

## Rolfs, Daniel

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**From:** Sue Thering [susan@designcoalition.org]  
**Sent:** Monday, August 04, 2014 6:09 PM  
**To:** Rolfs, Daniel  
**Subject:** Fwd: Garver / North Plat  
**Attachments:** Medicinal Greenspace, 2013, Logan.pdf; ATT00001.htm

Hi Dan

This message just came in from a member of the SASYNA,  
Will you enter it into the record of public comments?  
Thank you  
Sue

Begin forwarded message:

**From:** john steines <[jsteines@gmail.com](mailto:jsteines@gmail.com)>  
**Date:** August 4, 2014 6:00:43 PM CDT  
**To:** "Clausius, Joe" <[district17@cityofmadison.com](mailto:district17@cityofmadison.com)>, "Ahrens, David" <[district15@cityofmadison.com](mailto:district15@cityofmadison.com)>, "[district6@cityofmadison.com](mailto:district6@cityofmadison.com) Marsha" <[district6@cityofmadison.com](mailto:district6@cityofmadison.com)>, David Wallner <[annedave@chorus.net](mailto:annedave@chorus.net)>, [mcsheppard@madisoncollege.edu](mailto:mcsheppard@madisoncollege.edu), Sue Thering <[susan@designcoalition.org](mailto:susan@designcoalition.org)>  
**Subject: Garver / North Plat**

Dear Garver RFP Committee,

I had the honor of attending the 2013 Harvard Medical School Conference on The New Science Of Resiliency, of which the Logan presentation (attached) was only one. His presentation speaks specifically to the extensive research being done on benefits of nature for short and long term individual and social wellness.

Please recognize and remember that the neighborhood uses this land surrounding Garver for wild space. We think the building can have compatible uses. We think it can be improved and we think it needs to retain the elements of habitat for multiple species, as opposed to gardens which tend to be habitat primarily for humans.

Sincerely, J. Steines, 3327 Chicago Ave, Madison, WI.

# Medicinal Aspects of Greenspace in the Context of Ecotherapy

Alan Logan, ND

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The New Science of Resiliency and its Clinical Applications



**Harvard Medical School**  
*Department of Continuing Education*

## Genus Homo – Shaped by 2 million years of nature contact

‘Man is an outdoor animal. He toils at desks and talks of ledgers and parlors and art galleries; but the endurance that brought him these was developed by rude ancestors, whose claim to kinship he would scorn and whose vitality he has inherited and squandered.

He is what he is by reason of countless ages of direct contact with nature’.

James H. McBride, M.D. ~ Journal of the American Medical Association (1902)

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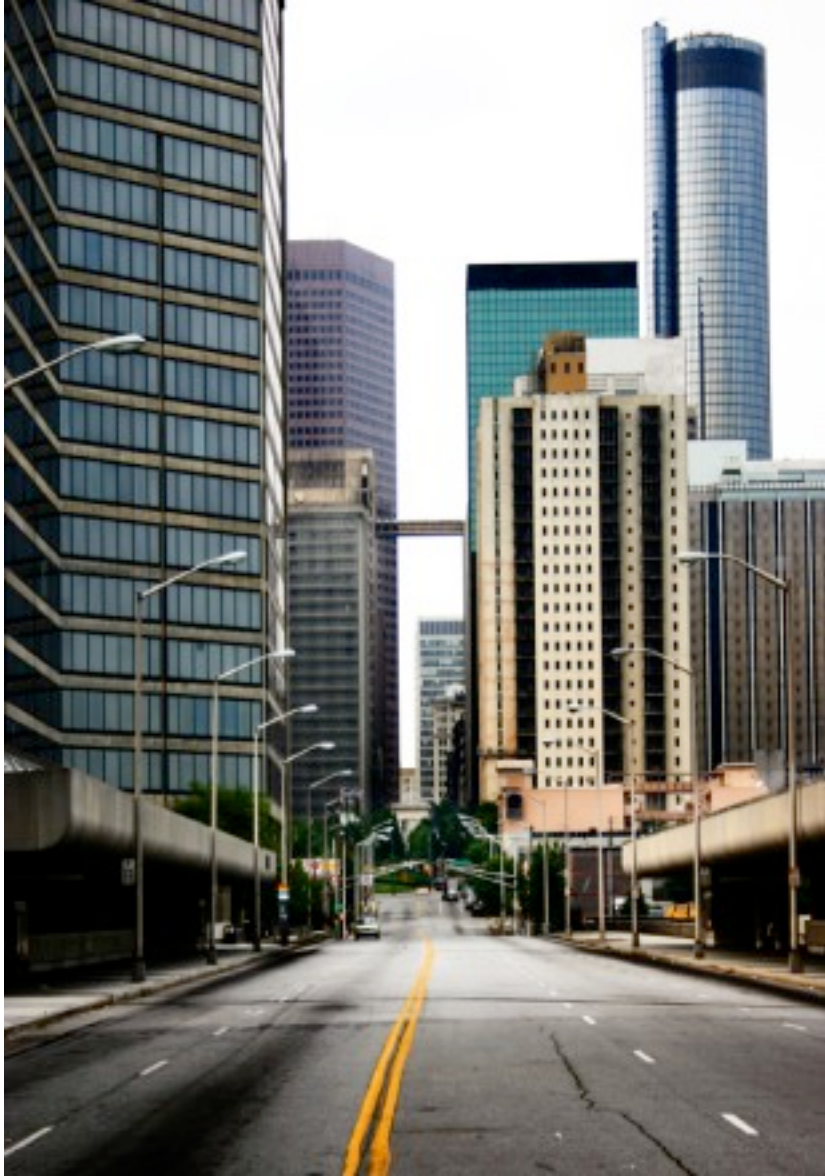
## Biophilia Hypothesis

- In the 1980s Harvard biologist Edward O. Wilson proposed that biophilia is an “innately emotional affiliation of human beings to other living organisms”.

- Innately - Not derived from experience or romantic notions, nor is it an exclusively North American ‘wilderness’ attraction - it is a universal attribute across cultures.
- Emotional - it has the potential to influence the matters that mental health care providers concern themselves with – cognitions and behaviors.
- If BIOPHOBIA exists...why not biophilia?

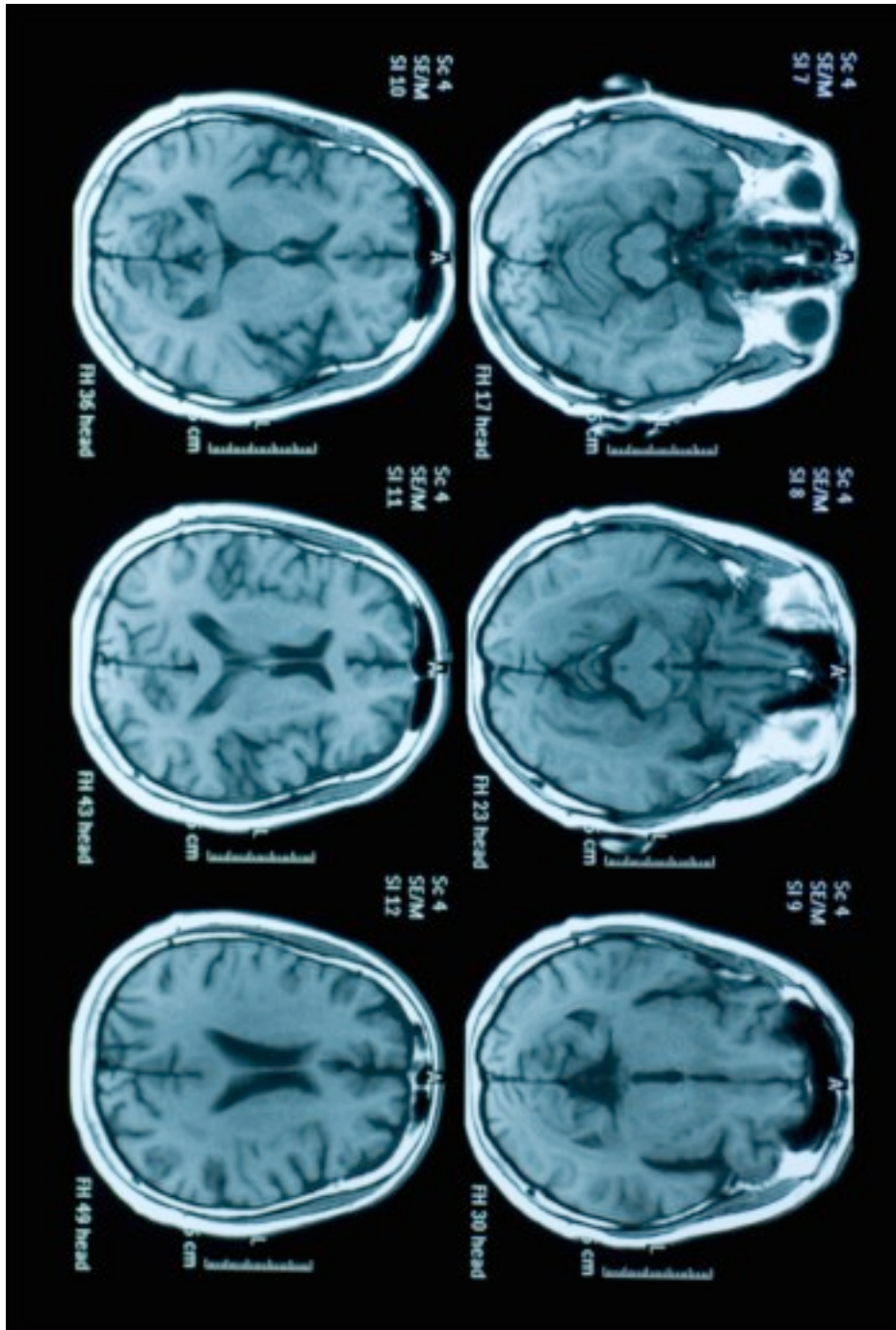
## The Brain “on” Nature

2-minute block of rural vs. urban; images presented every 1.5 seconds









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## Biophilia and the MRI Scanner

- Rural scenes produced  $\uparrow$  activity in the areas of the brain associated with...

- ✓ Emotional stability and **Empathy** ✓ **Love**, depth of love with partner ✓ Response to happy faces
- ✓ Pleasure, positive memories
- Urban scenes ↑ amygdala activity

## Nature and Stress Physiology

- Initiated by Roger Ulrich, several studies have shown that viewing nature scenes or conducting activities in nature can lower objective markers of stress
- ✓ ↑ EEG alpha wave activity in the brain (closer to a meditative state)
- ✓ ↓ cortisol
- ✓ ↓ Pulse, heart rate, blood pressure ✓ ↓ muscular tension

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## EEG - Walking in Urban Green Space

- University of Edinburgh study 2013...students monitored in real time with EEG under a cap as they walked for 25 minutes...
  1. Through a shopping district
  2. Through an urban park rich in vegetation



3. Back out through a commercial district

- EEG measurements reflected a meditative state, higher engagement, less frustration

Mobile EEG during validation



## Nature – In Sickness and in Health

- Ulrich - 11 years data, only adults who had undergone identical surgery to remove the gallbladder (cholecystectomy)
- Major distinction among the patients was the room into which they were wheeled for recovery time
- Windows in the rooms on one wing had a view to a mini forest, while the other wing, the windows had a different vista – i.e. red bricks  
Outdoor view to trees =
  - ✓ shorter hospital stays
  - ✓ less post-surgical complaints ✓ less potent analgesics
  - ✓ lower amount of negative comments placed in the chart by nurses

Ulrich R. View through a window may influence recovery from surgery. Science 1984;224:420-1.



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## Nature – In Sickness and in Health

- Several studies have backed up the original Ulrich observation...
- In those recovering from surgical removal of the appendix (appendectomy) and randomly assigned to a room with a dozen small potted plants – self-reported pain and use of pain medications was significantly lower, higher energy levels, more positive thoughts and ↓ anxiety.

- The mere presence of a floor plant (bamboo palm) and four potted shelf/table plants can significantly ↑ pain threshold in adult volunteers.

## “Shinrin-Yoku” – Forest Bathing

- 1982 - Forest Agency of Japan premiered its ‘Shinrin-yoku plan’
- Shinrin-yokustudieshaveinvolvedover1000 subjects, 2 dozen different forest settings
- Spending time/exercise within a forest setting can ↓ psychological stress, depressive symptoms, hostility; ↑ vigor and a feeling of liveliness
- Objectivemeasurementsshow ↓ cortisol, blood pressure, pulse rate, and ↑ HR variability, ↑ immune system functioning

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### Central nervous activity

Near-infrared spectroscopy (NIRS)



Endocrine parameter: cortisol

A typical stress hormone secreted from adrenal cortex







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(a) 'Viewing' the landscape (c) 'Viewing' the landscape in the forest area in the city area





(b) 'Walking' in the forest area

(d) 'Walking' in the city area



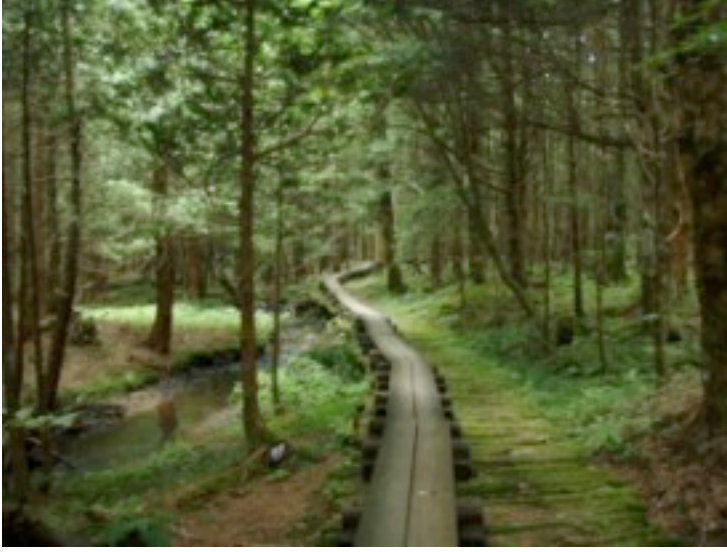
# Relaxation effect of nearby green space (urban park)

Forested urban park in Highly urbanized area in central Tokyo central Tokyo

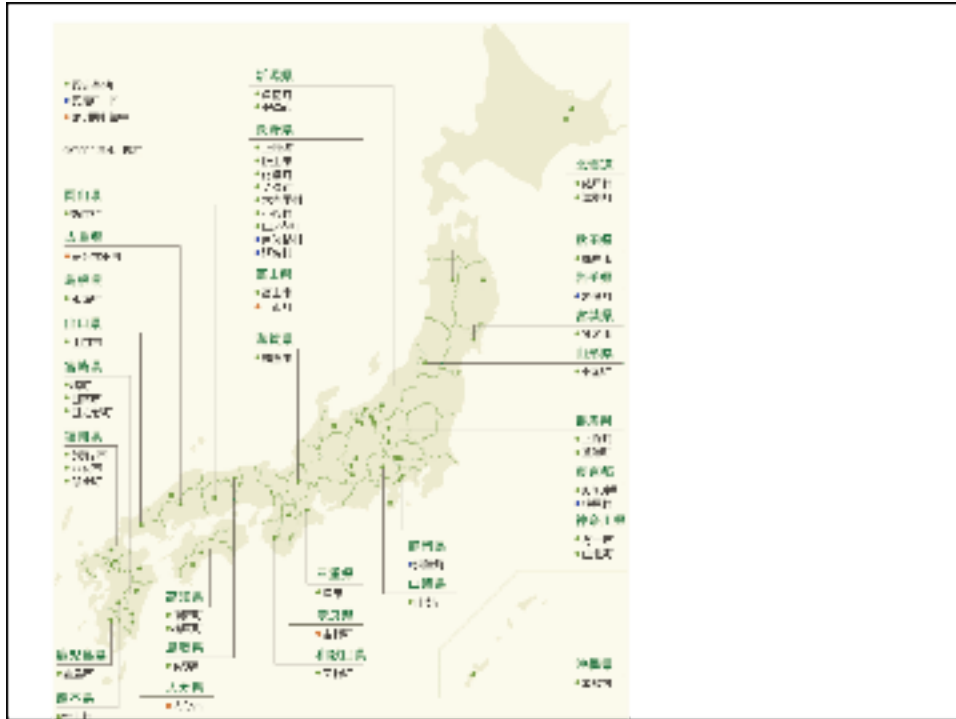




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Source: Forest Therapy Total Web <http://www.fo-society.jp/quarter/>



## Cognitive Benefits

- Seoul, Korea = immense urban national park
- Cognitive effects of a 50 minute walk through an urban pine forest vs. downtown streets
- Results showed the expected elevations in mood among the forest vs. built urban walkers; only after the forest walks ↑↑ improvements in post-walk cognition.





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## Cognitive Benefits

- Evaluation of 101 public high schools in Michigan
- Classroom and primary cafeteria views were scaled for the degree and types of nature,
- After controlling for socio-economic factors, class size, age of the school facilities and other factors, the results showed that classroom and cafeteria views to green vegetation were significant factors in academic performance on standardized tests.
- Views to trees and shrubs were associated with higher graduation rates and future plans for attendance at 4-year university programs.

- Trees and shrubs are key words because the degree of naturalness within the view mattered – a view to mowed grass was not a promoter of academic performance.

## Cognitive Benefits

- University of Illinois group, children with diagnosed ADD completed a series of challenging puzzles to ↑ attentional fatigue
- Then set out on a guided walk for 20 minutes

### Vegetation-rich urban park vs. built areas.

- Post-walk the child was driven back to a quiet indoor setting for neuro-cognitive testing – attention and executive functioning
- The children who had walked in the park showed improvements of cognitive function on par with top-selling ADHD medications!

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## Urban Nature Walk for Depression

- Patients with moderate-to-severe depression randomly assigned to 50 minute walk through arboretum vs. downtown streets.

- Subjects were instructed to think about a negative experience prior to the walk...priming rumination.
- Post-walk cognitive testing showed significant improvement in working memory capacity and positive affect in the nature group.

## Greenspace as Stress Buffer

✓ 15 of the top 24 disease states = lowest among those with the highest greenspace within a 1km radius from home.

✓ Those with  $\leq 10\%$  greenspace within 1km had a 25% greater risk of depression and a 30% greater risk of anxiety disorders vs. those at the upper end of greenspace near the home.



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## Greenspace as Stress Buffer

- Urban – Dundee, Scotland – At-risk community sample.

- Salivary cortisol compared to land-use data, physical activity and mental well-being. Green space % in neighborhoods varied by postcode between 14 and 74%.
- Green space was associated with normal diurnal cortisol over the day – lack of green space was associated with flat cortisol patterns in line with anxiety, negative life events PTSD, CFS et al.
- Less green space = ↑ self-reported perceived stress
- Green space % did not influence physical activity levels - suggesting that the potential value is not merely by providing a place to exercise.

## Greenspace and Health Equality

- Researchers from the University of Glasgow, Scotland compared land use database for greenspace vs. mortality records from the United Kingdom Office for National Statistics.
  - Controlled for socioeconomic differences – why? greater access to greenspace may be a marker of health advantages (healthcare access, nutrition, lower cumulative stress, cortisol etc).
  - Greenspace = great equalizer; low income + high levels of residential greenery = the mortality differences vs. the affluent were minimized.
  - However, when low income was associated with little surrounding greenspace, the health disconnect vs. higher socio-economic brackets became significantly ↑↑.
  - The researchers concluded that greenspace was an independent variable capable of saving thousands of lives per year in lower income populations.
-



# Nature and the Immune System



## Unseen Elements

- Phytoncide produced from trees can lower the production of stress hormones, reduce anxiety and increase pain threshold.

- The amount of phytoncide in the air, much higher in forest environments vs. urban areas without greenspace, has been associated with improved immune function.
- Higher airborne phytoncide = ↑ production of anti-cancer proteins in the blood, and front-line immune defense natural killer cells.
- Inhalation of aromatic plant chemicals increases the antioxidant defense system in the human body.

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## Unseen Elements

Relationship with light is out of balance...

- Just 30 minutes of exposure to 400 lux illumination, or 2 hours of 300 lux, can significantly reduce nocturnal melatonin levels.
- Plasma TVs and computer monitors boast about brightness - 400 to 1000 lux
- Proven morning light therapy dose is 1000 lux!!
- 60 watt bulb for reading, oil lamp, the candle, hearth fire used by our ancestors - 20-60 lux and have very little effect, if at all, on melatonin.



## Awe – Fostered by Nature

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### Awe

- Awe is...a feeling of wonder experienced by the self when facing something vaster, greater, beyond current understanding...
- Awe – induced by e.g. vistas, nature scenes, universally appealing art, childbirth
- Awe, when induced, increases feelings of R/S
- Induction directs attention away from the self and toward the environment

- Awe induced by nature = increased feelings of oneness to all others (humans in general)
- Awe induced by childbirth = increased feelings of oneness to friends

(Cappellen, et al. Awe activates religious and spiritual feelings and behavioral intentions. Psych Relig Spirituality 2012)

## Awe = A Nicer Person

- Induction of Awe (by nature) increases the perception of time availability...behavior implications...
- Decreases impatience
- Increases willingness to volunteer
- Increases subsequent (within an hour) desire to spend time in nature or creative pursuits
- Provokes choices of experience vs. material goods (i.e. Broadway show vs. a watch, dinner vs. a jacket etc.)
- Provokes momentary life satisfaction
- X-Cultural studies show natural settings to be one of the most common sites for peak experience.

(Rudd, et al. Awe expands people's perception of time, alters decision making, and enhances well-being. Psychol Sci 2012) (Shiota, et al. The nature of awe: elicitors, appraisals, and effects on self-concept. Cogn Emotion 2007;21:944-63)

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# Spiritual Experiences **by Nature!**



- A variety of studies have reported that time spent in forests, desert-like areas and blue-space can produce spiritual inspiration.
- Awe, relatedness, wonder, oneness.
- Participants note a heightened awareness of the present moment.
- Awe induced by nature does not require size/expanse – only the perception of beauty
- They note opportunity for reflection, improvement in resolution of personal difficulties
- Such experiences stimulate a desire for a return to the source and enhanced desire to protect nature. Snell and Simmonds. *Spiritual experiences in nature. Ecopsychol 2012;4:326-35.*

## Green Exercise

- 1800m running trail through woods vs. same in an open, non-wooded area.
- Subjects self-select a pace and jog the courses
- 1800m in woods = faster completion times, and on the psychological realm, more satisfaction, more enjoyment, and less frustration vs. the open laps.

- Woods joggers ↓↓ internally focused thoughts = decreasing perceptions of fatigue/symptoms exertion that can interfere with exercise adherence.
- In separate research: subjects asked to self-select a pace and walk on an indoor treadmill or an outdoor track
- Outdoor = self-select a faster pace, have more positive thoughts and perceive less overall exertion during the outdoor sessions.

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## Green Exercise

### Beyond Performance

- Head-to-head, outdoor exercise vs. the treadmill is associated with stronger intentions to continue participation in exercise - positive thoughts, or the enjoyment factor, appear to be a key driver of future adherence to exercise.
- Higher levels of enjoyment are consistently reported by participants in outdoor walking (vs. indoor), and at the completion of outdoor walking, energy levels and vitality are much higher.
- For experienced runners the same is true – outdoor running vs. the treadmill at an equivalent duration is associated with less fatigue, diminished anxious thoughts, less hostility, more positive mental thoughts and an overall feeling of invigoration.

## Pets

“Man’s machine-age technology has systematically alienated him from nature, but possibly his ancient

friend, the animal, can prove helpful...with a pet, most of us recreate unconsciously the time long ago when we had clear skies, wide-open spaces and an unhurried existence”.

~ Boris M. Levinson PhD, 1972

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## Pets

- Based on research published in the Journal of Personality and Social Psychology (2011), pets appear to be a true source of social support.
- In a community sample pet owners fared better on several well-being measures – provide an additional layer of social support on top of the circle of human support.
- Merely thinking or writing about a pet could stave off negative psychological reactions in a setting where the study participants were subjected to a social rejection experiment...  
“one’s pet was every bit as effective as one’s best friend’ when it came to lending support and buffering the typical negativity of social rejection.
- 2011 survey of over 2,000 adults – pets owners were happier in general and 60 percent of the people with pets attributed the pet to increased personal happiness.

## Pets

- ✓ facilitate social bonding, pro-social behavior and empathy
- ✓ decrease stress, improve mental outlook, turn down the dial on amygdala

activity

- ✓ enhance a sense of security, trust and pleasure

- Petting dogs and laboratory animals causes a rise in oxytocin levels of the animals and, in turn, humans also experience elevations in oxytocin.
- This two-way street of oxytocin could be a physiological glue within the human-animal bond
- Psychotherapists are viewed more favorably when evaluated in the presence of a dog, and individuals report themselves as more likely to disclose deeply personal information when the psychotherapist is in the presence of a dog.

Oxytocin has been shown to

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## Pets

• Dr Nancy Gee and colleagues from the State University of New York have shown that the mere presence of a dog in classroom settings can

- ✓ •minimize errors on cognitive tasks
- ✓ •enhance memory performance
- ✓ •increase adherence to verbal instruction
- ✓ accelerate the pace of tasks involving motor skills - without any loss in accuracy

“The common assumption that the presence of a dog can be distracting for children during the execution of cognitive tasks appears to be false.”

• When adult volunteers are subjected to stressful cognitive tasks, researchers find enhanced performance in the presence of a dog vs. a close human friend.

## Gardening as a Stress Buffer



- Community sample of 94 adults (age 50-88) with membership in various indoor and outdoor activity groups.
- With self-rated health controlled for, allotment gardeners reported significantly less perceived stress than participants of indoor exercise classes.
- No significant differences in reported levels of social support and/or physical activity
- What is the potential contribution of engagement with nature and psychological restoration?

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## Gardening – The Bridge to Healthy Fare

- School/community gardening programs = improved recognition and knowledge of, as well as preferences for, healthy vegetables.
- Compared to nutrition education alone, children with the added component of hands-on gardening are literally more willing to eat their peas!
- Community gardens have been shown to increase access to healthy produce and overall quality of nutritional intake, enhance physical activity, and

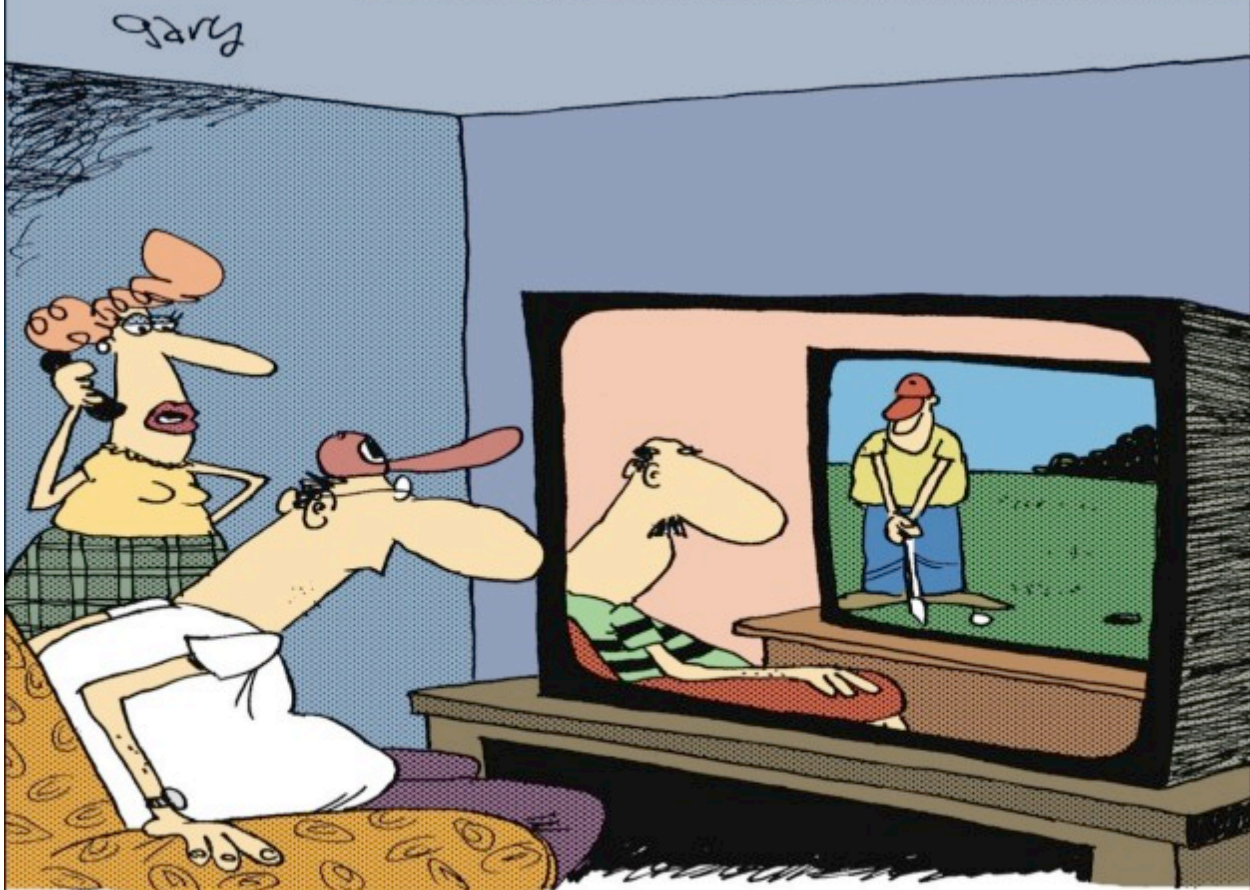
improve mental health, social cohesion, local ecology and sustainability.

## Wilderness – “Camp Cure”

- Not to be confused with fly-by-night “boot camps”
- 5-day forest camping programs (some inclusive of challenges such as rock climbing and hiking, as well as group activities) have proven effective in
  - ✓ improving depression
- Recent study highlights a collaborate effort with physicians, mental health and forestry experts;
  - ✓ 9-day forest program that begins with
    - i. simple forest experience in the camp
    - ii. days 3 to 6 there is an adventure-challenge portion
    - iii. days 7-9, there is an introspection component involving meditation and counseling within the forest setting.
  - ✓ This combination of systematic nature-based recreation, challenge, and psychotherapy may be an intervention of the future

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Problem: Less Green – More Screen – “Videophilia”



"Just when I thought it couldn't get any worse, now he's watching coverage of other people watching golf."

## The Great Indoors

- North Americans are in the process of 'a pervasive shift away from nature-based recreation'.
- Visits to National Parks in the USA have been experiencing a downward trend (as much as -25 percent) since the late 1980s.
- A recent study in the Proceedings of the National Academy of Sciences journal indicates that overall nature-based recreation is down 50 percent since 1975.

- Use of the Boundary Waters Canoe Area Wilderness (BWCA) with its million acres of wilderness and 1,000+ pristine lakes and streams has dropped almost 30 percent among residents since 1996.
- Similar declines in nature-based recreation have been noted internationally, including Japan.

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## More Screens in More Places

- When followed over 2 – 7 years, screen media consumption at baseline, video game use at baseline and computer use at baseline, increases the risk that otherwise healthy youths and working adults will subsequently experience depression, anxiety (particularly social anxiety), psychological difficulties and less sleep.
- Over 4,100 non-depressed teens are followed for 7 years, and screen media consumption predicts later depression in young adulthood
- Exposure to violent video games predicts an increase in aggression and a dip in empathy
- Significant immersion in any sort of video games predicts anxiety and depression.

## Drowning in Infotoxins

- We use the screen as a means to consume some 12 hours of information per day – television, web, texting, music, games etc.



- Since 1980=massive increases in info- consumption – 350% increase in total non-work related consumption; 60% increase in time devoted to non-work consumption.
- 75% of workers aged 18-44 check e-mail while on vacation, and the lure is magnetic - almost 40% describe themselves as either frequent or compulsive checkers while on vacation!

How much information? 2009 Report on American Consumers – University of California, San Diego

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## Drowning in Infotoxicity

Outside of school 8- to 18-year-olds:

- Devote an average of 7 hours and 38 minutes using entertainment media across a typical day...plus an additional hour of texting
- 72% reported parents did not set TV-watching rules
- 70% reported parents did not set rules about video game use
- 64% reported parents did not set rules about computer use  
 “I remember writing a paragraph saying we’ve hit a ceiling on media use, since there just aren’t enough hours in the day to increase the time children spend on media. But now it’s up an hour.”

Study author Dr Donald F. Roberts commenting on his confidence (in 2005) that media consumption couldn’t go higher

Generation M<sup>2</sup>: Media in the Lives of 8- to 18-Year-Olds. January, 2010

## Screen Culture: Empathy vs. Narcissism

- A number of recent studies have documented significant ↑ in narcissism among young adults – 89% more students answering almost all personality questions in the narcissistic direction in 2009 vs. 1994.
- Scores of empathic concern – the ability to exhibit an emotional response to someone else’s distress – ↓ 49% percent since 1980.
- Perspective taking, an intellectual understanding of another person's situational and individual circumstances - ↓ 34%.
- An “empathic drought” has been noted among graduating medical students

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## Why Even Small Shifts in Attitude Matter

- Those with ↑ narcissistic scores are more likely to cut down a hypothetical forest with greedy intent, forgoing long term gains and sustainability.
- Narcissists might pretend to care about the environment but are no friends of nature. Even a subtle shift in societal narcissism and empathy will have tremendous implications.

- We can hope that Twenge, Campbell and other psychologists erred in their calculations...



## Pro-social Aspirations

- Viewing/visualizing urban built = higher value of extrinsic aspirations (money, power, fame) and less likely to share resources
- Viewing/visualizing nature scenes = ↑↑ value intrinsic aspirations (community, intimacy, meaning) and a greater concern for pro- social goals vs. prior to nature immersion...more willing to share
- Separate portion of study – 75 subjects in one of 2 rooms...one room had 2 floor plants, a potted plant on a corner table and one potted plant on the computer desk...
- The mere presence of 4 plants in a room = robust elevation of intrinsic aspirations.
- Further, the presence of natural vegetation mediated higher scores on being related to nature, ↑↑ subsequent generosity

Weinstein, N., Przybylski, A.K., & Ryan, R.M. (2009). Can nature make us more caring? Effects of immersion in nature on intrinsic aspirations and generosity. *Personality and Social Psychology Bulletin*, 35, 1315-1329.



## Mental Health Crisis

- 7 Tons Sleeping Pills
- 12 Tons Anxiolytics
- 38 Tons ADHD Meds
- 150 Tons of anti-depressants
- 400 Million Rx for psychotropic medications in 2009
- 1 out of 2 can expect to have a diagnosable mental health disorder
- Depression rates are 20-fold higher vs. 1945
- Does our environment play a role in this reality?



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## We are “Amusing Ourselves to Death” via the Screen

- Science is proving social critic Neil Postman, author of the 1985 classic *Amusing Ourselves to Death* (1985), to be correct.
- In a 2011 prospective study of over 4,500 adults, total screen time was associated with subsequent risk of mortality.
- The risk increase was not small – 52% higher vs. those with the least screen time
- Being physically active didn’t provide much of an offset - high physical activity and screen time only dropped mortality risk mere 4 percent (to 48 percent higher risk of dying!) vs. those who exercised and had the least screen time.



- Australian researchers also found that lifetime TV viewing time is in itself a factor ↓ life expectancy = comparable risk of mortality with that of obesity and physical inactivity.

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## Ecopsychology

- Ecopsychology is the discipline within psychology “focusing on the interdependence of humans and nature”.
- Includes aspects of environmental and conservation psychology.
- Ecotherapy is an umbrella term for the practical application of mindful nature interaction (nature as medicine e.g. prescriptions for walking/exercise in nature, gardening, pet therapy etc.) and a commitment to supporting the health of that very same caregiver
- Two-way street i.e. living with a true depth of environmental awareness and understanding = such that we support the health of the planet.

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## Nature Connectivity

- Among almost 550 urban men and women, higher scores on the connectivity to nature scale = overall psychological well-being, vitality, meaningfulness.

- Strong connections between nature connectivity and personal well-being found broadly – private sector executives, high-ranking government employees, university students.
- Higher scores on Connectedness to Nature Scale, Nature Relatedness Scale, and/or Connectivity to Nature Scale = ↑ pro-environmental attitudes

## Mindfulness in Nature

- Sample of 450 North American university students, mindfulness is highly linked to the associations between connectivity to nature and psychological well-being.
- Mindfulness is the bridge.
- The relationship between connection to nature and psychological resilience is mediated by experience...the experience may be a product of socioeconomic background, education...opportunity

Ingulli and Lindbloom. Connection to nature and psychological resilience. *Ecopsychol* 2013;52-55

Howell A, et al. Nature connectedness: associations with well-being and mindfulness. *Personality Individ Diff* 2011;51:166-71.

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**It is possible to foster nature connectivity!**

- Contact with nature can foster positive mood state, which in turn facilitates a sense of nature relatedness.
- Psychologists Dr Elizabeth Nisbet and colleague Dr John Zelenski suggest this opens up a happy path to sustainability.
- Mindfulness also enhances connectivity to nature, a critical ingredient in creating depth to otherwise superficial concerns for the environment.
- Multiple studies show that lifetime experience/contact with nature is the greatest stimulator of pro-environmental behaviors and concerns for nature welfare.

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## Urban Biodiversity for Mental Health

✓The mental health benefits of 15 different urban greenspace settings were positively associated with a greater richness of various plant and bird species

– biodiversity, not simply green per se... ..and perceptions of biodiversity levels among green space users are surprisingly accurate

✓Well-being within urban neighborhoods is associated with species variety and abundance of local birds and totality of vegetation cover

Fuller, et al. Psychological benefits of greenspace increase with biodiversity. Biol Lett 2007

Luck G, et al. Relations between urban bird and plant communities and human well-being and connection to nature. Conservation Biol 2011



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## Urbanism and Mental Health

In developed nations...

- Mood disorders are 39% higher in urban areas
- Anxiety disorder 21% more prevalent.
- Schizophrenia as much as 4x higher

In developing nations...

- Trends are the same; daily depression and anxiety more common in urban centers

- Depression climbs with chronic disease – CVD, obesity, diabetes etc.
- Why isn't this on the radar?



## A New Psychotherapy Office

### Ecotherapy in vivo

- Some mental health providers are describing benefits by taking the counseling sessions into the outdoors - garden setting attached to office, meeting at designated parks, arboretums, botanic gardens, or urban greenspace.
- Researchers reported on the one month treatment of 63 patients with moderate to severe depression;
- Assigned to once-weekly CBT in either a hospital setting or a forest setting (arboretum), and a third control group were treated using standard outpatient care in the community.



- The overall depressive symptoms were reduced most significantly in the forest group, and the odds of complete remission – 20-30% higher than that typically observed from medication alone.
- CBT in forest group had more pronounced ↓ in cortisol and HRV

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## Vitamin G

Urgent

- Primary care doctors, psychiatrists, psychologists, and other mental health providers are now beginning to write formal prescriptions for Vitamin G
- Specified amounts of exercise and/or time spent in urban greenspace, gardens, arboretums and forests.
- Research from Dr Richard Ryan suggests 20 minutes per day of time spent in nature ↑ vitality



CoolClips.com

## Vitamin G

Urgent

- Stressed adults may actually need that Vitamin G Rx in hand
- Individuals w/ stress have the most to gain from Vitamin G
- However they are the least likely to make their way to the greenspace dispensary unless they have guidance
- Can include volunteerism in the outdoors



CoolClips.com

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## Vitamin G

Urgent

- Helps to be personally familiar with walking, hiking, gardening, and opportunities for solitude and contemplation in the green locations/routines within the Rx.

- Instructions on mindfulness - amplified benefit if the individual is 'there' in the true sense of the word.



## Equitable Opportunity





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## References for Biophilia

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