



# Epistemological Realism and Cognitive Science

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## Abstract

The author shows that the conception of epistemological realism as a contemporary variant of epistemological realism continues the realism tradition and at the same time takes into account some constructivist ideas, giving them a new interpretation. Constructive realism can be a fruitful strategy in cognitive studies, as it gives a philosophical interpretation of the current popular approach in cognitive science: so called “4 E approach”: understanding cognition as embodied, enacted, embedded and extended. The problem of Illusion and Reality is analyzed from the position of constructive realism. The relations between different surrounding worlds of different cognitive agents and the common real world is specially investigated in the context of the opposition between Realism and Relativism.

**Keywords** Realism · Reality · Constructivism · Constructive realism · Relativism · Activity · Enactivism · Illusion · Perception

## 1 The Old Discussion

The discussion of realists and anti-realists in epistemology is going on at least from 17 century. One can consider the subject of this discussion as an eternal philosophical problem. One can even think that this problem is insolvable (as a number of other ones) and add that although such discussions are intriguing, they don't deal with genuine human and cognitive problems.

But in reality, the situation is another. The first thing is that suggested solutions at this discussion are connected with a philosophical substantiation of relations between the human being and the world. The second thing is that such a solution determines a program of cognitive activity, especially of scientific one: what questions are essential, what cognitive strategy is preferable.

At present this discussion has gained new features. As it was clear already at the beginning of the twentieth century it concerns foundations of natural and human

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sciences. For example, different understanding of a status of mathematical objects (in frameworks of different philosophical programs of mathematics: platonic realism, formalism or constructivism) determines not only the interpretation of mathematical knowledge, but also acknowledge or not of a certain part of it and ways of mathematical reasoning. Epistemological phenomenalism of E. Mach oriented physicists to build “phenomenological” theories, while realism of M. Plank recommended to create so called “transcendent” ones. New matter for this discussion arose in connection with the interpretation of quantum physics: what is a role of a human being in a process of quantum mechanical measurement?

Now very acute discussions between realists and anti-realists are going on about philosophical interpretation of human sciences: at present the latter attracts a special attention, several thinkers consider the development of the global civilization as depended on the progress of these sciences.

Nowadays different kinds of epistemological anti-realism continue to have followers. They include such conceptions as “irrealism”, radical epistemological constructivism, post-modernist deconstructivism, so called “social epistemology”, different variants of relativism.

But at the same time epistemological realism is becoming more and more influential. There are different interpretations of it: philosophical naturalism, metaphysical realism, scientific realism (structural and entity realism), critical realism, direct realism and so on.

The development of contemporary science and especially the progress in the sphere of cognitive science (including cognitive psychology, cognitive linguistic, neuroscience, artificial intelligence) for the last 50 years gives a lot of arguments in favor of realistic interpretation of cognition and knowledge. Such interpretation not only means a better explanation of cognitive facts, but also substantiates such research programs in cognitive science, which are impossible in the framework of anti-realist epistemology. I think that the conception of constructive realism (or activity realism) is especially fruitful in contemporary context. From my point of view constructive realism, being a kind of realistic epistemology, can take into account some constructivist ideas, giving them a new interpretation.

## 2 Constructive Realism

It is a program of cognitive investigations, which is supported by experimental results and which has influenced cognitive science as whole, especially its current stage. Here are its main ideas.

This conception was formulated under the influence of the eminent American psychologist J. Gibson, who elaborated “ecological approach to visual perception” (Gibson 2015). The main point of Gibson’s theory is the idea, that perception is not a result of processing outer impacts to a sensory system, but is the continuous interaction of a perceiving agent with the outer world. Perception is not “an ideal object” in “the inner world” of mind, it is not an entity, but a process. Perception is not a construction. And it is not “given”. It is the extraction of information from the outer world with the help of agent’s actions. Actions, providing perception, are not ones

of mind or brain (although perception is impossible without brain), but real physical actions of a cognitive agent as a real being in the real world. Perception includes not only mind, brain and sensory system, but also a body of a perceiving agent, physical actions of an agent and a part of environment, with which an agent deals. Perception is not a simple mental phenomenon, but an event in the real world, a necessary component of life (Noe 2004).

Extracted information—in distinction from sensory signals, which according to old theories of perception produce sensations—corresponds to features of the real world. Sensations which were considered in philosophy and psychology as constituents of perception can't give knowledge of reality. But in fact such sensations don't exist: their existence is a myth of the traditional philosophy and psychology. Sensations, supposed by philosophical and psychological tradition, can't develop, new kinds of them can't arise. Meanwhile perception understood as extracted information can be more and more subtle, perfect and exact. One can learn to perceive all life.

Perception, interpreted as an active process of extracting information, presents those features of the outer world, which correlate with needs of an cognitive agent and with possibilities for actions. Different living beings have different needs and kinds of activity. Reality is multifarious and multi-layered. Each cognitive agent deals with only several of its features. A person, who is sitting at a table, a dog lying under the table, and a cockroach, skirting a table leg, perceive the same thing: a table. But they perceive it in different ways. The table doesn't exist for a dog as a thing that can be used for eating and writing, a cockroach can't perceive the table as a whole. All these beings live in the world in which the table exists, but they perceive it in accordance with affordances for their actions (one can say: in accordance with their ontological schemes). If there were extraterrestrial beings they would perceive the world, including our earth surroundings, in other ways than we do. If there were beings whose dimensions were comparable to the dimensions of elementary particles they could perceive the latter, which is impossible for humans.

Different levels of reality is not reducible to each other, although there are relations of dependency between them. There is the microworld. But there is also the macroworld. It is very strange to think that a chair does not exist, that it is only an illusion, that instead of a chair there is only a set of atoms and elementary particles in a certain region of space and time (although some physicists think so). The ways of existence at each level don't exclude other ways of existence, but presuppose them.

So naive (direct) realism and scientific realism are not in opposition to each other (a similar idea concerning real referents of theoretical objects of different scientific theories has been elaborated by Agazzi (2014)).

According to the conception of constructive realism that there is no old problem of "primary" and "secondary qualities". As J. Gibson has shown, such a "secondary quality", as for example color is not a feature of light waves and not that of a sensory system, but is a real feature of thing surfaces, which depends on some "primary qualities" of things (Gibson 1967).

In human sciences a researcher deals with such reality that is produced and reproduces by human activity and doesn't exist beyond it. The eminent Russian

psychologist L.S. Vygotsky elaborated the conception according to which high psychic functions of the human being, including consciousness and Self, are cultural and historical and arise in the process of communication and of a joint human activity (Vygotsky 1978). Now this conception is shared by a lot of specialists in cognitive science. This idea can be understood from the point of view of constructive realism.

Human individuals are real beings, the process of their communication is also real, existing in space and time. Individual cognition is connected with collective cognitive process. Another person without whom my individual cognition is impossible is not a construction of my mind (or brain), but a real being. It is possible to say that human consciousness and Self are products of social and cultural construction. It doesn't mean that they are fictions. They are real, although they belong to a specific kind of reality. Being constructed doesn't mean being non-real. A table at which I am sitting is constructed. But it really exists. Self arises at a certain age and under certain conditions. But it is real, and sometimes a person can not understand all features of one's own Self (even more so for another person). It is possible to assert that all social institutes are products of human activity, in other words construction of a certain kind. But they are real. The human being creates such things which are getting out control and begin to live their own lives. These include social institutes—so it is necessary to build social theories in order to understand them (and it is not easy). It is also the mental world: a subject of psychological and neural research: theoretical and experimental ones. It is also the world of ideal products of human creation (philosophical, scientific, literary texts, arts) which has its own trends of development. It is important to stress that if a certain entity or process have been constructed by means of a certain real constructive activity, that doesn't mean that they are constructed by a process of their cognition.

Every constructing presupposes reality in which it is carried out and which is revealed by activity. On the other hand, reality is exposed to a cognitive agent only by means of someone's actions (Lektorski 2013).

### 3 Illusion and Reality

The conception of constructive realism affords to give a new interpretation of the Illusion and Reality problem.

It seems that that the content of perception is the same independent of whether a perception is illusory or veridical. A lot of philosophers and psychologists think so. But if this is true, then one can't be certain that her/ his perception deals with a real situation. Several psychological experiments ("Ames room" and other ones) can be understood as a proof of such an interpretation. In the situation of gestalt—switching (one can see either a rabbit or a duck in the same picture) it is at all senseless to say about the difference between illusion and reality.

But, as I assert, perception is not a static state, but a process of extracting information with the help of a cognitive agent's actions, a process of inspecting a real situation. So it is impossible to understand, for example, the nature of a visual perception on the base of investigating the perception of a picture, as a lot of psychologists

tried to do (they proceeded from the false idea that the brain interprets a retinal image in the same manner as a human interprets a picture). In fact it is the opposite: if a researcher can't understand the process of perceiving real life situations, she/he can't understand perceiving a picture and other artificial forms of representation.

Everyone can face an illusion. It is not a product of mind, but is determined by objective conditions of perceiving. For example, a paddle half in water looks as broken. But this illusion is not an error of a perceiving system. According to laws of light reflection a paddle that is partly in water must look such a way. If it were otherwise it would be a mind aberration. One knows that a paddle really is straight because if it is pulled out of water it looks straight in vision and is felt as straight in touch. Let's imagine a situation when a baby sees for the first time in her life that a long thing immersed in water looks as broken. Let's suppose also that the baby hasn't never seen this thing in another situation and can't pull it out of water. The baby can't also touch it and can't carry out actions with the help of this thing. In such a case the baby can't distinguish illusion and reality: a thing half in water is perceived as really broken.

In the case of "Ames room" an experimenter creates such artificial situation when observing the inside of a room is made from only one point of view and from a very narrow opening: an observer can't see the inside from another point (it would involve her/his movement), can't extend the opening etc. In other words, an observer is put in such conditions, when she/he can do only one thing: stand in a certain place and passively look at the inside of a room from only point of view. As soon as an observer gets the opportunity to move and see the inside of the room from another point of view, an illusion disappears.

Perception presupposes active inspecting a situation with the help of actions. This takes place not randomly, but on a base of a scheme, which determines a mode of inspecting and is formed as a result of previous experience. A scheme of inspecting is not such a mental representation that is put between a cognitive agent and the real world, that obscures the reality and is the only immediately given to mind, as it was supposed in philosophical and psychological tradition. Such a scheme is a mode of actions for extracting information from the real world, it can be called "an activity oriented representation". The scheme sets a horizon of expectations. In cases when this horizon doesn't correspond to a real situation as a result of objective conditions an illusion appears. The latter can disappear when there is an opportunity for inspection. An illusion will last if inspection is obstructed.

Usually one can't inspect a picture and other artificial images, as it is possible to do with real things. In such cases one can't distinguish illusion and reality—to say what it is: a rabbit or a duck. One can't resist an illusion in a case of perceiving two drawn lines as having different lengths although it is known that in fact they have the same length: so called Muller-Lyer illusion. But in real life one can't take a rabbit for a duck and can't make mistake concerning lengths of two rods, if they are used in one's actions.

By the way it is impossible to inspect also situations, that are presented in dreams and hallucinations. Their contents are not the same as the mental content of a veridical perception. Meanwhile a lot of philosophers wrote about impossibility to distinguish between these contents: the famous idea of "the world as a dream".

## 4 Realism and Relativism

I have written that different cognitive agents extract from the real world different features, corresponding to peculiarities of their bodies, their needs and possibilities for actions. So different cognitive agents live in different surroundings. But may be, it is better to assert that they live in different worlds, which don't intersect, and that there is no common real world, that different cognitive agents don't select certain aspects of the common real world, that instead of this they construct different worlds in correspondence to their peculiarities? This idea is asserted by F. Varela and his co- authors in the famous book "Embodied Mind", which together with ideas by J. Gibson stimulated the appearance of the so called "Embodied" and "Enactive" approach in Cognitive Science. F. Varela doesn't agree with idealism which asserts that a cognitive agent deals with one's own mental states. But Varela also doesn't agree with realism, which proceeds from the idea that features of the outer world don't depend on the process of interaction between real things and a cognitive agent. F. Varela stresses that it is actions of a cognitive agent, determined by specific bodily organization of an agent form the features of the world in which an agent live and which she/he is cognizing. According to Varela cognition doesn't simply depend on actions, but coincides with actions. But this is a relativist position: each cognitive agent lives in one's own world and doesn't have an access to worlds of other agents (Varela et al. 1992).

According to the conception of constructive realism this problem can be understood otherwise.

Different cognitive agents live in the common real world, but they select its different aspects. The point is that different aspects are connected with each other. So an agent, interacting with those aspects that are available to her/him, at the same time contacts with those aspects that are not available to her/him immediately and not perceived by her/him. For example, a cockroach, crawling around a table's leg, fixes only a little part of a leg, which is in its vision field. But the features of this part of the leg's surface depend on a form of the leg as whole and on a mode of connections between the leg and the table. So really a cockroach interacts with the same real table which I see, although I perceive it in other ways. And besides our visual fields intersect: I see a cockroach, it sees me. As to the human being, there is a very important extra point: the human being goes beyond limits of natural sensitive borders, so she/he can perceive the world with the help of scientific devices and instruments and can understand the cognitive processes of a bat or a cockroach with the help of scientific theories.

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The human being is not the demiurge of the Universe. Her/his mind doesn't create the real world, her/his thought and language don't construct it. The human being live in the real world and belongs to it. But she/he is not alien to the world. She/he is not a kind of "cosmic mold". The appearance of the human being changes the world. The human being understands the world and transforms it.

The constructing realism is a fruitful strategy of investigating cognition and mind. It is very close to the conceptions of realist epistemology by Agazzi (2014) and continue the elaboration of Activity approach in the Russian philosophy and psychology at the second half of the XXth century (Lektorsky 2019, 2020).

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