



Human Health and the Natural Environment



Cover photo: Kimberley coastline,
Western Australia,
by Sheldon Pettit



Clearing remnant vegetation for road construction



**Increasing salinity in
Western Australia
as a result of extensive
clearing for agriculture**





Europe's e-waste in Africa



Dead fish in parts of the Swan River after elevated levels of microalgae were detected – overuse of garden fertilizer



Toxic effects of waste: The “Great Pacific Garbage Patch”

Described by scientists as a "plastic soup" of waste which now covers an area twice the size of the continental United States, stretching from about 500 nautical miles off the Californian coast, across the northern Pacific, past Hawaii and almost as far as Japan.

HOW LONG UNTIL IT'S GONE?

Estimated decomposition rates of common marine debris items



Estimated individual item timelines depend on product composition and environmental conditions.

Source: NOAA (National Oceanic and Atmospheric Administration), US / Woods Hole Sea Grant, US
Graphics: Oliver Lide / Museum für Gestaltung Zürich, ZHUK

Our relationship to the natural environment

Place Attachment

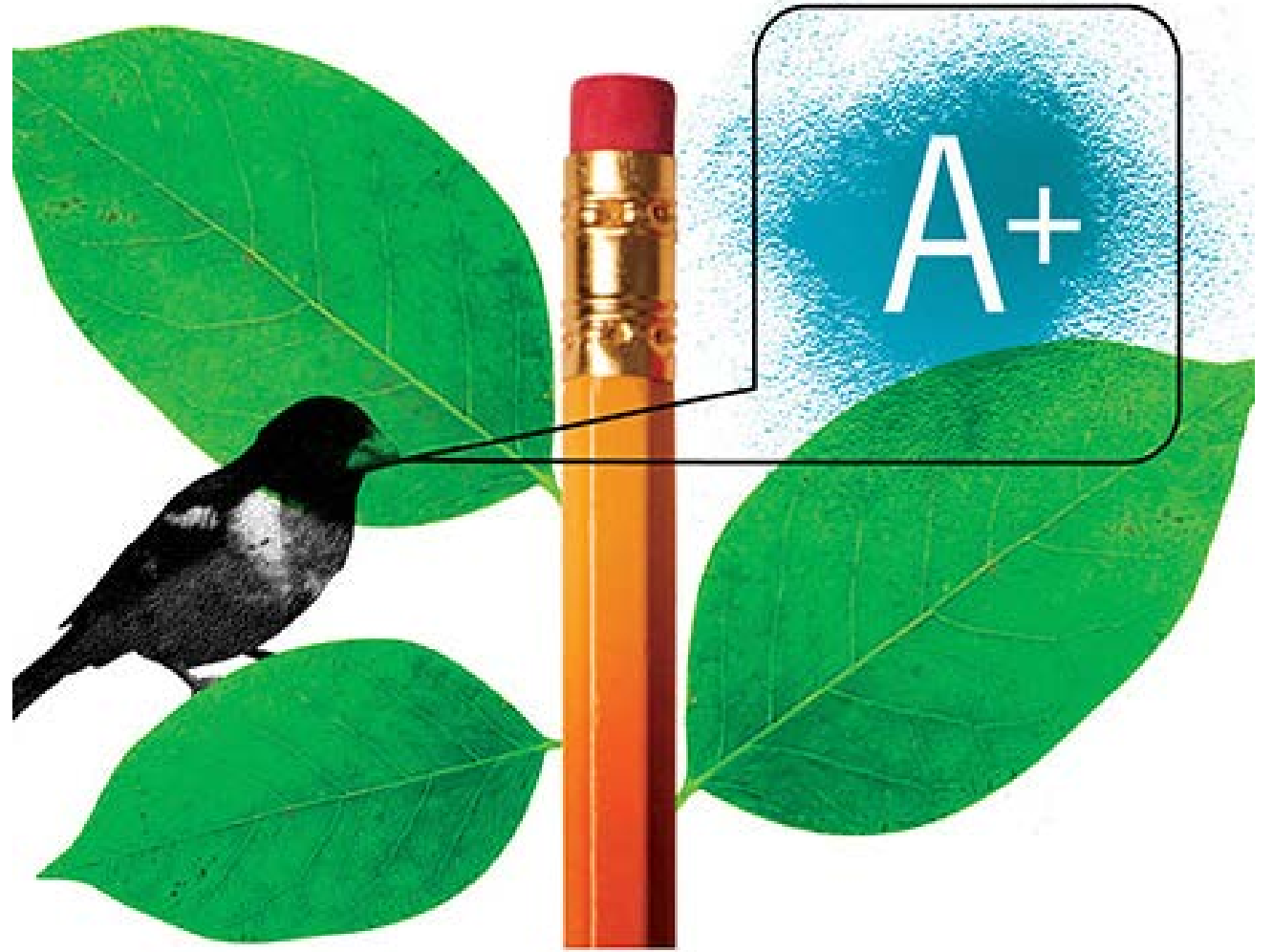
*People do not simply look out over a landscape and say 'this belongs to me'. They say, 'I belong to this'. Concern for familiar topography, for the places one knows, is not about the loss of a commodity, but about the loss of **identity**. People belong in the world: it gives them a home (p. 109, original emphasis). Jacobs, 1995.*

- **Attached community members** - more satisfied with their lives, had stronger bonding and neighbourhood ties, trusted people more, and were generally less egocentric and more altruistic; more likely to resist change.
- Evidence that “sense of place”, “place identity” – distinct dimension in neuronal processing.

Biophilia

- Biophilia - “the innately emotional affiliation of human beings to other living organisms.” (Wilson, 1984).
- Implies that humans have a biological need for connection with nature and that this connection affects our personal well-being, productivity, and social relationships.
- Gap between humans’ evolutionary environments & current living conditions.

Intervention: spending
time in the natural
environment



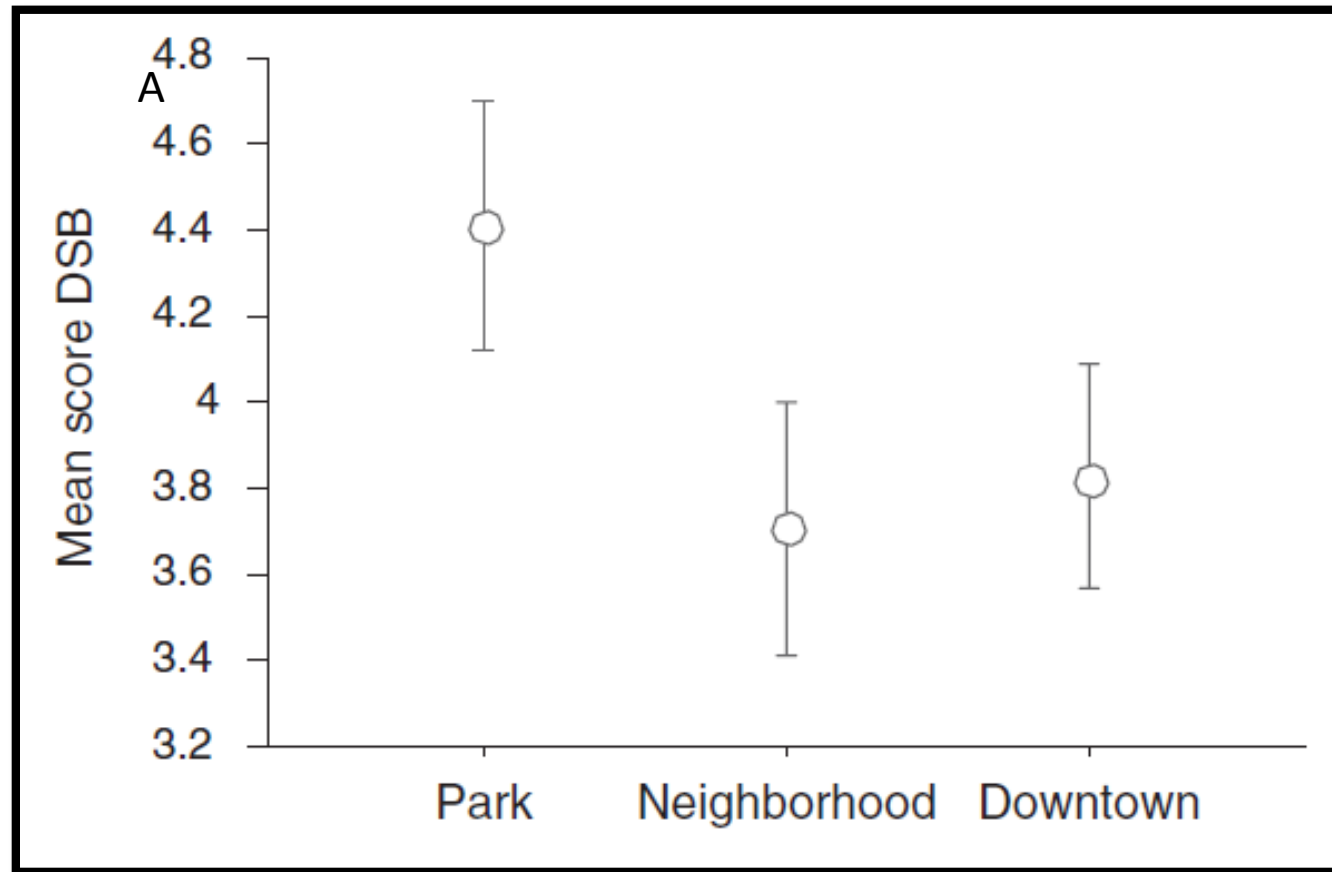


Figure 1: Mean Post walk Scores on Digit Span Backwards for Park, Neighborhood, and Downtown Conditions; Taylor & Kuo (2008)

A walk in the park is superior to drugs for children with ADHD



Urban

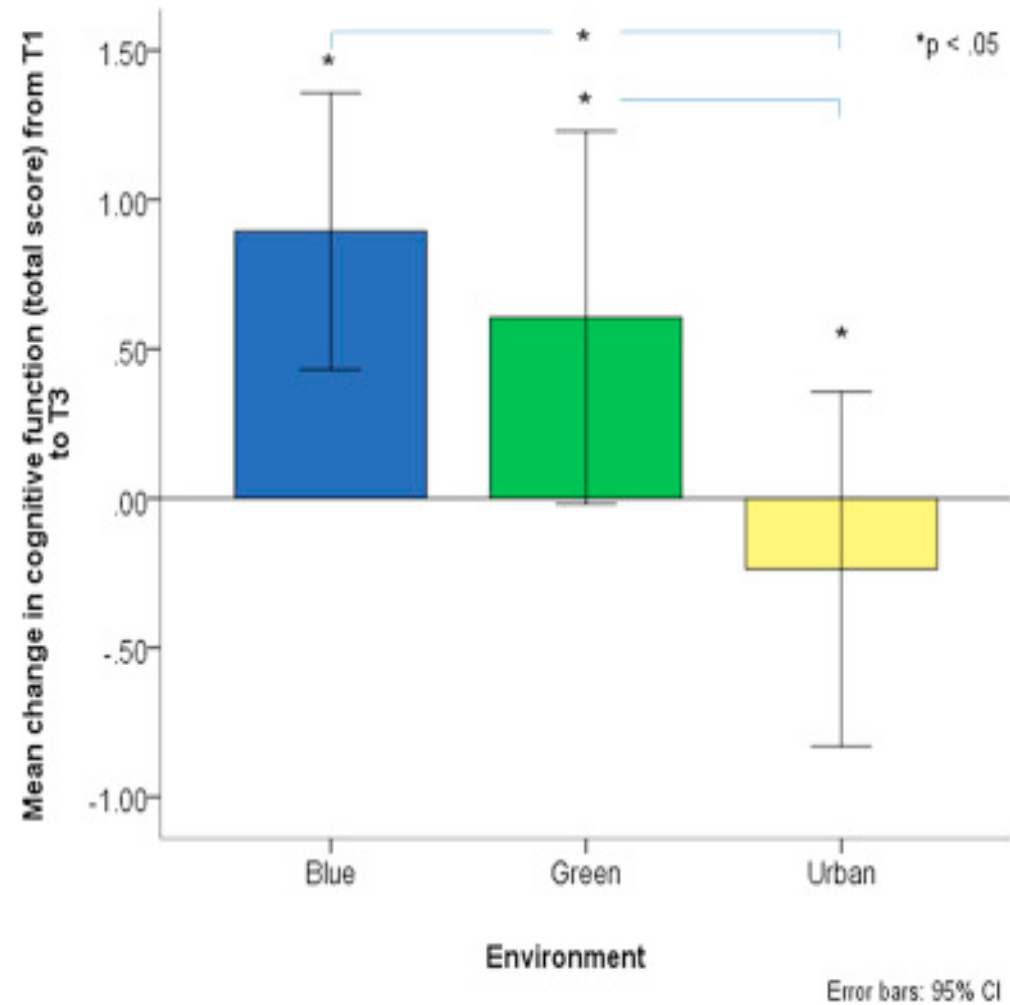


Green



Blue

Where to put your best foot forward: Psycho-physiological responses to walking in natural and urban environments



Mean change in cognitive function (backwards digit span task) from baseline to 60-min post exposure follow-up by environment.



Cox et al (2017) found that in five different types of neighbourhood the amount of vegetation cover and afternoon bird abundance were positively associated with a lower prevalence of depression, anxiety, and stress.

DOI: <http://dx.doi.org/10.1093/biosci/biw173>

Physiological effects of contact with nature

Lower stress indicators: salivary cortisol, blood pressure, heart rate, skin conductance, muscle tension (forest vs urban walk).

Japanese studies of “**forest bathing**” – decreased blood glucose levels in diabetic patients; more than exercise alone.



WHO Reports on Urban Green Spaces and Health

“The results indicate that urban green space is a necessary component for delivering healthy, sustainable and liveable cities. Interventions to increase or improve urban green space can deliver positive health, social and environmental outcomes for all population groups, particularly among lower socioeconomic status groups. There are very few, if any, other public health interventions that can achieve all of this, and especially the impact on active lifestyles, mental well-being and social interaction is frequently highlighted as a key benefit” (P 5).

Health Effects

Exposure to and use of green spaces (after controlling for other variables):

- Reductions in reported health problems (e.g. heart disease, cancer, musculoskeletal problems);
- Reduced levels obesity, higher rates physical activity (note – greater benefits from ‘green’ exercise);
- Higher self-rated mental health; lower rates depression;
- Moderating the effects of climate, pollution; benefits for health.
- Reductions in rates pre-term birth, low birth weight;
- Enhanced cognitive development.



Gardening: improves mood, self-esteem, physiological indices; for patients with dementia reduces agitation, aggression and other symptoms.

Urban Design: Effects of Natural Environment on Crime

U.S studies:

- Less graffiti, vandalism, and littering in outdoor spaces with natural landscapes than in comparable plant-less spaces.
- Public housing residents with nearby trees and natural landscapes:
 - fewer acts of domestic aggression and violence;
 - fewer property and violent crimes;
 - fewer police call outs

Measuring quantity of common space vegetation

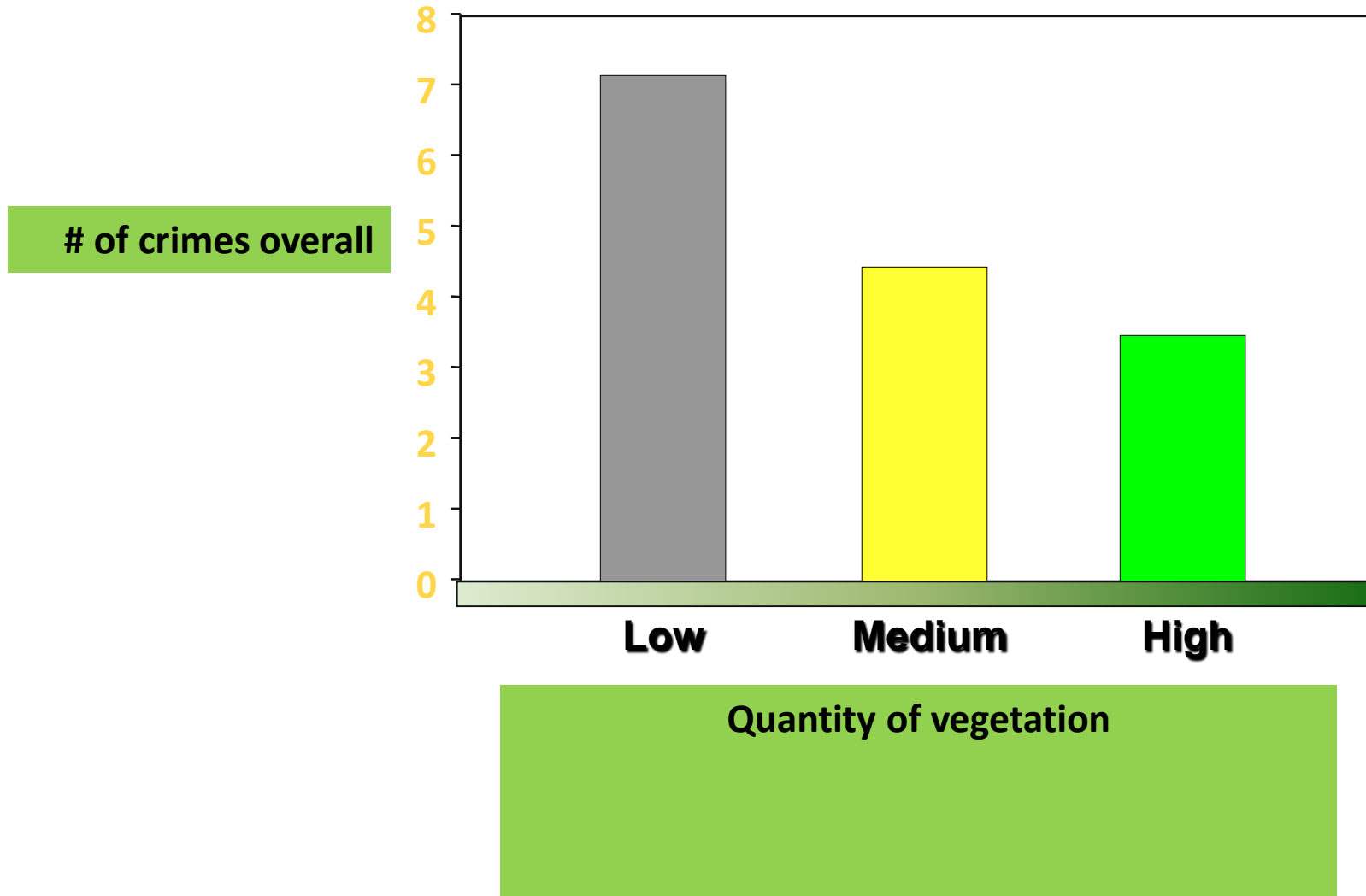


Common space with a low level of vegetation

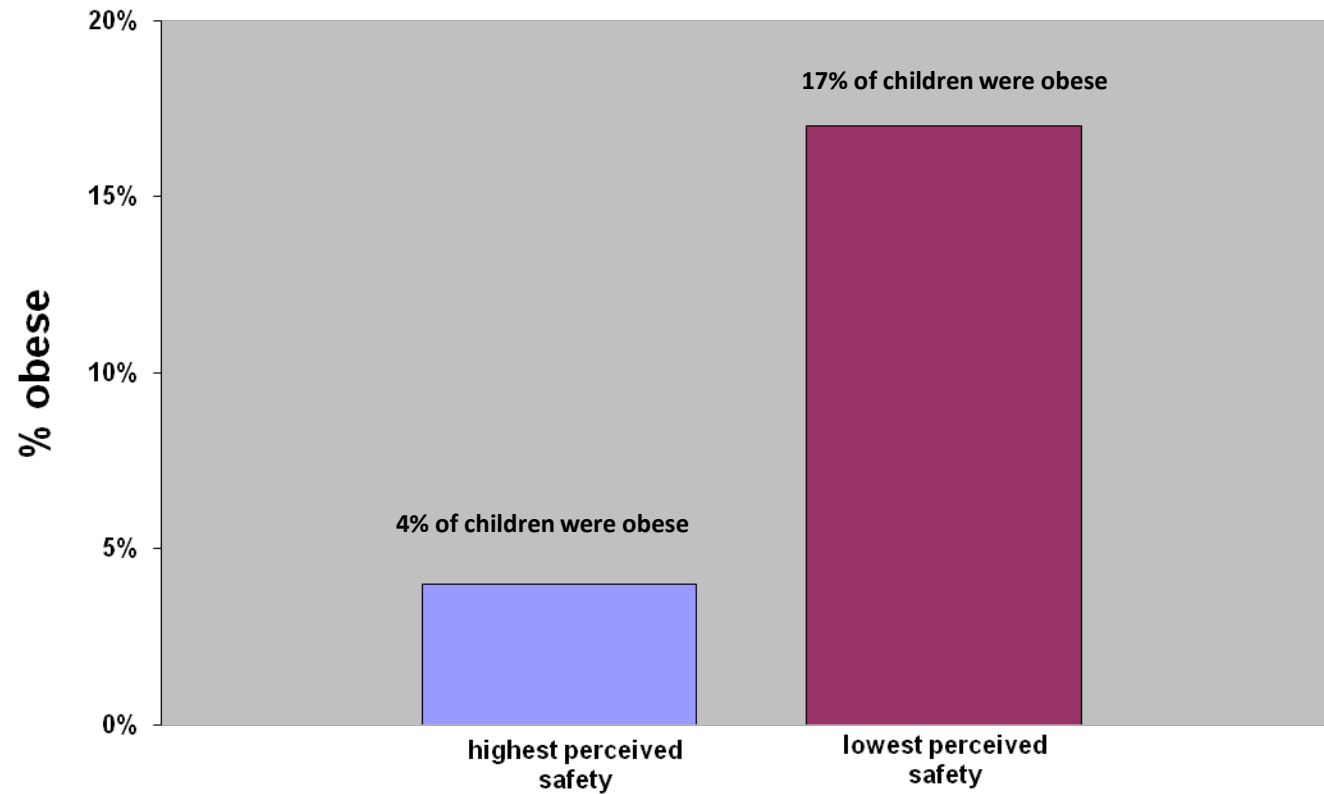


Common space with a high level of vegetation

Buildings with more vegetation had fewer crimes overall



A study of 768 children in urban and rural communities found first-grade children are less likely to be obese if their parents perceive their neighborhoods to be safe.



Lumeng JC, Appugliese D, Cabral HJ, Bradley RH, Zuckerman B. Neighborhood safety and overweight status in children. *Archives of Pediatric and Adolescent Medicine* 2006; 160(1):25-31.



Improved social relationships

Contact with the natural environment:

- **faster recovery from surgery;**
- **lower crime rates;**
- **improved social relationships;**
- **improved relaxation;**
- **reduced behaviour problems in children;**
- **better cognitive performance (attention restoration);**
- **reductions in reported health problems (e.g. heart disease, cancer, musculoskeletal problems);**
- **reduced levels obesity; higher rates physical activity;**
- **improved immune functioning;**
- **higher self-rated mental health;**
- **reduction of the ill effects of pollution, including noise pollution;**
- **reduction urban heat island effect:**
- **higher productivity;**
- **optimized exposure to sunlight and improved sleep.**

Conversely, environmental degradation produces ill effects

- Environmental degradation affects human health and wellbeing
- Extreme heat: increased psychiatric admissions
- Persistent noise: Increased anxiety, poorer health
- High levels pollution: lower subjective wellbeing
- Destruction of natural environment: higher rates depression
- Reduced biodiversity may compromise immune function

Health Effects of Air Pollution:

- 1. Impaired lung growth in children**
- 2. Increased asthma, coughs and bronchitis**
- 3. Impaired brain development**
- 4. Low birth weight**
- 5. Heart attacks and stroke**
- 6. Upper respiratory tract irritation, infection**
- 7. Exacerbation existing chronic conditions**
- 8. Increases in anxiety & depression**
- 9. Cognitive decline in the elderly**
- 10. Impaired cognitive development in children**

London under a blanket of smog: Diesel engines blamed