

Linking urban green space and health: opportunities and challenges for all ages

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Landscape perception and preference

Appleton's (1975) work on prospect and refuge, and that of Wilson (1984) and Bourassa (1991) propose a biological basis for human preference for certain types of environments and the psychological benefits they bestow.

The Biophilia hypothesis (Kellert and Wilson 1993) suggests that people's desire for contact with nature has an underlying cause based on genetic fitness and competitive advantage:

If, above and beyond any consideration of basic sustenance – food to eat and water to drink – the natural environment is a resource vital to human wellbeing ...

what does this mean for an urbanised society?



Urban Green Space Interventions and Health

*A review of impacts
and effectiveness*

WHO European Region report 2017

A review of local case studies and
Impact Assessment experiences, their
impact on environment, health,
wellbeing and equity

UN Sustainable Development Goals



Goal 11.7: “By 2030, provide universal access to safe, inclusive and accessible, green and public spaces, in particular for women and children, older persons and persons with disabilities”

There's nothing new in this:
Martial (c. 100 CE) promoted the virtues of *rus in urbe*



Urban parks were first labelled “the lungs of the city” in London in the 18th century



Birkenhead Park, Joseph Paxton, 1843

“A park in the East End [of London] would diminish the annual deaths by several thousand, and add several years to the lives of the entire population” 1839.

It will benefit artisans’ and labourers’ health “and that of their families, by inhaling the fresh air at least once a week, at a distance from their own confined and wretched habitations” 1847



Birkenhead Park opening, 1843

The artificial conditions of the town produce “a harmful effect, first on (a man’s) entire mental and nervous system and ultimately on his entire constitutional organisation” – the antidote is pleasing, rural scenery. *F L Olmsted 1886*

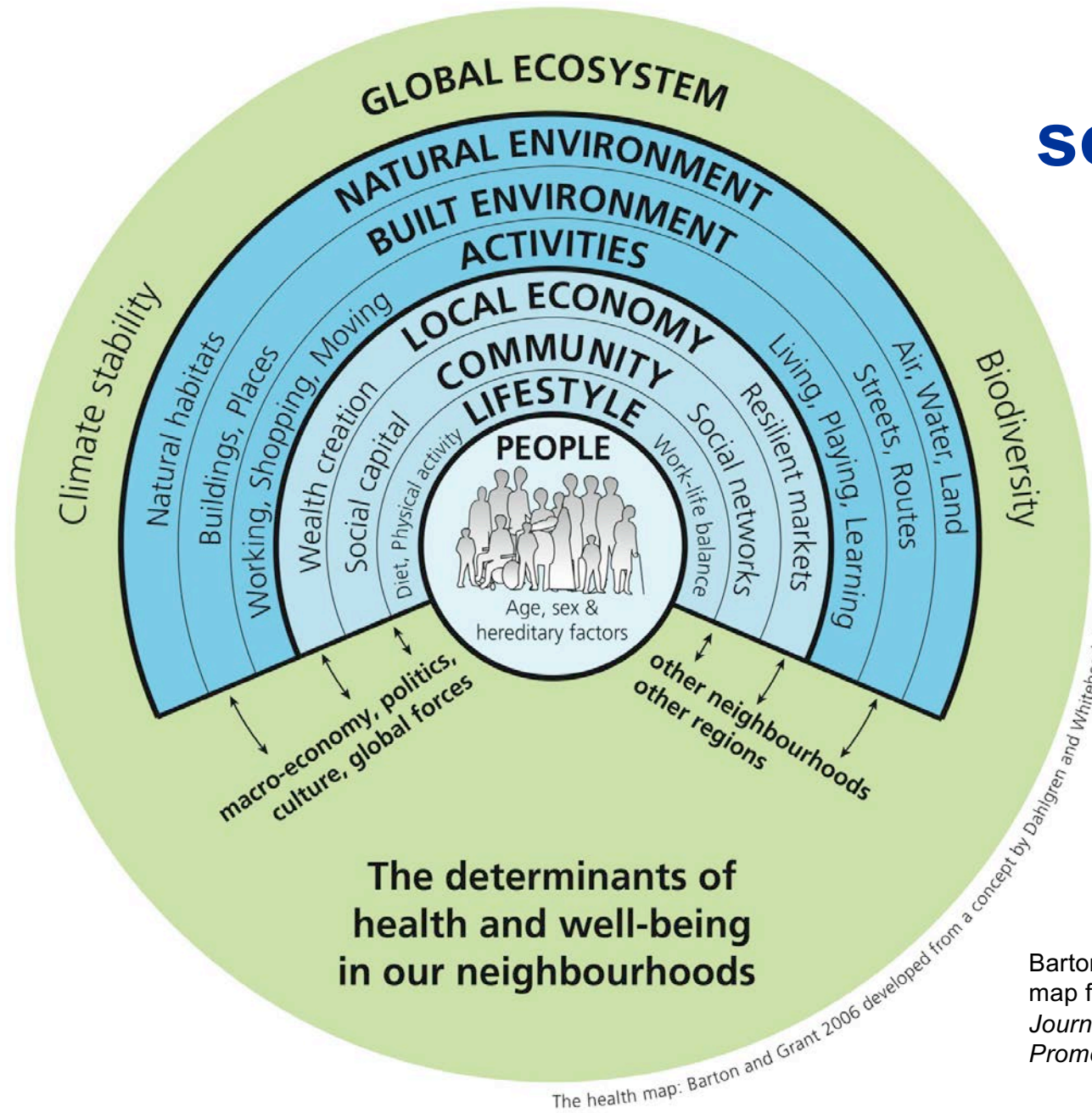


Central Park, New York City – The Bridge, Currier and Ives, U.S. Library of Congress

Prospect Park, Long Meadow, Brooklyn, by Olmsted & Vaux, 1866



The current socio-ecological approach to wellbeing



The determinants of health and well-being in our neighbourhoods

Barton, H. & Grant, M. (2006). A health map for the local human habitat. *The Journal for the Royal Society for the Promotion of Health*, 126, 252-253

Green/blue space is salutogenic

Urban studies from Japan, England, Lithuania, Canada, USA and Australia show that having green space near where you live is associated with reduced mortality rates, especially from circulatory diseases, even when income level is taken into account.



Green space is also equigenic

Associated with reducing the difference in health between the most economically deprived people and those better off.



Potential mechanisms linking landscape and health: Physical Activity




Many people walk when in natural landscapes – physical activity has positive effects on physical health, mood and stress

Potential mechanisms linking landscape and health: Social Engagement



Social contact when in natural environments – relieves social isolation (a health risk) and may enhance activity or mood

Potential mechanisms linking landscape and health: Attention Restoration

A photograph of a park scene. In the foreground, there is a vibrant flower bed with pink, red, and purple blooms. Behind it, a person is sitting on a wooden bench, facing away from the camera. The park is filled with large, mature trees with dense green foliage. Sunlight filters through the leaves, creating dappled light on the grass. In the background, a building is partially visible through the trees.

Psychological response to perceiving natural environments
Attention Restoration Theory (Kaplan & Kaplan)

Potential mechanisms linking landscape and health: Psychophysiological responses

A photograph of a park scene. In the foreground, there is a body of water, possibly a pond or a stream, with a rocky shoreline. A paved path runs along the water's edge. In the middle ground, a person is sitting on a wooden bench, looking towards the water. The background is filled with large, mature trees with dense green foliage. A building is partially visible behind the trees.

Include independent physiological responses: psychoneuroendocrine mechanisms
(Ulrich et al., Hartig et al, Ottoson & Grahn, Park et al)

The importance of biological pathways

If green space reduces or buffers the allostatic load of chronic stress, it will influence physical as well as mental health



We found we could predict chronic stress patterns in a deprived urban population (measured via cortisol) by % green space

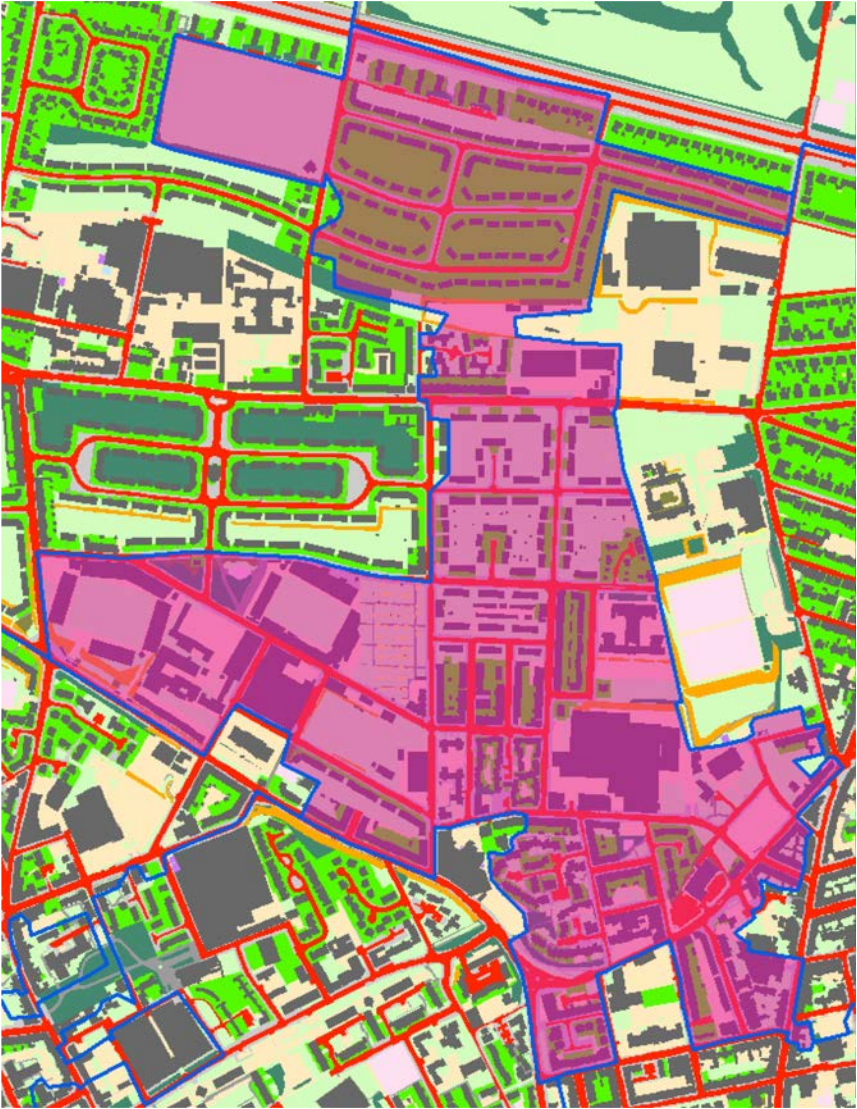
GreenHealth: relationships between green space and health and wellbeing for residents of deprived urban areas

A study for the Scottish Government



Catharine Ward Thompson, Jenny Roe, Lynette Robertson, Peter Aspinall, Mark Brewer, Betty Duff, Richard Mitchell, Angela Clow, David Miller:
Universities of Edinburgh, Heriot-Watt, Glasgow & Westminster; James Hutton Institute & Biomathematics & Statistics Scotland.

Green space measured using Census Wards - includes parks, woodlands, scrub and other natural environments, but not private gardens



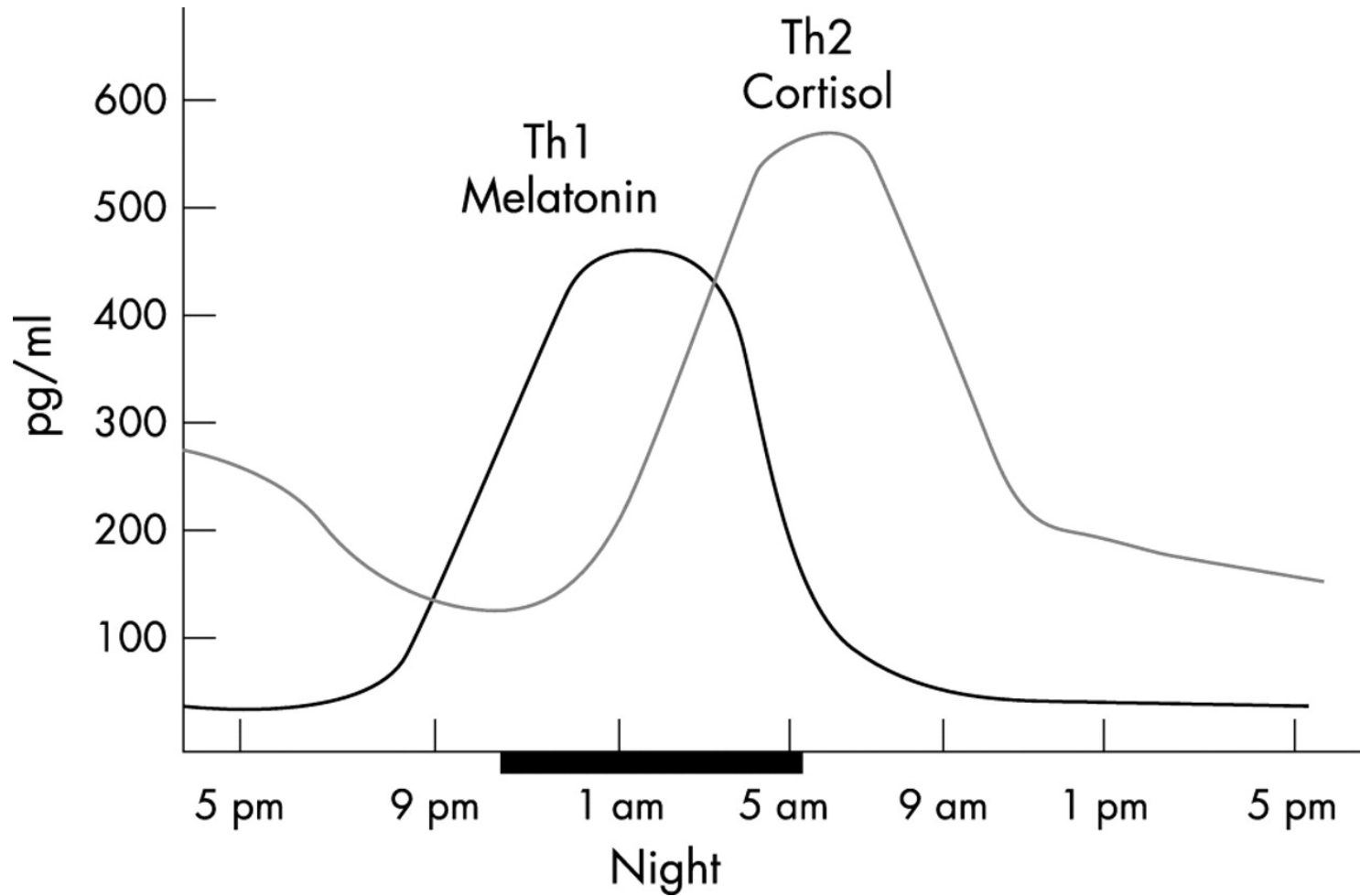
Low green space



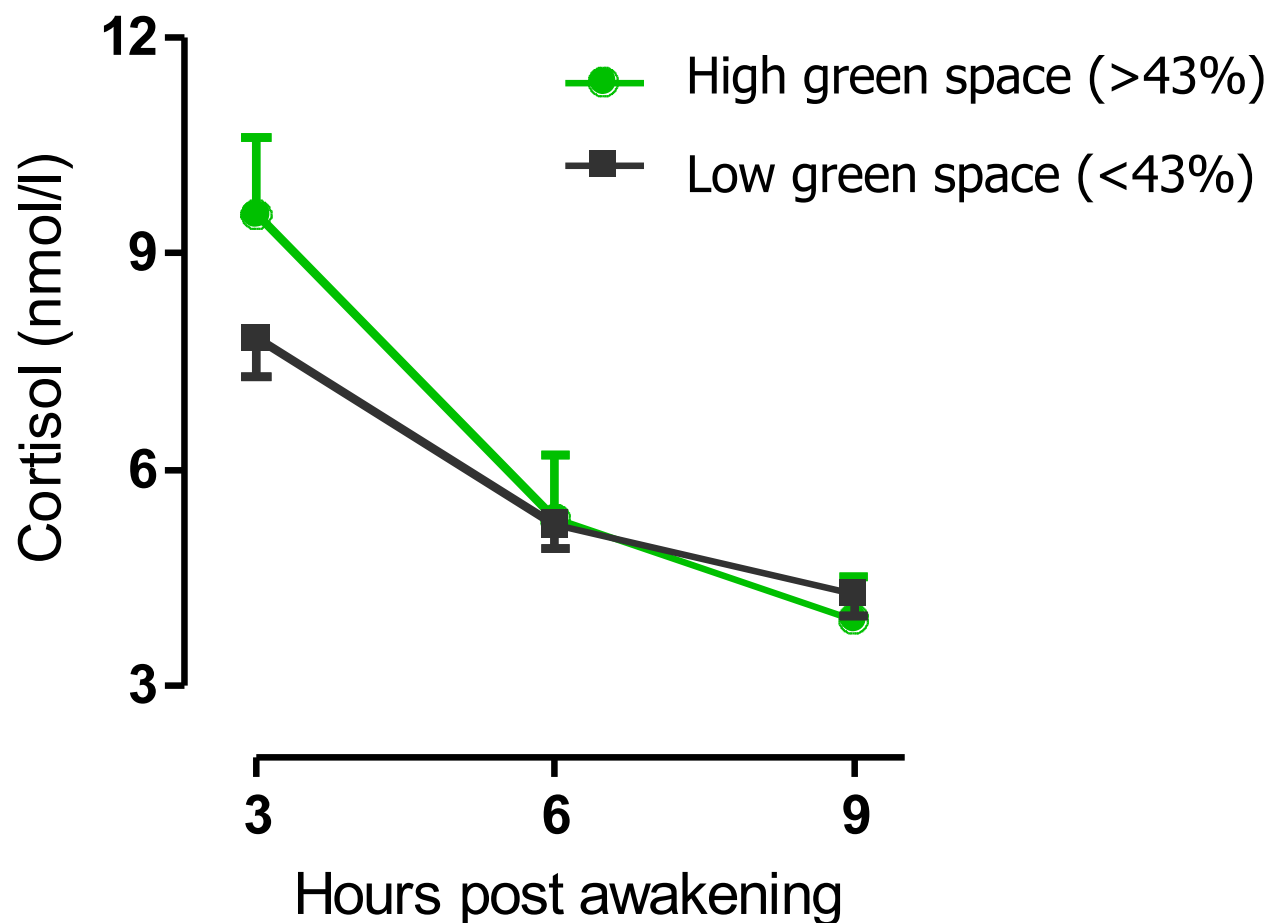
High green space



Circadian rhythms



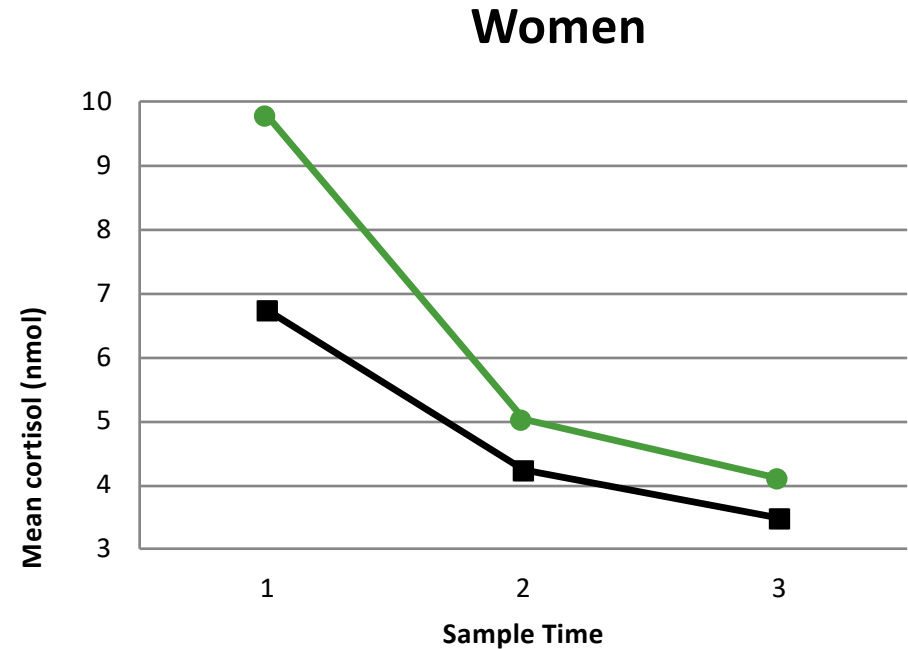
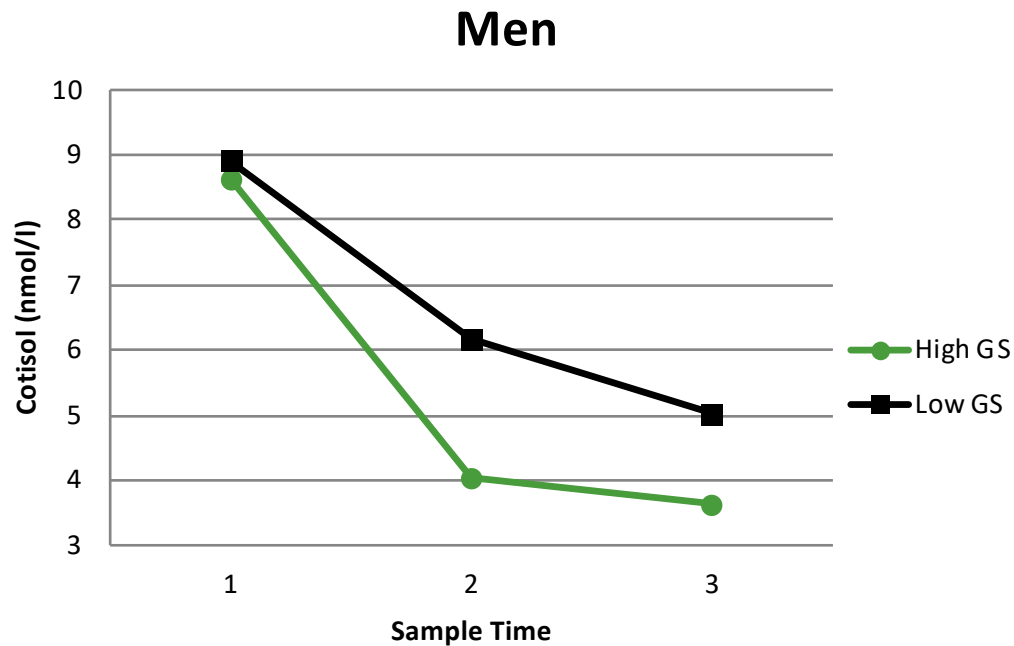
Relationship of cortisol slope to % green space (n=88)



Ward Thompson, C. Roe, J., Aspinall, P., Mitchell, R., Clow, A. & Miller, D. 2012. More green space is linked to less stress in deprived communities: Evidence from salivary cortisol patterns. *Landscape and Urban Planning* 105, pp. 221–229

Roe, J.J., Ward Thompson, C., Aspinall, P.A., Brewer, M.J., Duff, E.I., Miller, D., Mitchell, R., Clow, A. Green Space and Stress: Evidence from Cortisol Measures in Deprived Urban Communities. *Int. J. Environ. Res. Public Health* 2013, 10, 4086-4103

Differences between men's and women's cortisol slope in relation to % green space



Men and women have similar patterns and levels of cortisol in high green space (green line) *but* different in low green space (black line): men are classically stressed, females show longer term exhaustion or stress disorders.

Results from a larger household questionnaire and more detailed green space measures (n=407)



Green space and social wellbeing

Higher levels of green space in the neighbourhood were linked with a sense of place belonging, and both predicted lower stress



Ward Thompson et al., 2016, Mitigating stress and supporting health in deprived urban communities: the importance of green space and the social environment. *International Journal of Environmental Research and Public Health* 13(4): 440

Green space and gardening

Access to a garden or allotment also predicted lower stress and was linked with place belonging and social connectedness



Ward Thompson et al., 2016, Mitigating stress and supporting health in deprived urban communities: the importance of green space and the social environment. *International Journal of Environmental Research and Public Health* 13(4): 440

What might encourage us to get out more?

In a study across Britain, older people (aged 65+) living in an environment that makes it easy and enjoyable to go outdoors were more likely to be **physically active, healthier and more satisfied with life.**

Sugiyama et al. 2009. Associations between neighborhood open space attributes and quality of life for older people in Britain. *Env & Behavior*, 41, 3-21

Ward Thompson, C. & Aspinall, P. 2011. Natural environments and their impact on activity, health and quality of life. *Applied Psychology: Health and Well-Being*, 3 (3), 230–260



Understanding use of woods near urban areas in deprived communities:

“You can just go away by yourself. You can just disappear and nobody can see you...you can’t do that in the city, you can’t just keep walking, walking, walking”

“I find it’s quiet, it gets you away from everyday life. You just go away and be in a world of your own sometimes... if you’re angry at anything, just go away and get yourself all calmed down.”

Unemployed men and women from urban areas in Central Scotland



Open Space and Social Inclusion: Local Woodland Use in Central Scotland, Edinburgh: Forestry Commission, 2004

What did you do when you were small?

“Collected conkers, look for fishing in the river; there’s hardly any fish there now”

Teenager

“I was always in Greenfield when I was a wee lassie, climbing the trees”

Teenager

“We used to cook just at this little dip, and we used to play in it (Water of Leith) ...and we used to swim...it was very wild.”

Adult

Central Scotland

Experiential learning in childhood

In addition to being important for *healthy physical, mental, cognitive, emotional and social development*, **childhood play in natural settings** appears to have a long-term and positive effect on attitudes, well-being and behaviour

“Vivendo discimus” –

“by living, we learn”

Patrick Geddes, c.1904



Evaluating a government pilot study on children, looking at:

- obesity;
- unintentional injuries;
- asthma;
- mental health and wellbeing.

Good Places Better Health for Scotland's Children

Prepared by the Evaluation Group
of Good Places Better Health



4.0 OUR VISION

A Scotland where

Homes are warm and dry with **good quality space** for children to play indoors and **outdoors**

Children play, explore and relax **outdoors in streets, parks, green places, open spaces** and **have contact with nature** in their everyday lives

The presence of children outdoors is welcomed, supported and valued by parents and the wider community

Neighbourhoods are well maintained, safe, appealing, support healthy food choices and have a strong sense of community



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How does design encourage or deter new users?



Southwell, K., Roe, J.J. and Ward Thompson, C., OPENspace Research Centre. 2013. *Enhancing the Woodland User Experience: a toolkit for assessing Woods In and Around Towns*. Edinburgh: Forestry Commission Scotland.

How does design encourage or deter new users?



Southwell, K., Roe, J.J. and Ward Thompson, C., OPENspace Research Centre. 2013. *Enhancing the Woodland User Experience: a toolkit for assessing Woods In and Around Towns*. Edinburgh: Forestry Commission Scotland.

Our latest research project with older people

Mobility, Mood and Place (MMP) has explored how places can be designed collaboratively to make mobility easy, enjoyable and meaningful for older people.



Mobility, Mood and Place is funded by Lifelong Health and Wellbeing, a cross-council initiative addressing the challenges and opportunities of an ageing population.



THE UNIVERSITY of York

Co-created Environments



To envision places, from homes to public spaces, which are inclusive, that are truly enabling and inspirational for older people, we must include older people in the design process.

Castlefield, Manchester



Image: Pennine Waterways

Remote rural Scotland



Image: Lisa Johnson

Hackney Wick, London



Edinburgh and the Lothians



Image: Historic Scotland



Co-design work with older participants and students: Orkney



Alice Mears

Unit 3: Mobility, Mood and Place
Iain Scott, Derek Fraser and Elinor Scarth
AD:Tectonics, ESALA, 2015 -16

Qualities that really matter to our participants:
access for all
access to nature
access to others
access to light



Image by Masters students Rosanne Knight, Stephanie Sharpe and Jonathan Phillips

Brookfield, K. et al. 2015. The home as enabler of active lifestyles among older people, *Building Res & Inf.* 43(5): 616-630

THE A-Z OF CO-DESIGN

A brief introduction to participatory design

ANIMATE

Facilitators are critical to participatory design. They plan, structure, guide and encourage, creating opportunities for users to become engaged design decision-makers. Importantly, a facilitator's behaviour can consciously or otherwise, inform a participant's ability to engage. Lusk (2007) has highlighted the significance of a facilitator's spoken behaviour, including the user engagement is supported by clear expectations, unambiguous terminology, asking general questions that relate to users' experiences, as familiar conventional tone, a more conversational style, humour and, importantly, attending and responding to users' feedback to co-designing process.

Further reading: Lusk, R. (2007). Learning to be a user in participatory design practice. *Design Studies*, 28(1), 27-40.

ENGAGE

An inclusive society is one with ample opportunities for many different kinds of people to engage in important public decisions. There are many different ways in which participation can be facilitated. Needs that a public agency, Sherry, attempts to address through the concept of a citizen participant. The leader consisted of eight 'rungs', each relating to a different form of participation, with the degree of citizen control over decisions increasing the higher up the ladder you went. Although encountering criticism over the decades, Arnstein's model has continued to foster heated conversations about who gets to engage, in what ways, with whom, to what end, and at what stage in the decision-making process. These conversations should inform facilitators' decisions on the kind of engagement techniques to employ in a participatory design project.

Further reading: Arnstein, S. (1969). A ladder of citizen participation. *Journal of the American Institute of Planners*, 35(2), 216-221.

INCLUDE

Participatory design processes should be accessible to all users. To move beyond the usual suspect, it's vital to use strategies that are inclusive of individuals or groups who may be marginalised, such as low-income or underrepresented ethnic populations. In the literature, you'll often find about the effective communication opportunities to participate, taking into account the needs of people with different abilities and the opportunities to connect across cultural networks. For example, ICT can help, but don't assume that everyone has access to the internet. The structure, design and location of co-design activities should take into account specific delivery needs and resources (time, space, staff) and their varied patterns of daily life. Importantly, securing the involvement of a range of users is not the same as meeting the involvement of representative of users. Indeed, the latter may not be an appropriate or possible goal in participatory design, since the number of participants tends to be relatively small.

Further reading: Povey, R. (2009). *Participatory Design: A Guide to Inclusive and Collaborative Design*. London: Routledge.

MAP

Community mapping entails the production of a spatial map in collaboration with members of a community, often through reference to local knowledge and resources (Pembaid et al., 2006). Taking into account diverse information, community maps may be constructed using multiple tools and techniques, from simple paper and pens, through touch screens, to online mapping or GIS (Geographic Information Systems). The process can be time-consuming and therefore costly (Parker, 2006). The process of creating and negotiating the map content is often as important as the finished product. It may reveal how groups interpret, value and relate to a place, but also highlight locations of conflict or tension. Although potentially positive and empowering, community maps can sometimes be hijacked to affirm / reaffirm the position of powerful interests or to exclude certain groups (Pembaid et al., 2006).

Further reading: Pembaid, J. and Chelley, S. (2014). *A Guide to using community mapping and participatory GIS*. Available at: http://www.participatorydesign.com/wordpress/wp-content/uploads/2014/05/Community_Mapping_Guide.pdf

QUANTITY

Participatory design can produce huge amounts of information of variable types and quality. Preparing, organising, sifting through and interpreting large quantities of information can be complicated, often intensive and time-consuming (Pope et al., 2006), so it can be secure, though. This should be kept in mind when developing an appropriate information management plan before any design activities begin. Developing a clear set of questions to 'ask' of the collected information can help guide and streamline the review and analysis process.

Further reading: Pope, C., Dobson, C. and Hinton, N. (2003). *Analysing qualitative data*. London: Sage, 114-118.

UTILISE

Many different techniques, tools and materials can be utilised within, and to facilitate, participatory design. The rapid expansion in small, portable electronic devices, such as smartphones, and the introduction of computers into many of the commonplace devices we own and use (Sherry, 2010), creates new and convenient instruments for participatory design. Individuals can, for example, use the camera function on their mobile phones to create a visual record of their community's assets and needs (see Professional) or use the GPS function on their smartphones to identify an area most and least frequently used areas of greenspace (see Maps). This information can help build the location of often marginalised groups, such as older adults, who may be less likely to own or use smartphones, social media etc.

Further reading: Sherry, S. (2011). *Participatory research: introducing new user voice experiences to user-centred design*. *Design Management Journal*, 20(1), 20-27.

YES

Multiple international, national and local organisations have said 'yes' to the practice of involving users in decision-making. Since the 1992 Rio Declaration which, through Principle 10, called for the 'participation of all concerned citizens' in addressing environmental issues, a fundamental interest in participation has grown hugely (see Arnstein, 2006). In the UK, the Government recently introduced a raft of 'community rights' intended to provide new opportunities for citizens to actively design and deliver public services and, for many years, the National Health Service and social care providers have sought to involve users in service development (Cockwin and Singh, 2007).

Further reading: Local Government Improvement and Development (2015). *Empowering community engagement and service delivery: pointers to good practice*. London: Local Government Improvement and Development.

BUILD

Model-making is a creative, visual method of communication. Compared to verbal methods, such as interviews and focus groups, it may help co-design participants present their ideas more directly with less interference from the co-design facilitator (Buckingham, 2010). Physical models can allow the complex or ambiguous to be made simple and straightforward, 'holding' ideas (Design Council and Technology Strategy Board, 2015). The technique works best when facilitators understand some training in model-making whilst the choice of materials is also crucial. All participants need to work safely, quickly and effectively. Good models include platforms and building blocks.

Further reading: Gibson, A. and Cole, D. (2014). *Model-making: creative, visual communication*. London: Routledge.

FEEDBACK AND FEEDFORWARD

Feedback is typically the stage in the design process where outcomes inform members to earlier stages. Benefiting from the inclusion of people with different points of view and varying levels of expertise, co-design involves continuous appraisal of the topic, and information of the task domains. Feedback is less likely, but less efficient, than feedforward, which involves an assessment of what has been produced so far, with guidance on how to make it better. It's a formative type of feedback that occurs early on and throughout the process. Both feedback and feedforward are essential in participatory design.

Further reading: Povey, R. (2012). *Feedback, feedforward and control*. *Inter-organizational Research in the Service Industry Research*, 20(5), 465-477.

JUST

It's important that all kinds of stakeholders have real opportunities to discuss and influence the processes through which their living environments are modified. Participatory environmental decision-making also matters because the outcomes of such decisions are more likely to be socially just if there is a healthy diversity of perspectives represented. Co-designed public spaces are more likely to be socially inclusive and to foster social mixing by meeting the needs and preferences of multiple kinds of users, for example.

Further reading: Rowley, R. (2015). *Social Justice and user participation*. *International Planning Research and Practice*, 12(1), 1-10.

NETWORK

'Tapping into existing networks and groups can be a time-saving way to identify and involve users in participatory design activities (Brookfield et al., 2015). To help identify relevant groups and networks, it's useful to access the many available online directories of community groups, charities, professional organisations and businesses. It's important to remember, though, that by focusing on established structures and organisations, it's easy to miss people who tend not to participate, and groups which aren't 'under the radar'. Research has found that 'community groups in England would, for example, some 55 such groups/activities exist in 11 different areas (Baker, 2009). Large numbers of 'invisible' users can lead to a 'snowed-out' set of people with little to engage which, in turn, may result in 'biased' outputs.

Further reading: Baker, H., Povey, R., Cole, A., and Povey, M. (2010). *Revealing 'invisible' networks: a comparison of three user and effectiveness of networks*. *International Planning Research and Practice*, 7(1), 1-10.

REPEAT

Repetition is critical for improving participatory design processes and protocols. Learning-by-doing can lead to big improvements in practice in a short space of time (Lusk, 2007). Matters such as the duration of any participatory activity, plus its content, location, site and the necessary number of facilitators, can all be honed through repetition. Repeating the same activity with different users is likely, however, to produce different outcomes. Users are different and will participate differently.

Further reading: Brown, A. (2015). *Social research methods*. Oxford: Oxford University Press.

VALUE

Playing and learning tend to be 'instrumentalised', that is, treated as a means to something else. But participatory design offers an enjoyable, interesting, and meaningful activity in itself, not just as a prelude to action, and it's important to appreciate its intrinsic value. This is not to suggest that we shouldn't also care about the instrumental effectiveness of participatory design. If design processes are enjoyable and interestingly challenging in their own right, it is likely to produce useful and persistent outcomes (e.g. plans, products). Conversely, participants are more likely to remember the co-design process as a valuable one if they can see the influence that their discussions have had over real-world form and longer term actions, policies, and outcomes.

Further reading: Sherry, S. and Povey, R. (2008). *Active participation: deeper involvement, commitment and the quality of the design*. *International Planning Research*, 15(2), 255-274.

ZEITGEIST

Involving users in the design process may seem like a contemporary concern but the practice has a long history (Povey and Sherry, 2008). Key to its early development in the 1970s were Scandinavian workplace democracy projects which used methods to engage and develop the work practices of workers. These projects, and the user and participatory design were concerned with designing information systems that would meet the needs of users and the design and development of workplace systems. These projects, and the user and participatory design were concerned with designing information systems that would meet the needs of users and the design and development of workplace systems. These projects, and the user and participatory design were concerned with designing information systems that would meet the needs of users and the design and development of workplace systems.

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CHOOSE

Users should be able to choose how they wish to participate in a co-design exercise from a range of options set out by the facilitator (Cruickshank et al., 2015). Diverse participation techniques will, of course, produce diverse data / outputs which can be summarised and combined to formulate ideas in many ways (Dixon-Woods et al., 2006). Involving the selection, recording, and ordering of information, and the use of words and text, narrative summaries (NS) or narrative summaries. It's a less formal method of bringing data / outputs together and is useful for combining particularly varied data. Its form can vary from a simple descriptive list of the data, to a more interpretive account that incorporates commentary (Pope et al., 2007).

Further reading: Pope, C., Allen, N. and Povey, J. (2007). *Summarising qualitative data: a review of methods*. *International Planning Research*, 14(2), 167-181.

GIS

A Geographic Information System (GIS) is a tool used to store, analyse and visualise spatial information so as to determine patterns and relationships that can inform decision-making (Sutton et al., 2007). Spatial data for GIS is commonly collected from historical paper maps and satellites, and combined with measurements collected from questionnaires and sensors. The power of using a GIS is that it combines multiple layers of spatial and temporally indexed information to build a rich picture of the environment and deepen our understanding of geographically determined phenomena, e.g. health, to which access to the method, a form of participatory GIS (PGIS) has been developed which is 'horizontal' and issue-oriented rather than technology-led and not intended to emphasise community involvement in the production and use of geographical information (Dunn, 2007, p.614).

Further reading: Dunn, C. (2007). *Participatory GIS: a decade on*. *Progress in Human Geography*, 31(5), 619-627.

KEN

Ken is a Scottish word meaning 'to know'. Participatory design is premised on the notion that users hold different knowledge and experiences and better outcomes result when these are integrated into the decision-making process. Users can also hold different values and, since values capture the ideas and qualities that people deem particularly important, decisions that connect to users' values may be more successful than those which do not (Povey et al., 2006, 2015). Users' values should be considered a positive resource in the design process. They tend to emerge as participants discuss, design, test, and evaluate ideas. Representing values in involving design can lead to reflection and, potentially, value development and/or change. This can support the generation of novel and creative ideas (Povey et al., 2006).

Further reading: Povey, R., Hinton, N., Hinton, E., Singh, M., Allen, C. and Povey, R. (2006). *The value of values: representing values in involving design*. *Design Studies*, 27(4), 277-293.

ONE-TO-ONE

Participatory design activities may involve one-to-one engagement with users and / or engagement in small and large groups. Within groups, the group composition and dynamics inform what, how, issues and experiences are discussed. Group settings can, for example, encourage users to build on one others ideas (Povey and Casey, 2008), potentially leading to novel suggestions, but, less positively, may or perceived peer pressure, power dynamics, dominant individuals and familiarity with other participants might act to limit participants' contributions (Baker, 2007). Engaging on a one-to-one basis allows you to explore individual' feelings, views and experiences that stem from the influence of group effects, both positive and negative.

Further reading: Brown, A. (2015). *Social research methods*. Oxford: Oxford University Press.

SURVEY

Relevant information collected on, and from, people and environments is useful for informing design decisions. In terms of environments, items like architectural style and quality, building forms, land use, pedestrian, road etc., building condition, noise, light and air (e.g. footfall) can all be surveyed. In terms of people, behaviours, preferences, attitudes, views and experiences can be surveyed. How, when, where and what to survey are key issues requiring careful consideration.

Further reading: Day, J. (2008). *Design by Design*. New York: W.W. Norton & Company.

WALK

Walking interviews, or 'go-alongs', are conducted on the move and combine participant observation with interviewing (Capra, 2006). They allow for richer accounts of participants of the environment (Buckingham, 2010) and, by involving the researcher in the participant's 'place', support a deeper understanding of "participants' subjective experience of the built environment" (Povey and Sherry, 2008). Walking interviews can help provide more meaningful insights into environmental settings than static interviews completed in more traditional settings.

Further reading: Capra, R. (2006). *Walking with users: the value of walking interviews as a new method for studying the experience of place for health and well-being*. *Health & Place*, 12(1), 267-272.

EXPERIENCE

The nature and quality of users' experiences within a participatory design process will inform the type of participation, activities and when relevant, user ongoing engagement with the process. Factors which may help enhance the experience for users, and maintain their participation, include a welcoming, open, inclusive and supportive setting, arrangements, on-site chat-cams, a convenient time, comparison of experiences, help with transport, the provision of incentives (e.g. a retail voucher), opportunities to provide information in private, designers communicating their appreciation for their participation, assurance of anonymity and confidentiality, and maintaining contact with users outside scheduled events (Dunaway et al., 2015).

Further reading: Hinton, A., Cole, A., O'Keefe, A. and Povey, R. (2008). *Active participation: deeper involvement, commitment and the quality of the design*. *International Planning Research*, 15(2), 255-274.

DRAW

Drawing can be a useful way of investigating ideas quickly, as well as an effective mechanism for accessing a participant's understanding of their world (Povey and Hale, 2012). Popular drawing types include mapping, diagramming and sketching. Activities involving drawing require good drawing instruments and paper. Bear in mind individuals' differing abilities and interests when deciding whether drawing is appropriate in co-design. For example, drawing activities might be more successful if people are usually, or opposed to, verbally oriented. And it's important to remember that the various reasons from visual impairments to lack of confidence in one's abilities may be less willing or able to participate in drawing activity.

Further reading: Alcorn, K. (1986). *Using visualisation techniques for enhancing participatory planning and design processes*. *International Planning Research and Practice*, 3(1), 33-42.

HARMONY

Because participatory design processes typically incorporate a plurality of views, conflicts and compromises, rather than harmony and consensus, are pretty much inevitable (see Arnstein, 2006). But certain types of conflict can be a valuable resource in design and should be supported (Empoy, 2008). Whereas 'hard' conflict can lead to hostility, dismissal and questions of equality (Arnstein et al., 1999), 'good' conflict can lead to the identification of new possibilities, innovation and the questioning of assumptions, resulting in better quality, more robust decisions (Empoy, 2008). In group settings, 'bad' conflict tends to result in performance decrements, while 'good' conflict relates to substantive, issue-related conflict (Johnson and Johnson, 1996). Facilitators are critical in managing conflict. To encourage the 'good' conflict and to ensure they should be used positively, opportunities in such a way that others don't feel attacked (Arnstein et al., 1999).

Further reading: Johnson, D. E., Johnson, K. W. and Johnson, K. W. (2011). *Working together: making teams work*. London: Cengage Learning.

LOCATE

Participatory design must be spatially located, observing users' particular cultural and social norms and values, which may differ from those of the facilitator. When selecting settings for participatory activities, users' choice can inform who decides or is able to take part, and the type of participation achieved (Baker, 2007). Researchers have found, for example, that when engaging school children in group discussions, the format of the discussion varied according to the formality of the discussion setting (Green and Hart, 1999).

Further reading: Green, J. and Hart, G. (1999). *The benefit of context on data in user-centred design*. London: Springer.

PHOTOVOICE

Photovoice is a community-based participatory research method valued for uncovering key, first-person, descriptive information (Carter and Minkov, 2010). Suited to participatory design, it involves an understanding users' experiences. It involves community members using photography to record some aspect of their life, such as their needs and needs of their community, or the factors which contribute their lived reality. The method allows often excluded groups, such as people who cannot read or write, to participate (Wang and Burris, 1997). Typically, individuals are provided with cameras and some training in photography. The photographs and their meanings are discussed and critically reflected upon in one-to-one conversations and / or in small and large groups. In some projects, the photographs and the issues they raise are presented to the wider public and/or policymakers through exhibitions, talks etc.

Further reading: Carter, C. and Minkov, M. (2010). *Photovoice: a means of the disabled in health and public health*. *Health Education & Behavior*, 37(1), 40-47.

TRANSFORM

Co-design involves or enables transformation in various domains, including a transformed quality of design, a transformed conception of the user on the part of the design professional, a transformative experience of environment and credibility for the participant, and a transformed way of working. On the latter point, co-design requires the creation of non-hierarchical situations where power is shared from design professionals to participants. Though challenging, this can lead to the generation of new and exciting ideas and design decisions.

Further reading: Lusk, R. (2006). *Design participation: the challenges and new roles for designers in the co-design process*. *Design Studies*, 27(1), 41-50.

EXPERIENCE

The nature and quality of users' experiences within a participatory design process will inform the type of participation, activities and when relevant, user ongoing engagement with the process. Factors which may help enhance the experience for users, and maintain their participation, include a welcoming, open, inclusive and supportive setting, arrangements, on-site chat-cams, a convenient time, comparison of experiences, help with transport, the provision of incentives (e.g. a retail voucher), opportunities to provide information in private, designers communicating their appreciation for their participation, assurance of anonymity and confidentiality, and maintaining contact with users outside scheduled events (Dunaway et al., 2015).

Further reading: Hinton, A., Cole, A., O'Keefe, A. and Povey, R. (2008). *Active participation: deeper involvement, commitment and the quality of the design*. *International Planning Research*, 15(2), 255-274.

Environment and affect: measuring mood



We've been working with older participants to test neural imaging and ethnographic approaches to understanding emotional response to different environments



Urban Green



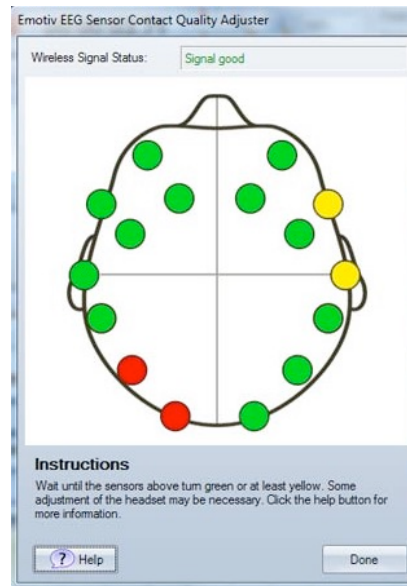
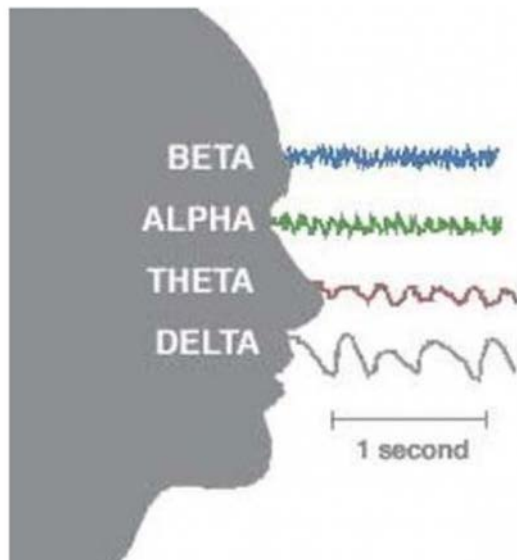
Urban Quiet



Urban Busy

In our study with older participants, do we get different patterns of brain activity response in different environments?

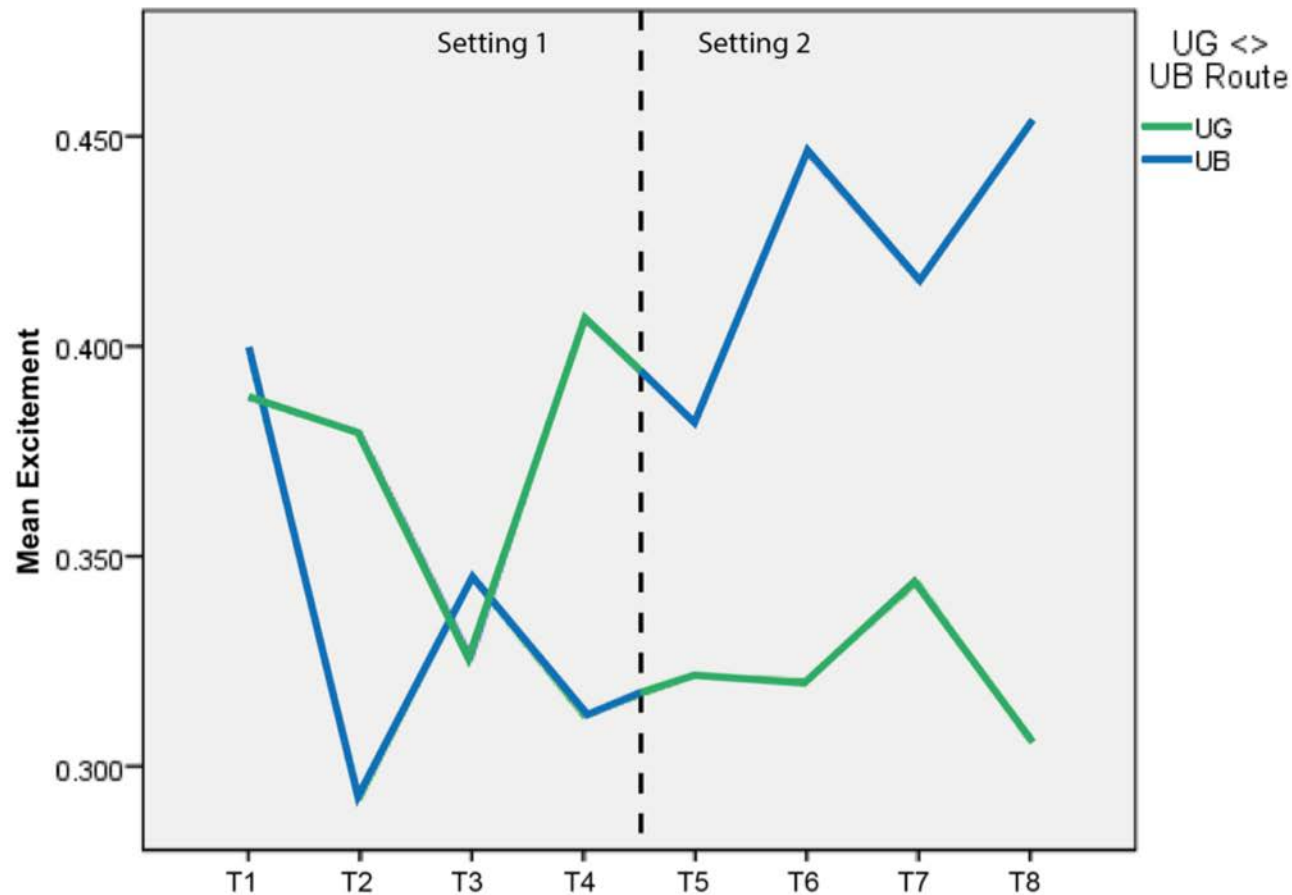
Electroencephalography



Delta	Theta	Alpha	Beta	Gamma
0.5 – 4 Hz	4 – 8 Hz	8 – 13 Hz	13 – 30 Hz	30 + Hz
Deep sleep	Drowsy	Relaxed	Engaged	Cognitive decline
High amplitude	Inhibition	Reflection	Spans calm > stress	Sensory perception (cross-modal)

EEG: poor at spatial resolution in the brain but excellent at temporal resolution: millisecond accuracy

Using Emotiv software to measure 'excitement': transitioning from Urban Busy <> Urban Green



Excitement is higher in UB as hypothesised.

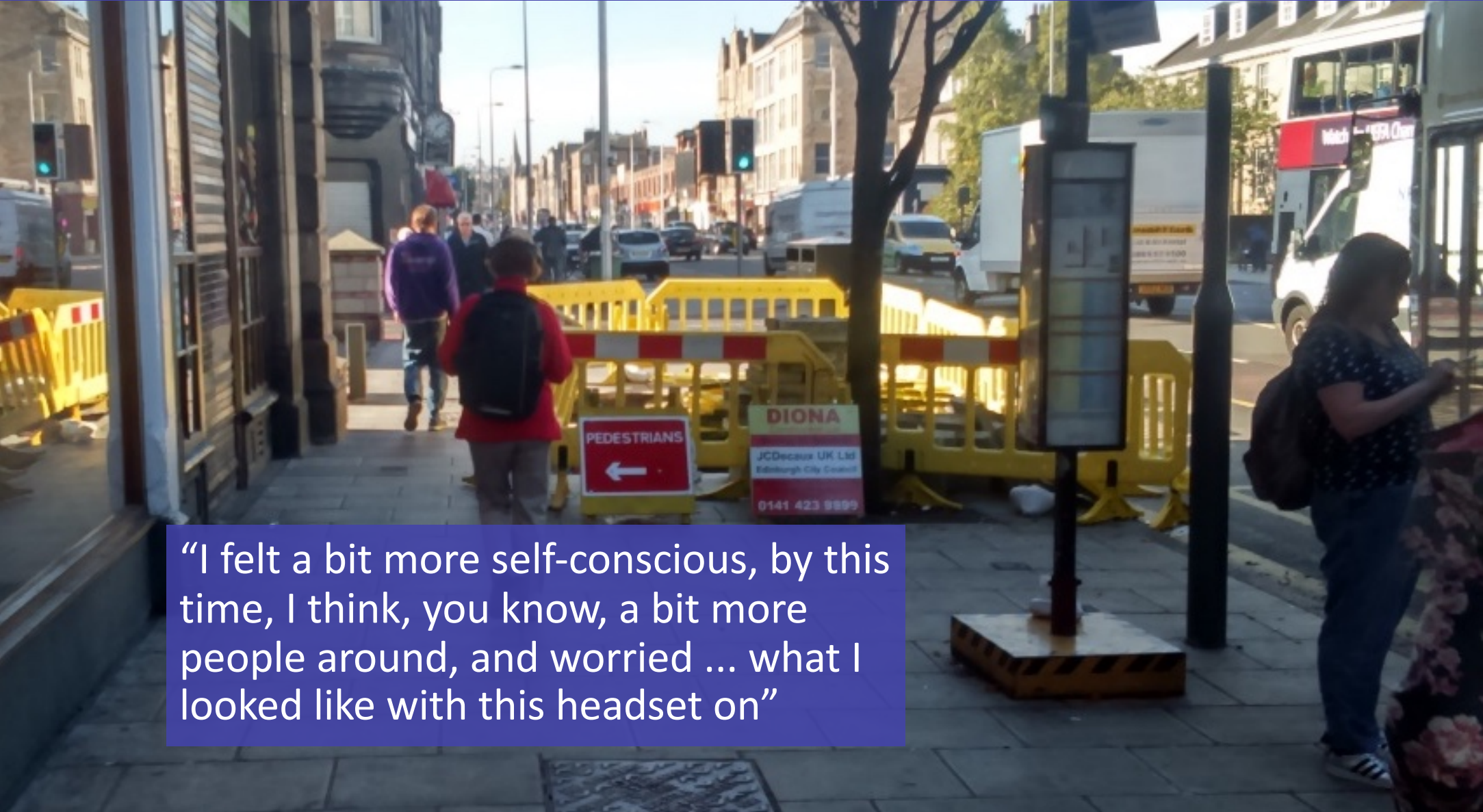
Neale et al., The ageing urban brain: Analysing outdoor physical activity using the Emotiv Affectiv suite in older people. *Journal of Urban Health* <https://doi.org/10.1007/s11524-017-0191-9>

Green – Interview Analysis



“It was quite nice at that point and quite peaceful really because it’s away from the traffic and noises”

Urban Busy – Interview Analysis

A photograph of a busy urban street. In the foreground, a woman with a backpack stands on the sidewalk, looking towards the camera. To her left, a yellow construction barrier with a red and white striped sign is visible. The sign reads "PEDESTRIANS" with a white arrow pointing left. Another sign next to it says "DIONA" and "JCDecaux UK Ltd Edinburgh City Council 0141 423 9899". In the background, there are several cars, a white van, and a red double-decker bus. The street is lined with buildings and trees. The sky is clear and blue.

“I felt a bit more self-conscious, by this time, I think, you know, a bit more people around, and worried ... what I looked like with this headset on”

Ethnographic Results



Colourful nature and wildlife



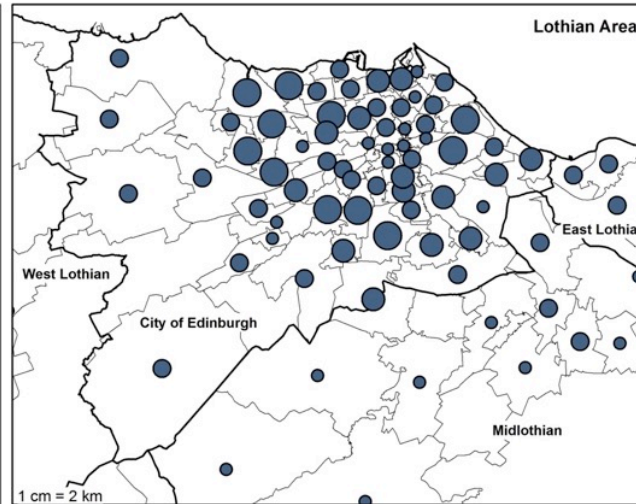
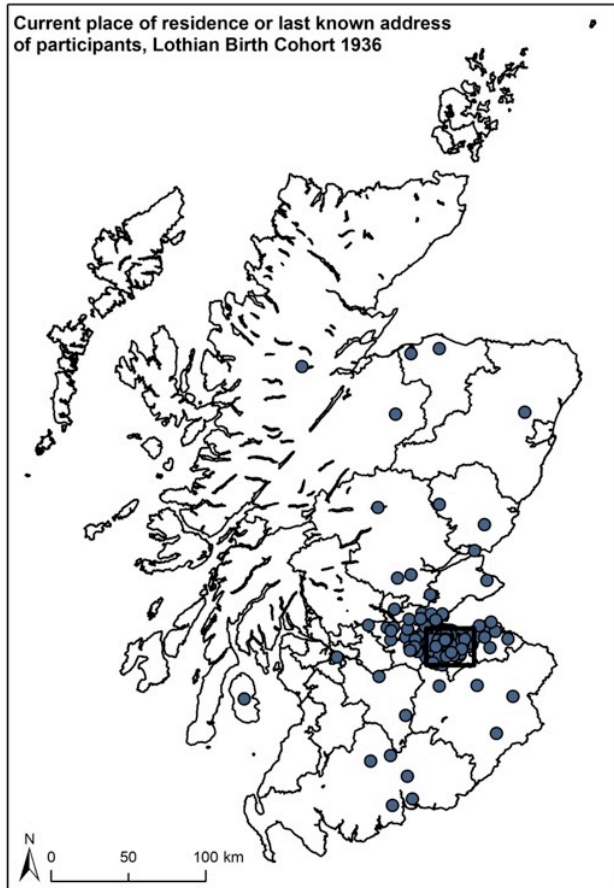
Memories and familiarity



Social contact and interaction

Environmental histories: the influence of place over a lifetime

We have mapped life-course environments for the 1936 Lothian Birth Cohort, using GIS to integrate longitudinal environmental measures with cohort data



Lothian Birth Cohort 1936 (n = 1087*)

Number of participants per postcode area

- 1 - 5
- 6 - 15
- 16 - 25
- 26 - 48

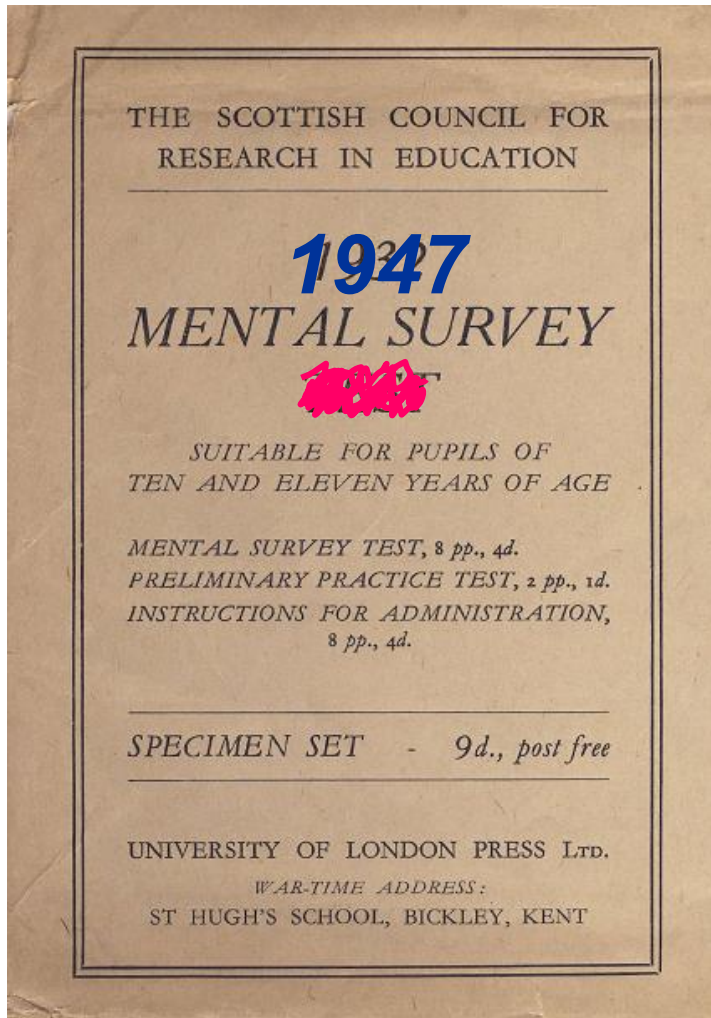
Postcode area

Council area

*Excluding 4 participants living outside Scotland.

Cartography:
Centre for research on environment, society and health (CRESH)
University of Edinburgh 2012

Shapefiles provided by the Boundary Commission for Scotland 2012,
based on data from Ordnance Survey and National Records of Scotland.

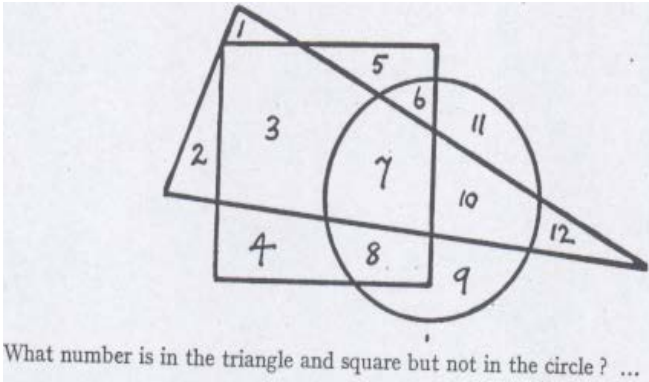


Lothian Birth Cohort 1936

13. John is younger than Jim, and Jim is younger than Bill. Which is the oldest of the three? (John, Jim, Bill)
 (Do not write anything, just underline the right one in the bracket).

In a certain secret writing
 lzqkcofu, fttr yggr means
 STARVING, NEED FOOD

In the same secret writing you find this. Write below it what it means:—
 yoct kgctkl rtqr.



'Life grid' technique – local, global and personal events are used to prompt recollection of past home addresses

Year	Home address	Local/global/personal events	Work
	Write the street name, suburb and town/city of the home where you lived at the start of each decade e.g. 1930, 1940, 1950...	Major events that may help you date home address. Personal events could include the likes of marriage, birth of children, major holidays, death of parents...	Write the title of your job (or your Father's job if appropriate) at the start of each decade
1970 1972 1974 1976 1978	<i>Aylen Lea Cottages Gorgie Road Edinb.</i>	Oil crisis <i>Married</i> Margaret Thatcher becomes prime minister	<i>Self Employed</i> <i>Mobile Fruit Van</i>
1980 1982 1984 1986 1988	<i>Harrison Gardens Stratford Edinb.</i>	Falklands War <i>Father Died</i> Lockerbie bombing, Hillsborough disaster	
1990 1992 1994 1996 1998	<i>Forrester Park Gardens Edinb. EH12</i>	John Major becomes prime minister Diana Princess of Wales dies Scottish Parliament opened	<i>Self Employed</i> <i>Black Taxi Driver</i>
2000 2002 2004 2006 2008		9/11 attacks in New York	
2010 2012 2014		Earthquake and tsunami off coastal Japan	

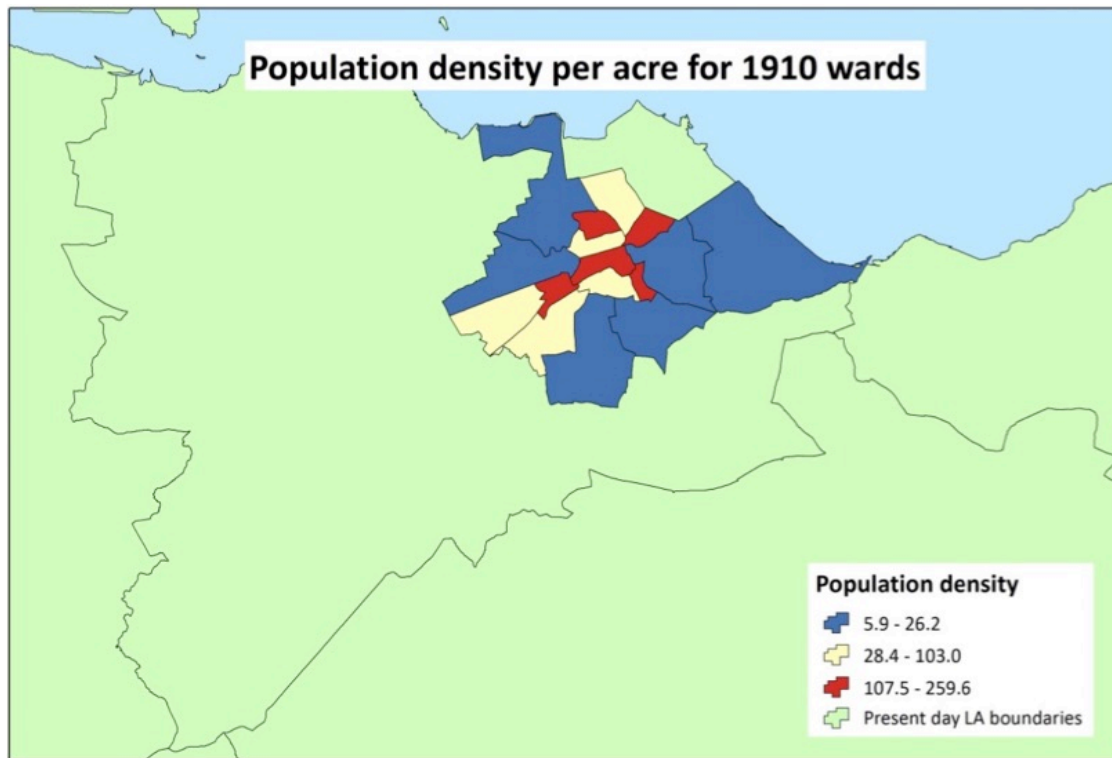


A Civic Survey and Plan for the City
and Royal Burgh of Edinburgh, 1949

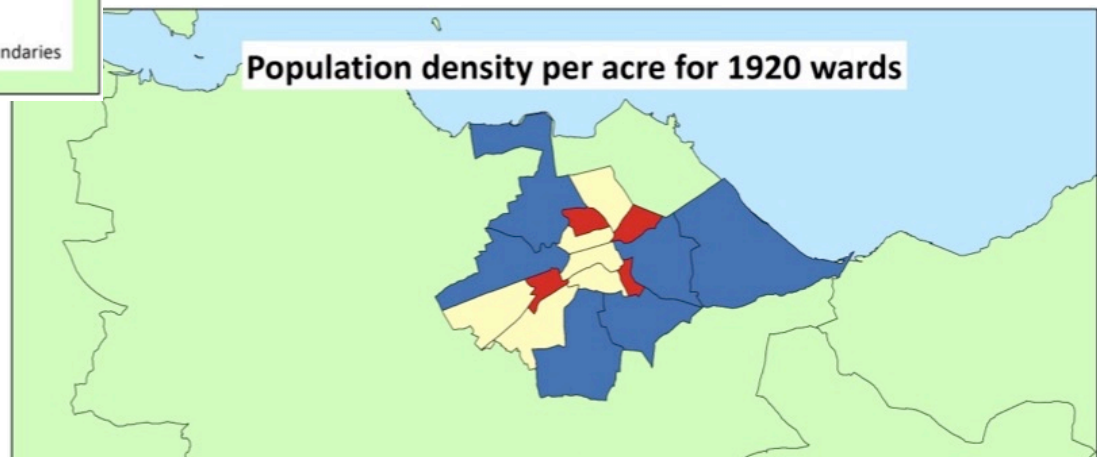


Sanitary Department Annual
Report, Edinburgh City
Archives

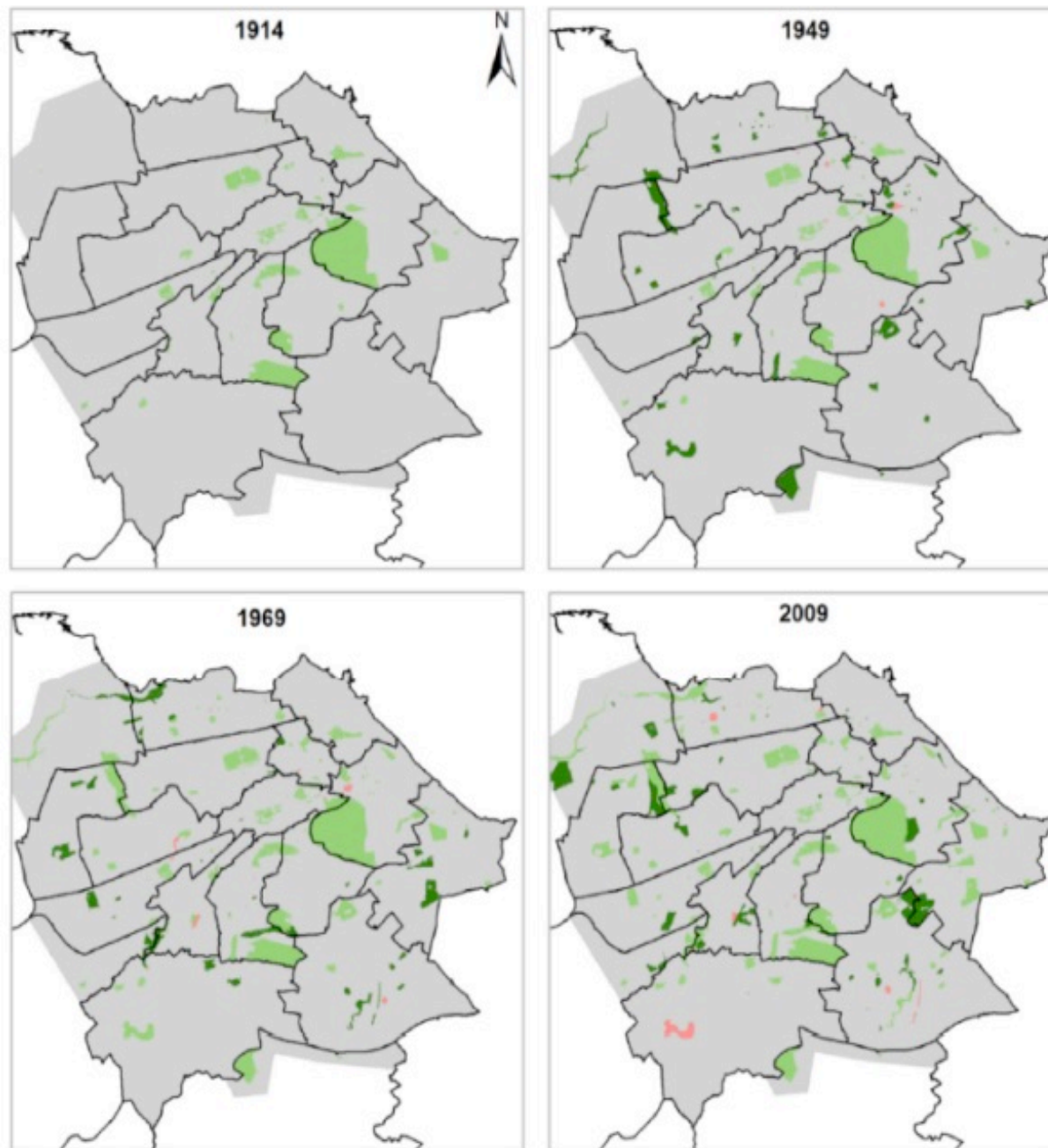
Mapping environmental
characteristics over the
birth cohort lifecourse



Medical Officer of Health reports
 Source: Lothian Health Services Archive



Mapping the public parks in Edinburgh in 1914, 1949, 1969 & 2009



- Public park removed since previous time period
- Public park
- Additional public park since previous time period
- Survey extent
- Ward boundary (2001)

Buffer zones around green space for cohort

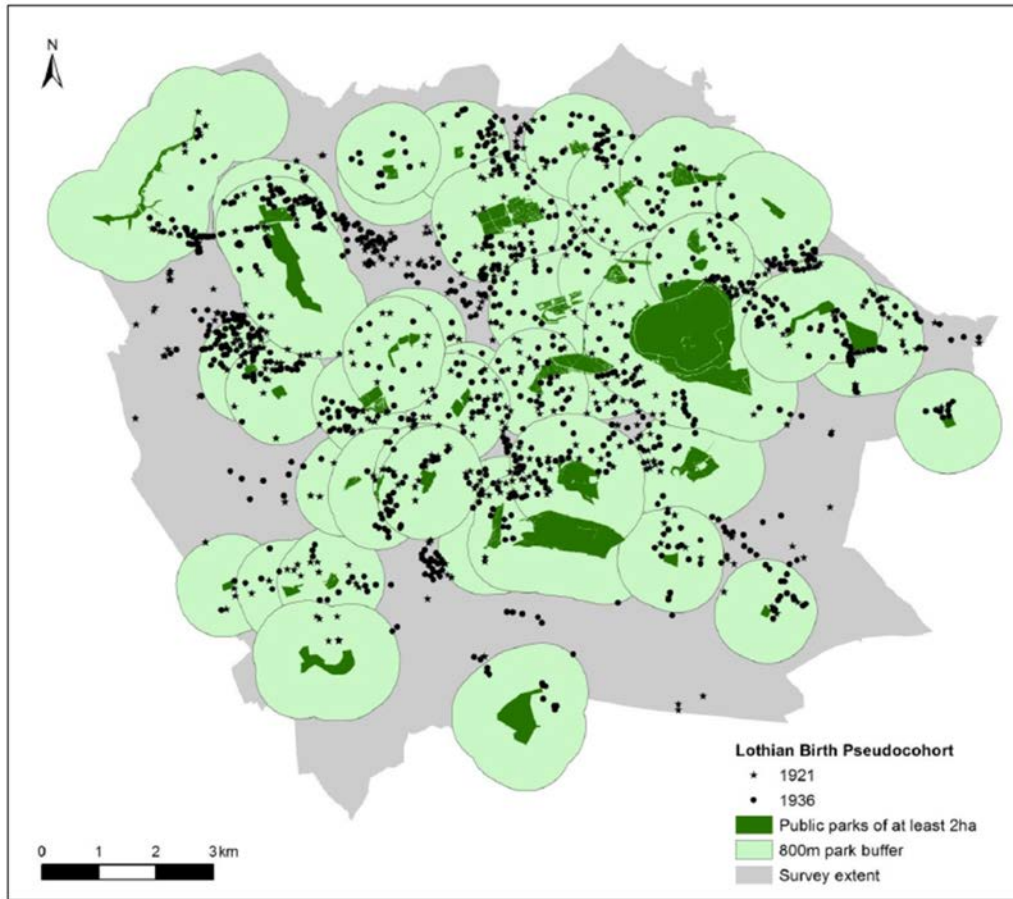
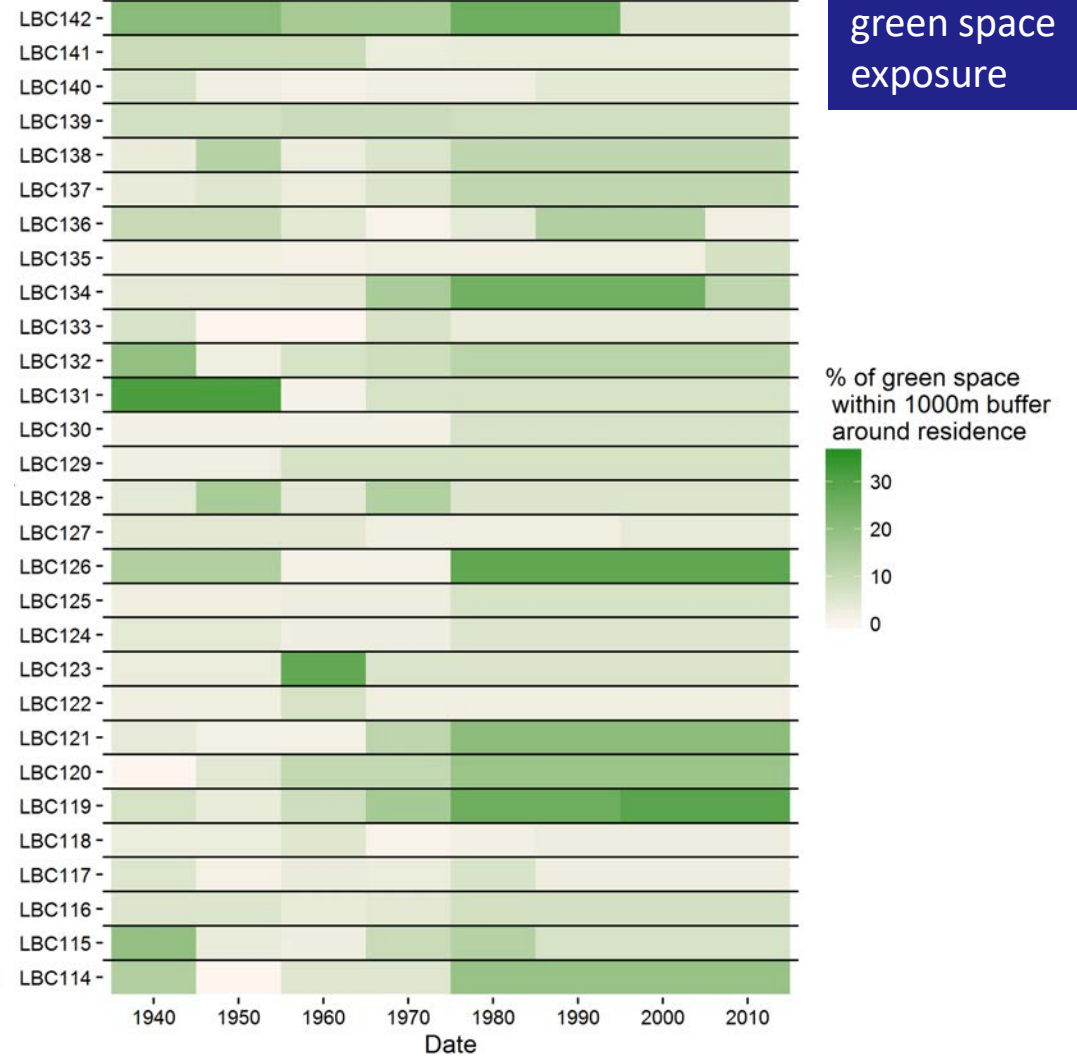


Figure 3. Distribution of the pseudo cohort in relation to public parks in the Edinburgh region in 1949.

Pearce et al., 2016 *IJERPH* 13(3), 331

Green space trajectories of selected LBC participants



Green space & cognitive ageing



No association with change in cognitive test score 11-70

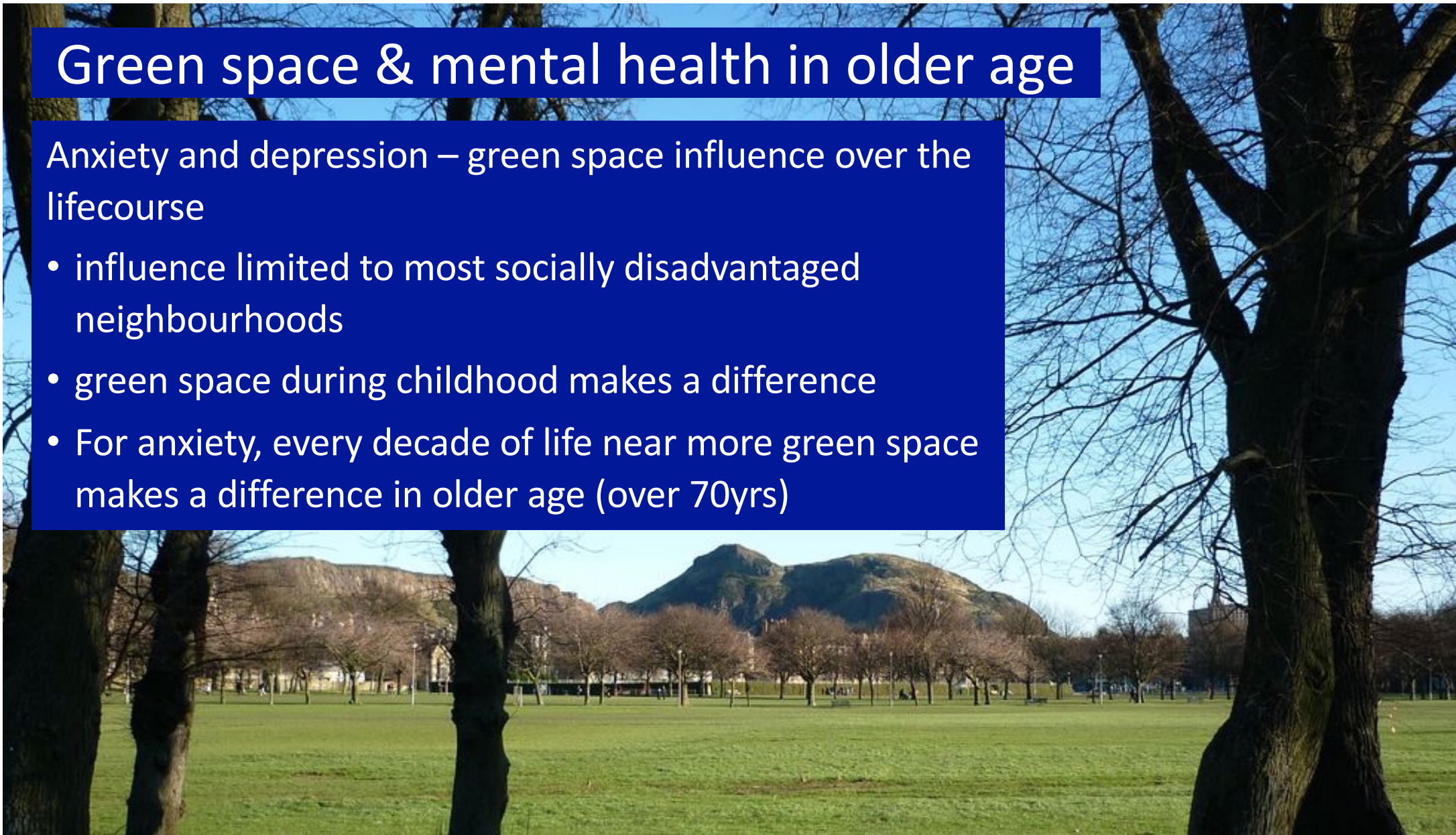
Positive association with change cognitive test score 70-76

- Childhood a particularly sensitive period: affecting cognitive function trajectory in later life
- enhanced by green space in adulthood
- Strongest amongst women, & low SES

Green space & mental health in older age

Anxiety and depression – green space influence over the lifecourse

- influence limited to most socially disadvantaged neighbourhoods
- green space during childhood makes a difference
- For anxiety, every decade of life near more green space makes a difference in older age (over 70yrs)



Pearce, J., Cherrie, M., Shortt, N., Deary, I. & Ward Thompson, C. (2018). Life course of place: a longitudinal study of mental health and place. *Transactions of the Institute of British Geographers* 2018;00:1– 18

What about people with no good childhood experience of nature or green/blue space?



What can we learn from other kinds of longitudinal studies?

Does inclusive design increase woodland use or are additional social interventions needed in deprived communities?



Southwell, K., Roe, J.J. and Ward Thompson, C., OPENspace Research Centre. 2013. *Enhancing the Woodland User Experience: a toolkit for assessing Woods In and Around Towns*. Edinburgh: Forestry Commission Scotland.

What is the impact of urban woodland improvements on deprived communities' mental health?

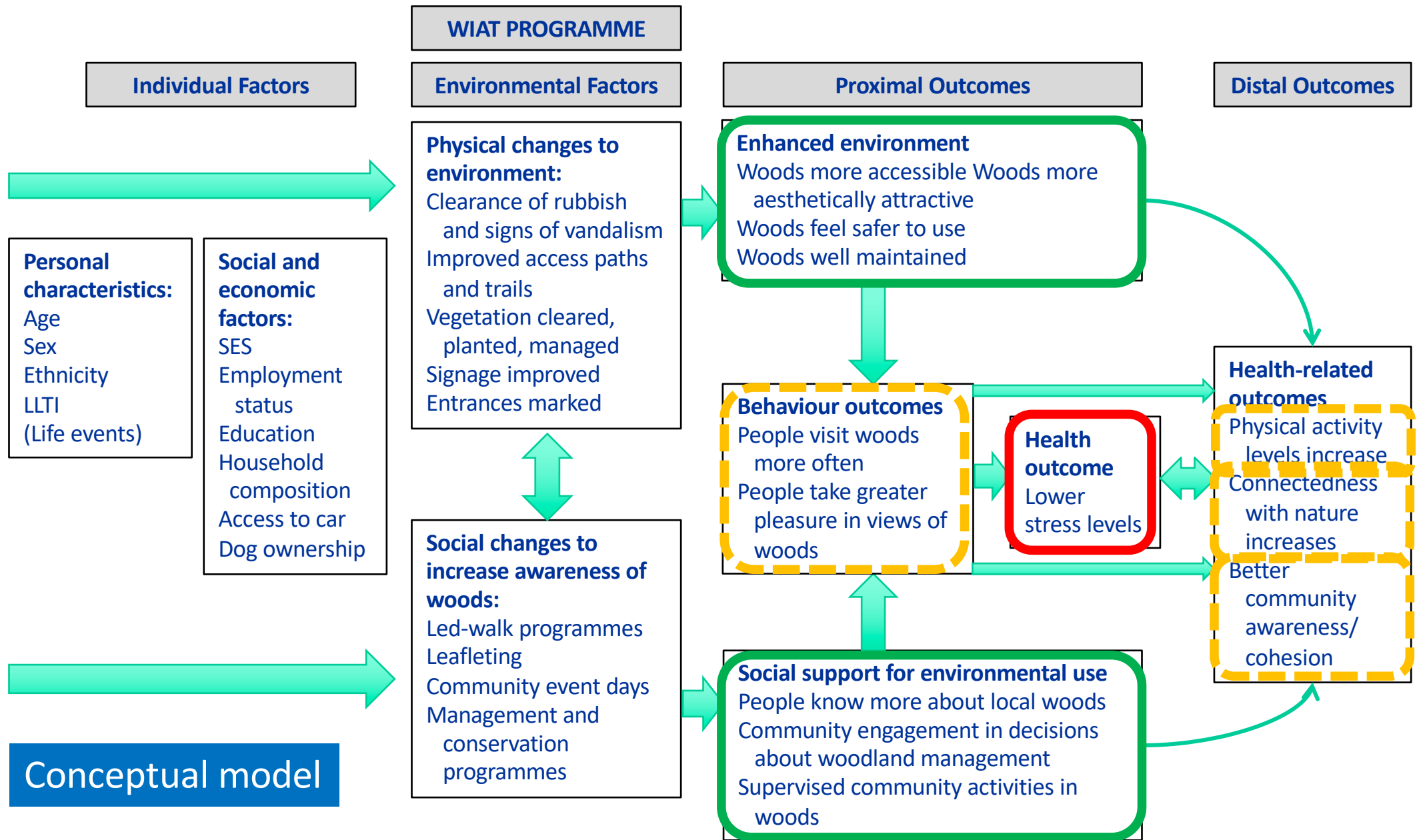
Three woodland intervention sites and three matched 'control' sites

1. Physical woodland improvements (management of vegetation and litter, new paths and surfacing, benches, more attractive entrances, etc.)
2. Increased promotion in the community (led-walks, family fun days, art work)



Catharine Ward Thompson, Richard Mitchell, Jenny Roe, Peter Aspinall, Steven Cummins, Andrew Briggs, Alastair Leyland, Eva Silveirinha de Oliveira, Sara Tilley, Aldo Elizalde, Willings Botha. See Silveirinha de Oliveira et al. 2013.. *BMJ Open* 2013;3:e003648.

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The views and opinions expressed therein are those of the authors and do not necessarily reflect those of the NIHR PHR Programme or the Department of Health.



Ward Thompson et al. (2019, in press) Health impacts of environmental and social interventions designed to increase deprived communities' access to urban woodlands: a mixed methods study. *NIHR Journals: Public Health Research*, volume 7, no. 2.



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