

Radical Constructivism – Childhood’s End

Ulrich Mohrhoff

Sri Aurobindo International Centre of Education, Puducherry

The constructivism of Jean Piaget was developed by Ernst von Glasersfeld into the epistemology known as “radical constructivism.” Knowledge, according to this epistemology, is not passively received, nor can it be transmitted. It is actively built up by the cognizing subject. Cognition serves the individual’s organization of her experiential world, not the discovery of an objective ontological reality. Although the social environment constrains the construction of knowledge, radical constructivism is an individualistic epistemology, which entails that agreement cannot be forced or bought but must grow from conviction. It comes as a wholesome corrective to both scientific totalitarianism and religious dogmatism. For those who believe that Truth is mystically accessible but cannot be put into words, it would seem to be the epistemology of choice. This article draws heavily from papers by Ernst von Glasersfeld, Dewey I. Dykstra, Jr., and Andreas Quale, which appeared in the highly commendable open-access e-journal *Constructivist Foundations* [↗](#).

1 Background

The expression “the construction of reality” first appeared in the title of one of Jean Piaget’s (1937) fundamental books on cognitive development in children. In the English translations, the central place occupied by the notion that reality is constructed by *each individual* is less obvious than it is in the original French publications. “In the English translations I later had to use in teaching,” Ernst von Glasersfeld (2005) writes, “this notion is much subdued if not eliminated, because most translators tended to assimilate everything to their conventional, realist views.” Piaget’s constructivism was developed by von Glasersfeld into the epistemology known as *radical constructivism*. In his own words, the epithet “radical”

was intended in the sense that William James (1976) had used in his radical empiricism, i.e., meaning “going to the roots” or “uncompromising.” I chose it because at the time many developmental psychologists were mentioning Piaget’s constructivism but without going into its epistemological implications. What they called construction seemed to refer to the fact that children acquire adult knowledge not all at once, but in small pieces. I did not think that this was a revelation and therefore called their approach “trivial constructivism.” It was clearly no way to gain the friendship of traditional psychologists. . . (von Glasersfeld, 2005)

The seminal volume *Die erfundene Wirklichkeit* (Watzlawick, 1981) with chapters by von

Glaserfeld, Paul Watzlawick, Heinz von Foerster, Rupert Riedl, David L. Rosenhan, Rolf Breuer, Jon Elster, Gabriel Stolzenberg, and Francisco Varela came out in 1981 and by 2005 had been reprinted 18 times. It has done more than any other publication to spread the notion of cognitive construction. An English version of the book was published in the United States by Norton in 1984, but apparently the first edition was never sold out and the book is no longer listed by the publisher. As von Glaserfeld observes,

The geographic difference in dissemination has remained characteristic of constructivist ideas in general. In the United States and England, radical constructivism is mentioned in the field of science and mathematics education. In Germany, Austria, and Italy it has become the subject of lively discussions among philosophers, psychologists, educators, and therapists, and quite a number of books have been published on the subject. (von Glaserfeld, 2005)

2 Basic principles and social aspects

Radical constructivism is based on two fundamental insights:

- 1 Knowledge is not passively received but is actively built up by the cognizing subject.
- 2 The function of cognition is adaptive, and serves the subject's organization of her experiential world, not the discovery of an objective ontological reality.

The second proposition maintains that ontological knowledge — knowledge about an objective reality existing independently of all subjects — is based on preferred *belief*, and as such is *not within the scope of cognition*. The possible existence of such an objective reality is not denied; what is asserted is that it is impossible in principle to obtain cognitive knowledge of such an entity.

We need to distinguish between our *experiential world* — the totality of our experiences: our individual perceptions and reflections — and the *knowledge* that we construct on the basis of our experiences. This knowledge can be of the cognitive kind, or it can be non-cognitive. Cognitive knowledge is based on *reasoning*, using rules and procedures that can be agreed on and communicated. Non-cognitive knowledge is of the “what it’s like” kind — for instance, what listening to a particular piece of music feels like to me — and cannot be communicated.

Whereas this conception of knowledge is inherently *individualistic* — each person confronts her own *experiential world* and constructs her knowledge of the world from that — the construction of knowledge is always done *in a social environment*, which constrains the learning process. Yet radical constructivism is not a *sociological* theory of knowledge. Social construction is only one aspect of epistemic construction: all mental tools are constructed, including those which are private to a single person, though many structures have an additional social input.

The social component in a child's construction of reality may be gleaned from the fol-

lowing passage by von Glasersfeld (2006):

Countless observations have led to the conclusion that, at the beginning, small children think that everything which moves is alive. The clouds and the moon move purposefully across the sky just as you yourself run out of the house into the garden. Trees move their huge branches in no less conscious a fashion than you lift your own arms. Eventually, however, you learn to tell the difference. You learn to ascribe awareness to the frog you would like to catch, because when you approach it head on, it seems to see you; and if you make a noise, it hops into the water. You also ascribe certain intentions to the cat and dog in your house; from the behavior of the human members of the family, you finally conclude that they sometimes act systematically, and then you begin the endless task of finding out what others' goals might be and their methods to attain them.

Kant summed this up in the first edition of his *A critique of pure reason*, when he said: "If I want to imagine another subject, I can only do this by ascribing to this other whatever makes me a subject myself." (Kant 1781, A353, von Glasersfeld's translation). This begins with spontaneous movement and awareness, then comes determination, intentions and plans, and it ends in attempts to deduce whether others follow their goals, in ways which one would follow oneself. Wherever that seems to be the case, i.e., when you feel the conclusion is justified that others are pursuing their assumed goal in the same way as you would do, you can see this as a confirmation of the fact that the world of these other people is not any different from the world which you have created from your own experience.

This is an important point. It shows not only that knowledge can be applied in a much wider field than the individual world of experience in which it is constructed, but also that an individual's experiential reality owes much of its stability to the others. If I see my knowledge being acquired and used by others, or if my knowledge of their goals allows me to make correct predictions of their behavior, it acquires a firmer foundation. As von Glasersfeld (2006) writes, "I need other people because only then is it possible to create the inter-subjectivity which allows me to build up a firmer basis for my experiential world than I can do on my own." This has an extremely important corollary:

my reality does not become more stable at all, if I force others to agree with my views and methods, because if it is not done voluntarily, it cannot confirm my world view. Only if I see others acting as I would, can I see in them a confirmation of my own principles. This obviously leads to tolerance and the realization that agreement cannot be forced or bought but must grow from conviction. (von Glasersfeld, 2006)

3 A logical trap

Current scientific theories of perception — the direct theories (Gibson, 1950, 1966, 1979; Michaels and Carello, 1981) as well as the indirect ones (e.g., Palmer, 1999; Enns, 2004) — agree that the goal of perception is to approximate or match true properties of an objective physical environment. Although vision is now widely regarded as a process of construction that is guided by (i) surprisingly sparse sensory data (Marr, 1982; Hubel, 1995; Velmans 2000) and (ii) surprisingly elaborate rules (Hoffman 2000; Enns 2004), the naive realist attitude has survived intact since pre-Socratic times, when it seemed obvious (as it still does) that our knowledge of the world is based on messages

we receive through the senses, and that these messages show us what the world is like. This attitude

satisfies healthy, i.e., naive, common sense and cannot easily be disproved. However, if you follow this line of thought, you reach the conclusion sooner or later that you have fallen into a logical trap. You actually end up in an insoluble paradox. . . If you assume that you make an image of the world within yourself, then you cannot avoid asking whether this image is accurate and whether it is identical to the outside world. But this a question you cannot answer. You would have to compare the inner image with the outside world, but this you cannot do because the outside world can be reached only through your senses. That means that you can no doubt make a new image, but this, too, will be the result of the way you perceive things and the way you articulate what you perceive. The Irish philosopher George Berkeley expressed this in the clearest fashion when he said that we can only compare ideas with ideas.

However, one would, of course, like to prove that the images one has of the world are “true” images. This desire was and is the driving force in the 2500-year old history of Western philosophy. The brightest people — thinkers, writers, artists — have unswervingly tried to somehow get round the logical impossibility. With hindsight, one can say that not one of them has ever succeeded. If we expect our knowledge to reflect the world as it was before we came to know and articulate it in our terms, then there can be no “true” knowledge. Skeptics, since the pre-Socratics, have tirelessly repeated the argument that the only way such truth could be proved would be by comparing the image with the supposed original, and precisely this comparison is ruled out. (von Glasersfeld, 2006)

4 The communication illusion

Before teaching cognitive psychology at the university of Georgia, USA, von Glasersfeld worked for ten years in computational linguistics. His research in this field convinced him that language was incapable of communicating knowledge. Radical constructivism is a logical consequence of this insight.

Language usually creates the illusion of transmitting thoughts, ideas, knowledge, and feelings from one person to another. One person speaks or writes and the other listens or reads, and in this way gains insight into how the other person thinks and feels. This, however, is an illusion. In order to see this clearly, you need to look more closely at what takes place in a verbal exchange. If I say something, I produce noises, if I write, I produce visible signs. Inasmuch as they are familiar with my language, those people who hear these sounds or see these signs will recognize them as words. In the course of their lives, they have ascribed meanings to these words, i.e., notions of objects, situations, processes, experiences and feelings. These are their own associations which they have made for themselves. As everyone creates meanings for words from his own subjective experience, they vary from person to person.

By this I mean that my words produce meanings and notions in other people which are not mine but theirs. Even when we talk about the most mundane things, about apples, trees, pencils, or traffic regulations, the ideas we associate with these words are not the same for everyone. Of course, the differences do not play a role in everyday life because our subjective meanings get ground down in the course of countless exchanges, so that

our meanings correspond with those of others well enough to not cause noticeable discrepancies. But the fact that they correspond more or less without friction does not mean that they are identical. As soon as you begin to talk about less mundane matters — philosophy for example — individual differences in the terms come to light very quickly. Although we all experience this quite frequently, the illusion that language is a means of transportation persists. If you say something and the other person does not understand it, you say it louder. (von Glasersfeld, 2006)

5 The difficulty of explaining radical constructivism

Obviously, radical constructivism is incompatible with realism.

What differentiates radical constructivism from the tradition, is the proposal unequivocally to give up the notion that knowledge ought to be a veridical “representation” of a world as it “exists” prior to being experienced (that is, ontological reality). (von Glasersfeld, 1999)

In spite of this, most critiques launched against radical constructivism more or less explicitly assume the truth of realism.

A claim that a conclusion from one paradigm is false because it does not fit another paradigm is trivial and *non-sequitur*. . . few, if any, of the arguments offered in the many publications and gigabytes of online discussion attempt to point out an error in logic from the basic premise of radical constructivism or from faulty data. They all make the strategic blunder of pointing out errors in radical constructivism as if it must be commensurate with realism. (Dykstra, 2007)

The challenge of understanding radical constructivism is that one must take to heart one of its fundamental tenets, namely, that a new understanding requires a process of construction; it cannot be handed out to anyone who will read or listen. If one wishes to engage someone in developing new understanding, *disequilibrium* is key.

When experience is encountered that is perceived not to fit existing explanation and this mismatch cannot be ignored, a state of disequilibrium between explanation and experience is experienced. Once avoidance is not an option, then a process of self-regulation is initiated and existing explanation is modified and tested until the new or modified explanation fits these new experiences. An accommodation is developed. The disequilibrium can be minor or monumental. Either way the new explanation fits experience better than the previously existing explanatory conceptions. . .

Society is set up by realists to be compatible with their view. They will work very hard at interpreting what we say in their terms. They cannot “hear” what we are saying in our own terms, because they have yet to construct the requisite ideas. Before they begin to develop another way of thinking, they have to disequilibrate. We have to calculate to say and do things, to bring their attention to things that do not fit their realist explanations of their world, i.e., things that do not make sense to them. We run the risk of their concluding we are deluded or misled. This is the equivalent of sweeping the experience, and us, under the carpet. On the other hand, there will be some who draw near to the discrepancy they perceive and begin to develop new conceptions in interactions with us. We cannot afford to let the risk of being written off deter us from our efforts to induce disequilibrium. Without disequilibrium, no change in understanding happens.

(Dykstra, 2007)

One question that is often asked in the discussion of constructivism vs. realism is: “What is it knowledge of?”

This is a natural question for a realist: to her, knowledge must be *knowledge of something*, with the implication that this “something” exists independently of the knower — an external reality. But a relativist does not think in those categories: radical constructivism takes knowledge to be constructed by the knower, as a model of (some part of) her experiential world — and that is all there is to it! (Quale, 2007)

6 Science

Science is an example of cognitive knowledge, defined by a certain methodology: data, hypothetic-deductive reasoning, theoretical models, observational techniques, computational procedures, etc. Most science teachers (including science writers and science journalists) adopt the epistemic position of realism, according to which science aspires to find a true description of the natural world, and this for various reasons: it’s the natural (read: naive) attitude, it caters to our natural vanity, it’s easier for the teacher and more lucrative for the writer, and it “explains” why science is so successful — never mind its failure to explain, e.g., consciousness, the paranormal, or the relationship between the natural world and the laws of quantum physics, which merely encapsulate statistical correlations between measurement outcomes (Mohrhoff, 2005, 2007).

But the proposition that science is in the business of finding a true description of the natural world is *non-cognitive* knowledge: a personally preferred *belief* that those teachers or writers are inviting their students or readers to share with them. It does *not* follow from the methodology of science. Radical constructivism, therefore,

advocates a pragmatic view, where the rules of science are presented as chosen by scientists, for the purpose of constructing knowledge of certain phenomena observed in the world, to answer certain questions that scientists like to ask about these phenomena — and then justified only by the success of these answers. (Quale, 2007)

On this view, scientific stories cannot legitimately be considered as (actually or potentially) “true,” in the sense of reporting the correct constitution of the natural world.

It may be noted that there are many other stories, constructed to portray various aspects of the world. Some are of the academic variety — say, as produced by the humanistic or social disciplines. Others are told (in different media) by writers, artists, performers and preachers. The crucial point here is that science is not to be considered as intrinsically more “true” or “correct” than any of these alternative stories.

... suppose that the biology teacher, in teaching about evolution in her class, discovers that some of her students are believers in creationism. Should she then try to persuade these students that they are mistaken — that Darwinian evolution gives the correct description, and that the Creation story told in the Bible is wrong? The answer, from the viewpoint of radical constructivism, is: “No, she should not — and indeed she cannot with honesty do so, since the criteria of being right or wrong do not apply here!” Her obligation as a biology teacher is to present to the students the story offered by biologi-

cal science: the theory of evolution, with the arguments and evidence that support it. If, in the end, the students decide to stay with their belief in the biblical explanation as more satisfactory — well, that is their privilege. It is *not* a teacher's responsibility to convert her students to the "true doctrine of science." Or, more succinctly: The teacher's job is to teach, not to preach!

Cognitive knowledge, we said, can be agreed on and communicated. Scientific knowledge — at any rate, its cognitive component — can therefore be shared. Or can it? Recall Section 4. How, for example, can a teacher *control* the learning process so as to make the learners construct the "right" knowledge — that which she wants to share with them?

The simple answer is: she cannot — there is no way for her to ensure with certainty that the learners have "learnt correctly"! Knowledge cannot be simply transmitted: i.e., imprinted on the learner, to be retrieved in identical form for inspection later. The question is then: "What is the meaning of "shareable knowledge," if we cannot check whether it is really shared? The answer. . . is that knowledge may be considered to be shared between two persons only insofar as *they can agree that they share it*. In other words: they share it until something happens that lets them discover that they do not! . . . Loosely speaking, then, we share, to the extent that we think we do! (Quale, 2007)

What about radical constructivism itself? Should it be regarded as being "right" or "wrong," in the sense of giving a correct or incorrect description of its subject matter? Emphatically not. Like science, it is *a story told to make a point* — and thus successful only to the extent that the listeners actually feel that the point was worth making.

7 Why I feel that the point was worth making

I believe in Truth with an uppercase T. So why do I advocate radical constructivism? Because I believe in Truth with an uppercase T! Such Truth is mystically accessible, but it cannot be put into words. As Sri Aurobindo says in an aphorism:

When Wisdom comes, her first lesson is, "There is no such thing as knowledge; there are only aperçus of the Infinite Deity." (Sri Aurobindo, 1997a, p. 431)

Our stories, scientific or otherwise, are aperçus of the Infinite Deity. None of them can claim to be *the* truth, so realism is not an option. Hence radical constructivism would seem to be exactly the right epistemology.

But thought nor word can seize eternal Truth:
 The whole world lives in a lonely ray of her sun.
 In our thinking's close and narrow lamp-lit house
 The vanity of our shut mortal mind
 Dreams that the chains of thought have made her ours;
 But only we play with our own brilliant bonds;
 Tying her down, it is ourselves we tie. . .
 For Truth is wider, greater than her forms.
 A thousand icons they have made of her
 And find her in the idols they adore;

But she remains herself and infinite.
(Sri Aurobindo, 1997b, p. 276)

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