

Benefits of Viewing Nature Content: A Review for the BBC

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Introduction

It is a deep human intuition that viewing nature and being in nature is good for the mind and body. This notion can be found in the thinking of indigenous peoples on different continents, who routinely guided their adolescents on ritualistic trips out in nature as rites of passage to adulthood. Forest walks in “healing forests” are a common practice in East Asian cultures such as Japan and South Korea because of the alleged benefits of being in nature. This notion is evident in the writings of the great philosophers from Descartes to Emerson, who made the case that experiences of awe and wonder in nature – for example in the woods or when viewing a rainbow – were the source of healthy mind and body and deep curiosity about life. More recently, scientific literatures have emerged that focus on documenting the benefits of being outdoors, of viewing nature, and of beauty, all in part inspired by E.O. Wilson’s celebrated concept, Biophilia, the evolved preference for beauty in nature that humans are endowed with, which guides them in adaptive fashion.

We have synthesized (see Table 1) a rich and complex literature on what we will call “the benefits of nature immersion.” These studies, now numbering over 100, are inspired by claims about the benefits of nature, and follow one of four methodological approaches to nature immersion. Some studies focus on the benefits an individual derives from being in nature (for example on walks, gardening, playing near parks, or on backpacking trips). Some studies focus on the benefits of living near green spaces (versus being deprived of such contact with nature). A third class of studies, more typically controlled experiments in the lab, have examined what happens when people view nature content in still photographs or short videos, most typically lasting about 5 minutes. And a fourth kind of study looks at people’s responses to artistic portrayals of nature, most notably landscape painting.

One way to summarize this literature is according to an elaborated version of E.O. Wilson’s “Biophilia” hypothesis. This hypothesis holds that for evolutionary reasons people love nature, they have aesthetic preferences for beautiful nature because these preferences produce emotions, thought patterns, and actions that lead people to find resource-rich natural environments that provide optimal food, shelter, and comfort. What this means is that nature immersion, even in viewing nature content in images or footage, triggers a constellation of responses in terms of the individual’s emotions, thought patterns, and physiology that enables goal directed and adaptive actions (e.g., within an evolutionary context, focusing on finding food, collaborating in building shelter). This early theoretical notion has guided dozens of studies we summarize in our Table, and been applied to an understanding of why children have what amounts to a need to experience nature (Kahn, 1997) and how to apply the principles of our preference for nature to environmental and urban design (Ramzy, 2015).

Translated to more general terms, this line of theorizing suggests that viewing nature should trigger a family of emotional processes that are inherently rewarding, and presumably calming to the nervous system. Those emotions in turn should guide cognitive processes – e.g., greater

focus, openness, creativity, curiosity, imagination, empathy -- in ways that enable the individual to take in important information about the environment. Through these processes, viewing nature should yield benefits for stress, well-being, and mental and physical health.

In this brief review, we are guided by this conceptual approach to nature immersion. We focus on findings relevant to one of the methods in the literature – viewing nature content in the form of pictures or video footage. We center our review on specific questions that derive from the preceding theoretical analysis.

Is there any substance to the theory that watching nature content (images or footage) can influence our emotions and wellbeing?

When the naturalist John Muir spent weeks in the Sierras in California, he would write of how nature produced profound emotions. Here is one passage: *We are now in the mountains and they are in us, kindling enthusiasm, making every nerve quiver, filling every pore and cell of us.* Several studies have indeed looked at how viewing awe-inspiring nature imagery in photos and video footage, when compared to nature imagery that is funny, or video content that is more neutral in meaning. It is clear that nature imagery can elicit emotions related to awe and beauty (e.g., awe, wonder, joy), and emotions related to amusement (mirth, humor). For example, to select one relevant paper, participants either viewed a few minutes of *Planet Earth*, a rather neutral video from a news program, or funny footage from *Walk on the Wildside*. Watching a few minutes of *Planet Earth* led people, compared to control participants, to feel 45.6% more awe and 31.4% more gratitude, but no shifts in feelings of negative emotions such as fear and sadness (Valdesolo & Graham, 2014). The influences on gratitude are pretty striking. This study, and several others like it, tells us that brief exposures to nature content in video footage are a powerful way to feel awe, wonder, gratitude, and reverence, all positive emotions known to lead to increased well-being and physical health. Importantly, these emotions also promote greater collaboration, suggesting that nature immersion will prove to be a predictor of elevated performance and commitment at work.

Given the power that viewing film images of the natural world have in evoking feelings of awe and gratitude, other studies have examined how an understanding of the world's place in the broader universe might also trigger these emotions. Studies are finding, for example, that virtual reality experiences of being an astronaut are powerful triggers of amazement and awe (Gallagher et al., 2014).

What positive and negative effects arise as a result of viewing nature content?

Positive emotions are well known to have beneficial effects upon thought processes (e.g., increased creativity, greater focus, and openness to new ideas and possibilities) and social processes (e.g., greater trust, cooperation, and closeness with others). Given what we have learned about the positive emotions that are triggered by viewing nature content, one would expect nature imagery to have many favorable effects upon the individual's functioning. This has been robustly confirmed in the literature on living near green spaces. Most notably, the work of Frances Kuo and her colleagues in poorer neighborhoods of Chicago finds that people who live near green spaces – lawns, parks, trees – show reductions in childhood disorders, greater calm and a sense of connection to neighbors, and more civility and less violence in their

neighborhoods (Bogar & Beyer, 2016; Kuo et al., 2001).

These findings raise the intriguing possibility that people can enjoy mental and physical health benefits from viewing nature in photographs or video footage. And indeed, laboratory studies are finding that this is the case. First, it is noteworthy that viewing nature in images appears to improve thought processes, leading to greater calm, focus, and enhanced cognitive functioning. For example, in one study participants who viewed a beautiful video of nature performed better than individuals in a control condition in what is called a digit span task that requires people to carry out a series of subtractions from a very large number (Kaplan et al., 2008).

Viewing nature in images and footage likewise shifts the individual's sense of self. Many reports of intense experiences in nature refer to such a vanishing of the self, a diminishment of the boundaries between self and others. In one study, participants who spent a minute looking up into a beautiful stand of Eucalyptus trees reported feeling less entitled and self-important (Piff et al., 2015). And laboratory studies have likewise demonstrated how viewing nature in video footage leads to less narcissistic conceptions of the self. For example, in one study simply viewing *Planet Earth* for 5 minutes led participants to report a greater sense that their concerns were insignificant and that they themselves were part of something larger than those participants in a control condition or who had watched amusing clips from *Walk on the Wild Side* (Piff et al., 2015).

Finally, several studies have found that viewing nature in images or video footage leads to greater prosocial tendencies – generosity, cooperation, and kindness. One would expect this result in light of what we have learned thus far – that viewing nature promotes emotions such as awe and gratitude, which are known to elicit more prosocial, altruistic behavior. And in keeping with this reasoning, one illustrative study found that people who simply viewed 10 slides of really beautiful nature (as opposed to less beautiful nature) gave more money to a stranger in a widely used economic game known as the trust game (Zhang et al., 2014).

What are the scientifically documented benefits of nature immersion and viewing nature content?

People often report that exposure to nature makes them feel stronger, happier, and healthier. Consider this well-known quote of Ralph Waldo Emerson on Nature:

In the woods, we return to reason and faith. There I feel that nothing can befall me in life-- no disgrace, no calamity (leaving me my eyes), which nature cannot repair. Standing on the bare ground, — my head bathed by the blithe air and uplifted into infinite space, — all mean egotism vanishes.

In this quote Emerson hints at the cognitive and social benefits of being in nature that we have already considered: “returning to reason,” “all mean egotism vanishes.” In this important quote Emerson also speaks of the reparative benefits of immersion in nature. And on this thesis, scientific studies are lending increasing support to the notion that people derive numerous benefits from viewing nature.

First, we are increasingly learning that viewing nature in video footage or still images increases personal happiness. One study found that simply viewing *Planet Earth* for 5 minutes led to a 35.6% boost in reports of feeling happy when compared to an appropriate control

condition (Valdesolo & Graham, 2014).

Second, viewing nature content can reduce stress. Support for this possibility comes from remarkable research examining the relation between living amidst green space and self-reports of stress and measured levels of the stress hormone cortisol (Thompson, Aspinall, Mitchell, Clow, & Miller, 2012). Being near green space is linked to less stress in deprived communities. In this study, people who lived near greater green space reported less stress and showed greater declines in cortisol levels over the course of the day. Yet another study with a similar focus in the clinical realm found that people who lived nearer to larger areas of green space were less likely to suffer from anxiety and mood disorder (Nutsford, Pearson, & Kingham, S. (2013). Laboratory experiments converge on the stress-reducing benefits of viewing nature content. For example, in one study participants either viewed a 1-minute video of awesome nature, or a video that made them feeling happy. After viewing the awe-inspiring nature video, participants reported that they felt as though they had enough time “to get things done” and did not feel that “their lives were slipping away” (Rudd et al., 2012).

Finally, a variety of studies are now finding that nature immersion in the form of being near green spaces is good for physical health. For example, self-report studies are finding that people who feel a good deal of awe and wonder and an awareness of the natural beauty around them actually showing lower levels of a bio marker (IL-6) that indexes elevated levels of the inflammation response (Stellar et al., 2015), which is known, when hyperactivated, to produce an increased likelihood of cardiovascular disease, depression, and autoimmune disease.

Given these influences of viewing nature imagery upon increased positive emotion, happiness, and stress, one would expect viewing nature content to benefit people in terms of their physical and mental health. As one illustration, one early study on this possibility found that patients recovered faster from cardiovascular surgery when they had a view of nature out of a window (Ulrich, 1984). A more recent review of different kinds of nature immersion -- viewing natural landscapes during a walk, viewing from a window, looking at a picture or a video, or experiencing vegetation around residential or work environments -- led to a variety of benefits, including reduced stress, improved attention capacity, facilitating recovery from illness, ameliorating physical well-being in elderly people, and behavioral changes that improve mood and general well-being (Velarde, Fry, & Tveit, 2007).

The aforementioned studies have largely focused on prototypical images of nature -- beautiful landscapes, the wonders of nature portrayed by BBC Planet Earth. One intriguing question is whether viewing other realms of the natural world -- most notably appreciating other species -- yields similar benefits. There is a growing literature showing that humans derive health and wellness benefits from taking care of pets -- such as dogs and cats -- which raises the intriguing question, as yet not studied, about whether viewing nature content that involves other species, produces increases in health and happiness (Marx et al., 2010).

How does nature immersion act on our brain and body?

The science we have reviewed thus far speaks to Emerson’s intuition -- that there is nothing that nature cannot repair. This appears to be true as well for viewing nature in video or photographs. We have seen that viewing nature footage and still photographs leads people to be happier, experience more positive emotion, feel less time pressure, show greater kindness to others, and enjoy better health (although this last claim is the least well-established). The applications of these findings are making their way into urban design, classroom content, and

even new approaches to cultivating well-being and better health.

The question, then, is *how* does viewing nature benefit the individual. How does viewing nature act on our body? Here the literature is new, and in need of systematically exploring how different kinds of nature content activate specific brain processes. But, the science is pointing to several direct effects of viewing nature that help explain why nature immersion is good for the mind and body and community. First, we are learning in the literature on “neuroaesthetics” that viewing natural beauty, most typically in landscape paintings and in film, activates specific reward circuits in the brain (the ventral striatum) associated with dopamine release that give the individual a sense of purpose, of joy, and the feeling of energy to pursue one’s goals (Keltner, Oatley, & Jenkins, 2013).

Second, we have seen that nature immersion reduces stress-related physiology as indexed in levels of cortisol and elevated activation in the sympathetic autonomic nervous system. What this means is that upon viewing content, we are less likely to be anxious and fearful, and thereby be more open to others and creative patterns of thought. These effects of viewing nature dovetail with a line of thinking that nature immersion produces a state of cognitive calm, which allows people to focus, to regulate stress, and to engage in more empathetic and cooperative behavior (Kaplan et al., 2008).

Finally, it is clear from numerous studies that viewing nature content is a primary source of awe, in fact one of the two most common sources of this important emotion (Shiota et al., 2007). Awe, wonder, and a sense of reverence are known to have a variety of benefits, from promoting well-being and altruism to evoking a sense of humility (Piff et al., 2015). Common to a lot of nature writing is the notion that immersion in nature triggers powerful feelings of self-transcendence and awe – Muir’s nerve fibers quivering mentioned above – and a fairly robust science speaks to how these specific emotions are likely to explain the mind body benefits of nature immersion.

Is immersion in nature a health and wellness intervention?

Regrettably, people are spending less time outdoors and less time immersed in nature than in the past (Williams, 2017). It is also clear that in the past 30 years people’s levels of stress and sense of “busyness” have risen dramatically (Cohen et al., 2013). These converging forces have been called “the nature deficit disorder” – people are increasingly losing touch with the power of nature immersion.

This deficit in experiencing nature has been most systematically studied in the extremes of US society – children growing up in urban poverty, where there often are no parks, trees, green spaces, and natural beauty. And here Frances Kuo and her colleagues have found that nature immersion has numerous benefits for children and adults living in nature deprived urban environments (Kuo, 2001). Building in exposure to nature in schools has benefits for such children (Li & Sullivan, 2016). And another literature has focused on the benefits of nature immersion for the elderly, showing that it has important benefits for health and well-being (McCaffrey & Liehr, 2015). Many of the benefits of nature on health and well-being have been documented in different European and Asian cultures (Williams, 2017). More generally, the benefits of immersion in nature generalize across different class backgrounds; while there is evidence nature immersion is particularly beneficial for the poor (given that they often lack basic access to nature), the benefits are enjoyed by people from different class backgrounds. There is mounting evidence that the emotional reactions to nature – awe, gratitude – have strong universal

elements (e.g., Bai et al., 2017).

What is all the more striking is that viewing nature content in film has been found, in controlled experiments, to yield benefits for well-being, health, and prosociality. These findings suggest that nature immersion is good for children and the elderly, and will be increasingly thought of as a pathway to health and happiness in different cultures around the world.