Critical Contextual Empiricism as a Version of Pluralist Realism

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Abstract: Critical contextual empiricism (CCE), developed by Helen Longino, has made it possible to permanently establish the social and normative aspects in the treatment of understanding of science. In addition, there is a belief that the approach makes it possible to make sense of some classical problems of the philosophy of science, especially the problem of underdetermination, in a better way than any kind of realist or antirealist approaches have been able to. However, quite recently, Rein Vihalemm proposed a realist approach, 'practical realism' (PR), which also assignes the

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cultural and normative aspects an influential role in making sense of science. The current paper includes a comparative analysis of CCE and PR and reaches the conclusion that the former can actually be taken as a version of pluralist realism, despite being traditionally critical of that kind of approaches. As a result of combining CCE with PR, a new version of realism is possible on the basis of these, one that could be called 'pluralist social realism'.

Keywords: *critical contextual empiricism, Helen Longino, pluralism, practical realism, realism, Rein Vihalemm*

Introduction

It is a long and well explored story in philosophy that realists and empiricists see the world somewhat differently. However, no philosopher of science, even the most radical realists, can deny the importance of looking for empirical evidence in the course of scientific research. The attitude is not so straightforward concerning acknowledging realism by empiricists. Typically, the followers of realism believe that science helps us to reveal an aspect of reality as it really is. It is quite easy to be sceptical about this belief and therefore position oneself outside of the borders of realism. Still, many empiricists admit that the approach they follow enables us to get at least a glimpse of reality. There are empiricists who believe that our sense perception shows objects to us as they really are, i.e. they actually accept a certain kind of realism, the most direct or naïve one.

These points of contact between empiricism and realism make it obvious that a fruitful synthesis between the two approaches can be possible in principle. Why would we not look for a combined approach that takes the best of both sides or, to put it differently, unites the most successful or at least promising versions of empiricism and realism? It is, of course, a very subjective decision as to which versions of empiricism and realism should be considered successful or promising ones, but the choice has to be made in order to move forward.

The main purpose of this paper is to discuss an option of a kind of reconciliation based on two definite versions of empiricism and realism. The possible common features of two particular versions of empiricism and realism will be analysed—namely, critical contextual empiricism (CCE) and practical realism (PR). One might argue that CCE is not really a typical empiricist view and neither is PR a typical kind of realism. However, the initiators of these approaches have marked

them as an empiricism and a realism. This could be trusted, at least as a starting point of our analysis. Actually, as the title of the article suggests, the ideal result of the current analysis would be to show that CCE could also be a kind of pluralist realism and accepted as such.

In all evidence, CCE is much better known on the international scene of philosophy of science than is PR. The former approach has been initiated and developed by Helen Longino with a lot of contribution and criticism added by many different thinkers the world over. PR is definitely not as well known and widely discussed. It is a recently developed way of understanding science, of what it includes and provides us with. PR was introduced by the Estonian philosopher of science Rein Vihalemm. PR has been the main target of debate at several conferences. In June 2011, an international workshop with PR as the central topic took place at the University of Tartu, Estonia. Several leading thinkers in realism and practical conceptions of science attended the workshop, among them Rom Harré, Joseph Rouse, and several others. A special issue of the journal *Studia Philosophica Estonica* (see Vihalemm, 2012; Müürsepp, 2012) was dedicated to the papers presented at the meeting.

To begin comparing the two approaches, one can point out an obvious similarity between CCE and PR, although on a rather general level. Both CCE and PR aim at taking science out of its golden cage of value neutrality which appears in various approaches advocated by many well-known philosophers of science. The core of these approaches is the idea that science has to be fully neutral and value-free, not depending in its evolution and results on who is actually achieving these results and in which social circumstances are they brought into public awareness. Scientific knowledge has to be objective. According to the classical understanding, its production does not require social agents to participate or normative aspects to be present. The normative approach does not play a role in science as the latter is totally about facts, not about norms. Both CCE and PR aim at putting science into the social context arguing against the immunity of science from social norms and values and the possibility of making a proper sense of science without considering or even acknowledging the normative aspect of it. PR goes deeper with the understanding, stressing that the world itself as seen by the scientist is not value-free either.

On the other hand, there is also a clear difference between CCE and PR. The former is rather about introducing and interpreting the social aspect of science. The latter aims at a better understanding of how science works in itself and what it can provide us with concerning understanding and making sense of the world

out there, emphasising that it is reality itself that reveals parts of itself to the individual scientist in the process of practical research. However, the normative aspect is clearly visible in PR as well. It comes in rather through the individual researcher but each individual is a member of a society from which he or she has obtained her cultural background and world outlook. PR claims that these influences play their role even in the context of dealing with the most rigorous physics-like science.

Obtaining scientific knowledge is an important topic for CCE, not so much of a central issue for PR, but it is definitely present in the latter approach as well as in any kind of philosophy of science. As the normative aspect is clearly relevant for both approaches, it is obvious that we cannot obtain scientific knowledge in an isolated situation. The traditional sterile value-free interpretation of the development of science does not hold according to either approaches.

The similarities and differences just pointed out offer us a good basis for the forthcoming analysis. The main question is whether CCE and PR contradict or rather complement each other. Our presumption is that the latter is actually true. It may be that even a new synthesised approach with a new name should be developed.

The essence of critical contextual empiricism

Owing to our general goal, we cannot avoid the extremely challenging task of pointing out the essence of both CCE and PR. Doing so briefly is especially tricky in the case of CCE as the works of Helen Longino have captured the attention of a very wide circle of important interpreters and critics. It is an unrewarding task to point out the basic core of the approach; then again, one can look it up in several reference books and there is obviously no need to repeat these entries in full. However, we still have to highlight the key points from the point of view of the current approach. After all, our final aim is to end up with an ambitious plan—to come forward with a kind of criticism of CCE that has rarely, if ever, been put forward before, one that allows comparing CCE and Longino's views with an approach that does not even belong to empiricism, strictly speaking. Furthermore, we have the responsibility to demonstrate that CCE does not necessarily contradict every kind of realism. It can even cohere with some different types of it, as we shall see below. In addition to this, we shall

see that PR is perhaps quite close to one specific type of empiricism, namely 'aim-oriented empiricism' (AOE) of Nicholas Maxwell. Hopefully, this observation will help us in our main task. Because of all this, we still need to state clearly what the core of CCE actually is for us.

Let us make a few remarks about the development of Helen Longino's thought in most general terms. In her first major work *Science as Social Knowledge* (1990), Longino put forward a kind of social epistemology of science, then called simply 'contextual empiricism'. Contextual empiricism differs from typical epistemologies of science in two ways:

> First, it requires subgroups in scientific communities to criticize and respond to each other's work. Second, it claims that both epistemic and non-epistemic values operate in scientific work, and that these values vary from community to community. (Solomon & Richardson, 2005, pp. 211–222)

An important development is presented in a more recent book called *The Fate of Knowledge* (Longino, 2002). 'Contextual empiricism' becomes truly 'critical'. The term 'critical contextual empiricism' appears. Although the critical aspect was present in Longino's views already before, this is an important and timely step bringing in the emphasis on the necessity of a critical dialogue for scientific knowledge creation.

While analysing the cognitive processes that eventuate in scientific knowledge, Longino claims that they are themselves social (Longino, 2002). She uses the underdetermination argument to express in logical terms the point made by the sociologically oriented researchers. Individuals participating in the production of scientific knowledge are historically, geographically, and socially situated in their observations. This fact does not undermine the normative enterprise of philosophy, but requires its expansion to include within its scope the social interactions within and between scientific communities. What counts as knowledge is determined by such interactions.

This general explanation alone brings us quite close to the main core of PR. Nothing in the basics of CCE really suggests that the approach is nonrealist, not to mention its being antirealist. It seems that the result of the interactions within and between scientific communities would reveal aspects of the real world, although this is not necessarily the case, of course.

Using the underdetermination argument as a point of reference for her main claims is reasonable in Longino's case as it allows showing the power and flexibility

of the contextual approach. Longino emphasises the semantic gap between statements describing data and statements expressing hypotheses or theories that the data should support. This is an acceptable way of posing the problem but it can be debated whether it is also the way to do it so that Pierre Duhem, who was the first to formulate and analyse the problem of underdetermination, would have considered most appropriate.

The problem of underdetermination is nothing special for PR. However, it is an important one for Nicholas Maxwell in the context of his defence of AOE (see Maxwell, 1998; 2004; 2007; 2017). According to Maxwell, AOE is the only philosophy of science that enables making real sense of, even to resolve, the problem of underdetermination (Maxwell, 2017). This claim may be overly ambitious but it certainly deserves attention. Longino has addressed Maxwell's work in one of her most recent papers (Longino, 2016). However, she mostly concentrates on the issue of metaphysical assumptions in science not knowing about Maxwell's latest thorough treatment of the problem of underdetermination (Maxwell, 2017). In addition to Maxwell's own work, his approach to science and the role of metaphysics in it has been addressed by Peeter Müürsepp (2011; 2017).

From the normative point of view, Helen Longino argues for the expansion of scientific norms to include norms that apply to communities. Here we have the four well-known criteria: (1) the provision of venues in which critical interaction can take place; (2) the uptake of critical intervention as demonstrated in change of belief distribution in the community over time in a way that is sensitive to the critical discourse taking place within that community; (3) public accessibility of the standards that regulate discourse; and (4) tempered equality of intellectual authority. By this latter condition, Longino means that any perspective has a *prima facie* capacity to contribute to the critical interactions of a community, even though equal standing can be lost owing to failure to engage in or to respond to criticism. In *The Fate of Knowledge*, Longino argues that the cognitive processes of science, such as observation and reasoning, are themselves social processes. Thus the interactions subject to community norms extend not only to discussion of assumptions in finished research, but to the constructive processes of research as well (Longino, 2002). This observation coheres well with PR, to a certain degree. In PR, the individual researcher constructs the object and designs the process of her research. However, the research community is necessarily present on the background.

Rein Vihalemm's practical realism

Rein Vihalemm introduced PR roughly at the end of the 2000s. One can learn about the approaches that influenced Vihalemm mainly from his article based on his paper presented at the XXIV Baltic Conference on the History of Science in Tallinn in 2010 (Vihalemm, 2011, pp. 46–60). At the beginning of the article, Vihalemm introduces his five theses of PR. The elaborated theses can be found in the guest editorial co-written with Endla Lõhkivi in the following year:

1. Science does not represent the world "as it really is" from a god's-eye point of view. Naïve realism and metaphysical realism have assumed the god's-eye point of view, or the possibility of one-to-one representation of reality, as an ideal to be pursued in scientific theories, or even as a true picture in the sciences;

2. The fact that the world is not accessible independently of scientific theories—or, to be more precise, paradigms (practices)—does not mean that Putnam's internal realism or "radical" social constructivism is acceptable;

3. Theoretical activity is only one aspect of science; scientific research is a practical activity and its main form is the scientific experiment that takes place in the real world, being a purposeful and critical theory-guided constructive, as well as manipulative, material interference with nature;

4. Science as a practice is also a social-historical activity which means, amongst other things, that scientific practice includes a normative aspect, too. That means, in turn, that the world, as it is accessible to science, is not free from norms either;

5. Though neither naïve nor metaphysical, it is certainly a realism, as it claims that what is "given" in the form of scientific practice is an aspect of the real world. Or, perhaps more precisely, science as practice is a way in which we are engaged with the world. (Lõhkivi & Vihalemm, 2012, p. 3)

At this point, we shall limit ourselves merely to the comment that PR may be seen and has been seen by some thinkers as not realist enough. Vihalemm is just declaring it to be a version of realism but perhaps is not showing it convincingly enough. This may make our task both harder and easier at the same time. Not being a strong version of realism may bring PR closer to CCE. However, we are looking for a new kind of realism rather than empiricism.

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A new kind of realism in sight?

Our approach, to put it briefly, will be going over the main theses of PR and testing them against the core ideas of CCE. As there is no generally recognised list of the main theses of CCE, we take the core statements of Helen Longino reiterated above as the point of reference. However, we obviously cannot provide a one-to-one comparison.

The first thesis of PR declares that science does not reveal the world to us as it really is in its full richness. Taken independently, this statement sounds sceptical and not necessarily belonging to realism. However, if looked at in conjunction with the other four tenets, it becomes obvious that we are not having a version of scepticism here. The idea of PR is that science does not enable us to have a full picture of reality but it is still an aspect of the real world that we obtain as the result of research practice. Strictly speaking, this issue is not in the focus of CCE. However, one can hardly deny a remote connection. According to CCE, science works effectively in the social context where interaction between social groups and communities is guaranteed. Thus, without that context applied properly, we do not get an adequate idea of reality by means of research practice according to CCE. Obviously, the empirical component in practical research is badly needed. It is as badly needed from the perspective of PR. There is even a direct reference to experimental research in the main theses of the latter.

The second tenet of PR asks for special attention as it includes a reference to another type of realism, namely the 'internal realism' of Hilary Putnam, as well as social constructivism. What kind of realism is Putnam's internal realism? First, we have to acknowledge that Vihalemm really needs to emphasise the difference between his PR and internal realism, as Putnam's main idea is very similar to Vihalemm's. Namely, just like Vihalemm, Putnam argues against the possibility of the god's-eye point of view for a scientist. According to Putnam, possessing the god's eye is characteristic of 'metaphysical realism'. The latter is untenable on the basis of the following claim: "What the metaphysical realist holds is that we can think and talk about things as they are, independently of our minds, and that we can do this by virtue of a 'correspondence' relation between the terms in our language and some sorts of mind-independent entities" (Putnam, 1982, pp. 141–167). According to Putnam, there is no evidence of such correspondences. This kind of criticism would definitely fit into PR as well. The scientist is in contact with reality in the course of research for PR but not because of linguistic correspondences

but for the reason of being engaged in practical activity that happens in the real world.

We still face the question of why we cannot simply accept internal realism. There is a brief explanation to be found in Vihalemm's works. In addition to a reference to Ilkka Niiniluoto's (1999) criticism of internal realism, Vihalemm claims (2011, p. 50) that internal realism is inconsistent in the sense that it is not realism of any kind at all, although the name presumes that it is (Lõhkivi & Vihalemm, 2012, p. 3). The reason for that is internal realism's belonging to the tradition of Kantianism (Vihalemm, 2012, p. 17). Still, the main issue seems to be practice itself which is not important enough for Putnam, as it concentrates rather on truth and objectivity in the universally abstract sense and is not paying attention to the interaction between mind and matter in research practice. Therefore, the normative aspect does not come in for Putnam either, at least not in the manner of PR. In his *Reason, Truth and History*, Putnam suggests that in the sciences we address reality via our internal conceptual schemes (Putnam, 1981). This means that the scientist still possesses a hidden god's-eye capacity in her mind, although perhaps a limited one. Thus, internal realism, if realism at all, is not that different from metaphysical realism.Why is social constructivism not acceptable? The impossibility to view the world independently of theories, referred to in the second tenet of PR, does not mean that we construct reality in the course of research. Constructing an object of research in physics-like science is another issue. This procedure enables us to reach for a piece of reality. CCE does not cohere with social constructivism either. Adherence to social norms is quite another issue than constructing social reality. In addition, Rein Vihalemm claims that, in its radical form, social constructivism appears to be self-refuting, since social constructivist views are constructions themselves (Lõhkivi & Vihalemm, 2012, p. 3). Vihalemm adds another interesting observation. It appears that radical social constructivism contradicts common sense. One cannot do anything he or she wants as reality resists (Lõhkivi & Vihalemm, 2012, p. 3). Social reality is dependent on material reality and cannot be constructed according to human will.

The socially normative approach of CCE attempts to render social constructivism unnecessary or at least more lenient. However, the window of opportunity for it to step in is still open.

We now turn to the third tenet of PR. It is about experiment. This is not an issue of the whole science unless we have a very narrow perspective which recognises only physics-like science (physics and part of chemistry) as science proper.

Human beings conduct experiments and therefore the setup of the experiment, not to mention the interpretation of results, cannot be free of norms neither in the individual nor in the social sense. Let us add that the founder of PR, Rein Vihalemm, received his first academic degree in chemistry and did some practical research in the field. Thus, he really knew what he was talking about when addressing the issue of the essence of the scientific experiment. For him, experimenting meant manipulative interference in the world with a definite purpose of finding out how the world behaves under some particular conditions. No human being is able to perform such task independently of the normative environment he or she is normally living in, individually as well as socially. Here, we do not really have any difference between CCE and PR. One might say that this is not really an issue for CCE but any critical debate between scientific communities often involves discussions about experimental research. There is no escape from that here. Never mind that the role of scientific experiment is changing (see Müürsepp, 2012). Even a nonclassical uniquely performed experiment remains manipulative. By taking manipulation away, we would end up in observation and no longer an experiment.

The fourth tenet of PR is especially interesting, but perhaps also somewhat controversial. Rein Vihalemm claims that scientific practice is not free from norms. Moreover, there is a further claim that the world itself is not value-free either. The world in itself should be as it is, after all. How to understand the presence of values in the world as such, independent from the interpretation by the human mind? In order to understand the point we must turn to the Kantian roots of PR. The world in itself may be value-free but the problem is that the value-free world-in-itself (*Ding an sich*) is not accessible to human cognition. The part of the world that reveals itself to the scientist cannot be value-free as the subjective human component inevitably enters the scene. More than that, the cognising human subject is able to cognise only part of reality that fits into her structure of cognition. In addition to this presumption, there is the theory. Picking the theory necessarily brings the normative side in. The world we experience in such a way cannot really be value-free. One might argue that this is not the world as it is. Perhaps, but it definitely is an aspect of reality and not a subjectively constructed one but an objective one.

Again, we have to admit that there is a strong similarity between PR and CCE. It is also Helen Longino's idea that bringing in social normativity does not mean that science becomes a subjective enterprise. The point may be and has been criticised, but not really refuted.

The final, fifth tenet of PR claims that, after all, we are having a realism here, although this might not be obvious. This is definitely an important claim. However, do we have sufficient grounds to agree with it? Rein Vihalemm emphasises that PR is neither naïve nor metaphysical realism. There is a tension with Hilary Putnam's internal realism, though. Putnam also tries to avoid metaphysical realism, as we saw above. This point brings PR and internal realism quite close together, at least seemingly. Neither internal realism nor PR really qualifies as naïve realism but denying the metaphysical version of realism remains at least partly declarative for both.

Are we still missing the real explanation why PR is a realism after all? So far, PR may look rather as a kind of constructivist empiricism or empiricist constructivism. Still, Rein Vihalemm maintains that the scientist gets a grasp of the real world by means of applying the scientific method. The point may seem controversial as, according to Vihalemm, the scientist dealing with physics-like science constructs the object of research for him- or herself. This is the reason why Vihalemm calls such kind of science (physics and the part of chemistry dealing with the laws of nature) constructive-hypothetico-deductive. Still, as we see in tenet five, Vihalemm believes that despite such kind of constructing activity a researcher gets hold of an aspect of the real world. This may be true because the researcher cannot construct his or her research object from the god's-eye point of view. Constructing the object is part of research activity and is not separate from the practical interaction between the scientist and the world. However, in that case there is the question of how to reach for anything unreal at all. This looks quite impossible but, after all, this may well be impossible. In the latter case, any kind of constructivism would be totally wrong. There may be a danger of getting too close to naïve realism here, an interesting issue for forthcoming analyses.

Eventually, we shall look directly into the question formulated in the title of this subsection. However, let us first elaborate the question and ask whether it would make sense to speak about realist empiricism or empiricist realism, i.e., is it possible to synthesise CCE and PR.

Let us try to approach the issue from the perspective of CCE. The task would be easier if we narrow our focus down to the question whether there is anything realist in CCE? The response could be negative if we considered just any kind of "regular" realism. After all, CCE is supposed to offer a better understanding of scientific practice than any kind of realism can do. In addition, CCE is supposed to overarch both realism and antirealism. Thus, it need not and actually cannot

be strictly against realism. In that case, it would be antirealism. It cannot be strictly against antirealism either as then it would be realism. In this light, our current analysis begins to appear to imply that CCE can actually be viewed as a version of realism. Perhaps we could call it 'pluralist realism' or even rather 'pluralist social realism'.

It may come all of a sudden to look at CCE as a kind of realism. However, let us take a look at what some constructive critics of CCE have claimed about the approach. Perhaps CCE is really not that far from realism as it seems according to some other interpretations, for instance, that by Sumei Cheng (2016, pp. 53–68).

The "realism issue of CCE" has been addressed before, for instance by Miriam Solomon and Alan Richardson (2005, pp. 211–222). According to their observations, realism comes in exactly through pluralism. "The idea is that scientific theories (or models) are partial representations of the world, and their partiality is often specified by values. Values, in turn, come from particular historical, physical, social, political and psychological contexts" (Solomon & Richardson, 2005, p. 218). The former of these claims is the basis of the metaphor of *perspective*. These ideas were central to the so-called Minnesota Pluralism. The position of Solomon and Richardson is strikingly close to the core of PR here. They position the founder of CCE, Helen Longino, at the radical end of Minnesota Pluralism. They explain: "The difference between the conservative and the radical sides of Minnesota Pluralism can be illustrated through their different uses of the metaphor of perspective and the analogy of maps" (Solomon & Richardson, 2005, p. 219). The analogy of maps is an observation of Ronald Giere (1999). For Giere, scientific theories are like maps in the sense that they represent some parts of the domain but not all of them, such as, for instance, the subway map of a city need not represent the museums of the city. We need many different maps representing different domains in order to increase knowledge of a city or a region. This is a strong argument in support of the pluralism of scientific theories. They increase the level of knowledge. Obviously, for the map analogy to work, they have to be theories that do not include major flaws, the real working theories that make sense. False maps or maps with major defects would not increase knowledge of the area they represent. This comparison is open to considerable criticism as well but this is not our concern here. Still, let us note that scientific theories should rather represent the understanding of a domain as a whole in general terms. This is not the task of a partial map. However, this kind of pluralism,

the one based on Giere's map analogy, is not really a challenge to realism as Solomon and Richardson (2005, p. 219) correctly notice. All the different maps represent, or at least this is the goal, different aspects of how things really are. The task of scientific theories is the same. If construed properly, they help to reveal a part of reality. The challenge is entirely realist.

It is true that Helen Longino makes use of the map analogy as well but in a different sense. For her, there is a difference between the spherical globe and the maps presented on a plane at stake. There is a difference with Giere'is approach but it is not in the representation of the domain. Subway routes on a sphere are not essentially different from the routes projected on a plane. This is how well-formulated scientific theories should work. Nothing essential should be omitted but can be represented in a slightly different way.

Solomon and Richardson also acknowledge the difference between the map analogy and the reality concerning scientific theories. Still, the attitude of Solomon and Richardson to Longino's spherical projection analogy is quite critical. They claim that it misleads as much as it explains (Solomon & Richardson, 2005, p. 220). They came forward with an important and probably valid explanation. There is a clear difference between matching the maps and finding out what the landscape really looks like and doing something similar with scientific theories. In principle, we do possess the god's-eye point of view in terms the case of landscapes but we do not have that in the case of trying to fine tune scientific theories because we do not know how the world really is in terms of scientific problems. Solomon and Richardson explain the issue:

> If we find out that our models seriously conflict with one another, we do not know whether the conflict is capable of being addressed and eliminated (e.g., by limiting the domains of theories so that they no longer conflict, or by showing that one theory is dispensable), or whether the conflict is ineliminable (e.g., due to ultimately comprehensible and important differences in perspective on the same world) (Solomon & Richardson, 2005, p. 220).

There is still something Solomon and Richardson have overlooked—practice. Conducting scientific research means being in contact and interacting with reality as it is. Therefore, it is not reasonable to adopt a sceptical attitude when fitting our theories with reality. The process is more difficult than map fitting but it is not a hopeless endeavour. We cannot say that scientific antirealism is justified. Solomon and Richardson are right in that we do not know in advance

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how to interpret different theories. However, we can obtain that knowledge in the process of scientific research. Still, it is possible to agree with the claim of Solomon and Richardson that the metaphor of perspective is not necessarily an argument for realism (Solomon & Richardson, 2005, p. 220). The authors, however, are generous enough to admit that a kind of scientific realism is compatible with deep pluralism. Therefore, realism is possible.

Let us see how different models conflict about the same part of the world because Solomon and Richardson (2005, p. 220) believe that there is a challenge here for any kind of realism, even the pluralist one. Obviously, there are several options to deal with conflicting models. The easiest would be just to drop one of them. However, in that case we need very good reasons for doing so, an insight that is close to the god's-eye point of view. One reason would be that one model is empirically considerably more successful than the other one. Still, history of science tells us that scientists do not necessarily prefer empirically more successful models (theories, paradigms) but follow quite different criteria, such as unity, comprehensibility, simplicity, i.e. not empirical but rather metaphysical criteria as Nicholas Maxwell keeps pointing out in many of his publications (see the references above and in the list below).

Another option to deal with conflicting models would be to limit the domain of application of at least one of the models. Helen Longino refers to one such case (Longino, 2002, pp. 180, 199).

In the end, there are still serious conflicts of models in the case of which no resolution is in sight. Solomon and Richardson call all these cases problematic for realism. Pluralist realism would work only if there is the case where different models work for a domain but they are not really in conflict. One such case would be John Dupré's 'promiscuous realism', where various biological classification systems are at stake (Dupré, 1993).

Considering the focus of our analysis, we are interested in the summary about the connection between dealing with conflicting models, pluralism and realism. Solomon and Richardson (2005, p. 221) claim that only most modest realism is possible, such that says that there is some truth in each of the theories but we cannot find out where the truth lies. In the approach of Rein Vihalemm, this problem does not arise for PR. Truth is not an issue. The understanding may be called deflationary. While doing practical research the scientist engages with reality and gets to know part of it. It makes no sense to speak about the truth or the falsity of those aspects of reality. Plurality of models inevitably works

in favour of PR. Solomon and Richardson make another claim—that deep pluralism is consistent with scepticism and antirealism as well, not just with realism (Solomon & Richardson, 2005, p. 221). This is a strange claim because it is always possible to be sceptical about anything except for the tautology and antirealism resists consistency by definition, calling into doubt claims about the reality of scientific entities.

Despite several disagreements with the interpretation of Solomon and Richardson, we are still prepared to agree with the very last point of their paper.

> Our most fervent criticism of Longino's work is that it does not sufficiently engage with the messy details of the real world in which science gets done, and instead specifies a normative ideal that may be neither possible nor necessary for scientific progress. Yet Longino stimulates us to ask normative questions of scientific practices, and provides a richer set of resources with which to answer them. (Solomon & Richardson, 2005, p. 221)

This observation enables us to call CCE nothing less than a conception that sets the stage for PR that completes the job by adding the engagement with the "messy details of the real world". However, such label would definitely be unfair to CCE in general terms. In addition, there is still a lot to do before we can call CCE a kind of realism, and perhaps PR as well.

In the end, there may really be a new type of realism in sight. In all evidence, it has to be pluralist but we would hardly mind adding that it is social as well.

Conclusion

The main purpose of the article was to show that CCE does not necessarily differ significantly from all kinds of realist approaches. This was demonstrated on the basis of PR. We saw that CCE itself can actually be taken as a type of realism that, being synthesised with PR, could be called 'pluralist social realism', taking into account the philosophical core of CCE and its orientation at the social context of science and PR's realist bias in addressing the understanding of science. After all, the empirical component is not that central for CCE that it should necessarily appear in the name of the approach. As an important issue for CCE, the problem of underdetermination was briefly addressed. We have to admit that its treatment from the position of CCE is not necessarily more

convincing than Nicholas Maxwell's solution of the problem from the basis of AOE.

In the end, what does the above analysis tell us about the relationship of empiricism and realism? Science needs the empirical component. Does the empirical evidence we obtain in the course of research reveal an aspect of reality to us? The response depends on our understanding of practical research. If we understand doing practical research as being in contact with reality then the problem fades away and realism triumphs. PR provides us with quite a convincing proof that this is really the case. However, more rigorous argumentation would not matter.

CCE is a very valuable development in philosophy of science. Obviously, it is socially oriented enough but lacks a strong connection with research practice. PR provides us with the latter. The combination of the two could be called 'pluralist social realism' and provide us with an even better understanding of the essence and aims of science.

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