

Can exposure to green space reduce  
the risk of anxiety and depression  
among young people aged 14-24 living  
in urban settings?

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**University Mental Health Day**

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# Wellcome Trust Mental Health

- Wellcome Trust funded 30 projects under their Mental Health Programme Strategy to learn more about potential ‘active ingredients’ in interventions to prevent/treat/manage anxiety and depression among young people aged 14-24 years
- <https://wellcome.org/what-we-do/our-work/mental-health-transforming-research-and-treatments/strategy>
- A multi-disciplinary team at UWE Bristol conducted a review into the role of exposure to green space in urban settings (June-September 2020)

# What is known already?

- Approximately 0.7 billion 14-24-year olds living in urban settings globally
- Urbanisation is a risk factor for poorer mental health
- The relationship between green space and mental health has been demonstrated in a number of systematic reviews for children / adolescents / adults, but not specifically young people aged 14-24 years, despite the fact that this is when majority of mental health conditions develop
- Young people's mental health, and access to urban green space, are increasing concerns in light of the Covid-19 pandemic
- Previous reviews have cited Attention Restoration Theory (Kaplan & Kaplan, 1989) to explain the relationship, but have not made clear links to clinical levels of anxiety and/or depression

# Aim



## *Attention Restoration Theory*

Natural environments allows attentional capacity to be rested and restored, by providing experiences that engage indirect attention

# Objective

- This review combined a wide range of evidence from the literature with insights from young people to answer the question:
  - “In which ways, in which contexts and for whom does exposure to green space reduce the risk of anxiety and depression among young people aged 14-24 living in urban settings?”



# Methods

- Search strategy informed by scoping review and two panels of young people with lived experience of anxiety and depression (4 aged 14-18 years, 3 aged 19-24 years)
- Search terms for exposure, outcomes and population:
  - Proximity to urban green space/vegetation, interventions in green/natural environments
  - Broad definition of anxiety and depression, including self-report of stress or low mood
  - Study designs – all, including reviews, experimental, observational and qualitative
- CINAHL plus, Global Health, MEDLINE, ProQuest: Dissertations and Theses, PsycINFO, Scopus and OpenGrey searched in June 2020
- Scoping review:  
<https://www.emerald.com/insight/content/doi/10.1108/JPMH-02-2021-0030/full/html>

# Methods cont.

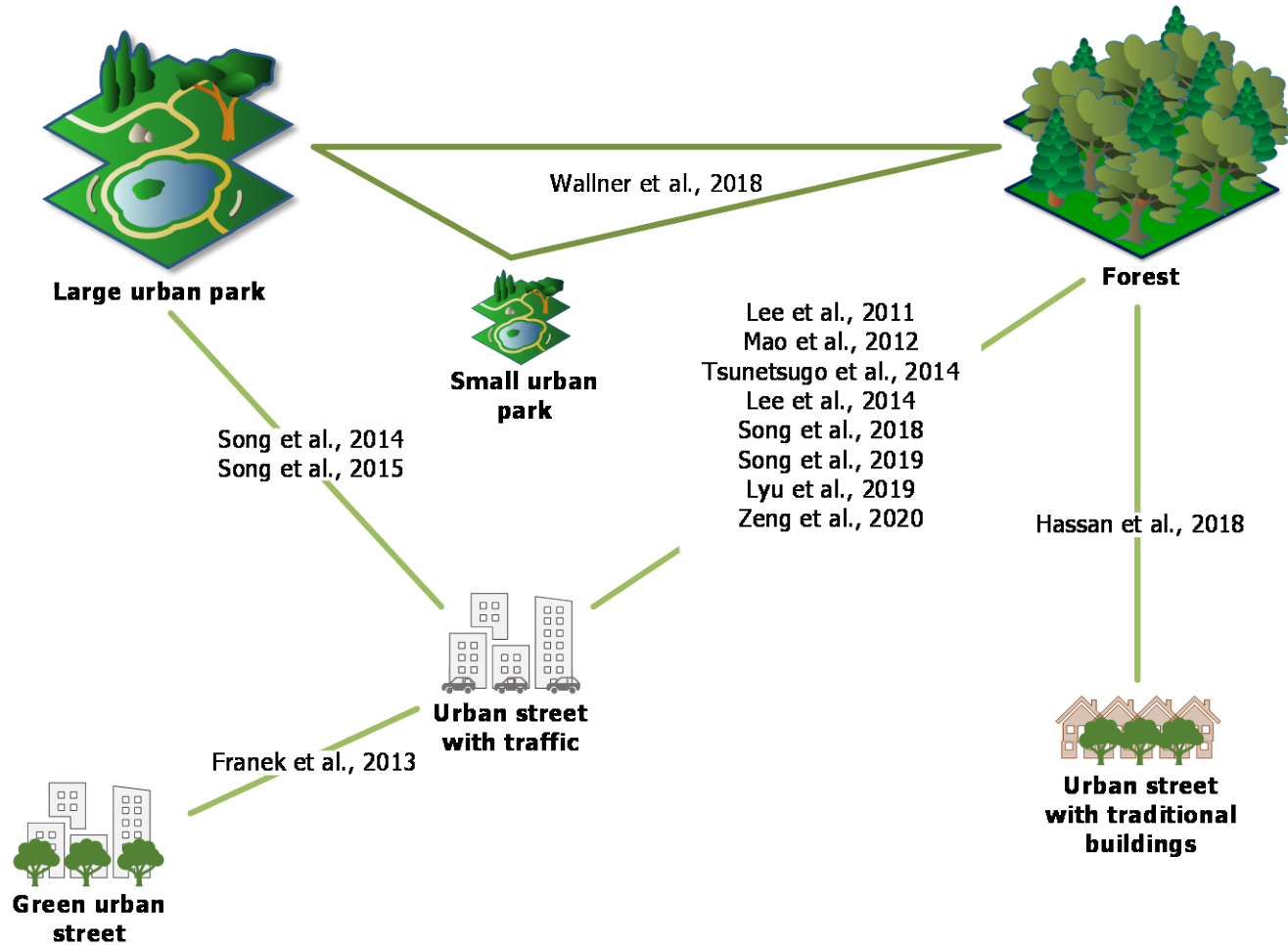
- Screening:
  - 9,204 titles and abstracts → 699
  - 699 full text assessed → 86 (main reason for exclusion was age range)
  - 86 considered against key criteria → 47:
    - neighbourhood green space
    - anxiety/depression
    - all participants 14-24 years
    - intervention studies

# Included studies

- 13 studies that compare urban streets, urban parks and forests (experimental)
- 8 studies that assess particular aspects of being in green/natural environments (7 experimental)
- 7 studies compare physical activity in a green/blue environment and indoors, or evaluate physical activity programmes (experimental)
- 11 studies that evaluate outdoor adventure programs, and education, training or employment in green environments - complex interventions (group belonging, physical activity, reflection)
- 4 studies of exposure to residential vegetation
- 4 studies of young people's perceptions of green spaces



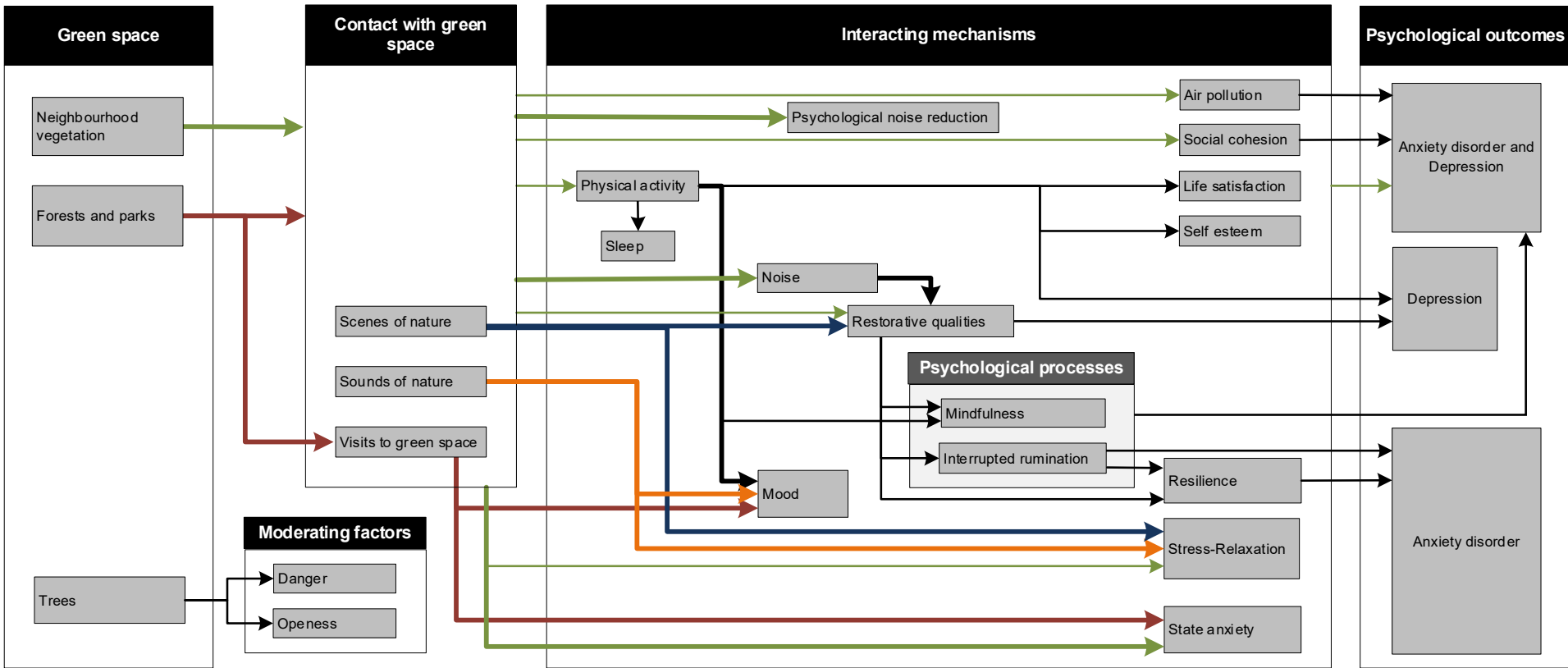
# Walking or being in a forest or urban park



## Walking or being in a forest or urban park

- Large urban park v urban street with traffic:
- Song et al., 2014 (17 male Japanese students)
  - Total STAI score was 14.3% lower after 15-min urban park walk compared with street walk (urban park:  $41.6 \pm 7.0$  (mean  $\pm$  standard deviation), urban street:  $48.6 \pm 6.3$ ;  $p < 0.05$ )
- Song et al., 2015 (23 male Japanese students)
  - Total STAI score was 19.3% lower after 15-min urban park walk compared with street walk (urban park:  $39.0 \pm 6.3$ ; urban street:  $48.4 \pm 7.5$ ;  $p < 0.01$ )
- Forest v urban street with traffic:
- Lee et al., 2014 (48 male Japanese students)
  - Total STAI score was 26.5% lower after 15-min forest walk compared with street walk (forest:  $33.2 \pm 6.9$ ; urban street:  $45.2 \pm 8.9$ ;  $p < 0.01$ )
- Song, et al. 2019 (60 female Japanese students)
  - State-anxiety was 23.2% lower after 15-in forest walk compared with street walk (forest:  $34.8 \pm 7.2$ ; urban street:  $45.3 \pm 7.1$ ;  $p < 0.01$ )

# Conceptual model



Line thickness denotes the strength of the evidence: thicker lines represent evidence from a systematic review, medium lines represent evidence from experimental studies and thinner lines represent evidence from observational studies. Colour coding differentiates pathways from each feature of green space.

# Results: Overall

- Exposure to forest environments leads to greater momentary mental wellbeing compared to being on an urban street
- Urban parks can deliver similar benefits to forests
- Some evidence of larger and longer-lasting effects from forests
- Dose of interventions: 15 minutes to 3 days. Further research must explore the “dose” and frequency of exposure associated with prevention of anxiety and/or depression
- Absence of traffic/noise/people/social media → noticing nature → mindfulness → interrupted rumination → restoration
- Blog: <https://blogs.uwe.ac.uk/sustainable-planning-and-environments/new-review-finds-that-better-access-to-green-spaces-has-a-beneficial-impact-on-anxiety-and-depression-in-young-people-aged-14-to-24-years/>
- Vlog: [Issy Bray - Green Spaces #ActiveIngredientsMH - YouTube](#)

# Mental health in young people is a serious concern

1 in 5 young adults have symptoms of depression or anxiety



Depression is 4<sup>th</sup> and anxiety is 9<sup>th</sup> most common cause of illness and disability in 15 to 19 year olds



Rates of depression are soaring in 14-24 year olds

Suicide is the 2<sup>nd</sup> leading cause of death in 15 to 29 year olds

16-24 year olds experience loneliness more often and more intensely than any other age group



40% of 16-24 year olds feel lonely often or very often



Social media activity among adolescents is associated with symptoms of anxiety and depression, and feelings of loneliness

81%

adolescents are not sufficiently physically active

## Urban green spaces provide an accessible place for young people to walk, run, cycle, play sports, meet friends and take time out



14% to 19%

reduction in anxiety from just 15 minutes walking in an urban park instead of a street with traffic

23% to 31%

reduction in anxiety from just 15 minutes walking in a forest instead of a street with traffic

Young people who have higher levels of vegetation within 500m of their home have improved mindfulness and resilience and reduced risk of anxiety and depression



500m



Being in green spaces encourages young people to take a break from screens and social media



Green environments reduce perceived noise and provide a space for young people to relax



Blue spaces such as streams, rivers, ponds and lakes and are also good for young people's mental health



Observing nature promotes mindfulness, which helps young people to deal with stress



Urban environments with traffic increase feelings of anxiety and anger

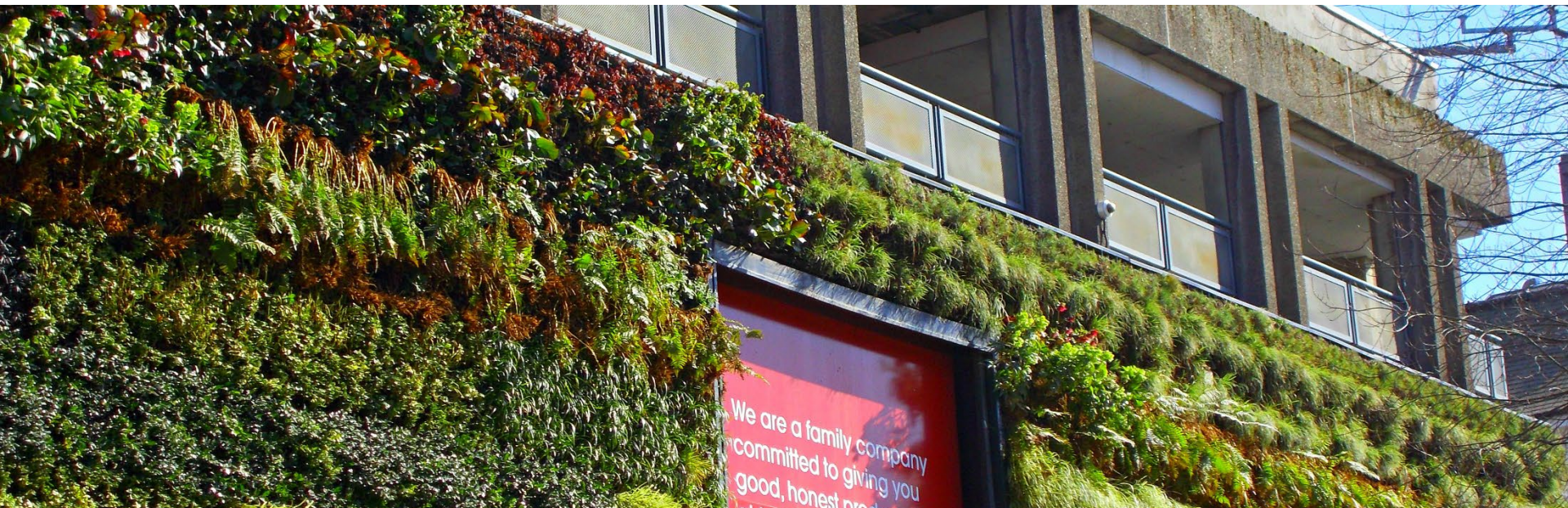
Trees reduce noise and pollution from traffic, which have harmful effects on young people's physical and mental health





# Recommendations for policy

- Opportunities for activities in green/natural spaces should be built into school and college curricula
- Neighbourhood green space and vegetation is crucial to the well-being of young people
- Increasing urban access (e.g. through local parks, school grounds, university campuses, workplaces) is a structural change – potential for broad reach and lasting benefits

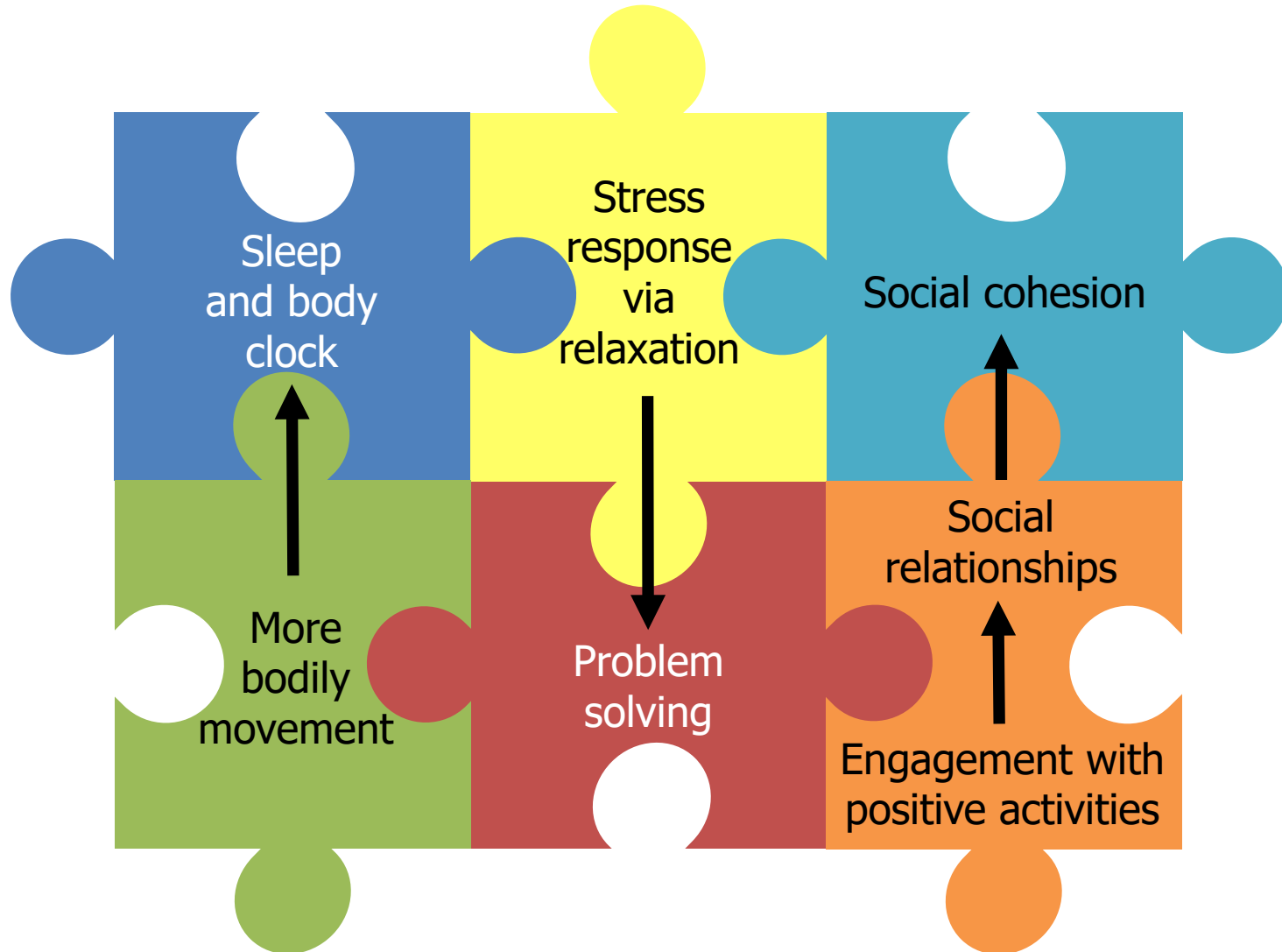




# Other benefits

- Increasing urban access to green space is likely to reduce inequalities, as those in the most deprived areas (often with less access to private gardens or high-quality green spaces) are likely to gain the most benefit
- It will also benefit other age groups, improving thermal comfort and biodiversity in cities, reducing pollution and risk of flooding, all of which have health implications for the future health of today's young people
- Finally, it facilitates many other active ingredients.....







# Recommendations for research

- Consider how green/blue spaces work for different groups (based on socio-demographics and experiences)
- Consider the different types and qualities of green spaces or green infrastructure
- There were two sets of studies where we found less evidence:
  - Longitudinal studies looking at mediators between residential vegetation and longer-term prevention of anxiety and depression
  - Qualitative work with young people about their perceptions of green spaces and barriers/facilitators for use

# Landscape & greenspace at UWE

# About us

- Split over 3 main campus sites: Frenchay, Glenside and City Campus
- Approximately 63 hectares of external space (85% FR, 12% GL, 3% CC)
- >30,000 students
- 4,000 staff
- Grounds maintenance in-house, within UWE Sustainability team



# Overall approach to greenspace

- Aim to optimise amenity, leisure and biodiversity benefit
- 2013-20 sustainability plan aimed to:
  - Create, enhance & manage habitats for a biodiverse estate
  - Improve access to campus green space
- 2020-26 Landscape & Biodiversity Plan
  - Promote benefits of greenspace to people and wildlife – bringing nature close to people
  - Strategically connected and harmonious green spaces
  - Facilitate education & engagement in biodiversity issues
  - Provide an estate that supports the health and wellbeing of staff, students and visitors

# Encouraging engagement in greenspace

- Community gardens
- Community orchards
- Partnering with SU@UWE, Sport Centre, Active Living team
- Gardening sessions
- Wellbeing themed guided wildlife walks
- Social prescribing model with wellbeing service

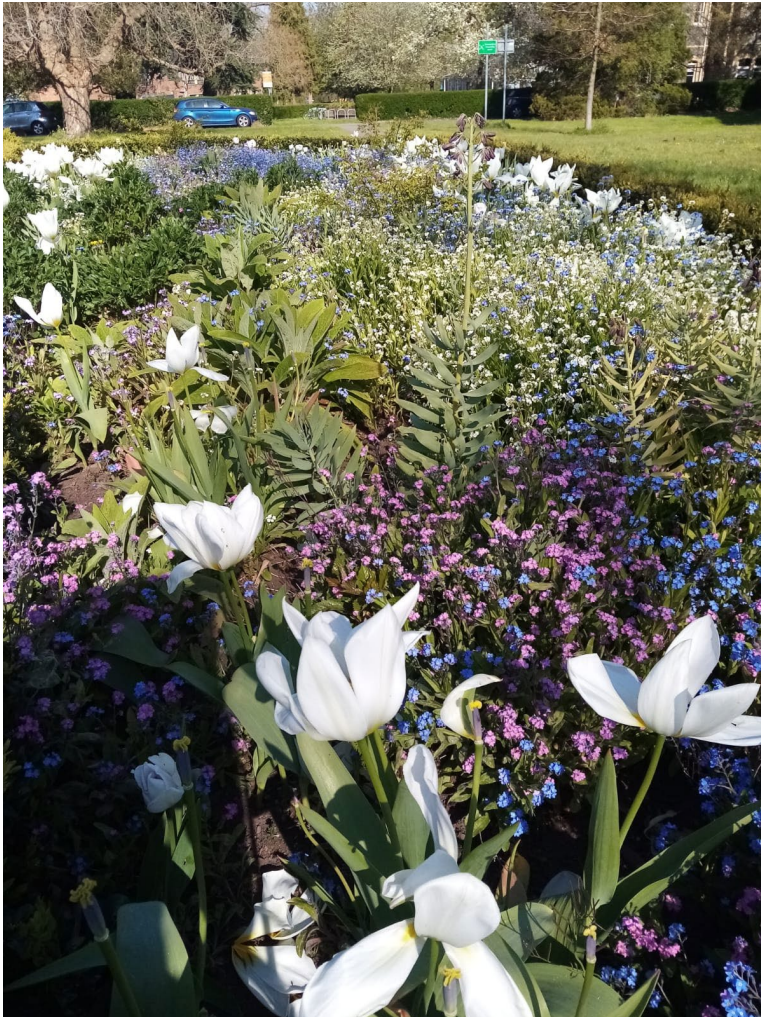
# UWE Beeline

- Edible and pollinator-friendly planting
- People encouraged to collect herbs etc for own use





# Ornamental planting at Glenside & Frenchay campuses





# Members of UWE grounds team launch the hedgehog friendly campus initiative (2019)





# HFC Gold awarded January 2022



# Planned: Restorative garden



## Restorative garden mood board images





# Planned: Building with Nature

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## CORE Standards

- Standard 1** Optimises Multifunctionality and Connectivity
  - Standard 2** Positively responds to the Climate Emergency
  - Standard 3** Maximises Environmental Net Gains
  - Standard 4** Champions a Context Driven Approach
  - Standard 5** Creates Distinctive Places
  - Standard 6** Secures Effective Place-keeping
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## WELLBEING Standards

- Standard 7** Brings Nature Closer to People
  - Standard 8** Supports Equitable and Inclusive Places
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## WATER Standards

- Standard 9** Delivers Climate Resilient Water Management
  - Standard 10** Brings Water Closer to People
- 

## WILDLIFE Standards

- Standard 11** Delivers Wildlife Enhancement
  - Standard 12** Underpins Nature's Recovery
-

# Maximising the potential benefits of UWE Bristol's Greenspaces to Improve student mental health

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# Overview of student mental health

- The issue of mental health is a global health concern
- Both adults and young people are adversely affected by mental health problems
- Students are not exempted from mental health issues
- Loneliness, social isolation and academic burnout are common challenges to students in periods of transitions at the university (Diehl et al., 2018)
- These challenges students encounter at the university could potentially lead to poor mental health and low academic attainment (Brakespear and Cachia, 2021)
- The pandemic has significantly affected the mental health of students (Li et al., 2021)
- However, 50% of students in the UK had poor mental health before the pandemic (National Union of Students (NUS), 2020)
- The overall university experience and wellbeing of students could be affected by poor mental health if not managed.

# Greenspaces and student mental health

- Greenspaces are areas within urban environment made up of nature and vegetations
- Includes but not limited to parks, gardens, natural areas, grass areas, woodlands, and playing fields
- Greenspaces support the mental health of young people and adults (Corazon et al., 2019; Reece et al., 2021)
- However, student interaction with greenspaces are limited although significant benefits are recorded among students who engage with greenspaces(Holt et al., 2019)
- Improved cognitive function(Wallner et al., 2018) , positive mood (Song et al., 2014) and sympathetic/parasympathetic balance(Lee et al., 2014) are some reported benefits of greenspace to university students.
- Nevertheless, some gaps exist in the literature.

# What are the gaps in the literature?

- Further investigation is needed to understand the mediating factors and mechanisms that determine how greenspaces lead to mental health outcomes of students.
- Most of the research do not consider the aesthetics of greenspaces and how specific features could lead to a specific mental health outcome
- Behaviours of students and how they engage with greenspaces are not well understood

# What is the aim of this study?

1. To explore specific features of greenspaces and how they impact the mental health of students, in terms of managing stress and anxiety.
2. To explore the barriers and enablers in increasing students' engagement with greenspaces.
3. To investigate how campus greenspaces can be designed to promote inclusivity and engagement for students.
4. To examine how campus activities can be revised to maximise direct and indirect engagement with greenspaces.



# What are some potential impacts of this study?

- Some mediators and mechanisms that determine how and why students engage or disengage with greenspaces could be understood- This may help in the development of interventions to encourage some behaviours and student engagement with greenspaces
- Deeper understanding could be generated on how specific greenspaces affect the mental health of students- This may inform the building of greenspaces and development of mental health programs across universities
- The findings from the study may also help in the development of policies and guidelines targeted at improving students mental health and overall university experiences.
- Other benefits could be identified by the end of the study.





**Questions?**



# References

Brakespear, G. and Cachia, M. (2021) Young adults dealing with loneliness at university. *New Vistas*. [online]. 7 (1).

Corazon, S.S. et al. (2019) *Psycho-physiological stress recovery in outdoor nature-based interventions: A systematic review of the past eight years of research* *International Journal of Environmental Research and Public Health*. [online]. 16 (10).

Diehl, K. et al. (2018) Loneliness at universities: Determinants of emotional and social loneliness among students. *International Journal of Environmental Research and Public Health*. [online]. 15 (9).

Holt, E.W. et al. (2019) Active and passive use of green space, health, and well-being amongst university students. *International Journal of Environmental Research and Public Health*. [online]. 16 (3).

Lee, J. et al. (2014) Influence of forest therapy on cardiovascular relaxation in young adults. *Evidence-based Complementary and Alternative Medicine*. [online]. 2014.

Li, Y. et al. (2021) *Impact of the COVID-19 Pandemic on the Mental Health of College Students: A Systematic Review and Meta-Analysis* *Frontiers in Psychology*. [online]. 12.

# References cont'

National Union of Students (2020) *Coronavirus Student Survey phase III November 2020 - Mental health and wellbeing2020* [online]. [Accessed 5 February 2022].

Reece, R. et al. (2021) Exposure to green space and prevention of anxiety and depression among young people in urban settings: a global scoping review. *Journal of Public Mental Health*. [online]. 20 (2).

Song, C. et al. (2014) Physiological and psychological responses of young males during spring-time walks in urban parks. *Journal of Physiological Anthropology*. [online]. 33 (1).

Wallner, P. et al. (2018) Reloading pupils' batteries: Impact of green spaces on cognition and wellbeing. *International Journal of Environmental Research and Public Health*. [online]. 15 (6).