

## **Amplification of a Constructivist Perspective**

The quotations Phillips (1997) has placed at the beginning of his article are a startling medley. To explain why and how each one of them made sense to its respective author would be a fascinating undertaking. Of course, this is not what Phillips sets out to do. He wants to present “Perspectives on constructivism” and it turns out to be no less a job. Phillips has undertaken it courageously and – I would like to emphasize – in a reader-friendly and civil fashion throughout. But constructivism is a vast and woolly area in contemporary psychology, epistemology, and education, because the people who quite unintentionally contributed to the mess, had perspectives that were every bit as divergent as the intentions of Mao Tse-Tung and Jean Piaget.

A perspective, it seems to me, pertains to a point of view, to the direction in which you look and, consequently, what you see from there. So the question arises, which perspectives are to be presented? Whenever we discuss the ideas and beliefs of others, we have to start from our interpretation of what they have said and written. One may try to justify these interpretations as best one can, but they remain one’s own. Although it may seem superfluous, I would like to make it clear that my critique of Phillips’ essay and the comments I make about other philosophers and authors are unabashedly from my “radical constructivist” point of view. Because this view entails the basic notion of subjective relativity, I was interested in grasping as well as I could, the orientation from which Phillips was making his survey.

As it happens, the point where he mentions his own position also affords me an opportunity to make the first of my comments. Phillips (p.64) declares himself in support of “the general orientation” described in a quotation from Wertsch, who is a major exponent of social constructivism. I repeat the quotation because it serves to make a distinction that I consider important in the context of the present discussion.

The basic tenet of a sociocultural approach to mind is that human mental functioning is inherently situated in social interactional, cultural, institutional, and historical context. Such a tenet contrasts with approaches that assume, implicitly or explicitly, that it is possible to examine mental processes such as thinking or memory independently of the sociocultural setting in which individuals and groups function. (Wertsch, 1990, p.86)

If we interpret this as referring to the contents of mental functioning, no one would disagree. If, however, we read it as pertaining to the *mechanisms* of mental functioning, it is too general a statement. Phillips himself says a little later that he believes that “ $2 + 2 = 4$ ” is accepted “by all of us ... because we have mathematical

evidence that it is true" (p.71). His use of "we" presumably is not intended to refer to a particular sociocultural group. I, too, hold (with Piaget) that there are certain basic mental operations that are fairly universal, although the conditions for their development may, of course, vary in different societies. Even if the whole of mathematics is considered a social construct, I would say that its construction requires mental operations that are developmentally prior. In short, I believe, that it is important to keep apart the contents of cognition and its mechanisms.

Phillips is aware of this distinction, because to separate "psychological" from "social" constructivists, he asks the following questions:

a) Is he or she interested in how individuals construct the knowledge that is stored 'in their heads' (and ancillary but vital questions such as how the validity of the 'knowledge' can be gauged)?

b) is the concern with the way in which public disciplines or bodies of sociocultural knowledge develop (and with the issue of their validity or justification)? (p.16)

Some present-day social constructivists set themselves apart from the other groups because they maintain that their answer to question (b) is the answer also to question (a). In my view, this is putting the cart before the horse. Individuals – including social constructivists – must have some way of forming concepts and connecting relations, before they can begin to observe, analyze and meaningfully discuss social interactions. Similarly, the initial ideas that later evolve into bodies of knowledge and disciplines have to be in individual heads. It therefore seems to me that one has little chance to create a plausible theory of how the development contemplated in (b) takes place, if one does not have a plausible model for the processes in (a). I know of no psychological constructivist who has no interest in question (b), but as far as I know, they agree that it cannot be answered without a model of the individual's cognitive operations.<sup>1</sup>

In question (b) and in other parts of the article it is taken for granted that there are "public disciplines and bodies of sociocultural knowledge". This is, of course, a common assumption in ordinary conversations. In a serious investigation of the construction of knowledge, however, it would be mandatory to ask how these interpersonal products come about. For Phillips, and some other social constructivists, it is apparently a foregone conclusion that concepts, knowledge, science, language, and other mental items can be characterized as "collective", in the sense that they are the same for the members of a society. I would suggest that this can only be the conclusion of an observer – and how observers operate requires an explanation. In formulating a conclusion about society, the observer makes a statement about his or her experience of others. That is, having perceived others and having interpreted the perceptions – which involves a way of seeing and conceptualizing – the observer makes a judgment. As a serious investigator, he or she has presumably checked the judgment in some way with others and found agreement. He or she then considers it, as Paul Cobb so aptly says, something that can be "taken-as-shared" (cf. Cobb, 1989). But this merely confirms the observer's belief that the others have interpreted and conceptualized their perceptions in a similar fashion. Any claim that such a conclusion reflects a "real" state of affairs, remains a hollow assertion, unless it can be shown how observers obtain access to a world beyond their

experience. – This is clearly a question that belongs to philosophy, a topic Phillips brings up explicitly at various points.

## Philosophy of Science

Phillips reports as “almost a truism” the contemporary notion “that theories are *underdetermined* by evidence (i.e., by nature)”. He goes on to explain that “theories are supported by experience,” but “it is always possible to devise *another*, rival, theory that is fully compatible with the available evidence”. Many of these rival theories, he then says, “can be ruled out on the grounds that they are extremely unlikely to be true, given the other things we know about nature and its mechanisms” (p.37, his italics). I am inclined to ask, are these “other things we know” not also based on underdetermined theories and therefore as questionable as the one we want to confirm?

For a constructivist, this lack of certainty is an important point. It successfully undermines any claim that a scientific theory is “true” in the sense that it describes nature and its mechanisms; and therefore we are compelled to replace the “correspondence” theory of truth with the theory of “coherence”. This is not a constructivist fad. The great physicists of our century said it in one way or another, and Einstein expressed it most succinctly:

The object of all science, whether natural science or psychology, is to co-ordinate our experiences and to bring them into a logical system. (Einstein, 1955, p.1)

If it is a truism that scientific theories are underdetermined, it applies to all rational knowledge and the notion of nature “instructing” the knower has to be changed. Indeed, Phillips says, “nature might *constrain* what we reasonably can believe about it” (his italics), but in parenthesis he adds “or so, at least, a constructivist might argue” (p.37). I read this remark as a hedge intended to distance himself from the argument, and I wondered what remedy he would suggest to salvage the “instruction” notion.

Phillips explains the constructivist theory of constraints, adaptation, and viability (pp.52–53), and at the end of his article he says that, in order to be believed, constructivists “have to find room for the fact that our knowledge is *about* something. And whatever it is, that it is about, has to be granted a role in influencing our constructions – ...” (p.72, his italics).

There seems to be a fundamental difficulty in our mutual understanding. To my mind, the 2nd constructivist principle (which Phillips quotes on p.52) makes clear that knowledge, in that view, pertains to *the world we experience*, not to a world beyond. In contrast, Phillips seems to think that examples, such as the common experience of a downpour (p.42), the common usage of color terms (p.43), and the “well-warranted” view that the earth is spherical (p.69) justify the belief that our knowledge captures something of an independent reality. He confirms this when he says: “the Earth has a shape, and this shape influences the data that can be generated about the Earth and thus influences the way we can conceptualize that shape” (p.72). The crucial difference springs from the interpretation of “influences” – for me this means *constraints*. for Phillips it means *instruction*.

This brings me to my main comment. During 2500 years no one has succeeded in finding a logical flaw in the skeptics argument that, as long as humans perceive through *their* senses and conceptualize in terms of *their* concepts, they cannot claim to know an objective reality. Hence I feel that anyone who asserts that the external world of nature does shape our knowledge, is under the intellectual obligation to show how that external world manages to do more than constrain the viability of our constructs.

## **Empiricism**

It can be argued, Phillips says, that in the theories of the British empiricist John Locke, and others like him, "the contribution of human constructive activity to the building of knowledge is relatively insignificant" (p.20). He then devotes much of the space of fifteen pages to a description of the difficulties Locke got himself into by asserting that the ideas gleaned from the senses, i.e., what philosophers call "secondary qualities", cannot represent the world as it is, whereas those gathered by reflection from "primary qualities" can. Later, Phillips reports (quite correctly) that I regard "the work of the British empiricists, including Locke, as being of great relevance to constructivism" (p.33). I consider this somewhat misleading, because Phillips nowhere mentions that Locke was the initiator of a way of thinking that was carried further by Berkeley and Hume and is called "empiricism" because it shifted the philosophical focus from ontology to the domain of experience, a shift that was then brought to its conclusion by Kant.

Berkeley, the second British empiricist showed, as most text books acknowledge, that the very arguments Locke used to explain that the sense-derived ideas could not be taken as representations of reality, were equally applicable to the ideas of primary qualities. And he suggested something even more fundamental for the constructivist way of thinking, namely that all the primary qualities could be obtained only by sequential experience and therefore required an active mind (Berkeley, 1950, §460). This prepared the way for Hume, the third in the British trio, who came to the conclusion that relational concepts could arise only through the relating activity of an active agent (Hume, 1742, Essay II).

The titles of the main works by Locke, Berkeley, and Hume mention *human knowledge*, respectively *understanding*. What they were investigating was knowledge, not the world as it might be in itself, and this is the reason why their ideas were considered pertinent to constructivism.

## **The Fiction of the "Solitary Inquirer"**

Focusing on learning, Phillips asks: "Is the student really a solitary inquirer, valiantly struggling to build up a cognitive apparatus and a set of cognitive content on his or her own?" He suggests that this could be argued to "emerge" from Piaget's work and also from mine. As alternative, he suggests: "Or, is the learner guided in these personal cognitive labors by teachers, parents, and peers ..." (p.16). Speaking, as I said earlier, from my "radical" point of view, I can answer these questions quite simply. The notion of the "solitary inquirer" is an unfounded fiction. In one of his most important books, Piaget wrote:

... society is the supreme unit and the individual attains his inventions and intellectual constructs only to the extent that he is the site of collective interactions, the level and value of which naturally depend on the society as a whole. (Piaget, 1967, p.421)

In *The psychology of the child* (1969), he said even more emphatically, "the affective, social, and cognitive aspects of behavior are in fact inseparable" (p.114), and in innumerable other places he reiterated that the majority of accommodations (i.e. learning) take place in the context of interaction with others.

Let me add a point that is clearly stated in my 1995 book (to which Phillips refers more than once). From my constructivist perspective, there is no functional difference between the constraints the individual thinker meets in the form of physical objects and the constraints that manifest themselves in interactions with people (von Glasersfeld, 1995, p.191). Both objects and people are part of the thinkers field of experience, and it is within this field that actions and the results of conceptual operations have to fit.

Language is no doubt the most frequent medium of social interaction. Phillips states that if "we all construct our own [subjective] meanings and understandings", communication would be impossible (p.43).

Earlier, Phillips raised the question "... how is it that twenty students in a physics class construct the same knowledge?" (p.21). This is an area with which I have had some contact during the last ten years as associate in an institute that has the main task of making the concepts of physics more accessible to high school students and undergraduates. I would say that the current methods of instruction achieve no such homogeneity of knowledge. The students learn some formulas and procedures, the better ones develop an eye for situations in which a given formula can be successfully applied, but a conceptual understanding of concepts and relations that would be deemed physics by physicists is exceedingly rare (cf. Lochhead & Yager, 1996; Novak, 1993, 1987; Désautels & Larochelle, 1989). Those who have picked up something useful, have memorized algorithms and routines, and even so, the "knowledge" they have acquired varies to an astonishing degree. None of this seriously impedes their ability to pass tests, because most tests require no more than repeating what was heard or read during the course.

The question of communication crops up also in the context of the common experiences of a downpour (p.42) and of a lump of gold (p.57). Phillips wonders how it come about that "we form the same ideas when we are in similar situations" and "how do we know that what one individual understands by particular words is the same as what another person conceives by them?" (p.42). I cannot repeat here the lengthy arguments to show that what we call "communication" does not depend on an identity of experience or meaning in the communicators, but merely requires compatibility in the given experiential situations (cf. von Glasersfeld, 1995, ch.7). In the radical version of constructivism, this compatibility is no less the result of social interaction than in the social versions. The denotation of a word is "taken-as-shared" – but this "taking as shared" takes place in the heads of individuals and is part of *their* knowing. No individual, not even a scientist or constructivist, can rightfully claim to be in the position of a God-like observer who perceives things *as they are* – without explaining how he or she got there.

Phillips mentions William James' idea that the experience of the newborn baby is a "blooming, buzzing confusion" and "that it takes a long time, and a lot of intellectual as well as physical activity, to construct an adequate set of conceptual equipment or categories to deal with experience" (pp.36–37). Radical constructivism, is an endeavor to design, following the lead of Piaget, a model of at least some of these activities. The goal of the endeavor is to see whether we can construct what is called knowledge without making assumptions about the character or structure of a prefabricated reality. As any other rational theory, constructivism presupposes a world and a knowing agent whose presence it cannot explain. I could not express this better than Piaget when he answered the question whether he would agree that the world existed: "Knowledge presupposes an activity of the brain; the brain is part of an organism that itself is part of the world – hence, I can agree with you" (quoted in Kesselring, 1988, p.98).

## Note

1. The criticism made by Phillips and many others, that Piaget disregarded social interaction, is at least partly due to the fact that his effort to grapple with question (b), in *Etudes sociologiques* (Piaget, 1965), has been ignored.

## References

- Berkeley, G. (1950) Philosophical commentaries, 1706-1708. Pp. 7-104 in A.A.Luce & T.E.Jessop (eds.) *The works of George Berkeley, Bishop of Cloyne, Vol.1*. London: Nelson.
- Cobb, P. (1989). Experiential, cognitive, and anthropological perspectives in mathematics education, *For the learning of mathematics*, 9(2), 32-42.
- Désautels, J. & Larochelle, M. (1989). *Qu'est-ce que le savoir scientifique?* Québec: Les Presses de l'Université Laval.
- Einstein, A. (1955) *The meaning of relativity*. Princeton: Princeton University Press.
- Hume, D. (1742) *Philosophical essays concerning human understanding*. London: Millar (After the 4th edition, the work was called "An enquiry concerning human understanding").
- Kesselring, T. (1988). *Jean Piaget*. Munich: Beck.
- Lochhead, J. & Yager, R.E. (1996). Is science sinking in a sea of knowledge? A theory of conceptual drift. Pp.25-38 in R.E.Yager (ed.), *Science/Technology/Society as reform in science education*. New York: State University of New York Press.
- Novak, J.D. (ed.) (1987). *Proceedings of the first international seminar on misconceptions in science and mathematics*. Ithaca, NY: Cornell University.
- Novak, J.D. (ed.) (1993). *Proceedings of the second international seminar on misconceptions in science and mathematics*. Ithaca, NY: Cornell University.
- Phillips, D.C. (1997). How, why, what, when, and where: Perspectives on constructivism in psychology and education, *Issues in Education* 3, 151-195
- Piaget, J. (1965). *Études sociologiques*. Geneva: Librairie Droz.
- Piaget, J. (1967). *Biologie et connaissance*. Paris: Gallimard.
- Piaget, J. & Inhelder, B. (1969). *The psychology of the child*. New York: Basic Books.

- von Glasersfeld, E. (1995). *Radical constructivism: A way of knowing and learning*. London/Washington DC.: Falmer Press.
- Wertsch, J. (1990). A sociocultural approach to socially shared cognition. Pp. 85-100 in L.Resnick, J.Levine, and S.Teasley (eds.), *Perspectives on socially shared cognition*. Washington, D.C.: American Psychological Association.
- 

This paper was downloaded from the Ernst von Glasersfeld Homepage, maintained by Alexander Riegler.



It is licensed under the Creative Commons Attribution-NonCommercial-NoDerivs License. To view a copy of this license, visit <http://creativecommons.org/licenses/by-nc-nd/2.0/> or send a letter to Creative Commons, 559 Nathan Abbott Way, Stanford, CA 94305, USA.

Preprint version of 8 Mar 2006