CHANGING CONDITIONS – CHANGING HEALTH

Urbanisation

Sedentary lifestyles

Stress

Social isolation

Obesity

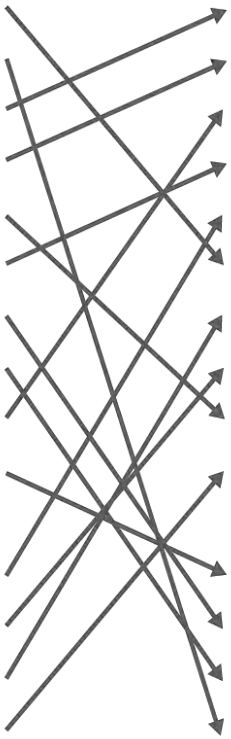
Disconnection from nature

Environmental threats

PREVENTION!

Ten leading causes of burden of disease, world, 2004 and 2030

2004 Disease or injury	As % of total DALYs	Rank		Rank	As % of total DALYs	2030 Disease or injury
Lower respiratory infections	6.2	1		1	6.2	Unipolar depressive disorders
Diarrhoeal diseases	4.8	2		2	5.5	Ischaemic heart disease
Unipolar depressive disorders	4.3	3		3	4.9	Road traffic accidents
Ischaemic heart disease	4.1	4		4	4.3	Cerebrovascular disease
HIV/AIDS	3.8	5		5	3.8	COPD
Cerebrovascular disease	3.1	6		6	3.2	Lower respiratory infections
Prematurity and low birth weight	2.9	7		7	2.9	Hearing loss, adult onset
Birth asphyxia and birth trauma	2.7	8		8	2.7	Refractive errors
Road traffic accidents	2.7	9		9	2.5	HIV/AIDS
Neonatal infections and other[a]	2.7	10		10	2.3	Diabetes mellitus
COPD	2.0	13		11	1.9	Neonatal infections and other[a]
Refractive errors	1.8	14		12	1.9	Prematurity and low birth weight
Hearing loss, adult onset	1.8	15		15	1.9	Birth asphyxia and birth trauma
Diabetes mellitus	1.3	19		18	1.6	Diarrhoeal diseases



Urban forests are probably better health resources than hospitals.

Urban foresters can provide as much health benefits as health practitioners.

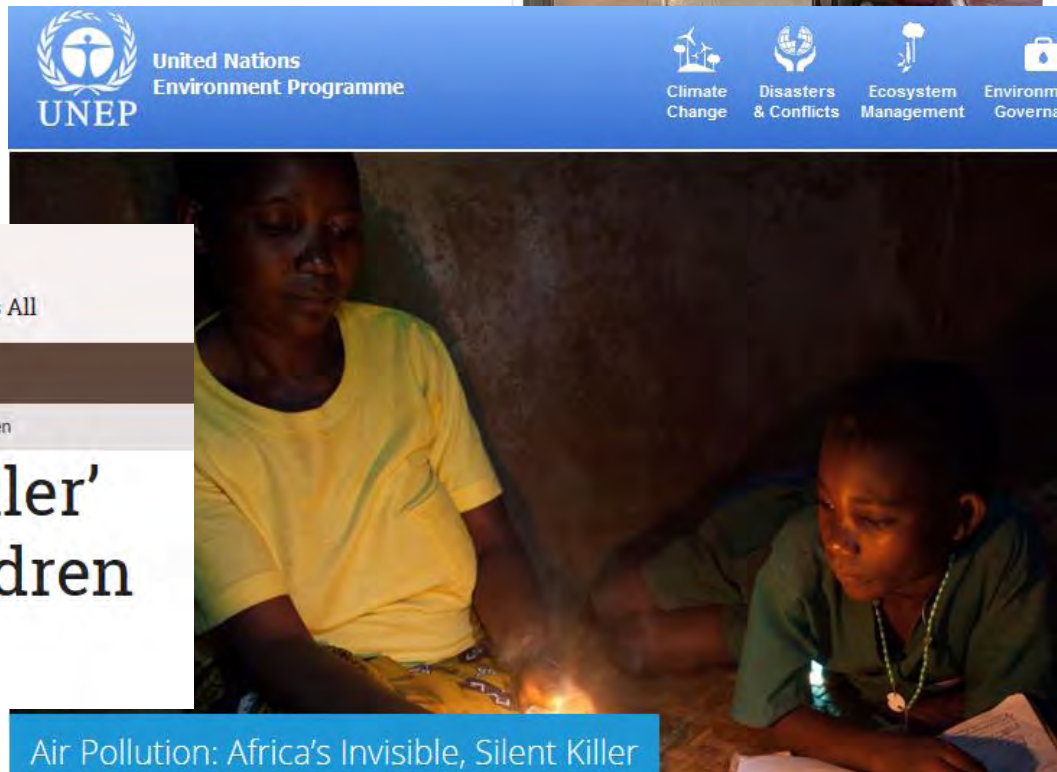
THE “SILENT”, “INVISIBLE” CAUSES OF TODAY’S DISEASES

Havering friends of the earth
See things differently

- Multifactorial
- Intertwined
- Related to/determined by

  culture, society, political systems, city planning,

  environment, climate change etc.



A BALANCED, “ZEN” LIKE LIVING ENVIRONMENT

Bring nature indoors – air quality, light, plants

“Advocates” for nature-health, spreading the knowledge

bonzai_expo_2012-10_CC BY 2.0

THE ROLE OF PERCEPTION

How do we perceive nature?

What determines differences? (individual, culture, type of nature, etc.)

How does the perception affect health outcome?

Perception by Riccardo Cuppini_CC BY-NC-ND 2.0

"Only in quiet waters
do things mirror themselves undistorted.
Only in a quiet mind
is adequate perception of the world"
Hans Margolius

SCIENTIFIC THEORIES ON NATURE AND HEALTH

January 17, 2017


Theory
Scientific studies
Evidence

Love

Beauty

Restora-
tion

Relaxa-
tion

BIOPHILIA
(E.O. Wilson)

Love

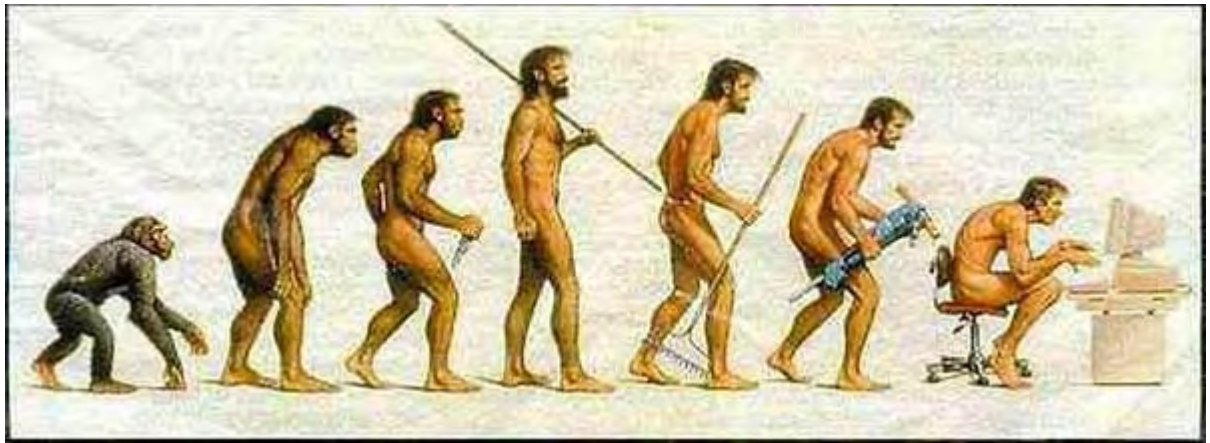
The inherent **love** for nature

Trust for nature, shelter and safety

Evolution – adapted to respond to natural stimuli, not to artificial input

Genetically **predisposed**

(Fear of snakes, not of guns, Ohman, 1986)



Savannah, Uganda by Rod Waddington_CC BY-SA 2.0

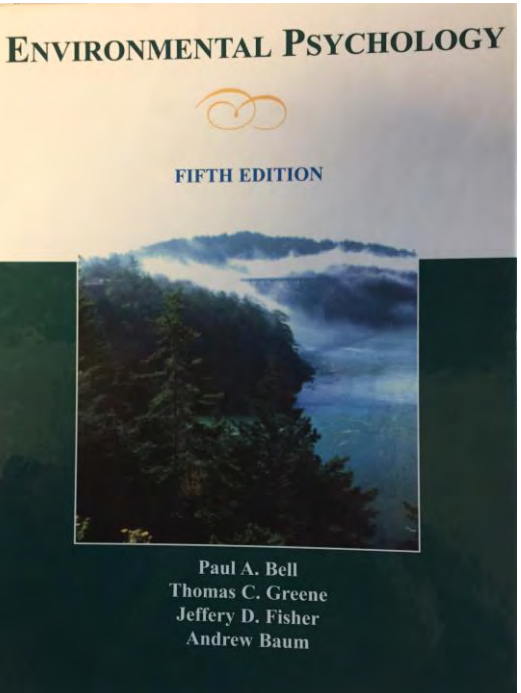
ENVIRONMENTAL PSYCHOLOGY

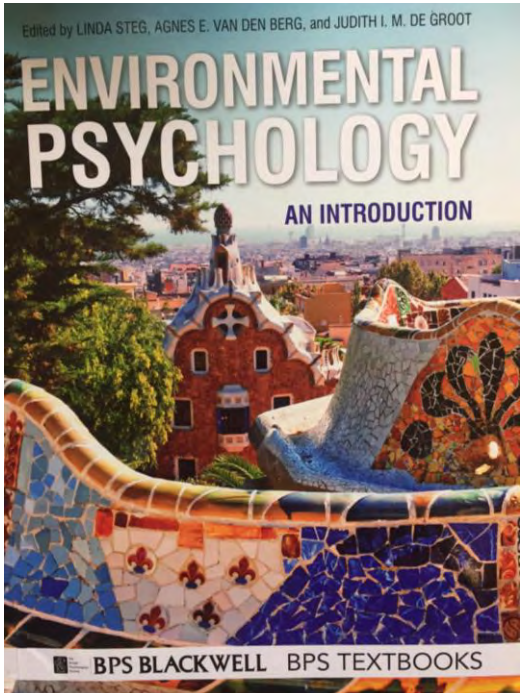
"Environmental psychology is a social science discipline concerned with the interplay between individuals and their physical environment"

(Steg et al., 2012)

Initially most about built environments

Since the 1980s more on natural environments





SCIENTIFIC THEORIES

1. Environmental aesthetics and landscape preferences

a) Arousal theory

b) Prospect refuge theory

2. Psychological restoration

a) Stress reduction theory

b) Attention restoration theory

3. Neural mechanisms

4. Learned associations and positive beliefs

1. ENVIRONMENTAL AESTHETICS AND LANDSCAPE PREFERENCES

The experience of **beauty**

Less beautiful – less health benefits

Beauty

1 a) AROUSAL THEORY

(Daniel Berlyne, Joachim Wohlwill)

- Aesthetically pleasing nature elicits an optimal level of arousal
- Aesthetically pleasing contains an **optimal blend** of arousal-increasing and arousal-decreasing features
- “unity-in-variety”

1 b) PROSPECT-REFUGE THEORY

(Jay Appleton)

- The potential of an environment to satisfy a biological drive
- “see without being seen”
- “hide and seek aesthetics”
- Panoramas AND shelters
- Landscape paintings and design

2. PSYCHOLOGICAL RESTORATION

Beyond beauty and aesthetics

Relaxing and restorative environments

2 a) STRESS REDUCTION THEORY

Roger Ulrich

- Immediate response to nature
- Non-conscious
- Physiological reactions – stress recovery, relaxation
- The savannah – vegetation, trees, and water, no threats
- We are prepared to react to nature but not to built settings

ULRICH ET AL. 1991

Stress recovery during exposure to natural and urban environments

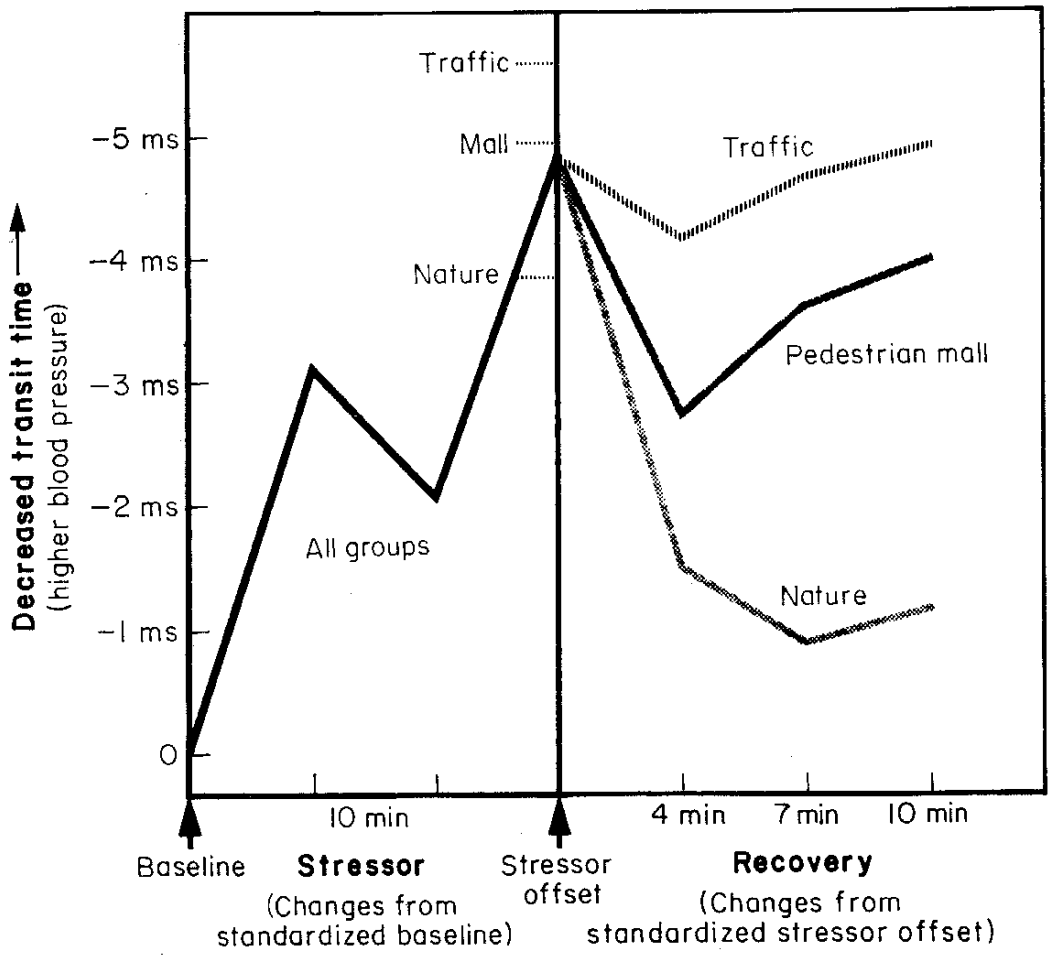


FIGURE 2. Changes in pulse transit time (PTT) during stress and recovery.

2 b) ATTENTION RESTORATION THEORY

Restora-tion

Rachel and Stephen Kaplan

- The universal meaning of nature to people
- General, positive value to everyone
- Cognitive mechanisms

Directed attention (energy demanding)

TIG Office by Yasmary_CC BY-NC-ND 2.0

Fascination (no effort)

RESTORATIVE ENVIRONMENTS ACCORDING TO KAPLANS

- Being away
- Fascination
- Coherence
- Compatibility

Clearing the head, recharging directed attention capacity, “hear” unbidden thoughts, reflections on one’s life





A TOOL FOR STUDYING RESTORATIVE ENVIRONMENTS

Humans seek for certain **characteristics/qualities** in green areas

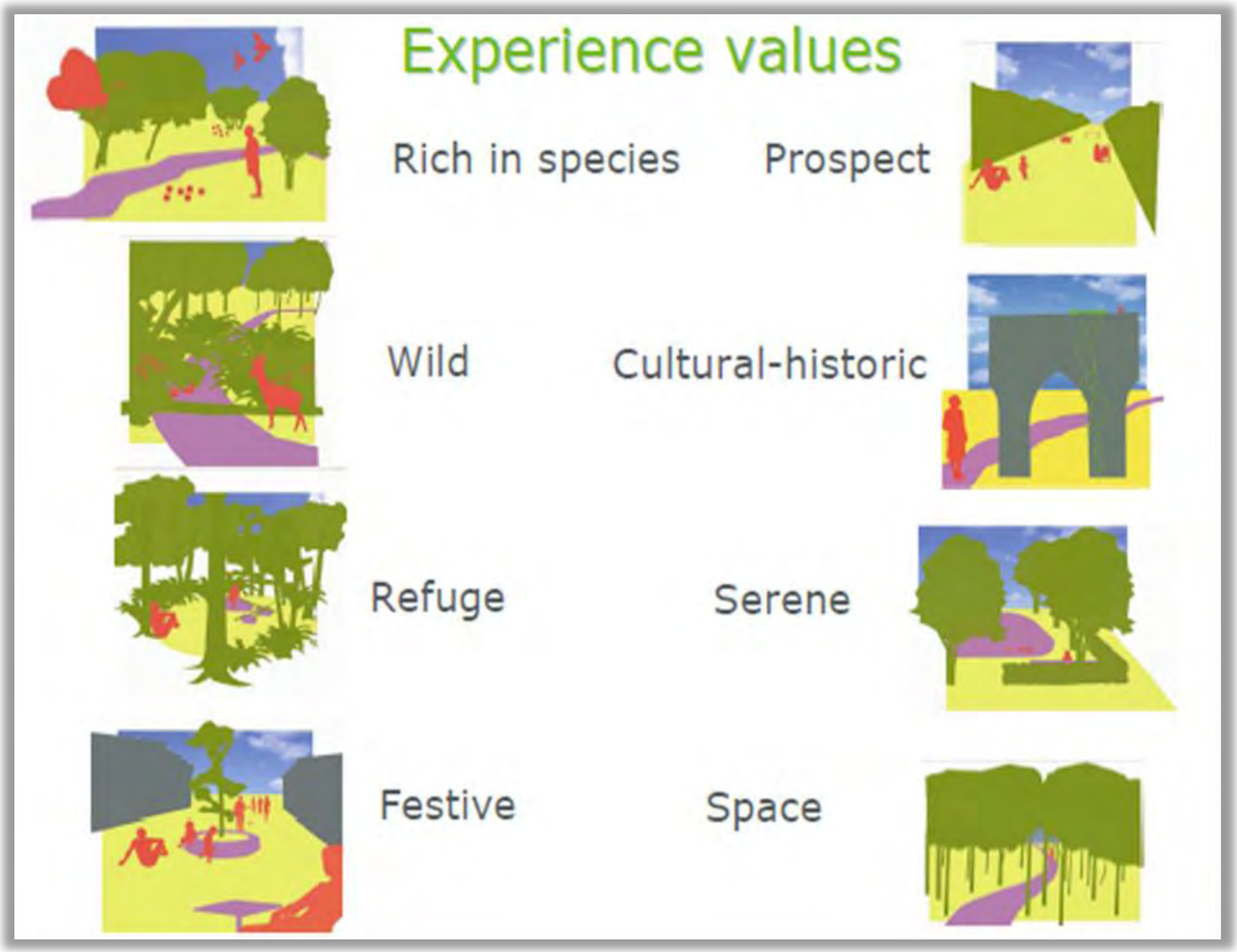
Eight experience values

Can be stored in geographic information systems (GIS)

Helps area-specific planning

(*Berggren-Bäring, Grahn, Stigsdotter*)

THE EIGHT EXPERIENCE VALUES



Grahn and Stigsdotter

EXPERIENCE VALUES AND MENTAL FATIGUE

Experiences especially important for **mental restoration**:

- *Serene:* undisturbed peacefulness, being on one's own

- *Space:* independent and special 'universe'

- *Wild:* wilder nature, nature on its own terms, untouched and vital

DOES SIZE MATTER?

The **experience** is the most important

If you **perceive** the value it is good enough – “perceived sensory dimension”

“**Pocket parks**”: grass, trees, tree canopy are most important for potential stress recovery

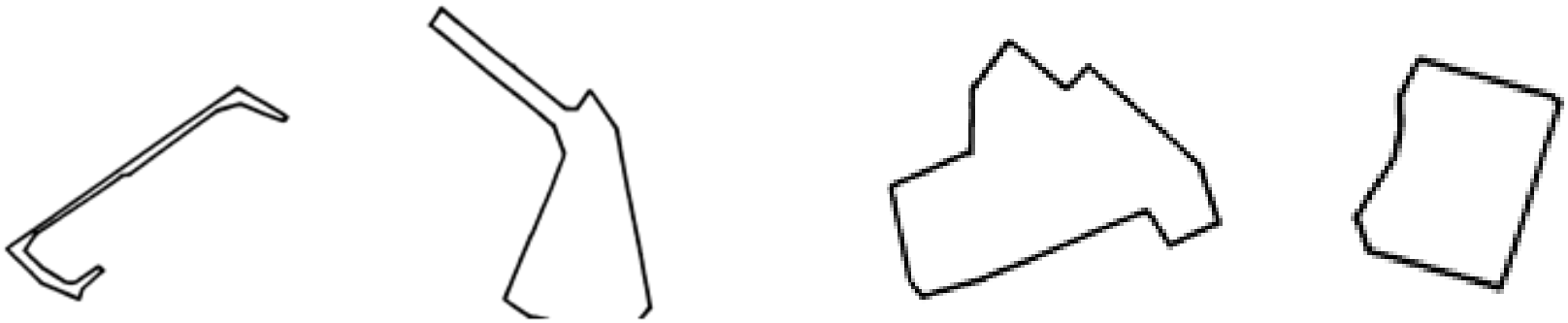
Access is more important

DOES SHAPE MATTER?

How the park is perceived

How much it is visited

How children play



Better

Perceived Restorativeness Scale (PRS) (Hartig, Evans, Korpela & Garling, 1997)

Please indicate on the 7-point scale the extent to which the given statement describes your experience in the setting (0 = Not at all; 6 = Completely).

0. 1. 2. 3. 4. 5. 6.	
☐☐☐☐☐☐☐	Being here is an escape experience.
☐☐☐☐☐☐☐	Spending time here gives me a break from my day-to-day routine.
☐☐☐☐☐☐☐	It is a place to get away from it all.
☐☐☐☐☐☐☐	Being here helps me to relax my focus on getting things done.
☐☐☐☐☐☐☐	Coming here helps me to get relief from unwanted demands on my attention.
☐☐☐☐☐☐☐	This place has fascinating qualities.
☐☐☐☐☐☐☐	My attention is drawn to many interesting things.
☐☐☐☐☐☐☐	I want to get to know this place better.
☐☐☐☐☐☐☐	There is much to explore and discover here.
☐☐☐☐☐☐☐	I want to spend more time looking at the surroundings.
☐☐☐☐☐☐☐	This place is boring.

3. NEURAL MECHANISMS - THEORIES

The basic biological mechanisms behind the automatic reactions to nature

What are the particular inputs/stimuli that evoke automatic, physiological reactions?

What happens in the brain?

3 NEURAL MECHANISMS - PERCEPTUAL FLUENCY

Hagerhall, Joye

The visual information is easier processed in the brain

Objective difference between natural patterns and patterns of most built environments

Fractal patterns (“Neuro-aesthetics”)

- aesthetically appealing, subjectively preferred (*Hagerhall, Purcell, & Taylor, 2004*)
- EEG activity in the brain: wakeful relaxation

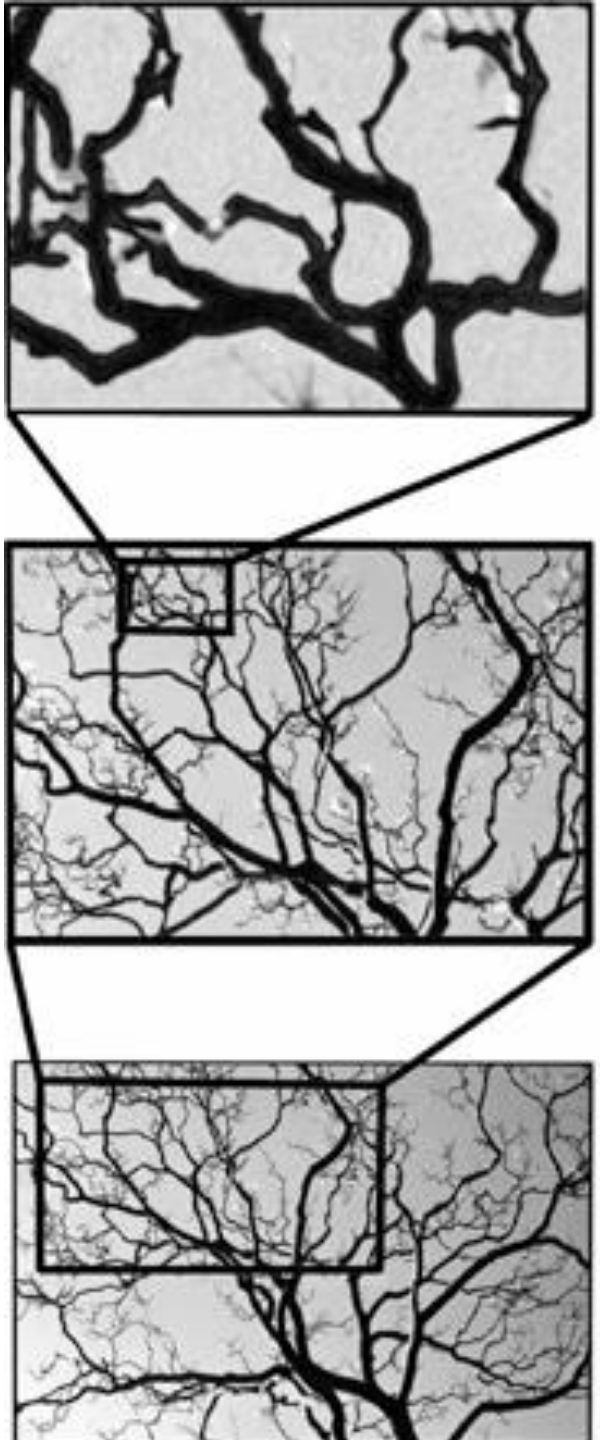
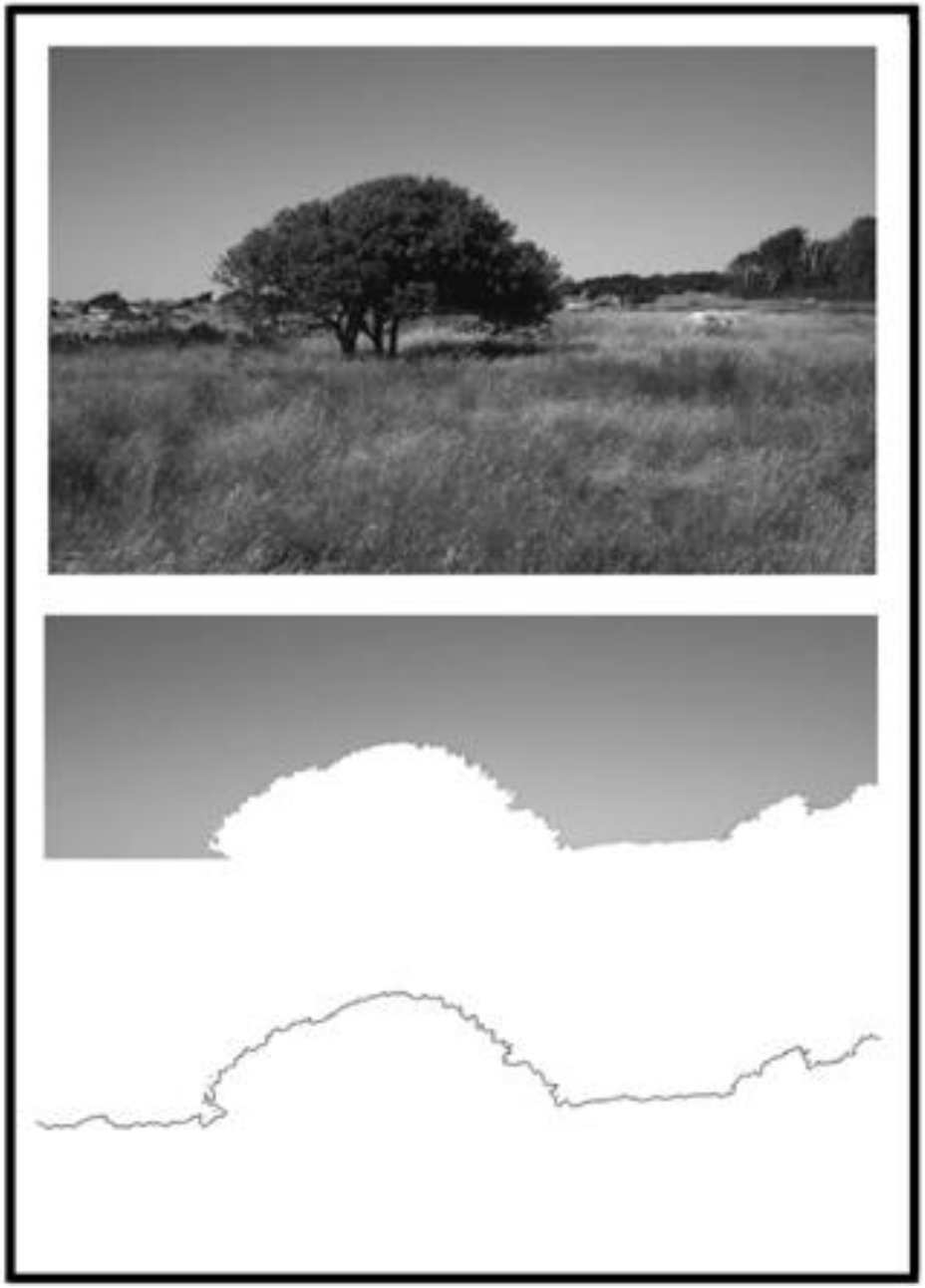
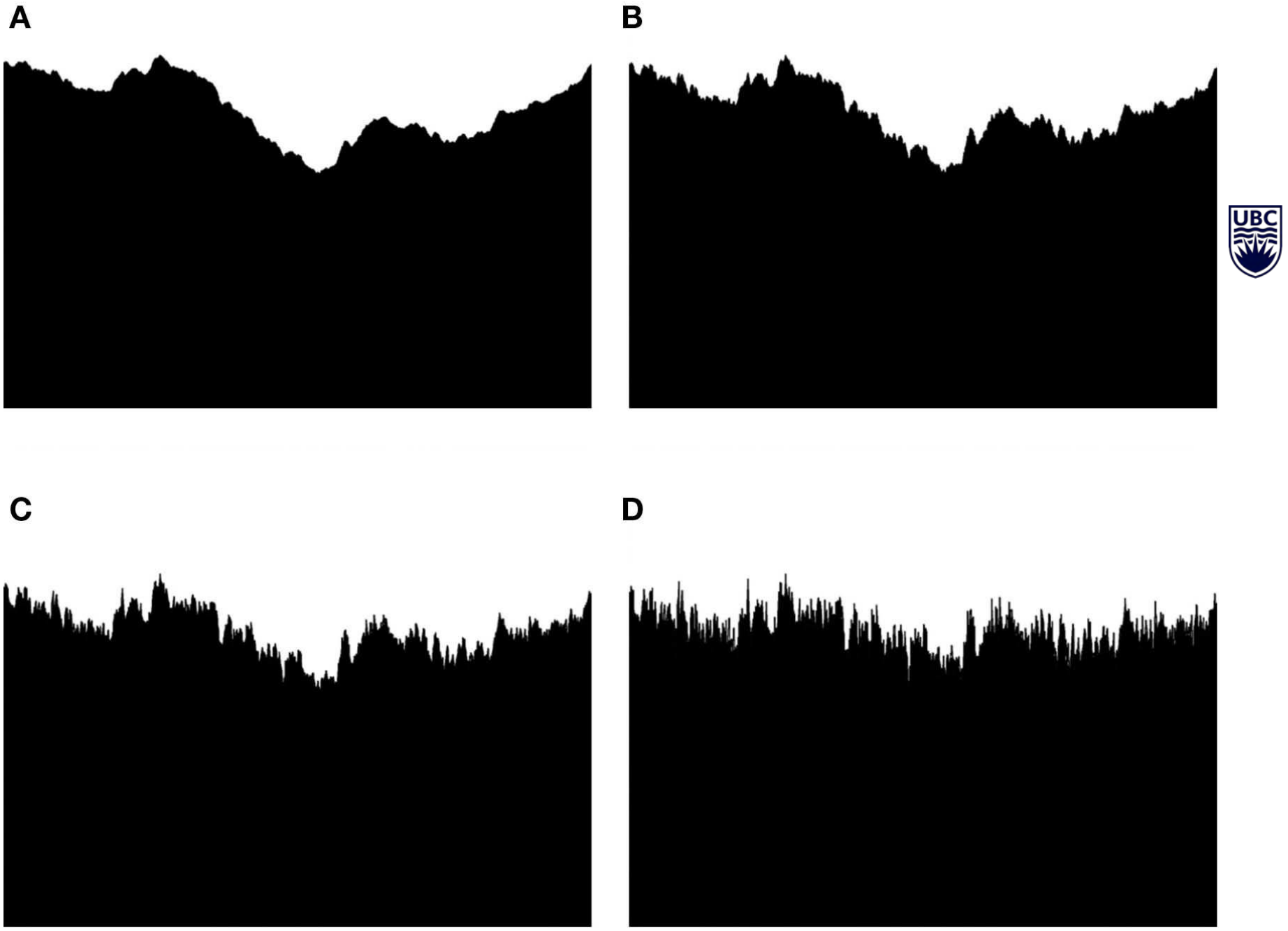


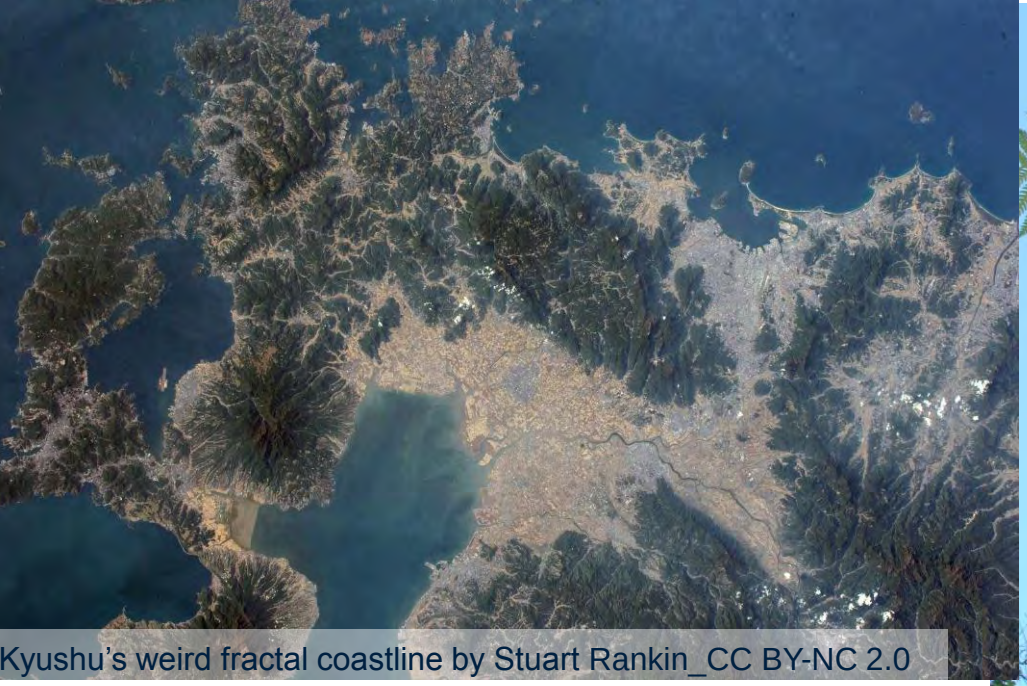
Photo credit: Richard Taylor



(*Hagerhall et al., 2004*)



(Hagerhall et al., 2008).



Kyushu's weird fractal coastline by Stuart Rankin_CC BY-NC 2.0

Cauliflower by Ian Turk_CC BY-NC-ND 2.0

Cloud fractals by liknes_CC BY-ND 2.0

4. LEARNED ASSOCIATIONS AND POSITIVE BELIEFS

People spend time in nature when on vacation, during leisure time, when spending time with family and friends

Built environments are more often experienced while at work, doing chores, and other more stressful circumstance

People believe that being in nature is good for your health

Placebo?

RECOMMENDED READING FOR NEXT WEEK

Browning, W.D., Ryan, C.O., Clancy, J.O. (2014). 14 Patterns of Biophilic Design: Improving Health and Well-Being in the Built Environment. New York: Terrapin Bright Green llc.

Annerstedt van den Bosch, M. & Depledge, M. 2015. Healthy people with nature in mind. BMC Public Health, 15, 1232.