Health Benefits of Green Infrastructure: evidence of nature & mental health

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Reducing Stormwater Runoff

Image courtesy of the Center for Urban Forest Research
Tanner Springs Park
Portland OR
linked to active living network
neighborhood social cohesion

environmental education & social learning
co-benefit opportunities
What is the Evidence?

Nearby Nature for Human Health, Welfare & Function
Finding that study . . . . . .
Green Cities: Good Health
www.greenhealth.washington.edu

Sponsors:
USDA Forest Service, U&CF Program
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thanks!
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Katrina Flora
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Sarah Krueger

research review & summaries
Local Economics

Trees in cities are not grown and managed for products that can be bought and sold on markets, but they do provide many intangible services and functions! This article serves two purposes. First, it introduces valuation methods that are used to convert intangible benefits to dollar sums.\textsuperscript{1,2} Then, it shows how nonmarket valuations can support local decision-making.

Fast Facts

- The presence of larger trees in yards and as street trees can add from 3\% to 15\% to home values throughout neighborhoods.
- Averaging the market effect of street trees on all house values across Portland, Oregon yields a total value of $1.35$ billion, potentially increasing annual property tax revenues $15.3$ million.\textsuperscript{9}
- A study found 7\% higher rental rates for commercial offices having high quality landscapes.\textsuperscript{14}
- Shoppers claim that they will spend 9\% to 12\% more for goods and services in central business districts having high quality tree canopy.\textsuperscript{34}
- Shoppers indicate that they will travel greater distance and a longer time to visit a district having high quality trees, and spend more time there once they arrive.\textsuperscript{34}
metro nature & health benefits across the life cycle
Urban Forests and Newborns
the natural environment may affect pregnancy outcomes . . .

10% increase in tree-canopy cover within 50m of a house
= lower number of low weight births (1.42 per 1000 births)

Donovan et al., Health & Place 2011;
Hystad et al., Env Health Perspectives 2014
Elders: mobility & social connections
Mental Health treatment & therapy
% of U.S. Population Using Mental Health Medications

2001 vs 2010

America’s State of Mind, Medco Health Solutions, Inc
Prevalence of Adult Antidepressant Use 2010

America’s State of Mind, Medco Health Solutions, Inc
Green Streets for Walkability

evidence of lower frustration and higher meditation when moving into the greener streets

Aspinall et al. 2013. The Urban Brain: Analysing Outdoor Physical Activity with Mobile EEG. British Journal of Sports Medicine
Physical Activity & Depression Reduction

- Review of 13 high quality studies
  - exercise recommended for mild to moderate depression
  - people who are willing & motivated
  - associated meditation and mindfulness are important

Improving Depression

20 adults with major depression walk in a park setting and an urban setting

- 50-minute walks one week apart
- before-after testing:
  - Mood: Positive and Negative Affect (PANAS)
  - Cognition: Backward Digit Span (BDS)

Cognitive and affective improvements after walking in a nature setting

Berman et al. 2012. *Journal of Affective Disorders*
Change in % Population on ADHD Treatments
2001 - 2010

America’s State of Mind, Medco Health Solutions, Inc
% of Americans Ages 20-44 on ADHD Meds
2001 - 2010

America’s State of Mind, Medco Health Solutions, Inc
ADHD and nature contact

- 17 children aged 7-12 with diagnosed ADHD
- 20-minute guided walks
  - Park
  - Neighborhood
  - Downtown
- Pre-walk puzzles
- Post-walk cognitive test

Faber Taylor & Kuo. 2009. Journal of Attention Disorders
ADHD and nature contact

- 96 children aged 7-12 diagnosed ADD or ADHD

- Parents gave *postactivity attentional functioning ratings* (PAAF) – 4 measures:
  - Can’t stay focused on unappealing tasks (homework or chores)
  - Can’t complete tasks
  - Can’t listen and follow directions
  - Easily distracted

Faber Taylor. 2001. *Environment & Behavior*
Mental Health & Function just doing better!
Green High School Campuses

- cafeteria & classroom window views with greater quantities of trees and shrubs
- positively associated with:
  - standardized test scores,
  - graduation rates
  - %s of students planning to attend a four-year college
  - fewer occurrences of criminal behavior

Matsuoka. 2010. Landscape & Urban Planning
Attention Restoration Theory
Rachel & Stephen Kaplan, U of MI
Workplace Nature Views

- **Well-being**
  - desk workers without view of nature reported 23% more ailments in prior 6 months

- **Job Satisfaction**
  - less frustrated and more patient
  - higher overall job satisfaction and enthusiasm

Nature and Creativity

http://www.jimkukral.com/
role of nature in creativity development

http://daycare.sulekha.com
Give Your Ideas Some Legs

creative test – analogy generation

conditions: sit inside, treadmill walk, walk outside, wheelchair outside

walking outside produced most novel & highest quality analogies – walking opens up free flow of ideas

Oppezzo & Schwartz. 2014. Journal of Experimental Psychology
Nature & Creative Professionals

focused interviews in Denmark

nature:
makes us more curious
supports flexible thinking
recharges directed-attention

aids 2 phases of the creative process: Preparation phase and Incubation phase

sensory dimensions: space & serene

Plambech & Konijnendijk van den Bosch. 2015. Urban Forestry & Urban Greening
Mindfulness

Mind Full, or Mindful?
constant busyness

attempted multi-tasking

‘out of balance’
Nature and Mindfulness

focus
soft fascination
undirected attention

Attention Restoration Theory, Kapan & Kaplan

credit: Michael Hellgren
Summary

- evidence of nature & human health?
  Green Cities: Good Health
- ~ 40 years of research, > 3K peer-reviewed publications
- better mental health & function
- ADHD, attention restoration theory, creativity, mindfulness
www.naturewithin.info