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CULTURE AS BIOLOGICAL ADAPTATION

ABSTRACT: The aim of this paper is the analysis of selected evolutionary theories of culture developed in the framework of evolutionary social sciences. Special attention is paid to sociobiology and evolutionary psychology in the context of an anthropological understanding of culture. The author argues that it is not possible to reduce culture to nature alone. This kind of explanation of culture is just one of four main types of relationships between nature and culture. The author concludes that it is possible to distinguish four types of relationship between nature and culture. Sociobiology and evolutionary psychology is just one of them. Nevertheless he agrees that much about culture makes sense in the light of evolution.

KEY WORDS: Anthropology – Evolution – Culture – Evolutionary social sciences

CULTURE AND NATURE

The word culture originates from the Latin word *colere* which means plantation or cultivation of the soil. The concept of culture is older than the word. The concept of culture can be traced back to ancient Greek philosophy. Culture was a particular philosophical concept for almost two thousand years. In the last third of the 19th century anthropologists came to promote culture as the key concept of anthropology. The main credit for this epistemological shift belongs to British anthropologist Edward Burnett Tylor who first defined the term culture in a broad anthropological sense (Tylor 1871). By the turn of the 20th century anthropologists had shaped anthropology as the science of culture. The concept of culture became the core epistemological, theoretical and analytical tool of anthropology (Kuper 2000).

In anthropology, a unified definition of culture does not exist, but anthropologists mostly agree that the main attributes of a culture are as follow: culture is learned, integrated, the product of a history and based on symbols and signs. In other words they assert that culture is the opposite of nature. Since the seventies so called evolutionary social sciences have been developing, which have been studying humans and their culture from a Darwinian perspective. Representatives of these sciences use term

culture in different ways than anthropologists because the background of their theory of culture is the theory of biological evolution. We could then label these theories as evolutionary theories of culture. From my point of view it might be said that the following evolutionary social sciences are progressive or influential: human ethology, sociobiology, evolutionary psychology, memetics, human behavioural ecology and coevolutionary approach. In the framework of evolutionary social sciences it is possible to distinguish four types of evolutionary theories of culture (Soukup 2010):

- 1) Culture as biological adaptation (human ethology, sociobiology, evolutionary psychology).
- 2) Culture as a system of behavioural adaptations (human behavioural ecology).
- 3) Culture as a system of replicators (memetics).
- 4) Culture as a product of coevolution (various scholars and scientists like William Durham or coauthors Richard Boyd and Peter Richerson).

In this paper I focus on the first type of evolutionary theory of culture with special attention on sociobiology and evolutionary psychology. Main two reasons for this focus are as follow: These evolutionary theories of culture are (1) historically linked and (2) the antithesis of the anthropological approach to culture.

SOCIOBIOLOGY AND EVOLUTIONARY PSYCHOLOGY AS CULTUROLOGICAL DISCIPLINES

The axioms of sociobiology

Evolutionary social sciences have been developing since the seventies. One of the originals is sociobiology founded by Harvard entomologist Edward Osborne Wilson who in 1975 published the paradigmatical textbook *Sociobiology: The New Synthesis*. The beginnings of the Wilsonian sociobiology may indeed be traced to his earlier works. Namely *Insect societies* (Wilson 1971a) and the study *The Prospect for a unified sociobiology* (Wilson 1971b). In these earliest efforts to establish sociobiology Wilson did not consider humans as a subject of sociobiology. As evidence we can cite: "the discipline can then be expected to increase our understanding of the unique qualities of social behavior in animals as opposed to those in man..." (Wilson 1971b: 403). In *Sociobiology* he included humans in the sociobiological effort. The definition of sociobiology implicitly includes humans: "systematic study of the biological basis of all social behaviour" (Wilson 1975: 4, my emphasis). Wilson devoted particular attention to social evolution in humans in the last chapter of the book. He narrated the course of social evolution in humans as the evolution of genes. The central dogma of sociobiology is the concept of competition between alleles of genes which a year later was popularized by Richard Dawkins under the title "selfish gene" (Dawkins 1976). The essence of this thesis is that all physiological and morphological traits as well as the behaviour of the organism have to be studied from the perspective of the competing "selfish genes". Wilson applied this central dogma of sociobiology to human society and culture. The earliest sociobiological statement on human nature, culture and society could be summarized into five pillars (Wilson 1975a, 1978):

- 1) The human is an animal whose genes determine all forms of social behaviour.
- 2) Genes do not directly determine human social behaviour.
- 3) Culture that we can account for is assembled from cultural universals.
- 4) Sociobiologists compare human social behaviour with the behaviour of other primates. Therefore they strive to reconstruct the evolution of human social behaviour and identify residues of the earliest forms of it in current cultures.
- 5) Sociobiologists study human social behaviour as biological adaptations on environment.

We can summarize the sociobiological thesis: human social behaviour as well as culture is determined by genes. Wilson tried to identify the key forms of human social behaviour and explained it from the perspective of sociobiology. For example in *On Human nature* he analyzed human aggressiveness, sexuality, altruism and religion and searched for their explanations on the level of genes (Wilson 1978). In principle he explained human social

behaviour by the theorem "gene for this and that". This developmental phase of sociobiology was too simplifying. Later Wilson in cooperation with Lumsden fundamentally re-evaluated his early sociobiological theories. In their later coauthored works Wilson and Lumsden hugely exploited their anthropological knowledge and theories and introduced them into the sociobiology concept of epigenesis as a link connecting genes and culture (Lumsden, Wilson 1981, 1983). In spite of the concept of epigenesis and utilization of anthropological ideas genes hijack culture. As a matter of form Wilson and Lumsden defined culture in a broad anthropological sense when they wrote that culture is the "sum of all of the artifacts, behaviour, institutions, and mental concepts transmitted by learning among members of a society, and the holistic patterns they form" (Lumsden, Wilson 1981: 368). This is a typical anthropological definition of culture. From an anthropological viewpoint it is wrong to explain culture as an expression of genes (see below). In other words, by culture, a sociobiologist understands a system of biological adaptations, by which people successfully face adaptive problems.

Rise of evolutionary psychology

Wilsonian sociobiology faced fierce critics across science and the social sciences (see details in Segerstråle 2001). The main criticism within biology came from evolutionary biologists Stephen Jay Gould and Richard Lewontin. In social sciences critics were recruited especially from anthropology. With the exception of a few, anthropologists rejected sociobiology as a reductionistic attempt to study culture under the doctrine of biological determinism (see Sahlins 1976). Freeman wrote that sociobiology is the antidiscipline of anthropology (Freeman 1980). In the light of the anthropological doctrine of cultural determinism the Council of American Anthropological Association during their annual meeting in 1976 resolved that sociobiology is "...an attempt to justify genetically the sexist, racist, and elitist status quo in human society. These attempts are but resurrections of assertions repeatedly discredited by the scientific community" (Anonymous, 1976: 7).

Anyway, sociobiology was accorded the label "bad science" (Segerstråle 2001). It might have been the motive for some scholars to migrate to a new scientific array, which they have been shaping since the eighties. They called the new approach evolutionary psychology. Evolutionary psychology shares some principles with sociobiology. That is why Wilson enounced that evolutionary psychology is just sociobiology with a different signboard (Wilson 2000). Mainly this branch inherited the premise that culture is a system of biological adaptations. But evolutionary psychology contrasts with sociobiology in the conception of the nature of these adaptations. The second difference is in the explanation of the design of the human mind. Sociobiologists assume that adaptations evolved in the course of the anthropogenesis and are still functioning; it is the so called current adaptation. On the other hand evolutionary psychologists argue that human

mental design evolved by facing challenges in the so called environment of evolutionary adaptedness and the human mind has a modular character. *Hominines* faced various adaptive problems both in their environment and sociocultural conditions. Successful solving of these challenges led to the shaping of the human mind. Each successful solving of some type of adaptive problem led to the evolution of a special psychological module of the human mind. Evolutionary psychologists describe the human mind as a modular tool for solving special problems and challenges and they compare the human mind to the Swiss army knife; i.e. a tool equipped with specialized instruments. The modularity of the mind was introduced into psychology by American cognitive psychologist Jerry Fodor, who understands the human mind as an algorithm for information processing. He assumes the existence of a few specialized psychological modules as input systems, which serve as the source of information for a general module for information-processing (Fodor 1983). Evolutionary psychologists excluded general modules. Humans face concrete, special problems and challenges not general ones. That is why there may exist only special psychological mechanisms and not a general one. In this context evolutionary psychologists characterize the human mind as massively modular.

Key concepts of evolutionary psychology are then the environment of evolutionary adaptedness and the modularity of the mind. Both of them are logically linked: if we study the design of the human mind we could understand the conditions, under which the human mind has been shaped and *vice versa*, because the human mind is the expression of Paleolithic conditions, in which *Hominines* tried to survive and reproduce. Evolutionary psychologists argue that due to the course of cultural evolution humans now live in totally different sociocultural conditions than Paleolithic hominids. A consequence of this is the insufficiency of some biological adaptations in the contemporary world. Evolutionary psychologists in this context argue that humans have in their modern skulls a Paleolithic mind.

Environment of evolutionary adaptedness

It seems that the main theoretical tool of evolutionary psychology is the concept of the environment of evolutionary adaptedness (EEA), which was coined by British psychiatrist John Bowlby as an epistemological tool for understanding the nature of the relationship between mother and child. Bowlby argues that the mother–child attachment is a biological adaptation evolved in the human evolutionary past, on which the survival of the children depends. Bowlby suggested using the concept of EEA as a theoretical tool for the explanation of human behaviour as the expression of adaptations evolved in the Paleolithic (Bowlby 1969). American evolutionary psychologist Donald Symons introduced the concept of EEA developed by Bowlby into evolutionary psychology in 1979 and used for this one label "natural environment" (Symons

1979). As a key concept of evolutionary psychology it was recognized at the end of eighties, especially by the efforts of Tooby and Cosmides, who paid particular attention to this concept during the eighties and nineties. The results of this effort are the special issue of *Ethology and sociobiology* (vol. 11, issues 4–5) devoted to the concept of EEA and the paradigmatical book *The Adapted Mind*, which we could designate as the manifest of evolutionary psychology (Barkow *et al.* 1992). In this book Cosmides, Tooby and Barkow wrote that the "*evolved structure of the human mind is adapted to the way of life of Pleistocene hunter-gatherers, and not necessary to our modern circumstances*" (Cosmides *et al.* 1992: 5). Later Cosmides and Tooby declared that "*the EEA is not particular place or time. The EEA for a given adaptation is the statistical composite of the enduring selection pressures or cause-and-effect relationships that pushed the alleles underlying an adaptation systematically upward in frequency until they became species-typical or reached a frequency-dependent equilibrium*" (Tooby, Cosmides 2005: 22). In other words, evolutionary psychologists argue that the design of the human mind was shaped in the Pleistocene world of hunter-gatherer societies. The structure and mechanisms of the mind is an expression of this past world and that to study the human mind is to enter a time-machine and travel to the evolutionary past of the human species. Tooby and Cosmides conclude that modern humans are "living Paleolithic fossils", their catchphrase is that "*our skulls house a Stone Age mind*" (Cosmides, Tooby 1997: 85). The logic of this explanation is based on the premise that properties of the ancestral environment were relatively stable and defining adaptive problems faced by hominins. There were for example plants, snakes, spiders, birds, pathogens, predators, two sexes, brothers and sisters, children, parents, distant relatives and rivals (see Hagen 2005: 156). In this ancestral environment hominins needed for example to avoid incest, identify plant foods, detect when children needed assistance, select mates of high reproductive value, interpret social situation correctly, recognize emotions and cooperate (Tooby, Cosmides 1992: 110). The result of the successful resolution of these adaptive problems is the human modular mind, which I discussed above. Tooby and Cosmides summarize that EEA is "*composite of the adaptive-relevant properties of the ancestral environments encountered by members of ancestral populations*" (Tooby, Cosmides 1990: 386).

Critique of the EEA

The concept of EEA was criticized for various reasons. The review of this concept carried out by the British anthropologist Robert Foley is crucial. He rejected the concept of EEA for these reasons (Foley 1995):

- 1) The concept of EEA is based on the wrong typological schema concerning Paleolithic communities of hunter-gatherers. Foley demonstrates variability of hunter-gatherers in time and space. He argues that evolutionary psychologists underestimate the variability of the

communities depending on this type of subsistence strategy. He gives evidence "*that marked differences exist between hunter-gatherers in similar environments but in different geographical regions*" (Foley 1995: 195).

- 2) The reconstruction of EEA starts from the assessment of the traits of hunter-gatherers, but we could not know that these are the products of a certain selective environment.
- 3) The migration of modern humans out of Africa precedes the end of the Paleolithic. Human populations then inhabited various environments and tried to adapt to them. Local differences in subsistence and the way of life are adaptive strategies which solve ecological challenges in local conditions. In other words, hunter-gatherer communities are not specimens of ideal type – anthropologists described great variability between hunter-gatherer communities. Extreme differences exist for example between Kung San and Kwakiutl. It is wrong to base the explanation of evolution of human mental design on the study of the traits of hunter-gatherers.

Foley points out that "*without a thorough assessment of the nature and extent of variability among hunter-gatherers, one must question the usefulness or validity of basing EEA models on generalized hunter-gatherers traits*" (Foley 1995: 196). He concluded that the concept of EEA is redundant in relation to the evolutionary explanation of human evolution and the design of the human mind, because we could explain human evolutionary heritage without it. Moreover this concept minimizes the possibility of variation in human behaviour (Foley 1997). If we were to accept the concept of EEA in spite of this criticism, the consequences of the theoretical approach developed by evolutionary psychologists are as follows:

- 1) Human nature was shaped during the Palaeolithic period in the hunter-gatherer communities
- 2) The human mind is an assemblage of biological adaptations and our current thought and behaviour is determined by these adaptations.
- 3) Cultural variability could be understood just as surface structures which cover the deep structure of human mental design, which is the result of biological evolution.

The third point is especially crucial to the subject of this paper. The concept of the EEA is a background, which makes it possible to study culture as a biological adaptation. In the framework of evolutionary psychology John Tooby and Leda Cosmides analyzed the concept of culture. They assert that "*culture and cultural dynamics cannot be understood apart from the evolved psychological mechanisms that create, shape, and maintain culture*" (Tooby, Cosmides 1989: 45). They distinguished three structural levels of culture: a metaculture, an evoked culture and an epidemiological culture. By metaculture they understand universal cultural content, which is created under the guidance of universal psychological mechanisms

of the human mental design. The interactions between a metaculture and the particular environmental conditions give rise to the various cultures. Tooby and Cosmides call these cultural contents the evoked culture. If the cultural contents originate by individual invention and these contents spread across the population then they call it epidemiological culture (Tooby, Cosmides 1992). They argue that anthropologists study only the evoked cultures. For them the anthropological focus on the evoked culture makes no sense, because the metaculture remains invisible in this type of research.

In general evolutionary psychologists and sociobiologists also, assert that the approach to culture developed in social sciences is inadequate, because it is built on old-fashioned theories of cultural determinism and focused on ethnographic details, which are just accidental surface structures. They base their arguments on the predication that without a Darwinian viewpoint it is not possible to understand culture, because culture mirrors evolved human nature. They criticize the "standard model of social sciences" mainly because the theories of those social sciences make no sense in the light of biological evolution. That is why they suggest transforming "*the study of humanity into a natural science capable of precision and rapid progress*" (Tooby, Cosmides 2005:5).

CONCEPT OF CULTURE: ANTHROPOLOGY VERSUS EVOLUTIONARY SOCIAL SCIENCES

The sociobiology and evolutionary psychology discussed above have a common denominator, which is the understanding of culture as a biological adaptation. Anthropologists indeed did not develop a unified theory or definition of culture, but they agree that culture is the opposite of nature. Culture is learned, is transmitted by nonbiological means, and is historical and based on symbols and signs. That is a common statement of anthropologists on culture.

In a living science the concept of culture has been used since the seventies. For example John Bonner extensively focused on the concept of culture (Bonner 1980). He defined culture as "*the transfer of information by behavioural means, most particularly by the process of teaching and learning. It is used in a sense that contrasts with the transmission of genetic information passed by the direct inheritance of genes from one generation to the next*" (Bonner 1980: 9). This kind of definition of culture is typical in evolutionary social sciences including sociobiology and evolutionary psychology. Especially representatives of the mentioned disciplines cultivate a broad anthropological understanding of culture, but explain culture in an inappropriate context, because they study culture as nature. An expression of this strategy is Richerson's and Boyd's statement that "*nothing about culture makes sense except in the light of evolution*" (Richerson, Boyd 2005: 237). I personally can not agree with this viewpoint without some reservations. Culture and

nature are naturally linked and is possible to separate them only on the level of theoretical abstraction. Nevertheless culture is not just camouflaged nature. In other words, culture is not biological adaptation as sociobiologists and evolutionary psychologists argue. If it was then maladaptive cultural elements should not exist. Anthropologists indeed describe many examples of such cultural elements.

An indicative example is the sorrowful story of the South Fore in Papua New Guinea. This tribe adopted in the thirties the practice of endocannibalism as a part of mortuary feasts. They believed that the soul of the deceased remains imprisoned in the dead body until it is digested in the wombs of female relatives. During the feast the women (and children also) consumed the dead members of the society. Along with the meat came the dangerous prions, which later incurred a fatal degenerative disease of the nervous system. This sickness was a version of Creutzfeldt-Jacob disease, which the natives called *kuru* (in the sense: fear or tremor). But the natives did not link the disease and the mortuary feast, because the latent period of the *kuru* was too long and that is why the natives could not easily understand the connection between the *kuru* and the mortuary feast. They instead interpreted *kuru* as a result of the activities of sorcerers. But for medical research, which revealed the source of the disease, and the timely intervention by the authorities, which prohibited the relevant part of the mortuary feast, the South Fore may have become extinct (Lindenbaum 1979). During my pre-research stay in Papua New Guinea I met a member of the Fore. He told me the story of the *kuru* and the tragic fate of his tribe. His narration closed with the words without hope: "I like to tell you more but I can't ask anybody". This example supports the conclusion that culture may not follow the interest of the genes in every case.

CONCLUSION

Culture is not then camouflaged nature. It is possible to identify four main relationships between nature and culture, and just the first of them corresponds with the discussed approach to sociobiology and evolutionary psychology:

- 1) Culture is the result of biological evolution (as in the case of human social behaviour and altruism).
- 2) Culture affects the evolution of genes (as in the case of population dynamics currently in China, which prefers boys in the politic of the one-child family).
- 3) Culture and nature are separated and have their own laws and patterns of development and evolution (existence of the different languages does not affect evolution of the genes; there do not exist different genes coding different languages).
- 4) Culture and nature are in opposition (as in the case of South Fore).

In my point of view it is not necessary to try to explain everything about culture in the light of the Darwinian

perspective. It does not mean that culture has no biological background. Culture is not naturally separable from nature, they coevolved for millions years. It is not necessary to try to explain everything from the Darwinian viewpoint. I think this kind of strategy of "all or nothing" is false. In this context I could rewrite the above statement: "much about culture makes sense in the light of evolution".

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