UBC Social Ecological Economic Development Studies (SEEDS) Sustainability Program

Student Research Report

Nature's Prescription: Soundscape

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What human health outcomes have been examined?

Nature as an experience of many senses has been shown to have positive effects on human health. There is a plethora of research that links the experience of nature and better mental wellbeing, for example, Franco, et. al. (2017), argues that just seeing nature has been associated with reduced anxiety and stress. Pretty (2004), posits that spending time in nature not only serves to relieve pre-existing stress, but also makes humans more immune to future stress. Relatedly, Hartig et. al (2014), suggest that spending time in nature can be effective in avoiding health issues, especially those that are related to chronic stress and fatigue. Nature itself has been described as a "stress buffer", and consequently aids in reducing the occurrence of physiological illness (Hartig, et. al., 2014). Other research shows cases that the experience of nature is not limited to seeing nature, Franco, et. al. states that nature sounds can relieve stress, as well as "perceived restoration and attention recovery" (Franco, et. al., 2017). It is believed that employing the sense of touch when in nature can prove to be beneficial as well, as stated by Franco, et.al., this is often in relation to interacting with animals. In their research they find that not only does touching or petting animals improve mood and alleviate stress, it also improves cardiovascular health (Franco, et. al., 2017). There is less research on the impact of smell or taste in relation to the experience of nature and well being, but there is some literature that links certain natural aromas to heightened mood and improved cognition (Franco, et. al., 2017).

Anderson links the emotional experience of nature with wellbeing, he finds that nature is commonly viewed as an awe-inspiring entity, and as such can promote wellbeing in humans by improving stress-related symptoms (Anderson, et.al., 2018). Pretty (2004), believes that engaging with nature is just as important to people's health as physical exercise. With there being strong evidence supporting the dramatic fall in physical activity, giving people the opportunity to engage with nature may be more important than ever. Pretty, et. al. (2006), found that out of 263 participants in the UK, green exercise is proven to lead to strong human health outcomes, such as the improvement of self-esteem and total mood. Ultimately, there is consensus on the positive effects that nature has on stress and other markers of mental and emotional wellbeing, how that consequently affects physiological health.

What does the evidence suggest are the effects of nature prescriptions on these outcomes?

Nature prescriptions are increasingly being incorporated by medical practitioners and clinicians. One such prescription is "wilderness therapy" which is often prescribed to psychiatric patients, and those suffering from other mental health illnesses, it is shown to be beneficial for both physical and mental health (Pretty, 2004). Zhang, et. al. (2014), prescribed nature environments to post-surgery patients that were randomly assigned to a hospital room furnished with foliage and flowers. As a result, the patients consumed less postoperative pain killers which resulted in lower systolic blood pressure and reported less pain, anxiety, and fatigue than patients in a room without foliage and flowers. Müller-Riemenschneider, et. al., (2018) have also studied the impact of "Park Prescriptions" on health, and they found that "Park Prescriptions" are

effective as they promote physical activity, but also because they are beneficial in that they promote exposure to natural environments, both of which have positive impacts on human health. Relatedly, Pretty (2004), showcases the effectiveness of "healing gardens, greenhouses, atriums, and plants." Alternative nursing homes in Texas found that employing these methods reduced the occurrence of bedsores by 57%, and reduced behavioural incidents by 60% (Pretty, 2004) .

Nature prescriptions are not limited to one sense, they can include senses such as touch and smell. One study showed that hospital patients preparing for procedures (such as bronchoscopies) that were exposed to images of nature and were given sounds of "birdsong and babbling brook" to listen to before the procedure reported a 50% higher level of pain control than those that did not (Pretty, 2004). Similarly, according to Franco et. al. (2017), nature sounds are used as a therapeutic intervention to relieve stress and to positively affect the perceived restoration and attention recovery. Gardening has also been put as one of the social interventions that provides people with the space to interact and engage with others meaningfully (Clatworthy, et. al 2013). As a result, gardening as a social intervention plays a key role in promoting a sense of belonging and enhancing social inclusion for people with mental health difficulties (Clatworthy, et. al 2013). The connection between man and nature allows one to get a sense of how they react within an environment, and what they would do to protect that environment. Litt et. al. (2015), found from a population-based survey on 469 urban residents that garden participation influences people's health "indirectly through social involvement with one's community, perceived aesthetic appeal of the neighbourhood and perceived collective efficacy."

What mechanisms explain these outcomes?

To explain the connectedness of nature and psychological well being, Zhang and colleagues (2014), suggest that interaction with nature is only associated with greater well-being for individuals who are "emotionally inspired by nature's beauty". Thus, they argue that people with a higher emotional connection and greater appreciation to nature's beauty tend to find a sense of purpose and meaning in specific natural environments, leading to "greater place identity" (Zhang, et. al 2014). Therefore, this results in greater subjective well-being as they are more likely to experience a sense of "awe and wonder from the natural world." (Zhang, et al, 2014) Additionally, Aerts et. al (2018), observed that the benefits of interaction with the "natural and man-made green environments depend initially on the duration and timing of the exposure." For instance, short-term exposure to forests, and other natural environments reduces stress and depressive symptoms, restores attention fatigue, increases self-reported positive emotions and improves self-esteem (Aerts, et. al 2018). While long-term exposure to natural environments, such as residing in areas with high greenness, has been proven to reduce all-cause, respiratory, cardiovascular and cancer mortality and to improve respiratory and mental health (Aerts, et. al 2018). Pretty (2004), theorizes that people can engage with nature in three different ways; by "viewing nature, being in the presence of nearby nature, and having active participation and involvement with nature." While these methods differ in the way people interact with nature, Pretty (2004), believes that all three provide the same physiological and psychological benefits. Also, Repke et.al (2018) further discusses other potential pathways such as restoration, social consequences, and physical activity as potential underlying mechanisms. Using the evidence that exposure to nature facilitates "physiological, emotional and attention restoration" the article drew

two complementary theories: Stress Reduction Theory and Attention Restoration Theory (ART) from this line of research (Repke, et. al, 2018). ART posits that nature exposure encourages effortless brain function, which facilitates its recovery from fatigue while SRT focuses on the role of effect (Repke, et al, 2018). Thus SRT suggests that exposure to natural environments facilitates "positively-toned emotional reactions, which in turn have a restorative effect." Although suggesting somewhat different routes to restoration, both theories emphasize that nature is psychologically restorative (Repke, et al (2018). Hence, in accordance with this, the restorative quality of nature has been identified as a mediator of the effects of nature exposure on a variety of health and wellbeing outcomes, such as emotional and mental wellbeing (Repke, et,. al 2018).

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