

Growing up in the Inner City

Research Evidence and Potential Applications

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A little about me...

- ❖ Researcher
 - ❖ Environment and behavior, landscape design
- ❖ Instructor
 - ❖ Landscape Graphics & Design
 - ❖ Perennials
 - ❖ Children & Nature
- ❖ Parent

Children's *physical* environments

Supporting development?

Physical environments & children's healthy development

Remember the languishing bean seed...?



Kids are always growing,

whether their physical environments are supporting them *or not*

Contact with nature & children's healthy lifestyles

Supportive physical environment

⇒

Healthy day-to-day functioning

⇒

Healthy development into young adults

Children's healthy lifestyles

How can communities foster healthy day-to-day functioning in children?

Children's healthy lifestyles

How can communities foster healthy day-to-day functioning in children?

Provide frequent (daily?) contact with green spaces

Norwegians know this

- ❖ You value time outdoors as an important part of healthy development
- ❖ Empirical evidence backs up what you believe
- ❖ The evidence can guide urban planning

We need frequent contact with green spaces



Humans and urban living

Greenspace as accessory?

Or....

Greenspace as *necessity*

Why greenspace is a necessity

Research evidence

Overview

Why greenspace is a necessity

1. Why does nature help?
2. What we studied
3. What we found
4. What this means for families and communities

Why does nature help?

Why does nature help?

Attention Restoration Theory

being in nature is mentally restorative



Attentional fatigue

- ❖ Something we all experience!
- ❖ Information overload drains our attentional capacity
- ❖ Your capacity to direct your attention is crucial

Attention Restoration Theory

We need to frequently restore our attention from fatigue

How do YOU restore when mentally fatigued?

Theory

Two types of attention

Directed attention

Involuntary attention

Theory

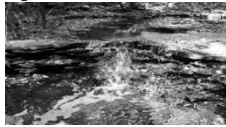
Directed Attention (*effortful*)
necessary for daily activities

Finite capacity

Theory

Involuntary attention (*easy*)
watching fire, moving water, wildlife

Does not fatigue



Attention Restoration Theory

Natural settings

■ engage our *involuntary attention* (easy)

■ REST our *directed attention* (effortful)

Nature can foster...

attention restoration in fatigued children, students

attention restoration in fatigued adults

attention restoration...

translates into

- ❖ Improved focus and learning
- ❖ Improved mental functioning, productivity
- ❖ Reductions in aggressive behavior, impulsive behavior



Theory of Loose Parts

Theory of Loose Parts

"In any environment,
both the degree of inventiveness and creativity,
and the possibility of discovery,
are directly proportional to the number and kind of
variables in it."

Nicholson, S. (1971). How not to cheat children: The Theory of Loose Parts.

The Loose Parts Theory - not limited to nature

Natural environments in some ways superior
provide many **loose parts**

- ❖ leaves and twigs
- ❖ nuts and berries
- ❖ rocks and shells
- ❖ flowers to pick
- ❖ Water to scoop and splash
- ❖ Sand to move, etc.



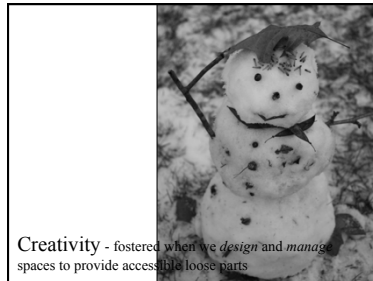
Snails

A snail 'boat'

Construction and experimentation
are possible with natural materials



Allow children to "pick" plant materials for creative play



Creativity - fostered when we *design and manage*
spaces to provide accessible loose parts

Fostering creative
play in today's
communities –

Time Magazine
Aug 9, 2010



What we studied

What we studied

Day-to-day functioning

- Self-discipline
- Concentration
- Impulse control
- Delay of gratification



What we studied

Day-to-day functioning

- Self-discipline
- Concentration
- Impulse control
- Delay of gratification
- Play and creative forms of play



What we studied

Day-to-day functioning

Self-discipline
Concentration
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Access to / interaction with adults



What we studied

Day-to-day functioning

Self-discipline
Concentration
Impulse control
Delay of gratification
Play and creative forms of play
Access to / interaction with adults
Attention Deficit & Hyperactivity
Disorder (ADHD) symptoms



What we studied

Day-to-day functioning

Self-discipline
Concentration
Impulse control
Delay of gratification
Play and creative forms of play
Access to / interaction with adults
ADHD symptoms
Adults' functioning



What we studied

Greenspace

Tree cover
Grass cover
Residential space greenness
Play space greenness
Activity setting greenness



What we studied

Greenspace

Private spaces (e.g., private residential yard)
Public / common spaces (e.g., public housing courtyard)

Greenness of space around home
Greenness of views from home

What we studied

Techniques

Performance measures
Parent ratings
Raters blind to hypothesis
Within and Between
Subjects design
Statistical testing
Testing for alternative
mechanisms

Many participants
Many settings
High vs. low green
conditions
Conditions otherwise
identical

What we found

What we found

Greenspace & healthy functioning

Findings:
•Statistically significant
•Build on theory (*Attention Restoration Theory*)

What we found

Barren & green courtyards
Chicago Public housing



A green view

makes a measurable difference
in functioning

What we found

Greenspace & healthy functioning

Psychological functioning - children

What we found

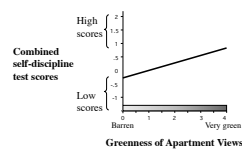
Greenspace & healthy functioning

The greener the view the greater girls' self-discipline

Faber Taylor, A., Kuo, F.E., Sullivan, W. (2002) *Journal of Environmental Psychology*

What we found

Greenspace & healthy functioning



Faber Taylor, A., Kuo, F.E., Sullivan, W. (2002) *Journal of Environmental Psychology*

What we found

Greenspace & healthy functioning

On average, the greener a girl's view from home:

- ❖ the better she concentrates
- ❖ the less she acts impulsively
- ❖ the longer she delays gratification

7-12 years old

What we found

Greenspace & healthy functioning



Faber Taylor, A., Kuo, F.E., Sullivan, W. (2002) *Journal of Environmental Psychology*

What we found

Greenspace & healthy functioning

Psychological functioning - adults

- ⬆ Cognitive functioning
- ⬆ Management of major life issues

- ⬇ Aggression
- ⬇ Violence

www.lhhl.illinois.edu

What we found

Greenspace & healthy functioning

Social functioning - adults

- ⬆ Strength of community
- ⬆ Courtesy, mutual support

- ⬇ Graffiti, noise, litter
- ⬇ Loitering, illegal activity
- ⬇ Property Crime
- ⬇ Violent Crime

www.lhhl.illinois.edu

What we found

Green & barren courtyards

Chicago Public housing



What we found

Greenspace & healthy functioning

Green common spaces:

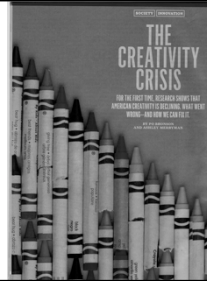
- ❖ Twice as much play
- ❖ more creative play
- ❖ No difference in other activities

Inner city, low SES, ages 3-12

Faber Taylor, Wiley, Kus, Sullivan, (1998) *Environment & Behavior*

Creative play is
important - maybe
now more than ever

Newsweek
July 19, 2010



What we found

Greenspace & healthy functioning

Green common spaces: more
accessible adults

Inner city, low SES

Faber Taylor, A. Wiley, Kus, Sullivan, (1998) *Environment & Behavior*

What we found

Greenspace & healthy functioning

ADHD

a **neurobiological disorder** characterized by
developmentally inappropriate impulsivity, inattention, and in
some cases, hyperactivity.

9.5% 4-17 yr olds diagnosed in U.S.

(<http://www.nlm.nih.gov/science-news/2011>)

Prevalence and treatment increasing in Norway, but
lack of agreement regarding numbers

What we found

Greenspace & healthy functioning

Children with ADHD – Midwestern U.S.

What we found

Play environments



"Places where there are big trees and grass"

What we found

Play environments



"Places indoors where it feels very much indoors"

What we found

Greenspace & healthy functioning

Frequent play → less severe
greener spaces ADHD symptoms overall

Children with ADHD - Midwestern U.S.
7-12 years old

What we found

Greenspace & healthy functioning

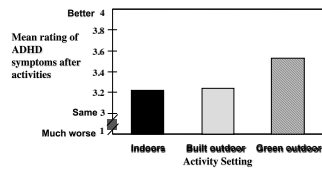
Activities in green settings → reduced ADHD
symptoms

Post-activity

Children with ADHD - Midwestern U.S.

What we found

Greenspace & healthy functioning



Faber Taylor, A., Kuo, F.E., Sullivan, W. (2001) *Environment & Behavior*

What we found

Greenspace & healthy functioning

Children with ADHD - **Nationwide U.S.A.**

(over 450 participants)

What we found

Greenspace & healthy functioning

Frequent play in greener spaces → less severe ADHD symptoms overall

Children with ADHD - **Nationwide U.S.A.**

Faber Taylor, A., & Kuo, F. (2011) *Applied Psych: Health & Well-being*

What we found

Greenspace & healthy functioning

Children who typically play in greener spaces have less severe ADHD symptoms overall...

Even when family income level is controlled

Children with ADHD - **Nationwide U.S.A.**

What we found

Greenspace & healthy functioning

Activities in green settings → reduced ADHD symptoms

Post-activity

Children with ADHD - **Nationwide U.S.A.**

What we found

Green activity settings related to better attentional functioning

❖ Regardless of:

Community size (rural to large city)

Region of the U.S.

Gender

Age (5-18)

Severity of symptoms

Kuo, F.E., Faber Taylor, A. (2004) *Amer. Journal Public Health*

What we found



Field study –

Controlled walks through

❖ park

❖ neighborhood

❖ downtown

What we found

After a walk in PARK
higher scores - measure of attention
than after neighborhood or downtown walks

What parents say...

Greenspace & healthy functioning

“...my son can fish for hours and afterwards his symptoms are hardly noticeable.”

- parent of child with ADHD

What parents say...

"...two weeks camping in a pop-up camper is just bliss. We have a great time. He's great."

- parent of child with AD/HD



What we found



Summary

Trees / greenspace	Healthy functioning	Populations
Views from apartment	'Self discipline' Concentration	Low SES Middle SES Upper SES
Overall home greenness	Impulse control Delay of gratification	Children with AD/HD
Play space greenness	Play & creative play	Children with regular attention function
Public/common space greenness	Adult supervision	
Activity setting greenness	Reduced AD/HD symptoms	

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University of Illinois

Summary others' research

Nature - health link in children

Residential nature - attentional functioning (Wells, N.)

Residential nature - coping with stressors (Wells, N. & Evans, G.)

Residential nature - lower obesity rates (Liu, Bell, et al., 2007)

Residential nature - lower asthma rates (Lovasi, 2008)

Summary others' research

Nature - health link in children

Daycare nature - attentional functioning (Grahn, P., 1997)

Schoolyard nature - better outcomes high school
(Matsuoka, R., 2010)

Summary others' research

Future stewards

Childhood experiences of nature (bonding) → pro-environmental ATTITUDES and BEHAVIORS as adults

Wells, N. & Lekies, K. 2006;
Chawla, L. 2007

Summary

Evidence suggests

trees / green space support:

- Healthy day-to-day functioning
- Healthy development & outcomes
- Future stewards of the earth



What this means

Implications for design and urban planning...

Design and urban planning

Trees / green space ~

a *necessity* for supporting

- ❖ Children's healthy development
- ❖ Adults' healthy functioning

A *necessity* for our cities

Children and adults' daily experiences
of nature are valuable
It DOES make a measurable difference.

A *necessity* for our cities

Even a few trees and
grass make a
difference in intensely
built environments



Design and urban planning

Intensely urban areas need greenspaces:

- ❖ frequently
- ❖ easily accessible
- ❖ woven into everyday life
- ❖ variety of forms



Design and urban planning

Intensely urban areas need green
spaces:

Where adults and children

- ❖ Work
- ❖ Live
- ❖ Play

Greenspaces where adults and children Work

Children 'work' at school and daycare

Greenspaces where adults and children Work

Children 'work' at school and daycare

"Green" schoolyards and daycare centers

- ❖ for recess
- ❖ class activities
- ❖ outdoor learning
- ❖ within view from classroom, cafeteria?

Schoolyard green
spaces for:

- relaxation
- attention restoration





Schoolyard green spaces for: Play



Schoolyard green spaces for:

- food production
- science lessons

Greenspaces where adults and children Work

Adults often work in intensely built settings

Do they have a view of greenspace?

Can they take a break in greenspace?

(e.g., Shin WS. The influence of forest view through a window on job satisfaction and job stress. *Scand J Forest Res* 2007;22(3):248-53.
Kaplan, R. (1993). The role of nature in the context of the workplace. *Landscape and Urban Planning*, 26, 193-201.)



Greenspaces where adults and children Live

Daily doses' appear to be beneficial

Weave green spaces into daily routines

- ❖ Traveling routes
- ❖ Quick trip after school or work
- ❖ Pre-homework, especially children with ADHD

(e.g., Maas, J., Verheij, R.A., Vries, S., Spreeuwenberg, P., Schellevis, F.G., Groenewegen, P.P. (2008) Mobility is related to a green living environment. *J Epidemiol Community Health*, 6, 1-7.)

Design and urban planning

Intensely urban areas need green spaces

within view from inside the:

- ❖ home
- ❖ hospital
- ❖ long-term care facility

(Ulrich, R.S.(1984) View through a window may influence recovery from surgery. *Science*, 124, 420-421.
Vanman, C.M., Chappick, R.(1985) Views to nature effects on attention. *Journal of Environmental Psychology*, 15, 71-85.
Kaplan, R. (2001) The nature of the view from home: psychological benefits. *Environment & Behavior* 33, 507-542.)

Greenspaces where adults and children Play



Greenspaces where adults and children Play

Design greenspaces compatible with
'real life' schedules

It is not enough to tell adults,

"Greenspace is good for you, good for
your kids, you should go there"

Greenspaces where adults and children Play

Community design should make
greenspace:

- ❖ attractive to parents
- ❖ supportive of parents' needs (benches,
bathroom, drinking water)
- ❖ easy to get children there (consider traffic
barriers, bike paths, etc)

"People do not usually compensate for
lack of green environments in their own
residential area with more visits to public
parks or urban forests."

"...laying out more green areas close to apartment
houses, and making these areas more accessible, could
make for more restorative environments. Outdoor areas that provide environments
free from demands and stress, and that are available as part of everyday
life, could have significant positive effects on the health of town-dwellers in
Sweden."

Grahn, P., & Stigsdotter, U.A. (2003) Landscape planning and stress. *Urban Forestry
and Urban Greening*, 2(1), 1-18



"These trends and these profound disconnects
from nature...suggest the time is ripe to revisit
how we design and plan our communities and
cities."

Timothy Beatley (2011) *Biophilic Cities: Integrating Nature into
Urban Design and Planning*

*Perhaps more than just sustainable cities, we
need nature-rich cities*

Richard Louv, 2013



Intensely urban areas need green spaces...

incorporating characteristics of
restorative environments (restore from mental fatigue)

- ❖ Soft fascination
- ❖ Sense of being away
- ❖ Extent
- ❖ Compatibility

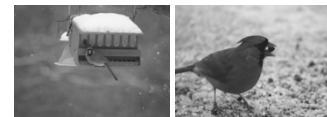
Design for *soft fascination* -

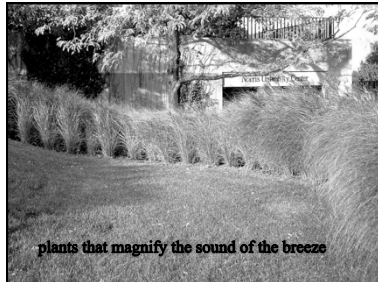
benches and foot bridges, natural materials - foster lingering and reflective
thinking



Design for *soft fascination* -

attracting birds and other wildlife



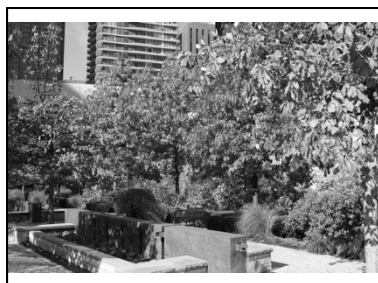


To foster restoration from mental fatigue...

Design with **4** characteristics of restorative settings:

1. Soft fascination
2. Sense of being away

Kaplan, Kaplan, & Ryan (1998) *With People in Mind: Design and Management of Everyday Nature*. Island Press.



To foster restoration from mental fatigue...

Even just a view out of an office window, or home,
can provide a momentary

Sense of being away

Kaplan, Kaplan, & Ryan (1998) *With People in Mind: Design and Management of Everyday Nature*. Island Press.

To foster restoration from mental fatigue...

Design with **4** characteristics of restorative settings:

1. Soft fascination
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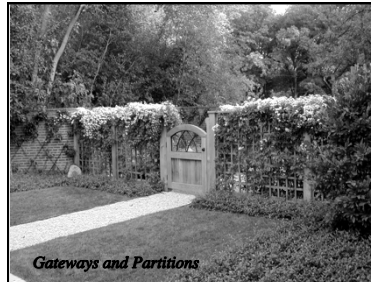
Kaplan, Kaplan, & Ryan (1998) *With People in Mind: Design and Management of Everyday Nature*. Island Press.

To foster restoration from mental fatigue...

In addition to "sense of being away" a space needs

Extent – depth, no signs of everyday life, or feels like whole different place

- ❖ Looking through a microscope
- ❖ Small but richly planted backyard



To foster restoration from mental fatigue...

Design with 4 characteristics of restorative settings:

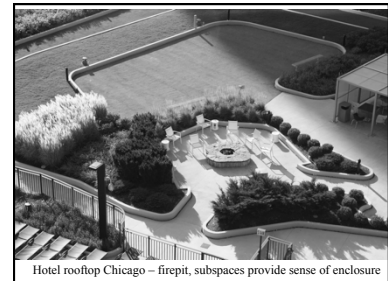
1. Soft fascination
2. Sense of being away
3. Extent
4. Compatibility

To foster restoration from mental fatigue...

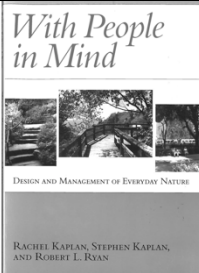
Compatibility = nothing working against desired actions / inclinations

- ❖ Domestication
- ❖ Observation
- ❖ Fire building
- ❖ Constructing shelter
- ❖ Locomotion
- ❖ Predation (fishing & hunting)
- ❖ Gathering?

Design for compatibility-
locomotion and fire building



Useful design guidelines
for restorative
environments



Use the research publications
to leverage for adding / preserving
greenspaces

Empirical evidence propels greening



Chicago, IL

Chicago Tribune

♦ *growing evidence...
trees can help temper
social ills*

♦ *20,000 trees -- more
than ever in Chicago's
history*

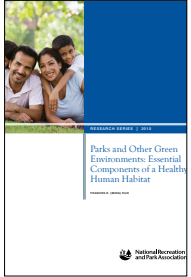
Some resources

Our research
www.lhhl.illinois.edu

The Children and Nature Network
www.childrenandnature.org

Evergreen
www.evergreen.ca

Useful summary of research





A *necessity* for our cities

We can't "fix" all the stressors families endure...

... we CAN make it easy for them to put themselves in supportive environments




We need contact with nature in everyday living

In America I quote you...

"There is no bad weather,
 ...just bad clothing"

Scandinavian saying

