

A Countryside for Health and Well-Being: The Physical and Mental Health Benefits of Green Exercise

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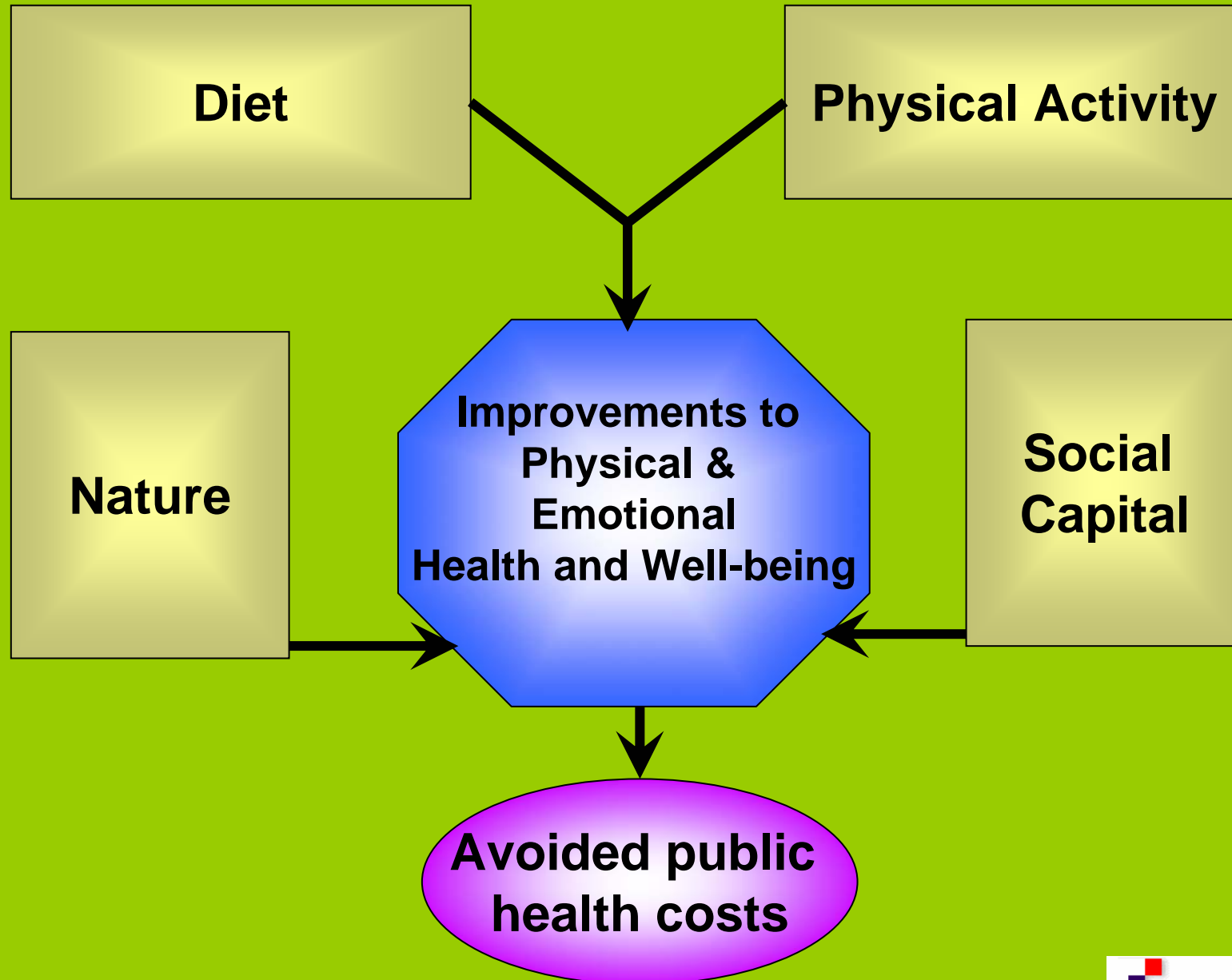
University of Essex

Evolutionary perspective



- For most of our history
 - daily lives of humans played out close to land
- But since divergence from apes
 - hunter gatherers 300 - 350,000 generations
 - agriculture 600 generations
 - industrialised 8-10 generations
 - dependent on industrialised agricultural and food systems for 2 generations
- Past two generations
 - Changed diets
 - Less physically active
 - Widespread destruction of nature and loss of species





Poor diets - consequence of disconnections



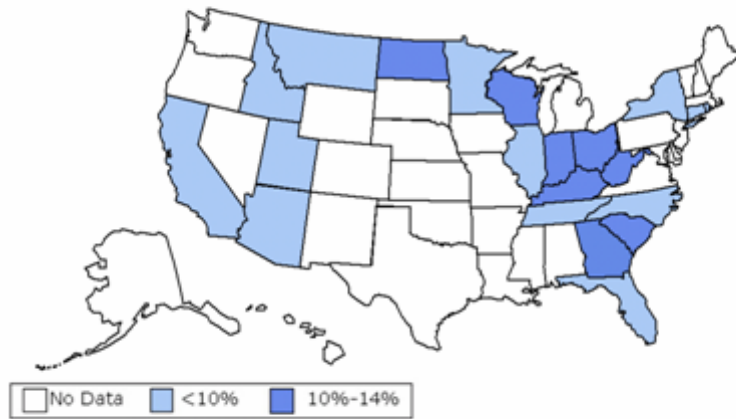
- Nutrition transition
 - Shift from traditional and local foods, mixed diets, high in fruit and vegetables - to refined cereals and sugars, more fats, more processed foods, fewer vegetables
- Mediterranean diet
 - High in fruit, vegetables, carbohydrates
 - Low in meat, with some fish and olive oil
- Large increase in chronic diseases in adults (and now in children)
 - Coronary heart disease, strokes, type II diabetes, gall stones, osteoporosis, cancers (30% caused by diet), obesity
 - Risk of diabetes – up 100X if child enters adulthood obese



Eurodiet (2001) study concluded that *“disabilities associated with high intakes of saturated fat and inadequate intakes of vegetable and fruit, together with a sedentary lifestyle, exceed the cost of tobacco use”*.

Obesity Trends* Among U.S. Adults BRFSS, 1985

(*BMI ≥ 30 , or ~ 30 lbs overweight for 5'4" woman)

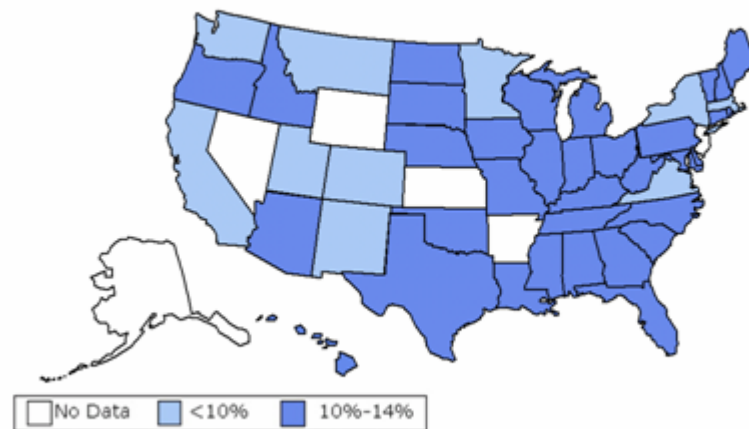


Source: Mokdad A H, et al. *J Am Med Assoc* 1999;282:16, 2001;286:10.



Obesity Trends* Among U.S. Adults BRFSS, 1990

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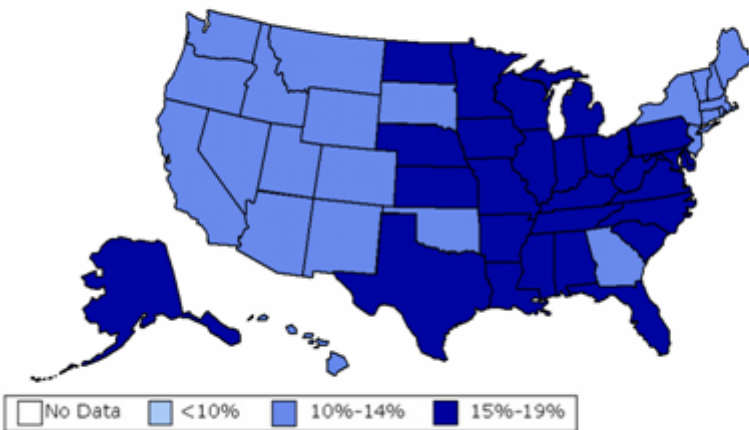


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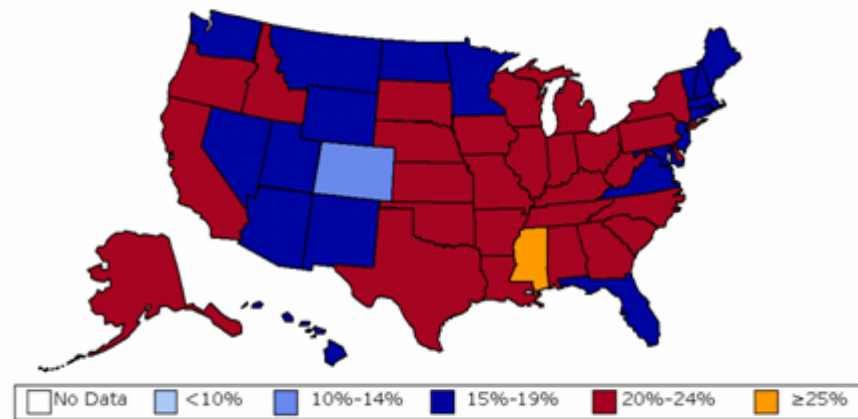


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Obesity Trends* Among U.S. Adults BRFSS, 2001

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Physical activity transition

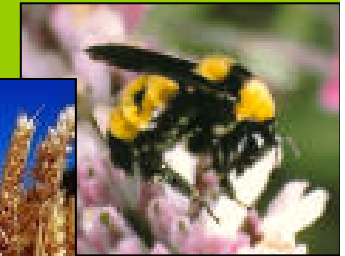


- Dramatic fall in physical activity in past 50 years
 - 2 MJ (500 kcal) less energy output per day in adults
 - Equivalent to a marathon per week
 - Both less walking, cycling and less organised sports
- UK
 - Only 32% adults take 30 mins moderate exercise 5x per week
 - Moderate physical activity reduces morbidity rate by 30-50%
- Reduce risk of death by
 - 33% if walk 15 km + per week
 - 25% if climb 85 flights of stairs per week
 - 50% if carry out 3+ hours of moderate physical activity per week



Why Save Nature?

Ethics



• Now in the world's 6th great extinction episode

- Species disappearing at 100-1000x faster than before humans diverged from apes
 - 1 in 4 mammal species at risk of extinction
 - 1 in 8 bird species
 - 1 in 11 trees (8700 spp)
 - 1 in 8 of all plants (34,000 spp)

Economics



Psychological benefits?

- The Biophilia hypothesis
 - Closeness to nature increases well-being
 - as well as increasing the likelihood of understanding and caring for nature
 - Biophilia – holds that we have “*an innate sensitivity to and need for other living things – as we have co-existed for thousands of generations*”
 - Nature has a positive and negative emotional impact on us
 - Context for links between emotions and dreams, stories, myths about nature



Why do people all over the world have a negative response to spiders and snakes?

- And not modern dangers such as guns and cars?



Green Exercise hypothesis

- Physical activity
 - Known to have positive effects on physical and mental health
- Exposure to nature
 - Known to have positive effects on mental health
- Green exercise
 - To what extent does physical activity in the presence of green space affect mental and physical well-being?
 - Does activity in social groups have an additional benefit?

Three levels of engagement with nature

- Viewing nature through a window
 - Through a window
 - In painting or photograph
 - Incidental exposure to nearby nature
 - Walking
 - Cycling to work
 - Sitting in garden or park
 - Active participation
 - Gardening, farming
 - Trekking, camping
 - Cross-country running and walking
 - Horse-riding, fishing
- Most research evidence
- From USA, Scandinavia & Japan
 - Very little in UK
 - Very little disaggregation of effects of social capital

1. A room with a view

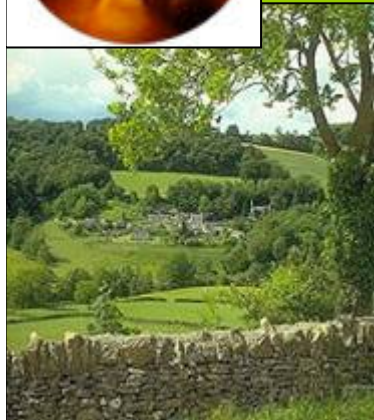


- Prisoners
 - Comparison of those in cells facing farmland/trees or prison yard
 - Those with nature views – 24% fewer sick cell visits
- Hospital patients
 - Comparison of patients in rooms looking out on brick walls or trees
 - Patients with nature views
 - Stayed in hospital for less time
 - Less medication & fewer negative comments in nurses' notes



Nature distraction therapy

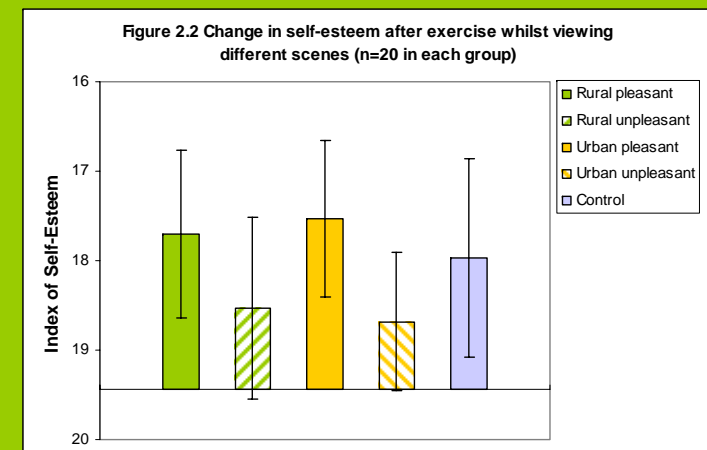
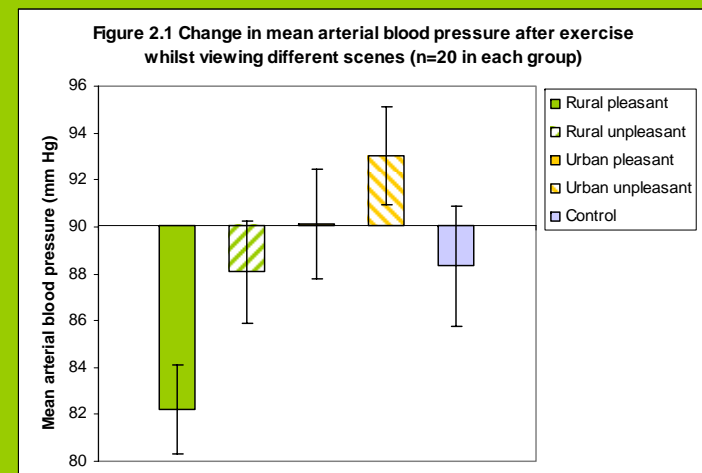
- Bronchoscopy patients – nature scene placed at bedside (still, not moving), and patients provided with tape of nature sounds
- Significantly better pain control
 - » Total cost significantly less than cost of drugs



Rural and urban views



- University of Essex study
 - Controlled conditions
 - 100 subjects
 - Comparison of 4 types of views while running on treadmill
- Measured two effects
 - Of difference scenes
 - Of physical activity
- Blood pressure
 - Decline greatest in rural pleasant
 - Increased with urban views relative to control
- Self-esteem
 - All improvements
 - Best with rural pleasant and urban pleasant
 - Unpleasant scenes made self-esteem worse relative to control



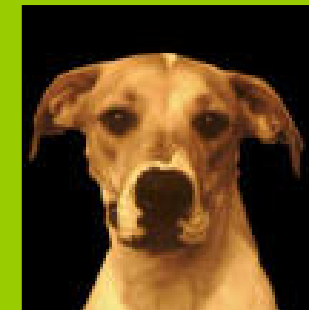
2. Incidental exposure



- Dental patients
 - Those observing a live aquarium before treatment were more relaxed than control patients
- Plants in offices & homes
 - Improve mood and relaxation
 - No plants – more stress
 - Eden Alternative, Texas – healing gardens, glasshouses, atriums, plants
 - After conversion
 - » 60% fewer bedsores
 - » 20% reduction in patients restrained
 - » 50% reduction in staff absenteeism
 - » Less expenditure on drugs and surgery



- Healing gardens in hospitals
 - Patients report positive changes in mood when visiting gardens
- Pet owners
 - Lower blood pressure and cholesterol levels than non-owners (Australia)
 - Fewer visits to doctor (USA)
 - Dog-owners after heart attacks 6x more likely to survive a year after trauma than non-owners



3. Active Participation

- Gardening
 - Private, allotments, city farms
 - Gardening makes people feel better
 - Horticulture therapy movement
- Forest Schools
 - Hands-on learning for children in woodlands
 - Improves confidence, well-being and self-esteem
 - Improves pride and sense of ownership
- Wilderness experiences
 - Original reason for establishing national parks
 - Both person-place and person-person connections important
 - Adventure therapy movement
 - People seem to seek several things
 - Desire for tranquillity and natural beauty
 - Escape from stresses of modern life
 - Potential for dramatic “peak” experiences



Walking the Way to Health Initiative and Green Gyms

- Walking
 - Known to be beneficial to health
 - WHI est. in 2000 (BHF and CAg)
 - Volunteers lead groups
 - 350 schemes est.
 - 900,000 people encouraged to walk more
- Green Gyms
 - Est. by BTCV
 - Members self-referred or by GPs
 - 35 across the UK
 - Most people not already involved in conservation
 - Improves physical and mental health
- Key issues
 - Adherence rates – better than gyms, but room for improvement
 - Continuing investments needed
 - Low uptake by ethnic groups
 - Benefits of being in groups important

“I’m still there after two and a half years and go out every Tuesday in all weathers! I’ve lost weight, got my confidence back, become involved in lots of projects at the community centre and got to know lots of people.”

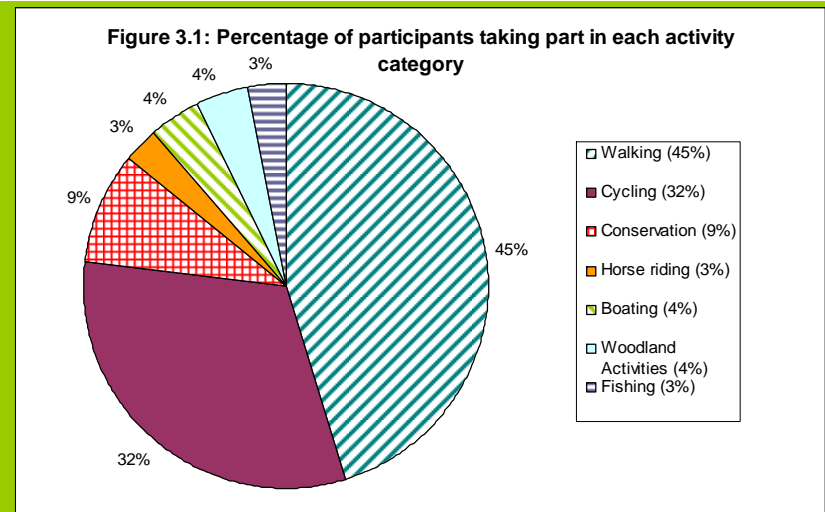
“Not only have our fitness levels risen, but, just as important, our mental inspiration to meet and mix has greatly improved.”

“I thought I’d give it a go, really enjoyed it and decided to train as a walk leader. I take out lots of groups of people and I can talk to people with food disorders because I know what it’s like. What I’ve lost is more than the body weight of some of the walkers. I’m stronger mentally and physically.”

“The walks have done me a world of good. I’ve got the confidence now and seen the improvements. The social activity is enjoyable as well.”

Green exercise cases – active participation

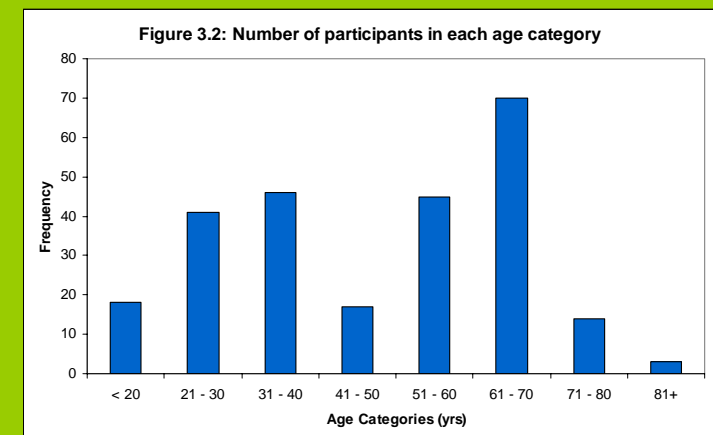
- Five type of initiatives
 - Geographic; Issue-based; Habitat-based; Activity-based; Group-based



Arnside and Silverdale AONB, Lancs	Conservation activities
Glentress Forest, Borders	Mountain biking & walking
Re-Union canal boats, Edinburgh	Canal boat trips
Close House, Hereford	Outdoor activities
Walking the Way to Health Initiative, Ballymena	Walking
Lagan Valley horse centre, Antrim	Horse riding
Afan Forest, Glamorgan	Mountain biking & walking
Torfaen Green Gym, Pontypool	Conservation work
Walking out project, Lincs	Walking
Fishing, Essex	Fishing

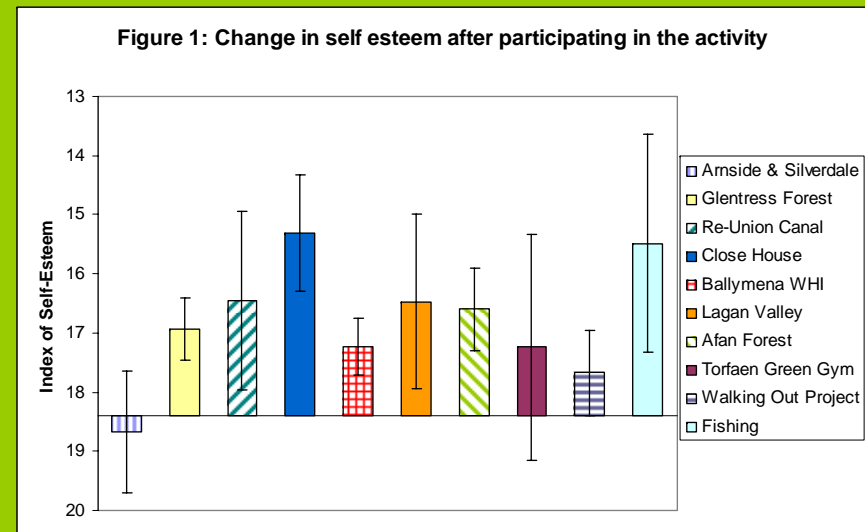
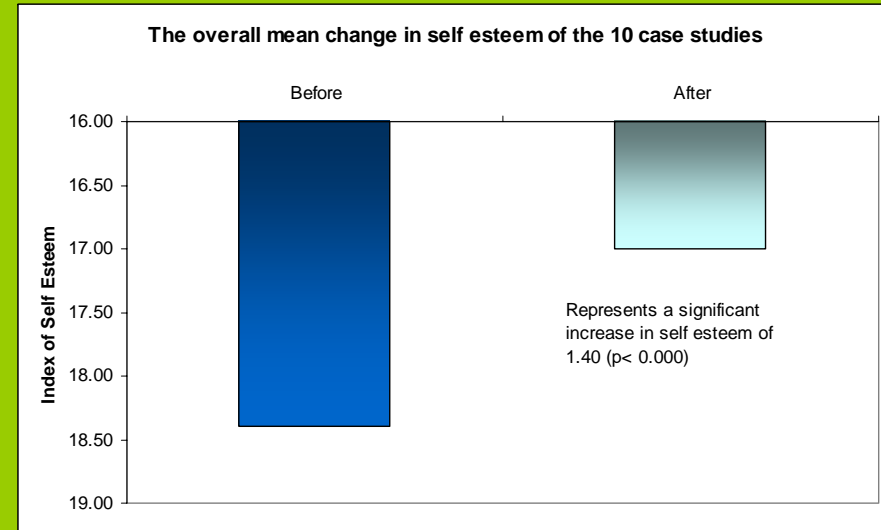
Methods

- Composite questionnaire
 - Before and after activity
 - Health data
 - Euroquol (general health)
 - General health q'aire (mental health)
 - Self-esteem
 - Rosenberg self-esteem
 - Mood
 - Profile of mood states (POMS)
 - No physiological measures taken – but inferred from responses
 - Qualitative responses of subjects
- Sampling
 - 263 completed q'aires (134 men; 129 women)
 - No children or referred patients
 - Sample is people who have already chosen to engage in various green exercise activities
 - Already quite healthy
 - Does not include habitually inactive

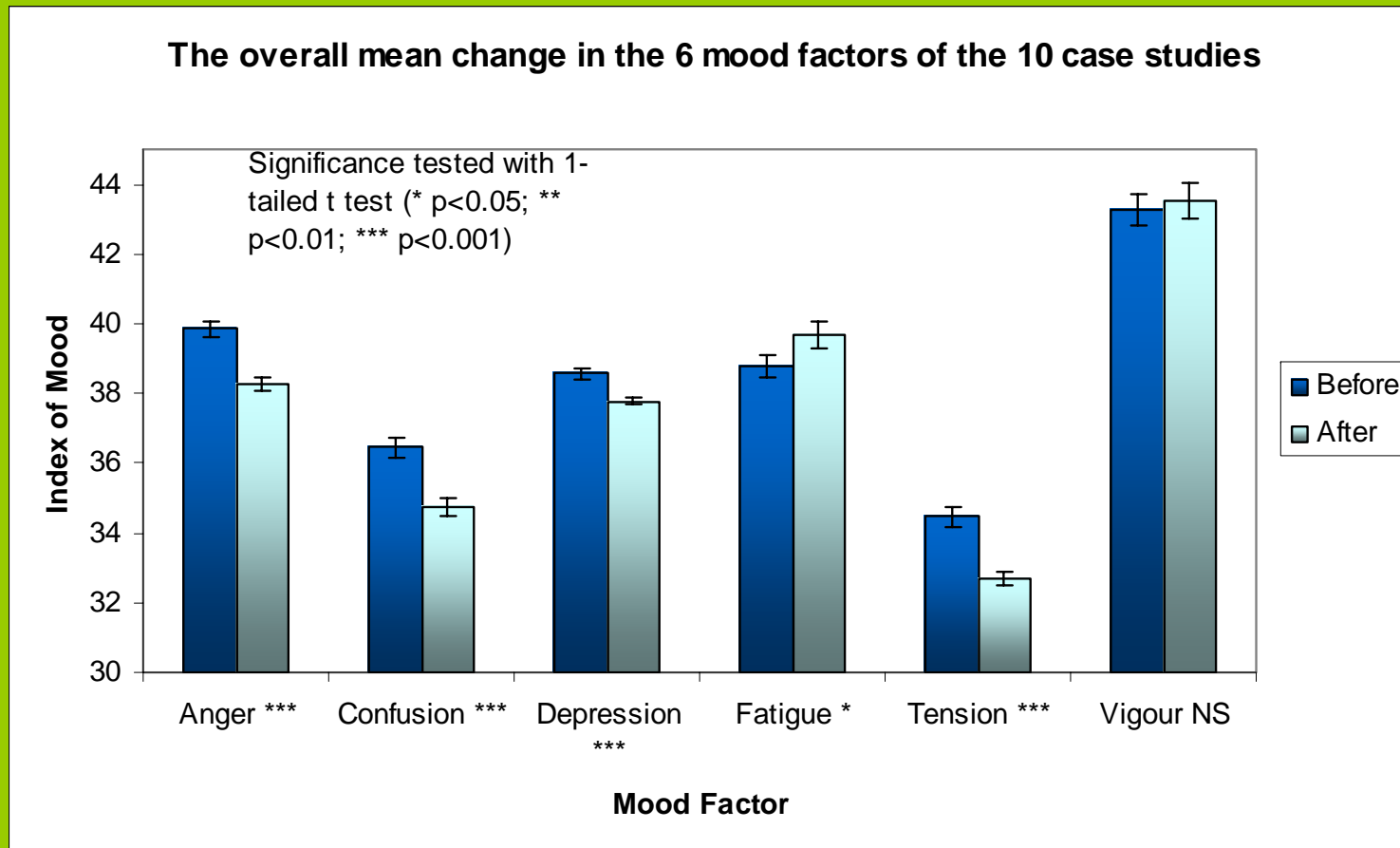


Self-Esteem

- Background
 - Higher self-esteem in men, with more education, and better general health
 - Lower self-esteem with higher body weight
- Self-esteem
 - Increased significantly in 9 of 10 cases
 - Largest change – Close House
 - Smallest – walking projects
 - Fell – very vigorous conservation work
- Duration of activities varied from
 - 1-2 hrs walking & conservation
 - 4-6 hrs mountain biking, boating, conservation, woodland activities
 - 12 hrs fishing

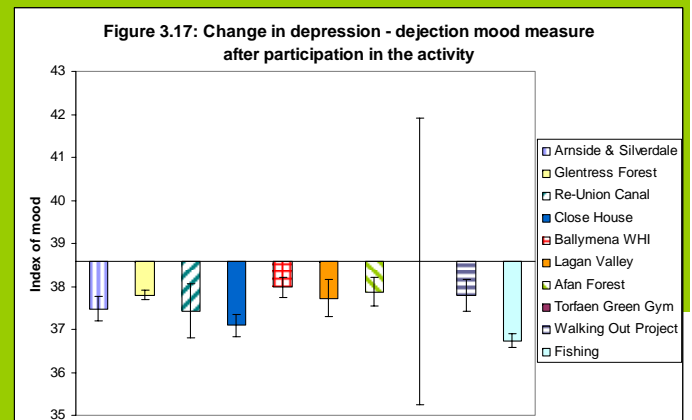
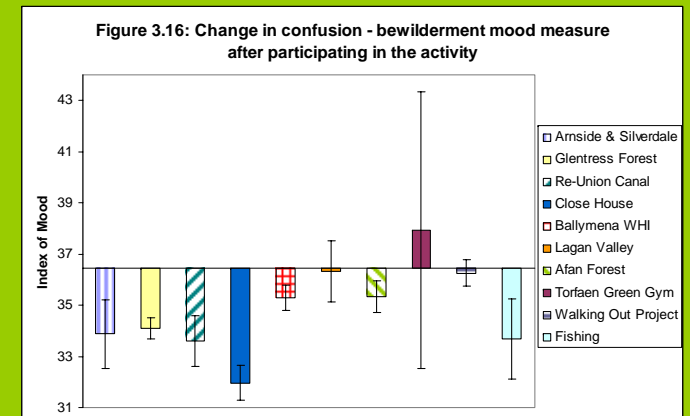
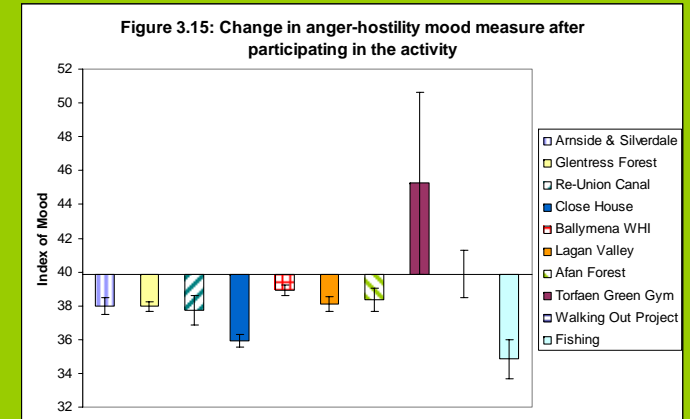


Mood changes in the 10 projects



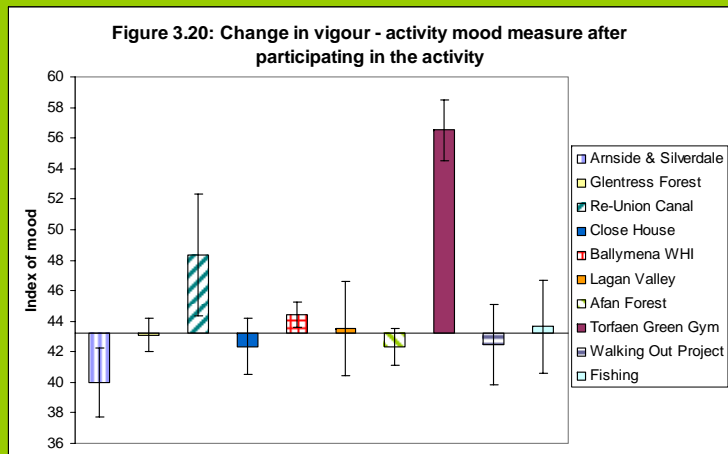
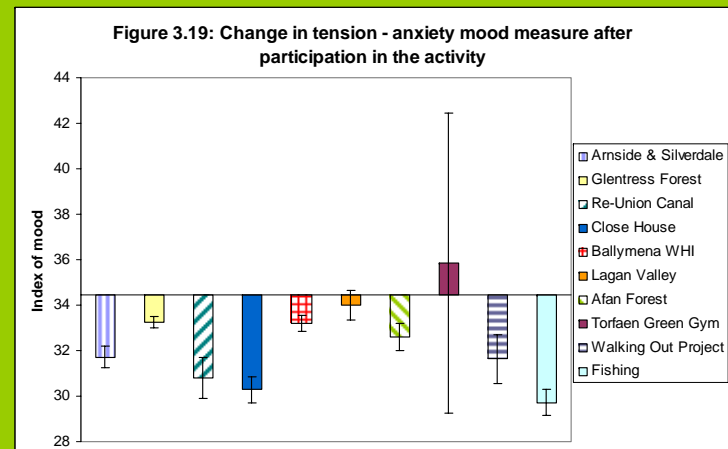
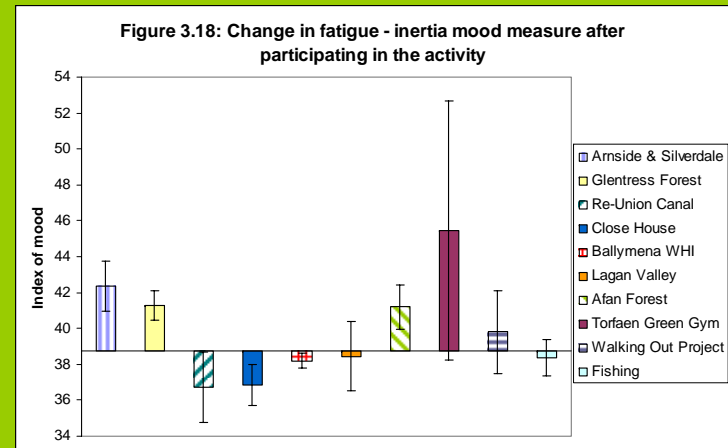
Mood

- Anger-hostility
 - Improvements in all (except small sample sizes)
 - Fishing – largest improvement
- Confusion-bewilderment
 - Large improvement in 5 projects
- Depression-Dejection
 - Consistent improvements



Mood

- **Fatigue-Inertia**
 - Half projects increase in fatigue (vigorous cycling, conservation)
 - Half decline (canal boat, woodland activities)
- **Tension-Anxiety**
 - Large improvements in all but green gym (small sample size)
 - Decrease an anomaly
- **Vigour-Activity**
 - Change for all 263 not significant
 - For each project – variable outcomes



Does calorie expenditure affect self-esteem?

Case Study	Main Activity	Calories used per hr (kcal)	Duration of activity (hrs)	Calories used per visit (kcal)
Arnside & Silverdale	Conservation	300	5	1500
Glentress Forest	Mountain biking	606	4	2424
Re-Union Canal	Boating	102	6	612
Close House	Woodland activities	516	6	3096
Ballymena WHI	Walking	336	1	336
Lagan Valley	Horse riding	540	2	1080
Afan Forest	Mountain biking	654	4	2616
Torfaen Green Gym	Conservation	330	2.5	825
Walking Out Project	Walking	324	2	648
Fishing	Fishing	294	12	3528

Does calorie expenditure affect self-esteem?

Figure 3.13: Effect of green exercise activities (calories per hour) on changes in self-esteem

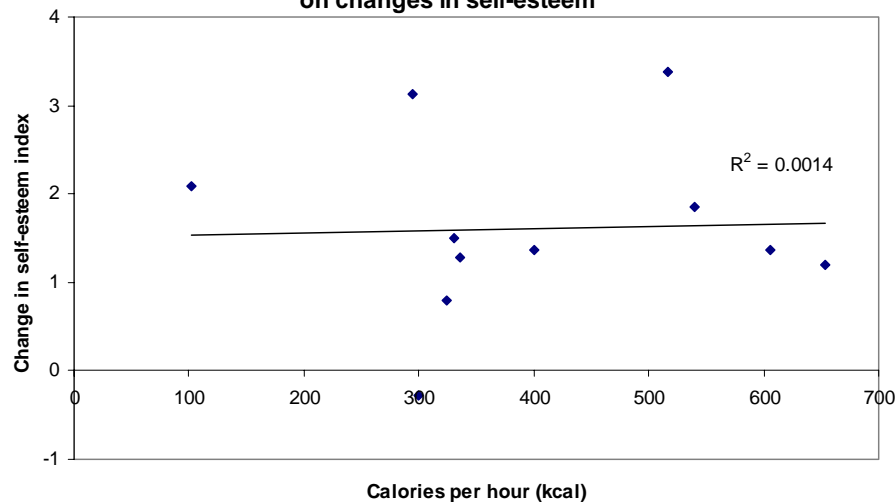
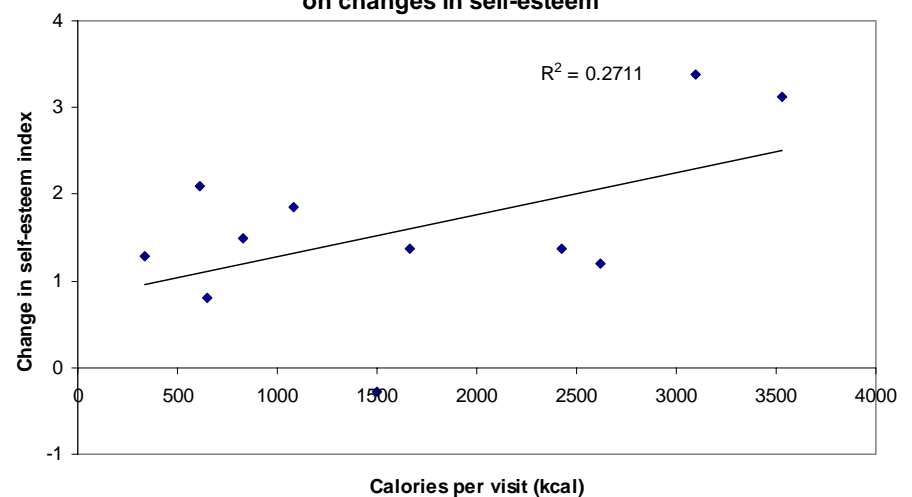


Figure 3.14: Effect of green exercise activities (calories per visit) on changes in self-esteem



Concluding comments from cases

- Self-esteem significantly improved
- Mood measures
 - 4 of 6 significantly improved
 - Significant increase in fatigue
- Self-esteem improved by gentle as well as vigorous exercise
- Short and long visits work
- Cannot separate out benefits from green exercise and from social capital
- Significant health and well-being dividend from a wide range of green exercise activities

“I can go into the hills and enjoy peace and quiet, the exercise and relax. My troubles take a back seat on a day like today”

“I like to see the forest changing with the seasons. I feel refreshed when I return home. The dog loves walking here and it gets me some time for me”

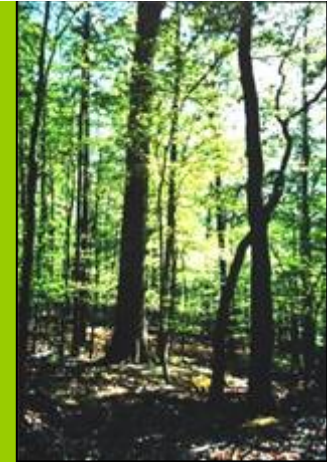
“Therapeutic. Socially, talking to people. The exercise of walking is a healthy activity physically and mentally”

“Walking with friends, enjoying the beauty of the autumn countryside and the fellowship over the cup of coffee and biscuits”

“Relaxing, exercises the body, clears the head”



Current participation in green exercise



- Changes in physical activity in past 50 years
 - Leisure visits up; gyms & health clubs up
 - But activity at work, in home and in transport is down
- Day trips
 - 1.26 billion trips per year to countryside
 - 404 million walking & rambling
 - 50 million cycling
 - 140 million sports and outdoor activities
 - 101 million parks, gardens and leisure attractions
 - 2.5 billion trips per year to urban parks
 - 270 country parks
- Private and public gyms and health clubs
 - >4000 clubs (up from 2200 in 1980)
 - 5.4 million members
 - Some evidence that group and organised activities declining, with greater individualism



Economic benefits of green exercise

- Research shows short-term benefits
 - Do not know long-term effects
 - Suggests need for continuing re-exposure to GE
- Can GE be considered a good buy for public health?
 - No comprehensive economic analysis yet conducted
- Some indicators
 - 10% increase in physical activity – save £500m
 - Cost of each sedentary person to NHS £130 per yr
 - Workplace absence costs UK £11bn per yr
 - Some reduced if population healthier
 - Mental health problems increasing in UK
 - Exposure to green space leads to improvements
 - CHD kills 110,000 per yr – largely preventable with good diets and physical activity
- Costs
 - No analysis of costs
 - Overuse of visitor hotspots
 - Reduction in welfare of others
 - Provision of facilities and staff



Barriers and accessibility

- If green exercise so positive – why do not more people engage in it?
 - How can environmental and health policy engage the sedentary?
- Physical constraints
 - Distance of green space from home
 - Obstacles (roads to cross, lack of transport)
 - Lack of information on rights of way
 - Lack of knowledge about terrain
 - Lack of facilities (toilets, parking, cafeteria)
- Social and cultural constraints
 - Public spaces seen as risky (associated with crime)
 - Countryside populated with dangerous animals & angry farmers
 - Motivation (too tired from work)
 - Purpose – people need a reason (dog walking, social groups)



Good practice for projects

- Generic issues
 - Good partnerships between public & private sector
 - Opportunities for feedback from public
 - To create ownership
- Land-based projects
 - Clearly-marked routes
 - For safety and confidence
 - Information
 - Length and time required
 - Calories expended
 - Features – natural, historical
 - Facilities
 - Car parking, toilets, changing rooms
 - Cafeteria, bike washers
 - Market research to identify users
 - Targeted approach for facilities
 - Staff
 - At visitor centres & information points
 - Forest and park rangers



Good practice for projects

- Group-based projects
 - Regularity of meeting
 - Fixed days and times
 - Programme of events
 - Promotes motivation
 - Personality of group leader
 - Increases adherence rates
 - Social groups
 - » Inclusive when a member
 - » Can appear exclusive when new
 - Advertising
 - Local papers, village halls, community centres
 - GP surgery, hospital waiting areas
 - Word of mouth



Policy recommendations

- Two challenges
 - Increase the number of people participating in green exercise, especially
 - » those suffering ill-health
 - » those not accessing countryside or green space
 - Increase the rate of use by those already participating
- Nine policy areas for recommendations
 - Access and recreation providers
 - Maintenance of paths
 - Sustainable transport
 - Provision of facilities and information
 - Agricultural managers and policy makers
 - Use agricultural reform to increase access
 - Promote farming and countryside as part of public health provision



Policy recommendations

- Nine policy areas for recommendations
 - Schools
 - Ensure all primary children access green space
 - Establish on-site gardens
 - More physical activity
 - Health sector
 - Physical Activity Plan should include use of green space
 - NHS focus on therapeutic value of outdoors
 - Reform hospital design
 - Planners and developers
 - Take account of value of green space and nearby nature
 - Social services
 - Encourage value of green exercise for socially-excluded groups
 - Consider value of green exercise for anti-social behaviour amongst young people



Policy recommendations

- Nine policy areas for recommendations

- Environmental managers

- Revise local and national BAPs to include health benefits

- Sports and leisure

- Fitness centres – green views?
- Strategic planning for both formal and informal recreation activities

- Partnerships

- Better links between public and private sectors
- Need for cross-disciplinary links across policy areas

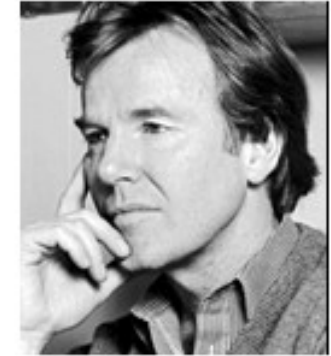


Concluding remarks on green exercise

- Brings mental and physical health benefits
 - Even from short exposure
- Health benefits will lead to avoided health costs (save money)
- Many opportunities available
 - Already accessed by reasonably healthy
 - But need to do much more for other social groups
- Need investments in good land- and group-based projects
- Need a wide range of policy reform to increase health and green-space dividend



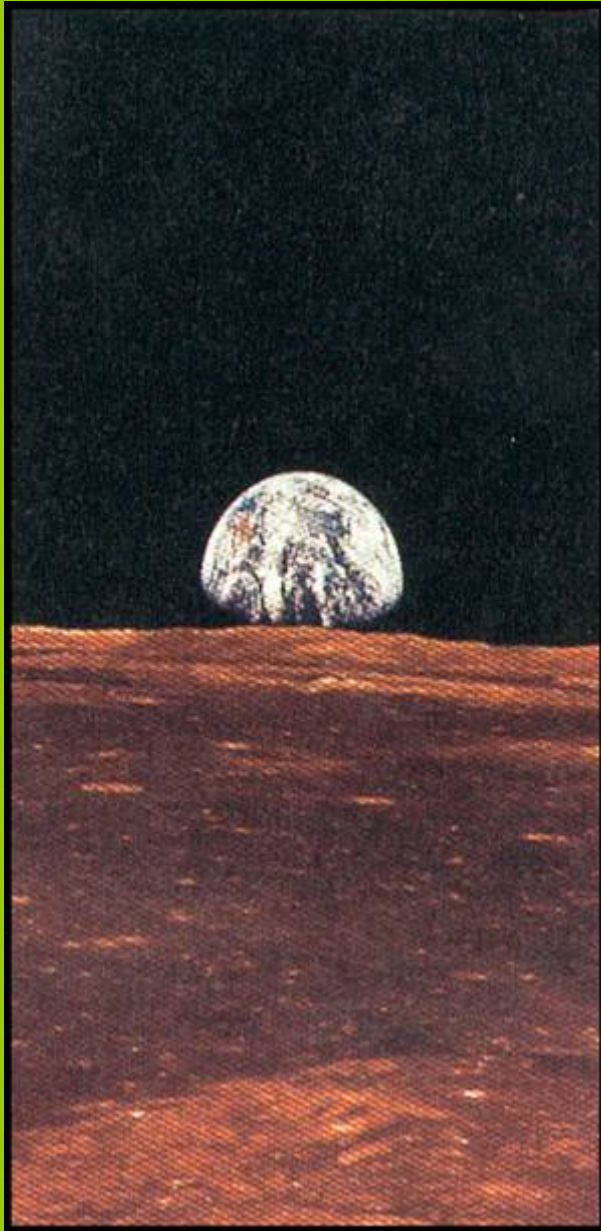
Thinking differently



- Peter Senge (The Fifth Discipline)

“when things are going poorly, we blame the situation on incompetent leaders, thereby avoiding any personal responsibility... Through all of this, we totally miss the bigger question `what are we, collectively, able to create?”

“... to think that the world can ever change without changes in our mental models is folly”.



“we are still settlers on this earth”

David Suzuki

