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Living and Playing in Nature: Daily Experiences of Tupinambá Children

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Abstract

In a contemporary context of material and symbolic distancing between people and nature and the urbanization of living spaces, researchers sounded the alarm about the nature deficit and negative consequences on child health and well-being. This research aimed to explore how nature is experienced during school by Tupinambá children, an ethnic group in Brazil. Starting from concepts such as biophilia, affordances, and place, we describe the research background of the Tupinambá, as well as their life context. We adopt a multi-method approach using photographic and interview records as well as participatory observations. Our results allow us to affirm that participants' daily school life promotes biophilia through outdoor activities and direct contact with nature. In nature, children perceive affordances through interactions with living beings and landscape elements. Traditional knowledge is shared in daily school life and teachers allow children to make their own discoveries in the natural environment. The Tupinambá experience can inspire schools in other contexts to carry out activities in nature and thus promote environmental awareness.

Keywords: children and nature, indigenous community, place attachment, biophilia, affordances

Introduction

In an urban and industrialized society, nature and human beings belong to distinct worlds; it is this concept that underlies the contemporary socio-environmental crisis. This divorce between nature and culture has made technological-scientific societies use living beings and ecosystem services as natural resources endowed with economic value. At the same time, traditional communities in developing countries that subsist and support their way of life and culture through nature are increasingly vulnerable to the expansion of cities and agricultural frontiers over forests. However, the urbanization of living environments is an issue that affects both industrialized countries and emergent ones such as Brazil. The UN predicts that by 2050 the world's urban population will reach 66 percent (UNFPA, 2017). According to a recent study, 70 percent of the Brazilian population already lives in urban areas (IBGE, 2013). People's daily lives, and particularly those of children, increasingly occur in closed, built environments with artificial lighting and climate control, populated by inanimate beings and electronic devices. Thus, the development and urbanization of Western industrialized societies confine children in houses and schools with limited opportunities for interaction with nature, its beings, and life processes.

Against this background of material and symbolic distancing between people and nature, over the last decades many childhood and human development researchers have sounded the alarm about the negative consequences on child health and well-being (Chawla, 1992; 2009; Soga & Gaston, 2016; Wells, 2000). Concepts such as biophilia (Wilson, 1984) and nature deficit (Louv, 2009) have inspired investigations about the child-nature connection. In short, this research contends that natural contexts offer interactive opportunities with living beings and processes that are fundamental to individual development. Moreover, the deprivation of this type of natural experience entails damage to both humans and nature itself. Without experiencing nature directly, and thinking about it only in terms of resources to be exploited, people feel less concerned about or committed to solving the serious environmental problems caused by the expansion of cities, such as the reduction of forests and the loss of socio-biodiversity.

With these ideas in mind, our research aimed to explore how nature is experienced by Tupinambá children during the school period. In the next section, we present the theoretical references that guide the field of child-nature research, as well as the concepts adopted in our work, namely: biophilia, affordances, and place attachment. Next, we describe the research background of the Tupinambá ethnic group in Brazil, as well as their life context in their socio-historical and environmental dimensions. In the methods section, we describe participants and procedures we adopted in our multi-method approach, using photographic and interview records as well as participatory observations. In the results and discussion sections, we share research data and discuss them from our theoretical perspective. In the conclusion, we consider the importance of promoting direct interactions between children and nature, especially during the school period.

Conceptual Framework

In the assessment of child-nature interaction, the concept of biophilia (Wilson, 1984) is often discussed in the literature of person-environment studies (Crain, 2011; Kellert & Wilson, 1993; Zhang, Goodale & Chen, 2014; Profice, Santos & Anjos, 2016). Biophilia refers to humans' attraction to living beings and natural elements and environments. Although conceived of as a human condition, biophilia happens through people's experiences (Vygotsky, 2010), especially through opportunities to interact with animals, plants, trees, forests, lakes, and beaches. Hence, we can assume that children who spend most of their time indoors with little or no contact with nature have their biophilia interrupted, or at least disturbed. In this scenario of nature deficit (Louv, 2009), children are deprived of contact with other living beings and tend to know them less, and are thus less knowledgeable about their protection. Alternatively, children who interact daily with the beings and elements of nature have their biophilia promoted, are aware of natural processes and cycles, tend to regard nature highly, and feel responsible for its protection.

The concept of affordances is also relevant to our discussion. Affordances are defined as properties in the environment that are recognized by animals, including humans, through their own bodily and mental equipment of interaction (Gibson, 1979). Under this perspective, children unveil ways to interact with other people, beings, and elements in their environments (natural or built). We can only find affordances when there is a body in an environment; we can never identify them separately, whether in the individual or the surroundings (Heft, 1988). In contexts of natural predominance, children perceive affordances according to their own physical and mental conditions; for example, for a small child, a tree can serve as shadow or shelter, while for an older one it can incite them to climb to get a fruit or simply to hang on. In this sense, outdoor free play is very relevant to promoting biophilia, enabling children to experience affordances in nature without objects or equipment; their own biophilic tendency guides their bodies to interact with living beings, processes, and natural elements.

Another important concept for our research is place attachment, that is, the positive bonds between people or with a particular location where well-being is experienced (Chawla, 1992). Children's place attachments, like affordances, are dependent on the characteristics of each individual or group as well as aspects of the environment. The experience of a place is carried in memory, through smells, sounds, light, textures, and sensations of well-being and safety or uneasiness and apprehension. All dimensions from the environment contribute to place attachment.

Children develop their attachment to nature as a place through their everyday, recurrent and meaningful experiences with living beings and natural processes. In conditions where interactions with natural beings and environments are limited and have little meaning for children, place attachment occurs in closed environments between walls populated by objects and unnatural processes. We can therefore articulate our conceptual references as follows: in life contexts where nature is present, biophilia is experienced—children know and affectively attach themselves to natural beings and elements, and are prone to protect them. Alternatively, in life

contexts with little nature, biophilia is interrupted—children do not create a positive attachment to the natural world and tend not to care about its protection.

Research Background

Although urbanization is a dominant global tendency, some communities continue to live in tight, direct, and daily contact with nature and its elements. Some of these are traditional communities that are local and indigenous, such as the Tupinambá. The land of the Tupinambá of Olivença is in Ilhéus, Bahia, in northeast Brazil. The Tupinambá were the first indigenous people in Brazil to have contact with European travelers and colonizers during the XVIth century. The way of life and cultural reality of the two groups were significantly different in terms of their traditions, political organization, religious rituals, and education. One of the main differences between the two cultures, with respect to how children are treated, was the fact that the indigenous culture did not exploit children for labor, nor did it inflict punishment or physical and verbal abuse on children (Fernandes, 1975).

Today, about 4,300 Tupinambá of Olivença Indians live in a community located in the municipalities of Ilhéus, Buerarema, and Una, in the state of Bahia. They live in a zone of the Brazilian Atlantic forest biome, which is highly threatened by the advances of urbanization and deforestation. In this context, in 2009, research groups led by the authors, the Socio Environmental Studies and Research Group from the Universidade Estadual de Santa Cruz and the Childhood, Ancestral Traditions, and Environment Culture Research Group from the Universidade Federal do Estado do Rio de Janeiro, in partnership with teachers and indigenous leaders, initiated a research effort that focused on the interaction between children and natural environments, and their outdoor activities during school time. As of 2014, the research team has carried out observations of the daily school routine of 10 branches of the Indigenous Tupinambá School of Olivença (CEITO) using a multimethod and participatory approach (Darbyshire, MacDougall, & Schiller, 2005). The school branches, except for the central school, are simple local buildings that are adapted to function as a school with multiple grades and multiple ages. The 10 branch schools were Sapucaeira, Katuana, Low Acuípe, Middle Acuípe I, Middle Acuípe II, Taba Jairi, Tukum, Serra Negra, Itapoã, and Mamão.

Method

Participants and Procedures

We conducted drawing sessions and interviews with 91 children aged 6 to 14 years. The mean age of the sample was 8.55 years *(SD* = 1.85 years), and 45 of them (49.5 percent) were girls, while 46 (50.5 percent) were boys. Outdoor school activities were videotaped and photographed. We also interviewed teachers, but these data are still being analyzed, and they will be presented in a future publication. The research team comprised the two authors of this work, as well as undergraduate and master's students.[1]

[1] All the ethical and institutional research protocols for studies with indigenous communities were adhered to, with ethical approval obtained from the National Council of Research

Like all the national indigenous schools, the CEITO's Political Pedagogical Project is guided by the National Indigenous Education Guidelines (MEC, 2012). According to these guidelines, the indigenous schools must do their best to respect community traditions, the knowledge shared through generations, and the traditional methods of educating that are specific to each group or ethnicity. These guidelines affirm that indigenous school education must be differentiated, bilingual, and specific to each group. Accordingly, and in consonance with the local context, a part of the everyday school routine at the CEITO is conducted outdoors, in direct interaction with the natural world. Further, 80 percent of the CEITO's teachers stated that they spent more than one hour per day outdoors within a four-hour school period, in the mornings or evenings. However, the teachers who participated in the present study were educated in conventional public schools, since at that time the regulation referred to above did not yet exist. For this reason, the indigenous schools used both Western educational practices and cultural activities in a local hybrid between the written, Western way of teaching and learning, and the oral transmission of traditional knowledge. As mentioned earlier, the Tupinambás were the first indigenous group to have contact with the European world in the 1500s. Consequently, they incorporated Western cultural and pedagogical features in their school practices.

The researchers visited each school branch twice. In the first session, children were instructed to draw pictures based on the theme "nature and the natural world around you." Each child received a square, blank sheet of paper (21cm × 21cm) and a box of 12 colored pencils. As they completed their drawings, they were interviewed by previously trained members of the research team. During these interviews, each child was first asked to describe their drawing and its elements. Then, the children answered five questions about their feelings and knowledge about nature: *What are your feelings about nature? What is the value of nature? What is good about nature? What is bad about nature? How should human beings' relationship with nature be?* At the end of the interview, we asked them questions related to indigenous belongingness and evaluation of the school. An analysis of these last questions has not been included in the present article.

Ethics. Free and informed voluntary participation forms were collected, as well as permission for use of the images.

Results and Discussion

Nature outside the School

Figure 1. Playing in the sand

(source: Research team)

During the school period, the teacher accompanied the children to a beach; the children climbed a hill and then slid down the sand (Figure 1). The ability of children to realize the playful affordances of their environment is evident here. Another relevant reflection is the low interference on the part of the adult educator, who observed the children but did not always participate actively in the game. The children belonged to multiple age groups, and they did not require equipment, paraphernalia, or industrialized toys to engage in play. The properties of sand and its arrangement showed the children what can be done: slide, climb, roll, run, sink, and build. Thus, this activity was direct, with little mediation, and without instructions or interference. The sand hill was high, and it allowed for a broad view of the Atlantic forest around it.

Figure 2. Swimming in the creek

(source: Research team)

While swimming in the river, the children had direct interaction with the water. Again, the game was nature itself; a tree branch was a trampoline, and it was possible to dive, swim, float, run, climb, and balance on the rocks (Figure 2). The children's perception of these affordances did result from an adult-centric and explanatory pedagogical orientation, characteristic of Western and urban schools. The central and organizing axis was nature itself, its elements, and their configuration. Children knew how to play and have fun there; they did not need guidance from the teacher. The educators were present, but they rarely interfered when monitoring the group. This is consistent with observations of how indigenous and traditional people educate and learn.

Figure 3 shows rope play outside the school. The children jumped as the teacher, who held one end of the rope, sang to mark a rhythm that accelerated progressively. In this image, it is evident that the school building and the outside premises did not have very precise borders; the outdoor spaces were an extension of the school, which are much ampler than its building, which is generally a very simple house with few comfortable furnishings.

Figure 3. Rope play in front of the school

Figure 4. Playing on a tree

(source: Research team)

A tree provided distinct affordances for children: climbing, hanging upside down, playing in groups under its shade, reaping its fruit, and looking up and down (Figure 4). In this way, nature also promotes group play, face-to-face interactions, peer negotiations, and the negotiation of rules. Again, adults did not need to interfere or set standards to prevent things from getting out of control. This allowed the children to self-organize. Indigenous school education guidelines demand that educators continually reflect on their practices, mediating school practices and experiences in nature, and placing themselves as facilitators of the teaching-learning process and not the protagonists. Among the indigenous educators, we did not observe panic about safety issues in the outdoor activities. The opposite happens in urban and conventional schools, in which children leaving a school building to experience nature is perceived to be difficult and risky. Indigenous teachers are attentive to the safety of all, yet they do not assume that a disaster, such as drowning, falling, or breaking a bone, is imminent. They are not terrified of the presence of animals and insects or of diseases and contamination. Outdoor school experiences allow children to observe nature, its elements, beings, and processes; such activities motivate movement, observation, contemplation, and cognitive curiosity. Our observations revealed a high degree of autonomy of movement in Tupinambá boys and girls; they moved around in groups or alone in the environment. The older ones took care of the younger ones, handling instruments that are not common in the hands of urban children, like knives and machetes.

What Children Feel and Know about Nature

Table 1 shows the frequency of the children's responses, distributed in categories defined from the analysis of the material itself. Children's responses to open-ended questions were grouped thematically by the researchers. Good feelings were expressed in 71.4 percent of the answers to the first question. Regarding the value of nature examined in the second question, it is clear that the children were aware of nature's direct importance in everyday life, guaranteeing ecosystem services (energy, water, and air) and human well-being (44.0 percent and 20.9 percent, respectively). The same trend was observed in the third question about what is good in nature. Children's responses most often included living beings, ecosystem resources and services, and responses related to human well-being. In their response to the question about what is bad in nature, children highlighted dangerous animals and poisonous plants (38.5 percent), followed by responses of "nothing" (40.7 percent).

Regarding the ideal relationship between humans and nature, most children (48.4 percent) were found to adopt a biocentric attitude, in which they favored other living beings in interactions with people. A further 31.9 percent of the children were interpreted to have an eco-centric attitude, in which human beings and other beings of nature must be mutually benefited through interactions. Finally, only 2.2 percent of the children were identified to have an anthropocentric attitude, in which humans have primacy over natural beings and processes and can make use of them indiscriminately. Finally, 17 percent of the responses were categorized as Indefinite/No response.

Table 1. Answer clusters from interview questions

What are your feelings about nature?	Good feelings	71.4%
	Bad feelings	2.2%
	Resources	3.3%
	Ethical/environmental concerns	13.2%
	Others/No answer	9.9%
	Total	**100%**
What is the value of nature?	Ecosystem resources and services	44%
	Human well-being	20.9%
	Environmental issues	8.8%
	Others/No answer	26.4%
	Total	**100%**
What is good in nature?	Animals, plants, and landscape elements	56%
	Resources, ecosystem services, and human well-being	25.3%
	Everything	8.8%
	Others/No answer	9.9%
	Total	**100%**
What is bad in nature?	Aggressive animals, poisons, dangerous plants, and natural disasters	38.5%
	Human behaviors that damage nature	5.5%
	Nothing	40.7%
	Others/No answer	15.3%
	Total	**100%**
How should human beings' relationship with nature be?	Biocentric	48.4%
	Eco-centric	31.9%
	Anthropocentric	2.2%
	Undefined/No answer	17.6%
	Total	**100%**

As demonstrated above, the questions asked in the interviews did not focus on the theme of play, but the words "to play" and "play" appeared spontaneously in 14.3 percent (n = 13) of the participating child interviews. In some interviews, even when the word "play" did not appear, it was possible to recognize that participation in the natural environment and its elements were part of the playful universe of children.

Eight-year-old Rilary, for example, included her home and her school, along with the river and a rock in her depiction of "nature" (Figure 5). The landscape includes natural elements that are in harmony. In spite of the absence of a human figure, the positive attachment to the place can be perceived by the anthropomorphism of the calm and smiling sun. In her interview, Rilary was able to associate nature with good experiences; pleasant affective memories; aesthetic pleasure; and important natural resources like water, solar energy, and wind; as well as a source of income like cocoa. The sun and the rain provide playfulness and enchantment (Table 2).

Figure 5. Rilary, 8 years old

Table 2. Interview of Rilary, 8 years old

What are your feelings about nature?	I think it's very beautiful. I like it. There's a place that goes from my grandmother's house to the beautiful beach; I think nature is beautiful.
What is the value of nature?	To make a house, to make a river with water, a tree is used to give an apple, to give fruit, and also gives the rain that gives water to drink, the sun to dry clothes, dry the cocoa to sell.
What is good in nature?	A house, a river, the sun to play, the rain that I also like to fill the tanks, that's it.
What is bad in nature?	To eat spoiled fruits, and to drink beach water. That is bad, and you cannot.
How should human beings' relationship with nature be?	Because people find nature to be beautiful; it has beautiful scenery and also has a lot of pretty things, tasty things, and fruits. Living in nature and having a lot of good things; live in nature too, because it is beautiful and very good.

Nine-year-old João Pedro's drawing (Figure 6) included the forest, his house, two rivers, bushes, clouds, the sun, fish, coconut trees, his parents holding hands, and the road. He explained that it was raining and the fish were swimming. Nature is omnipresent in his life; she is present in all forms and demands care and attention. According to him, there is nothing bad in nature. The smiling face of the sun completes the landscape that provides well-being and security. In his interview, he revealed his biophilic tendency and attachment to the natural world that surrounds him (Table 3). Planting and caring are activities that complement each other and are beneficial both to the people who feed on the plants and for the protection of nature.

Figure 6. João Pedro, 9 years old

Table 3. Interview of João Pedro, 9 years old

What are your feelings about nature?	We must take care, plant, and care with tenderness
What is the value of nature?	To plant stuff
What is good in nature?	There are plants and rivers
What is bad in nature?	Nothing
How should human beings' relationship with nature be?	It must be a relationship of love and care

Final Considerations

This study demonstrates how nature is experienced by Tupinambá children during the school period and their feelings about the natural world. Through the use of different methodological tools, it was possible to estimate the participants' biophilic

tendencies and to identify their play affordances, as well as their attachment to the natural place in which they live. Nature is ubiquitous in their lives, and Tupinambá children are aware of its importance in their daily life and well-being. This indicates how natural and human interests are shared in this community through their traditional knowledge. Like all low-income communities in Brazil, indigenous people experience the problems of a society with unjust income distribution. Health, transportation, and education public services are precarious. Teachers work for a minimum wage and rarely have opportunities for training. Despite this unfavorable social context, Tupinambá teachers recreate their pedagogy daily, integrating nature into their school practices, and thus strengthening children's biophilia and attachment to the natural place.

From our research, we can conclude that school, whether in traditional or urban communities and in emerging or industrialized countries, has an essential role in promoting child-nature interaction. It is in school that children spend much of their life and where socially relevant knowledge is shared. We cannot let this everyday experience be wasted in closed and lifeless environments, have teachers and students teaching and learning knowledge that reinforces the separation between people and nature. Schools need to go outside and include living things and natural processes in their own pedagogical dynamics. Children need free play opportunities in nature to promote their biophilia so that they develop attachment to living beings and the landscape. Future research should focus on theoretical deepening, methodological improvement and, if possible, on conducting longitudinal studies to identify the extent to which childhood experiences in nature strengthen biophilia and contribute to environmental awareness.

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