and furthermore confuses the way we use language to make descriptive statements and the way we use language to formulate theories. So let us first take a closer look at the relation between language and the world before moving, in the fourth section, to the relation between theory and the world.

3. Language and the world: the difference between language and discourse

The story of the three umpires

At the start of his book *The Psychology of Organizing* (1979), Weick presents this story:

'The story goes that three umpires disagreed about the task of calling balls and strikes. The first one said, 'I calls them as they is.' The second one said, 'I calls them as I sees them.' The third and cleverest umpire said, 'They ain't nothing till I calls them'.' (Simons, cited in Weick 1979:1)

According to Weick, the third umpire correctly shows us the important role that people play in creating the environments that impose on them. What Weick means, when he speaks about sensemaking and enacted environments, is not the trivial truth that we act on our environment

and by doing so co-create it. According to him, the environment is not 'out there', but 'in here', that is, in our heads. That is pretty strong stuff that needs a careful investigation.
In a pair wise comparison I first show that the second umpire is the cleverest one, that is, expresses and understands what umpires in fact do. I will contrast (1) the realism of the first two umpires with the constructivism of the third, (2) the activity of the second and third with the passivity of the first and (3) the infallibility of the first and third umpire with the fallibility of the second. The second umpire is the only one that comes out correct in all three comparisons.

Are strikes and balls independent 'things out there'?
The most obvious similarity is that between the first two umpires. They both think that balls and strikes are things 'out there' in the world, things that are independent of their calling them balls and strikes. In that sense you could call them realists. Compared to them, the third umpire could be called a constructivist: balls and strikes do not exist independent of his calling them balls and strikes, they come into being or 'are discursively constituted' by his calling them balls and strikes.
The third umpire attributes Godlike qualities to himself. He thinks he is able to do what only God could do: creating things in the world by uttering the words "let there be …" But, in thinking he is the one who creates balls and strikes, he conflates two different rules. The first rule is about balls and strikes and determines what counts as a ball and a strike. With this rule we define what balls and strikes are, that is, what the concepts 'ball' and 'strike' mean. This rule is used by everyone involved in the game: players, umpires and spectators. Without an understanding of the rule, they could not see balls and strikes.
The second rule is about the umpire and states that, in the game, only the umpire has the right to decide which are balls and strikes. In the game, the umpire has formal and final authority. So, it is a rule, not about balls and strikes, but about the special status of the umpire in the game. You could say that players, spectators and umpires agree in the language they use, but not necessarily in the truth of the statements they make: "What people say can be true or false. But they agree in the language they use" (Wittgenstein Philosophical Investigations par. 241). The agreement is one in definitions: we all agree on the definition of balls and strikes. This agreement does not ensure agreement in the things we say, for example, calling a throw a ball or a strike. That's why we need umpires. With so much at stake, they enable the game to go on, to prevent it from turning into one long fight on whether a particular throw was a ball or strike.
So, first, umpires don't create, produce or construct balls and strikes. These are created, that is, thrown by pitchers. Pitchers, like all ordinary people, don't confuse concept (the rule) and object (balls and strikes). Formulated in the language of Bhaskar, playing baseball presupposes as its condition of possibility both the transitive-intransitive distinction between word and thing and referential detachment: when we discuss whether a throw is a ball or strike, we refer to the same throw.
What then, second, about the rules themselves, they surely are human creations, productions, constructions or inventions? Of course they are. Who else could have created them: God or Nature? But again, those rules are not created by umpires. Umpires apply those rules. They neither create them nor change them in every application, for these rules are pretty stable. Then, who does? Well, because baseball grew into a highly formalized game, the rules of the game are nowadays determined by those who got the authority to do so. But in the informal beginning there was someone who said "let there be balls and strikes." Probably it went like this. Two boys are playing. They take turns in throwing and hitting balls. Then they get into a fight over changing places, the hitter saying: "that was not a real throw; it was too wide of the mark." To end the fight, one of them then says "let there be balls and strikes," that is, "let us

distinguish within throws between balls and strikes and let us change places after not hitting three strikes."
What they did was this. From an indefinite number of similarities and differences between throws they selected the relevant ones and used them to define balls and strikes. Assessing similarities and differences is an empirical matter. Selecting from them the relevant ones is not. That is, as Goodman (1972) says, an eminently practical affair. These relevant or important similarities and differences are then used as the defining criteria of balls and strikes. In this way we create a difference that makes a difference (Bateson). The difference is already there, but only after the introduction of a concept or distinction does it make a difference. This normative status is something added to the similarities and differences. You can look at those similarities and differences as long as you like, but they will not tell you which of them are relevant: throws don't come labeled as balls and strikes. For that, you have to look at yourselves and what you are doing. In this case you are playing a game in which the need arises to introduce a new distinction. In that sense Wittgenstein can say that concepts express and direct our interests. Concepts are not forced on us by reality, which makes language autonomous and arbitrary in a semantic (but not in a sociological) sense. This, of course, is the standard critique of referential theories of meaning.

The passivity of the first versus the activity of second and third umpire
Both the first and second umpire treat balls and strikes as things 'out there' in the world. That is not something they believe, it is not an opinion or theory that could be false. And it certainly is not an ontological theory. It is just implied in what they do. Making this explicit requires special circumstances. Imagine asking umpires whether they really believe that strikes and balls are things out there. They would be baffled by your question. But what, then, is the difference between the first and second umpire?
We discover the difference by contrasting the passivity of the first with the activity of the second and third umpires. For the first umpire, the presence of balls or strikes acts as the cause of his calling them balls or strikes. It looks like a kind of automatic and unproblematic stimulus-response or cause-effect relationship. He functions like an empiricist mirror of the world. Not so for the second and third umpire. For them, calling balls and strikes requires an active contribution. According to the second you need to see them, which requires looking at the throws. And according to the third you create them. The third umpire doesn't have to look, for there are no balls and strikes to see or look for. According to him there are balls and strikes only after him calling balls and strikes.

The fallibility of the second versus the infallibility of the first and third umpire
A third similarity, that often goes unnoticed, bears upon the first and third umpire. They both, but for different reasons, think that they cannot make mistakes. They both are absolutely certain that there are balls and strikes when they call balls and strikes. The first one thinks so, because he calls balls and strikes when there are balls and strikes. And the third one thinks so because when he calls balls and strikes there are balls and strikes. For the first umpire, the presence of balls or strikes acts as the cause of his calling them balls or strikes. For the third umpire his calling them balls or strikes, acts as the cause of there being balls or strikes.
The naivety of the first and the megalomania of the third umpire contrasts with the epistemological modesty, with the fallibility of the second umpire. According to him, his calling balls or strikes is conditional on him *seeing* balls or strikes. He admits that he can err in two ways. He can call balls or strikes when in fact there are no balls or strikes and he can not call balls or strikes when in fact there are. The second umpire correctly understands that calling balls and strikes is a normative, ruled guided practice that has to be learned. Not the umpire, but the rules of the game determine what counts as a ball or strike. To be able to

apply these rules, umpires have to understand the meaning of the words 'ball' and 'strike,' they have to understand what counts as balls or strikes. The correct application of these rules is a practical skill that has to be mastered. Like all skills, this ability implies training and stages of skill development (Dreyfuss & Dreyfuss, 1986; Benner, 1984): umpires start as novices, pass through the stages of advanced beginners, competent umpires and proficient umpires, and will end as experts who seldom make mistakes.

The presuppositions of the practice of calling balls and strikes

We now turn to some of the presuppositions of the practice of the second umpire. The practice of calling balls and strikes presupposes (1) agreement in definitions (of the words we use), (2) agreement in judgments (of the statements we make) and (3) a distinction between seeing and interpreting.

Agreement in definitions: the relation between language and the world

When we define a concept, we treat different particulars or things in spite of their differences as the same in some relevant aspect. In this way we classify throws as balls and strikes, sexual behaviors as normal and abnormal, (like incest or rape), organizations as public and private, heavenly bodies as planets or stars and so on. In doing so, we don't create or change similarities and differences: Pluto is still the same dirty mass of icy rocks although it does not count as a planet anymore (Jewitt, Luu 2007; Gingerich 2007) and sexual behaviors don't change by calling them rape (see Hacking 1999). We value the behaviors differently and feel the need to express that in our concepts. When scientist are discussing the introduction of new concepts (like the distinction between autopoietic and allopoietic systems) or the change of existing ones (should we call the liquid with the chemical structure D_2O another kind of water, because it looks like water or another kind of liquid, because it has another chemical structure), they are not discussing similarities and differences. Those can be settled empirically: biologists did not disagree with Maturana and Varela on the way cells work, but whether that way should be raised to the defining criterion of life or living systems. The same with discussing the status of Pluto (is it another kind of Planet or a different kind of thing?) or the liquid (is it another kind of water or a different kind of thing?). To decide, scientists looked, not at similarities and differences but at the respective consequences for their classificatory schemes. For that reason Pluto isn't a Planet anymore and the liquid is another kind of water: it is called 'heavy water' (Hacker 1996: 250-253).

This, of course, is the standard critique of referential theories of meaning that you can find in authors as diverse as Wittgenstein (1954), Goodman (1972), Ellis (1984), Hunter (1990), Hallett (1991) and Elgin (1997), to name only a few. But no constructivist conclusions follow. What we self evidently construct are the concepts we use, not the things referred to:

> 'Wittgenstein does not deny that we, for the most part, talk about language-independent things; he denies only that the latter constitute the meanings of our words, and hence that there are *semantic* connections between language and world. Empirical propositions refer to language-independent items and are verified or falsified by the way things are.' (Glock 1996: 275)

When discussing the relations between word, meaning and referent, we could use Archer's forms of conflation as a tool to classify the different positions. Upward conflation would be the position of the semantic or metaphysical realist: referents determine meaning or in Kantian language: concepts conform to objects. According to the metaphysical realist, language represents the essential structure of the world. Downward conflation would be the position of the constructivist: concepts create their referents or objects (objects conform to

concepts). From a correct critique of the referential theory of meaning, they draw a wrong, constructivist or idealist conclusion. Central conflation would be the position of those who say that in our discourse about the world, our contribution and the contribution of the world interpenetrate in an indistinguishable way:

'Elements of what we call 'language' or 'mind' penetrate so deeply into what we call 'reality' that the very project of representing ourselves as being 'mappers' of something 'language independent' is fatally compromised from the start.' (Putnam 1990: 228)

Analytical dualism would be the Wittgensteinian position. We readily distinguish between the contribution of the world (the similarities and differences) and our contribution (attributing some of them as relevant). Analytical dualism rests on some form of the conceptual-empirical distinction whether in the form of Carnap's analytic-synthetic distinction, Wittgenstein's distinction between grammatical and empirical statements or Luhmann's distinction between self reference and external reference. So, it distinguishes, against Quine, between conceptual truths (as in 'I am a bachelor because I am an unmarried man') and empirical truths (as in 'I am a bachelor because I am afraid to commit myself'). The distinction between married and unmarried men makes sense, for I could be both and whether I am is settled in an empirical way. The distinction between married and unmarried bachelors makes no sense and that matter is settled by a conceptual analysis. Philosophers often introduce nonsensical distinctions like married and unmarried bachelors and then proudly proclaim that there are no married bachelors: all bachelors are unmarried. As we saw and will see, absolute distinctions such as complete/incomplete theories, objective/subjective facts and truths, direct/indirect access to the world, are like the married/unmarried bachelor distinction. They are nonsensical distinctions and from nonsense you can only derive further nonsense.[1]
The kind of realism involved has got many names like transcendental realism (referring to the way it is argued for) or common sense realism (referring to the common sense of the second umpire). I prefer 'promiscuous realism' as in Dupré:

'The realism derives from the fact that there are many sameness relations that serve to distinguish classes of [things] in ways that are relevant to various concerns; the promiscuity derives from the fact that none of these relations is privileged.' (Dupré 1981:82)

As a consequence, truth is not language relative. Language does not describe anything and so can not be true or false. We use a language to say things about the world. So, questions of meaning (of the words we use) antecede questions of truth (of the things we say). What we *can* say depends on the language we use, as every bilingual person knows (Kuhn). But the *truth* of what we say depends on how things are in the world. Even Kuhn does not relativize truth to a language:

'The point is not that laws true in one world may be false in another but that they may be ineffable, unavailable for conceptual or observational scrutiny. It is *effability, not truth* that my view relativizes to worlds and practices.' (Kuhn 1993: 336; my emphasis)

Agreement in judgments
We distinguish between umpires who have difficulties in applying rules and rules that are difficult to apply. According to Wittgenstein, application of the rules presupposes not only

[1] 'In fact, one might say that it is characteristic of Wittgenstein to try to show us that when philosophers say that we can't do something, say that something is impossible, typically the thing they tell us it is impossible to do is a nonsense thing, unintelligible thing.' (Putnam 1995: 40).

agreement in definitions but also in judgments, that is, application of definitions. A certain constancy of results is required: if we would come to blows with every judgment, we would have a reason to change the rule. The rule would not be false, but unpractical because difficult to apply. It would lose its point. That is why such an agreement in judgments belongs to the framework conditions of the game. And the agreement itself requires a certain amount of training. So, calling a throw a strike is not true because everyone or a majority of the community calls it a strike (the reference is, of course, to Krippkenstein's' community view). Measuring devices in tennis show that sometimes the majority is wrong. It is the other way around. All those involved in the game speak the language of the baseball community. But, without a certain level of agreement in judgments of balls and strikes, the game would be difficult to play. And, indeed, it is sometimes difficult to judge whether a throw is a strike or not.

Constancy of umpires' judgments can be threatened for different reasons. First, seeing something requires the right position. That's why we have linesmen in soccer and tennis. Second, even when you are in the right position, seeing is not measuring. You can see that someone is tall, but not that he is six foot three. For that kind of precision we need a measurement device (like nowadays in tennis). And third, sometimes the umpire is confronted with ambiguous (March) or equivocal (Weick) information. In that case an act of interpretation or sensemaking is required.

The typical case in soccer is the 'Schwalbe': when a player falls to the ground, is that because he was tackled or because he tried to set the scene for an undeserved penalty kick? Is it obstruction or obfuscation? Sometimes the thing is clear (the umpire sees a 'Schwalbe') and sometimes it is not (the umpire sees the player fall to the ground but does not know whether he has to see it as a 'Schwalbe' or not).

Seeing and interpreting

The distinction between seeing (a player fall to the ground) and interpreting (it as a 'Schwalbe') is an important one. If we accept it, March and Weick enriched organizational theory by adding something that applies to the special case of ambiguous or equivocal information: in those cases a *specialized* act of interpreting or sensemaking is required. In this way, three conditions of decision-making can be distinguished. Decision-making can be difficult because of incomplete information (bounded rationality), unreliable information (opportunistic behaviour) and because of ambiguous information. Special about ambiguous information is that no further investigation of the facts is possible (the umpire has to decide on the spot) or that no further investigation of the facts will help you in solving your problem: is it a duck or a rabbit (Wittgenstein), is he a fascist, in which case you shoot him or a human being, in which case you don't (Orwell in Spain during the civil war) and is joining the resistance a moral obligation or a betrayal of your mother who needs your help (Sartre)?

If, however, we say, that every seeing (hearing, reading and so on) necessarily and always involves interpretation or sensemaking, we need a radical transformation of the language or conceptual scheme in which we formulate our empirical statements and theories. In normal usage, we distinguish in most cases between seeing and interpreting.[2] If you expect your mistress and instead see your wife entering the restaurant, you ask yourself 'what's up?', which is Weick's favorite expression for the start of sensemaking. Now you are definitely in an emergency crisis that calls for an act of sensemaking. However by calling seeing your wife

[2] But not always, see Raatzsch 2003. Generally speaking, we distinguish, for example when we teach, between reading, understanding and interpreting. We give students a reading assignment, hope they understand what they read and then start a discussion on interpretation. Exams would be superfluous if we couldn't distinguish between students who don't understand and who interpret differently. But sometimes we call a different interpretation a different reading of the text. As always, we shouldn't be dogmatic.

an interpretation, you introduce a new kind of 'what's up question' and a new concept of interpretation as a super type with as subtypes: seeing and that which we formerly (or in ordinary usage) called interpreting. So you now need a new word for what we formerly called interpretation. Does that make sense?
Of course, you could call seeing your wife an act of sensemaking and making sense of seeing her an act of interpretation: sensemaking produces the data that need an interpretation (Weick). But then the question remains: what are the data of sensemaking? If those data are inner things, you will end up by denying the knowability or even the existence of the outer world. In that case, the wife you see is not out there, but in your head, as Weick seems to think.

Weick on sensemaking and enacted environments

Seeing as interpreting: Cartesian and empiricist misunderstandings
Constructivists like to stress the interpretive, subjective nature of reality: to see balls and strikes is the same as interpreting or making sense of 'something' with the help of concepts. To see something is like making an inference or stating a hypothesis. This interpretivist thesis can come in a Cartesian and an empiricist form. In the Cartesian subject-object conception, the 'somethings' that are interpreted are outer, physical objects and their movements: you see the physical object and its movements and infer it is your wife. In this conception we are detached minds, confronted with a meaningless physical world and permanently engaged in the activity of interpreting or giving meaning to it. The contrast, of course, is the anti-Cartesian, embodied and embedded conception of Merleau-Ponty, Heidegger and Wittgenstein: we live and are practically engaged in a meaningful world of projects and tools (including concepts as tools). Interpretation or sensemaking is a secondary activity that we need only when something goes wrong, as in the famous hammering example of Heidegger.
In the empiricist conception, the 'somethings' that are interpreted are inner things (sense data), that are given in our experience and to which the mind adds something. As a remarkable result, the outer world proves to be really an inner one: it is no more than a logical reconstruction out of inner sense data. So, what we see (hear, smell, describe, explain, react to) is Appearance, not Reality as it is 'in itself.' This empiricist conception (with idealist results) was forcibly criticized in Sellars (1956) as the 'myth of the given', in Wittgenstein (1954) who toyed with the idea of a phenomenalist language in his intermediate period and in Austin (1962) on 'sense and sensibilia.' The critique is further expanded upon in among others Strawson (1966), Bhaskar (1975) and Hacker (1987).
The empiricist conception seems to be difficult to resist. It reappears in Chia (2000), according to whom we apply concepts to the undifferentiated flux of our pre-linguistic experience. Things in the world (like balls and strikes)

> 'have to be forcibly carved out of the undifferentiated flux of raw experience and conceptually fixed and label[l]ed so that they can become the common currency for communicational exchanges.' (Chia 2000: 513)

But umpires don't apply concepts to the flux of their inner experience. They apply concepts to what they see: throws, thrown by pitchers. Neither throws, nor the throwing, nor the pitchers are in your experience or mind but outside your mind in your environment. This is emphatically denied by Weick to whom we now turn for a second close reading of a philosophizing scientist.

Appearance and Reality: Weick on enacted environments

According to Weick, what we think is outside, really is inside:

'While the categories external/internal or outside/inside exist logically they do not exist empirically. The "outside" or "external" world cannot be known. There is no methodological process by which one can confirm the existence of an object independent of the confirmatory process involving oneself. The outside is a void, there is only the inside or internal view. A person's world, the inside or internal view, is all that can be known. The rest can only be the object of speculation … [W]hat investigators tend to dismiss is the assertion that the environment is located in the mind of the actor and is imposed by him on experience in order to make that experience more meaningful. It seldom dawns on organizational theorists to look for environments inside of heads rather than outside of them.' (Weick 2001: 184-185)

First, saying that the categories external/internal or outside/inside do not exist empirically is a confusing way of saying that, as logical or formal categories, they have no empirical content. But, of course, we can give them empirical content. We all know what these distinctions generally mean. But to give them empirical content we have to specify what we are talking about. Are we talking about refrigerators ('put the things inside'), persons ('watch that car coming at you full speed') or organizations ('don't forget to observe your competitors').

Next, according to Weick, the outside or external world cannot be known, because it cannot be confirmed independent of the confirmer's confirmatory process. But that is, first, a tautology: to confirm is to execute a confirmatory process and the one who is doing it is a confirmer. So, what Weick is saying, is that a confirmer cannot confirm without confirming. Second, it implies that we could know the external world if we could confirm it without a confirmatory process. But that is something we cannot do, because it is a nonsensical, unintelligible thing. The presupposed distinction between confirming with and without confirmatory processes is like the one between married and unmarried bachelors. So, like Mintzberg, Weick first introduces a nonsensical distinction and then proudly proclaims that we cannot confirm without confirming.

The further conclusion that the outside is a void and that only the inside exists is, first, a self-contradiction. To say that the external world is unknowable is to say that we cannot know whether it is a void or a space filled with all kind of things. Second, if only the inside exists, the distinction collapses. In this, Weick goes further than the constructivist who says that you could have used another distinction (which is trivially true). He also goes further than the deconstructivist who deconstructs the distinction by saying that there is more inside in the outside than you think, and vice versa (for a sober critique, see Ellis 1984). Weick goes one step further: 'there is no such distinction, for everything is inside.' In fact, Weick says three different things: the outside is unknowable (an object of speculation), we know the outside is a void and the outside does not exist. But, third, the inside has also to be confirmed, so would be a void (or unknowable) too. This brings us to the last point: if everything is a void, then where are we, where do we stand when we look?

According to Weick, all we can know is a person's world, his inside or internal view. But that is confusing. A world (that what you see) is not a view. A room with a view enables you to see outside things. But what you see depends on what things there are outside. Of course, in a room without a view you could not see anything outside. That is what Weick seems to think we are: rooms without a view.

What Weick probably means is that our view or perspective on the world determines what we *can* see in the world, just as the language we use determines what we *can* say. In fact, it all boils down to this: if a subject looks at an object from a different perspective, the subject will see a different aspect of the object. Or, as Luhmann says, the multiplicity of perspectives of the subjectivist corresponds to the multiplicity of aspects of the world of the objectivist

(Luhmann 1988: 50). In that sense, they are just different sides of the same coin: to be a subjectivist about perspectives is to be an objectivist about aspects of or things in the world. So, perspectives on and knowledge of the environment are 'inside things', but not the environment itself. This is pretty trivial and no constructivist conclusions on an unknowable outside world (as in Weick) or on an indirect access to the outside world (as in Luhmann) follow (see Christis 2001). To do so, you need to define knowledge of (or direct access to) the outside world either as knowledge without a perspective or as an all perspectives encompassing knowledge. But, both are nonsensical things (like married bachelors). The view without a perspective, the absolute standpoint (Williams) or the view from nowhere (Nagel) is a nonsensical thing both literally and metaphorically. Compare: 'From where did you look at things?' 'From nowhere.' 'But then, what did you see?' 'Well, nothing of course, for how could you see anything if you are nowhere?' And an all perspectives encompassing knowledge is nonsensical because the number of possible perspectives is indefinite. There is no such thing as encompassing an indefinite number of perspectives. So, both the view from nowhere and the view from everywhere are nonsensical views. These are not places where we can be when we look at things.

4. Theories and the world

We now turn to the relation between theories and the world. I first show that the way we assess the truth of descriptive statements cannot be applied to theories. Then, I introduce a fourth umpire who uses a theory to explain the things she saw. Next, I compare theories with maps, as Weick and Fay do, and show that no constructivist conclusions follow. Lastly, I explain how we assess the truth of theories and why we don't need a theory of truth to do so.

Language, discourse and truth

Our language consists of words which we combine in sentences that we use to say things or make statements, among them, empirical statements. Empirical statements can be descriptive or explanatory. Calling balls and strikes are descriptive empirical statements. These are true when things are as stated. If so, we say that it is true or a fact that the throw is a strike. Now enters a philosopher who says: 'that is true and a fact indeed, but only subjectively so, for there are no objective truths or facts.' The distinction between objective and subjective facts is a new one, introduced by the philosopher. So we ask him what he means (as in Rundle 1993). Does he mean that we are lying that it rains (as in facts and lies), that we are making it up (as in facts and fiction or fantasy), that we conjecture it (as in facts and conjectures or hypotheses) or that we make a value statement (as in facts and values)? But, no, says the philosopher, that the throw is a strike is neither a lie, nor fiction, nor a conjecture, nor a value statement. It is a fact, but only subjectively so. But, then, what does he mean by that?
Pressed for an answer he will point to the language dependent nature of facts. Without a language we could state neither facts nor truths. And the language we use determines what facts we can state. With that, we heartily agree, for that is a trivial truth we all know. But, if you call facts for that reason subjective, than objective means: stating a fact without a language and that is something we cannot do: it is a nonsense thing, a non-intelligible thing. If so, then the distinction itself is a nonsensical one. The philosopher is, again, like someone who introduces a distinction between married and unmarried bachelors and then proudly states that there are no married bachelors. In this case he distinguishes between stating a fact with and without a language, between objective and subjective facts and proudly concludes that we cannot state a fact without using a language: there are no objective facts. Because the

distinction is a nonsensical one, it doesn't apply. Facts are neither objective nor subjective, but just facts period. As we saw before, what we can say depends on the language we use, but the truth of what we say depends on how things are in the world. If what we say is how things are, we state a fact period. And if not, what we state is not true and so cannot be a fact.
Theories are not just descriptive empirical statements (of for example the level of inflation in Holland). We use theories to explain things by describing causes and effects (of the level of inflation). They typically have the form 'C causes E by acting on B', where acting on B is the mechanism that produces E. Government spending causes inflation by acting on the economy, but as we all know, there are more contributing and counteracting forces acting on the economy. That is why Cartwright (1983) can say that the laws of physics lie and why Weick can say that "[w]hen experimental findings support a theory the theory, not the findings, is generalized to the world outside the laboratory and people will predict what will happen in that world based on the theory" (Weick 1983: 494). And both are reformulations of Bhaskar's transcendental refutation of a Humean conception of causal laws as constant conjunctions.
So, we need a theory on the causal meaning of government spending, that is, a description of the way government spending acts on the economy. Note the difference between the language and theory dependent nature of our observations. Simply put: without a language, we don't know or understand what we see and without a theory we don't know where to look (for causes and effects). That is all we can milk out of the language and theory dependent nature of our observations.
The peculiar thing about theories is that we cannot count the number of statements it consists of. In that it resembles our beliefs. There is no answer to the question 'how many beliefs do you have?' As a consequence, we assess their truth differently. Truth, applied to single empirical statements is an all or nothing affair: throws are either balls or strikes and that it rains is either true or false. Not so with theories. Like maps, they allow grades of truth, that is, grades of similarity in relevant features. Before expanding on that, let us first apply the distinction between descriptive and theoretical or explanatory discourse to our umpires.

Seeing fool balls and inferring fixed games

The distinction between empirical and theoretical discourse can be elucidated by looking at a fourth umpire who was introduced by Engeström (2000: 305). This umpire is involved in a game in which the favorite team loses after hitting easy foul balls in critical situations. Everyone involved saw what she saw, but for her, regularly hitting easy foul balls is an odd fact that calls for an interpretation or explanation. After discussing this with a colleague with similar experiences, they suspect fixed games with betting money behind it. An investigation is opened, and it eventually escalates into indictments of several hundred players, coaches and local baseball officials who have been involved in fixing games and profiting from them in betting.
The example shows us the difference between *seeing* batters regularly hitting easy foul balls and *interpreting* the causal meaning of this fact. The 'things' she saw (foul balls) and that needed an interpretation were neither Cartesian, outer meaningless objects nor empiricist inner things in her experience. Our umpire looked, not at inner things in the flux of her experience, but at outer things in the world, that were there to see for everyone who understands the concept of 'foul balls.' In that she is just like our second umpire.
Just as fool balls are not her individual, psychological constructions, so fixed games are not the collective, social construction of the umpires and the investigating team, as Engeström seems to imply. Foul balls presuppose the institution of baseball and its rules and fixed games presuppose in addition the institutions of betting systems and judicial systems. Fixed games are, like foul balls, things 'out there' in the world, although, of course, we need to understand

the meaning of the expression 'fixed games,' we need to know what counts as a fixed game in order to be able to distinguish fixed from not-fixed games. Without such an understanding we could not discover which games were in fact fixed. So, the idea that the games were fixed started as a conjecture or theory and after gathering evidence, the idea ended as a fact: after the investigation the conjecture proved to be true. The investigation resembles the game of Mastermind: the games were fixed before the investigation started and the task was to find out whether this indeed was the case. Not so for Weick and Fay.

Theories as maps

To explain what sensemaking is, Weick uses Fay's distinction between the 'objectivist and realist' game of Mastermind and the 'constructivist' game of mapmaking: "Mastermind is precisely what sensemaking is not … The task of sensemaking resembles more closely the activity of cartography" (Weick 2001: 8-9). Mastermind is about discovering the code that reveals a pre-existing order, while "for mapmakers the idea of a pre-ordered world has no place or meaning" (Fay, as cited in Weick 2001: 9). The opponent is the metaphysical realist according to whom there is one true map that corresponds to the ultimate structure of reality. The alternative is to be, first, a fallibilist about maps: a terrain can be mapped in an indefinite number of different ways and, second, a constructivist about the terrain: the terrain does not contain a map to be discovered by the mapmaker, but "[t]he terrain is an entity in part constituted by some form of representation" (Fay 1996:210).

This is confused in many respects. First, Mastermind resembles the activity of the private eye or detective, who has to discover who did it. In this he uses Bayesian logic. He starts with an idea with a prior, subjective probability. Then he stirs things up, makes moves that elicit counter moves and so adjusts his prior probabilities. In the process, some ideas get discarded and other ideas gain in subjective probability till he gets the idea right. This is how our fourth umpire worked and many scientists and diagnosticians work (see McKeon 2004 and Gill et al. 2005).

Second, as we saw before, metaphysical realism is a nonsensical idea. But Fay and Weick use a wrong, fallibilist argument and draw a false, constructivist conclusion. Fallibilism about knowledge has nothing to do with the fact that many maps can be made of the same terrain. Fallibilism is about each of those maps: they all can be true or false. Fallibilism makes science into a self correcting enterprise (which presupposes that you can be wrong). That is why Merton called science a form of organized scepticism. And from the obvious fact that a terrain does not contain its own map (how could it?), it does not follow that we construct or constitute terrains by mapping them.

Third, the map metaphor is a much used one. Goodman (1972) stresses the simplifying nature of maps and uses this to defend constructional systems (whether those of Carnap or his own system) against

> 'the basic anti-intellectualistic complaint that philosophy does not duplicate experience. … The function of a constructional system is not to recreate experience but rather to map it. … A map is schematic, selective, conventional, condensed, and uniform. And these characteristics are virtues rather than defects. The map not only summarizes, clarifies, and systemizes, it often discloses facts we could hardly learn immediately from our explorations.' (Goodman 1972: 15)

More relevant for our purposes, the map metaphor is used by Toulmin (1953), Ziman (1978), Azevedo (1997) and Giere (2006) to defend a non-metaphysical kind of realism. It is easy to see why: maps are neither empiricist mirrors of a terrain nor constructivist stories that constitute a terrain. Maps simplify and are made to inform is about the terrain, not to move us,

as with pictures and stories (Ziman 1978). I restrict myself to the basic points and recommend reading the originals.

First, map makers reduce the infinite complexity of the terrain mapped. To ask for a complete representation of the terrain is to ask for a duplication of the terrain, which shows that you don't understand what a map is: "There is no such thing as a completely unabridged map; for abridgement is intrinsic to map making" (Goodman 1972: 15). Just ask yourself what a map would look like with a scale of one to one, with a method of projection that does not distort areas, angles, gross shapes, distances and directions and with symbols that are exact copies of what they stand for. Most noteworthy, this simplified representation or model of the terrain enables us to make new inferences about the terrain, which are not inferences about our experience. To use a map to determine the best route to take is not to make an inference about your experience. In the language of Bhaskar: model making is at the heart of the theories that we use to represent and explain things in the world.

Second, the same terrain can be mapped in indefinitely many ways. The reason for this, of course, is not that the terrain has no pre-ordered structure, is unknowable or is a void. On the contrary, the reason is that the terrain is ordered or structured in too many different ways. Map makers have to select a perspective that determines what kind of order will be represented. Without a perspective the map maker couldn't even start. And to ask for an all perspectives encompassing map is to ask for a nonsense thing. In the language of Bhaskar: like map makers, scientific model makers are epistemological relativists. The choice of perspective is purpose dependent. You can make subway maps, road maps, geological maps, weather maps, statistical maps, and so on. Only after the choice of perspective, the question of completeness arises: is the map complete with respect to its purpose, does it contain all relevant features, given the purpose of the map? The same applies to the choice of projection method. To map a three dimensional object on a two dimensional sheet of paper necessarily produces distortions. Again, the question is not 'do maps distort?' but 'do they distort, given the purpose of the map?' If your purpose is navigation, you use the Mercator projection and definitively not the Peters projection. If your purpose is a general purpose world map, you use neither (see Monmonier 2004).

Third, map makers don't confuse map and terrain. They know they don't change the terrain by using a subway instead of a roadway map, just as organizations do not change their environment by defining and claiming a domain (range of products, populations served and services rendered), which enables them to map their relevant or task environment (Thompson 1976). Of course, you can use a map to determine where best to build a new road. But the terrain is changed by building that road, not by using the map, just as organizations change their environment by, for example, managing external interdependencies (Thompson 1976). Note the distinction between 'creating' a *relevant* environment and changing it by acting on it. And map makers distinguish between changes in maps (that better represent an unchanged terrain) and changes in the terrain (that necessitate a new map). Without this distinction they could neither construct maps on the base of data about the terrain, nor verify them, again based on data about the terrain.

In the language of Bhaskar: map makers are transcendental realists. As ontological realists, they distinguish between the intransitive dimension (the terrain) and the transitive one (the map). As epistemological relativists, they know that the same terrain can be mapped in many purpose dependent, different ways. They know that a map is not a mirror of the terrain. Models, like maps, do have non-empirical, non-deductive and non-propositional surplus elements, that refer to the intensional, analogical and iconic aspects of theories (Bhaskar 1975: 152). And as judgemental rationalists they know the distinction between different maps of different terrains and different maps of the same terrain (referential detachment). This enables them to rationally appraise both the purpose dependent value of the different maps of

the same terrain (for example their explanatory value) and their correctness or truth with respect to relevant features of the terrain.

The truth of theories

According to Luhmann, the differentiation of science as a societal subsystem is based not only on the use of scientific concepts (the 'conceptualization of words'), but also on its specialization in questions of truth. Science is essentially a sceptical enterprise, a form of organized scepticism (Merton). It can doubt the truth of all empirical propositions, in the awareness that the truths of today will be the falsities of tomorrow (Weber). Other sub-systems cannot afford a similar sceptical attitude (for one thing, because they are under pressure to act), and neither do we assume such a sceptical attitude in everyday life. In Luhmann's view, we implicitly use something like a redundancy theory of truth in everyday life and don't distinguish between knowledge and true knowledge. Because knowing that *p* means the same as knowing that it is true or a fact that *p*, the concept of 'true' seems to be redundant. We use the true/false distinction only after doubting: I say that it rains; you doubt that and check by looking outside and then say that it is true or a fact that it rains. Therefore, to Luhmann, this redundancy is valid only for the first-order observer. For this observer, knowledge is true knowledge; to know that it rains is the same is to know that it is true that it rains. When one wants to know whether this knowledge is true knowledge, one must observe this knowledge in a second-order observation using the distinction between true and false (Luhmann 1990: 170).

Now how does science determine the truth of substantive theories? To answer this question, we do not need a theory of truth, but an elucidation of the meaning of the concept 'true', of the way the concept is used, when applied to theories. Science does determine truth in various and combined ways. We do so by looking at the world. This is the rational kernel of correspondence theories of truth. But we know that theories are underdetermined by the facts. We do so by looking at each other to find out if we can agree about what is the case. This is the rational kernel of consensus theories of truth. But we know that we all can be wrong. We do so by looking at our theories and their internal consistency. This constitutes the rational kernel of coherence theories of truth. But we know that coherent theories (like the extremely consistent theories of those who suffer from paranoia) can be wrong. And we do so by looking at the success of its practical applications. This is the rational kernel of pragmatic theories of truth. But we know that practical successes can be based on false theories.

All those different theories of truth for the most part just single out one of the many aspects of the use of the word true and try to convert this aspect into a theory that alone determines the correct application of the term true. What we need is not a theory of truth, but a perspicuous overview of the different ways the word true is used (Luhmann 1990: 610; also Strawson 1992 and Williams 2002). Our problem is not determining what the word 'true' means but finding out what is true.

5. Conclusions

In this paper I used the examples of umpires and mapmakers to elucidate the relation between language and the world and between theories and the world. In doing so, I didn't tell anything we didn't already know. Neither did Bhaskar when he introduced specialized terms like the transitive/intransitive dimension, referential detachment and so on. These are all reminders of things we already, implicitly, know but tend to forget when we start philosophizing. According to Bhaskar, philosophy is a conceptual, *a priori* discipline that presupposes the

distinction between conceptual and empirical investigations (as all analytical dualists do). As such it does not produce empirical or *a posteriori* synthetic knowledge. Instead, it uses transcendental arguments, that start with a premise on X (that scientists use experiments, umpires call balls and strikes and mapmakers map a terrain) that we can all agree on and then elaborate on what X means or on what we do when we do X. As transcendental deductions they make explicit what X means or what is implied in doing X. And as transcendental refutations they show what happens if you forget what X means or what is implied in doing X: you then produce nonsense.

Bhaskar took over this technique from Strawson (1959; 1966), who used it as part of his project of a descriptive metaphysics, that is, of an analysis of the general structure of the language we use to say things about the world. Strawson later (1992) used the term 'connective analysis' to refer to his technique and the similarities with Wittgensteinian grammatical arguments are apparent (see Hacker1996; Glock 2002 and 2003). Taken in this way, the 'knowledge' (the reminders) produced by transcendental arguments, connective analyses or grammatical arguments, is not about the world, but about the language we use to talk about the world. That the world is structured is not a deep 'ontological' discovery about the world, but a statement on the way we use the word 'world.'

So, to conclude, am I a realist who thinks that we talk and think about language and mind independent things in the world? And if so, what kind of realist? In a conversation I would ask you what you mean by that and then would show that you either are talking nonsense or are a realist yourself. Not so in a paper. So let's invent a new name. My view on realism is a redundancy view. In normal life we all are, just as the ordinary parents introduced by Wittgenstein and just as the umpires and map makers, introduced by Weick. Only when doubted, do you have to affirm it, but you do so best in an indirect way: by showing the nonsensicality of the view of your opponent (the refutation). What remains (the deduction) are trivial things we all know.

References 'Realistic umpires and mapmakers'

Austin, J. 1962 *Sense and sensibilia*. Oxford: Oxford University Press.

Azevedo, J. 1997 *Mapping reality*. Albany: State University of New York Press.

Barber, B. 1988 *The conquest of politics*. New Jersey: Princeton University Press.

Benner, P. (1984) *From novice to expert*. California: Addison-Wesley.

Bhaskar, R 1975/1997 *A realist theory of science*. Leeds: Leeds Books.

Cartwright, N. 1983 *How the laws of physics lie*. Oxford: Oxford University Press.

Chia, R. 2000 'Discourse analysis as organizational analysis.' *Organization* 7(3): 513-518.

Christis, J. 2001 'Luhmann's theory of knowledge: beyond realism and constructivism?' *Soziale Systeme* 7 (2): 328-349.

Dreyfuss, H., and S. Dreyfuss 1986 *Mind over machine*. Oxford: Basil Blackwell.

Dupré, J. 1981 'Natural kinds and biological taxa.' *Philosophical Review* 90: 66-90.

Elgin, C. 1997 *Between the absolute and the arbitrary*. Ithaca: Cornell University Press.

Ellis, J. 1989 *Against deconstruction*. New Jersey: Princeton University Press.

Ellis, J. 1993 *Language, thought and logic*. Evanstone: Northwestern University Press.

Engström, Y. 2000 'Comment on Blackler et al.. Activity theory and the social construction of knowledge: a story of four umpires.' *Organization* 7(2): 301-310.

Fay, B. 1996 *Contemporary philosophy of science*. Oxford: Blackwell.

Fogelin, R. 1994 *Pyrrhonian reflections on knowledge and justification*. Oxford: Oxford University Press.

Giere, R. 2006 *Scientific perspectivism*. Chicago: University of Chicago Press.

Gill, C. 2005 'Why clinicians are natural Bayesians.' *Medical Journal* 330: 1080-1083.
Gingerich, O. 2007 'Planetary perils in Prague.' *Daedalus* 137 (1): 137-141.
Glock, H. 1996 *A Wittgenstein dictionary*. Oxford: Blackwell
Glock, H. 2002 'Strawson and analytic Kantianism' in *Strawson and Kant* H. Glock (ed.), Oxford: Clarendon Press.
Glock, H. 2003 'The linguistic doctrine revisited.' *Grazer Philosophische Studien* 66: 143-171.
Goodman, N. 1972 *Problems and projects*. New York: The Bobbs-Merrill Company.
Goodamn, N. 1976 *Languages of art*. Indiana: Hackett Publishing Company.
Hacker, P. 1987 *Appearance and reality*. Oxford: Blackwell.
Hacker, P. 1996 *Wittgenstein's place in twentieth-century analytic philosophy*. Oxford: Blackwell.
Hacking, I. 1999 *The social construction of what?* Cambridge: Harvard University Press.
Hallett G. 1991 *Essentialism. A Wittgensteinian critique*. Albany: State University of New York Press.
Hirschman, A. 1970 *Exit, voice, and loyalty*. Cambridge: Harvard University Press.
Hunter, J. 1990 *Wittgenstein on words as instruments*. Edinburgh: Edinburgh University Press.
Jewitt, D., and J. Luu 2007 'Pluto, perception and planetary politics.' *Daedalus* 136 (1): 132-137.
Kuhn, T. 1983 'Afterwords' in *World changes. Thomas Kuhn and the nature of science*. P. Horwich (ed.), Cambridge: MIT Press.
Luhmann, N. 1988 *Erkenntnis als Konstruktion*. Bern: Benteli.
Luhmann, N. 1990 *Die Wissenschaft der Gesellschaft*. Frankfurt: Suhrkamp.
McKeon, (2004)
Mintzberg, H. et al. 2001 'Researching configuration' in *Rethinking strategy*. H. Volberda and T. Elfring (eds.), London: Sage.
Monmonier, M. 2004 *Rhumb lines and map wars: the social history of the Mercator projection.* Chicago: Chicago University Press.
Nussbaum, M. 1988 *The fragility of goodness*. Cambridge: Cambridge University Press.
Pawson, R. and N. Tilley 1997 *Realistic evaluation*. London: Sage.
Putnam, H. 1990 *Realism with a human face*. Cambridge: Harvard University Press.
Putnam, H. 1995 *Pragmatism*. Oxford: Blackwell.
Quine, W. 1969 *Ontological relativity and other essays*. New York: Columbia University Press.
Raatzsch, R. 2003 *Eigentlich Seltsames. Wittgensteins Philosophische Untersuchungen*. Paderborn: Ferdinand Schöningh.
Rundle, B. 1993 *Facts*. London: Duckworth.
Sellars, W. 1956/1997 *Empiricism and the philosophy of mind*. Cambridge: Harvard University Press.
Strawson, P. 1959 *Individuals: an essay in descriptive metaphysics*. London: Methuen.
Strawson, P. 1966 *The bounds of sense*. London: Routledge.
Strawson, P. 1993 *Analysis and metaphysics*. Oxford: Oxford University Press.
Thompson 1967 *Organizations in action*. New Brunswick: Transaction.
Toulmin, S. 1953 *The philosophy of science*. London: Arrow.
Watson, T 1994
Weick, K. 1979 *The social psychology of organizing*. New York: Random House.
Weick, K. (1983) 'Utilization as reverse simulation: making the world more like the laboratory' in *Producing useful knowledge for organizations*. R. Kilmann et al.(eds), 494-521. San Francisco: Jossey-Bass.

Weick, K. 2001 *Making sense of organizations*. Oxford: Blackwell.
Wittgenstein, L. 1954 *Philosophical investigations*. Oxford: Blackwell.
Wittgenstein, L. 1967 *Zettel*. Oxford: Blackwell.
Wittgenstein, L.1969 *On certainty*. Oxford: Blackwell.
Ziman, J. 1978 *Reliable knowledge*. Cambridge: Cambridge University Press.