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Forests and Human Health

Over the last decades, a growing body of research on restorative needs and preferences suggest that daily demands and stress need to be countered in order to maintain or increase health and well-being. One powerful behavioral option to restore is to visit nature or to spent time in green spaces such as forests.

Recovery

Recovery, as an antagonist of stress is a process of psychophysiological unwinding after exposure to demands and stressors (Allostatic Load Theory, McEwen 1998). An important condition for recovery to occur is that the stressors causing strain reactions are no longer present and therefore recovery can be conceptualized as the process that is opposite to the stress process.

According to the Effort-Recovery Model, mental or physical detachment is an important mechanism of recovery, as delayed recovery has been associated with range of negative health symptoms (Meijman & Mulder, 1998). Recovery implies that resources are replenished and resource-loss cycles are halted (Hobfoll, 1989) and recovery enables individuals themselves to prevent negative long-term consequences of stress and to actively promote their health and well-being (Conservation of Resources Model).

Scientific evidence exists which proves that exposure to forest has a significant impact on human health: Forest visits can lower blood pressure and pulse rate, reduce cortisol level, suppress sympathetic nervous activity, and enhance parasympathetic nervous activity. After approximately 15 minutes of exposure, blood pressure and salivary cortisol decreases and positive mood increases (e.g. Lee et al., 2012; Park et al., 2010; Tyrväinen et al., 2014).

Even passively viewing urban parks or woodlands produces greater physiological changes toward relaxation, positive emotions, and faster recovery from attention demanding cognitive performances than watching built environments without natural elements (Hartig et al., 2003; Beermann et al., 2008; Raanaas et al., 2012).

Many studies show that the Forest is a special place to almost all people. In our own research we have conducted qualitative interviews about recreation in forests (“immersing into another world”) we have found something very interesting: Going to the forest is usually portrayed as a movement not *towards the forest*, but *away from something* – it offers a refuge from everyday life (Ensinger et al., 2014).

Psychological detachment can be experienced in different modalities within forests: Particularly in the face of workload, the forest is discussed as a place you visit, because of what there is not, so as an alternative concept to a stressful life. This is reflected in the semantics of negation: *“The forest is like a ... maybe kind of a symbol for this, like, there's no computer and no, no civilisation either. And somehow, it's also, erm ... there's something about it, there's no stress” (employed man, 32 year-old).*

Interestingly, children and adolescents know their parents' concept of forests as recreation areas and anticipate it for their own future life ("when I've grown older..."). Even though adolescents dissociate themselves from visits of the forest, there is still a shared perception of the forest as a resource for recreation across age differences that are meaningful throughout all phases of life (Ensinger et al., 2013).

Learning and Personal Development

Throughout all phases of life forests enable people to learn and develop. The relationship with the forest is ongoing. In a study from 2012 in USA only 51 percent of the parents went outside with their children once a week. Nearly half the preschoolers in the same study had no parent-supervised outside opportunities at all (Pooja et al., 2011). The name for this growing trend was created by Richard Louv (2009): Nature Deficit Disorder means that children cannot make crucial experiences when they grow up in a too highly structured environment.

In the worlds of children today everything is manageable, predictable and controllable. What matters is that children experience the reality of the uncontrollable and unpredictable. And that's what you can find in nature. There you cannot get by, by pressing a button on the tree, cannot dictate how something should be - nature evolves as it will, regardless of what we want.

As we know, forests offer a lot of stimulation and there are some fascinating insights in brain research that show that creativity and responsibility are furthered when playing in natural environments that offer the possibility to build and create (Renz-Polster & Hütther, 2013). Forest also provides space for various types of movements such as climbing, crawling and walking on uneven ground (Gerlach 2008). Nature experiences can also affect the overall mood and personality development (Kaplan & Kaplan, 1989). So people can avoid stress, reduce stress, reduce mental fatigue and restore attention. Outdoor play allows children develop an active lifestyle, and encourages children to take smaller, measured risks (Warden, 2014).

Which kind of forest is needed to enable people to recover?

Attention restoration theory (Kaplan & Kaplan 1989, 1995) describes restoration occurring in environments and situations that involve four components: Restoration requires psychological and geographical distancing from aspects of one's usual environs, routines and situations (being away), immersion in a coherent physical or conceptual environment that is of sufficient scope to sustain exploration (extent), effortless attention as drawn by objects in the environment or engaged in the process of making sense of the environment (fascination), and a good match between personal inclinations and purposes, environmental supports for intended activities, and environmental demands for action (compatibility).

Results of a study in Switzerland demonstrate that different forest conditions have influence on psychological wellbeing (Martens et al.; 2011). In our own quantitative and qualitative research the forest visitors preferred mixed forest, open woodland, panoramic viewpoints, edge of forests, small paths and the potential of encounters with animals (Ensinger et al., 2013). But the impact of forest on health may be stronger if people have their own experiences in childhood (Hunziker et al., 2012; van Lindern, 2014).