

Landscape Perception of Children Under the Age of 12 Living in Different Settings: A Systematic Review

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Abstract

Due to the increasing scale of urbanisation, the topic of natural landscape perception is receiving more and more attention. Children who live in the city experience significantly less contact with nature and, due to that, lose connection with it. Therefore, this study aims to determine how the landscape perception of children who live in urban areas differs from that of children who live in rural places. The main findings were obtained using a systematic analysis of the literature. The results of this study show that in rural areas, children often have more space, freedom, and opportunities to experience and get to know the natural landscape and understand its processes, while in cities, children lose their close connection with nature and are constantly exposed to adverse environmental factors. This deterioration of environmental conditions, pollution, and constant noise is already becoming a common phenomenon for children. There is a need to conduct deeper research to understand better how children perceive the natural environment and how it can help preserve a child's connection with nature in the cities.

Introduction

The perception of the landscape plays a crucial role in human lives and evolution. Even the European Landscape Convention (2000) [1] states that perception is an integral part of the landscape. Lapka and Sokolickova define that “there could be no landscape without any (culturally determined) perception of it” [2]. The authors also note that the landscape is the place where humans and nature interact [2]. The area of human perception of natural landscapes is attracting growing attention because of urbanisation: in 2050, 70 % of the world's population is expected to live in urban areas. In these areas, people, especially children, are becoming more and more isolated from nature; they lose their relation to it. However, the age of a human being plays an important role in the perception of the landscape: it is said that childhood is relevant for the perception of being an adult [3]; also, biophilic design has the greatest impact on children at an early age [4]. Therefore, it is very important to understand

how the landscape, especially the natural environment, is perceived by children. As Adams and Savahl note: “The natural environment, in particular, has been identified as a significant space that children engage in and explore, and has been shown to contribute positively to their well-being” [5, 291–292]. In many cases, city development ignores natural processes, cities are full of concrete, buildings, and automobile infrastructure [6]. Bratman, Daily, and Hamilton claim that “today, most people are experiencing significantly lower levels of daily contact with nature as compared to their parent's generation” [7, 119]. Cities are usually designed taking into account only the ergonomics and needs of adults. This means that children's needs are not met in these spaces. It is also increasingly recognised that urbanisation affects children's outdoor presence and activities. Rapid urbanisation, heavy traffic, risk of strangers, lack of safety, places full of garbage, noise, air pollution, and lack of purpose all contribute to the fact that children avoid outdoor activities [8]. Children who grew up in this environment already consider the ongoing processes

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natural. According to the authors, this process, in which the increasingly degraded environmental level becomes normal with each generation, is called “generational environmental amnesia” [9], [2]. This causes changes in our perception of landscape, particularly of natural areas. So, the aim of this study is to systematically review and analyse if there are any differences in children’s perception of the natural environment who live in rural, urban, and suburban settings. The main findings are obtained using literature systemic analysis. This paper has been divided into the following parts: the first section presents the methodology, and the second section – the research results. In the first part of the second section, based on the literature analysis, the basic data of the review and results are presented. The second part introduces the difference in landscape perception between children who live in rural areas and children who live in urban and suburban areas.

I. Methodology

The method of this study is based on a systematic review method. First, the research question was raised: How does the landscape perception of children under the age of 12 who live in urban areas differ from children who live in rural places? The search of relevant articles in the Scopus, Web of Science and Google Scholar databases was performed on 19 April 2024 using the following combination of keywords: “landscape perception” OR “environmental perception” OR “landscape awareness” OR “attitude to landscape” OR “sense of place” OR “make

sense of landscape” OR “assign meaning to environment” OR “experience spaces” AND children OR childhood OR “child behaviour” OR kids OR child AND urban OR “urban environment” OR rural OR town OR “natural spaces” OR natural OR village OR “green spaces” OR city OR cities OR nature. Inclusion criteria were peer-reviewed journal articles and research studies in English, and primary empirical research was presented. Articles should have been published between 2012 and 2024. The inclusion criteria of the research area were social and environmental sciences, education, arts, psychology, architecture and urban planning. According to these criteria, 2608 records were identified through database search. The Articles were analysed in the following stages: title review, abstract review, and full-text review. In the first stage, articles that did not match the title were rejected. 145 articles were identified for analysis. Also duplicates of articles from different databases were removed with the RefWorks tool. After this, 114 articles were left for screening. In the second stage, articles whose results presented in the abstracts do not correspond to the research question, and articles and studies focused on age groups over 12 years old were rejected. 46 articles were excluded after noncompliance with the criteria. In the third stage, 30 articles that present non-empirical quantitative research results, articles that are not freely available, and articles that do not clarify the perception of children on the landscape were excluded. According to the established selection criteria, 24 publications were included in the systematic review. The results of the article search in databases are presented in Fig. 1 as a PRISMA flow diagram [10].

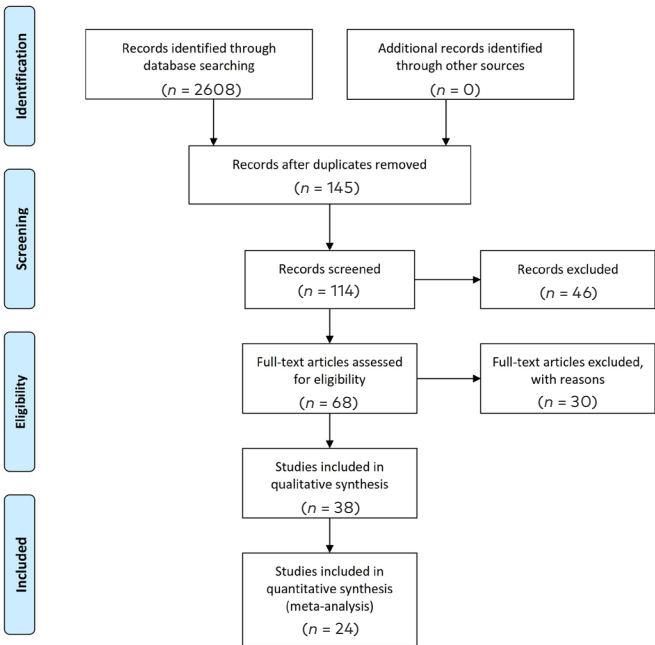


Fig. 1. PRISMA flow diagram introducing the results of the search and screening (prepared by authors according to [10]).

II. Results

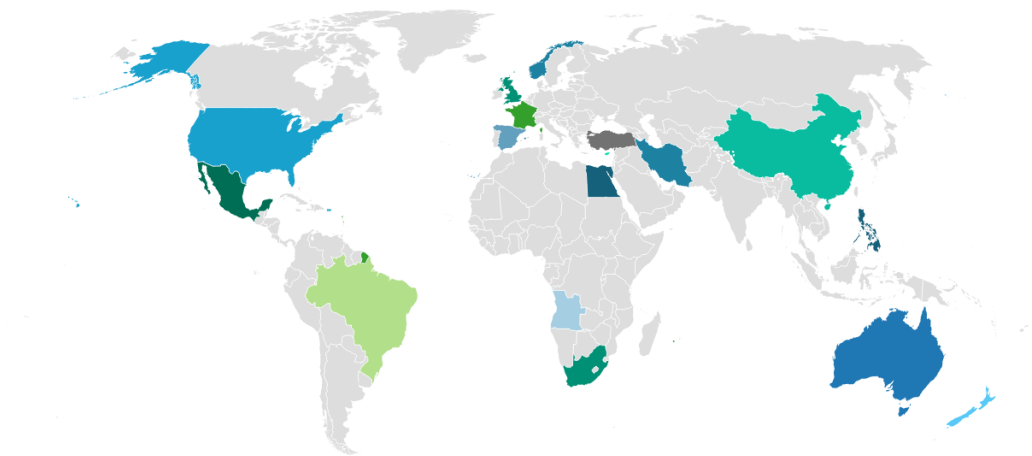
A. Basic Data of Review and Results

The geographical scope of the conducted research that analysed children’s perception covered the entire world (see Fig. 2). Most of the research was done in Brazil. The ages of the children in the studies ranged between 3 and 12 years. Some of the children who participated in the research lived in rural settings, coastal settings [11], villages, or small towns [12], [13], [14]. The other part lived in typical urban environments surrounded by buildings or in suburbs and the peripheries of the city [5], [15]. Some studies were carried out in two settings, both rural and urban areas [11], [16]. In these publications, it was analysed how children perceive the natural environment while living in different landscapes.

To understand how children perceive these environments, the researchers used verbal and visual methods (Table I). Sixteen studies used both verbal and visual methods, three used only verbal methods, and five used only visual methods. Visual methods mainly involve

Angola Australia Brazil France Malta Mexico New Zealand Norway
Philippines South Africa Spain Turkey United Kingdom China Cyprus Arab
Republic of Egypt Islamic Republic of Iran United States of America

Fig. 2. Geographical coverage of studies (different colours indicate countries where the perception of the landscape by children was analysed) [created by authors].



drawing, which was used in fifteen studies. Other visual methods used in the studies were mapping and the photo-projective method. Surveys, individual interviews with children, and group discussions were used for verbal methods.

The authors claim that “drawing is an effective language” [17], [18], especially in the first years of life, when it is easier for a child to express his thoughts, feelings, and ideas without limitations [19]. It is often easier for children to express their understanding in drawing than in words; it is a usual, relaxing activity for them and often does not require too much effort. Visual and verbal methods interact when asking children to explain their drawings in words [15]. However, it is often difficult for a child to express his thoughts in words due to a lack of knowledge or time [19]. As stated by Cubukcu, Yavasa, and Kahraman, verbal methods often fail to attract the attention and interest of children because they dislike answering long questions. On the other hand, children enjoy participating in tasks such as drawing, which are less demanding and are also easier to complete” [16, 862]. In addition, visual methods such as photography and drawing are considered as sources of creativity and imagination, thereby developing new ideas [20], [17], [18].

B. Differences in Landscape Perception

Both in urban and rural areas, children “indicated a preference to pristine nature”; they perceive nature as consisting of elements of flora and fauna [21, 1145]. As stated by Profice, the drawings of children who grow up in a natural environment are more vivid than those living in the city. There was also more animism in their drawings. As noted in Alexander’s research, children living in the city also depict animals less often than children from the countryside (67.6 % and 78.8 %) [12].

Alexander, Cocks, and Shackleton, in their research, write that vegetation is an important element in children’s drawings too; it is depicted by both children living in the countryside (97.8 %) and those living in the city (91.2 %). Pedrosa and other researchers found that children living in rural areas valued the benefits of the natural environment, such as fruits, fresh air, and plants that can cure diseases. They also positively assessed the possibility of connecting nature and school lessons that teach about nature, birds or animals. They evaluated the natural environment negatively due to attacks by wild animals and crimes. Children expressed that they lacked infrastructure, such as lighting, to improve security conditions and support.

Water was also an important element of the landscape for these children. Children evaluated this environment in terms of accessibility and pleasant activities near the water. Alexander’s research found that children living in villages choose rivers as a favourite and important place. In urban spaces, children also prefer playgrounds and green spaces, especially with water [8]. Water is also important for children because it “promotes the creation and imagination that help in affording more constructive play” [17], [18].

Although, according to Sanchis, Ferrandis, and Gómez, children value natural spaces as important in their environment, children living in the city also depict the urban environment more often in their drawings. According to the authors, the reason for this might be that the children spend most of their time in cities, so even when other natural areas are close by, they are not aware of them and don’t feel like they belong there. Bodenhorn and Lee indicate that children who have deep knowledge of their residential area also have a strong attachment to it.

Children who live in the city also often depicted imaginary elements of nature in their drawings, and more often depicted machines [22]. They found “street trees,

TABLE I
Methods and Purposes of the Research Analysing Children's Perception of Natural Landscape [created by authors]

No.	Reference No.	Method type	Method used in research	The type of landscape of children's living place	The main purpose of the research
1.	4	Visual	Drawings	Rural areas	To analyse children's perceptions of the natural environment
2.	5	Verbal	Structural Equation Modelling (SEM) and Confirmatory Factor Analysis (CFA), a cross-sectional survey	Rural areas	To analyse the relationship between children's perceptions of the natural environment and well-being
3.	8	Visual	Web-based participatory mapping techniques	Urban areas	To identify play places and perceptions about them
4.	9	Verbal and visual	Drawing, individual discussions	Rural areas	To evaluate children's environmental perceptions of the ecological characteristics
5.	11	Verbal and visual	Drawing, interview	Urban and rural areas	To evaluate children's perception of natural environments in different settings
6.	12	Verbal and visual	Drawing, cultural mapping and storytelling sessions	Rural areas	To establish the factors influencing children's environmental use
7.	13	Verbal and visual	Photographs, individual discussions	Rural areas	To evaluate children's sense of place
8.	14	Verbal and visual	A questionnaire and Photo-Projective Method (PPM)	Rural areas	To evaluate children's perception of the neighbourhood environment for outdoor activities
9.	15	Verbal and visual	Conversations and drawings	Urban and rural areas	To analyse children's environmental perceptions
10.	16	Verbal and visual	Verbal (questionnaires, interviews, focus group discussions) and visual methods (sketch drawings, maps, photographs, etc.)	Urban and rural areas	To evaluate children's perception of natural environments living in different settings
11.	17	Verbal and visual	Drawings, photographs, and sound recordings	Urban and suburban areas	To evaluate children's perceptions of the environment and analyse the impact of natural urban design on play behaviour
12.	18	Visual	Behavioural observations, drawing and photographs	Urban areas	To analyse the impact of urban design on play behaviour and child development
13.	19	Visual	Drawings	Rural areas	To analyse children's perceptions of the natural environment.
14.	20	Verbal and visual	Photovoice	Suburban areas	To evaluate children's sense of place
15.	21	Verbal and visual	Drawings, interviews	Rural areas	To analyse children's environmental perceptions
16.	22	Verbal	Interview	Urban areas	To evaluate children's landmark recognition and outdoor space preferences
17.	23	Visual	Space syntax, drawing	Urban areas	To analyse the gender and socioeconomic status impact on children's environmental perceptions
18.	24	Verbal	A questionnaire, interviews	Urban areas	To analyse territorial psychology and behaviour of children
19.	26	Verbal and visual	Guided tours, field conversations, drawings and constructive play using Lego	Urban areas	To establish the characteristics of a child-friendly city
20.	27	Verbal and visual	Photo-taking tours, photo-elicited interviews, interview-elicited drawings	Suburban areas	To analyse children's ideas about the design of a new inclusive centre
21.	28	Verbal and visual	Walks with children, interviews – conversations	Urban and rural areas	To evaluate children's sense and fear of place
22.	29	Verbal and visual	Mental mapping and focus-group interviews	Urban areas	To evaluate children's environmental perceptions
23.	30	Verbal and visual	Drawings and interviews	Suburban areas	To evaluate children's perceptions and suggestions for improving green spaces
24.	31	Verbal and visual	Drawings and interviews	Urban and rural areas	To analyse children's perceptions of the natural environment

scenery and curvilinear forms” attractive [14]. Some of the children evaluated the streets positively “because when rain falls, it becomes a big puddle” [14, 437]; they can ride a bicycle, scooter, or skate. They also like streets with sidewalks and crosswalks. At the same time, children wanted wider and safer streets with fewer cars in their environment. In the studies conducted by Bolzan-de-Campos, Fedrizzi, and Santos-Almeida, it can be seen that children living in the city depicted nature in a similar way to children living in the countryside. According to the authors, this may be due to the fact that in Brazil, children from the age of six have environmental lessons.

In the research conducted by Cubuck, Yavasa, and Kahraman, it was found that children who live in the city drew school grounds and soccer fields as their activity zones, while children who live in the countryside drew open fields in front of their houses. The authors claim that rural children have the opportunity to use larger areas. The city was depicted as denser, with more physical limitations. Li says that children’s perception of the landscape is influenced by things such as traffic safety, low car intensity, wide streets and dead ends [14].

Children who live in the countryside spend more time outdoors, close to home, and are also more likely to be alone or only with their peers [16]. Rural children have more opportunities for independent mobility. The school space also limits children’s perception [22]. For this reason, city children tend to draw apartments rather than houses like country children. Urban children also often draw closed places, such as a swimming pool or sports hall, while rural children more often depict open places [16].

Research also shows that children are generally only familiar with the close surroundings of their home and school environment [22]. Children like a safe and playable environment. Such spaces, according to Li, are more accessible in traditional neighbourhoods. Although city children appreciated the accessibility of the city and the opportunities to ride a bicycle, they rarely walked in the city without their parents, and unlike rural children, they spent most of their time at home. This and the fact that “children as they live in a gated community, an artificially designed environment with planned recreational activity areas for children” leads to children depicting their environment as if they were observing it only through the window of the room [23, 254].

C. The Preference for Landscape

Despite the differences in landscape perception, both rural and urban children prefer natural spaces in the first place, thus spreading biophilic feelings [24], [8]. Only children who live surrounded by the natural environment, in rural areas, unlike children living in the city, have greater opportunity to better understand the elements and processes of nature [15]. This experience, compared

to urban children, leads to the fact that “children from rural settings, who have more proximal experiences of nature, when compared to urban children display a less anthropocentric response pattern” [11, 188].

Elnesr also points out that children value not only the appearance or characteristics of a particular place. Children also evaluate the environment emotionally, so they may not like a particular place because of the way they feel. Therefore, safety is one of the most important aspects of choosing places for children. It is important that places must be close to home; children avoid places in surrounding areas of cities and prefer places where they can meet people they know: “*It’s close to my home, so I won’t be lost. And my parents say it is safe to play close to home.*” [8, 874]. The children evaluated the landscape according to safety criteria and found a safe environment the most attractive [25]. Research shows that free-roaming pets also provide security for children; they “photographed the free-roaming chickens, pigs, and dogs as an important feature of their community” [13, 394]. The rural environment was also seen as a safe environment for children [12]. Children who live in the city also prefer natural places such as parks and open spaces.

Children who had more access to the forest chose it as their favourite place [12]. Research shows that children who lived in the village positively evaluated the forest environment, which is tranquil and beautiful. They evaluated this environment according to the opportunities to play in it, climb trees, or just play with friends [14]. Boys rated the forest as an important place more than girls, who often rated the forest as a dangerous place. Densely forested areas were associated with dangers. According to researchers Bodenhorn and Lee, although it is fun to spend time in the forest during the day, the forest at night can make children afraid of spirits or other mythological creatures.

Children who live in different types of landscapes also prefer different spaces. Children living in villages are more likely to choose open spaces, whereas children in cities are more likely to choose road spaces [21]. They also prefer places that are close to their homes, visually attractive and vibrant. For city children, it is important that the places are interesting with programs and events, where they can meet friends and visit with family [8]. In rural areas, children usually use spaces for games, most often hiding places, for adventures and experiences. The authors claim that children living in different environments have different options for choosing space, the types of games, the frequency and duration of being outdoors, and the purpose of using the territory [24]. All this leads to a different perception of the environment.

However, as shown by the studies analysing children’s perceptions, children want to participate in shaping the environment in which they live and spend time. Children who live in the city are led by the desire to have their own

space [9], [21]. The need for one's own space arises from the desire to play hide and seek, have private conversations, have space to express one's feelings and personal time and have the opportunity to be alone. It is also important for children to have excitement and adventure as well [21].

Research also shows that it is important for children to have natural spaces where they have opportunities to play creative and complex games and spend time safely with their families [26]. Children are attracted to natural spaces where there is freedom and the opportunity to choose a game that is not pre-planned, as well as to engage in barefoot activities, such as wading in the water and running on the grass [17], [18]. In the studies by Bodenhorn and Lee, children also mentioned that they like certain spaces where they can do what they want. Children expressed the need to run, move freely, observe the environment, and walk through tunnels [27]. According to Elnesr and Said, children often depicted and highlighted elements in their drawings where they could test their skills – climbing a tree, playing with pebbles, plants, and domestic animals, and exploring insects.

The environment is also important for children to cope with physical challenges such as climbing, crawling, sliding, and nature exploration [26]. It is also noticed that children preferred authentic, not artificially created environments, as well as hiding places, small and closed spaces where they could play without constant adult supervision, and places where rules, routines and planned activities are reduced to a minimum.

Elnesr indicates that *“children seem to understand space as segmented places and do not perceive them as a whole”*. According to researchers, children evaluate the environment according to the elements in it that can be played with and according to the possibility of adapting the environment to the game, so *“every spatial typology is associated with a specific play pattern”* in the city [18].

Conclusions

According to the reviewed literature, children have a unique perspective on their surroundings. They often perceive and evaluate the landscape through opportunities for action and play. Analysis of different studies shows that the child's living environment affects his/her perception and determines the perception of the natural landscape and his/her connection with it.

The literature analysis shows that children who have more opportunities to be in the natural environment have better possibilities to identify themselves with nature and forests, are more aware of natural processes, are more in favour of nature, and have fewer anthropocentric response patterns. Children who live in rural areas have more time to

use open and larger natural spaces and more opportunities for independent mobility. Rural children, especially boys, tend to value forests more highly, while girls may bring different elements from the forest into their homes, e.g., plants, etc. In contrast, an urban living environment can limit a child's exposure to public spaces and force him/her indoors.

Previous studies have shown that regular interaction with nature leads to positive connections with the environment. Nowadays, childhood in urban settings is pushed into private spaces and away from the streets and public spaces. Urbanisation changes children's perception – the spaces they perceive are getting smaller and smaller. Limits appear in perception, and high building densities, edges, boundaries, and fragments appear in pictures. Recent studies reveal that urban children, particularly girls, tend to lose their connection with nature.

Detailing the perception differences, these findings suggest that both city and rural children consider water and vegetation as important elements of the natural landscape, but the nature of these landscape components is different as in an urban environment, children interact more with man-made elements and in a rural setting, children have easy access to natural surroundings. Understanding of environmental safety is similar to the city and rural children, and the natural environment is considered safe, but city children consider civilised nature safer than the wild one. It can be stated that children who live in the rural setting evaluate their environment according to the possibility of social relations, while children who live in the city – according to the physical characteristics of the environment. Furthermore, children living in the city choose closed spaces for outdoor activities while children in the countryside are more likely to choose open spaces.

The review of the literature also revealed the variety of methods used for analysing children's perceptions of natural landscapes. Although it is claimed that it is easier, simpler, and clearer for children to draw, our research of different methods used shows that interviews and conversations can provide more valuable and deeper information about how children perceive their environment, how they feel in it, and what fears they have, especially in an informal environment when hiking. In addition, it can be understood that movement, such as climbing and active exploration of nature, is very important for children's perception and knowledge of the environment on a walking trip. Studies also show that it can be difficult for children to evaluate a place without being there.

More research is needed to better understand children's perceptions of natural landscapes and environments, particularly to assess the impact of different sociocultural factors. Such studies can help preserve a child's connection with nature.

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