

The Nature experience as an inventiveness process

Sabina Couto
Domingos Loureiro
Universidade do Porto

Abstract

The article summarizes a research project aimed at the experience of Nature as an impulse to creativity. It is reflected here on the relationship with Nature, and the experience of direct contact that manifests a potential that symbolic and indirect experiences cannot provide. This direct contact not only strengthens the connection with nature and increases well-being, but also increases curiosity and invention. This research brings together a set of studies that indicate Nature as capable of evoking creative thinking, making a person more flexible in the way they think and more able to get new ideas. In addition, it helps restore focused attention, fundamental in the evaluation, and evolution of ideas. Finally, artistic practices are mentioned that ground this issue of nature as a creative promoter.

Keywords: Art. Experience. Nature. Inventiveness.

Introduction

Such as the continuous exploitation of resources, expansion of the urban network and chemical proliferation, have promoted the lack of biodiversity and, consequently, the decline in quality and the contact of the human with Nature. According to Heesoon Bai (2015), this deficiency is putting at risk the basis of children's mental, and physical development, noting that today in general most children grow up without feeling direct contact with Nature, particularly feeling the forest floor with their own feet. Even if their parents have a rural background, the conceptions they formulate of contact with Nature are rudimentary, and they teach children indirectly and explicitly that Nature is primitive, dangerous and has only value as an economic resource. He also states that children are urbanized and taught to view Nature as something that must be destroyed for the sake of civilization (BAI et al., 2015). So, children live far from the natural world, and their experiences usually take place in the media, or through images (WHITE, 2004). The child enjoys vast access to information and images of Nature that only provide indirectly experiences, which will never have the same emotional and sensory effect as direct contact, like the discovery of what lies beneath a stone in the river or the feeling

of climbing a tree, or the spiritual peace you feel when you are just looking at Nature (FINCH; BAILIE, 2015).

The experience of direct contact with Nature manifests potential that symbolic and indirect experiences cannot provide. From the point of view of Kellert (2002), this direct contact, besides strengthening the connection with the Nature and elevating well-being, also increases curiosity and invention. Children who have the opportunity to live experiences in natural landscapes and feel a complex of emotions such as joy, satisfaction, and simultaneously challenge anxiety and fear. The outdoor space, and especially Nature, arouses enthusiasm and pleasure but, on the other hand, a feeling of uncertainty, risk, and sometimes fear. These direct experiences confer vast emotional, revealing, and inventive opportunities (KELLERT, 2005). Likewise, Wendy Banning considers that direct contact with Nature can provide children with the development of skills and creative thinking that will last throughout life (BANNING; SULLIVAN, 2010). According to naturalist painter Robert Bateman (1930-) children are naturally captivated by plants, trees, and rivers. Also, Helen Tovey (1921 - 2019) says that children give preference, when they have the possibility of choosing the natural spaces where they can experience something unpredictable, mysterious, exciting, and live moments of adventure (TOVEY, 2007). For this reason, it is assumed that children are born with great probability of becoming Nature lovers, full of wonder and curiosity. Following this thought, to teach them to acquire sensitivity and values related to Nature is not to present something that will be totally new to them (BAI et al., 2015).

1. Nature and inventiveness

The investigation around direct contact with Nature reveals evidence that this kind of experience influences creativity and certain cultures consider that there is a special link between Nature and creativity. In this context, promising studies were carried out that sought to test the relationship between Nature and inventiveness that had consistently manifested an increase through contact with natural environments or natural elements in constructed media. Two essays reveal the benefits of contact with Nature, namely: the essay by researcher and professor of psychology at the University of Utah, David Strayer, and scientists Ruth Ann Atchley and Paul Atchley of the University of Kansas. These essays published in the journal PLOS ONE of the Public Library of Science (2012) results from an research on the effects of prolonged exposure in natural environments and appears as a first attempt to analyze the changes in cognitive development of higher order of this extensive exposure (SIC NOTÍCIAS, 2012). The higher order cognitive test used was the "Remote Associates Test" (RAT) designed by professor/researcher Sarnoff Andrei Mednick (1928 - 2015) substantially used as an evaluation of creative reasoning and problem solving (MEDNICK, 1962). This test consists of three words (triads), and the exercise is to write a fourth word as response that is associated with the three words (e.g., Drop, Actor, Powder/solution = star).

The study was conducted among fifty-six people (twenty-six women and thirty men) with an average of twenty-eight years participating in expeditions carried out by the non-profit organization Outward Bound, in natural areas with reduced human intervention. The project consisted of eight walking groups randomly divided in half, one part assigned to the pre-walking group and another part to the walking group. In the pre-hike group, eight originated from Alaska, ten from Colorado and six from the Maine region; and in the hiking groups, nine from Alaska, fourteen from Colorado and nine from the Washington region. The experiment was conducted for four to six days, with only one backpack on the back, without communication between various groups and without any use of technology. The pre-walk group consisted of twenty-four participants (eleven women with an average age of thirty-four years) and the walking group comprehend of thirty-two participants (fifteen women with an average age of twenty-four years). Since age interferes with activity, this was considered as a variable in the subsequent analyses. Continuing, the prearrangement group finished the RAT in the morning before starting the journey and the walking group finished the RAT on the morning of the fourth day or during the course. All participants had an unlimited time to finalize the ten questions of the test and in an independent way, without collaboration between the participants, as was proven both by the analysis of answers as indicated by Outward Bound (ATCHLEY; STRAYER; ATCHLEY, 2012). The results indicated that the stakeholders who had the four days in Nature answered an average of 6.08 questions, while the other participants only got 4.14 correct answers.

When our research participants spent four days in a natural setting, absent all the tools of technology, the surrounding natural setting allowed them to bring a wide range of cognitive resources to bear when asked to engage in a task that requires creativity and complex convergent problem solving (Atchley, Strayer & Atchley, 2012, p.2).

This study revealed that the brain functions associated with creativity and problem solving are stimulated when there is a connection with Nature. And following this line of thought, we have the study carried out by the professor of psychology and researcher, Frank M. Ferraro III, of the University of Nebraska.

The purpose of the current study was to investigate whether nature immersion can improve an objective and convergent measure of creativity, as opposed to divergent, artistic, or self-assessed creative processes (Ferraro III, 2015, p.8). (Atchley, Strayer & Atchley, 2012, p.2).

Despite being based on the essay by Atchley et al. (2012) implemented internal control group (classroom) for comparison between subjects, which was not the case in the previously mentioned study. Starting from this study, Ferraro III (2015) assumed that students of higher education after traveling six days outdoors, in the middle of Nature, would get answers with a

higher level of creativity compared to students tested only in the classroom space (internal group). The essay consisted of twenty-five students from a private university, of whom twenty-two were Caucasian, one African American, one Asian, and one Latino. The students (eleven) who belonged to the outdoor group were enrolled in the first year of the wilderness seminar course and the students (fourteen) of the internal group enrolled in the first year of the abnormal psychology seminar course. Both groups performed the RAT as was the case in the essay by Atchley et al. (2012) in which they had ten minutes to answer ten questions, but first they performed a pretest. This pre - RAT test (random and different items from the study) was carried out by the two groups in a common university room to become familiar with the conditions of the respective test. The pretest results clearly showed few differences between the two groups (external and internal). Regarding the fundamental test (RAT), the group that was in Nature answered the questions at the end of the six-day trip abroad near a lake, Boundary Waters Canoe Area Wilderness (BWCAW). The other group made up of internal students also carried out the test six days after the test - to coincide with the temporal sequence of the external group (FERRARO III, 2015). The data set indicated that the external group had scores of five to ten correct items with an average of seven, while the internal group obtained from one to seven with an average of six. The results of the test:

[...] indicate multi-day wilderness experiences may aid convergent creativity ability. A significant increase in creativity (measured by selected items from the RAT) was found in first year students completing a BWCAW trip compared to an indoor control group. Interestingly, the percentage increase [...] seen in the current study (49%) is similar to the cognitive improvement published by Atchley et al. (2012), showing nearly a 47% increase in RAT scores in an outdoor hiking condition. [...] A strength of the current study is that pretest creativity scores for both the indoor and outdoor groups were not significantly different. Only after a multi-day wilderness experience did the outdoor group show a significant increase in correct RAT items, establishing temporal precedence of the nature effect. (Ferraro III, 2015, p.9).

This experience directly influenced the increase of inventiveness and produced psychological and cognitive benefits. According to the author, immersion in Nature can be a method to enhance creativity in young adults. He also believes that these current revelations should be deepened to understand how Nature can provide an improvement in the experiences of higher education students (FERRARO III, 2015). Other investigations tested the effect of the experience of Nature on creativity and highlighted characteristics of this relationship to understand how this happens. One example is the study published in the journal *Urban Forestry & Urban Greening* (2015) by Trina Plambech, manager of the Alexandria Institute in Copenhagen and Professor Cecil C. Konijnendijk van den Bosch of the Department of Landscape Architecture, of the Swedish University of Agricultural Sciences. The aim of the study is to evaluate the role of Nature in the creative process through interviews with Danish

professionals working in creative areas such as arts and design. They used the method of semi-structured qualitative interviews directed at seventeen professionals from different areas, eight of whom were men between the ages of thirty-four and seventy-three, and nine were women between the ages of twenty-eight and fifty-seven. It was intended to verify the creativity, the relationship with Nature and to determine the ability of the experience of Nature to stimulate the inventiveness in these professionals. The interviews were conducted during the summer of 2012 by mobile phone or via Skype for approximately one hour and divided into two phases: first, understanding what creativity is for respondents, their experience, as well as the importance of the places for valuing inventiveness. At this stage, the interest was to explore the creativity of stakeholders in general, before being questioned about the influence of nature; second, a set of questions directed to the knowledge they have of nature, what kinds of Nature they preferred and how important it was in their lives. This phase aimed to understand the relationship between Nature and creativity (PLAMBECH; VAN DEN BOSCH, 2015).

During the interviews, participants described the experience and the positive aspects of the time they spent in Nature, specifically: restoring energy to creative activities; transmitting calm and provide more ideas; and greater ability to synthesize and organize ideas.

The respondents explained how Nature makes them more curious with an awakened desire to explore. In Nature there is an infinite variety. The same place is never the same. Being in Nature is intriguing, it makes one wonder and it is fascinating (Plambech & van den Bosch, 2015, p.259)

It was found that some professionals traveled to Nature to gather ideas and inspiration through the observation of shapes, smells, and sounds. Regularly the experience of Nature boosted the process of creativity, that is, Nature granted a kind of rest from the exhaustive preparation of an inventive task. For this reason, it restores the ability to direct the indispensable focus to certain activities during two subsequent phases of productive performance: creating and evaluating ideas. That is, Nature has the ability to evoke creative thinking, making a more flexible person in the way of thinking and more able to get new ideas. In addition, it assists in the restoration of targeted attention, essential in the evaluation and evolution of ideas (PLAMBECH; VAN DEN BOSCH, 2015). The results indicate that Nature presents sensory dimensions that reveal to be of special importance for creative processes, and therefore it is an asset to have access to different natural environments. In general, the data recorded consistent changes in cognitive function at a higher level, associated with prolonged exposure to Nature. According to the results of the study Atchley et al. (2012), after four days in the wild, presented a high range of cognitive resources and increased creativity. Likewise, the essay by Ferraro III (2015) showed that the direct experience of Nature reinforced inventiveness and provided psychological and cognitive benefits. In this sense, other studies have indicated that immersion in Nature can be a method to enhance creativity

(PLAMBECH; VAN DEN BOSCH, 2015). Therefore, continuously experiencing Nature can boost the process of inventiveness, through the gathering of ideas and inspiration that arises from observation.

2. Artistic Practices

In relation to the potential of creative stimulation, and the valorization of imagination, Nature is constantly a reference in several areas, such as literature, music, architecture, and visual arts. If we reflect on visual arts for example, we can find artists who use materials directly from Nature and who recognize the value of organic materials and find creative stimulus in the natural world. Work in an external context is also frequent in a multiplicity of strategies, visual, phenomenological, contextual, among others. This is the case of the Land Art practices that emerged in the 1960s in the United States and Europe, in which artists use materials from Nature and work directly on the spot. In this context, we have the artist Richard Long (1945 -) who uses natural materials and establishes a direct relationship between his body, and these materials. He works on issues related to scale, how it moves and interacts with places, and their elements (Figure 1). The selected spaces are areas with a wild look that doesn't pretend to appropriate them, but instead a personal brand of its course that goes away with time (LONG, 1994).



Figure 1 – Richard Long, *A Walking and Running Circle*, Warli Tribal Land Maharashtra, India, 2003 (source: <http://www.richardlong.org/Sculptures/2011sculpupgrades/walkrun2.html>)

If we think about music, we have the "Grand Canyon Suite" by composer Ferde Grofé (1892 - 1972), in which the trip to the Arizona desert to watch the sunset over the Grand Canyon emerges as a base of creative inspiration. The way natural elements interact, the silence and sound of birds, drops falling, or wind in trees (SCHIAVONE, 2000). They are all possibilities of inspiration to create various melodies. As for architecture, we have the works of Antoni Gaudí (1852 - 1926) who, due to health problems since childhood, devoted his time to meticulously observing the forms and dynamics of nature, to the details of each branch, leaf, fruit or insect. From these experiences of Nature, he found inspiration and creativity for his works, such as: the "Casa Milá" (La Pedrera) built between 1905 and 1907; and the "Sagrada Família" with the construction beginning in 1826 and scheduled completion date in 2026. The interior of this building is inspired by the forest, being constituted by columns that resemble trees and that branch in the ceiling (Figure 2). Gaudí found in contemplation of Nature the creative stimulus that helped him to design works with a unique and individual style (MODESTO, 2014).



Figure 2 – Antoni Gaudí, detail of the Sagrada Família Cathedral, Barcelona. Photograph by John Kellerman Alamy (source: https://www.bbc.com/portuguese/noticias/2015/09/150921_vert_earth_arquitetura_natureza_ml)

And, continuing on the potential of Nature as a creative stimulus, we have the work of the German artist Mario Reis (1953 -) who carried out along his path the project "Nature Watercolors" (Figure 3) in which Nature expresses itself directly on a horizontal surface and leaves its marks. These works follow the interest in Nature, expressiveness of the water and:

unstable character of water, as well as the fact that we are deeply connected with water anyway. Water always changes, by nature. Sometimes it is fluid, sometimes gas or solid. Water is able to carve deep canyons out of the hardest rock. (Mario Reis citado em Grande, 2014, p.115).

Reis addresses Nature directly and installs canvases on various riverbeds around the world, enabling plant and mineral residues to accumulate on the surface of the support. The screens stay for several days in place and the result is obtained through the force and changes of Nature that occur (GRANDE, 2004). Here, the water appears as a brush that creates a wide variety of patterns, textures, and colors according to the space chosen by the artist.



Figure 3 – Mario Reis, photo of the work process, project Nature – Watercolors (fonte: <http://www.marioreis.de/>)

Also, the Portuguese artist Alberto Carneiro (1937 - 2017) discovers in Nature the creative impulse and each material he chooses from the natural environment has to do with the energy he can observe and identify in the matter. He works with trees and wood, but when working with this material seeks to discover again the tree that exists in it, the energy, and the essence of the tree's life (AMARANTE, 2015). The work arises from experimentation, from the connection and reflection with Nature and develops from an aesthetic relationship with its trees and flowers, that is, from its intimate experience with these elements and guides it in artistic creation (Figure 4). Thus, Carneiro mentions:

My interest in the use of Nature as matter in the work has to do with the awareness or the search that the fundamental is the energy that comes out of things and circulates between them. [...] my own identification with what I had experienced, in a direct relationship with the materials and materials of the earth. Naturally, there is a lived relationship with Nature [...] (Alberto Carneiro cited in Amarante, 2015, p.23)



Figure 4 – Alberto Carneiro, a field after harvest for aesthetic delight of our body, 1976 (source: <https://www.wikiart.org/en/alberto-carneiro/um-campo-depois-da-colheita-para-deleite-est-tico-do-nosso-corpo-1976>)

Another example is the facilities with plant elements of the Belgian Bob Verschueren (1945 -) as leaves, branches, and fruits. The materials are selected according to their shape and color, in which it maintains its own structure and organizes very precisely almost as geometric (GRANDE, 2004). Carefully observe the structures of the plant elements, and the forms arise from rigorous and previously marked cuts (Figure 5). Before the beginning of its implementation establishes a basic principle, avoid the use of ropes and other technical means as wherever possible, eliminate any non-plant element, allowing exceptions only when necessary. This interest in exploring the elements of nature occurred:

by accident [...] Feeling the need to explore other paths, I went outside, and I there met Nature. It left a strong impression on me. [...] then used leaves because [...] leaves are easy to carry, in autumn they change color and create a large carpet on the ground. What fascinated me with this material was its constant transformation, both in color and form. When one brings this leafy material into interior space, we see it anew. Installed out of their natural context, leaves are free from any of the usual associations we have

with them. [...] The work changes and moves, just like a living being (Bob Verschueren quoted in Grande, 2014, p.84).

Verschueren explored the sounds of the plants at the Banff Center for the Arts and presented extensively his photographs and installations in Europe, as well as in Japan and North America. The work of this artist invokes a phenomenological approach and, in each project, applies natural elements to create a relationship with the landscape and architecture of each location, whether in interior spaces, in natural outdoors or in the city.



Figure 5 – Bob Verschueren, Installation I, 2002, beech branches. Galerie Usagexteme, Bruxelles (source: <http://www.bobverschueren.net/DimensionSupplementaireEng.html>)

The artistic practices shown here allow us to recognize Nature with a high potential for creative stimulation and as a constant reference in several areas. Although the natural environment has assumed a fundamental role in all the works mentioned, for each author, Nature and position it takes in the creative process, is different. For example, the "Grand Canyon Suite" of the composer Ferde Grofé who found in walking and contemplation of the sunset the inspiration to create the melodies; and Antoni Gaudí, who lets Nature emerge in his projects through the constant and detailed observation of all the elements that surrounded him. Richard Long, Mario Reis, Bob Verschueren and Alberto Carneiro resort to the collection of materials directly from outdoor natural landscape, which are part of the work and interfere directly, however, are inspired in different ways. Long,

opt for wild areas and does not appropriate, only leaving its mark, when it moves and interacts with places and their materials. In relation to the work of Reis, he chooses water as an element that leaves marks and traces in his works, this being his brush. Comparatively, Verschueren, the natural elements (leaves, branches, and fruits) are elected by similarity to the cycle of life, which will change color and state. Concerning Carneiro, there is a deep relationship with Nature, especially with the lands of his childhood, and the tree, in search of energy and essence.

Finally, understanding the configuration of the natural environment in the previously mentioned cases, it is significant to recognize how these direct experiences make artists more inventive. Thus, Nature allows restoring energy and provide a kind of rest that helps for an inventive task, such as conceiving the interior design of the Cathedral of the "Sagrada Familia". In this respect, transmitted calm provides greater ability to synthesize and organize, as ability to direct focus (restoring attention) and more flexibility. In addition, infinite varieties generate curiosity and more ideas, in which sensory dimensions are explored (PLAMBECH; VAN DEN BOSCH, 2015). For these reasons, artists who immerse themselves in Nature have brain functions associated with creativity and more stimulated problem solving (ATCHLEY; STRAYER; ATCHLEY, 2012). For example, psychological and cognitive benefits (FERRARO III, 2015) that enhance inventiveness.

In conclusion

We observe in this investigation, based on the mentioned essays, that direct experience with Nature influences the creative process. As revealed by the study conducted by David Strayer, Ruth Ann Atchley and Paul Atchley, brain functions associated with creativity and problem solving are stimulated when there is a connection with Nature. The results of this study indicated that stakeholders who had four days in Nature answered an average of 6.08 correctly, while the other participants only got 4.14 correct answers. Continuing, Ferraro III's essay also indicated that some of the professionals traveled to natural landscape to gather ideas and inspiration through the observation of shapes, smells, and sounds. Regularly the experience of Nature continuously boosted the process of creativity, that is, Nature granted a kind of rest from the exhaustive preparation of an inventive task. For this reason, it restores the ability to direct the indispensable focus to certain activities during two subsequent phases of productive performance: creating and evaluating ideas. In other words, Nature has the ability to evoke creative thinking, enabling the person to become more flexible in the way of thinking and more able to get new ideas. In addition, it assists in the restoration of directed attention, which is fundamental in the evaluation, and evolution of ideas. The results indicate that Nature presents sensory dimensions that reveal to be of special importance for creative processes. Therefore, Nature has a high potential to stimulate inventiveness and imagination, and the

song "Grand Canyon Suite" by composer Ferde Grofé; Gaudí's "Sagrada Família"; the "Nature watercolors" of Mario Reis; the installations of Bob Verschueren; the relationship of Richard Long with the places/materials; and "a field after the harvest for aesthetic delight of our body" by Alberto Carneiro, are just some illustrations of Nature's power as a creative promoter.

Therefore, this article gives us indications on the importance of the relationship of experience with Nature, and its ability to evoke creative thinking. However, in this case, in the future, it is important to understand the impacts of these processes in the case of children. As mentioned above, the relationship between man and Nature reveals advantages in several aspects, and following this thought may be more effective in the context of children, who will be the subject of the next research.

Referências

- AMARANTE [Câmara Municipal de Amarante]. Alberto Carneiro: Grande Prémio Amadeu de Sousa-Cardoso. [S. l.], 2015.
- ATCHLEY, Ruth Ann; STRAYER, David L.; ATCHLEY, Paul. Creativity in the Wild: Improving Creative Reasoning through Immersion in Natural Settings. *PLoS ONE*, 7(12), p. 10-13, 2012.
- BAI, Heesoon; ELZA, Daniela; KOVACS, Peter; ROMANYCIA, Serenna. Re-searching and re-storying the complex and complicated relationship of biophilia and bibliophilia Re-searching and Re-storying the Complex and Complicated Relationship of Biophilia and Bibliophilia. *Environmental Education Research*, [s. l.], 16(3), 351-365, 2010. Retrieved from: https://www.researchgate.net/publication/248965513_Re-searching_and_re-storying_the_complex_and_complicated_relationship_of_biophilia_and_bibliophilia
- BANNING, Wendy; SULLIVAN, Ginny. *Lens on Outdoor Learning*. St. Paul, MN: Readleaf Press, 2010.
- FERRARO III, Frank M. Enhancement of Convergent Creativity Following a Multiday Wilderness Experience. *Ecopsycologie*, [s. l.], v. 7, n. 1, p. 7-11, Mar. 2015.
- FINCH, Ken; BAILIE, Patti Ensel. Nature Preschools: Putting Nature at the Heart of Early Childhood. *Occasional Paper Series*, [s. l.], n. 33, 2015
- GRANDE, John K. *Art nature dialogues: interviews with environmental artists*. New York: State University of New York, 2004.
- KELLERT, Stephen R. Nature and Childhood Development. In: *Building for Life: Designing and Understanding the Human-Nature Connection*. London: Island Press, 2005.
- LONG, Richard. *Walking in circles*. London: [s. n.], 1994.
- MEDNICK, Sarnoff. The associative basis of the creative process. *Psychological Review*, [s. l.], v. 69, n. 3, p. 220-232, 1962.
- MODESTO, Filipa. A osteologia na arquitetura de Gaudí: Casa Battló, Casa Milá, Parque Guëll, Colonia Guëll e Sagrada Família. 2014. Dissertação (Mestrado em Anatomia Artística) – Faculdade de Belas-Artes, Universidade de Lisboa, [s. l.], 2014.
- PLAMBECH, Trine; VAN DEN BOSCH, Cecil C. Konijnendijk. The impact of nature on creativity – A study among Danish creative professionals. *Urban Forestry & Urban Greening*, [s. l.], v. 14, n. 2, p. 255-263, 2015. Retrieved from: <http://dx.doi.org/10.1016/j.ufug.2015.02.006>.

SCHIAVONE, Theresa. *Grand Canyon Suite*. [s. l.], 2000. Retrieved from: <https://www.npr.org/2000/10/29/1113160/grand-canyon-suite?t=1579090605880&t=1579177828724>.

SIC NOTÍCIAS. Estudo prova que passar quatro dias na natureza sem tecnologias aumenta a criatividade em 50%. [s. l.], 2012. Retrieved from: <https://sicnoticias.pt/vida/2012-12-12-estudo-prova-que-passar-quatro-dias-na-natureza-sem-tecnologias-aumenta-criatividade-em-50>.

TOVEY, Helen. *Playing Outdoors: Spaces and Places, Risk and Challenge*. Maidenhead, England: Open University Press, 2007.

WHITE, Randy. *Young Children's Relationship with Nature: Its Importance to Children's Development & the Earth's Future*. [S. l.]: White Hutchinson, 2004. Retrieved from: <https://www.whitehutchinson.com/children/articles/childrennature.shtml>. Accessed: 25 Oct. 2020.