

SHAKY CONSTRUCTIONS

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Abstract: I aim to examine what should be demanded of a constructivistic theory trying to describe the construction of a human belief-system. My claim is that such a theory cannot allow entities in the description of how a human being constructs the world he or she lives, that are not allowed in the act of constructing the life-world. I will argue that the only coherent theories describing this activity are either phenomenological or social. That is, theories where the description of the constructing and the construction of the theory itself are identical or the constructor of the theory is taken to live in the same or a similar life-world as the one described. To substantiate my claims I will closely examine the theory of radical constructivism. This theory can be described as an attempt to give a partly empirical description of a non-social construction of a life-world, from an observer's point of view. I will argue that the attempt is not successful.

1. INTRODUCTION¹

Science does not rest upon solid bedrock. The bold structure of its theories rises, as it were, above a swamp. It is like a building erected on piles. The piles are driven down from above into the swamp, but not down to any natural or 'given' base; and if we stop driving the piles deeper, it is not because we have reached firm ground. We simply stop when we are satisfied that the piles are firm enough to carry the structure, at least for the time being.

Popper (1959, p. 111)

Different kinds of construction materials are needed if we want to build in a swamp. Piles have to be found that are solid, and able to resist the humidity. These are used to support the building, and it is important that we choose them carefully. For the building itself we need planks and window-frames, doors and floor boards. These do not have to be as solid as the piles, but they will have to fit into each other, so that a building may result. In this essay I describe and examine the theories of constructivism. These theories seek to provide an alternative foundation for the study of how a human being comes to understand the world he or she lives in. They do this by focusing on the contributions we, as humans or organisms, give to

this understanding. The constructivistic theories propose a different sort of piles. This is something else than the suggestion that the windows can be made from a another material. With the proposed change of the foundations come demands. It will have to be shown that they are solid and can stand the pressure of the building. This essay is an evaluation of how well they do.

Program

I aim to examine what should be demanded of a constructivistic theory trying to describe the construction of a human belief-system. My claim is that such a theory cannot allow entities in the description of how a human being constructs the world he or she lives in that are not allowed in the act of constructing the life-world.² I will argue that the only coherent theories describing this activity are either a phenomenological theory, where the description of the constructing and the construction of the theory itself are identical or a social theory of constructivism where the constructor of the theory is taken to live in the same or a similar life-world as the construction described in the theory.³

I do not set out to prove that a phenomenological or a social theory of constructivism is true, only

¹I would like to thank Peter Gärdenfors and Johannes Persson for helpful comments on this text.

²By life-world, I will mean the entire construction, no matter who has constructed it. I hope the word is not too theory-laden for this use.

³Unless you accept an entirely circular theory.

that they can be used if one decides to take a constructivist view of the system of human beliefs. It is also important to keep in mind that what I mean by constructivism is the attempt to describe the *active* construction of a (complete) life-world. A general claim on what human knowledge looks like, or how beliefs are organized will not encounter the same problems, as it makes no attempt to describe the entire situation. Theories that limit themselves to describing a part of human beliefs as a construction will also be untouched by my criticism.

To substantiate my claims I will closely examine the theory of radical constructivism. This theory can be described as an attempt to give a partly empirical description of a non-social construction of a life-world, from an observer's point of view. I will argue that the attempt is not successful.

What is meant by constructivism?

What I mean by constructivism in this essay is the view that the world a single human being or a group of humans live in is their own construction.⁴ The construction is the totality of beliefs held by an individual, and their interrelations. There may be parts in this life-world that are true in the correspondence sense of the word, but it is impossible for the person(s) living in the construction to decide which, as he or she has access only to the beliefs. That is, our constructions cannot be seen as mirroring the "real", independent world.⁵ Sometimes the theory of constructivism is linked to a coherence theory of truth, leaving the independent world completely out of the picture, but as most constructivists ignore traditional epistemological questions in their theories, so will I.

I limit my account of constructivism to theories that claim that the entire life-world, and accordingly all human knowledge (beliefs) is a construction.⁶ A constructivistic approach can be found in many different areas such as the conventionalism of Poincaré, and Duhem's criticism

of it in the philosophy of science, or in the intuitionism and formalism in the philosophy of mathematics. I will not discuss these approaches, as they limit themselves to a part of human beliefs, but they will sometimes be referred to.

At least two kinds of constructivism

I will make a distinction between two existing types of constructivism, between a radical and a social constructivism. The main difference between these theories is who they see as the primary constructor of the life-world; a single individual or a group of individuals. For radical constructivism it is an individual human who constructs the world he or she lives in. In so far as this world contains an external world (see footnote 1) or other human beings, these are constructs made by the individual him(her)self. Social constructivists on the other hand argue that the construction of a life-world is a social enterprise and accordingly that it is a group of individuals who together create and/or inherit a life-world.⁷

The kind of constructivism I deal with in this essay is a rather new discipline, although the ideas behind it are ancient. There is no real consensus on what different approaches should be called. For instance, I will claim that radical constructivism has the aim of providing an outline of how a life-world is constructed without making any ontological assumptions. This is a claim made by Ernst von Glasersfeld, whom I will use as a role model for the radical constructivist: "Hinter allen meinen Überlegungen steht der Versuch, die Epistemologie vollständig von der Ontologie zu trennen."⁸ There exist people who call themselves radical constructivists and who do not make this claim, for instance Siegfried Schmidt: "Der Radikale Konstruktivismus vertritt nicht etwa einen *ontologischen* Solipsismus (oder objektiven Idealismus), sondern – wenn überhaupt – dann einen *epistemologischen* Solipsismus, der an den Begriff des Beobachters gebunden werden könnte."⁹ I will place these "radical constructivists" under the heading of social constructivism, if they argue that the construction is social (as indeed Schmidt seems to do). If they do not claim this, but still believe that they can make ontological assumptions in their theory, they will have to be placed as

⁴ As does for instance Watzlawick (1984).

⁵ To keep the distinction clear I will use "life-world", or "construction" for the world a person experiences that he or she lives in (and that, according to a constructivist theory is created by this person or a group of persons) and "real" or "independent" world for the ontological world this construction probably exists in. "External world" is reserved for the constructions someone places outside (the construction of) him or herself, the external world is not independent, but is usually regarded as such by the individual who has constructed it.

⁶Watzlawick (1984), Stewart (1996), von Glasersfeld (1995).

⁷It could be said that the view suggested by Maturana & Varela (1992) is a middle position, not completely radical as an observer's perspective is used, and not social (if they claim that a life-world cannot be shared). Their approach will be briefly discussed later.

⁸ von Glasersfeld (1987, p. 411).

⁹ Schmidt (1987, p.35).

“phenomenologists”, given that they base their theory on their own experiences. If they fail to do this, their theory is untenable. This is argued later on in this essay (section 3), where I deal with this kind of approach under the name of “radical” constructivism.

Outline of the essay

The aim of this essay is to show that there only exist two tenable approaches to how a life-world is constructed, a phenomenological approach, and a social constructivistic approach. To do this I show that the approach radical constructivism uses is untenable. Therefore the first part of this essay is devoted to the refutation of radical constructivism, uncovering the ontological assumptions that have to be made in a theory like this. I begin in section 1 by describing how a radical constructivist could describe the activity of construction. I analyse what assumptions have to be made to be able to hold such a view in section 2. The description comes mainly from von Glasersfeld, and he in turn relies heavily on Piaget. Of course, there can be other radical constructivistic approaches to how the construction is made, but they will fall into the same pit as von Glasersfeld does unless they take a wholly phenomenological approach to the construction. Having thus dissected the theory of radical constructivism, I make some general points about what kinds of constructivistic theories can be maintained. I also explain why empirical evidence is useless for a radical constructivist theory of knowledge. In section 6 I give a short description of what a social construction of a life-world could look like. In this case, I follow some recent authors’ interpretation of Vygotsky. The reason I do this is partly to remain in the contemporary debate, partly to give social constructivism the same treatment as radical constructivism. I do not attempt to defend or define a social constructivistic theory. I only wish to show that it is a possible alternative to phenomenology. I finish the essay with some reflections on what can be achieved in a constructivistic approach.

1. THE CONSTRUCTION OF A WORLD; RADICAL CONSTRUCTIVISM

According to radical constructivism, a single individual constructs the world he or she lives in. This includes the construction of an external world and the construction of other human beings. To its aid, the individual has inborn preferences both to what is good or bad for it and to what kind of inferences that can be drawn from what it

experiences. These preferences (or principles) are the way they are due to evolutionary selection. Still the most important building blocks in the construction are the experiences the individual human being has. These are fitted into the previous construction in a manner that suits the builder. The experiences are interpreted with the aid of the preferences, but the importance they are given by the individual can vary.

[...] perception modifies what is perceived in order to fit it into the organism’s conceptual structures, whereas, in the general biological sense, natural selection modifies the structure of organisms so that they fit within the constraints inherent in their environment.

von Glasersfeld (1995, p. 63)

By constraints is meant that which prevents the individual from constructing its world arbitrarily, the inborn principles (due to evolution) and those experiences that do not turn out the way they were expected.¹⁰ So the construction of a life-world by a single individual is depends on:

- a) the experiences the person has, both experiences that confirm its beliefs, and thereby its construction, and those that refute them.
- b) the inborn principles due to natural selection that guide the individual in the constructing.
- c) the previous structure that helps the person interpret its experiences and sophisticate the principles.

The construction is shaped by the constraints; by the principles and by the unexpected experiences. These variables can be found in von Glasersfeld’s Piagetian view on how the construction is made, how a child develops the life-world it inhabits.¹¹ I will take one example, how a child comes to construct the notion of an external world, to show how these variables fit into the theory. In the following section, I will make a brief outline of how the construction of an external world proceeds, according to von Glasersfeld (1995).

The construction of an external world

The construction of what is apprehended as an external world begins with the construction of objects. This construction is made in two steps.

¹⁰ von Glasersfeld (1984), Stewart (1996).

¹¹ This connection is also made by von Foerster (1987).

The first step is the associating of all the different sensory qualities belonging to one object, with one another. The shape, smell, weight, colour, taste and so on of, for instance, a ball are recognized as belonging together. This is the realization that what is experienced and done is not completely dependent on the situation.

The second step is the assumption that the different qualities of the ball belong together and exist, even when the child is not there to perceive it. This amounts to the construction of a permanent object. The ability to do this is dependent on the child's judgement that the ball it sees now is the same ball as it saw yesterday. These balls are the same in another way than the red ball has the same colour as the red apple. That is, to be able to construe a permanent object the child will have to have access to two different concepts of sameness. With the aid of these, it can distinguish between the experience of a ball that is the same (as in identical) with the previous ball-experience it had, and the experience of a ball that is the same (as in similar) with another ball it has seen (perhaps yesterday).

Given the recognition of these two kinds of sameness, the child will have to explain where the ball is when it is not seen. The easiest solution to this problem is that it exists, even though the child cannot perceive it. This amounts to the construction of "protospace". Hand in hand with this construction comes the construction of "prototime"; the ball not only has to be somewhere while not observed, if it is supposed to be the same ball, it has to have an existence over time, to exist during the period when it is not perceived.

These constructions are the simplest solutions to the problems that arise when a human infant constructs objects. To be able to make this sort of judgements, the child will have to evaluate its experiences of the ball. It will have to discover that the ball it sees today is the same ball as it saw yesterday. This is called an *assimilation* of the present experience (after Piaget). The child assumes that the ball today will have the same qualities today as yesterday, for instance that it can be made to bounce. If the child plays with the ball and it behaves as it is supposed to, this assumption is confirmed. This would be the case even if the ball was a different ball than the one the child played with yesterday. As long as the beliefs are confirmed, the ball will remain identical with the one encountered yesterday (from the child's point of view).

The child will also have to be able to discover that not all balls are the same ball in order to make the distinction between different kinds of sameness. An example would be the child playing with a ball that looks exactly the same as the one played with yesterday but which does not behave like that ball. The assumption that the balls are identical is false even though they look the same. This would be an instance of (the Piagetian notion of) *accommodation*, something that can arise when the attempted assimilation is unsuccessful, when the ball is not identical even though it looks the same. An accommodation changes at least one of the assumptions made in the attempt to assimilate. It might for instance change the way the child assumes that a ball is identical with another ball (perhaps it has to be found where it was last left). An accommodation does not have to take place even though an experience contradicts the expectation. The child could as well have assumed that the ball was in a bad mood that day, and therefore did not want to bounce as well as it did yesterday. What can be found in this description?

1. The child bases its construction of the world on the different *experiences* it has. Some of these are used to erect constructions, such as the discovery that a certain roundness, redness and taste always come together. Some are used to refute assumptions. An example would be two balls that are not identical even though they look the same.
2. There are *principles* that guide the child in its construction of the world, in this case the principles of accommodation and assimilation. These affect the way the construction is made.
3. The *previous construction* affects how the life-world is built. Unless the child has created a concept of an object it cannot create the two kinds of sameness. That is, the way an experience is incorporated into the construction is affected by previous experiences.

2. THE THEORY OF RADICAL CONSTRUCTIVISM

The previous section contained a description of how a "practical" construction of a life-world could proceed in radical constructivism. Now the time has come to examine the assumptions that are hidden in radical constructivism. I will mainly refer to Ernst von Glasersfeld, as he is one of the few radical constructivists that has elaborated how the construction is made.

I will focus on what ontological assumptions have to be made in order to maintain a radical constructivist theory. This is, of course, contrary to the claim of radical constructivists that their theory has nothing to do with ontology. I do not believe that it is possible to hold such a view. Von Glasersfeld attempts to describe something; how an individual human being comes to see the world the way it does. This is something more than pure epistemology. Even if it were epistemology, this is no guarantee that it needn't make ontological assumptions. If someone holds a correspondence theory of knowledge he or she will have to assume the existence of an independent world, a coherence theorist will have to assume at least the existence of a system of beliefs and so on. I argue that there are at least two ontological assumptions hidden in radical constructivism, the assumption of an independent world, and the assumption of the existence of other human beings. These assumptions have to be made in different parts of the theory.

I will start by examining what parts of radical constructivism have to use the notion of an independent world. I then proceed to examining the need of an independent existence of other people.

The independent world

Experiences

The basic building blocks of the construction of a life world are experiences. It is these that have to be incorporated into the construction with the aid of principles such as accommodation and assimilation. One of the first objections that can be made to radical constructivism is that these experiences have to have a source. As it is not necessary to have an external source for experiences, this is no proof that radical constructivism will have to assume the existence of an independent world. The experiences could just as well be dreams or hallucinations. A radical constructivist would probably argue that the theory does not contain *any* assumptions about where the experiences come from. The radical constructivist regards the question as uninteresting — it does not make any difference for the theory whether they have an independent source or not. This is indeed the reply that Schmidt (1987, p. 39) gives: the objection that we cannot invent our experiences “..verwechselt epistemologischen mit ontologischen Solipsismus, Erfinden mit Phantasieren.”

The problem for radical constructivism comes with the claim that experiences can be contrary to what they are expected to be, the claim that experiences constrain the way a life-world can be constructed.

It is difficult to argue that it does not matter where the experiences come from and at the same time give them the force to change the construction. And it is difficult to imagine why a system of beliefs constituting a life-world would generate experiences incompatible with it, when its goal is to incorporate every new experience in a coherent way, with as few changes as possible to the system.¹²

This point is made stronger as the radical constructivists claim that it is possible to know *some* things about the independent world — to know when our constructed life-world differs from it in a significant way. An example would be Watzlawick (1984, p. 14): “... all we can ever know about the real world is what it is **not**.” or von Glasersfeld (1984, p. 24): “The only aspects of that ‘real’ world that enters into the realm of experience is its constraints.”

There is an obvious parallel to Popper here. Von Glasersfeld (1995) notices this and makes an attempt to escape the realistic connotations by making a difference between what a radical constructivist and a Popperian would call ‘false’. One of the Popperian uses of ‘false’ is the case of a crucial experiment, “that shows the theory to be false (where ‘false’ is interpreted as the opposite of ‘true’).” This is not the case for radical constructivism, von Glasersfeld claims: “It replaces the notion of ‘truth’ (as in true representation of an independent reality) with the notion of ‘viability’ within the subject’s experiential world. Consequently it refuses all metaphysical commitments and claims to be no more than one possible model of thinking of the world we can come to know, the world we construct as living subjects.” Need I say that this makes no difference? Whatever is called ‘false’ or ‘true’; negative feedback from an independent world does still have to come from an independent world. Von Glasersfeld even seems to shift position in the end of the book (chapter 8) where the difference to Popper is characterized in this way: “... we put the stress on the viability of the conjectures rather than on their refutation; and we do not claim that the pursuit of viability is a progression towards truth”. Apart from the shift in attitude, and the fact that it does not change a thing, it leaves us with the delicate question of what von Glasersfeld thinks is the difference, for this is exactly what Popper claims.

If it is possible to know what the world is not, it is no longer tenable to say that it does not matter

¹² See von Glasersfeld (1984) and (1995), Watzlawick (1984).

where the experiences come from. More so as the fact that we can change our construction is explained with the claim that evolution has furnished the human race with this capacity. Why should the human race be able to discover that a construction is wrong, if the experience that refutes an assumption does not have a source outside of the construction?

Evolution

The notion of evolutionary selection is important in the theory of radical constructivism. It explains where the principles used in constructing our life-world (such as accommodation and assimilation) come from, and why we sometimes change our constructions.¹³ If a human being does not have access to these abilities it will not survive. In the same way as a certain camouflage or a nest-building capacity can be inherited, a certain ability to make sense out of experiences, and to have certain attitudes towards them makes the human race more fit to survive. What the radical constructivists caution us to remember is that survival does not mean that a species has developed a life world that mirrors the independent world, only that the life-world fits it.¹⁴ The introduction of evolutionary selection into radical constructivism makes it even more difficult to ignore the existence of an independent world. Those organisms whose constructions do not fit, are annihilated. By what? It seems impossible to have a theory including evolutionary selection without any ontological commitments. There has to be something “out there” that affects the life-world of an unfit organism in a very concrete way, by extinction.

What could be said in defence of radical constructivism is that the evolutionary selection and the contradictory experiences are part of the radical constructivist’s life-world, and that it is this life-world that the radical constructivist describes. This possibility will be examined later.

External and internal stimuli

What an individual regards as being on the outside or inside of it, is only external or internal relative to the construction of the life-world.¹⁵ The reason why this is not generally thought to be a constructed distinction is, according to von Glasersfeld, that it was made so early in our

development, mainly during the sensorimotor period.¹⁶

Now comes the time to recall that radical constructivism is a theory of human beliefs, and not just a part of these beliefs, but the whole life-world. This life-world cannot exist in any arbitrary form, it has to be consistent, and it will have to function.¹⁷ A life-world does not function if experiences arise, that are not what they were expected to be, and in that case the experiences will have to be explained in a way that does not alter the life-world, or some part of the construction has to be changed. This brings out another problem for radical constructivists; how are we to distinguish our experiences from other kinds of impressions, from representations, ideas or dreams? Our experiences cannot be just like these other entities, they are able to make us revise our constructions. This gives them a certain status.

There are attempts to explain the difference phenomenologically, e.g. von Glasersfeld (1995) and Stewart (1996): something perceived will change with bodily movements. This is not the case for a representation, it is easier for us to recognize something when we perceive it than to represent it and much easier to analyse and conceptualize something when it is perceived. This is more or less a modern variant of Locke’s and Hume’s vividness. Unlike these authors (at least Locke), the notion of vividness is the only criterion for experience in radical constructivism, it does not have to be caused by an external world. Even if an observer can estimate whether the distinction between experiences and representations are made correctly by someone observed, his or her observations have no preference over the perceptions of the one observed. There is nothing else to judge by. (This makes me feel uneasy, but of course the theory might work anyway.)

There is another problem internal to the view of a life-world as a functional construction based on (what has the quality of being) experiences. It seems as if we can have experiences we later come to see as wrong. Perception can be mistaken. We can have a hallucination or a dream we think are genuine perceptions when we have them, but we are able to change our mind. We can say, “I thought that was a dog, now I know that I was mistaken”. What happens to the phenomenological touch of knowledge then? Does the experience lose its vividness? Unless there is something objective that,

¹³ von Glasersfeld (1984), (1985) and (1995), Schmidt (1987), Stewart (1996).

¹⁴ von Glasersfeld (1995).

¹⁵ He also uses the words “exogenous” and “endogenous”.

¹⁶ von Glasersfeld (1995).

¹⁷ von Glasersfeld (1984) and (1995), Stewart (1996), Watzlawick (1984).

at least in theory, can be used to distinguish between experiences and representations, the judgement that something has the quality of an experience must be absolute. This objective criterion cannot be provided by an observer, as the observer's life-world is the same sort of construction as the life-world of the observed. Perhaps the problem can be solved if we actually say that an experience that we discover does not fit into our construction of the world loses its vividness, but it will be difficult to account for how this change takes place, and why it seemed to have the right quality at first. Especially as some other "real" experiences make us rebuild our construction, precisely because they are not compatible with it.

This point is made even stronger by the fact that radical constructivists, including von Glasersfeld, use the fact that we can be mistaken about our experiences as evidence, or confirmation in favour of their theory. It is difficult to find an article, book or collection of papers on constructivism that does not mention empirical findings supporting the view that the world is a construction, findings that suggest that it is very easy to make perceptual mistakes, and that attention and opinions affect what we will experience. (See for instance von Foerster's presence in *The Invented Reality* and *Der Diskurs des Radikalen Konstruktivismus*¹⁸, both edited collections of papers).

Other people

"Objective" reality

Von Glasersfeld realizes that it is difficult to explain the difference between perceptions and other experiences, without an independent world. To solve this he tries to construe an "objectivity" in quotation marks, that can be used to judge which experiences can be given the status of perception, and thereby the ability to change the construction of the life-world.

How is this accomplished? By introducing *others* in the individual's construction of the world.¹⁹ These others are not seen as existing in the independent world — they are constructions — made out of the experiences the individual has had.

This introduction of 'others' might seem to be in flat contradiction of the constructivist

principle that all knowledge is subjective. However the apparent contradiction will disappear if I am able to show that, although the others are the individual subject's construction, they can nevertheless provide a corroboration of that subject's experiential reality.

von Glasersfeld (1995, p. 119)

Von Glasersfeld tries to provide this proof by examining how an individual goes about in constructing other individuals. It begins with the child's ascription of spontaneous movement to some of the things it experiences, its discovery that they seem to be able to perceive things, the imputing of motives and emotion to some of them, and finally some of the things the child experiences are considered as similar to him or her. The child assumes that they have the same sort of knowledge that (s)he has, and this is eventually confirmed by prediction and observation. It is this prediction and observation that can then be used to corroborate our view of the world. If these others also assume that there is a table in front of me, I will have confirmed that this part of my knowledge (construction) of the world is not mistaken. This is of course correct, and it is not difficult to see how we can construe others that agree with us. But the most important information is the one obtained when the others do not agree. How are these others construed?

To appreciate the value of this kind of corroboration, it is crucial to remember that the individual's construction of other constructing agents is no more a free construction than that of the physical objects with which we furnish our experiential world. It is a construction that is continuously impeded and thus oriented, but not determined, by obstacles that function as constraints.

von Glasersfeld (1995, p. 121)

So these others are not merely a construction! The experiences of them are impeded and oriented by obstacles, by the negative knowledge that comes from constraints. But if the assumptions of what another human being believes and desires can be mistaken, can be refuted by reality, this must mean that other thinking and acting human beings exist, that they exist (ontologically) as independent objects. The construction of another human being is quite different from the construction of a stone. The expectation that there is no stone in front of me is refuted when it causes me to stumble. I look back and I see a stone. Of course it might not be a stone to an observer, it may be a crocodile or

¹⁸Watzlawick(1984) and Schmidt(1987).

¹⁹It seems as if von Foerster (1984) makes a similar attempt, but without von Glasersfeld's constraints. The reason is presumably that he does not focus on the construction of a (common sense) life-world, but on neurophysiological properties.

nothing at all. Still, even if we replace the stone with something else I might stumble on, or a spontaneous stumbling, or something entirely different, there seems to be a simple connection between the “real world”, what makes me stumble, and the stumbling. The situation is far more complicated when it comes to intersubjectivity. What can affect the construction of a thinking, acting subject but a thinking acting subject? The behaviours they are furnished with are subtle, most interaction is verbal (at least when it comes to corroboration). This is nothing like the rough, physical reality that makes it impossible to go any further, makes someone feel sick or causes pain.

This argument is, of course, not entirely convincing. It does not have to be other people that constrain the construction, but it is difficult to see what else it could be. If radical constructivism is to contain a description of how a life-world is constructed, this will be a very difficult description to make, unless it contains the assumption of the existence of other people. And the entire radical constructivistic project seems to combine the secret assumption that everything is the way it is believed to be, with an overt claim that ontology is uninteresting for the theory.

The construction of a theory of radical constructivism

If the radical constructivist still wishes to maintain that all knowledge is subjective, and that the theory does not carry any ontological commitments there is only one way to go. The constructivist will have to claim that the entire theory is his or her construction of the world, and that it is built on his or her judgements of what is external and internal, on what is a correct argument or not, et cetera. When von Glasersfeld discusses what conclusions can be drawn from empirical experiments, he ends up with something similar to this view:

Whatever the theory a psychological investigator builds up, it will not be a description of the observed subjects' objective mental reality, but rather a tool for systematizing the investigator's experiences with the subjects.

von Glasersfeld (1995, p. 71)

Unless the radical constructivists accept at least the existence of an (ontological) independent world, this is a claim that will have to be made on them as well. If a theory claims that there is nothing but

subjective knowledge, it follows that the theory is subjective knowledge as well.

Let us take a look at what the theory of radical constructivism would be like if it were a truly subjective theory. The constraints would be a theorist's construction of the world as something with a past and a future, in which there are objects and different organisms, that have been shaped in the past by the fact that some of them survived and some did not. The reason that some were found fit and some not lies in the way the theorist has construed the world. In this world there are other individuals (construed by the theorist) who in turn construe their worlds based on their assessments of what this constructed world looks like, sometimes impeded in their construction of the world by the way the theorist has constructed his world, sometimes by the way *their* constructions look like. The hindering itself is of course also constructed. Even though the theorist has construed these individuals he does not know what their construction looks like, and sometimes his predictions of how they will act are refuted. By what? The only thing that can refute him is the construction he has made. Furthermore, even if the individuals he has constructed can base their constructions on some inherited principles, on the experiences they have and on the negative information that they (are ascribed to) gain from the theorist's construction, the theorist has no such things to go on. He has no rules of thought or principles to use, these he will have to invent himself. He has nowhere from where he can get his experiences and nothing but himself to refute them. Furthermore, if we are to take the “no ontological assumptions” -principle seriously, he can't even be sure that he exists. We are not there to construe him. (But perhaps von Glasersfeld, following Descartes, allows himself this basic ontological assumption.)

Assesment

Unless von Glasersfeld means that radical constructivism is incomprehensible when he says that one of its virtues is that it: “accentuates the need to contemplate the realm of the mystic's wisdom”, he will have to accept at least the existence of an objective reality. If he wants the theory to be one of knowledge he will also have to assume the (ontological) existence of other thinking subjects. It wouldn't have been necessary for him to accept these ontological entities in his theory, had he stayed away from the actual construction of the world. I greatly appreciate that he seeks to account for how human beings work with the aid of his general view on what knowledge

is and what the world looks like. However, I also believe that it is not possible to explain how a human (or any other organism) actually constructs its view of the world without making any ontological assumptions. I have no problem with these assumptions, but they are incompatible with the claim that “Constructivism [...] has nothing to say about what may or may not exist.” (von Glasersfeld, 1995, p. 114). This leaves us with a theory that attempted to do without any ontological commitments and ended up making just as many as any other theory.

3. CONSTRUCTIVISTIC THEORIES AND META-THEORIES

Judging from section 2, it seems as if it is not possible to give a description of how a human being constructs the world he or she lives in without any ontological assumptions attached to it. One possible way out of this dilemma would be for radical constructivism to say that it does accept the ontological existence of an external world, or of other people, but that the theory still insists that a single individual never has access to these. The radical constructivists could claim that their *theory* has to make such assumptions to be able to describe how an individual, from an observer’s point of view, constructs a life-world, but that this in no way means that the individual from the inside of the life-world is able to tell the difference. This would explain the sometimes obvious contradictions in von Glasersfeld’s texts. When he talks about evolution and constraints he does this from “the outside”, while the insistence on the “no-ontological assumptions-principle” comes from “the inside”.²⁰ In this section I will examine if it is possible to maintain such a view. That is, the view that the constructivistic meta-theory of how a single individual builds the life-world, contains different entities (i.e. an external world, evolutionary selection and interaction with other people) that do not exist in the individual’s theory of the world, since this can only contain constructions.

²⁰An analogy from the philosophy of mathematics would be the theory of formalism, where the objects of mathematics are seen as empirical. $2+3=5$, as two apples put together with three apples resulting in five apples. The theory of mathematics, the meta-mathematics is about how these operations with (possible) empirical objects are carried out. To prove that these operations are correct the formalists will have to admit independent criteria for the correctness of inferences into their meta-mathematics. These criteria do not exist in mathematics, which is left purely empirical (Körner, 1960).

Who describes and who is described?

Let us take a step back and examine what different sorts of constructivistic theories can exist. There are, as far as I can see, three possibilities.

I) An individual can describe how he or she comes to understand the world and handle different experiences. This description would be of *that* individual’s life-world and its changes, and it would not contain any claims on what other people’s life-worlds look like. In this sort of theory, other people are merely a “construct”, that is, they are experienced, just as everything else. This sort of theory would not contain any metaphysical assumptions (apart from, perhaps, the Cartesian assumption that the individual whose description it is exists), but it would also have a very limited range. The theory only applies to the individual described, the individual who describes. I will call this a phenomenological theory of constructivism.²¹

II) An individual can attempt to describe how other people construct their life-worlds. This can be made in two ways; the individual can attempt to do this from an observer’s point of view, attributing to the subjects certain beliefs and patterns of action. In this approach the person who describes these subjects is an outsider. The inferences made by the observer can differ from the ones made by the one observed, as the observer can have access to different or more information than the subject observed. An example would be an observer watching someone interact with an environment, and being able to tell if the subject’s assumptions about the external world are right or wrong. If the subject avoids a wall that is not there, the observer is able to tell, but not the observed.

III) An individual can assume that he or she lives in the same life-world as the one observed. This would mean that the observer will have to allow the subject access to the same kind of information that he or she has (at least in most cases), and to accept that he or she usually follows the same principles and has the same kind of beliefs that the subject described has. That is, the individual who

²¹Føllesdal (1972, p. 425): “He studies the structure of the noemata of his acts. He elucidates how his expectations are arranged in patterns, how new sense impressions can change his expectations and sometimes lead to an ‘explosion’ of the noemata and make him reject his original supposition about the direction of his act”. I do not claim that phenomenologists ordinarily deny the existence of other people or an independent world, but following this method it should be possible to give a description of a belief system (the describer’s) without ontological assumptions like these.

describes will have to include him or herself in the description. That is, there is an observer in this theory as well, but the observer has access to *the same sort of information* as the subject.

The fact that the observer's information differs from the sort of information available to the one who is observed, is what distinguishes approach II from the first and the last. In the phenomenological approach the one who describes and the one who is described are the same person, the observer has thus access to the same information as the one observed. In the last case, the individual who describes and observes is assumed to live in the same world as the ones that are described. This means that the describer will not have access to information that the others do not have access to.

What kind of approach is radical constructivism? It could be the phenomenological one, if the description were limited to the person that constructs the theory. That this is not the case must be obvious by now. Radical constructivism relies heavily on the observer's perspective, and the individual described is always referred to as a third person. Generalisations to how people in general construe their life-worlds are made. I would still like to point out that it would be possible to create a phenomenological radical constructivism. The study of the development of children will perhaps have to be left out, and the constraints would be constraints in virtue of their phenomenological qualities, but the basic assumption of the theory, the attempt to distinguish epistemology from ontology would be successful. Actually this is the only way for a radical constructivist to steer clear of ontological assumptions, so if this is the most important part of it, the approach will have to be phenomenological.

The radical constructivistic approach could also be transformed into approach III, but this would make it a social constructivism. It would then have to contain something that explains how several individuals (with an ontological existence) can come to live in the same world. This is contrary to the radical constructivistic claim that each individual constructs his or her life-world, and that others are admitted into it merely as constructs.

As radical constructivist theories rely on an observer's perspective, and make claims on what the constructions of the rest of the human race look like, it does not seem to be a phenomenological theory. As it denies the ontological existence of other people it cannot be a social constructivistic theory. This leaves us with the assumption that radical constructivism, in its ordinary form, most probably is of the second kind. It takes an observers

perspective on how subjects construct their private life-worlds. It makes a distinction between the one who observes and the one who is observed. The subject is seen as "A captain who on a dark stormy night has to sail through an uncharted channel, devoid of beacons and other navigational aids, [who] will either wreck his ship or regain the safe open sea beyond the straight" (Watzlawick, 1984, p. 24), but the constructor of radical constructivism can safely claim that "the *actual* geographical shape of the straight might offer a number of safer and shorter passages." (Ibid.). There is nothing wrong with an observer's perspective on other people, but it is *not* tenable in a constructivistic theory. In a theory that attempts to describe the *totality* of human beliefs and knowledge²², there is no room for anything *outside* the theory. For where are the beliefs and claims of radical constructivism supposed to come from, if they, themselves, are not a construction? And if they are a construction, why should they have the force to say what is right and wrong in another individual's life-world. If radical constructivism follows this path it will end in the same muddle as the one that arouse in the attempt to describe the construction of radical constructivism. The theory cannot choose this option, that is, to say that it is merely a possible description of reality, and that this description only comes from the individual who has construed the theory, if it wants to make sense. And a minimal demand that must be made on the theory is that it will have to make *some kind of sense*, that it at least will make things easier than without the theory.

A brief look at Maturana & Varela

There is another constructivistic theory that might claim that it has resolved the difficulties encountered by radical constructivism, without having to give up the claim that a life-world is private. This is the theory of knowledge and life presented in, for instance, *Tree of Knowledge*.²³ In this theory the emphasis is put on an observer's perspective, as in approach II. The observer can find correlations between changes in the environment of an organism and in the organism itself, but if the observer considers what the organism has access to, it will discover (from an observers point of view) that the organism does not have any access to its environment, all changes made in the organism are based on the structure of the organism itself.

The problem begins when we unknowingly go from one realm to the other and demand

²²If a suitable definition of knowledge is accepted.

²³Maturana & Varela (1992).

that correspondences we establish between them (because we see these two realms simultaneously) be in fact a part of the operation of unity [...]

Maturana & Varela (1992 p. 136)

The conclusions that can be drawn from observing the behaviour of organisms (usually not human) will then be applied to the observers, as they themselves are organisms. As a result the claim that the theory is applicable on human beings can never be validated (for who is supposed to observe the observer?). This makes the theory circular.²⁴ The only way out of this circularity, if you wish to remain a constructivist, is to adopt a phenomenological or social approach. However, Maturana's and Varela's solution is to keep the circularity.

Recognizing this cognitive circularity, however, does not constitute a problem for understanding the phenomenon of cognition. On the contrary this is the starting point that enables us to explain it scientifically.

Ibid., p. 244

However, I cannot accept circularity in a theory of this sort. There might be a discussion on whether one of the theses in the theory of evolution "Only the fittest will survive" is circular (or analytic), but even if this is true, the theory will be acceptable only as long as there are other parts of it that are empirical. The theory of Maturana and Varela consists solely of this circularity, and I will therefore not accept it as a scientific theory. I believe that a scientific theory must attempt to give some arguments for why it should be accepted, arguments that can be compared to those of other theories. This is something this theory lacks. One may accept it or not, and this will be a question solely of faith. I do not accept it, and even though I might miss something, a proponent of this theory cannot blame me for this, in the same way as someone who is religious can only regret my ignorance. *The Tree of Knowledge* might still be an excellent way of gaining a deeper understanding of the world, but it is not a good way to explain

²⁴The theory would actually make much more sense if it were a "realist" theory. In the description of how organisms interact with the environment it is again and again stated that the structure of the environment *triggers* structural changes in the organisms (ibid, p. 75). No realist theory I ever have heard of denies that our knowledge of the world is imperfect, and depends on what tools we have available for interpreting it, so if this were all that is meant by their new interpretation of knowledge, it need not be constructivist, and their problem of circularity would disappear. (Even though new problems would probably replace them.)

(scientifically) how we come to understand the world we live in.

Why phenomenology is not a solution for constructivists in cognitive science

The constructivistic movement has been given a lot of attention lately. Most books and articles in the area have been written during the late 1980s or during the 1990s, and often refer to cognitive science. This recent interest has often focused on empirical findings that could support this view of human knowledge. For this reason traditional phenomenology has been left out of the discussion. It is difficult to combine a phenomenological approach with an experimental one. This makes the approach, although sympathetic, unsuitable for a cognitive scientist. It deserves more attention than it is given in this essay.

4. EMPIRICAL EVIDENCE

I have mentioned the use of empirical evidence in constructivistic theories, together with the fact that radical constructivists (and presumably phenomenologists) have no right to use such findings as evidence in favour of their theory. As constructivists often refer to empirical evidence in trying to substantiate their view of human knowledge, I will give a short introduction to what kinds of empirical findings are referred to.

Von Foerster cites findings about how human and animal perception works to prove that the environment we perceive is our own construction. The fact that we are not always aware of deficiencies in our sensory information (an example would be the blind spot) and that we can remain unaware of sensory information unless we have means to interpret them (an example would be attention studies) is used by von Foerster to support his principle of undifferentiated encoding:

The response of a nerve cell does not encode the physical nature of the agents that caused its response. Encoded is only "how much" at this point on my body, but not what.

von Foerster (1973, p. 45)

This is then transferred to a statement on human perception. As the information we get is purely quantitative, what we actually experience with qualitative properties have to come from us. And since we can ignore such quantitative data that we do not have an interpretation for, and imagine data we never received, qualitative data is not necessary for our experiences.

Stewart makes a comparison between different species, to illuminate the evolution of our constructions:

[...] symbols came into existence at a certain point in the evolutionary process, but their underlying nature is illuminated [...] by a consideration of the processes involved in their genesis.

Stewart (1996, p. 318)

Some bacteria are able to approach stimuli in its environment (sugar) and avoid other (acid). The bacteria have the ability to sense certain variables, and with the aid of these direct itself to the most promising environment in its proximity. In Stewart's words, the bacteria know how to do this. Animals with a central nervous system are able to perceive, they can compensate for the effects on their sensory input caused by themselves. That is, it is possible for this kind of animals to distinguish themselves from their environment. They have constructed an outer world. Some of these animals have also the ability to represent that which is not themselves and manipulate it internally. This means that they can "live" in their construction also when they do not perceive it.

Most of the findings used to support constructivism come from studies of how we live according to our interpretations of the world, and how we interpret anything that we experience as evidence for this. The frequency and ease of these ("mistaken") interpretations are seen as supporting constructivism, as this could be the case for all of our interactions with the world. An example would be Rosenhahn's (1973) *On being sane in insane places*, where a number of healthy individuals were admitted as schizophrenics to mental hospitals in the USA. Not a single one of the diagnoses were questioned. The subjects reported an endless number of instances when their behaviour (which we will have to assume was normal) was interpreted as signs of their mental illness. An illustrative example is the case where a psychiatrist uses the fact that all the patients line up for food an hour in advance, as an example of their oral behaviour (in front of the patients!). The explanation made by one of the subjects was that there is so little to do in a mental hospital that food is one of the few things to look forward to.

However, an orthodox theory of radical constructivism cannot be allowed to use empirical evidence as support. The reason for this is simply that a theory that makes all human knowledge the construction of a single individual cannot give preference to some sorts of construction over

others. I, as an individual human being, can in my construction of the world decide to give empirical findings a certain weight, and allow them to change some of my other opinions of the world if they are contradictory. This is an individual decision, and someone else might decide to do otherwise. There are no independent criteria for deciding which decision is the correct one. If the theory of radical constructivism is to be seen as a construction itself, it might say that it gives certain weight to empirical findings. Apart from the fact that it seems impossible to maintain such a view, this still would not explain why anyone else should accept this kind of knowledge as more valid than others.

5. THE THEORY OF SOCIAL CONSTRUCTIVISM

In the previous parts of this essay I have shown that radical constructivism is not a tenable theory. If a theory attempts to examine the construction of an entire life-world, it will have to solve the problem of where the theory itself fits in the system of beliefs. The only possible ways of doing this is either by limiting the theory to the individual who constructs it, or by extending the individual's life-world to a common life world. The phenomenological approach would leave out much of what is seen as the hallmark of constructivism (constraints, stress on evolutionary selection, the talk of constructions that fit the independent world), and I will therefore not examine it closer. The other way, is what I would call the social constructivist approach, as it assumes that the life-world is a construction made by several individuals.

There are advantages to this sort of theory, but it also has many problems. The advantages are, apart from the fact that a constructivistic approach can be maintained, that this common life-world enables the theory to take steps that are not allowed into the radical constructivism. There is no hindrance to the use of empirical (experimental) evidence. As the evidence can be assessed by several individuals it can be given a status that goes beyond the ideas of a single individual.²⁵ Empirical evidence is of course

²⁵I do not put any emphasis on empirical evidence in this essay. Most findings that support a theory of social constructivism could also be used to support a theory of radical constructivism. Findings that, for instance, support a view of learning as a social event can be reinterpreted as evidence for the fact that other human beings are first constructed and then used to consent with the learning process. There are some cases where the predictions of for instance a Piagetian differ from the predictions made by a

used in a phenomenological theory as well, but the force of the experiences the phenomenologist has applies only to him(her)self. It will also be more easy for a social constructivistic theory to explain the occurrence of language. And it is easier to explain the *learning* of other skills, such as mathematical problem solving, if interaction with teacher and peers is something more than a construction.²⁶

What has to be remembered is that many problems come up in social constructivism that a radical constructivistic theory does not have to deal with. What has to be explained in a social constructivistic theory is the relation between the individual's life-world, and the life-world of the social group. Are they similar or do they differ? And in what way are they connected? How can an individual human being come to share a life-world with other people? Is the entire life-world shared or are there private life-worlds as well as a common one? How do they affect each other? Do all human beings share a life-world? Can other animals be admitted into it (as subjects, not as constructs)?

I hope that I have made it clear that a social constructivistic theory will have to accept the ontological assumptions radical constructivism ran in to. It seems pointless to build a theory on how a group of individuals come to form a life-world, unless you believe that there exist several human beings in the independent world. And if you have accepted this, what is the point of denying that there is an independent world? If the learning ability is explained in evolutionary terms, this would force the social constructivist into assuming an independent world. As a constructivistic theory it will have to accept that it is impossible to know which, if any, parts of the theory that are true²⁷, but the theory can maintain that the group, or an individual in the group can obtain negative knowledge of the world. It is not necessary to care about constraints that are non-social, but such constraints can be incorporated into the theory at wish, and will explain why the world is not always as it is supposed to be, and hence why the (social) life-world changes. They can also, as in the case of evolution, explain why the life-world is built, and at least hypothesize about why the constructions are made the way they are.

Vygotskian (as in the case of egocentric speech), but as there is no need for a radical or social constructivism to consent to these theories of how the construction of a world-view proceeds, I will not elaborate this point.

²⁶See for instance Lerman (1996).

²⁷In a correspondence sense of the word.

There are several examples of (what I would have to call) social constructivistic theories, and they differ greatly. My aim is now to introduce one possible way of explaining the most obvious difficulty for social constructivism; how can an individual come to share a life-world with other individuals? One way of explaining this is the Vygotskian theory of learning where a child can come to share at least parts of the life-world with other people; the child is eased into the construction, by first learning to master the external²⁸ expressions of the life-world, and only then learning to understand what they mean. In the next section I will introduce some of the basic concepts of this theory. But my main point has already been established; it is possible to construe a constructivistic theory that can manage the problems of radical constructivism. Some ontological assumptions have to be admitted into the theory (and the subjects, as well as the theorist, are allowed to come in negative contact with them). This will enable the constructivist to maintain the notion of constraints and evolutionary selection of the construction principles. The problem of distinguishing between the experiences that will have to be allowed to change the construction and those that are not is solved, as an individual can verify his or her experiences with the aid of others. Moreover, the theory can use empirical evidence in a way that radical constructivism is barred from. And the theory can use the notion of a common life-world to explain its own existence; it can be argued that it can, in a coherent way, explain how their life-world is constructed, while following the rules of thought and common experiences of the social group.

Now the time has come to examine how this common understanding can be established.

6. SOCIAL CONSTRUCTIVISM

I will now attempt to give a short description of how a theory of social constructivism would explain the construction of a life-world in collaboration with others. In doing this I will rely heavily on different authors' interpretation of Vygotsky, just as I used von Glasersfeld's view of Piaget as the basis for my description of radical

²⁸By external I mean external in the common life-world's distinction between what is internal to its different members and what is external and thereby intersubjective in the world. As the theory of social constructivism will have to place itself in the same life-world, as those it describes, what is external to the individuals described will be external to the person who constructs the theory.

constructivism. The reason that I have not turned to the original authors is that I wish to remain in the contemporary context of constructivism. This essay is not an attempt to build a constructivist theory, it attempts to examine what possible alternative constructivistic descriptions of reality there are.

A Vygotskian view of learning

What is most emphasised in this view of how we come to understand the world is the way it is done; in cooperation with others, with adults or “more competent peers”. A child grows into the praxises and mental tools of its society as it develops. The emphasis is on language acquisition much more than on the construction of an external world, but the difference is not so large as might be thought. It is not assumed that a child merely starts imitating the way others behave, the child makes the external knowledge shown by others internal, and in this transition the knowledge changes. A child might learn how to use a word in a specific context, but it is by using the word correctly that it eventually forms an opinion of what the word actually means, that it understands what it is saying. It might be easier to understand the distinction with another example. I have on several occasions (and I know others with the same experience) for the first time understood exactly what I was doing, during a test, at the same time as I successfully solved the test problem. For a Vygotskian the managing of the tools comes first, and the insight afterwards.

This is not to say that a child or an adult is incapable of learning something on its own, especially not after having acquired some basic insights as an infant. However, development still proceeds much faster with the aid of others, and it is possible for the child to reach much further. The term “zone of proximal development” is coined for the problem solving capacity a child has with the aid of adults or more knowing children compared to the capacity it has while left on its own with an assignment.

How can we learn?

How do the adults or peers proceed in helping a certain child to a new ability? And how is the child able to understand them? One of the reasons given is almost identical with those of (Ernst von Glasersfeld’s) radical constructivism. The child is assumed to have access to certain processes enabling it to understand vicarious or transactional learning. These are, as usual, assumed to have an evolutionary basis. We can also assume that the one who teaches has a certain feeling for what it can ask of the

child, and this ability could also be attributed to biology.²⁹

The adult or the peers guide the child with the aid of props and/or instruments, trying to make it focus on certain aspects of the problem and giving them hints on what the child might do to facilitate the problem solving (“you might want to compare this puzzle with the picture on the box”). In this way the child is enabled to see things it would not have if left on its own.

The teacher will also make use of certain procedures to facilitate learning or problem solving. An example would be the requirement made in my school that solutions to mathematics assignments should specify what was asked for and of what dimension the result was supposed to be.

Involved in the learning is not only the teacher and the student, but also the environment in which learning takes place. The environment preferred is one that is well known to both teacher and child, where the interpretation of references will be as little vague as possible and the context is structured. This reduces the risk that what the child and the teacher see as the reference differ.

In this way the child is directed into the life-world the adults live in, and thereby acquires, step by step, the approaches and evaluations made by the rest of the society.

7. CONCLUSIONS

There seems to be a way to save constructivism, as a theory of the totality of human beliefs with the assumptions of constraints and evolutionary selection. To do this other people have to be admitted into the life-world, not only as constructs, but also as independently existing constructors. That it is possible to explain this common construction is made more plausible by the Vygotskian theories of learning. What has to be kept in mind is the lesson from the radical constructivists. It is very difficult to build a constructivistic theory of how the construction of a life-world is made. Anyone who attempts to do this will have to remember that everything said will apply directly to the theory itself. Probably, the amount of entities in the theory increases the

²⁹As a matter of fact Jerome Bruner cites a study made by himself and A. Ninio (The achievement and antecedents of labelling, from *Journal of Child Language* 5, 1978) where it appears that a mother interacting with its child only responds to a mistake made by the child as an error, if it has previously been able to answer correctly.

need to be careful, as well as the probability of making an assumption that makes the theory inconsistent. Moreover most social constructivistic theories do not seem to have given the relation between their theory and what the theory claims much thought. It is of course possible to say that the theories are not constructivistic in my sense of the word, that is, that they are not about the totality of human beliefs. In that case it would still be nice to get an explanation of where the theory ends, and what parts of human beliefs are left out. This is something that can be learned from radical constructivism. Even though the theory fails, it makes an attempt to describe the actual construction of the life-world, and it tries to be clear about the relation between the content of the theory and the theory. Both of which are excellent qualities.

For someone inclined to consider these qualities more important than the need to be able to generalise or the theoretical framework (with its talk of constraints and evolutionary selection), I believe that phenomenology is the best solution. This theory has only a weak connection to cognitive science, but it is easier to defend philosophically.

As I believe that the notion of constraints is important, and as I believe that intersubjectivity is an important part of these constraints, my inclination is towards social constructivism. One of the major reasons for this is that I believe that a social life-world can provide us with constraints that are needed if we truly want to understand why the life-world looks the way it does. For it is not only when we collide with a wall, or find inedible food that we obtain negative knowledge about the world. When someone shows us that the solution we thought we had found to a mathematical problem is wrong, or when we have access to a map that shows us that the building we are looking for is in the other part of town, something similar happens. Indeed, most of the constraints we encounter are of this kind. What else would language learning be, or the scripts and schemata that cognitive psychology tells us about? The way a sentence should be formed or food should be ordered is not information we have obtained by blindly navigating on a dark sea.³⁰ We get it while we observe other people, try to imitate them, and when *they* let us know that we are sometimes wrong. How these constraints (and the ones discussed in, for instance, radical constructivism) are discovered is something that has to be more closely examined. Perhaps this examination could also tell us something about the relation between

the individual life-world and the intersubjective one.

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³⁰Watzlawick (1984).