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Functional Fit and the Instrumental Character of Knowledge: Rethinking the Theory of Knowledge with Radical Constructivism

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ABSTRACT

Radical constructivism (RC), introduced by Ernst von Glasersfeld, is an instrumentalist theory of knowledge that challenges the notion of knowledge as a picture or representation of a real, external world. Instead, RC, by integrating ideas from different theoretical fields - such as cybernetics, evolutionary biology, and evolutionary psychology - considers the purpose of the cognitive organism to construct knowledge not to achieve truth, but to construct perceptual and conceptual structures that help to maintain adaptation and cognitive equilibrium. However, the basic question here is, by what character these structures can achieve the purpose. By examining Glasersfeld's writings, this paper argues that the character is a "functional fit", which is based on a fundamental shift in RC, i.e. the shift from "matching" to "fitness". From this point of view, the "fit knowledge" is not due to its match with the external reality, but due to its repeated success in solving a specific problem, it is viable, and by preventing unwanted changes or perturbations, it gives order to the experiential world of the organism and helps to maintain its cognitive equilibrium. This perspective has the potential to create transformation in various fields, from education to ethics and social issues. Therefore, this paper, while examining the basic concepts of radical constructivist epistemology, also deals with its theoretical and practical applications.

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Radical constructivism is unashamedly instrumentalist (in the philosophical sense of that term) and this must offend advocates of the maxim 'Truth for Truth's sake'. (Glaserfeld, 1988, 87)

Introduction

Philosophical inquiry has long centered around deciphering the nature of knowledge. Epistemological theories rooted in realist ontology have proposed a range of perspectives regarding the connection between knowledge and reality. Radical constructivism (RC), a framework introduced by the German epistemologist and psychologist Ernst von Glasersfeld, challenges the main assumptions of these theories, which he calls traditional epistemology, and provides new insights into the theory of knowledge.

RC criticizes that part of Western philosophy that considers knowledge as a representation or picture of a real and external world in the subject's mind. Instead, Glasersfeld (1984) understands knowledge not in the relation between a representation and an external reality, but metaphorically in the relation between a key and a lock: rather than a picture of reality, knowledge is merely a key that unlocks the locks in front of us. He claims that instead of considering knowledge as an internal representation of an external world, we can, like pragmatists, consider it as a tool in the realm of subject experience (Glaserfeld, 1998). Thus, RC holds that traditional epistemology and its central problem - how we acquire knowledge of (external) reality and how reliable or true this knowledge can be - must be abandoned. In fact, RC is an attempt to dissolve the epistemological problem, not solve it; Because Glasersfeld (1984) believes that the way this question was posed in the first place made it impossible to answer, and the efforts that have been made since then have not been able to come close to proposing a solution to that.

However, this is not a common opinion among all theorists of constructivism and constructionism. For this reason, Glasersfeld uses the "radical" as an adjective to distinguish his view from other theories that, despite using the term constructivism/ constructionism, still do not question the traditional epistemology based on representationalism (Glaserfeld, 1998). Indeed, this view is radical because it abandons ontological realism once and for all. Following the ideas from evolutionary biology and developmental psychology, RC believes that the purpose of constructing knowledge is not to achieve objectivity, but to maintain the adaptation and cognitive equilibrium of the organism.

RC can be defined in terms of two basic propositions: first, knowledge is not passively received, but is constructed through an active process by the cognitive organism, and second, the function of this learning process is adaptive, and instead of seeking to discover an ontological and objective reality, the cognitive organism serves to organize its own experiential world (Riegler & Quale, 2010). Indeed, as Glasersfeld puts it, radical constructivists never say: 'This is how it is!' They merely suggest: 'This may be how it functions.' (Glaserfeld, 2000, 4).

However, even with the acceptance of RC's criticisms of traditional epistemology and its instrumentalist view of knowledge, how knowledge can be used as a tool to maintain "adaptation" and "equilibrium" will remain a question. In answering this question, the present paper relies on a basic concept in RC and Glasersfeld's views, namely "functional fit". In fact, in the framework of radical constructivism, it is suggested that the goal of cognitive activity is not to achieve the truth or representation that is "match" to external reality, but to produce ways or tools that are simply "fit"; In the sense that they are only able to solve the problems faced by the organism and help to maintain its adaptation and equilibrium.

The theory of knowledge proposed by RC will have transformative potential for various fields from epistemology to education, ethics and social relations. Therefore, this article tries to highlight the importance of this perspective in today's theory of knowledge and epistemology by exploring the basic concepts of RC, theoretical contexts, current status and its applications.

1. Theoretical Backgrounds of Radical Constructivism

RC, which is a response to the limitations of traditional and mainstream theories of knowledge, owes its origin mainly to Glasersfeld's efforts in the 1970s and 1980s. Beginning academic career in collaboration with the Italian philosopher and linguist Silvio Ceccato in the 1940s, Glasersfeld has drawn on a variety of sources from cybernetics and biology to epistemology and psychology to develop his version of constructivism.

On the one hand, Glasersfeld repeatedly emphasizes the influence of Giambattista Vico's views, the Italian political philosopher, in obtaining the idea of knowledge construction (for example, see Glasersfeld, 1988; 1989; 1991a; 1995a). On the other hand, he points to the importance of Alexander Bogdanov, the Russian thinker, in adopting the instrumentalist approach in RC (for example, see Glasersfeld, 1991a; 1995a). Humberto Maturana, a Chilean biologist and one of the second-order cybernetic theorists, is another important source of inspiration for Glasersfeld, especially regarding the constructivist view of science (for example, see Glasersfeld, 1995a; 2001; 2005). Also, Glasersfeld mentions the importance of the views of American pragmatists, especially William James, as well as sociologists such as Georg Simmel (for example, see Glasersfeld, 2007), however, according to Glasersfeld's references, it does not seem that these influences be as direct and impressive as other sources.

Despite the importance of the aforementioned sources, the two main theoretical backgrounds for radical constructivist epistemology are Charles Darwin's evolutionary framework and Jean Piaget's ideas in his constructivist developmental psychology. First, many of the basic concepts in RC, such as adaptation, which we will discuss further, are influenced by Darwin's description of evolution (for example, see Glasersfeld, 1991a). On the other hand, Glasersfeld is inspired by Piaget's perspective, which is also known as genetic epistemology (for a full description of this influence, see Glasersfeld, 1995a). He praises Piaget in particular for bringing the idea of

constructivism to developmental psychology and considering an adaptive function - in its biological sense - for knowledge (Glaserfeld, 1991a).

It is important to mention here that despite the common sources and roots, there are also differences between constructivism and constructionism. Constructivists, from Piaget and Glaserfeld to the psychology of personal constructs proposed by George Kelly (1955) mainly focus on the "individual" and the construction of knowledge by him/her. But on the opposite side, there are some theorists who prefer the title of constructionism, especially social constructionism. This distinction reflects the concern of constructionists to be careful not to assume the human being as an isolated individual; Because according to their opinion, knowledge is social in nature and the product of temporal and spatial discussion between humans (Raskin, 2002). Social constructionists consider concepts such as "individual", "person" and "self" to be a completely social phenomenon and the structure of our knowledge, even our self-knowledge, is a product of social interaction with others (Burr, 2002). From this point of view, characteristics such as individuality and agency are the characteristics that Western culture attributes to the mentioned concepts, not its necessary and universal characteristics (Burr, 2015). We will return to the contrast between constructivism and constructionism in the following sections.

In short, having diverse theoretical backgrounds has made RC an interdisciplinary framework with many innovative aspects. However, these innovations can only be understood in opposition to traditional epistemology, which is the purpose of the next section.

2. Radical Constructivism and the Traditional Epistemology

Although the history of Western epistemology cannot be reduced to a coherent approach with specific assumptions, what Glaserfeld calls and criticizes as traditional epistemology during his philosophical life is an approach that tries to find a way to match knowledge and external reality. From this point of view, Glaserfeld's audience is primarily those epistemological theories that adopt realist ontological assumptions. However, RC is not ontologically idealist either, but takes an agnostic (i.e. neutral) position. In fact, according to Glaserfeld, a theory of knowledge does not need to adopt an ontological position, and it is not its duty to assume the existence or non-existence of external reality. The decisive emphasis on such a position, which can be seen even in Glaserfeld's final works (for example, see Glaserfeld, 2008), is one of the reasons why he chose the 'radical' title for his view. The adjective radical here does not mean that this type of constructivism is dogmatic, extreme or inflexible. In fact, the purpose of Glaserfeld's choice of this title is to emphasize that RC, in contrast to many traditional approaches, abandons ontological realism once and for all.

In RC, the subject is not a passive receiver of information from the environment, but it actively constructs knowledge. Therefore, all cognitive activities in the experiential world of the subject are performed in a purposeful way and are not necessarily related to external reality. From this perspective, a cognitive organism evaluates its experiences, and while evaluating them, it tends to

repeat some of them and avoid others (Glaserfeld, 1984). Thus, according to Glaserfeld (1991a), what distinguishes his view from traditional epistemology is the transition from the ideas of representation and match, and their replacement by adaptation in its functional sense.

In this regard, Glaserfeld (1989; 1995a) formulates two fundamental principles of RC as follows:

1. The cognitive organism does not acquire knowledge for fun. The structure of human knowledge and actions is organized based on the desire to repeat favorable experiences and avoid unfavorable experiences.
- 2- Knowledge does not reflect the real or external world. The cognitive organism is not concerned with discovering the external reality, but is looking for evolved ways and tools that are considered useful for it.

The adoption of the two principles has caused the title "instrumentalist" to be applied to RC; A title that may offend epistemological theorists who seek 'truth', but Glaserfeld accepts it without any shame for his approach (Glaserfeld, 1988). In fact, RC sees knowledge as a 'tool' in the service of adaptation. Although the idea is clearly inspired by Darwin's evolutionary framework, Glaserfeld follows Piaget in extending adaptation from the domain of biological survival to the conceptual domain and internal mental equilibrium of the organism (Glaserfeld, 2001). In this regard, in addition to the biological aim of adaptation (i.e. survival), RC also proposes another aim at the conceptual and cognitive level, in which the organism seeks to produce coherent and non-contradictory structures of knowledge (Glaserfeld, 1998). This knowledge structures include ways and tools to achieve the main goals of the organism, which in the conceptual field means achieving "cognitive equilibrium".

Therefore, RC goes beyond the traditional assumptions of knowledge and proposes a new perspective to it. However, how knowledge can help the organism maintain equilibrium and adaptation lies in a conceptual shift: replacing the traditional concept of "match" with "fitness". In the next section, we will discuss this conceptual shift.

3. Functional Fit and Instrumental Character of Knowledge

As we have seen, RC tries to provide an instrumentalist theory of knowledge without an ontological stance. In order to achieve this aim, Glaserfeld talks about the 'experiential reality/world' instead of the concept of reality/world in the ontological sense. For him, what we commonly call 'reality' is a set of relatively viable perceptual and conceptual constructions that we construct, use, and maintain, in our subjective experience (Glaserfeld, 1995a). Therefore, from the point of view of RC, the subject acts in the realm of his/her experience or the experiential world, and this experience is organized based on the history of his/her activities (Glaserfeld, 1998).

Here, Glaserfeld, a second-order cybernetic theorist, uses the term "self-regulation" in a pioneering way in epistemological theory. As in any cybernetic system, "equilibrium" is achieved whenever an interpretation of new input sensory signals fits to a predetermined desired pattern, so

in a cognitive organism whenever new experience can be made without reorganizing the current conceptual structures, the cognitive equilibrium will be maintained (Glaserfeld, 1986). To achieve this purpose (i.e., cognitive equilibrium), the organism must put its experiential world in order; An order that will be the result of cognitive self-regulation.

The emphasis on cognitive self-regulation has important implications for a theory of knowledge. Above all, as Glaserfeld (2008) explains, the purpose of perception is not to discover facts about the world, but to acquire coherent and, if possible, familiar patterns that have been useful in the past to provide significant action. Therefore, perception serves the purpose of "prediction" by ordering the experiential world, which itself leads to maintaining cognitive equilibrium. In cybernetic terms, the system maintains its equilibrium by eliminating perturbations.

But what is the role of knowledge in maintaining this equilibrium? Here, RC makes a conceptual shift in the function of knowledge to answer this question. Glaserfeld (1984) explains this shift by contrasting the two terms "match" and "fit" in everyday English. While in the former, we seek to "match" two things (here, representation and external reality), in the latter, the aim is simply to achieve adaptivity. He makes this distinction clear by using an interesting metaphor based on the lock and key relationship. When a key opens a lock, it does not necessarily mean that the two are match, as it would not be possible for the locks to be opened with anything other than their own key. He writes:

Thanks to professional burglars we know only too well that there are many keys that are shaped quite differently from our own but which nevertheless unlock our doors. The metaphor is crude, but it serves quite well to bring into relief the difference I want to explicate. From the radical constructivist point of view, all of us—scientists, philosophers, laymen, school children, animals, and indeed, any kind of living organism—face our environment as the burglar faces a lock that he has to unlock in order to get at the loot. (Glaserfeld, 1984, 21)

The key-and-lock metaphor indicates two basic points about knowledge. First, knowledge, like a key, has the sole function of opening the locks in front of us. A "fit" key need not exactly "match" a particular lock; Simply opening it is enough. In fact, the function of the key is "to open" the lock, not to match it. In the same way, in the framework of RC, it can be said that solving our problems and needs in an adaptive way depends on the extent to which the knowledge structure used is functionally fit.

Second, unlike match, which describes the relationship between the lock and the key, fit simply describes the 'capacity' of the key, not the lock. Since different keys are able to open a specific lock, the opening of a lock by a key does not necessarily reveal anything about the characteristics of that key. Instead, the only result is that the key has a capacity that makes us want to use it again the next time we encounter that lock. Likewise, being effective, useful, or adaptive for a knowledge structure does not necessarily mean that it matches or reflects an external reality. In fact, the fitness

of a knowledge structure gives us no clue about what the outside world is like. That we have found a solution to our problem is not the same as that we have discovered the external world. Even this kind of knowledge does not and cannot tell us how many other solutions there are to the problem; Just because one key opens a door does not mean that no other key will open that.

Therefore, the concept of functional fit can explain how knowledge helps to maintain the adaptation and equilibrium of the organism. If the construction of knowledge does not achieve the aim, it becomes questionable, unreliable and useless, thus losing its credibility and being abandoned; The key that does not open the lock is replaced by another key. On the other hand, the knowledge that can be successful in solving specific problems will be retained. This point leads us to another fundamental concept, 'viability', which means that a knowledge structure will remain as long as it is useful in fulfilling the relevant tasks or goals (Glaserfeld, 1998). Therefore, due to its repeated success in solving specific problems, a fit knowledge will be survived, and by preventing unwanted changes or perturbations, it has given order to the organism's experiential world and maintains its cognitive equilibrium.

Nevertheless, emphasizing the experiential world and that the aim of an organism at the conceptual level is to maintain cognitive equilibrium, does not mean that the organism is able to construct and maintain any type of knowledge structure. Just as the organism has limitations at the biological level, it also has limitations at the conceptual level that do not allow for 'free' construction. These limitations are what separate viable, fit and efficient knowledge from others (Glaserfeld, 2007).

In sum, as we have seen, RC considers features such as functional fitness, viability, and efficiency for knowledge, which are different from traditional epistemology. The knowledge that has the mentioned characteristics is able to help us in predicting, implementing or avoiding the upcoming tasks. Such knowledge is a tool for maintaining adaptation and equilibrium at the conceptual level that the organism is trying to maintain through self-regulation. However, RC believes that the organism faces limitations in constructing knowledge. It seems that talking about these limitations indicates a violation of RC from one of its basic principles, i.e. lack of ontological stance. This will be one of the important challenges for this approach, but before addressing it, in the next section, we will briefly review some theoretical and practical considerations and applications of RC.

4. Considerations and Applications

RC, unlike many other epistemological approaches, considers itself obliged to adopt an interdisciplinary approach as well as the continuous use of insights created in various natural and applied sciences. As Riegler and Quale (2010) point out, this interdisciplinary approach distinguishes RC from so-called "armchair philosophy". The extent of various theoretical and practical effects and applications of RC is very wide, thus, in this section only some of them are briefly mentioned.

The application of RC to education was perhaps Glasersfeld's most important practical concern, as can be seen in his writings on the subject (for example, Glasersfeld, 1991b; 1995a; 1995b). His efforts were not fruitless and as one of the important theoretical approaches in education, RC plays an important role in changing curricula with the aim of facilitating diversity in schools and empowering children in the current education (Gash, 2014).

Since in RC, knowledge is actively constructed by the subject and its function is to organize the experiential world, it is natural that this view will have important implications for education. In RC, traditional assumptions in educational systems, especially that children are passive recipients of knowledge, are discarded. From this point of view, the teacher's role is not to transfer 'real' knowledge to the student, but to provide a space for the student to construct a fit and viable knowledge structure. Therefore, RC emphasizes that instead of focusing on the idea of knowledge transfer in the learning process, we need to understand how the student constructs knowledge. Even young children have a structure of knowledge that has been useful and viable so far to them. To improve this structure, any type of education should first understand and act on the student's current structure. For this reason, RC challenges the traditional views of teaching and approves the use of an active approach in learning.

Ethics is also one of the other issues that have been considered by radical constructivists. In fact, this topic, along with social interaction, are the topics that Glasersfeld found challenging in their explanation, so he recommended that radical constructivists present models in these areas that, instead of mere metaphysical explanations, are capable to be tested practically and experimentally (Glasersfeld, 2000). However, in RC, the conditions for construction of moral knowledge are the same as other knowledge structures, and moral beliefs are also constructed by individual subjects. Therefore, even though RC does not support a specific moral position, by assigning an active role to the individual in the construction of knowledge, it considers people morally responsible for their decisions and actions (Quale, 2014; Riegler & Quale, 2010).

Theorizing and researching in social sciences from a constructivist perspective has attracted a lot of attention today: social interactions (Scholl, 2010), culture (Troadek, 2007; and Rusch, 2007) and micro-macro problem (Palmaru, 2016; and Scholl, 2016) have been among the topics of interest. RC and related approaches such as critical cybernetics, unlike the common discourse of social sciences, mainly deals with the narratives and theories that people construct (Krippendorff, 2023). However, since RC rejects the concept of truth and emphasizes the subjectivity of knowledge, as expected, talking about social experience will be very challenging for constructivist researchers (Gash, 2023).

RC is also closely related to recent developments in cognitive science such as 4E cognition. Accepting constructivist assumptions requires us to adopt new perspectives on mind and cognition. For example, RC asserts that, like a cybernetic system, for any cognitive organism the output, i.e., action, is only a means of controlling the inputs, i.e., perception (Riegler and Quale, 2010). In fact,

perception and action have an intertwined relationship with each other. Descriptions like this can change our understanding of the mind and its processes.

The application of RC in other theoretical and practical fields such as psychotherapy (Oblak, 2011), political psychology (Goldstein, 2021), international relations (Kharkevich, 2023), social policy (Richards, 2007), emotional relationships (Glaserfeld, 2006), religion (Quale, 2015), drawing (Galuszka, 2009), design (Herr, 2019; & Glanville, 2006), robotics design (Bettoni & Castellini, 2021) and nursing education (Epp et al., 2021) has also been discussed.

5. Discussion: Challenges and Responses

It seems that RC aims to present a theory of knowledge that faces fewer challenges by abandoning some of the cumbersome assumptions of traditional epistemology. However, this view was not well received from the beginning. Among other things, Glaserfeld has been a pioneer in addressing this issue among radical constructivists (see, for example, Glaserfeld, 1988; 2000; 2010). Also, other proponents of the theory have also addressed the pathology of RC's lack of acceptance and its inability to become a mainstream approach (for example, see Gadenne, 2010; Riegler & Quale, 2010; Hug, 2010; and Kenny, 2010). In this part, we will try to point out some of the basic challenges of RC and its responses to them.

One of the most frequent criticisms is that RC denies external reality. Rather than being a challenge, this criticism is due to its misunderstanding of RC by some critics. Denial of external reality requires an idealistic stance. However, as mentioned earlier, since this view targets epistemologies based on realism, it does not have an idealistic position, but rather adopts a neutral or agnostic position about external reality. To put it more clearly, RC believes that a theory of knowledge does not have to adopt an ontological position. Therefore, Glaserfeld does not deny the existence of external reality, but rather our ability to know a reality beyond and independent of our own experience (Glaserfeld, 2001).

As we have seen in the previous sections, although Glaserfeld avoids talking about external reality, it seems that he has violated this principle when he talks about the existence of limitations on the knowledge construction (for example, see Glaserfeld, 1984; 1995a; 2007). In RC, where a practical or conceptual structure breaks down, the limits of action and thought are revealed, and the notion that we can freely shape our knowledge structure is challenged. However, while it might seem that RC here has a claim about external reality, or at least can speak to it, Glaserfeld again disagrees. In his opinion, such limitations merely indicate the inadequacy of our existing knowledge structure in dealing with that particular problem and do not tell us anything about reality (Glaserfeld, 1986). The same knowledge structure may be responsive in other situations, but in that particular situation, it is not appropriate (i.e. functionally fit) and the organism should change its procedure or use other patterns of knowledge to provide an adaptive response. Glaserfeld (1984) cautions that RC draws absolutely no conclusions about reality from the revelation of limits, since such an event gives us no clue as to what the external or "objective" world might be like. It

simply means that we know a practical way to achieve a goal that works under certain conditions in our experiential world. Indeed, we can only feel that there are constraints on our conceptual system, just as we have biological constraints, but we cannot say whether these constraints are imposed on us from an independent external world or from elsewhere.

Another criticism is that the consequence of rejecting the possibility of obtaining true knowledge will be our inability to evaluate different knowledge structures. In this case, there is no difference between different types of knowledge and RC will fall into the extreme relativism. However, RC is by no means indifferent to the value of knowledge; Rather, instead of truth, it proposes other criteria such as adaptivity, fitness and viability. More precisely, as Glasersfeld (1991a) emphasizes, as long as constructed knowledge models are capable of solving our problems, their ontological status should not concern us.

On the other hand, rejecting the idea of "knowledge as a representation of external reality" challenges the belief that every problem has a real solution. Instead, from this point of view, each problem can have several solutions at the same time. However, these solutions are not equivalent. They differ in terms of performance levels, speed, economy and even aesthetic factors and achieve different levels of results (Glasersfeld, 1986). Thus, RC does not adopt a neutral stance towards different types of knowledge, but instead provides criteria for evaluating them. Perhaps it is because of this emphasis that Glasersfeld clearly separates his position from postmodernism towards the end of his life:

What I have presented here is the view of an individual that no longer wants to have anything to do with the 'postmodern' movement. A couple of decades ago it seemed to me an acceptable epithet for radical constructivism because it advocated breaching with the traditional notion that reason is a means of access to objective knowledge of reality . . . The model I am suggesting is, in fact, a theory of rational knowing. (Glasersfeld, 2008, 64)

Another challenge is raised by social constructionists who consider Glasersfeld and other constructivism unable to explain social phenomena due to their focus on the individual. As we mentioned, constructivism and social constructionism, despite having similar theoretical sources, have serious differences. In the meantime, the comparison of Glasersfeld's views with Kenneth Gergen, a contemporary social psychologist and postmodern thinker, is the most enlightening because of the relational attitude Gergen adopts. Gergen (2011a) believes that the most important idea of constructionism is that our knowledge about the world and ourselves is rooted in human relationships. According to Gergen, in social constructionism, it is not the individual's mind in which knowledge, wisdom, emotion and ethics are based, but the place of all these is in relationships (Gergen, 2011a). If, as stated by Gergen, the origin of all meanings is in collaborative or interactional action, then the individual finds meaning only in the relationship and cannot be understood independently (Gergen, 2011b). As Gergen (2009, 5) says, "relational being, seeks to

recognize a world that is not within persons but within their relationships, and that ultimately erases the traditional boundaries of separation".

Therefore, the basic conflict between these two approaches is over the primacy of the individual. In response to Gergen, RC could never accept Gergen's basic assumption that the individual is intrinsically intertwined with others and emerges in social relations, as this seems to be an ontological stance. As Glasersfeld (2008) points out, RC cannot make a claim about the existence of relations independent of the subject, but believes that, first of all, relations need an "agent" to be perceived by him/her. In this regard, the assumption of primacy of relationships over the subject, as assumed by social constructionism, will not be acceptable in RC.

Therefore, although RC does not hide the importance of the social, since it does not want to assume an external reality independent of subjective experience of any kind - including the world, others and relationships - it emphasizes the primacy of the subject. However, the fact that knowledge is made by the subject is not a prohibition to construct meaning in relations and interactions with others, but as Glasersfeld also emphasizes, it provides a possibility for phenomena such as social knowledge (Glasersfeld, 2000). Indeed, RC asserts that before we can form a concept of society, we must construct and describe the "others" in our experiential world (Glasersfeld, 2008). As the contemporary phenomenologist, Dan Zahavi, also points out in his critique of social constructionism, emphasizing the primacy of the individual never means rejecting the social issue, but rather it is the basis for it (Zahavi, 2022).

But despite the efforts of radical constructivists, especially Glasersfeld, why hasn't RC become a dominant paradigm in theory and research? In response to this question, Glasersfeld (2010) believes that accepting this view means accepting individual responsibility for one's thoughts and actions, which perhaps people prefer to avoid. On the other hand, the desire to achieve certainty is another motivation that RC seriously thwarts, thus disillusioning many people in the first place.

But apart from the hidden motivations of people facing RC, some believe that the disadvantages of this approach are also effective in not welcoming it. For example, Gadenne (2010) examines two main assumptions of this approach. First, the "construct hypothesis", which has been accepted by an important part of psychologists and neuroscientists due to the fact that it is possible to investigate it experimentally. Also, the practical aspects of RC such as emphasis on pluralism, active learning and tolerance are other things that were accepted more easily. However, Gadenne believes that these are not the main aspects of RC, because accepting them does not make one a radical constructivist. Instead, the second assumption, which is the "closed-system hypothesis" and the anti-realist aspect of this approach, seems to be more important. Unlike the first hypothesis, the second one is a philosophical assumption that cannot be tested empirically. RC does not logically follow from any of the empirical results that we are cognitively closed, or unable to acquire knowledge of the real world. As Boden (2010) also emphasizes, many people in science and engineering still tend to maintain their realist assumptions and, on the other hand, RC has not been

able to convince them. Apart from this issue, Gadenne (2010) believes that the anti-realist approach of RC has made it difficult to deal with common sense and people are not inclined to accept this assumption.

It is important to note that, regardless of how well RC has overcome these challenges, this approach never claims to be the only "correct" theory, because that claim would contradict its own principles (Glaserfeld, 1991a). Obviously, such an attitude leaves the doors open for an explanatory pluralism in epistemology. Therefore, like any other structure of knowledge, RC should also be evaluated based on its functional fitness, viability and usefulness.

Conclusion

As we have seen, RC by having various theoretical sources and by criticizing the assumptions of what it calls traditional epistemology, tries to present an instrumentalist theory of knowledge, in which knowledge contributes to the adaptation and cognitive equilibrium of the organism. Presenting such a theory requires RC to make a fundamental shift about knowledge function, and that is to replace concepts such as functional fit and viability instead of match and truth. From this point of view, the cognitive organism maintains its cognitive equilibrium by constructing fit and viable knowledge that is able to solve problems in a repeatable manner, by ordering the experimental world and making it predictable. Therefore, RC rejects the idea of knowledge as a representation of an external and independent reality and considers it as a tool to keep adaptivity.

It should be noted that RC is a theory of knowledge and not an ontological theory. In fact, it neither wants nor can claim that external reality exists or does not exist. This means that a radical constructivist never says "this exists" and "that doesn't exist", but rather looks for the purpose for which knowledge is constructed. Our mind does not need to represent the world in matching with reality, but it needs a structure of knowledge that solves problems for us just like a "fit key".

Glaserfeld himself points out that due to various factors, RC is not a very popular view among people and theorists (Glaserfeld, 1988; 2010), but as we have seen, its transformative potential has caused it to be successfully used in different fields of theory and practice. This issue indicates the need for deep understanding and accurate evaluation of this approach in future theoretical and practical researches.

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