

GREEN DESIGN EFFECT ON HUMANS

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Abstract

Testing nature's impact on people with experiments like replacing bold geometrics with abstracted nature forms in the interior, hanging on walls pictures of trees and water. Limited amount of nature and forcing humans to stare at wall has impact on people, their complications and taking pain medication. Limited amount of wildness and greener settings nonetheless has a marked impact on children living nearby. Nature doesn't just have an effect on the mind. Nature helps the body. Views from windows have effects on people. Architects should work as sculptors. Leaving signature in nature and landscape. The green landscape is not what most people would call green. This paper is not talking only about isolated pockets of green containing just grass and a tree. Modern architecture has profound implications for human health and behavior. Small amounts of noise, lack of water can be harmful. City planners, architects and the others need to pay more attention to this. Instead of heading to the wildness, new city design should be giving the inhabitants easy access to the surrounding countryside, close gardens, vertical parks, non-expected wild areas. Facilities should incorporate such features as nature views and nature related areas. Aquariums, atriums with greenery and fountains, gardens where people can find relief. The goal of this paper is to determine whether nature can help mitigate the negative impact of living in bleak, urban environments. Achieving this is simply naturalizing places we live in.

Key words

Adults; children; disease; disorder; green; workplace

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1 INTRODUCTION

Encountering with nature, alleviating mental fatigue. is kind of relaxing and restoring mind. Green spaces are settings for cognitive respite, encouraging social interaction and de-stressing through exercise or conversation. Green spaces provide calming settings. Burying architecture, covering it with vegetation represents a layer of earth serving as insulation. Allowing nature to return to its rightful place on a given site, bringing nature into city means providing relief from an otherwise artificial environment.

Having quality landscaping and vegetation in and around the places where people live is a good investment. Being within green space helps to restore the mind's ability to focus. This means improving job and school performance, helping alleviate mental stress and disease, having new natural places for sports, leisure having fun and relax.

The paper focuses on differences between people living and working in buildings surrounded by barren concrete and limited amount of nature and people living near a green spot. The aim of this paper is to examine nature's impact on people with psychological disease and children with different disorders. The paper focuses on nature healing also body, not only mind.

Aim of this paper is pointing at the balance between artificial and natural environment when it comes to designing cities for people living, working and raising children in it.

2 METHODS

While working on masterplans, city planners, architects and designers must keep in mind placing green areas, parks, gardens, spots for rest in cities. Christian Norberg-Schulz in his book *Genius loci* claims: *"Man dwells when he can orient himself within and identify himself with an environment or, in short, when he can experience the environment meaningful. Dwelling therefore implies more than 'shelter'. It implies that the space where life occurs are places in the true sense of the world. A place is a space which has a distinct character"* [1]. Key factor of designing a space with distinct character nowadays is designing healthy cities. Integrating nature into dwelling, covering buildings in plants, designing and constructing vegetative roofs, living walls, implementing green policies, people interacting in places they live, designing polyfunctional buildings offering many different activities, lots of entertainment (Fig. 1) for children, seniors, healthy people, people with mental disorders, giving them free places, hidden places to relax (Fig. 2), eat, shop, drink, have fun, relax.

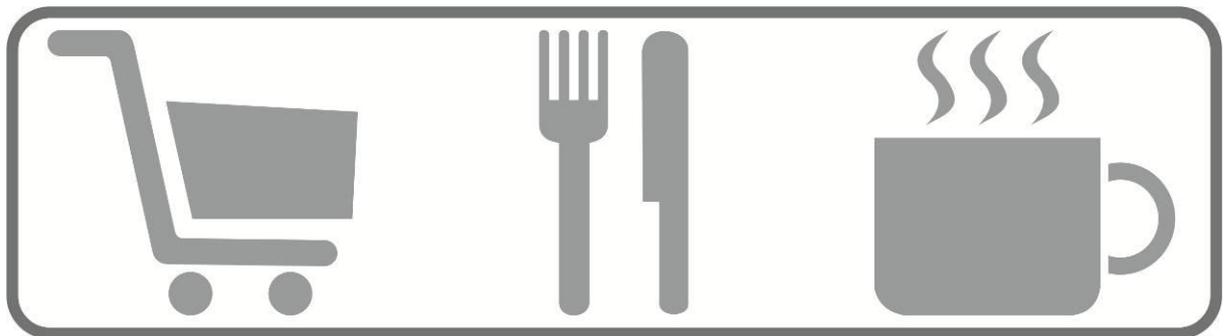


Fig. 1: Entertainment

Same places, uniformity (Fig.3), alike town parts can be mentally exhausting for people living in the city and can actually dull our thinking and mental abilities. *"It's not an accident that Central Park is in the middle of Manhattan. They needed to put a park there."* [2]. Outdoor environment must constantly monitor traffic lines and pedestrian lines, focus on where is it

leading and what is going to be at final point when we get there. The city cannot be same everywhere. Nature is a tool that must be used in this “game”.

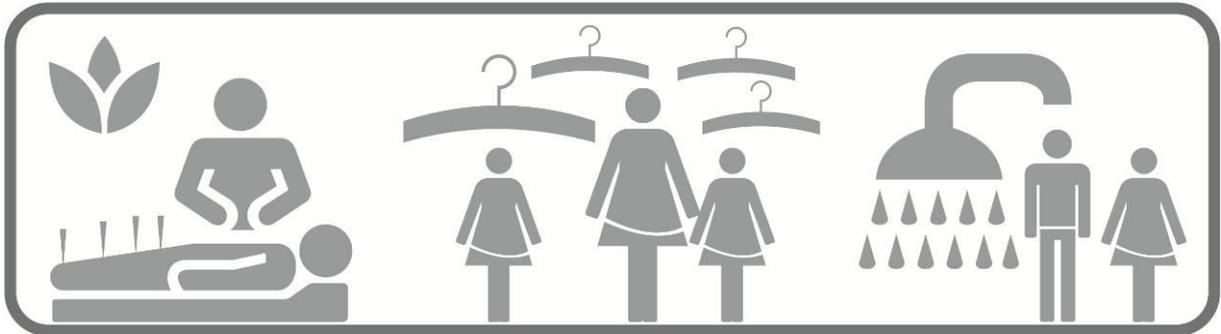


Fig. 2: Relax

Brief glimpse of nature, quick look at tree, ability to touch a flower improve brain performance by providing a cognitive break from the complex demands of urban life [2].

Immediate environment can prompt subconscious effects. Positive and negative. A glance at a building or some object resembling some animal, a snake may cause fear response. Similarly, a glance at nature, plants, flowers may cause subconsciously impact, when the brain responds in positive way.



Fig. 3: Uniformity

At work, people need to focus their attention on crucial information, tasks. At school, students and children need to focus their attention on presentations and education. Comparing memory retention in people viewing low versus high fascination scenes in built and natural environments, people viewing natural environments perform significantly better. The addition of natural features significantly improves attention [3].

Passive strategies used across the globe for centuries are a logical and economic response to the environmental conditions of the building. Such as temperature, orientation and the wind in the area. You can also take an advantage of the orthography to thermally regulate the interior spaces or use materials with high thermal mass and insulating capacity [4].

French-Swiss architect Philippe Rahm has begun to make a career out of imagining architectural environment in which fundamental factors such as the oxygen content of the air are modified with an aim to alter the physical states of visitors. His latest scheme called Digestible Gulf Stream is a small residence in which one level is maintained at 12°C and the other at 28°C. Since these are calculated to be the two extremes that are considered “comfortable” by most people. He maintains that air conditioning, heating and other forms of architectural environmental controls are systematically geared to maintain a “normal” set of conditions that few people ever bother to question unless they are uncomfortable. He says, on

the contrary, that it is precisely by challenging these norms that architecture can branch off into new directions, fundamentally related to physiology. He also experiments with the idea that edible substances like mint (Fig. 4) can create a sensation of cooling that is unrelated to the usual set of refrigerating machinery that hums out sight and out of mind in just about all modern buildings [5].

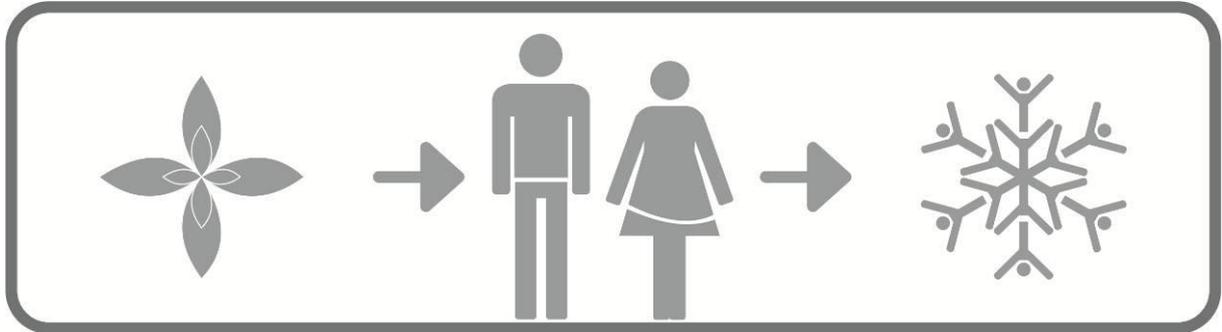


Fig. 4: Mint creating cooling

3 RESULTS

Workplace

Nature experience helps restoring mind from mental fatigue, work, studies etc. Experience of nature green and fresh air contributes to improve work performance and satisfaction [6,7,8]. One of the main forces at work is a stark lack of nature (Fig.5), which is surprisingly beneficial for the brain. When a park is properly designed, it can improve the function of the brain within minutes. Looking at a natural scene can lead to higher scores on tests of attention and memory. While people search for ways to improve cognitive performance from doping themselves with Red Bull, it appears that it is not as effective as simply taking a walk in a natural place [2].

Office workers claim that plants make work environment more attractive and pleasant. Plants and nature views have impact on work performance. In one study, people in windowless spaces compared to people in workplaces with windows brought twice as many nature elements to their work areas. Studies shown improvement of employee morale, decreasing absenteeism, increasing worker's efficiency [9,10]. Having plants within view decreases both disease incidence and the amount of self-reported sick leave. One study found that workers with workstation views that included green elements were more satisfied at work and had more patience, less frustration, increased enthusiasm for work, and fewer health problems [7]. Not having nature views or indoor plants are associated with higher levels of tension and anxiety in office workers [11].

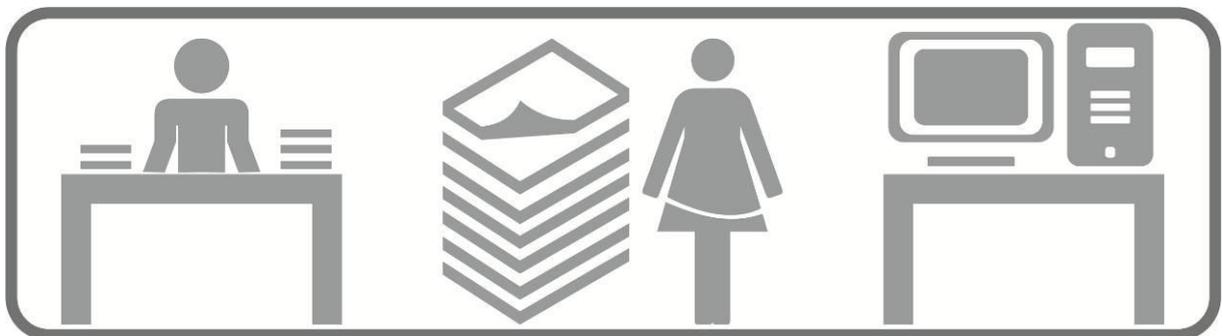


Fig. 5: Working

Physical activities (Fig. 6) are so needed these days. Bringing natural surfaces to the cities provides necessary places and opportunities for physical activity, exercise. Exercise improves cognitive function, learning, and memory [12].



Fig. 6: Sports

Children

Lately, children have fewer opportunities to go out and play. On the other hand, modern children do not have that much enthusiasm about going out, playing, having fun in the exterior, going to nature. There are some schools and kindergartens providing nature experiences during classes, school trips and holidays hoping to achieve affects on learning and mental health.

Urban dwellings providing necessary natural and wild places as parks, walkways, promenades, roof gardens on tops of buildings assure calming and inspiring environments. This kind of city design encourages learning, inquisitiveness, and alertness [13]. Children who tend to have a close contact with nature develop cognitive, emotional, and behavioral connections to their nearby social and biophysical environments. Experiencing nature is very important for encouraging their imagination and creativity, but also cognitive and intellectual development, and social relationships (Fig.7) [14,15]. Adding plants to computer lab and making them participating in a nature walks makes students more productive, less stressed, more concentrated. They tend to be more creative compared to those students who go for an urban walk and have artificial empty room [16].

Younger children often use outdoor settings having plants, stones, and sticks as props for imaginative play, which is the key to social and cognitive development. One study of children's play found that a cluster of shrubs was the most popular place to play on an elementary schoolyard because it could be transformed into many imaginary places: a house, spaceship, etc. [15].

"We see the picture of the busy street, and we automatically imagine what it's like to be there. And that's when your ability to pay attention starts to suffer." This also helps explain why, according to several studies, children with attention-deficit disorder have fewer symptoms in natural settings. When surrounded by trees and animals, they are less likely to have behavioral problems and are better able to focus on a particular task [2].

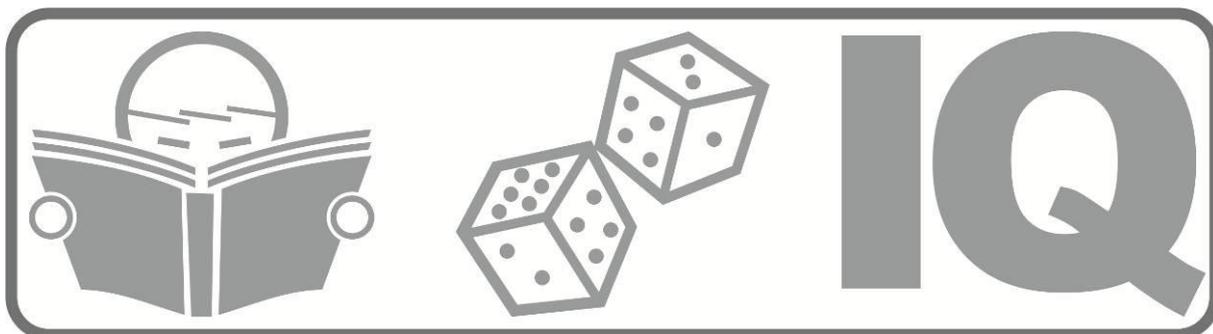


Fig. 7: Education

Child behavior disorders – ADD, ADHD

Human's brain is the only organ in human's body undergoing substantial maturation after birth. This process is shaped by stimuli in our surrounding, environment we are living in [17]. The process lasts whole human's life. Positive and negative conditions are shaping our brain. Natural environment evokes positive emotions, facilitate cognitive functioning, and promote recovery from mental fatigue for people who are in good mental health. The experience of nature (Fig. 8) can also provide respite for those who experience short-term and chronic mental disease [17].

Over 2 million children in the U.S. have been diagnosed with Attention Deficit Disorder (ADD), a condition that has detrimental effects on social, cognitive, and psychological growth. Symptoms of ADD in children can be reduced through activity in green settings, thus "green time" can act as an effective supplement to traditional medicinal and behavioral treatments. Children who played in windowless indoor settings had significantly more severe symptoms than those who played in grassy, outdoor spaces with or without trees [18,19,20]. Studies have demonstrated, for instance, that hospital patients recover more quickly when they can see trees from their windows, and that women living in public housing are better able to focus when their apartment overlooks a grassy courtyard. Even these fleeting glimpses of nature improve brain performance, it seems, because they provide a mental break from the urban roil [2].

In another study, children diagnosed with Attention Deficit Hyperactivity Disorder (ADHD) performed better on an objective concentration test after exposure to a relatively natural urban setting as compared to a less natural urban petting [20].

According to all these facts and studies, children living in greener settings are richer. The ability to go out, play in the water, stare at animals, feed and touch them, climb the trees is something no one can give to a child staring at computer playing game or talking to a friend on facebook.

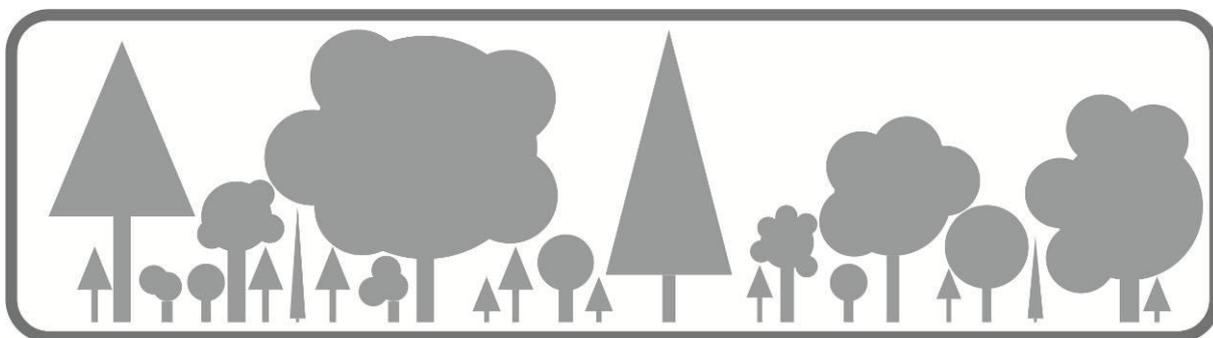


Fig. 8: Nature

Adult diseases – Dementia, Alzheimer, MDD, Stress, Depression

Dementia patients with access to outdoor places, gardens, parks etc. that are designed to positively stimulate the senses and promote positive memories and emotions are less likely to express negative reactions and fits of anger. Better sleep patterns, improved hormone balance, decreased agitation and aggressive behavior have all been observed in dementia patients in association with contact with nature and the outdoors [21].

Nature experiences provide mental health benefits for the elderly as well. Alzheimer is a type of dementia that causes memory impairment, intellectual decline, temporal and spatial disorientation, impaired ability to communicate and make logical decisions, and decreased tolerance to high and moderate levels of stimulation. Certain environments can provide prosthetic support for dementia patients to compensate for their reduced cognitive capabilities. For example, spaces that have dead-ends or are crowded can increase frustration and anxiety in Alzheimer's-diagnosed residents. Supportive outdoor spaces include these design features: looped pathways, tree groves or sites to act as landmarks for orientation, non-toxic plants, seating areas with the suggestion of privacy and use of low-key fragrances and colors to soothe, rather than negatively stimulate, the patient [22].

Major depression disorder (MDD) also occurs at any age and can be helped through improved social connections and exercise. Both of which are promoted by having nearby green outdoor spaces. In one study, 71% of people found a reduction in depression after going on an outdoor walk versus a 45% reduction by those who went on an indoor walk. Another study investigated MDD and found that an exercise program can be just as effective as antidepressants in reducing depression among patients. The value of green spaces in encouraging exercise is relevant to treating depression symptoms [23].

Loss of concentration and distractibility in patients experiencing serious diseases are noted (Fig. 9). Studies have tested the correlation between stress and cognitive function under various conditions in women diagnosed with breast cancer. Participation in activities interacting with natural environments showed ameliorating and helping stave off mental fatigue. Before and after breast cancer treatment or surgery [21].

In study, the effect of views from windows on patients recovering from abdominal surgery were investigated. Patients whose hospital rooms overlooked trees had an easier time recovering than those whose rooms overlooked brick walls. Patients able to see nature got out of the hospital faster, had fewer complications and required less pain medication than those forced to stare at a wall. Simply viewing representations of nature can help. In a study at a Swedish hospital, heart surgery patients in intensive care units could reduce their anxiety and need for pain medication by looking at pictures depicting trees and water [23].

These and other findings form the guidelines for designers of health-care facilities. To soothe patients, families and employees, facilities should incorporate such features as nature views and nature-related art in patients' rooms, aquariums in waiting areas, atria with greenery and fountains and gardens where patients, family and staff can find relief [24].

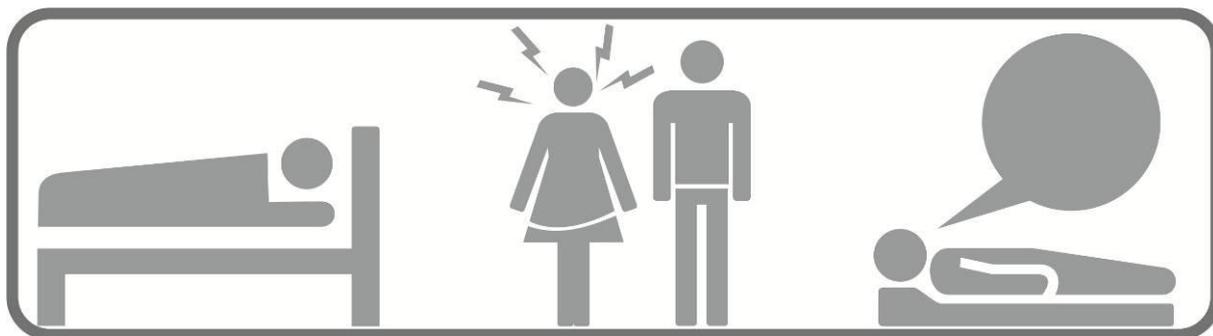


Fig. 9: Mental diseases

Stress and depression can occur any time in life. Stress is usually a response to physical, psychological and social changes. Death of someone related to the person, disease, mental health, financial troubles. Many studies have shown that park decrease stress levels and improved moods. The longer participants stay in a park, the less stress they exhibit [25].

Outdoor activities can help alleviate symptoms of Alzheimer, dementia, stress, and depression and improve cognitive function in those recently diagnosed with breast cancer. Quality of life of these patients is achieved by giving them access to gardens and nature.

4 DISCUSSION

Green spaces, community gardens, green roofs, places close to living walls, shade of a large tree or any kinds of parks and landscape architecture found in a concrete city encourage social contact by serving as meeting points for groups, individuals sharing same activities and having common needs. Green spaces work as natural free therapy respite from stresses. Green spaces in close proximity to homes encourage exercise, give people opportunities to go out for a run, for a walk with kids or the dog, nearby green areas improve mental health of people visiting the park or even for people staring at it through the window. As described earlier, studies indicate that having views of nearby nature, living, working and going to school within green spaces can improve worker productivity, focusing on presentations and education at school during classes, reduce stress, improve school performance, lessen the symptoms of child diseases such as ADD and ADHD. Useable and safely accessible gardens or green spaces provide psychological benefits among its members. As it has been noticed, dementia, Alzheimer, MDD, stress and depression can be reduced by using nature as a tool for reducing symptoms of these diseases.

Green walls, gardens, green roofs, atriums, aquariums, green free areas should be incorporated into building design to help mental health and cognitive function. Rhythmic movements of a trees or grasses, light breeze, light, shade created by cumulus clouds, aroma of herbs planted on the roof. These named examples represent Heraclitean motion. Patterns associated with safety, tranquility, calm phases, stable mental state. Role of the architects is to design place that mimics Heraclitean motion. Calm, safe and peaceful interiors, workplaces and exterior areas. Designs that would enhances mood, promote neurological health, lower stress and help human's mind and body.

5 CONCLUSION

The aim of this paper is to show the necessity of using nature in built environment where people, children, old people, healthy and sick people, live, go to school, spend their free time, work, have fun, relax, try to beat their diseases, live full and happy life. Many examples of different studies have been explained. The conclusion is always the same. Encountering with nature

means social interaction, de-stressing, exercise, calming down, looking and listening to nature. Restoring our minds, improving job and school performance, helping alleviate mental stress. Urban nature is inspiring, calming. Green spaces in towns are needed, because they help children, old people, healthy and sick people. Many symptoms can be reduced through green games, green activities, green times. Aim of this paper is pointing at the balance between artificial and natural environment in terms of human's health.

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