



Terrain-led support for children and teenagers with special needs

Dr Jenny Roe

The Well-Connected Child
Seminar 3. The Child's Natural & Built Environments
Thursday 4th July 2013

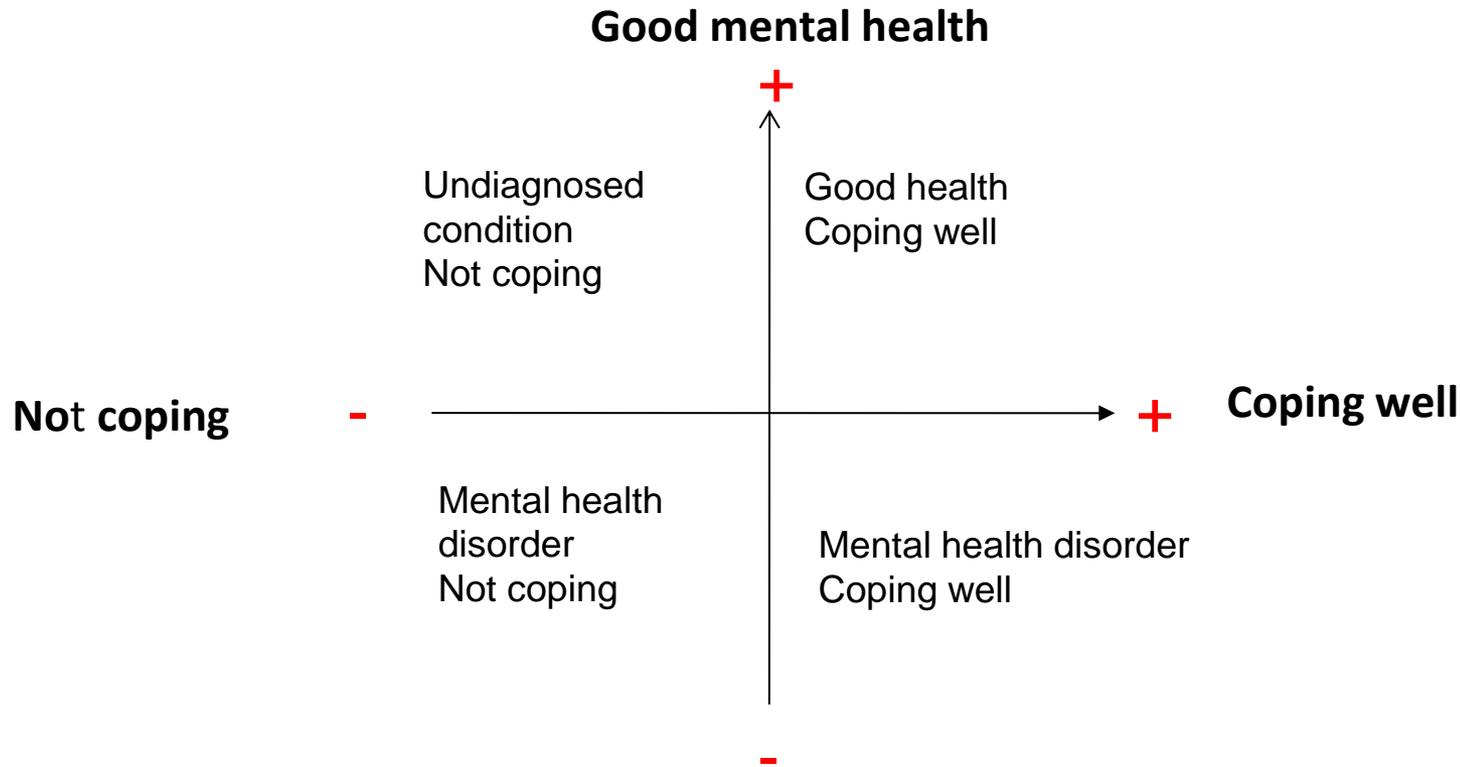
Outline

- The theoretical context
- The mental health context
- 4 studies exploring outdoor classroom/effects of natural settings:
 - Children in mainstream school:
 - (i) primary school & (ii) secondary school
 - Children in a residential context with
 - (iii) severe behavioural disorders and
 - (iv) children with ASD (autistic spectrum disorder).

Key theoretical concepts

- Short term restoration e.g. attention restoration
- Longer-term restoration: Instoration (Hartig et al., 1996)
- What's normal? Controversy rages over newly published DSM-5 and ... disruptive mood dysregulation disorder

Re-framing mental illness



Mental health disorder:
Psychosis, PTSD, ASD

Research Evidence

Evidence of short-term restorative effects of natural settings in children

- Attention restoration (Faber Taylor et al 2002, Kuo 2001, Wells 2000)
- Affective restoration (Faber Taylor and Kuo 2008)
- Stress reduction (Wells and Evans 2003)

Special needs

- Reduction in ADHD symptoms (Faber Taylor et al 2001, Kuo and Faber Taylor 2004, Faber Taylor and Kuo 2008)

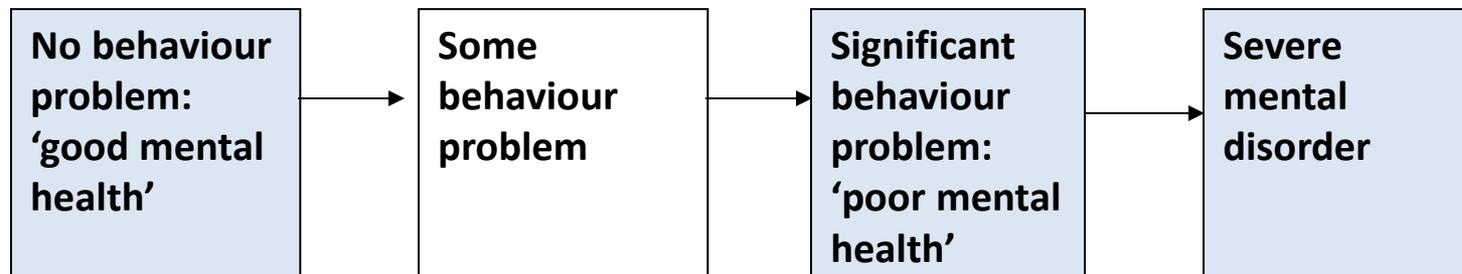
Outdoor education

- supports learning in young children, offering alternative forms of engagement with evidence of greater levels of social interaction and greater non-verbal communication outdoors (Waite et al, 2012).

Evidence of differential capacities for restoration

- the intensity of a restorative experience can be influenced by mental health state in response to different settings (Roe and Aspinall 2011a).

Spectrum of mental health in children & teenagers



Buchanan et al 2004

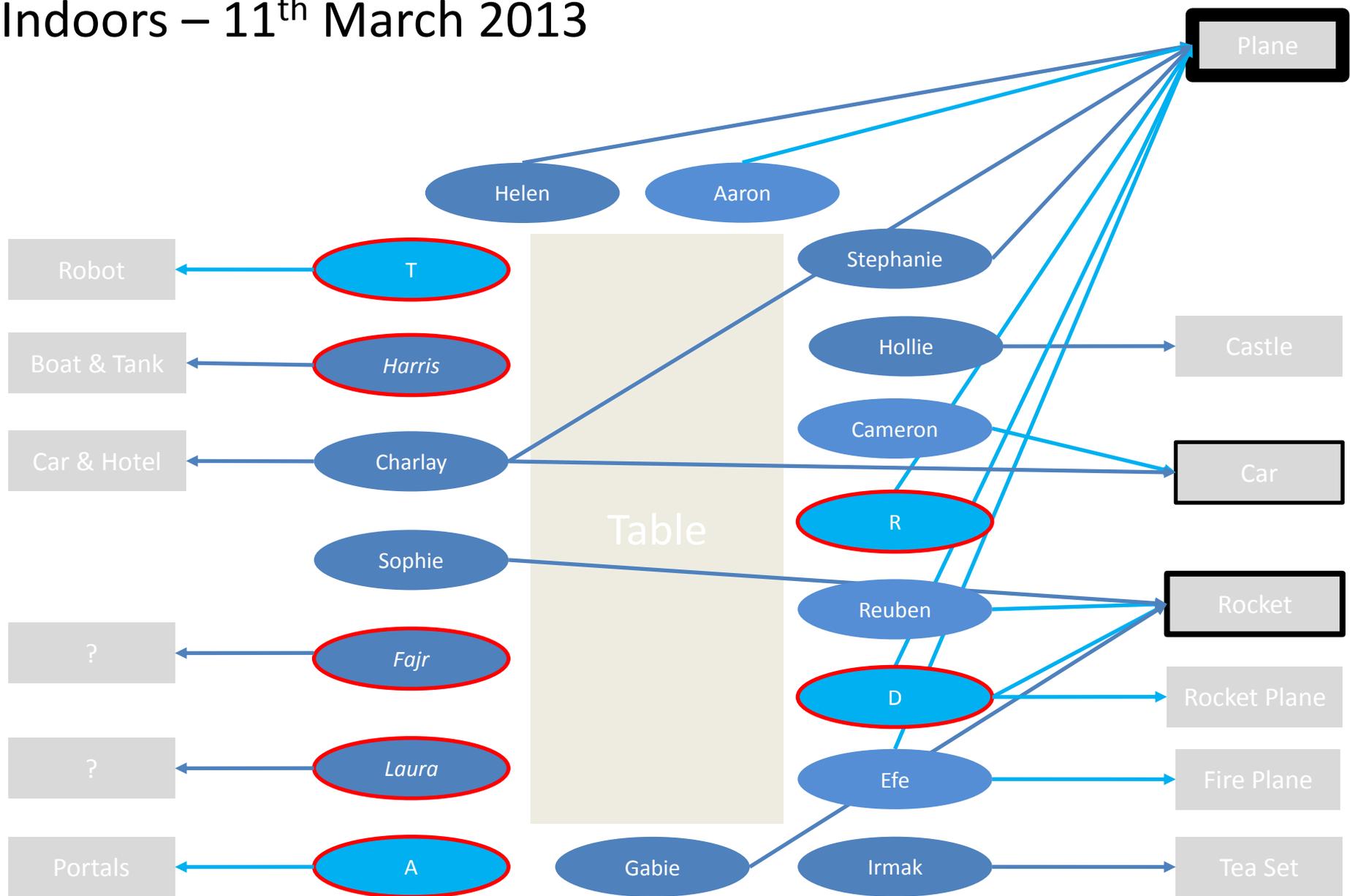
Study 1

Primary School: Indoor Task vs Outdoor Task

McKenzie Hamilton, J (2013): N is for Nature: An Exploration of Relationships between Outdoor Learning and Linguistic Experiences in Early Years (unpublished PhD Research).

Supervised by Dr Jenny Roe, Pete Higgins and Peter Aspinall.

Indoors – 11th March 2013



Outcomes: Indoor vs Outdoor Task

R



Plane



Ship / Helicopter

T



Robot

D



Rocket

A



Portals



Big House



Gourmet Campfire

Study 2

Secondary school: restorative outcomes of forest vs indoors settings in young people with varying behaviour states.

Roe, J. and Aspinall, P A. (2011b), Urban Forestry and Urban Greening, issue 3, Volume 10.

short-term restoration



Mainstream school



Urban forest school

Outcome variables

Restorative health differences between good and poor behaviour groups: stress, anger, hedonic tone and energy.

Anger & Stress Outcomes

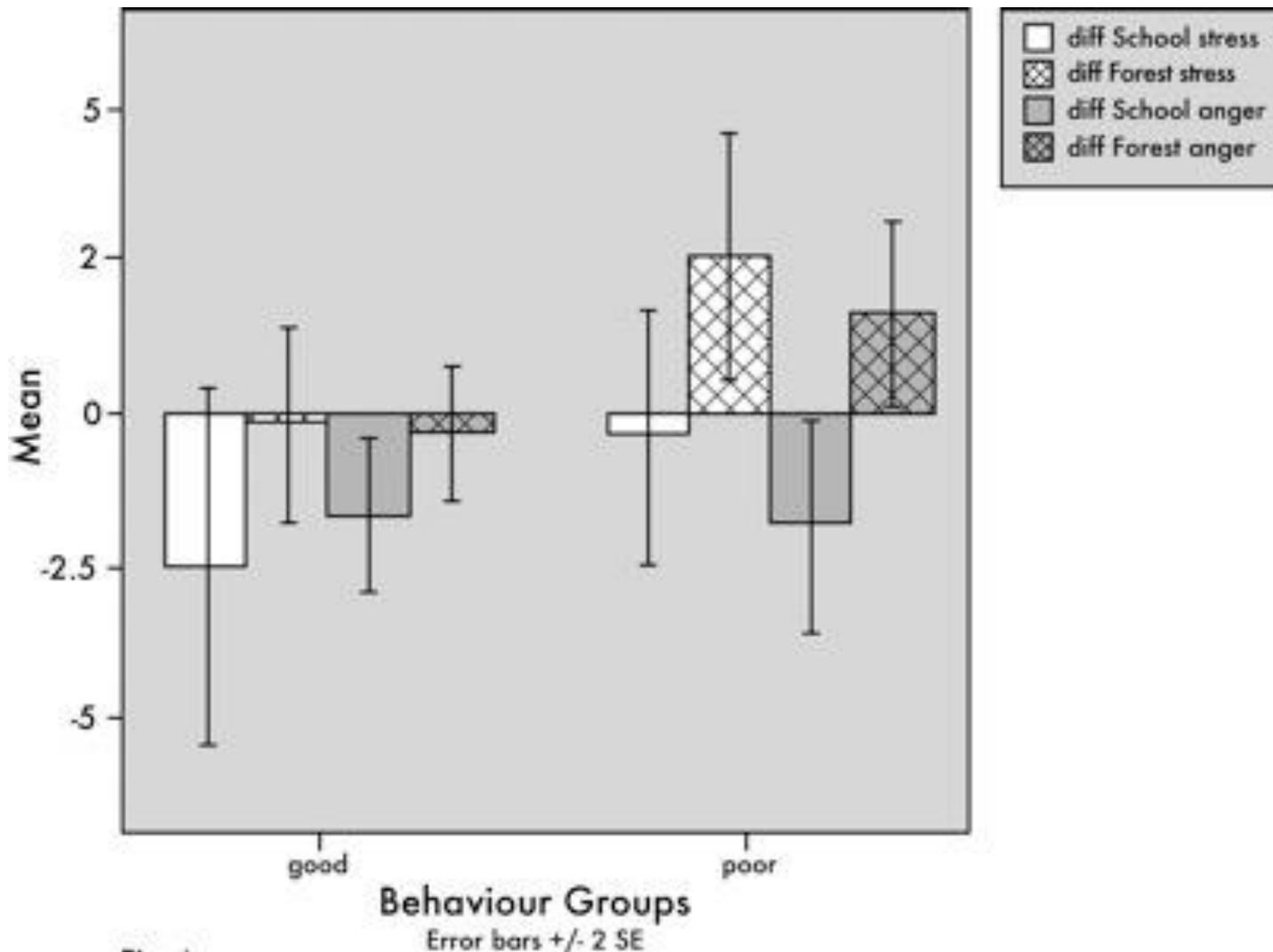


Fig 4

Note: the y axis indicates the change in mood scale pre-post intervention. A higher value on the y axis indicates a reduction in stress and anger.

Energy and Hedonic Tone Outcomes

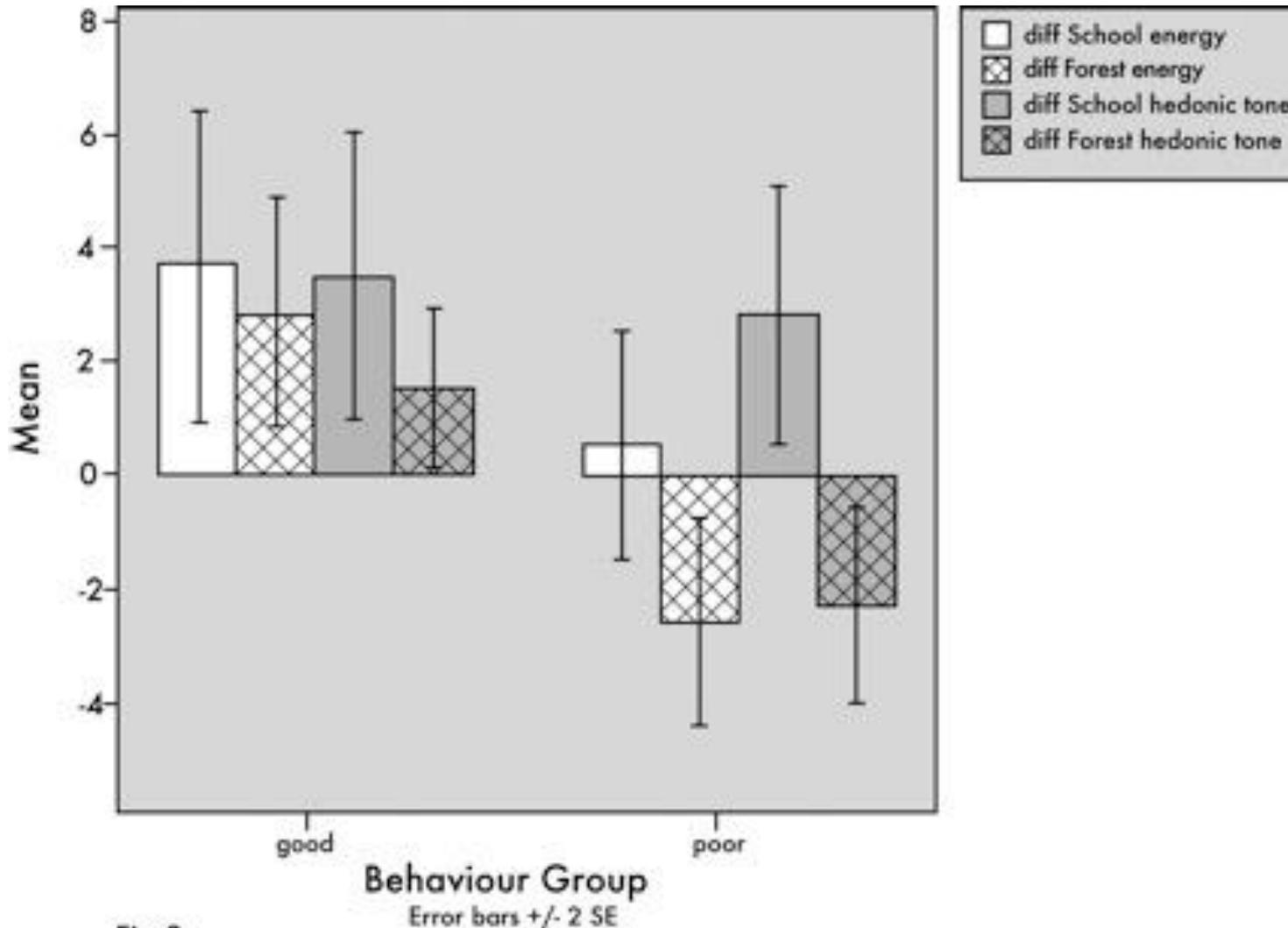


Fig 3

Note: the y axis indicates the change in mood scale pre-post intervention. A lower value on the y axis indicates an increase in energy and hedonic tone (HT).

Participatory Video



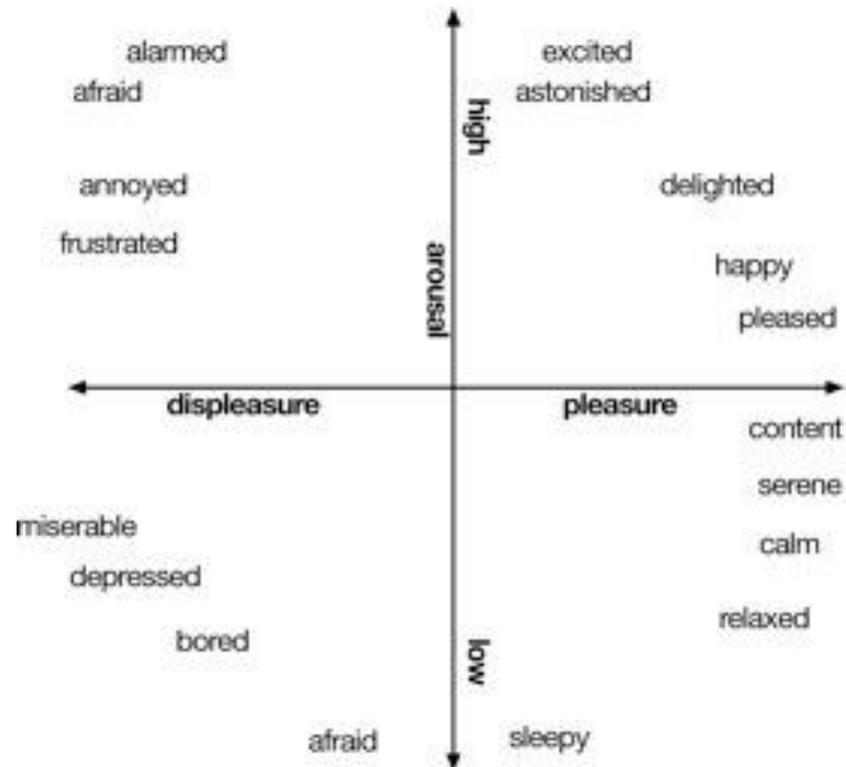
Video Diary Box

Study 3

Residential School: instorative outcomes of forest in children with severe mental health problems

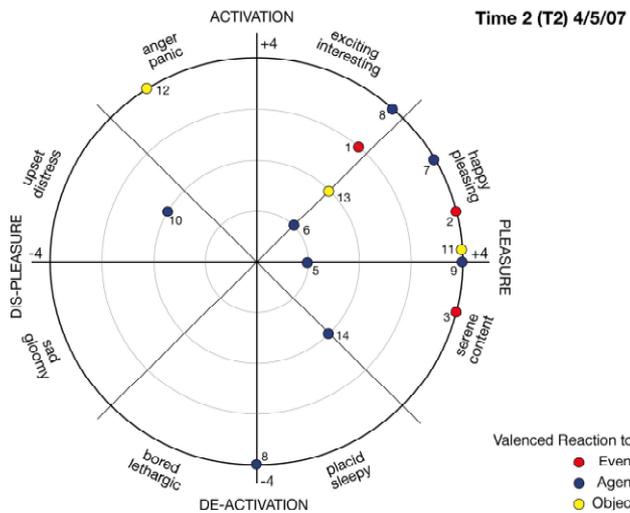
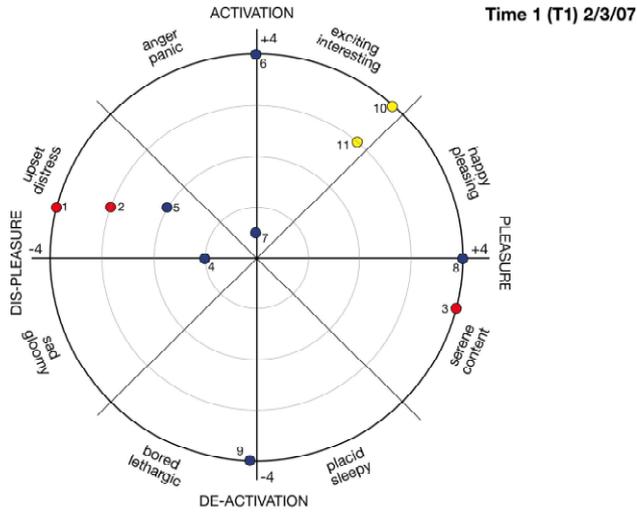
Roe, J. and Aspinall, P A (2011b): *The emotional affordances of forest settings: an investigation in boys with extreme behavioural problems*, Landscape Research. 22 March 2011 (iFirst), 36 (5).

Affective spectrum

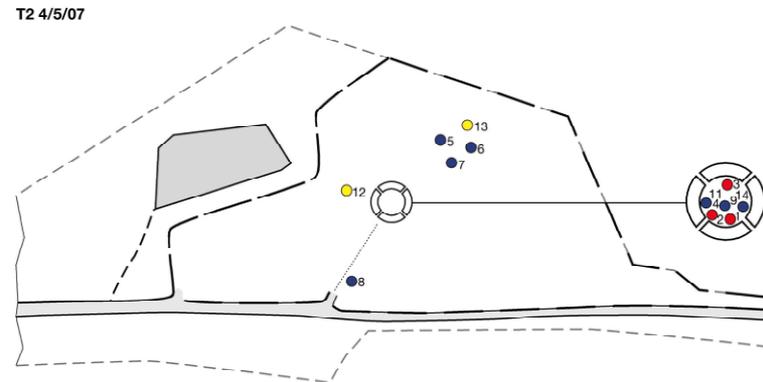
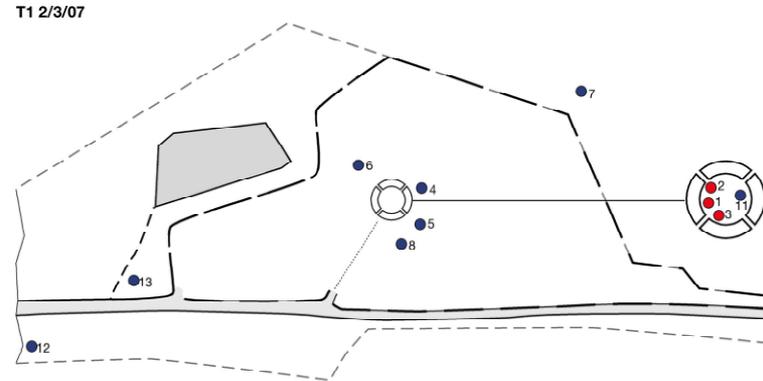


Circumplex model of emotion(Russell 1988)

Mapping affective affordances



Valenced Reaction to:
 ● Event (red)
 ● Agent (blue)
 ● Object (yellow)



KEY

- Forest school boundary
- Site boundary
- Camp hub
- Curling pond

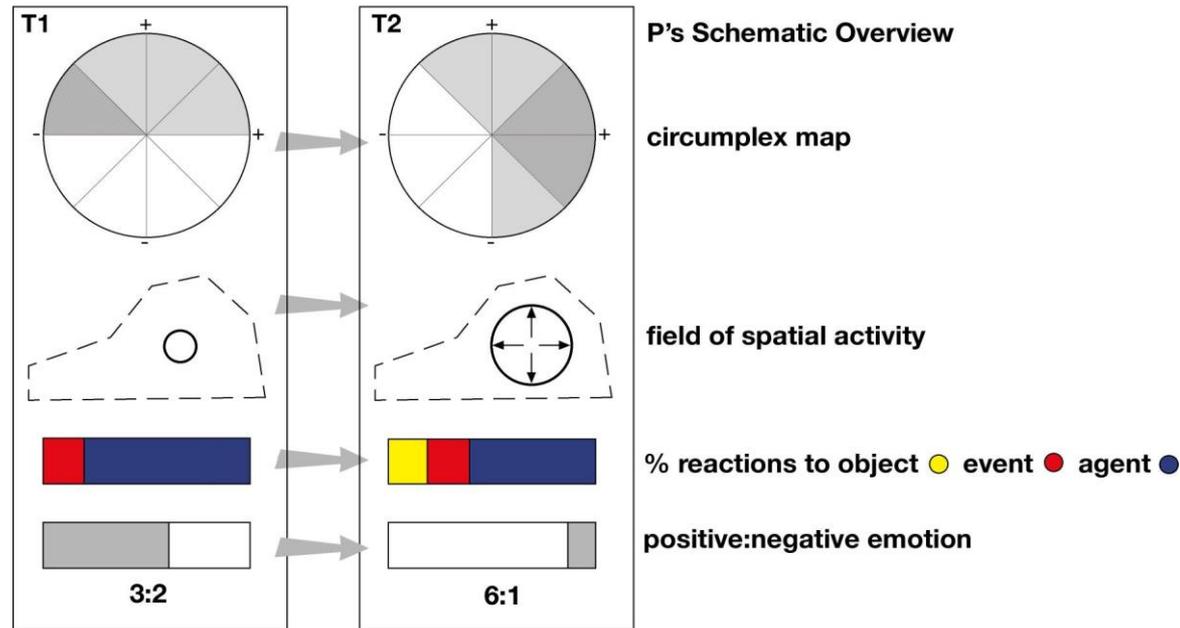
Valenced Reaction to:
 ● Event (red)
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P's Spectrum of Emotions at T1 and T2

Spatial mapping of P's emotional affordances, T1 and T2

Summary map

Shifts in Emotional and Physical Spectrums For P



Main findings

- Increased curiosity and exploratory behaviour
- Increased capacity for trust and recollection
- Increased social cohesion

Participatory Video



Proposition study: autism and blue light exposure

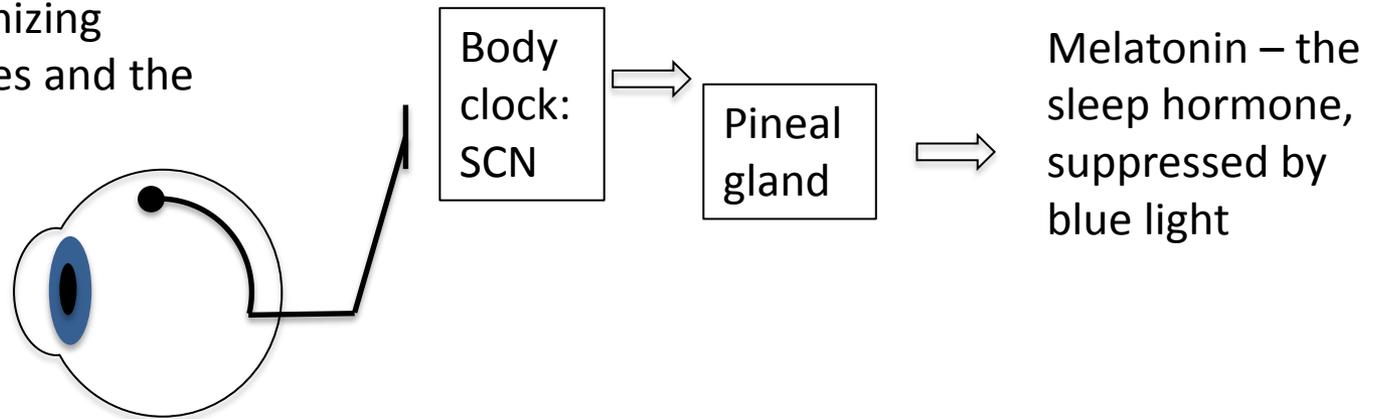


Amanda Nioi, PhD Candidate

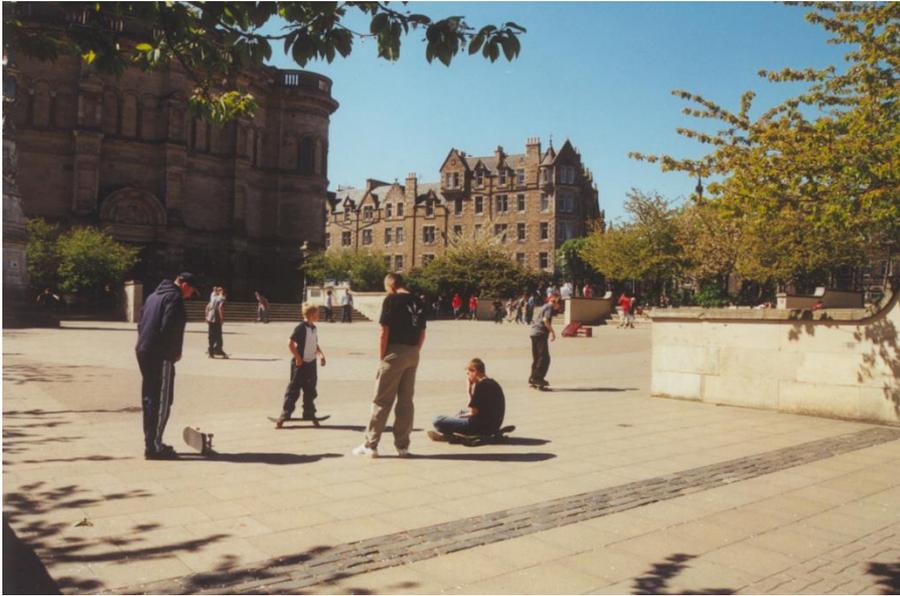
Supervised by: Dr. Jenny Roe, Prof. Peter
Aspinall, Prof. Bal Dhillon, David McNair

The non-visual eye

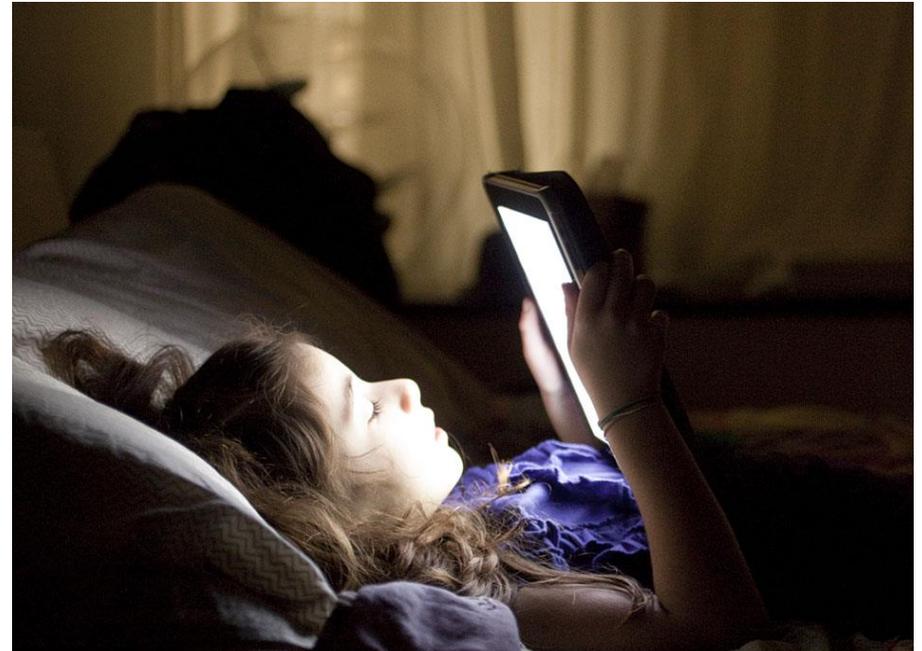
Non-image forming cells at the back of the eye send signals to the brain synchronizing environmental cues and the body clock



Czeisler et al., 1995: Suppression of melatonin secretion in some blind patients by exposure to bright light



- All of these are sources of blue light and all affect our body clock.
- Our most effective sources is daylight.



Autism Spectrum Disorder (ASD)

Key findings

- Sensitivity to fluorescent light – can cause over arousal in behaviour.
- Disruption in the melatonin rhythms – sleep/wake cycle can become out of sync.

Gaps for further study

- Quantify amount of blue light reaching the eye and the level of sleep disruption.
- Limited research on light therapy as a non-pharmaceutical to synchronize circadian rhythms.
- Simple light intervention measuring the effects of sleep.



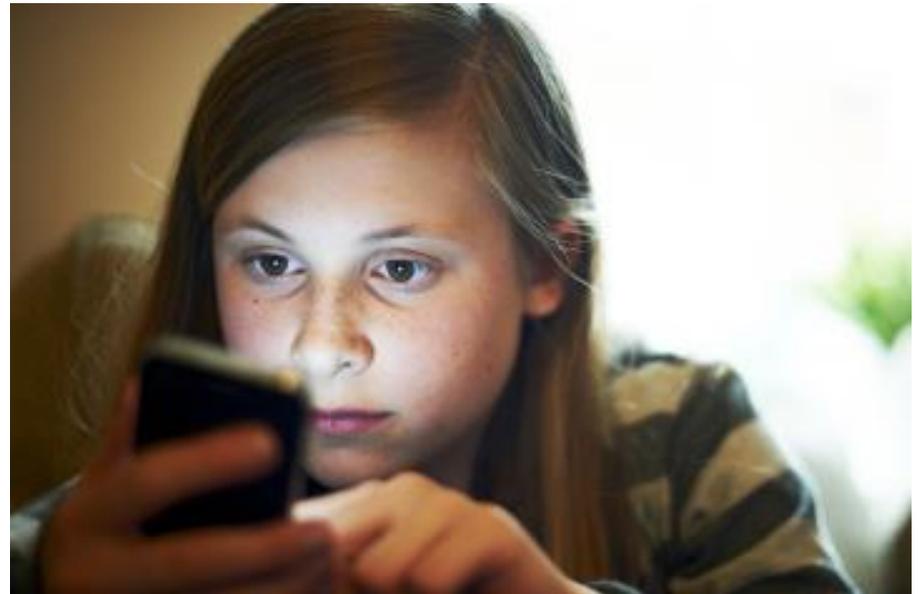
Adolescents

Key findings

- Lack of blue light in the am or over exposure in the pm causes disruption to sleep cycles.
- Blue light the morning proven to help daytime alertness during the school day.

Gaps for further study

- Exploration of the connection between morning blue light exposure and academic performance.
- Examine the longer term implications on sleep and well-being due to over exposure to evening blue light.



Conclusions