

## SCHOOL OF LOST BORDERS

### **Psychological Benefits of Nature: Research Findings for Wilderness Therapists**

**Based on a presentation at the  
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#### **OVERVIEW**

The target of this outline is psychological research which specifically examines the effects of contact with nature. This is only one aspect of the work of the **School of Lost Borders**, but direct contact with the wild natural world is a core of our approach.

1. Research strongly supports the value of increased contact with nature. It is rare to be able to make sure an unequivocal statement in psychological research.
2. Research settings include a broad range of encounters with nature: pictures and videos of nature scenes, natural scents, indoor plants, trees and fields viewed from a window, gardening, interacting with animals, nearby nature such as a city park or green spaces in a housing development, forest walks, and wilderness. Most of the research findings are based on time in nearby nature and images of nature, primarily because these settings are easier for researchers to work with. These findings are corroborated with more highly controlled experimental settings and more realistic and intensive nature encounters.
3. The research comes from several different psychological approaches (evolutionary, cognitive-behavioral, psychodynamic, phenomenological, and transpersonal psychologies). A wide variety of research methods are used (narrative content analysis, survey, quasi-experimental, experimental, and qualitative methods).
4. The consistency of findings across such a wide diversity of settings, methods, and theoretical approaches points to the strength of this phenomenon.

**“If nature were a drug, it would be hailed as a miracle!”** (Steven Kaplan, U Mich)

These notes are:

- Not looking at all research on wilderness rites of passage, ecotherapy, or wilderness therapy programs. That body of research is strong and getting stronger. Many variables are at work in such programs.
- Not looking at research on animal-assisted therapy, horticultural therapy, or other therapies with a strong nature component. There is also a growing body of research in these areas. These include nature but are also multidimensional.
- Not looking at research on other aspects of activities in nature or wilderness. Such as physical fitness, the benefits of challenge activities, social support, relationship skills, emotional self-regulation, resilience skills, insight into one's inner dynamics, nutrition, and more), though all are often factors in nature and wilderness experiences.

### **CAUTIONS/LIMITATIONS**

1. Using nature as a commodity, object, or mechanism. Treating nature as a drug or a substance. Some researchers are written about the need to establish "dose levels" for nature. This objectification means a narrowing of the possibilities of interacting with nature. The orientation of this review is that benefits arise from engaging with nature, developing a relationship, and bonding deeply in a reciprocal communion with nature.
2. Idealizing, romanticizing, and over-simplifying. Idealization is also a kind of objectification or reification of nature. Encounters with wilderness require proper context. Nature encounters are not automatically or always positive. Nature can kill, threaten, and traumatize. Nature experiences benefit from contextualizing.
3. Mistaking a healthy experience with healthy development. How do we integrate the positive experiences we have in nature when we return to our familiar worlds? How do we support nature experiences' potential for healing, maturation, and self-transformation?

### **RESEARCH FINDINGS**

#### **I. RELAXATION, STRESS REDUCTION**

Faster recovery from stress. "A consistent finding in well over 100 research studies of recreation experiences in wilderness and urban nature areas has been that stress mitigation is one of the most important verbally expressed perceived benefits" (Ulrich, 1991). THIS WAS OVER 20 YEARS AGO. Much research and several comprehensive reviews continue to confirm this finding.

Examples:

- Self-reported stress levels: wilderness backpacking < non-wilderness vacation < control. (Hartig, Mang, & Evans, 1991)
- Self-report of stress and affect, cognitive performance, physiology: urban environment < natural environment < passive relaxation. (Hartig, Mang, & Evans, 1991)

- Stressful movie of woodshop accidents followed by nature or urban (mall or traffic) videos. Faster stress recovery with nature video. (Ulrich 1984)
- Exposure to nature reduces stress (Leather et al, 1998)
- Nature visualizations promote deeper relaxation than non-nature visualizations (Segal; Chalquist).
- Stressful cognitive problem: walk in natural area > nature videos > rest in quiet room with music or magazines.
- Outdoor exercise reduced “tension” in 71% of participants compared to 45% for indoor exercise; 0% reported more tension from outdoor exercise compared to 50% for indoor (University of Essex)

## II. HEALING, FASTER RECOVERY FROM SURGERY, REDUCED PAIN

Very strong research published in *Science*. Early and surprisingly robust demonstration of the benefits of nature. Included here because pain and healing are intimately entwined with cognitions and emotions. Other research has shown other benefits of the view of nature from a window.

Examples:

- Window view of natural area rather than built walls reduces hospital stays, pain medications, nurse time, negative evals of patients, and complication after surgery. (Ulrich et al)
- Fewer health problems in prisoners.
- Painful stimulus less painful when followed by nature video compared to non-nature video.

## III. COGNITIVE BENEFITS (ATTENTION, PROBLEM-SOLVING).

Broad range of exposure to nature (e.g., watching a nature video or taking a walk in a green space or wooded area) → cognitive restoration (Berman, et al, 2008; Kaplan, 1995). Cognitive restoration may also mediate other benefits. Mental fatigue → negative emotions, etc. (Kaplan et al). Stemming from the original research by Stephen Kaplan at the University of Michigan, this is one of the strongest areas of research on the psychological benefits of nature.

Examples:

- Better working memory (Kaplan; Berman et al)
- Many areas of cognitive functioning and attention improved with nature walk, decreased with urban walk (Berman et al)
- Reduced mental fatigue and increased ability to concentrate (Maller et al 2008)
- Exposure to nature increased connectedness to nature, attentional capacity, positive emotions, and ability to reflect on a life problem; these effects are more dramatic for actual nature than for virtual nature. (Mayer, Frantz, Bruehlman-Senecal, & Dolliver, 2009).

- 50% more creativity from pre to post wilderness trip (Atchley, U of Kansas, unpub 2012)
- Reduced ADD symptoms (Taylor, Kuo, & Sullivan, 2001)

#### **IV. EMOTIONS, WELL-BEING, VITALITY, AND SELF-ESTEEM**

“Psychological well-being, meaningfulness and vitality were found to be robustly correlated with connectedness to nature.” (Cervinka et al, 2012) This is also a very strong area of research.

##### Examples

- Reduced anxiety and depression, e.g., 70% had lower depression scores after outdoor exercise and 45% after indoor exercise. (U of Essex, UK)
- Increased positive mood (Maller et al 2006).
- Persons with MDD: Positive affect improves more from a nature walk than an urban walk. (Berman et al 2012)
- Increased vitality (Ryan et al, 2010).
- Nature-connectedness → higher psychological well-being, vitality, agreeableness, openness, meaningfulness, life satisfaction (Mayer et al, 2009; Cervinka et al, 2012)
- Nature-relatedness → vitality, positive affect, autonomy, purpose in life, self acceptance, positive relationships with others, and life satisfaction. (Nisbet, 2011)
- Environmental education → nature-relatedness → vitality (Nisbet 2011)
- Happiness increased more from nature walk than indoor walk (Nisbet & Zelenski, 2011)
- Increased self-esteem, optimism, and empowerment. Women living in housing project with green space had higher self-esteem than women living in comparable housing without green space (Kuo).
- 90% of Ss reported improved self-esteem after outdoor exercise compared to 17% after indoor exercise; Reporting lower self-esteem: 5% outdoors to 44% indoors. Similar pattern for depression and tension. (Bowler)

#### **V. PRO-SOCIAL VALUES AND BEHAVIORS**

Nature reduces anger and aggression, leads to greater pro-social values, and promotes generosity.

##### Examples

- Nature exposure led to higher ratings for prosocial values (such as close relationships and community) than for self-centered values. Reverse for urban scenes. (Weinstein et al, 2009). Several replications of these findings. Found with immersion in nature scenes vs urban scenes and with being in a room with greenery vs no greenery.
- In “funds distribution task,” nature exposure led to more generosity and interpersonal trust (Weinstein et al. 2009)

- Aggression is lower when green space is nearby a large housing project (Kuo and Sullivan, 2001)
- Reduction in anger and increase in positive emotions after a walk in woods compared to walking in urban setting (Hartig)
- Violent aggression increased in Alzheimer patients on units without gardens; stayed the same or decreased in units with gardens.

## VI. NEUROPSYCHOLOGY

Supports other findings. *NOTE: THIS AREA HAS GROWN A LOT SINCE THIS REVIEW. I HAVE NOT HAD A CHANCE TO UPDATE IT. CHECK THE BOOK BY LOGAN AND SELHUB FOR A MORE COMPLETE REVIEW.*

- Alpha EEG activity
  - Ulrich (1981). Higher alpha with nature images. Alpha = relaxed awareness.
  - Japanese studies (see Logan & Selhub) found potting a plant → higher alpha compared to simply putting plain soil in a pot.
  - Corroborated with NITHS (blood flow) data showing relaxation.
- Limbic System: Kim et al (2010 and 2011) using fMRI
  - Urban scenes increase *amygdala* activity (Amygdala responds to fear & aversive stimuli)
  - Nature scenes increase activity in *anterior cingulate* (assoc with empathy, emotional stability, positive mental outlook).
  - Impact of nature scenes on *insula* is same as viewing pictures of loved ones.

## VII. TRANSPERSONAL AND SPIRITUAL DEVELOPMENT

Direct contact with nature is a portal to the deepest and highest levels of mental health.

Examples

- Nature is one of the most common triggers for peak experiences, ecstasy, & awe.
  - Wuthnow (1978): 82% of the general population have "experienced the beauty of nature in a deeply moving way," 49% felt this had a lasting influence on their lives.
  - Greeley (1974): 45% of general population said "beauties of nature" led to an "intense spiritual experience."
  - Keutzer (1978): 50% of a large sample of students said "beauties of nature" and other nature-related experiences had led to "an intense spiritual experience." This was the most frequent trigger for peak experiences in her survey.
  - Laski (1990) found nature was the most frequently cited setting for

- ecstatic experiences
- Hoffman & Muramoto (2007) provided cross-cultural confirmation. A sample of Japanese students reported nature as 1<sup>st</sup> or 2<sup>nd</sup> most common trigger for peak experiences.
  - Rudd, Vohs, and Aaker (2013) found that experiences of awe, in comparison to other positive emotions such as happiness, brought people more into the present moment and led to an expanded sense of time, greater willingness to engage in prosocial behavior, stronger preferences for experiences over material objects, and increased life satisfaction. They used images of nature such as waterfalls and whales (and other techniques) to elicit awe.
  - Siota, Keltner, & Mossman (2007) found nature to be the most common trigger for awe.
- Kaplan & Talbot (1983) On their wilderness experience programs found peak experiences more common in adults, but adolescents still had positive reports. They summarized their findings this way:

[During the backpacking trips] for many participants there is eventually a surprising sense of revelation, as both the environment and the self are newly perceived and seem newly wondrous. The wilderness inspires feelings of awe and wonder, and one's intimate contact with this environment leads to thoughts about spiritual meanings and eternal processes. Individuals feel better acquainted with their own thoughts and feelings, and they feel 'different' in some way — calmer, at peace with themselves, 'more beautiful on the inside and unstifled.' (p. 178)

[Immediately after the trip] the strongest connection between the wilderness experience and individuals' feelings about themselves [is that] they feel comfortable in their natural surroundings and are surprised at how easily this sense of belonging has developed. There is a growing sense of wonder and a complex awareness of spiritual meanings as individuals feel at one with nature, yet they are aware of the transience of individual concerns when seen against the background of enduring natural rhythms. (p. 179-180)

[After a follow-up] the wilderness is remembered as awesome, and is felt to have offered a compelling glimpse of a real world, and of a way of relating to one's surroundings and responding to one's daily opportunities and challenges, that was immensely satisfying. (p. 182)

- Terhaar (2009) integrated interview data to document intense spiritual experiences in nature and sense of oneness with nature. “[Those interviewed] do not seem to mean being in the midst of nature, but a sense of actually *being* nature, of existing as nature, where they and the natural world are one single entity” (p 312).

- Nature and spiritual/religious practice. Spiritual and religious practices are beneficial to mental health. Most common (in order) are prayer, meditation, attending religious services, and spending time in nature (out of 23 possible choices). 40.3% of respondents reported time in nature as a spiritual practice beneficial for mental health. (Lukoff and Mancuso, 2009)
  - NOTE: There is a lot of other research on wilderness programs and spirituality which dovetails with the findings on the psychological benefits of nature. For example, Frederickson & Anderson, 1999; Stringer & McAvoy; Dustin, Driver, et al; many others.
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### WHY? VARIOUS THEORIES

1. **BIOPHILIA.** Love for nature has an **evolutionary basis** (Wilson; Kellert; Terhaar). In this evolutionary view, specific values confer an evolutionary advantage (Kellert). Among the values associated with Biophilia are “strong feelings of affinity, ethical responsibility, and even reverence for the natural world. This perspective often reflects the conviction of a fundamental spiritual meaning, order, and harmony in nature” (Kellert, 1993, p 53). Biophilia also suggests a biological need for contact and affiliation with nature based in our evolutionary development. If these needs are met, then healthy development. If unmet, then some kind of deficit.
2. **ATTENTION RESTORATION THEORY** (Kaplan; Berman et al).
  - Modern life taxes capacities to direct and maintain attention
  - This leads to mental fatigue and many kinds of cognitive, emotional, and relational deficits (e.g., in attention, emotions, interpersonal relating, self-esteem).
  - Nature fosters effortless engagement of attention; fascination ...
  - Which leads to cognitive restoration.
3. **NATURE-CONNECTEDNESS, NATURE-RELATEDNESS** (Nisbet, Zelenski; Mayer, Frantz)
4. **TRANSPERSONAL PSYCHOLOGY.** Nature is mirror into ourselves, and more fundamentally, we are nature. Connecting with ecological unconscious (“the rest of you”) leads to wholeness, positive experience, and optimal development. Nature promotes spiritual wellness and fullness. Nature experiences take us out of our conditioned, deadened, and defense ego-selves into greater awakensness, openness, intimacy, fulfillment, peace, and inner freedom, i.e., ego-transcendence and the transpersonal.

In short, nature promotes access to transpersonal and spiritual dimensions of experience and development.

Specifically,

- Cogn restoration → awareness, awakeness → curiosity, fascination → wonder, awe → ego-transcendence and contact with the transpersonal
- Relax → Comfort → trust → dissolution of separating boundaries → nonduality, ego-transcendence, and contact with the transpersonal
- Connection → intimacy → union → ego-transcendence and contact with the transpersonal
- Adventure → beyond familiar self-concepts and boundaries → ego-transcendence and contact with the transpersonal

Any step on these paths is good. Each can ultimately lead to the transpersonal, the spiritual, and the numinous.

## CONCLUSIONS

1. Contact with nature, such as that provided by the wilderness-based programs of the SCHOOL OF LOST BORDERS, has a strong evidence-based foundation in the psychological benefits of nature experiences.
2. There are many ways and degrees to which we can encounter nature, and each is likely to have some psychological benefit. We might even expect that the more intensive the encounter, the greater the benefit (while recognizing that many other factors come into play).
3. The more explicit, focused, and engaged our encounters with nature are, the more they promote psychological health and development. The key may be participatory encounters with nature which are direct and first-hand, rather than indirect and second-hand. Examples of ways to deepen participatory encounters with nature include mindfulness practices, ritual and ceremony, sensory awareness, learning about a place through environmental and ecological education, using myth and symbol to engage a place, and ecopsychological environmental regeneration/service.
4. We need to preserve and promote access to nature on public health, mental health, and spiritual health grounds. This makes nature conservation a public health issue (Frumkin & Louv).



## SUGGESTIONS FOR FURTHER RESEARCH

1. Most research uses nature images or walks in green spaces because these are easier to control in research studies. This is helpful, but not complete. Since many of these findings are in controlled experimental settings, we need to replicate findings in field settings, both wilderness and nearby nature. Also suggests complementing quantitative research with qualitative-phenomenological methods.
2. Similarly, most of this research is on brief encounters with nature or imagery. What are the effects of deeper immersion in wilder nature and longer times in nature?
3. What interventions and techniques are most effective at increasing active engagement with nature (mindfulness, ritual, environmental education and learning about a place, service to a natural area such as regeneration, etc)? And does this active engagement lead to (a) greater nature-relatedness and (b) better mental health and psychological development?
4. Some terms which are common in wilderness therapy and ecotherapy have not shown up in research yet, e.g., resilience, attachment, impulse control. Does exposure to nature affect these?
5. There is strong research on the benefits of nature for stress and depression and a little on aggression. Can we replicate research on other variables relevant to mental health such as anxiety and trauma. Nature can provoke anxiety. What is the optimal level of anxiety in nature for mental health benefits? Under what conditions can nature experiences help heal PTSD?
6. How long do benefits of nature experiences last? How to help WT participants bring the benefits back home? How to keep the benefits growing?

## Bibliography

These references focus on surveys of recent research and, in some cases, “classic” studies. Those in bold are especially recommended as literature reviews accessible online. This list is a couple of years old now. I recommend doing your own searches on these topics, e.g., using Google Scholar.

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