ETHNOBIOLOGY AND CONSERVATION

SHORT REVIEW

Ethnobiology and Conservation 2017, 6:10 (14 July 2017)
doi:10.15451/ec2017-07-6.10-1-7
ISSN 2238-4782 ethnobioconservation.com

Landscapes preferences in the human species: insights for ethnobiology from evolutionary psychology

Joelson Moreno Brito Moura[1], Washington Soares Ferreira Júnior[2], Taline Cristina da Silva[3], Ulysses Paulino Albuquerque[4]

ABSTRACT

According to evolutionary psychology, landscapes preferences by the human species are influenced by their evolutionary past. A set of psychological processes may have been selected to guide the selection of landscapes that offered advantages for the survival and reproduction of human groups in the past. In addition, these psychological mechanisms may also influence the current human behavior in landscapes preference. Based on this, Gordon Orians postulated the savanna hypothesis, which predicts that the human being prefers these environments, since in the past, African savanna environments had a set of important characteristics for survival. If this is true, there are important implications for ethnobiological studies that seek to understand the factors that can influence the selection and management of landscapes by human groups.

Keywords: Evolutionary Ethnobiology, Evolutionary Psychology, Socio-ecological Systems

[1] Programa de pós-graduação em Etnobiologia e Conservação da Natureza, Departamento de Biologia, Universidade Federal Rural de Pernambuco, Rua Dom Manoel de Medeiros, s/n, Dois Irmãos, PE, 52171-900, Brasil

[2] Departamento de Biologia, Universidade de Pernambuco, Cidade Universitária, Petrolina, PE, 56300-000, Brasil

[3] Departamento de Biologia, Universidade Estadual de Alagoas, Santana do Ipanema, Al, 57500-000, Brasil

[4] Laboratório de Ecologia e Evolução de Sistemas Socioecológicos (LEA), Centro de Biociências, Departamento de Botânica, Cidade Universitária, Recife, PE, 50670-90, Brasil

* E-mail address: JMBM (bmoura.joelson@gmail.com), WSFJ (kba.bio@hotmail.com), TCS (talinecs@hotmail.com), UPA (upa677@hotmail.com)

INTRODUCTION

There are some evidences – such as the emergence of bipedalism – that points to the African continent as the point of origin of the first human beings (Rodrigo 2014). Some scientists defend the idea that a set of psychological mechanisms was selected in our evolutionary past, particularly at a time when human groups were primarily hunter-gatherers in African environments, influencing human behaviors that favored their survival (Klasios 2016, Orians and Heerwagen 1992). This idea has founded a number of investigations in the field of evolutionary psychology (see Buss 1995).

One of the focuses of evolutionary psychology is to understand the factors that may have affected the selection of environments by human groups in the evolutionary past. In this case, the selection of environments that favored and minimized costs, especially of survival and reproduction, may have been important in our evolutionary history. For some authors (Appleton 1975, Orians and Heerwagen 1992, Sommer 1997), the savanna has a combination of environmental conditions that allowed the survival and reproductive success of the first hominids in the Pleistocene. For example, as an open landscape - unlike a tropical forest, which has a closed vegetation - but presenting shrubs and sparse trees - unlike the desert and tundra, landscapes with no trees at all - the savannah has a combination of perspective and refuge. Thus, its structure facilitated the identification of the predator approach by the hominids and provided hiding among bushes and on top of trees. Therefore, the savannah was the less inhospitable environment, providing to the hominids not only physical shelter, but also psychological shelter (Appleton 1975).

Thus, a set of human behaviors, based on certain psychological mechanisms, may have been selected to enhance the choice of environments that favor the chance of survival. Some authors support the idea that these mechanisms affect the current behavior of the human being. For example, in 1980, Gordon Orians elaborated a hypothesis based on the evidences of human evolution (Orians 1980). As the evidences suggest that evolution occurred in the African savanna in the Pleistocene, there is an innate affinity in the human species to prefer open savanna-like landscapes – savanna hypothesis –, and this phenomenon has been evidenced in various cultures (see, for example, Falk and Balling 2009, Orians and Heerwagen 1992, Sommer 1997).

In this sense, innate preferences are only triggered according to certain environmental stimuli that drive the mind to solve a particular adaptive problem (Buss 1995). For example, when observing landscape photographs of several biomes, people may prefer savanna-like biomes. This choice would be a response to a set of cognitive procedures or decision rules, depending in part on other environmental stimuli (Buss 1995). Thus, it is possible to indicate that the preference for savanna environment is considered an evolved psychological mechanism[1], because: 1) it solved the problem of the perception of the approach of predators in human ancestral environments; 2) it is driven only by a narrow range of information – open landscape that offers

[1] There are psychological mechanisms that process information from the environment and that evolved to solve particular adaptive problems that the first hominids faced under ancestral conditions (Buss 1995). Evolutionary psychologists often analyze tasks to understand the types of psychological mechanisms required to solve specific adaptive problems and which relevant clues were available to humans in the paleoenvironments (Buss 1995).

protection and resources; 3) it processes this information making it possible to make a decision that will be expressed through a manifest action or behavior favorable to survival – that is, to prefer and settle in the savanna (Buss 1995).

The evolutionary psychology scenario, and the predictions related to landscape preference, provide interesting ideas for ethnobiological investigations, since they may favor the understanding of some human behavioral bases in their interactions with the environment. In this article, we present a brief review of the current scenario on the study of human preferences for landscapes, based mainly on the findings of evolutionary psychology, and the theoretical and applied implications for studies in ethnobiology.

The evolution of the human mind and preference for landscapes

Due to the environmental conditions of the African Pleistocene savanna, our mind was shaped during our evolutionary history in such a way that some argue that we still prefer environments with savanna-like vegetation (Orians and Hemerwagen 1992). The preference of humans for savanna environments has found support in several empirical studies (see Balling and Falk 1982; Sommer 1997). Despite the evidence supporting the savanna hypothesis, and its popularity, there are recent conflicting findings (see Han 2007, Hartmann and Apaolaza-Ibáñez 2010), where landscape preference was influenced primarily by people's familiarity with the environmental context, where they currently live and develop, or by the presence of certain elements of the environment that may be present in different landscapes, such as clean water and the presence of very green vegetation (Hartmann and Apaolaza-Ibáñez 2013). In this sense, sociocultural values and the current environmental context seem to have a share of influence on the way in which a person will respond affectively to the environment (Korpela et al. 2002). These findings suggest that there is not necessarily an innate response to savanna environments, which led to the emergence of alternative hypotheses (Table 1).

In general, studies that tested the innate preference for landscapes – whether or not they support the savanna hypothesis – have methodological biases, for example: 1) the phenomenon was evaluated in a few countries[2]; 2) the emotional scales measured in relation to landscape environments are ambivalent – happy-sad –, forcing people to choose only "positive" or "negative" options; and 3) the images used do not cover the six large terrestrial biomes – desert, tundra, savanna, coniferous forest, deciduous forest and tropical forest (Han 2007). Another criticism pointed out in the literature is that these studies use images of very heterogeneous landscapes and this also generates biases, for example: landscape very similar to where the person lives or developed (Balling and Falk 1982); landscape with the presence of clean water – water alone evokes positive feelings, such as pleasure and calmness (Ulrich 1983); very green vegetation in one landscape and not very green in the other (Hartmann and Apaolaza-Ibáñez 2010, 2013); and landscapes with distinct shades of blue in

[2] Among the countries evaluated are Nigeria – in which the landscape of savanna and tropical forest predominates –, South Africa – with a landscape of savannah, desert and prairies –, Zimbabwe – prevailing savanna landscape –, Estonia – with a landscape of temperate forest and prairie –, Italy – with Mediterranean vegetation and temperate forest –, Switzerland – prevailing prairie and grassland landscape –, United States – with diversifying landscapes, including tundra, temperate forest and desert – and Spain – with temperate forest and prairies landscapes.

Table 1: Some theories and hypotheses that try to understand the evolution of the human mind and the development of preferences for landscapes of natural environments.

Theories/Hypotheses	Description	Preferred landscape	Author
Prospect refuge theory	There is a human preference for open areas as they provide hiding places and ease of detecting threats.	Open natural environments.	Appleton 1975
Savanna Hypothesis	The human species has innate preference for a savanna-like landscape.	Natural environments similar to the savanna.	Orians 1980
Affectivity Hypothesis	People respond affectively to natural environments without relying on cognition due to gradients of positive attractions.	Natural environments with water	Ulrich 1983
Wood pasture hypothesis	The human being evolved in a mosaic of open and closed environments.	Open and closed forests	Blumenschine 1986
Forest Hypothesis	Human evolution occurred in closed forest configurations.	Closed forests	Andrews 1989
Information Processing Hypothesis	There are landscape preferences due to different domains of variables (mystery, openness, smoothness, coverage), not just one.	Very green environment with clean water.	Kaplan and Kaplan 1989
Theory of habitat selection	Humans evolved in varied habitats according to their adaptive needs.	Any natural environment that offers conditions of survival, reproduction and well-being.	Orians 1980; Orians and Heerwagen 1992
Attention restoration hypothesis	Contact with nature decreases stress and restores attention without great cognitive effort.	Very green environment with clean water.	Kaplan 1995

the sky, which is considered a universally preferred color (Saad and Gill 2000). These limitations do not allow one to understand whether in fact the evolutionary past – evolution in a savanna environment, for example – influences current human preferences.

All the theories/hypotheses cited in table 1 argue that the behaviors that allowed human survival in paleoenvironments can influence the manner people react to environmental stimuli in the present. Appleton (1975) argues, for example, that open landscapes that provide perspectives of refuge – physical or symbolic – and panoramic view, evoke positive reactions in people, as observed in the study by Lückmann et al. (2013). However, some behaviors that provided adaptive advantages in the past may be poorly adapted at the present time. A good example of poorly adapted behavior is the global preference for

sweet and greasy foods (Saad and Gill 2000), which corresponds to an adaptive mechanism for food scarcity that was prevalent in the ancestral world. However, today we do not suffer from the scarcity of food on the same scale as our ancestors. Thus, the presence of this behavior leads to a scenario of diseases such as diabetes and obesity (Saad and Gill 2000).

Relevance for ethnobiology

An interesting aspect for research in ethnobiology is to understand the factors that affect human behavior linked to actions directed to the environment. Several studies have investigated human perception about the landscape and how this may provide clues about people's decisions on the management of certain environments (see Johnson and Davidson-Hunt 2011). It has been observed that the perception of people about the environment can be affected by several elements, such as cultural, social and biological factors (Silva *et al.* 2017). The scenario presented by the evolutionary psychology and its effects may assist in understanding the biological factors that affect human perception and, as a consequence, the interactions of human groups and their environments.

In this sense, in a study of landscape perception in an Australian Indigenous tribe, Stanley (2000) observed that there is a regular practice of burning vegetation, making them more open and scrubland dominated. For these indigenous people, a "good country" must have an open vegetation and low vegetation (Stanley 2000). Thus, an evolutionary view of the psychological origin of open landscape preference may have important practical implications and help in understanding human responses to biologically diverse environments (Williams and Cary 2002) and landscape management.

Understanding the factors that influence the classification and management of landscapes by different human groups is a matter of interest for evolutionary ethnobiology (see Albuquerque and Ferreira Júnior 2017, Silva *et al.* 2017). There is a set of evidences demonstrating the transformations in the landscapes by human groups in the present and in the past, indicating that the landscapes can be identified or managed in a way that meet the needs of human survival (see Levis et al. 2017, Silva *et al.* 2017). For example, in a study carried out in a Conservation Unit in the Brazilian northeast, Silva *et al.* (2017) observed that people from three human groups adjacent to the Conservation Unit classified environmental landscapes primarily for utilitarian purposes, such as the presence of useful species or management characteristics in the past. The study of Molares and Ladio (2014) showed that the classification of landscapes in a Mapuche group, Argentina, is influenced by organoleptic characteristics of plants, which guided the use of these plants in medicinal use.

Based on the consequences of these evolutionary perspectives applied to ethnobiology, landscapes transformed by human beings may meet a set of characteristics. Among them, the presence of useful plants for food and medicine, for example, that are associated with the psychological mechanisms selected in the evolutionary past, and modulated by different factors, which offer greater well-being, safety perceptions, and others related to human survival in environments.

ACKNOWLEDGEMENTS

The authors thank the Laboratory of Ecology and Evolution of Socio-ecological Systems, Universidade Federal de Pernambuco, for the physical and intellectual support, and the Coordination for the Improvement of Higher Level Personnel (CAPES) for a scholarship granted to JMBM.

REFERENCES

Albuquerque UP, Ferreira Júnior WS (2017) **What Do We Study in Evolutionary Ethnobiology? Defining the Theoretical Basis for a Research Program.** Evolutionary Biology 44: 206-215.

Andrews P (1989) **Palaeoecology of Laetoli.** Journal of Human Evolution 18: 173-181.

Appleton J (1975) **The Experience of Landscape.** 1 ed. Wiley, London, UK.

Balling JD, Falk JH (1982) **Development of visual preference for natural environments.** Environment and Behavior 14: 5-28.

Blumenschine R (1986) **Early hominid scavenging opportunities: Implications of carcass availability in the Serengeti and Ngorongoro ecosystems.** Archaeopress, Oxford, UK.

Buss DM (1995) **Evolutionary psychology: A new paradigm for psychological science.** Psychological Inquiry 6: 1-30.

Falk JH, Balling JD (2009) **Evolutionary influence on human landscape preference.** Environment and Behavior 42: 479-493.

Han KT (2007) **Responses to six major terrestrial biomes in terms of scenic beauty, preference, and restorativeness.** Environment and Behavior 39: 529-556.

Hartmann P, Apaolaza-Ibáñez V (2010) **Beyond savanna: An evolutionary and environmental psychology approach to behavioral effects of nature scenery in green advertising.** Journal of Environmental Psychology 30: 119-128.

Hartmann P, Apaolaza-Ibáñez V (2013) **Desert or rain: Standardisation of green advertising versus adaptation to the target audience's natural environment.** European Journal of Marketing 47: 917-933.

Johnson LM, Davidson-Hunt I (2011) **Ethnoecology and landscapes.** In: Anderson EN, Pearsall DM, Hunn ES, Turner NJ (eds) Ethnobiology. 1 ed. Wiley-Blackwell, New Jersey, pp. 267-284.

Kaplan R, Kaplan S (1989) **The Experience of Nature: A Psychological Perspective.** 1 ed. Cambridge University Press, Cambridge, UK.

Kaplan S (1995) **The restorative benefits of nature: Toward an integrative framework.** Journal of Environmental Psychology 15: 169-182.

Klasios J (2016) **Evolutionizing human nature.** New Ideas in Psychology 40: 103-114.

Korpela KM, Klemettilä T, Hientanen JK (2002) **Evidence for rapid affective evaluation of environmental scenes.** Environment and Behavior 34: 634-650.

Levis C, Costa FR, Bongers F, Peña-Claros M, Clement CR, Junqueira AB... and Castilho CV (2017) **Persistent effects of pre-Columbian plant domestication on Amazonian forest composition.** Science 355: 925-931.

Lückmann K, Lagemann V, Menzel S (2013) **Landscape assessment and evaluation of young people: Comparing nature-orientated habitat and engineered habitat preferences.** Environment and Behavior 45: 86-112.

Molares S, Ladio A (2014) **Medicinal plants in the cultural landscape of a Mapuche-Tehuelche community in arid Argentine Patagonia: an eco-sensorial approach.** Journal of Ethnobiology and Ethnomedicine 10:61.

Orians GH (1980) **Habitat selection: general theory and applications to human behavior.** In: Lockard J (ed). The evolution of human social behavior. 1 ed. Elsevier, Chicago, pp. 49–66.

Orians GH, Heerwagen JH (1992) **Evolved responses to landscapes.** In: Barkow JH, Cosmides L, Tooby J (eds) The adapted mind: evolutionary psychology and the generation of culture. Oxford University Press, New York, pp. 555–579.

Rodrigo MD (2014) **Is the" Savanna Hypothesis" a Dead Concept for Explaining the Emergence of the Earliest Hominins?.** Current Anthropology 55: 59-81.

Saad G, Gill T (2000) **Applications of evolutionary psychology in marketing.** Psychology and Marketing 17: 1005–1034.

Silva TC, Peroni N, Medeiros MFT, Albuquerque UP (2017) **Folk classification as evidence of transformed landscapes and adaptative strategies: a case study in the semiarid region of northeastern Brazil.** Landscape Research 42:521-532

Sommer R (1997) **Further cross-national studies of tree form preferences.** Ecological Psychology 9: 153–160.

Stanley A (2000) **Indigenous land management perspective on conservation and production.** In: Barlow T, Thorburn R (eds.) Balancing conservation and production in grassy landscapes. Proceedings of the Bushcare Grassy Landscapes Conference, Canberra, Australia, pp. 98-100.

Ulrich RS (1983) **Aesthetic and affective response to natural environment.** In: Altman L, Wohlwill J (eds) Human behavior and the environment. 6 ed. Plenum, New York, pp. 85–125.

Williams KJ, Cary J (2002) **Landscape preferences, ecological quality, and biodiversity protection.** Environment and Behavior 34: 257-274.

Received: 14 March 2017
Accepted: 16 June 2017
Published: 14 July 2017