



Nature's Contributions to Stress Recovery and Perceived Attention Restoration¹

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Abstract

Nature and nature images are known for their regenerative properties after stress and disintegration. When the related researches are examined, it is seen that nature has cognitive, emotional, and psycho-physiological effects on stress and attention. However, no research on attention restoration has documented in the participants' own words how they perceive nature as restorative and related their observations to theories of attention restoration and stress relief. This qualitative study in Turkey investigated the healing power of nature in recovery from stress and in attention restoration. The participants were 16 young adults from Marmara University, recruited by sampling through academic networks. Their comments could be classified under six themes that express the nature's contribution to stress recovery and to the perception of attention restoration. Findings showed that most of the participants preferred to be in the nature due to stressful and careful tiredness.

Keywords: nature, stress recovery, perceived attention restoration.

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Introduction

Interaction with nature is a type of treatment that has no knowledge of negative side effects, is readily available, and can increase cognitive functioning at zero cost. Many researchers have investigated the relationship between nature, cognitive functioning, and general well-being, and they have reported that nature positively influences these variables (Berman, Jonides, and Kaplan, 2008).

In addition to the effects of nature on cognitive functioning, interacting with nature also has restorative benefits on stress (Ulrich, 1979). Being in such environments is more adaptable to human beings as people have developed and developed in very natural environments from urban environments (Ulrich et al., 1991).

Nature and restoration

Nature is the cheapest way for people to get so many many psychological benefits such as relaxation, stress reduction, mindfulness, improved cognitive functioning, and overall well-being (Berman et al., 2008). The effects of natural environments can be divided into three categories: (1) physiological effects, (2) behavioral effects, and (3) self-reported measures. The urine and blood levels and effects of cortisol, a stress-related hormone, can measure the physiological effects of the natural environment. Parasympathetic system tests also provide information on stress. Behavioral effects of natural environments can be observed in people's concentration, discipline, inhibitory impulsivity, self-control, and degree of risk taking. Self-reported measures indicate that the natural environment is more restorative than other settings (Berto, 2014), because they make it easier to strengthen the personal adaptive resources needed to meet the demands of everyday life.

Nature, attention restoration, and stress recovery

One of the best theories explaining the relationship between nature and attention restoration is Kaplan's Attention Restoration Theory (ART). According to ART, attention can be examined in two ways: involuntary and voluntary (or directed) attention. The difference between them refers to the functioning of the will. Directed attention is a controlled process (Berman et al., 2008) requiring mental energy to carry out (Stack & Shultis, 2013), and mental effort to prevent distractions and maintain focus



(Herzog, Black, Fountaine, & Knotts, 1997); it is vulnerable to fatigue and less effective when used continuously (Felsten, 2009). If a person cannot continue to direct attention because of mental fatigue, healing is needed to get rid of the fatigue (Ozfidan, & Ugurlu, 2015). When intentional attention is active for a long time, a period of directed rest becomes necessary. Sleep may provide recovery, but not enough (Kaplan, 1995).

In a research study on the cognitive benefits of interacting with nature (Berman et al., 2008), participants first assessed their moods with the Positive and Negative Affect Schedule (PANAS). Afterwards, participants completed a managerial forgetful task to reveal information about their short-term memory. They then took a walk of about 50 to 55 minutes at either the Ann Arbor Arboretum or the Ann Arbor town center. At the end of the walk, each participant returned to the laboratory and performed the numerical task, PANAS, backwards. The results showed that a nature walk could improve directed attention ability as measured by a retrospective numerical task and the Attention Network Task.

According to Berto (2014), the physical environment has a dual effect on stress, both reducing stress and helping people to cope with it better. In addition, natural environments offer more physiological, emotional, and attentional restoration than urban places while also keeping people away from environmental stressors. Although there exist many studies on the benefits of experiencing nature, it has not been determined whether prolonged exposure to nature may help people to adapt to or reduce stress or mental fatigue (Berto, 2014).

In a study by Kaplan and Kaplan (1989), participants in a 7- and 10-day wilderness program indicated that the wildlife experience was indeed reparative for them. Nevertheless, they were not sure whether they would want to spend more time in nature in the future. Longitudinal studies should be undertaken in this regard to understand how an experience of nature can help with long-term adaptation to or healing of stress and mental fatigue.



Aims

As mentioned above, research based on different psychological approaches has shown that nature experiences are desirable and healthy. The findings of research on the psychological benefits of nature experiences are intercultural and universal (Davis, 2004). The present study aimed to reveal the perceptions of young adults about nature's contributions to attention restoration and stress relief. Our approach seeks to obtain qualitative information on the contributions of nature experiences in Turkey in addressing cognitive fatigue and stress.

Methodology

Design and procedure

No research on attention restoration in Turkey has documented in the participants' own words how they perceive nature as restorative and related their observations to theories of attention restoration and stress relief. In this study, a phenomenological model has been used as a qualitative method. The phenomenological model seeks to reveal people's experiences, perceptions, and the meanings attributed to them by pursuing a deep understanding of their awareness (Creswell, 2007; Lester, 2009, Simon and Goes, 2013, Yildirim & Simsek, 2011).

Participants

The interviews were held as part of a research on how people felt about the environment. Sixteen participants from Marmara University, all graduates age 23 to 35, were recruited as a sample through academic networks. Purposive sampling has been used because it is very useful in many cases in explaining examples and events. More specifically, maximum variation sampling, a form of purposeful sampling, was used to understand if there are common or shared phenomena across various types of experiences and to present different dimensions of the phenomenon. The number of repetitive concepts and processes presented determined the number of interviewees (i.e., interviews took place until data saturation was reached). Young adults' perceptions of contributions to attention restoration and stress recovery are especially important, since entering adulthood is a significant milestone in life (Onur, 2008).



Data collection tools

Interviewing is one of the basic qualitative research data collection tools. It can reveal perceptions and explanations of reality by eliciting people's opinions (Punch, 2005). There are three types of interviews: structured, unstructured, and semi-structured interviews. In semi-structured interviews, researchers prepare a protocol in advance containing questions that they plan to ask, but they can also ask the interviewees to expand and elaborate on their answers (Ekiz, 2003).

In this study, semi-structured interviews were used to collect data. Research questions were prepared in accordance with the literature, finalized through consultation with experts, and then included in a form that was sent to participants, who answered the open-ended questions online.

Analysis

The interviews, which aimed at understanding participants' perception of the attention restoration and stress relief gained from nature, were recorded via Google forms. Content analysis was used to analyze the data and determine main themes and categories. After the initial categories and a coding scheme were developed, the coding scheme was tested on a text sample. After a review of that sample, all text was coded and coding consistency was evaluated. Finally, findings were based on the themes that emerged from the coded data (Zhang & Wildemuth, 2009).

Findings

Stress recovery

Participants' answers to the question "Where would you prefer to go when you're stressful and in a negative mood?" were grouped under the headings "natural environment, sports field, a place to be accompanied by a friend, and a place to be alone" (Table 1). Desires to be alone and to go to a natural environment were mentioned frequently. Although almost all participants emphasized experiencing on nature, some of them preferred to be accompanied by a friend. P13 expressed this sentiment by saying, "I would go to my friend to understand me, because I relax when I pour out my feelings, commiserate, and feel to be understood by her. I would prefer to go there because it helps me to feel more positive and reduce my stress level."



Table 1: Desired places to visit

Desired place	Descriptions by participants
Natural environment	<p>“A place where I can observe other creatures. If possible, nature or seaside.” (P3)</p> <p>“I would go to the forest.” (P8)</p> <p>“I would go to the seaside.” (P9)</p> <p>“I would go to a peaceful, clean, natural place.” (P16)</p>
Sports field	<p>“If possible, skiing is also good for me in this situation. When I ski, I cannot focus on anything other than skiing. And this helps me to discharge my mind and to get weight off my mind. Additionally, I receive oxygen and I secrete the hormone of happiness.” (P2)</p> <p>“It would be good to do sports.” (P5)</p> <p>“I would go to do sports.” (P11)</p>
A place to be accompanied by a friend	<p>“I would go anywhere to be with someone who understands me.” (P13)</p> <p>“I would go to a place where I can sit and talk with one of my best friends. Or I’d go to anywhere I can have a heart-to-heart talk with a close friend. This would be a quiet place where we can easily hear each other.” (P14)</p>
A place to be alone	<p>“I would not prefer to deal with anyone when I’m stressed, so I refrain from communicating with people. Therefore I would go to some place that is more isolated.” (P1)</p>



“Again, home would be the first choice for me. If I cannot go home, I would go somewhere away from crowds.” (P2)

“I could go to a place to get alone and not have to communicate with others.” (P7)

When asked to describe their desired location for recovery, participants mentioned woodland or green areas, waterfront, airiness, and quiet tranquility (Table 2). Again, almost all of them cited natural items. P2 emphasized the tranquility that most of the participants underscored: “I think I can feel better and decide objectively when I’m far away from noise and crowds. Noise may increase my stress level. If so, I get into a vicious circle.”

Table 2: Description of the desired place

Description of the desired place	Descriptions of participants
Woodland/greenery	<p>“It would be a place where I can write something under a tree in the countryside.” (P1)</p> <p>“It may be under a tree, or anywhere silent with a nice scenery.” (P2)</p> <p>“Anywhere covered with pine trees and a fragrant smell.” (P5)</p> <p>“Anywhere with greenery and lots of trees.” (P8)</p>
Waterfront	<p>“If I’m at the seaside, it may be a place for me to sit on rocks. If possible, a place to touch and feel the sea.” (P6)</p> <p>“Blue, and freedom in where the sky and sea meet.” (P9)</p> <p>“It may be the seaside. I like listening to waves. If the</p>



sea is clean, its smell makes me relax. It may also be a little river. Purl also gives me peace.” (P10)

Airiness	<p>“It’s very important for a place to have fresh air when I’m stressful.” (P1)</p> <p>“Again, the most important criteria for me is having plenty of oxygen.” (P2)</p>
Quiet tranquility	<p>“It would be a place where people cannot reach me and I don’t see anyone.” (P7)</p> <p>“No one lives next to this farm surrounded with fig and olive trees. The nearest village is eight kilometers away.” (P12)</p> <p>“People do not disturb me when they see me sitting alone in the summerhouse.” (P14)</p>

When participants were asked why they preferred going where they like to go, the answers fell into the categories of relaxing, staying alone by oneself, and getting away from crowds (Table 3). Relaxing was the category mentioned most often. P2 described the relationship between nature and relaxation: “Because I need to relax, I look for a quiet place to appreciate myself and to make realistic decisions. The rustling of leaves and the view and sound of water help me to relax.”

Table 3: Reasons for getting away

Reasons	Descriptions by participants
Relaxing	<p>“Nature makes me relax.” (P3)</p> <p>“Nature has characteristics that make me calm and relaxed.” (P5)</p> <p>“Ripples makes me calm and relaxed.” (P10)</p> <p>“It helps me to spend time not thinking about anything,</p>



and so I can become calm.” (P12)

“Nice scenery, plenty of clean air, ripples, the smell of the sea ... these are relaxing for me.” (P15)

Staying alone by oneself “I can stay by myself here. I can drive negative energy out of my body easily without harming anyone.” (P1)

“It’s for staying with the feeling that I am in, allowing them to be there before, providing relaxation, and in fact realizing this healing feeling.” (P6)

“I would like to wait for undergoing anger, and for thinking on myself. I tend to wait for undergoing anger by leaving quietly instead of giving reactions to break ones I know and love.” (P7)

Getting away from crowds “I think that when I’m away from crowds and noise, I may feel better and decide more objectively. Noise may increase my stress and aggression level. At this point, I get into a vicious circle.” (P2)

“To get away from people and to get alone. Because there is something that cannot be solved by talking.” (P5)

“I guess it is because I can be far away from people and live in nature.” (P12)

P2 also described getting away by oneself so as not to hurt other people when upset: “I like to think by myself and control my anger. I wait until I can get away quietly to deal with my anger instead of breaking the hearts of my loved ones.” P8 preferred getting away from people in order to “walk around without anyone to account to for hours.” P11, said, “[Natural] scenery gives me the sense that I have escaped to another place and left behind the troubles I was feeling at first.”



Attention restoration

Table 4 describes the main categories of answers given when participants responded to the scenario, “Think about a day when you have worked hard and feel suffocated.”

Table 4: Places to visit after a hard work day

Desired places	Descriptions by participants
Natural environment	<p>“I would like to go to the seaside, walk, and listen to the sound of waves.” (P6)</p> <p>“I would like to go to a park full of trees.” (P10)</p> <p>“I would like to go to mountains and the seaside.” (P12)</p> <p>“I would like to go to the seaside and a quiet park.” (P13)</p>
Home	<p>“I would like to spend time at home. I would watch something on television where I can chill out.” (P5)</p> <p>“Probably I would like to go home. Sleeping is really good for me at such times.” (P2)</p>
Café	<p>“I would like to go to a café with good music and coffee.” (P15)</p> <p>“I would like to go to somewhere like a coffee shop.” (P11)</p>
A silent place	<p>“I would like to go to a silent place away from crowds.” (P1)</p> <p>“Unless it’s possible to go home, I would like to go to a silent, noiseless place. This place should be away from crowds and the noise of the city. It may be indoors or an open area according to the season and conditions, but the most important criterion for me is that it should be calm,</p>



peaceful, and quiet.” (P2)

“I would go to a place without so many people. My preference would be an open area. I would walk there.”

(P14)

The main categories of answers were the natural environment, home, a café, and a silent place. All but one of the 16 participants emphasized natural items. P7 stated, for example, “If possible, I would like to go to a place overlooking the sea. It would be greenery. Sea waves make me calm.” Some participants indicated that home was also an acceptable alternative, such as P1, who indicated, “I would like to go to a silent place away from crowds. This could be somewhere in nature or at home.”

As illustrated by Table 5, almost all participants mentioned natural items in explaining where they would most like to go for attention restoration. The data showed that waterfronts were the most preferred category. P12 stated, “It would be a calm place covered with blue and green. It makes me relaxed to swim and to walk without any thoughts.” P10 expressed a desire for a place dominated by tranquility and abounding with trees.

Table 5: Description of the desired place for attention restoration

Desired place	Descriptions by participants
Waterfront	<p>“It would be nice to be at a place near a small lake, a sea, and a river.” (P1)</p> <p>“It would probably help me to focus very much.” (P2)</p> <p>“It would be a seaside. It is very relaxing for me to watch the sea.” (P5)</p> <p>“If possible, I would like to go to a place overlooking the sea.” (P7)</p>
Woodland	<p>“If I don’t have a chance to go to the seaside, I</p>



	definitely prefer the forest and greenery.” (P6)
	“It would be a forest full of tall trees. A place where I feel that I can breathe deeply, and watch the other creatures move and breathe.” (P8)
	“A shady place with many trees.” (P10)
A silent, calm place	“There would be two main factors directing me here.” (P1)
	“Again, I would prefer somewhere silent, calm, and peaceful.” (P2)
	“It would be a silent and cool place.” (P11)
Sounds from nature	“Here are only unique sounds of nature. I mean, it’s away from crowds and noise.” (P4)
	“Here is somewhere with water, waves, and sounds of gulls. Here is where I can smell greenery and I can breathe deeply.” (P6)
	“Here is a place away from disturbing sounds, except for the sounds of birds and water.” (P13)

Asked why they preferred the places that they named, the participants gave answers that described escaping from the city noise and crowds, relaxing, a sense of unity with nature, refreshing and refocusing, and self-awareness (Table 6). Almost all the participants who live in Istanbul highlighted getting away from crowds. P10 explained that “places without the noise of people and cars, where I can hear the sound of nature, make me relaxed.”



Table 6: Reasons for the places chosen for attention restoration

Reasons	Descriptions by participants
Escaping from the city noise and crowds	<p>“My bewilderment becomes more complicated with the noise and chaos.” (P1)</p> <p>“I’ve been bored with the crowds and the noise. I think our country is very noisy and crowded. And this crowd makes me tired.” (P2)</p> <p>“Noise makes me tired. I missed seeing trees in Istanbul. Everywhere is full of houses, offices, and shopping centers. Therefore, nature reminds you of your humanity.” (P10)</p> <p>“I live in a crowded city, and I have a crowded workplace. I’m covered with electronic devices.” (P12)</p>
Relaxing	<p>“Because the sea has the effect of making me relaxed.” (P5)</p> <p>“It would make me relaxed to be somewhere with full of trees and where I can touch the sea and ground.” (P7)</p> <p>“I believe in the tranquillizing effect of greenery and water.” (P14)</p>
A sense of unity	<p>“Humanity is a part of nature. When we get away from nature, we feel fatigue and suffocation within the soul. Healing comes from getting back to and communing with nature.” (P4)</p> <p>“My mind focuses not on myself, but on the other creatures. Then I let myself go with the harmony of the forest.” (P8)</p>
Refreshing/refocusing	<p>“The reason why I prefer to be there is that it enables me</p>



to see my faults more easily when I get back to work by making my attention focus on other things such as mushrooms, insects, worms, etc. and clearing my mind.” (P11)

“Because this place enables me to feel safe and relaxed. And it gives me a chance to refresh.” (P13)

“I need these to focus on sth.” (P16)

Self-awareness

“I can appreciate my feelings and thoughts easily in silence.”

“A silent place enables humans to appreciate their own thoughts.” (P14)

Relaxation was also one of the most popular answers. K8 stated, “I feel at peace in the forest. My mind focuses not on myself, but on the other creatures. Then I let myself go with the harmony of the forest.” P10 observed, “Nature reminds you of your humanity.”

Discussion and Results

It was clear that most participants desired to be alone in a natural environment when they are stressful and in a negative mood. Likewise, results related to the scenario “Think about a day when you have worked hard and feel suffocated” were similar. Participants spoke of wanting to go to a natural environment, home, café, and a silent place. Quiet and natural places can be seen as having relaxing effects that lead to recovery from stress (Kaplan, 2004). They and the other places named share the feature of tranquility, which is one of the aspects of nature most often cited in other studies (Berto, 2014; Davis, 2004). In the same way, participants spoke mostly of natural environments when describing places to reduce stress. The four main categories identified were woodland/greenery, waterfront, airiness, and quiet tranquility. Descriptions of the desired places in the second scenario fell into the categories of waterfront, woodland, a silent and calm place, and sounds from nature. According to Ulrich and Parsons (1992), cities—with their high levels of visual complexity, noise,



intensity, and movement—may affect people negatively, since they produce high, stressful, and weakening levels of psychological and physiological tension. People tend to prefer being in nature because environments containing plants have stress-reducing benefits for people. Therefore, it can be said that people seek a natural and tranquil place when they're stressful, because cities increase their stress levels.

Natural scenes are generally more preferable than artificial scenes (Stack & Shultis, 2013) and have been found to be associated with attention restoration (Felsten, 2014; Liprini, 2014; Ratcliffe, Gatersleben, & Sowden, 2013). As Berto (2014) stated, the features (such as forms, colors, and textures) of the environment and key natural elements such as water and plants can have positive effects on human emotional well-being, stress reduction, cognitive efficiency, learning, and healing processes. Berman et al. (2008) found that walking in nature or viewing pictures of nature can improve directed attention abilities. Simple and short interactions with nature can also enable important gains in cognitive control. Consistent with Hartig, Kaiser, and Bowler (2001), one frequently preferred location was a waterfront. This prior study investigated ecological behavior, finding that many members of their sample specified their interest in a freshwater marsh.

The results showed that participants' reasons for preferring particular sites when under stress were that they seek relaxation, being by themselves, and getting away from crowds. In the second scenario, the reasons for participants' preferred places were avoiding city noise and crowds, relaxation, a sense of unity, refreshing and refocusing, and self-consciousness. These categories resemble the four properties that Kaplan (1995, 2001) identified as enabling restoration to emerge from being in nature: being away, extent, fascination, and compatibility. Participants of the study especially mentioned the theme of being away, referring to gaining some distance from usual activities that lead to attention fatigue. Extent means an environment full of rich content and perceived as another world; fascination is voluntary attention that doesn't need effort; and finally, compatibility refers to a fit between the individual and the setting (Kaplan, 1995, 2001).

Two of the most frequently cited categories among this study's participants were being alone by oneself and self-awareness. Respondents said that they like being in nature both to be alone and to regain a clear mind when they are stressed and confused.



Kaplan (1995) indicated that this self-knowledge is one of the requirements for preserving and renewing directed attention. It can enhance some skills as mental resonance, mindfulness, and meditation. Davis (2004) also stated that wilderness experiences can put individuals in contact with their external environment in addition to fundamental stricter within self such as mirror, evoke, support, and co-emergent. Interacting with nature enables people to gain a fuller understanding of themselves. As Davis (2004) stated, nature experiences also have benefits in helping people attain a realistic internal locus of control. This is one reason why plants and animals are brought into hospitals and nursing homes, because they can provide opportunities to experience an internal locus of control.

A sense of unity was mentioned as one common reason why participants liked the place where they preferred to go. This explanation seems similar with Kaplan (2004)'s discourse on the benefit of nature. People believe in the beneficial effect of nature intuitively, because nature helps individuals to feel whole again. Also, coherence (described as perceptions of connectedness, wholeness, and meaningfulness) is related to better psychological and mental health as well as a reduction of negative stress (Davis, 2004).

Interacting with nature not only improves directed attention, but also offers a good way to decrease one's stress level. Almost all participants in this study referred to nature as a way to reduce stress and improve attention restoration. This result aligns with those of other studies that have found positive affects of nature on stress and attention. Since nature helps people to escape from daily routines, spending time outdoors may help people to relax and so contribute to restored directed attention (Daniel, 2014).

As nature has a positive effect on psychological health, exposure to it can benefit a population's overall well-being (Hartig, 2007). The results of this study showed that almost all participants would like to get away from other people and the city at times. This may be because Istanbul, where they live, is so crowded and chaotic. However, it is not necessary to provide each individual in the population with a personal escape. Rearranging city life and recreation opportunities can provide ways for people to get together peacefully even in urban settings.



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