

Evolutionary Epistemology of Donald Campbell

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Extended Abstract:

Donald Thomas Campbell is among the psychology and sociology scientists which has played a great role in developing the evolutionary approach towards philosophy of science, morals and in particular epistemology. Campbell named his epistemological ideas which are a kind of descriptive epistemology, evolutionary epistemology. In this approach, he uses the logic of natural selection process to explain the different levels of epistemology from biological levels to culture and science levels. In other words, he is trying to classify the general theories on the epistemology relating to the natural selection by the data gained from biology, psychology, and sociology sciences. Campbell considers blind variation and selective retention mechanism as universal mechanism of evolutionary processes among biological, learning, creativity and scientific changes processes. In this paper, in addition to giving a descriptive-analytical report and criticizing the evolutionary epistemology of Campbell, we also pay attention to the psychological results of his evolutionary epistemology.

Keywords: Campbell, Evolutionary Epistemology, Selection, BVSR, Naturalistic.

Campbell's evolutionary epistemology

Evolutionary epistemology is a naturalistic approach to the epistemology that studies "evolution as a product of biological evolution" within the framework of evolutionary biology research programs. In this kind of epistemology, the scope of knowledge is not limited to the propositional knowledge, and, besides, the method of research is not limited to the linguistic and philosophical analysis, and application of knowledge does not confine to humans. From the evolutionary point of view, all living beings exhibit knowledge-based behaviors.

Campbell's naturalistic evolutionary epistemology has begun by the application of choice theory in the learning processes through trial and error and the application of Gestalt models of problem solving in the visual perception and creative thinking. He claims that various beliefs are products of blind variation and selective retention processes - BVSR - (Campbell, 1990, p.7).

Evolutionary epistemology is a term coined by Campbell (Gontier, 2006, p.10). In one of his most important articles, he introduces evolutionary epistemology. He says evolutionary epistemology at its least extend is that cognition is compatible with human condition as a product of biological and social evolution. Evolution, even in the biological aspects, is a cognitive process, and the pattern of natural selection for growth of knowledge is also generalizable to other epistemological activities, such as learning, thinking, and science (Campbell, 1974, p. 413)

Campbell's epistemological evolutionary program aims to rebuild science through using theories of biological and social sciences (Gontier, 2006, p. 10). Natural selection mechanism and abstract BVSR mechanism are used by him to explain other levels of knowledge (Campbel, 1959, p.3-152). In Campbell's view, science is only one of the levels of knowledge, and different social and biological layers embrace different aspects of knowledge.

In his most important article, Campbell introduces ten different levels of knowledge (Campbell, 1974). These levels are as follows: (1) Problem solving without mnemonic, (2) vicarious motor tools, (3) habit, (4) instinct, (5) visual thinking, (6) mnemonic-based thinking, (7) social vicarious heuristics: observational learning and imitation, (8) language, (9) culture, and (10) science. We will focus only on the level of science in the later sections.

From Campbell's point of view, concept of selection from the molecules to the scientific concepts is applicable from one level to another without reduction. In other words, culture is not reducible to biological sciences, but a selective process operates at the level of culture. Campbell introduces blind variation model and selective retention to explain growth of knowledge. According to him, the given model is a proper solution for three issues of "fit": the fit between the organism and the environment, the fit between the visual perception and the physical world, and the fit between the scientific theories and those aspects of the world which theories intended to describe and explain them. Campbell claims the mechanism of blind variation and selective retention is presently the only explanatory pattern for each of these issues. However, he has known the need of a general choice theory that goes beyond mere comparison between biological evolution and evolution of human knowledge (Campbell, 1988, p. 171) While generalizing choice theory to the level of science, Campbell considers a social system in which beliefs are exchanged and chosen. In his view, physical realities play an important role in changing beliefs of the scientific community (Campbell, 1987, p.158). Beliefs are tested and selected through interaction with reference or source of belief, and validity of beliefs depends on influential factors in the selection process. Scientists partially act in line with the cultural and ethical norms of science, in other words, Mertonian norms, and attract financial contributions to keep up the group. However, scientists are under influence of various historical expediences, interests, and limitations. (Campbell, 1987, p.165)

Preliminaries and Philosophical Consequences of Campbell's Evolutionary Epistemology

Campbell's evolutionary approach is accordant with a bunch of philosophical doctrines (Campbell, 1959, p.8-156)

- (1) Hypothetical Realism: There is an external world in which there are entities and processes occur. Realism is a hypothesis about the world which is retained by resistance to elimination, and hence, we are born with the presumption of realism.
- (2) Denial of No First Philosophy: Denial of no first philosophy that states a sufficient explanation of science is only possible through a knowledge outside of science, such as philosophy. Consequence of this remark on truth and realism discussion is that scientific findings can also be used to make the result, although this act is doubtful. Therefore, evolutionary epistemology is placed against both traditional rivals of philosophy, empiricism and rationalism. Neither sensory data nor prior knowledge is not unrevisable.
- (3) There is no distinction between humans and animals in the process of knowledge acquisition: Campbell does not distinguish between humans and animals in the process of knowledge acquisition, and considers man as a kind of animal.
- (4) Other's epistemology: Campbell calls his own evolutionary epistemology "other's epistemology." By knowing the process of knowledge acquisition in other creatures we come to know this process in ourselves.
- (5) Epistemological Dualism: There is a difference between what is knowable from the object and what we know about it. Knowledge is always indirect and fallible. What is perceived about the object is never entirely correspondent with the object in itself. This does not imply that there is no connection between these two, but only means this relationship is not corresponding. This is the origin of the doctrine of fallibility of knowledge.
- (6) Perspectivism: Organisms live in different nests, and have different courses in their evolutionary history. Therefore, they enjoy different cognitive capacities and perceive different perspectives of the hypothetical reality. Perspectivism at the level of scientific theories imply a different representation of the hypothetical reality through different theories. From perspective point of view at the level of observation two general points are deduced. The first point is that none of perspectives is complete and

comprehensive, but is partial and relative; the second one is that there is a reality that every perspective, is a perspective of that reality.

Concluding remarks

The way Campbell's evolutionary epistemology explain knowledge is parallel to the way Darwin's evolutionary theory acts in biology. Darwin's theory of natural selection explains the fit between the organism and the environment without needing a theological causal factor, and evolutionary epistemology explains the fit between the belief and the reference of belief - the external world - without needing theological/goal-oriented propositions. In Campbell's evolutionary epistemology, the concept of truth in epistemology is equivalent with the concepts of fit, knowledge and adaptation. Acquisition of individual knowledge and growth of scientific knowledge are examples of adaptation and are products of selective processes.

Explanation of non-theological fit between the beliefs and the external world in Campbell's approach, is a mechanistic attitude in epistemology and cognitive sciences. In Campbell's view, natural and artificial systems increase chance of fitting with the world through producing numerous tests. Selective variations have more fitness with the world. By production and selection of a variation which is the shortcut of blind variations, the selective role of the environment – natural selection - within the system is internalized and will act as a vicarious selector on behalf of the external environment, and the system will not need to produce more variations. BVS, vicarious selectors and hierarchical complex networks make new knowledge possible. According to Campbell, BVS provides an appropriate explanation for all issues of fitness, acquisition of knowledge at all levels - from the lowest to the highest - and scientific knowledge. Campbell's pattern provides a mechanistic explanation about intelligence, creativity, and purposeful behaviors.

In Campbell's view, phylogenetic evolution is not goal-oriented, but internal choice is purposeful. Phylogenetic evolution and ontogenetic learning outline goals and motivations for organisms. These goals are representations of actual state of affairs and have survival value. Therefore, the world represented as an inner criterion selects among the blind ideas.

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