



Nature doesn't judge you – how urban nature supports young people's mental health and wellbeing in a diverse UK city

Jo Birch^{a,*}, Clare Rishbeth^a, Sarah R. Payne^b

^a Department of Landscape Architecture, University of Sheffield, UK

^b The Urban Institute, Heriot-Watt University, UK

ARTICLE INFO

Keywords:

Mental health
Wellbeing
Young people
Urban nature
Cities
Nature connection

ABSTRACT

Reviewed research reveals a lack of young people's voices articulating if and how urban nature supports their mental health and wellbeing. This paper presents qualitative research with young multi-ethnic urban residents living in a northern UK city and offers an important counter-narrative to the pervasive notion of childhood nature-deficit disorder. Using interviews and creative arts workshops, we explored the value of urban nature for the mental health and wellbeing of 24 young people aged 17–27 years, 9 of whom had lived experience of mental health difficulties. Trees, water, open spaces and views were frequently experienced nature typologies offering benefits. Deteriorating landscapes, young people's shifting identities and perceived time pressures disrupted support. Young people expressed how urban nature encounters were experienced as accepting and relational, offering a: stronger sense of self; feelings of escape; connection and care with the human and non-human world.

1. Introduction

[This nature place would] just like give me a hug basically, like 'here's a hug', this is a gift from me to you and like these are all of the resources that you'll ever need: you've got the ground to ground you, you've got the sky to inspire you, [laughs] you've got the trees and how well rooted they are and, that offer you security and like you can recognise the cycles of death and life and you can let them come and go as you please (Mina).

In this paper we explore how 'nature' does (and does not) provide a mental health and wellbeing resource for young city dwellers. Mina was asked what a 'feel good' place (a peri-urban riverside walk) would say, if it could speak. Her thoughts serve to present a youth view and a mental health perspective on the value of an urban 'nature place' in her northern UK city. And while not representative of all our participants, it points to a more positive, and certainly more nuanced, youth-nature relationship than many popular debates which centre on deficits of care, knowledge and innocence.

Now is a fitting time to talk about young people, place, mental health and wellbeing. From a UK perspective, a current youth mental health crisis (Thomson and Katikireddi, 2018) coupled with the knowledge that most mental illnesses begin during youth (Kessler et al., 2005) underpin our research. Young people's mental health and wellbeing, across

childhood, teen and young adult years, is variously thought to be subjected to negative pressures of study, financial difficulty, digital technology, bullying and social media. Children and young people are increasingly deemed to live in places of risk to their safety and are restricted in their freedoms to be in outdoor places (Pain, 2006; Skar et al., 2016). Overarching structural factors play a role, with mental ill-health being found to be higher: among children and youth living in low income families (Morrison Gutman et al., 2015), among those with refugee histories (Almqvist and Brandell-Forsberg, 1997; Sack et al., 1999) and among some ethnic groups living in the UK (Hawton and Anthony, 2005; McManus et al., 2009). A shortage of mental health professionals and health resources directed at youth mental health in the UK (National Audit Office, 2018) shifts much of the challenge in providing support for young people to wider society and this potentially calls for new ways of thinking and resourcing. Whilst place-based approaches are being given new attention (Public Health England, 2019), in this paper we specifically ask what role might be played by nature-as-place.

It is also apposite to approach questions about the wellbeing benefits of nature for young people now given debates focusing on young people as disinterested and disconnected from nature (Hughes et al., 2018; Louv, 2008; Soga and Gaston, 2016). This needs to be positioned alongside both the responsibility of young people as 'eco-saviours', who

* Corresponding author.

E-mail addresses: joanna.birch@sheffield.ac.uk (J. Birch), c.rishbeth@sheffield.ac.uk (C. Rishbeth), s.r.payne@hw.ac.uk (S.R. Payne).

<https://doi.org/10.1016/j.healthplace.2020.102296>

Received 18 October 2019; Received in revised form 29 January 2020; Accepted 6 February 2020

Available online 21 February 2020

1353-8292/© 2020 The Authors. Published by Elsevier Ltd. This is an open access article under the CC BY license (<http://creativecommons.org/licenses/by/4.0/>).

may be unready, or unsupported by adults, and the active concern which has become evident globally in youth environment and climate strikes and protests (Fisher, 2019).

This cross-disciplinary paper builds on an ever growing body of research indicating that having contact with nature and/or green space can be good for people's happiness, wellbeing and mental health at general population level (Alcock et al., 2014; de Vries et al., 2003; Sugiyama et al., 2008; van den Berg et al., 2010; Ward Thompson et al., 2012). Previous psychological and planning studies have articulated particular mental wellbeing benefits of nature or greenspace access for people living in deprived urban areas (Ward Thompson, Aspinall and Roe, 2014; Wells and Evans, 2003; Rigolon and Flohr, 2014) and for those with ethnic backgrounds, who are thought to have reduced access to high quality greenspaces compared with the general population (Mceachan et al., 2018). To these studies, we add a much needed qualitative and detailed account of multi-ethnic, deprived urban youth experiences, thus expanding the fields of environmental and health justice research. We augment others' work which has addressed place-based means for helping with mental health difficulties (Andrews, 2014; Fox, 2011; Parr, 2008). We add to research that has explored how nature experiences and places may offer benefits specifically for people with mental health problems (Bakolis et al., 2018; Barton and Pretty, 2010; Bierski, 2016; Boucher et al., 2019; Maas et al., 2009). Additionally, we build on a corpus of work that addresses the implications of urban environments and urban living upon mental health and wellbeing (Peen et al., 2007; Lederbogen et al., 2011; Gruebner et al., 2017). Evered (2016) and Söderström et al. (2016) provide summaries of studies which have suggested associations between urbanicity and higher incidences of psychosis and sometimes severe depression.

Our study is set within these youth/health/place contexts. After presenting and critiquing research literature and pertinent public discourses, we describe the qualitative methods of our study with 24 young people living in Sheffield, a diverse and, in parts, deprived northern UK city of around 600, 000 residents. Participants were aged between 17 and 27 years, 9 of whom had lived experience of mental health difficulties. We go on to present findings and conclusions highlighting that the young people in our study with a range of ethnic, cultural and socioeconomic backgrounds do value and draw on urban nature for their mental health and wellbeing. They gain: a (stronger) sense of self; a sense of escape from the city and a sense of connection with both human and non-human aspects of their urban environment. Finally, we urge researchers to shift questions, methods and emphasis to attend better to young people's mental health and wellbeing through research about place with young people themselves.

Beginning by further embedding our work in others' studies and discussions, we first highlight an understandable but problematic emphasis upon deficit. This deficit, we suggest, lies at the heart of youth-nature discourse and drives much research around 'improving' nature and/or young people. This emphasis upon deficit also clouds understanding of health-affirming relationships between young people and (the rest of) nature. We necessarily include childhoods in our review of literature in order to include the widest public framings of youth and, importantly, to attend to the oft-spoken about childhood experiences among our young participants.

2. Framings of children, young people and nature – deficit of care; deficit of knowledge; deficit of 'natural childhoods'

Kraftl et al. (2019) have touched upon the extent to which a (minority world) discourse is blooming around the associations between childhoods, young people and nature. We expand upon this to suggest that children and young people's relationships with nature have been constructed around a deficit model with three parts. First, research and wider public discussions have highlighted a *deficit of care* for nature or insufficient human action in protecting the environment. This work has sought to address a hope that children become adults who will do better,

care more and be 'better connected.' Children and young people are feared to feel less responsibility than previous generations (Wray-Lake et al., 2010) yet it is hoped that they will develop pro-conservation behaviours (Hughes et al., 2018; Richardson et al., 2019) to save an ailing natural world.

A second more public framing of children, young people and nature is in a *deficit of knowledge* about nature. A charge has been made that children know more Pokemon 'species' than local wildlife names (McFarlane, 2017; Balmford et al., 2002). A framing that calls for young people to become 'good nature stewards' or to 'better connected' with nature emphasises both the personal loss and social inadequacy of, children's lack of explicit species knowledge (Lisewski-Hobson and Watkins, 2019; Lucas and Colwell, 2018; RSPB, 2010). This framing can also privilege certain types of nature experience, such as forest-based learning environments that are scientific and understood within the 'Western scientific episteme' (Dickinson, 2013:323). More immediate, door-step, urban and everyday nature is overlooked.

Third, we note the persistence of a striking discourse that children and young people have fallen from states of 'good' natural childhoods over generations, and that there is a *deficit of 'natural childhoods'*. This societal mood has a strong element of fear that children are in a Rousseauian way (Rautio, 2013) being corrupted, lost and denied what are felt to be innate and innocent childhood qualities if not allowed time to play in nature. One frequently-quoted headline stated that children and young people have less time outdoors than prisoners (see Edelman Berland, 2016' survey for Unilever, used in Persil's 'Dirt is Good' campaign). Research in this field has been dominated by bibliographies, literature reviews and often commissioned reports detailing how little children spend time 'in nature', and their inability or lack of desire to roam independently (Charles and Louv, 2009; Charles and Wheeler, 2012; RSPB, 2013). However, critics of (the fall from) 'natural childhoods' have begun to emerge, highlighting it as an over-romanticised notion of children's engagement with nature (Dickinson, 2013; Malone, 2016). An idea of 'natural childhoods', becomes most problematic in a trope of nature disassociation labelled as 'nature deficit disorder' (Louv, 2008), as an unhelpful pseudo-medical term, entrenching the Cartesian divide between humans and nature (Fletcher, 2017). This term predicates normality and homogeneity among children's and young people's experiences of nature (Dickinson, 2013). An acceptance of 'nature deficit disorder' risks a problematic framing of young people themselves as needing improvement whilst deeper structural and cultural societal dynamics (such as around parental nature attitudes, risk perceptions, school cultures, and commercial youth marketing) are overlooked. These are complicated factors that warrant deeper critique and analysis if children and young people are to be believed as disconnected from natural environments.

3. Nature's benefits for young people's mental health and wellbeing

Whilst notions of children and young people as societal sites of 'improvement' are most apparent in the youth-nature literature, the situation is reflected when mental health and wellbeing are introduced. Using Little's (2010, p. 164) understanding of quality of life and flourishing, children's and young people's 'competencies and accomplishments', physical wellbeing and 'positive impact upon the ecosystem' have been foregrounded rather than how natural environments might support subjective wellbeing or response to mental distress. An 'improved capacity to concentrate or pay attention when exposed to or engaged with the natural environment' can be synonymous with mental health benefit according to Woolley et al. (2009), p.12) who list in this category work by Kaplan and Kaplan (1989), 2002; Grahn et al., (1997); Hartig et al. (1991); Wells (2000). Much mentioned in academic discourse is a series of very specific enquiries around alleviating what authors call 'symptoms' of ADHD (Attention Deficity Hyperactivity Disorder) (Faber Taylor and Kuo, 2009, 2011). Analogously, more

recent studies explore sensory-motor, emotional, and social benefits to young people with autism (Li et al., 2019; Larson et al., 2018) – from the perspectives of carers rather than young people themselves.

Greater subjectivity in young people's own experiences and psychological restoration has been explored by Roe and Aspinall (2011). Findings indicated that it was urban youth exhibiting 'poor behaviour' who benefitted the most from forest school experiences with positive changes in their mood, energy levels and hedonic tone (degree of happiness/sadness). Whilst still highlighting solutions for behaviour management, this is one of a growing number of studies which have explored the potential wellbeing benefits of nature within learning environments. Often, mental wellbeing is a tangential enquiry, with academic performance and behaviour being emphasised in school greenspace research (Browning and Rigolon, 2019; Kelz et al., 2015) though wider concepts of wellbeing have been addressed in Australian studies of school nature projects (Maller, 2009; Maller and Townsend, 2006) and in a US study where green school yards were found to provide peaceful refuges or 'havens from stress' (Chawla et al., 2014).

Proximity and exposure to nature near home have been favoured areas of enquiry, with studies frequently seeking to identify associations between proximity to nature or greenspace and a state of emotional health and/or behaviour. Within this field, the concept that natural environments act as a 'buffer' for (low level) adverse stressful situations for young people has been introduced by the quantitative studies of Corraliza et al. (2012) and Wells and Evans (2003). Other work has focussed upon whether nature spaces might help children and young people: regulate emotions (Korpela et al., 2002); develop a sense of positive self-image and self-confidence (Ward Thompson et al., 2006); boost self-discipline (Faber-Taylor, Kuo and Sullivan, 2002). In Denmark, large scale health and greenspace data analysis suggests that 'higher levels' of childhood greenspace are associated with lower risk of developing adolescent/adult psychiatric disorder (Engemann et al., 2019). Within a study of medical records of Dutch citizens, more green space near home was associated with lower levels of depression among children and strongest associations among children under twelve (Maas et al., 2009).

Work with older youth, in their teens and twenties has to some extent omitted diversity of youth experience by primarily working with university students and employing quantitative measures and methods to explore the effect of campus greenspace (Bang et al., 2017; Hipp et al., 2016; Lau and Feng, 2009; Liprini and Coetzee, 2017; McFarland et al., 2010). These studies present gaps in subjective and qualitative description of mental health and wellbeing from young people, with measures of reduced stress and mental fatigue, and improved quality of life taking precedence. Useful in providing alternative insight is the qualitative study by Milligan and Bingley (2007) with 16–21 year olds. Of particular pertinence is their acknowledgment how therapeutic landscapes are 'constructed' from past and present experiences. Milligan and Bingley indicate how a range of influences impact upon young peoples' nature (woodland) interactions whilst cautioning that an indiscriminate interpretation of woodlands as therapeutic environments would be misplaced.

Knowledge of nature's benefits to the mental wellbeing to BAME (Black, Asian and Minority Ethnic) youth and/or those living in areas of urban deprivation is extremely limited. Exploring adults' greenspace experience, Ward Thompson, Aspinall and Roe (2014) found that perceived quality of greenspace can be associated with lower levels of stress and better mental wellbeing among people in urban deprived areas of Scotland. More commonly, within wider urban greenspace research are broader questions of environment and health (in)justice which is framed in terms of physical access to urban greenspace. Bates et al. (2018) suggest that children from low income families are increasingly growing up in urban areas with limited access to nature. Concerns have been raised regarding poorer access to large well-maintained urban greenspaces among low income and ethnic minority residents in the USA (Wen et al., 2013; Wolch et al., 2014) and in

the UK (Evans et al., 2012). Rigolon and Flohr (2014) provide substantial review of work exploring unequal physical access to green spaces, often parks and play areas, according to ethnicity and income. Mears and Brindley (2019) point out that greenspace distribution equity and urban deprivation are measured in multiple ways, the complexity of which is overlooked; their work points to a need for more detailed perspectives of those living in underserved urban areas. We highlight that it is not the role of this paper to add to work attending to greenspace proximity, nor to discuss patterns of urban nature use by different ethnic groups. More relevant to this paper are understandings of ethnic minorities' experience of social exclusion associated with 'nature' that is rural or countryside (Slee, 2002) and fear of standing out (Rishbeth and Finney, 2006) – matters which may or may not be applicable in environments of urban nature.

4. Mental health and nature research – a different direction

Our paper does not dwell upon discussing and redefining 'therapeutic' spaces, experiences or landscapes but has drawn from this field of thinking (Gesler, 1992; see Bell et al., 2018 for a review and Emmerson, 2019 for a critique), in particular by focusing on the everyday rather than the exceptional (Bell et al., 2015). We seek to offer, as Duff (2012) puts it, *real experiences* of how nature in a city might (or might not) support mental health and wellbeing. This support might be by strengthening day to day moments of happiness and fulfilment; mitigating moments of distress, or as a means of coping with long term experiences of mental illness. We acknowledge the value of frameworks such as the Biophilia Hypothesis (Kellert and Wilson, 1993), Stress Recovery Theory (Ulrich, 1991) and Attention Restoration Theory (Kaplan, 1995) but choose to take a narrative and relational approach to open up more nuanced understandings associated with young people/place/mental health.

We also move away from a pursuit of causal connections. Nature-and-health research is at a problematic phase in which there remains concern over the lack of causal connections and strong associations (Markevych, 2017; Pinder, 2009). There is unease regarding weak evidence for positive association between greenspaces or greening interventions and mental health (Moore et al. (2018). (Chawla, 2015, p. 446). suggests that experimental, quasi-experimental and correlational studies of nature, children and youth health and wellbeing have followed 'a medical model that compares nature contact to a medication that can be used to treat conditions'. Our approach instead focuses on the importance of recognising population heterogeneity. Given persistent social and health inequalities, we address the need to explore different experiences of nature for mental health and wellbeing as narrated by people of different ages, ethnic and cultural backgrounds, and also according to wider concepts of place typology. In foregrounding urban young people here, many with minority ethnic backgrounds and/or living in urban deprived areas, we attend to The World Health Organisation's priority for research which asks, 'what works, in what circumstances and for whom?' (WHO, 2017, p.11). Such a priority is not (only) an invitation to seek causal connections and statistically significant associations. It is also a call for research that can describe and reflect upon experience, placing emphasis upon how context matters.

Finally, before next outlining our study's methodology, it is worth highlighting that studies seeking to understand nature, mental health and wellbeing associations are often criticised because of inconsistency in how these terms are defined and measured (Moore et al., 2018). We do little to ease this perceived problem and argue that, in a qualitative study, formulating a top-down consistency is too limiting in understanding the complexities of individual experiences. 'Nature' and 'urban nature' have been self-defined by the participants in this study (see 6.1). Equally in investigating a personal sense of wellbeing (Dinnie et al., 2013) we defer to participants' own self-defined experiences of mental wellbeing and mental health. We use the UK mental health charity Mind's definition as a inclusive starting point:

‘Mental wellbeing describes your mental state - how you are feeling and how well you can cope with day-to-day life. Our mental wellbeing is dynamic. It can change from moment to moment, day to day, month to month or year to year’ (Mind).

Our paper makes a specific contribution of offering *in-depth* insight into subjective youth experiences of mental wellbeing in relation to encounters with the urban natural environment. Measurement of association between mental health and nature is both difficult and provides limited detail that robustly describes how mental health and urban nature are *felt* and we highlight the value of research methods that use personal story and multi-modal methods of enquiry.

5. Methods

Working with young people was just one part of a larger multi-disciplinary study: ‘Improving Wellbeing through Urban Nature’ (IWUN). It sought to explore questions around urban nature and urban residents’ mental health and wellbeing in Sheffield, a northern British city. Within the IWUN study, a qualitative strand exploring cultures and values of nature, health and wellbeing of 90 people aged 17–86 years was carried out via in-depth life-course interviews to understand a general population experience of nature and mental wellbeing. Additionally, we used arts-based workshops to understand more deeply the experience of urban nature for wellbeing in the context of lived experience of mental health difficulty. For this paper, we draw on the interview and workshop data relating to 24 participants aged 17–27 years old.¹ Our initial age category was 16–25 but participants interested in our project were as old as 27 and we wished to respect their self-identification as young people.

Of our 24 participants, 20 were interviewed and one person (Emil) also attended workshops. An additional 4 young people attended workshops only. Workshops were open solely to people with lived experience of mental health difficulties. Whilst not seeking people with mental health difficulties among interview participants, 5 out of the 20 interview participants expressed lived experience of mental health problems. In total, 9 out of 24 participants had mental health difficulties.

Our purposive socioeconomic and ethnic sampling worked to access voices and experiences heard less frequently in this area of research and to include people often categorised as ‘low users’ of nature (Natural England, 2015, 2019). Our sampling also served to ‘normalise’ more diverse recruitment in nature and mental wellbeing studies, to address a hitherto emphasis upon white nature/environment/countryside lives (Agyeman, 1990; Birdgirl Blog, 2016) and to take into account the greater risk factors for youth mental health that are reportedly associated with ethnicity, migration experience and deprivation. 15 of the 24 participants lived in an area of urban deprivation. Participants included 12 White British people and 12 with a Black, Asian and Minority Ethnic (BAME²) background: 4 of whom were first generation migrants – 1 Romanian and 3 asylum seekers from Kurdistan, Iran and Sudan. No translators were required. Other BAME participants born in Britain variously had Pakistani and Persian heritage. 14 participants were female; 10 male. Participant information is included in Table 1.

The methodologies for the interviews and arts workshops have been informed by the value of narrative research (Andrews et al., 2008), giving participants ways of communicating events, feelings and experiences through not just speech but also visual media. In health contexts in particular, narrative research can: ‘help to set a patient centred

Table 1

Participants by pseudonym, gender, age, deprivation and mental health.

Pseudonym	Gender	Age	Living in an area of urban deprivation ^c	Self-defined mental health difficulties
Interview participants				
Ashley	F	20	Yes Q2	No
Bassam	M	Late twenties	Yes Q2	No
Ben	M	24	Yes Q2	Yes
Daleel	M	18	Yes Q1	No
Danny	M	21	Yes Q1 /Q2	No
Emil	M	25	Yes Q1/Q2	Yes
Euan	M	21	No Q4 /Q5	Yes
Farida	F	21	Yes Q2	No
Grace	F	20	No Q3	No
Hannah	F	17	No Q5	No
Idin	M	27	No Q3	Yes
Ivy	F	17	No Q4	No
Jacob	M	17	Yes Q1/Q2	No
Khalifa	F	18	Yes Q2	No
Khal	M	22	Yes Q1/Q2	No
Laila	F	18	Yes Q2	No
Mina	F	26	Yes Q1	Yes
Nafisa	F	20	Yes Q1/Q2	No
Rojwan	M	24	Yes Q2	No
Yasmeen	F	22	Yes Q2	No
Arts workshop participants				
Jen	F	27	No Q4/5	Yes
Sam	F	26	No ^b Q3/Q4	Yes
Zoe	F	17	No ^b Q3	Yes
Natasha	F	26	No ^b Q3/Q4	Yes
Emil ^a	M	25	Yes Q1/Q2	Yes

^a Emil wished to be involved in both workshops and interviews.

^b Sam, Zoe & Natasha all spent childhoods living in areas of high deprivation but had moved post 16 years.

^c Quintile 1 (Q1) is most deprived (20% most deprived Lower Super Output Area or LSOA), Quintile 5 (Q5) the least deprived LSOA of Sheffield, according to the Index of Multiple Deprivation. We have classified those living within a neighbourhood which is predominantly Q1 or Q2, or a mix of Q1 and Q2 by area as ‘living in an area of urban deprivation’ (Brindley et al., 2018).

agenda; may challenge received wisdom; may generate new hypotheses’ (Greenhalgh and Hurwitz, 1999). We chose arts workshops as research method (Tarr et al., 2018) for their capability in underlining process of participation and to provide opportunities to communicate where spoken language might be difficult. The work of Tolia-Kelly (2004) on visual cultures, memory and biographical mapping has been helpful in illustrating the worth of visual ‘non-elite representations’ of landscape in understanding identity. For both the interviews and workshops, ethics review and approval were provided by the University of Sheffield (Approval references 013454; 016352). Ethical issues around participants’ production of images and visual material and around how use of this material as part of health research have been discussed by Clark et al., 2010 and were taken into account within our study.

5.1. Interviews

We recruited 20 interview participants via charities, support groups, a conversation club and social media. In order to avoid a common selection bias towards ‘nature enthusiasts’ (which biases against those who would not normally talk about nature), the flyers we sent out did not highlight nature, nor mental health nor wellbeing as interview topics. Rather, young people were invited to an informal interview in a place of their choice to talk about ‘feeling good and not so good in Sheffield’. Only one person was a ‘nature enthusiast’ having studied ecology and a being a member of the UK Scouting organisation. We deliberately desired conversation to be about more than landscape quality, including opportunities for discussion of relational experience of the city and of nature (Conradson, 2005). Interviews were

¹ ‘Young people’, used interchangeably with the term ‘youth’, are defined by the United Nations as people between the ages of 15 and 24 and the definition is acknowledged as flexible (UNESCO <https://en.unesco.org/youth>).

² This labelling, we recognise is problematic. We acknowledge inequalities of power as white academic researchers speaking of ‘Others’ stories, telling them back in a ‘new way’ (hooks, 1990).

semi-structured with 'nature' left unmentioned and undefined up until the moment when participants were asked to say what came into their mind when they heard the word 'nature', so that each person could reveal personal perceptions, values and experiences. Each interview, (lasting between 60 and 90 min), involved a moment where the researcher invited a drawing of a 'feel good nature or outdoor place in Sheffield'. This allowed the participant to imagine a verbal exchange between this place and themselves. A single project researcher (Jo) interviewed and audio-recorded interview participants. One young person, an asylum seeker, preferred the researcher to make hand-written notes only.

5.2. Arts workshops

We recruited 5 workshop participants via the organisations who helped with interview recruitment and via social media. We offered a series of six free sessions to enable people with mental health difficulties to explore their experience of 'nature and wellbeing', whilst not aiming to provide therapy. There was no requirement for participants to present medical histories, labels or diagnoses, though where participants volunteered information about their mental health, we learned that across the group of 5 young people there was history of: anxiety, depression, self-harm, borderline personality disorder, paranoia and panic attacks.

At the workshops, (each 2–3 hours duration), a key researcher (Jo) was present at all sessions. Themes and questions that we wished to explore arose from the researchers' early literature review; interviews already carried out and conversations with arts facilitators. Key themes addressed included: memories of nature; relationality of nature experiences; the value of nature at different points of mental health difficulty; nature inside and outside; material, social, cultural and symbolic aspects of nature. Two different kinds of workshops recruited young people. The zine-making³ workshops with Natasha, Sam, Emil and Zoe were all held indoors and involved printing with different materials, collage or cut up poetry, free writing, mood boards, word play, painting. Another set of workshops attended by Jen (where she was one young person amongst older adults) used mixed creative methods and a range of activities to respond to needs of the researcher and participants over the weeks. Activities included: handling nature objects, responding to and taking photographs, drawing, collage, free-writing, poetry, journaling, one outdoor walk plus discussion guided by the facilitator. In both kinds of workshop, the researcher took fieldnotes and collected photographs of artwork where people permitted. Workshop material and findings were later curated for public exhibition in Sheffield and London, with the intention of stimulating public conversations and raising awareness around the range of ways that urban residents experience nature and express its value for mental health and wellbeing.

5.3. Data analysis

Data analysis made use of 'diffractive' analysis (Lenz-Taguchi, 2012). 'Whereas reflexivity or reflection invites the illusion of mirroring of essential or fixed positions, diffraction entails the processing of ongoing differences' (Lenz-Taguchi, 2012, p.268). We challenge the idea that data collection and analysis in a study of this kind allows a simple reflection or mirroring of young people's experiences around nature, health and wellbeing. Using the idea of diffractive analysis, we propose acceptance that a researcher's involvements and analyses, as in wave diffraction, invite original 'waves' partly remaining (the words, pictures, creations of participants). At the same time, these researcher involvements act as obstacles or apertures that positively bring in

changed and new 'wave' movements (our ideas, themes, our codes). In addition, we have drawn on more traditionally interpretive approaches to data analysis, especially thematic analysis (Braun and Clarke, 2006), with all texts coded both inductively and deductively. Participants in arts workshops narratively decoded photos, drawings and other visual data produced (Kolb, 2008). Creative materials and artefacts were analysed for meanings using participants' explanations and our understandings of their socio-cultural contexts (Curtis, 2011). Nvivo software was used for researcher data management and for coding of transcripts and fieldnotes.

6. Findings

6.1. What kinds of urban nature?

As might be expected, nature is perceived and experienced in multitudinous ways, yet there were qualities and characteristics that recurred. Nature was most commonly defined in relation to trees and woodland in and around the city. It was also frequently defined as something that lies outside the city (Cronon, 1996; Latour, 2000) or is more readily associated with quieter, less peopled, environments, 'proper countryside' or farms. For others, nature meant more designed spaces such as gardens and parks. In the arts workshops, nature descriptions often carried additional symbolism and agency. Jen said that as the leaves 'say goodbye, something else is coming. It's all connected, all linked – one big dance'. Sam suggested one of her houseplants 'must really hate life – it wants to die'. In many cases, a culmination of different of nature elements worked to form more than the sum of their parts, combining different benefits from different elements of the landscape.

Central to our paper is rich description of the mental wellbeing benefits outlined in 6.2 but as backstory, a summary in Table 2 provides illustration of the most common nature typologies and associated qualities which young Sheffield residents conveyed. The three most cited kinds of *helpful* nature (trees, water and views) may not be surprising given the physical geography of the UK city of Sheffield as a 'green' and hilly city with five rivers, situated at the foothills of the Pennine hills. Whilst stating trees, water and views as frequently mentioned, we emphasise that just as Doroud et al. (2018:118) note that there are no universal place characteristics that are 'recovery promoting' in mental health recovery, there are no universal nature typologies that help.

6.2. What kinds of mental health and wellbeing benefits?

Across experiences of good and poor mental health, of ethnicity and deprivation, we regularly heard words and ideas like 'calm', 'relief', 'peace', 'breathing space' to describe health and wellbeing benefits of nature or natural elements. However, here too the diversity of descriptors gives a specific insight. In Table 2, the responses included narrations of: beauty (Richardson et al., 2015); awe (Rudd et al., 2012), freedom (Aaron and Witt, 2011) and anthropomorphism (Tam et al., 2013; Rautio, 2011). We also heard how nature could also offer wisdom and supportive messages. For example, a road lined with mature street trees in Yasmeen's picture would say to her 'you're doing really well'. Farida voiced gratitude to nature for a calm space and helping her 'forget what happened - live day by day'. Gratitude to nature was an emotion expressed by half the participants. Overarching these ideas of respite, wisdom and gratitude, our analysis produced three kinds of wellbeing benefits centred around: sense of self, a sense of escape and a sense of connection and care. Yet sometimes nature cannot help.

6.2.1. A sense of self

Nature's support was portrayed as offering young people a stronger, authentic sense of self or offering a new perspective of oneself within the world. This finding was particularly perceptible within responses from

³ Our workshop flyer stated that "'Zine' is short for fanzine or magazine. It is a low-tech kind of booklet with words and/or pictures, usually having a home-made feel; it can be very roughly or neatly produced. Anyone can be an author of a zine".

Table 2

Most commonly cited 'nature' supporting young participants' mental health and wellbeing

Trees and plants	Water	Open spaces and views
<p>Trees viewed from a home study window give Emil 'energy'.</p> <p>For Euan, the beauty of flowering plants helps: <i>'all the flowers and stuff ... sounds a bit weird but it is a pretty place to be in'.</i></p> <p>The beauty of street trees captured on a phone camera <i>'the sun lights shine through, it just looks ... do you know when you see those things out of the movies? It looks really nice'</i> (Khalifa).</p> <p>A cherry blossom tree offered beauty and a safe haven for Zoe while she was growing up in a neighbourhood where she would feel unsafe, awkward and surrounded by concrete.</p> <p>A sense that trees suffer like people do: <i>It's ridiculous because it's like, because like, to be honest with you, I think, if trees could speak oh bloody hell. If [trees] could speak it'd be amazing, because they could say so many things, they could talk about so much abuse, so many things that they'd gone through. Yeah, it's just, they would say everything, literally everything a person feels when they feel sad, abuse, everything, because obviously trees, trees ... people don't know but trees are living creatures, living things and they feel, people don't know, they actually feel</i> (Daleel).</p>	<p>Farida says of water on a home-work route: <i>'it clears your brain out'.</i></p> <p>A watery metaphor is used by Jen who spoke of experiencing urban nature more generally as <i>'like sticking my head in a clear green pool'.</i></p> <p>Water sounds and 'stillness' for Danny offer a break from feeling stressed in town or where he works in the city centre nearby.</p> <p><i>'My mate and I went to Endcliffe park, the little river, recently and did like a letting go ritual. We added messages to float on flowers and said out loud what we wanted to let go. We watched until our flowers drifted out of sight' (Sam).</i></p> <p>Water for Sam is <i>'cleansing, freeing to be around'.</i></p> <p>Mina says that nature experiences are <i>'incomplete if there's not some sort of water'.</i></p>	<p>Views for Idin afforded a link to remembered home environments and for him enabled both thinking and feeling better: <i>I can see in every view, I can see ... the city. I am at the top. I see the other parts of the city. Every week in [Iran], I was going to the top of hills and just looking at the city. I can feel better, think better than sitting at home or being in the city centre.</i></p> <p>Ben identifies the landscape as something bigger than himself and feels comfort: <i>'It's kind of like awe, it's like wow, this is big, this is, I'm small kind of thing I guess, erm, and I think, I don't know, that just makes me feel happy, it's, I don't know. Maybe it's comforting, maybe, to know that you're kind of, what's the word? Enveloped? In a big valley or something like that.</i></p> <p>Nafisa finds views peaceful and drives to a commercial/ex-industrial part of the city: <i>It's just like an area where they have [...] garages and stuff, but it's like uphill so you can park your car and then you can just see the, the actual hill and everything and the sunset and it's a really nice place [...] then it's like all greenery and it's nice</i> (Nafisa).</p> <p>Open space was valued by Rojwan for its association with <i>'emptiness'</i>, and as a <i>'wild area'.</i></p> <p>Sometimes open space was seen to offer a contrast to the built up parts of the city, and other times just qualified as a personal or family-held <i>'value'</i>: <i>I think I do like open space, like it gives you that chance to breathe, especially from being in a city, where everything isn't open</i> (Grace).</p>

the 9 young people with lived experience of mental health difficulties, but also among others who voiced difficult times in their lives.

Notions of 'being myself', and nature helping people not to worry about what others think were strong for some like Mina:

I guess it's just like the idea of being around nature I find very soothing. I think it's ego free, yeah. You don't have to have like a mask on or anything (Mina).

Similarly, Jen told us that 'nature doesn't judge you'. Jen, a long term mental health service user told us of how she doesn't 'feel like a weirdo' if she is out walking with her dog and she intimated noticing details of nature whilst feeling, helpfully, that nature doesn't notice her:

... so I go off & smoke and just take like 10 or 15 minutes to myself & I'll notice things like the way the flowers hang down or the wild flowers people plant & the way that they blow in the wind. There's something about nature ... it's indifferent (Jen).

We also heard how nature offers an opportunity to get 'out of yourself' or gain a wider perspective, a 'sense of wonder' as suggested by one participant. These expressions tie in with the notion of a perhaps spiritual 'force of nature' (Wilson, 2003 endorsed by Boucher et al., 2019:67). Nature, for Ivy, helps you think 'about the rest of the universe rather than your little social bubble'.

6.2.2. A sense of escape

For Sam and Zoe, 'escaping' people in nature spaces was especially valuable. Some prefer solitude - Sam told us 'it's not a sanctuary if it's shared'. For others, the company of a few friends is important. Nature or greenspace offers something of a 'world out there' for Jacob, who sometimes feels 'a bit trapped' and lives in a deprived area in the north of the city. Like Kalifa who talked about escaping the city to a 'bit of green', Jacob escapes the city for nature experiences and for symbolic headspace - usually with friends:

As a mood management tool nature's really important and being able to go out and especially with friends, just to be out and away from the city and away from, you know, metaphorically away from the problems that are within the city and literally away from them (Jacob).

Escape of another kind was told by Rojwan, a Kurdish asylum seeker. Rojwan explained his experience of curfews in his home country where he was not free to be outside after a certain hour. In Sheffield, parks especially offered great freedom and 'not any rules'. Nature also represented to him a freedom from people's negative judgement. If it could talk, the park in his drawing would say to him:

It's not like, we made it for you to [...], to be fighting, to be doing the bad things [...] you must be like friendly and [...] all kinds of people must like stay in peace together, not to be racist, not to be saying you are brown and you are white or you are black, all these things, so, yeah, that's what nature all the time tries to tell us (Rojwan).

Like Rojwan, Bassam, Idin and Emil were first generation migrants who each moved to the UK as young adults and each of their interviews revealed a particular notion of freedom and escape that related specifically to their memories of home countries. These four participants talked of memories of other places from times before moving to Sheffield. It was their experiences and values of *present* urban nature in Sheffield that seemed to enable momentary mental escapes to past positive nature memories from home: warm beaches by the sea; grandparents' homes in the countryside; a family vineyard; solitary walks up hills near a home city - one with mountains, 'like (Sheffield)'. The experience that Farida revealed was nature providing some escape from loneliness and a sense of support where people failed to provide it. That support came in the form of peace and detachment from people which she gained from sitting on a bench by a stream:

I've got polycystic ovaries and at the same time I had like a lot of problems with my iron and my Vitamin D etcetera so especially it was a teenager time as well, like when I started my period and my polycystic ovaries started kicking in and I got a lot of facial hair and [...] that was a time, you know, when I guess my friends and everyone around me, they didn't, they weren't there for me, like so I kind of felt lonely, so I think that's when nature, you know, really helped me out because I could sit there and I could forget everything and I could forget everyone, I could just admire nature and, you know, get peace and everything (Farida).

Another kind of escape was through disconnection from digital

technologies which young people felt was aided by time in natural environments. Hannah and Ivy, who usually experienced good mental health, but felt anxiety around school life, talked about how life for them ‘revolves so much around your phone and social media’, so nature gave ‘life another dimension’. Echoed here in young people’s descriptions is what Kaplan and Kaplan (1989) term ‘being away’. As part of Attention Restoration Theory, this describes a person’s sense of being able to disconnect from usual worries and concerns.

6.2.3. A sense of connection and care

Whilst some dis-connection from people was welcome at times, we gained a strong sense of nature helping in creating connection(s) for young people. Connection was characterised both in terms of how nature experiences are entangled with people – family in particular and sometimes peers – and with non-human nature. We go here beyond a ‘nature connection’ definition as ‘a multidimensional trait thought to be important for developing positive conservation behaviour’ (Hughes et al., 2018:11, italics ours). We found connection to be expressed in terms of young people’s care *from* and, at times, *for* ‘nature’. Positive relational activities were spoken of by Ivy, who felt that when she was outside she was ‘more with’ her family and Leila found helpful the peaceful ‘atmospheres’ of family time spent in moorland on the edge of the city. When Daleel goes to the park with friends now or takes younger members of his family, he told us how it links in with earlier memories, it: ‘gives you a flashback from your childhood, playing in the park’. He says that the childhood memory of time with his family makes him feel good. Such memories of social connections and activities are discussed in the work of Ratcliffe and Korpela (2018) who emphasise the emotionally restorative value of memories in connection with place and environment.

We heard of how it is indoor nature that forms social connection for Natasha. During the arts workshops she recalled how plant cuttings would connect generations of her family. Natasha spoke of loving the old ‘old fashioned’ plant books, passed on to her which contained her Mum’s and, before her, her Grandma’s hand-written notes. These indoor and outdoor nature places of connection, as social and material intertwining, evoke what Duff (2012, pp. 66, 68) calls ‘atmospheres of sociality’ and ‘atmospheres of safety and belonging’.

Another form of connection was expressed in a notion of care. In a rebuttal of the aforementioned youth-nature relationships, (see section 2 within this paper), we noted that care of and concern for the natural environment was much stronger among the group of 24 young people than among the mid-age adults or over 70s who were part of our wider study. No interview questions nor workshop activities purposely elicited feelings about ‘the environment’ nor about care for it yet there were powerful expressions of both the need for Sheffield nature and wider ‘nature’ or ‘earth’ to be cared for. Both Khal and Bassam, a Sudanese refugee, expressed strong views about the importance of not dropping litter locally and others expressed care at a larger scale:

[Nature means] nobody must destroy that (Idin).

[Nature is] Being eco-friendly [...] because I feel like whenever I hear ‘nature’, it’s always got to be like protect nature or save nature or, because this threat of global warming and everything like that, I think [...] that’s the first thing that comes to mind. Everybody’s pro saving the earth and I’m pro saving the earth (Grace).

You want to preserve it, [...] you want to have that [nature] around you your whole life, you don’t want to be raising kids with nothing like this around because they can’t survive (Ivy).

Several of the young people we heard from demonstrated mutuality of care *for* and care *from* home-based nature. For Leila and Zoe, indoor plants at home and in cafes were beneficial. Zoe shared a photograph of her much-mentioned houseplant that she named ‘Jeremy’. Naming plants and animals were one of the ways in which care, relationship and the positive wellbeing benefits seemed to be manifest in her experience

of urban nature. Leila drew a plant in her bedroom and spoke of her relationship with it:

You feel good knowing that you’ll look after your plant. It’s like it’s a kind of like a trust from nature, like – ‘I’m giving you some plants make sure they’re healthy, make sure you look after them’ and I guess I have (Laila).

Ashley, who openly expressed being ‘anti’ plants, spoke of a sense of care around animals instead – her pet dogs and parrot. Hannah gained great comfort from a cat in the public Botanical Gardens, making the most of opportunities to see and stroke the cat during school lunch breaks. These involvements, alongside Daleel’s account of trees’ feelings (see Table 2) attest to the worth in exploring therapeutic spaces and experiences of human-animal relationships (Gorman, 2019) as well as the more than human affective relationships with plant lives as inhabitants of a city (Phillips and Atchison, 2018).

6.3. When nature can’t help

Young people made clear to us, especially those with lived experience of mental health difficulties that urban nature was no cure-all for mental health difficulties, especially when times were bad. Zoe in the arts workshop talked about positive and negative aspects of healthcare practitioners’ ‘prescribing’ of nature, especially in the context of suicidal feelings:

it wouldn’t be any good for people to glibly say “oh, you could try walking in the park!” But then it depends on who is talking to you. One woman GP was really supportive and asked what I was doing already and encouraged me with the park stuff (Zoe).

Euan who had also faced periods of poor mental health would sometimes actively avoid park environments that have become run down:

with having mental health issues, your mood can be all over the place so you need something to like counteract whatever you’re feeling ... if you walk, even walk through like parks and you look at the playgrounds that haven’t been done up in twenty years, and everything’s falling apart, it makes some places that should be happy more miserable (Euan).

The ability to access high quality greenspace differed between participants. Where urban nature ‘goods’ became urban nature ‘bads’ or ‘disservices’ (Lyytimäki et al., 2008) either through physical deterioration of a place or through association with negative stories, participants avoided these places. Jacob and Nafisa told us about greenspaces that had ‘got a lot worse’; places that are now a bit ‘dodgy’ and a park that would now never be visited alone. Zoe and Natasha talked of frightening gangs of children, noisy and anti-social neighbours; games involving knives and fear of certain nature routes that made them landscapes of fear (Lekies et al., 2015; Tuan, 1980). Getting to a park that feels safer or more beautiful was not always a choice because of transport costs, described by Mina as a ‘luxury I can’t afford’.

Ability to gain benefits from outdoor nature also differs over time. For most participants, childhood was conveyed as a phase with more time spent outdoors. Now, as older teenagers and young adults, most felt that they were much busier (Boyd et al., 2018) and had different priorities:

Now I don’t have time for nature and now as a kind of working adult I haven’t got time to be going into a park and spending time there and like I say I live a very hectic lifestyle. There’s always something going on, there’s always places we’ve got to be or stuff to do (Danny).

Grace reflected that she goes outside less nowadays because her younger teenager brothers are not keen. She said she would often be the one instigating a family walk because she knows it is likely to make

everyone feel better. Jacob felt that he experienced nature less during early teenage years, being 'busier', as well as not quite being old enough to 'wander around' freely on his own or with friends - a lack of independence highlighted by Woolley and Griffin (2015). These findings mirror studies which have cited adolescent and teenage years as particular periods within the life course of 'nature connection drop off' (Richardson et al., 2019; Hughes et al., 2019; Bell et al., 2003).

For some, especially those recently arrived in Sheffield, free time was available, yet there was a desire for someone to 'go' with or to be with, especially in accessing nature just outside the city:

Well I haven't got anyone in my life to go with, I would go with them but, you know, because I'm living on my own, you know (Emil).

Natasha and Emil both reflected that they needed someone to organise, to say 'let's do it' to get a trip out to the Peak District; going with friends was better. This desire for a social nature engagement was felt by some while others, like Farida, in a period without friends took solace from nature.

Farida spoke during interview about a park incident in which she experienced a family moving themselves and their children away from her, on account of her wearing a hijab. This was a single but notable experience of social exclusion among our participants. Mina, a young BAME woman with mental health difficulties spoke during interview about sometimes feeling unsafe around men within her low-resourced and predominantly BAME neighbourhood. These accounts reveal some potential fear and concern that can be felt by BAME people within public nature spaces and in making journeys to nature spaces in the city. Whilst these experiences resonate with findings from a UK study by Cronin de Chavez et al. (2019) detailing barriers to nature access for low income, multi-ethnic urban deprived families, neither Farida nor Mina were deterred from seeking nature experiences for mental wellbeing. Indeed, both young women gained considerable respite in urban nature and helpful ways of thinking about their experiences in the world. Overall, findings from Natural England (2015, 2019) reporting lower BAME engagement in nature and The Countryside Agency's (2005) report of negative multi-ethnic youth perceptions of nature are not strongly reflected among the young urban BAME participants in this study. Of the two participants who detailed fewer day to day experiences of urban nature and drew on it much less for their mental health in comparison to other participants in participant, one was a white British female (Ashley) and another was a Sudanese male (Bassam). Accounts from young participants (as with older adults in the wider study) indicated urban deprivation, much more than ethnicity, to be a barrier in gaining well-being support from nature (Birch and Rishbeth, 2019).

7. Discussion

Discussion is organised below, attending to each of finding themes with reflections upon how they might help respond to matters of youth mental health.

First: a reflection upon how *nature does not always help*. Physical and structural aspects of the city can weaken possibilities for gaining mental health support from nature, as difficulties are often aligned to localities with poor quality urban natural environments and concern regarding other users. In response to this, there are clear implications for investment in care and maintenance of nature spaces, in enabling affordable transport to reach desired green and blue areas of the city, working out what helps people feel safe in urban nature spaces. These are matters of urban green equity - 'ability to participate' (Nesbitt et al., 2018) and are complex mix of spatial and social intertwinings, some of which seemed to affect youth living in more deprived areas in our study, but which are also relevant to the other young people. Hearing about barriers to gaining support from nature reminded us that there are pressures, changing priorities, challenges of finance and friendship which fluctuate across time for all young people. Relational factors are complex

mediators; for some, lack of peer support to experience nature was an obstacle, while for others such as Farida, that lack of human support was an influence in her turning to help from urban nature. For adults, there has been an emergence of social and 'green' prescribing activities or 'green care' (Sempik, 2010; Bragg and Leck, 2017) and we recognise there are possibilities to turn to these kinds of hopeful and urgent responses, for they are rarely used for young people.

Second: consideration of the ideas around *connection and care* emerging from our study. Whilst acknowledging the significance of time and many other social pressures affecting young people, we challenge the persuasive 'deficit' oriented suggestions of 'extinction of (nature) experience' (Miller, 2005; Pyle, 1978) or 'environmental generational amnesia' (Kahn et al., 2009). Our participants, mostly from backgrounds commonly assumed to be less engaged with natural environments (Natural England, 2015), demonstrated not only rich nature experiences in and around a city, but highlighted themselves as active agents of their own mental health and wellbeing. They make choices to engage with nature in many forms, usually outside formal institutional or health care structures. Connections and relationships (Conradson, 2005) were felt across spaces and species (views, street trees, houseplants, wildlife and pets) and in some cases evoked anthropomorphic responses. In part, our methods invited this. Using a novel and purposely playful animistic question, asking what nature would say if it might speak, different understandings of relationship with nature were unabashedly revealed. They illuminated young people's sense of mutual care as well as gratefully received support 'from' the more-than human world (McConnell et al., 2019), where humans could not help. These caring relationships were sometimes developed in homes and indoor social spaces, revealing the possibility of indoor spaces to act as stepping stones for those are less comfortable with or who have limited access to outdoor settings. There were stories in our study of empathy or perhaps rather 'atunement' (Despret, 2004) and of plants and people co-inhabiting urban spaces (Pellegrini and Baudry, 2014) with added human mental health benefits.

Third: the idea that urban dwellers value 'escape' that green spaces provide, raised by Guite et al. (2006) and by Halpern (1996), was affirmed among the young people but in new ways and in more detail. Escape can happen within the city itself, not just by leaving it, and we build on previous work which notes different ways in which cities' natural environments can be sites not just of stress but of stress relief (Bornioli et al., 2018; Korpela and Ylen, 2007; Wakefield and Mc Mullan, 2005). We present detail and nuance by revealing escape as often metaphorical and imagined: getting a break, temporarily getting away from technologies, 'rules' and societal labels. An apparent othering of nature in the context of 'escape', in that it is what people are not, meant that nature can offer a place or feeling of no judgement, or a different judgement, and this relates to a more secure sense of self. Whilst our research questions were not designed, nor able with such a small sample, to identify patterns of nature experience according to ethnicity, we note how urban nature, experienced as both escape and inclusion, may be of particular mental health value for new young migrants to cities. Those supporting wellbeing for refugees, asylum seekers and new migrants may be in positions to facilitate helpful urban nature experience (Rishbeth et al., 2019).

Fourth: *sense of self*. In Bierski's study set in Richmond UK he heard participants' 'narrative and skilled being-in environment in a drive to overcome mental health problems' (2016, p.143). He also learned of their 'contemplating and actively engaging with the world and its features' (Rishbeth et al., 2019, p.138). The ways in which young people in our study also skilfully chose to 'be-in' urban natural environments, gaining different sense(s) of self speaks of their choices to 'tune in' to nature and feel better for doing so. We find that urban nature experiences go beyond acting simply as a stress-buffer; they help young people *worry less about what others think*. There is clearly value, for a young person, in feeling less of 'a weirdo', within long term lived experience of mental illness, or knowing that a notional or physical place in their city has no 'ego'. This matters especially when mental distress is associated

with feelings of self or public stigma, labelling and judgement (Moses, 2009; y Garcia et al., 2012). Fears of standing out in urban nature, were not felt among our BAME participants. Feelings of social exclusion in urban nature were almost never experienced and in one instance where they were, acceptance and respite gained from urban nature contact outweighed negative experience.

Fifth: *what kinds of nature help?* Our research points to the need for greater attention in research and in practice to the spatial, material and affective dimensions of young people's relationships with urban nature. There are implications for design and use of school, campus, city routes and spaces that reflects especially 'helpful' landscape elements in urban contexts. These elements were trees, water, open views in the case of Sheffield but which may be different in other cities. Nature may still be 'out there' (de-institutionalised, un-instrumental), and 'out there' may be a helpful place to be either physically or metaphorically. We understood this through young people's reflection upon everyday experiences and routines in and around a city (Hitchings, 2013), rather than the exceptional. These everyday experiences include the material, more ethereal and the relational. We invite exploration of further questions on social relationships with parents, families, peers, those in learning institutions, work and healthcare. Such exploration calls for particular attention to supporting times and places for beneficial nature experiences, and for attention to developing feel-good relationships, including with the non-human. We also call for nature and wellbeing research to change direction, to move away from foregrounding greenspace access and proximity for BAME youth and those living in under resourced areas, to move towards understanding personal experience of the mental health value of all kinds of urban nature in particular. Whilst others have suggested rural, activity-based nature can be off-putting for urban youth (Lekies et al., 2015) our study indicates how everyday urban nature, closer to home, can offer more approachable and positive experiences.

Overall: *we emphasise caution when seeking simple 'solutions'*. Whilst revealing valuable findings about the worth of urban nature for supporting youth mental health, we are concerned about what 'nature on prescription' for youth might look like. We indicate a need to 'stay with the trouble' (Haraway, 2016, reiterated by Philo and Parr, 2019). This means continuing to ask questions around what if anything about place helps and hinders young people's subjective experiences of mental health. The Improving Wellbeing Through Urban Nature project has resulted in guides for health and/or nature practitioners which focus upon youth mental health; and addressing inequalities (Birch and Rishbeth, 2019) and each of these takes a relational and personal approach in guiding decisions about actions that might help young urban residents. Acceptance of a simple solution prescribing a 'dose' of nature, such as a minimum nature 'exposure' (White et al., 2019) for young urban residents is problematic in several ways. It potentially offers a political tool for placing the burden of mental health care upon individuals, failing to fully address structural drivers of declining mental health, declining environments and of unequal experience of high quality nature. It neglects a full comprehension of young people's experiences of city environments, of mental health difficulty, of social relationships and the multiple fluctuations within a young person's life course.

7.1. Limitations

Our study was part of a larger case study carried out in one city location within the UK. As such, it is with caution that generalisations can be made about young people who live in other physical and political contexts.

Whilst planned interview numbers were reached, the study sample size was smaller than hoped for. Fewer young participants than expected joined the research and proposed workshops with school students (16–18) were abandoned late-on in the study due to pressures facing school staff with mental health responsibilities. Given that research workshops were over-subscribed by adults as part of the wider IWUN

project, we reflected upon a number of factors that may have led to fewer young people participating. These factors included: perceived or real difficulties in young people's commitment to a 6-session programme of workshops; problematic timing (early evening sessions) that may have clashed with study, part time work, socialising or relaxation; time of year (dark evenings in early spring); the workshops' focus upon making of a zine which though clearly defined on the flyer may have been read as overly art-focussed, exclusive or confusing; the art-studio venue for the workshops which may have been perceived as elite and which was, in practice, difficult to find.

That fewer young people with mental health difficulties engaged in 'nature and wellbeing' workshops may also serve to illustrate how young people may be hesitant around disclosure of mental health experiences and identities (Bradford and Rickwood, 2015). By contrast, most older adults attending the workshops defined themselves as long-term mental health service users and attendees of mental health support groups.

As far as possible, co-production of decisions was carried out, planning, setting up and running workshops through close conversation with and advice sought from the 3 workshop facilitators. Future work might include co-productive roles for youth co-researchers.

7.2. Concluding reflections and new directions

We began by identifying that now, which is described as a period of crisis for both mental health and for nature, is the time to ask how urban nature might matter for young people's mental health. We have contributed to debates about framings of youth and nature and nature's benefits for young people's mental wellbeing by highlighting problematic and persistent narratives of deficit. We have heard not only that urban nature supports mental health among BAME urban youth and youth from deprived areas, for whom 'deficit' of nature experience would be most anticipated according to a flawed notion of 'nature deficit disorder'. We have also heard that such support can arise through everyday, soulful and mutually caring moments of noticing nature in city. Our paper has made key contributions by extending youth/mental health/nature research, through use of arts and qualitative interview techniques, identifying within responses: narratives of stronger sense of self in relation to urban nature encounters; helpful feelings of escape; connection and of care with the human and non-human world. These were present across responses from all participants across ethnicity, deprivation and levels of mental health. Whilst nature can support youth mental health, in preventative and recuperative ways, we note that uncared for and unsafe-feeling 'natural', green and watery environments can reduce young people's access to what can be a helpful resource; as can an absence of supportive human relationships. We caution against the concept of a 'dose' of nature for young people, yet see opportunities for city institutions and spaces, for supportive individuals and groups to thoughtfully identify opportunities and times for young people's personal nature experience.

For new research directions, we borrow from Maria Puig de la Bellasca's contemplation of care, in suggesting further research into 'nature's' care of young people (and their mental health and wellbeing that is not separate from them). We find that care has, so far, been rather too much conceptualised as control (Puig de la Bellecasa, 2017) and this has been manifest in an overly behaviourist approach in thinking how nature might benefit young people. We suggest a need for other researchers to present nuanced qualitative research that attends to the complex youth/nature/mental health entanglements we have revealed. That research would go beyond our location-specific focus and would develop understanding of young people as a heterogeneous group with shifting identities and relationships with the rest of the natural world (Bell et al., 2014). We have attended to a major gap in researching a young people /nature /mental health and wellbeing nexus. We have challenged research agenda which have been preoccupied with how young people might deliver better planetary health. We have disrupted ideas around

how nature might cause or directly deliver better human mental health and better youth 'behaviour'. The hope is that we open up stronger, broader debates of young people's mental health in relation to urban nature engagements as relational and accepting.

Author statement

All authors have seen and approved the final version of the manuscript being submitted. They warrant that the article is the authors' original work. It has not received prior publication and is not under consideration for publication elsewhere.

Funding source declaration

This research was funded by the Natural Environment Research Council, Biotechnology and Biological Sciences Research Council, Arts and Humanities Research Council & Department for Environment, Food and Rural Affairs grant number [NE/N013565/1], as part of the Valuing Nature Programme.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Acknowledgements

We are immensely grateful to the 24 young participants; the 3 arts facilitators, the organisations and individuals assisting with recruitment: Sheffield Futures; Chilypep; Roshni Sheffield; Learn for Life Enterprise; Sheffield Flourish; Brendan Stone, Chrissy Bonham; Charley Alcock; Lisa O'Hara. We gratefully acknowledge the support of Anna Jorgensen as Principal Investigator of the wider IWUN study. Thoughts and comments on earlier versions of this paper, shared by Maria Patsarika, Kevin Thwaites and two dedicated reviewers are deeply appreciated.

Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.healthplace.2020.102296>.

References

- Aaron, R.F., Witt, P.A., 2011. Urban students' definitions and perceptions of nature. *Child. Youth Environ.* 21 (2), 145–167.
- Agyeman, J., 1990. Black people in a white landscape: social and environmental justice. *Built. Environ.* 16 (3), 232–236.
- Alcock, I., et al., 2014. Longitudinal effects on mental health of moving to greener and less green urban areas. *Environ. Sci. Technol.* 48 (2), 1247–1255.
- Almqvist, K., Brandell-Forsberg, M., 1997. Refugee children in Sweden: post-traumatic stress disorder in Iranian preschool children exposed to organized violence. *Child Abuse Negl.* 21 (4), 351–366. [https://doi.org/10.1016/S0145-2134\(96\)00176-7](https://doi.org/10.1016/S0145-2134(96)00176-7).
- Andrews, G.J., 2014. Co-creating health's lively, moving frontiers: brief observations on the facets and possibilities of non-representational theory. *Health Place* 30, 165–170. <https://doi.org/10.1016/j.healthplace.2014.09.002>.
- Andrews, M., Squire, C., Tamboukou, M. (Eds.), 2008. *Doing Narrative Research*. Sage, London.
- Bakolis, I., et al., 2018. Urban mind: using smartphone technologies to investigate the impact of nature on mental wellbeing in real time. *Biol. Psychiatr.* 83 (9), S374. <https://doi.org/10.1093/biosci/bix149>.
- Balmford, A., et al., 2002. Why conservationists should heed Pokémon [1]. *Science* 295 (5564), 2367, 1095–9203.
- Bang, K.-S., et al., 2017. The effects of a campus forest-walking program on undergraduate and graduate students' physical and psychological health. *Int. J. Environ. Res. Publ. Health* 14 (7). <https://doi.org/10.3390/ijerph14070728>.
- Barton, J., Pretty, J., 2010. What is the best dose of nature and green exercise for improving mental health? A multi-study analysis. *Environ. Sci. Technol.* 44 (10), 3947–3955. <https://doi.org/10.1021/es903183r>.
- Bates, C.R., Bohnert, A.M., Gerstein, D.E., 2018. Green schoolyards in low-income urban neighborhoods: natural spaces for positive youth development outcomes. *Front. Psychol.* 9 (May), 805.
- Bell, S., Thompson, C.W., Travlou, P., 2003. Contested views of freedom and control: children, teenagers and urban fringe woodlands in Central Scotland. *Urban For. Urban Green.* 2 (2), 87–100. <https://doi.org/10.1078/1618-8667-00026>.
- Bell, S.L., et al., 2014. Green space, health and wellbeing: making space for individual agency. *Health Place* 30, 287–292. <https://doi.org/10.1016/j.healthplace.2014.10.005>.
- Bell, S.L., Phoenix, C., Lovell, R., Wheeler, B.W., 2015. Seeking everyday wellbeing: the coast as a therapeutic landscape. *Soc. Sci. Med.* 142, 56–67. <https://doi.org/10.1016/j.socscimed.2017.11.035>.
- Bell, S.L., et al., 2018. From therapeutic landscapes to healthy spaces, places and practices: a scoping review. *Soc. Sci. Med.* 196, 123–130.
- Bierski, K., 2016. Recovering mental health across outdoor places in Richmond, London: tuning, skill and narrative. *Health Place* 40, 137–144. <https://doi.org/10.1016/j.healthplace.2016.05.00>.
- Birch, J., Rishbeth, C., 2019. Guides for practitioners: (1) Supporting young people's mental health - How urban nature can help (2) Supporting people's mental wellbeing through urban nature - challenging inequalities (3) Supporting people with mental health difficulties - How urban nature can help. IWUN. University of Sheffield. <http://iwun.uk/findings/>. (Accessed 29 November 2019).
- Birdgirl Blog, 2016. Race equality in nature conference. Black2Nature 1st november 2016. A blog post by mya-rose craig young naturalist. <http://www.birdgirluk.com/2016/10/race-equality-in-nature-conference.html>. (Accessed 29 November 2019).
- Bornioli, A., Parkhurst, G., Morgan, P.L., 2018. The psychological wellbeing benefits of place engagement during walking in urban environments: a qualitative photo-elicitation study. *Health Place* 53, 228–236. <https://doi.org/10.1016/j.healthplace.2018.08.018>.
- Boucher, M.-E., Groleau, D., Whitley, R., 2019. Recovery from severe mental illness in Québec: the role of culture and place. *Health Place* 56, 63–69. <https://doi.org/10.1016/j.healthplace.2019.01.008>.
- Boyd, F., et al., 2018. Who doesn't visit natural environments for recreation and why: a population representative analysis of spatial, individual and temporal factors among adults in England. *Landsc. Urban Plann.* 175, 102–113. <https://doi.org/10.1016/j.landurbplan.2018.03.016>.
- Bradford, S., Rickwood, D., 2015. Young people's views on electronic mental health assessment: prefer to type than talk? *J. Child Fam. Stud.* 24 (5), 1213–1221. <https://doi.org/10.1007/s10826-014-9929-0>.
- Bragg, R., Leck, C., 2017. Good practice in social prescribing for mental health: the role of nature-based interventions. *N. Engl. Comm. Rep. Number* 228. York.
- Braun, V., Clarke, V., 2006. Using thematic analysis in psychology. *Qual. Res. Psychol.* 3 (2), 77–101. <https://doi.org/10.1191/1478088706qp0630a>.
- Brindley, P., Goulding, J., Wilson, M.L., 2018. Generating vague neighbourhoods through data mining of passive web data. *Int. J. Geogr. Inf. Sci.* 32 (3), 498–523. <https://doi.org/10.1080/13658816.2017.1400549>.
- Browning, M., Rigolon, A., 2019. School green space and its impact on academic performance: a systematic literature review. *Int. J. Environ. Res. Publ. Health* 16 (3), 429–450. <https://doi.org/10.3390/ijerph16030429>.
- Charles, C., Louv, R., 2009. Children's nature deficit: What we know and don't know. *Child Nat. Netw. Sept.* 1–32.
- Charles, C., Wheeler, K., 2012. Children & Nature Worldwide: an Exploration of Children's Experiences of the Outdoors and Nature with Associated Risks and Benefits. *Children & Nature Network*, Minneapolis.
- Chawla, L., Nasar, J.L., 2015. Benefits of nature contact for children. *J. Plann. Lit.* 30 (4), 433–452. <https://doi.org/10.1177/0885412215595441>.
- Chawla, L., et al., 2014. Green schoolyards as havens from stress and resources for resilience in childhood and adolescence. *Health Place* 28, 1–13. <https://doi.org/10.1016/j.healthplace.2014.03.001>.
- Clark, A., Prosser, J., Wiles, R., 2010. Ethical issues in image-based research. *Arts Health* 2 (1), 81–93. <https://doi.org/10.1080/17533010903495298>.
- Conradson, D., 2005. Landscape, care and the relational self: therapeutic encounters in rural England. *Health Place* 11, 337–348. <https://doi.org/10.1016/j.healthplace.2005.02.004>.
- Corraliza, J.A., Collado, S., Bethelmy, L., 2012. Nature as a Moderator of Stress in Urban Children, vol. 38. *Procedia - Social and Behavioral Sciences*, pp. 253–263. <https://doi.org/10.1016/j.sbspro.2012.03.347>. C.
- Countryside Agency, 2005. What About Us? Diversity Review Evidence – Part One. Challenging Perceptions: Under-Represented Visitor Needs. Produced by ETHNOS for the Countryside Agency, Research Note CRN, 94. July 2005.
- Cronin de Chavez, A., Islam, S., McEachan R.C., R., 2019. Not a level playing field: a qualitative study exploring structural, community and individual determinants of greenspace use amongst low-income multi-ethnic families. *Health Place* 56, 118–126. <https://doi.org/10.1016/j.healthplace.2019.01.018>.
- Cronon, W., 1996. The trouble with wilderness; or, getting back to the wrong nature. *Environ. Hist.* 1 (1), 7–28. <https://doi.org/10.2307/3985059>.
- Curtis, E.K., 2011. Understanding client imagery in art therapy. *J. Clin. Art Ther.* 1 (1), 9–15.
- de Vries, S., et al., 2003. Natural environments—healthy environments? An exploratory analysis of the relationship between greenspace and health. *Environ. Plann.* 35 (10), 1717–1731. <https://doi.org/10.1068/a35111>.
- Despret, V., 2004. The body we care for: figures of anthropo-zoo-genesis. *Body Soc.* 10 (2–3), 111–134. <https://doi.org/10.1177/1357034X04042938>.
- Dickinson, E., 2013. The misdiagnosis: rethinking "Nature-deficit disorder. *Environ. CommuN.* 7 (3), 315–335. <https://doi.org/10.1080/17524032.2013.802704>, 2013.
- Dinnie, E., Brown, K.M., Morris, S., 2013. Community, cooperation and conflict: negotiating the social well-being benefits of urban greenspace experiences. *Landsc. Urban Plann.* 112 (1), 1–9. <https://doi.org/10.1016/j.landurbplan.2012.12.012>.

- Doroud, N., Fossey, E., Fortune, T., 2018. Place for being, doing, becoming and belonging: a meta-synthesis exploring the role of place in mental health recovery. *Health Place* 52, 110–120. <https://doi.org/10.1016/j.healthplace.2018.05.008>.
- Duff, C., 2012. Exploring the role of 'enabling places' in promoting recovery from mental illness: a qualitative test of a relational model. *Health Place* 18 (6), 1388–1395. <https://doi.org/10.1016/j.healthplace.2012.07.003>.
- Edelman Berland, 2016. Survey for Persil's dirt is good campaign. <https://www.edelman.co.uk/work/dirt-is-good>. (Accessed 20 September 2019).
- Emmerson, P., 2019. More-than-therapeutic landscapes. *Area* 51 (3), 595–602. <https://doi.org/10.1111/area.12557>.
- Engemann, K., et al., 2019. Residential green space in childhood is associated with lower risk of psychiatric disorders from adolescence into adulthood. *Proc. Natl. Acad. Sci. U. S. A.* 116 (11), 5188–5193. <https://doi.org/10.1073/pnas.1807504116>.
- Evans, G.W., Jones-Rounds, M.L., Belojevic, G., Vermeulen, F., 2012. Family income and childhood obesity in eight European cities. *Soc. Sci. Med.* 75 (3), 477–481.
- Evered, E., 2016. The role of the urban landscape in restoring mental health in Sheffield, UK: service user perspectives. *Landscape Res.* 41 (6), 678–694. <https://doi.org/10.1080/01426397.2016.1197488>.
- Faber Taylor, A., Kuo, F.E., 2009. Children with attention deficits concentrate better after walk in the park. *J. Atten. Disord.* 12 (5), 402–409. <https://doi.org/10.1177/1087054708323000>.
- Faber Taylor, A., Kuo, F.E., 2011. Could exposure to everyday green spaces help treat ADHD? Evidence from children's play settings. *Appl. Psychol.: Health Well-Being* 3 (3), 281–303. <https://doi.org/10.1111/j.1758-0854.2011.01052>.
- Faber Taylor, A., Kuo, F.E., Sullivan, W.C., 2002. Views of nature and self-discipline: evidence from inner city children. *J. Environ. Psychol.* 22 (1–2), 49–63. <https://doi.org/10.1006/jevp.2001.0241>.
- Fisher, D.R., 2019. The broader importance of #Fridays For Future. *Nat. Clim. Change* 9 (6), 430–431. <https://doi.org/10.1038/s41558-019-0484-y>.
- Fletcher, R., 2017. Connection with nature is an oxymoron: a political ecology of "nature-deficit disorder". *J. Environ. Educ.* 48 (4), 226–233. <https://doi.org/10.1080/00958964.2016.1139534>.
- Fox, N.J., 2011. The ill-health assemblage: beyond the body-with-organs. *Health Sociol. Rev.* 20 (4), 359–371. <https://doi.org/10.5172/hesr.2011.20.4.359>.
- Gesler, W.M., 1992. Therapeutic landscapes: medical issues in light of the new cultural geography. *Soc. Sci. Med.* 34 (7), 735–746.
- Gorman, R., 2019. Thinking critically about health and human-animal relations: therapeutic affect within spaces of care farming. *Soc. Sci. Med.* 231, 6–12. <https://doi.org/10.1016/j.socscimed.2017.11.047>.
- Grahn, P., Martensson, F., Lindblad, B., Nilsson, P., Ekman, A., 1997. Ute Pa Dagis (Outdoors at Daycare), p. 145. *Stadt and Land (City and country)*.
- Greenhalgh, T., Hurwitz, B., 1999. Why study narrative? Narrative based medicine. *BMJ (Br. Med. J.)* 318 (7175), 48–50.
- Gruebner, O., Rapp, M.A., Adli, M., Kluge, U., Galea, S., Heinz, A., 2017. Cities and mental health. *Deutsches Ärzteblatt International* 114 (8), 121. <https://doi.org/10.3238/arztebl.2017.012>.
- Guite, H.F., Clark, C., Ackrill, G., 2006. The impact of the physical and urban environment on mental well-being. *Publ. Health* 120 (12), 1117–1126.
- Halpern, D., 1996. More than bricks and mortar? Mental health and the built environment. *PsychCRITIQUES* 41 (7).
- Haraway, D., 2016. *Staying with the Trouble: Making Kin in the Chthulucene*. Duke University Press, Durham, NC. <https://doi.org/10.1215/9780822373780>.
- Hartig, T., Mang, M., Evans, G.W., 1991. Restorative effects of natural environment experiences. *Environ. Behav.* 23 (1), 3–26. <https://doi.org/10.1177/0013916591231001>.
- Hawton, K., Anthony, J., 2005. Suicide and deliberate self harm in young people. *Br. Med. J.* 330 (7496), 891–894.
- Hipp, J.A., et al., 2016. The relationship between perceived greenness and perceived restorativeness of university campuses and student-reported quality of life. *Environ. Behav.* 48 (10), 1292–1308. <https://doi.org/10.1177/0013916515598200>.
- Hitchings, R., 2013. Studying the preoccupations that prevent people from going into green space. *Landscape Urban Plann.* 118 (C), 98–102. <https://doi.org/10.1016/j.landurbplan.2012.09.006>.
- hooks, b., 1990. Marginality as a site of resistance. In: Ferguson, R., et al. (Eds.), *Out There: Marginalization and Contemporary Cultures*. MIT, Cambridge, MA, pp. 241–243.
- Hughes, J., Richardson, M., Lumber, R., 2018. Evaluating connection to nature and the relationship with conservation behaviour in children. *J. Nat. Conserv.* 45, 11–19. <https://doi.org/10.1016/j.jnc.2018.07.004>.
- Hughes, J., et al. Hughes, J., Rogerson, M., Barton, J., Bragg, R., 2019. Age and connection to nature: when is engagement critical? *Front. Ecol. Environ.* 17 (5), 265–269. <https://doi.org/10.1002/fee.2035>.
- Kahn, P.H., Severson, R.L., Ruckert, J.H., 2009. The human relation with nature and technological nature. *Curr. Dir. Psychol. Sci.* 18 (1), 37–42. <https://doi.org/10.1111/j.1467-8721.2009.01602.x>.
- Kaplan, S., 1995. The restorative benefits of nature: toward an integrative framework. *J. Environ. Psychol.* 15 (3), 169–182. [https://doi.org/10.1016/0272-4944\(95\)90001-2](https://doi.org/10.1016/0272-4944(95)90001-2).
- Kaplan, R., Kaplan, Stephen, 1989. *The Experience of Nature: a Psychological Perspective*. Cambridge University Press, Cambridge.
- Kaplan, P., Kaplan, S., 2002. Adolescents and the natural environment. In: Kahn, P., Kellert, S. (Eds.), *Children and Nature*. MIT Press, Cambridge, pp. 227–253.
- Kellert, S.H., Wilson, E.O. (Eds.), 1993. *The Biophilia Hypothesis*. Island, Washington, DC.
- Kelz, C., Evans, G.W., Röderer, K., 2015. The restorative effects of redesigning the schoolyard: a multi-methodological, quasi-experimental study in rural Austrian middle schools. *Environ. Behav.* 47 (2), 119–139. <https://doi.org/10.1177/0013916513510528>.
- Kessler, R., Berglund, P., Demler, O., Jin, R., Merikangas, K., Walters, E., 2005. Lifetime prevalence and age-of-onset distributions of DSM-IV disorders in the national comorbidity survey replication. *Arch. Gen. Psychiatr.* 62 (6), 593–602. <https://doi.org/10.1001/archpsyc.62.6.593>.
- Kolb, B., 2008. Involving, sharing, analysing potential of the participatory photo interview. *Forum Qual. Soc. Res.* 9 (3).
- Korpela, K.M., Ylén, M., 2007. Perceived health is associated with visiting natural favourite places in the vicinity. *Health Place* 13 (1), 138–151. <https://doi.org/10.1016/j.healthplace.2005.11.002>.
- Korpela, K., Yttä, M., Hartig, T., 2002. Restorative experience, self-regulation, and children's place preferences. *J. Environ. Psychol.* 22 (4), 387–398. <https://doi.org/10.1006/jevp.2002.0277>.
- Kraftl, P., et al., 2019. (Re)thinking (re)connection: young people, "natures" and the water-energy-food nexus in São Paulo State, Brazil. *Trans. Inst. Br. Geogr.* 44 (2), 299–314. <https://doi.org/10.1111/tran.12277>.
- Larson, L.R., et al., 2018. Gray space and green space proximity associated with higher anxiety in youth with autism. *Health Place* 53, 94–102.
- Latour, B., 2000. When things strike back: a possible contribution of 'science studies' to the social sciences. *Br. J. Sociol.* 51 (1), 107–123. <https://doi.org/10.1111/j.1468-4446.2000.00107.x>.
- Lau, S.S.Y., Yang, F., 2009. Introducing healing gardens into a compact university campus: design natural space to create healthy and sustainable campuses. *Landscape Res.* 34 (1), 55–81.
- Lederbogen, F., Kirsch, P., Haddad, L., Streif, F., Tost, H., Schuch, P., et al., 2011. City living and urban upbringing affect neural social stress processing in humans. *Nature* 474 (7352), 498–501. <https://doi.org/10.1038/nature10190>.
- Lekies, K.S., Yost, G., Rode, J., 2015. Urban youth's experiences of nature: implications for outdoor adventure recreation. *J. Outdoor Recreat. Tour.* 9, 1–10. <https://doi.org/10.1016/j.jort.2015.03.002>.
- Lenz Taguchi, H., 2012. A diffractive and Deleuzian approach to analysing interview data. *Fem. Theor.* 13 (3), 265–281. <https://doi.org/10.1177/1464700112456001>.
- Li, D., Larsen, L., Yang, Y., Wang, L., Zhai, Y., Sullivan, W.C., 2019. Exposure to nature for children with autism spectrum disorder: benefits, caveats, and barriers. *Health Place* 55, 71–79.
- Liprini, R.M., Coetzee, N., 2017. The relationship between students' perceptions of the University of Pretoria's on-campus green spaces and attention restoration. *Hum. Geogr.: J. Stud. Res. Hum. Geogr.* 11 (2), 155–167. <https://doi.org/10.5719/hgeo.2017.112.2>.
- Lisewski-Hobson, V., Watkins, C., 2019. 'My wood isn't one of those dark and scary ones': children's experience and knowledge of woodland in the English rural landscape. *Landscape Res.* 44 (5), 507–525. <https://doi.org/10.1080/01426397.2018.1493444>.
- Little, B.R., Ward, C., Thompson, 2010. Opening space for project pursuit: affordance, restoration and chills. In: Aspinall, P., Bell, S. (Eds.), *Innovative Approaches to Researching Landscape and Health*. Open Space: People Space, vol. 2. Routledge, Abingdon, pp. 163–178.
- Louv, R., 2008. *Last Child in the Woods: Saving Our Children from Nature-Deficit Disorder*. Chapel Hill, second ed. Algonquin books, North Carolina.
- Lucas, C., Colwell, M., 2018. Children Are Developing a Nature Deficit Disorder. *The Times*. October 25th, 2018. (Accessed 14 July 2019).
- Lyytimäki, J., et al., 2008. Nature as a nuisance? Ecosystem services and disservices to urban lifestyle. *Environ. Sci. J. Integr. Environ. Res.* 5 (3), 161–172. <https://doi.org/10.1080/15693430802055524>.
- Maas, J., et al., 2009. Morbidity is related to a green living environment. *J. Epidemiol. Community Health* 63 (12), 967–973. <https://doi.org/10.1136/jech.2008.079038>.
- Maller, C.J., 2009. Promoting children's mental, emotional and social health through contact with nature: a model. *Health Educ.* 109 (6), 522–543. <https://doi.org/10.1108/09654280911001185>.
- Maller, C.J., Townsend, M., 2006. Children's mental health and wellbeing and hands-on contact with nature: perceptions of principals and teachers. *Int. J. Learning* 12 (4), 357–373.
- Malone, K., 2016. Posthumanist approaches to theorizing children's human-nature relations. In: Skelton, T., Nairn, K., Kraftl, P. (Eds.), *Space, Place, and Environment. Geographies of Children and Young People*, vol. 3. Springer, Singapore.
- Markevych, I., et al., 2017. Exploring pathways linking greenspace to health: theoretical and methodological guidance. *Environ. Res.* 158, 301–317. <https://doi.org/10.1016/j.envres.2017.06.028>.
- McConnell, A.R., Paige Lloyd, E., Humphrey, B.T., 2019. We are family: viewing pets as family members improves wellbeing. *Anthozoos* 32 (4), 459–470. <https://doi.org/10.1080/08927936.2019.1621516>.
- Mceachan, R.C., et al., 2018. Availability, use of, and satisfaction with green space, and children's mental wellbeing at age 4 Years in a multicultural, deprived, urban area: results from the born in bradford cohort study. *Lancet Planet. Health* 2 (6), 244–254.
- McFarland, A.L., Waliczek, T.M., Zajicek, J.M., 2010. Graduate student use of campus green spaces and the impact on their perceptions of quality of life. *HortTechnology* 20 (1), 186–192.
- McFarlane, R., 2017. Badger or Bulbasaur. Have children lost touch with nature? *Guardian*. September 30th 2017. (Accessed 14 July 2019).
- McManus, S., et al., 2009. Adult Psychiatric Morbidity in England, 2007. The Health and Social Care Information Centre, Social Care Statistics, Leeds. <https://files.digital.nhs.uk/publicationimport/pub02xxx/pub02931/adul-psyc-morb-res-hou-su-r-eng-2007-rep.pdf>. (Accessed 19 May 2019).

- Mears, M., Brindley, P., 2019. Measuring urban greenspace distribution equity: the importance of appropriate methodological approaches. *ISPRS Int. J. Geo-Inf.* 8 (6), 286.
- Miller, J.R., 2005. Biodiversity conservation and the extinction of experience. *Trends Ecol. Evol.* 20 (8), 430–434. <https://doi.org/10.1016/j.tree.2005.05.013>.
- Milligan, C., Bingley, A., 2007. Restorative places or scary spaces? The impact of woodland on the mental well-being of young adults. *Health Place* 13 (4), 799–811. <https://doi.org/10.1016/j.healthplace.2007.01.005>.
- MIND How to Improve your Mental Wellbeing. <https://www.mind.org.uk/information-support/tips-for-everyday-living/wellbeing/>. (Accessed 17 July 2019).
- Moore, T., et al., 2018. The effects of changes to the built environment on the mental health and well-being of adults: systematic review. *Health Place* 53, 237–257. <https://doi.org/10.1016/j.healthplace.2018.07.012>.
- Morrison Gutman, L., Joshi, H., Parsonage, M., Schoon, I., 2015. Children of the New Century: Mental Health Findings from the Millenium Cohort Study. Centre for Mental Health, London.
- Moses, T., 2009. Self-labeling and its effects among adolescents diagnosed with mental disorders. *Soc. Sci. Med.* 68 (3), 570–578. <https://doi.org/10.1016/j.socscimed.2008.11.003>.
- National Audit Office, 2018. Improving Children's and Young People's Mental Health Services. Report by the Comptroller and Auditor General. Department of Health & Social Care, NHS England and Health Education England. NAO, London. <https://www.nao.org.uk/report/improving-children-and-young-peoples-mental-health-services/>. (Accessed 12 September 2019).
- Natural England, 2015. Monitor of Engagement with the Natural Environment. The National Survey on People and the Natural Environment. Annual Report 2013–2014.
- Natural England, 2019. Monitor of Engagement with the Natural Environment. The National Survey on People and the Natural Environment. Children and Young People Report. Analysis of Data Collected between March 2018 and February 2019.
- Nesbitt, L., Meitner, M., Sheppard, S., Girling, C., 2018. The dimensions of urban green equity: a framework for analysis. *Urban For. Urban Green.* 34, 240–248.
- Pain, R., 2006. Paranoid parenting? Rematerializing risk and fear for children. *Soc. Cult. Geogr.* 7 (2), 221–243. <https://doi.org/10.1080/14649360600600585>.
- Parr, H., 2008. Mental Health and Social Space: towards Inclusionary Geographies? Wiley Blackwell, London.
- Peen, J., et al., 2007. Is the prevalence of psychiatric disorders associated with urbanization? *Soc. Psychiatr. Psychiatr. Epidemiol.* 42 (12), 984–989. <https://doi.org/10.1007/s00127-007-0256-2>.
- Pellegrini, P., Baudry, S., 2014. Streets as new places to bring together both humans and plants: examples from Paris and Montpellier (France). *Soc. Cult. Geogr.* 15 (8), 871–900. <https://doi.org/10.1080/14649365.2014.974067>.
- Phillips, C., Atchison, J., 2018. Seeing the Trees for the (Urban) Forest: More-Than-Human Geographies and Urban Greening. *Australian Geographer*, pp. 1–14. <https://doi.org/10.1080/00049182.2018.1505285>.
- Philo, C., Parr, H., 2019. Staying with the trouble of institutions. *Area* 51 (2), 241–248. <https://doi.org/10.1111/area.12531>. *Psychology*, 3, 77–101.
- Pinder, R., et al., 2009. Exploring perceptions of health and the environment: a qualitative study of Thames Chase Community Forest. *Health Place* 15 (1), 349–356. <https://doi.org/10.1016/j.healthplace.2008.06.006>.
- Public Health England, 2019. Place based approaches for reducing health inequalities. <https://www.gov.uk/government/publications/health-inequalities-place-based-approaches-to-reduce-inequalities/place-based-approaches-for-reducing-health-inequalities-main-report>. (Accessed 18 July 2019).
- Puig de la Bellacasa, M., 2017. Matters of Care: Speculative Ethics in More than Human Worlds. University of Minnesota Press.
- Pyle, R.M., 1978. The extinction of experience. *Horticulture* 56, 64–67.
- Ratcliffe, E., Korpela, K.M., 2018. Time-and self-related memories predict restorative perceptions of favorite places via place identity. *Environ. Behav.* 50 (6), 690–720. <https://doi.org/10.1177/0013916517712002>.
- Rautio, P., 2011. Writing about everyday beauty: anthropomorphizing and distancing as literary practices. *Environ. Commun.* 5 (1), 104–123. <https://doi.org/10.1080/1524032.2010.540251>.
- Rautio, P., 2013. Children who carry stones in their pockets: on autotelic material practices in everyday life. *Child Geogr.* 11 (4), 394–408.
- Richardson, M., Hallam, J., Lumber, R., 2015. One thousand good things in nature: aspects of nearby nature associated with improved connection to nature. *Environ. Val.* 24, 603–619. <https://doi.org/10.3197/096327115X14384223590131>.
- Richardson, M., et al., 2019. A measure of nature connectedness for children and adults: validation, performance, and insights. *Sustainability* 11 (12), 3250. <https://doi.org/10.3390/SU11123250>.
- Rigolon, A., Flohr, T., 2014. Access to parks for youth as an environmental justice issue: access inequalities and possible solutions. *Buildings* 4 (2), 69–94. <https://doi.org/10.3390/buildings4020069>.
- Rishbeth, C., Finney, N., 2006. Novelty and nostalgia in urban greenspace: refugee perspectives. *Tijdschr. Econ. Soc. Geogr.* 97 (3), 281–295. <https://doi.org/10.1111/j.1467-9663.2006.00520.x>.
- Rishbeth, C., Blachnicka-Ciack, D., Darling, J., 2019. Participation and wellbeing in urban greenspace: 'curating sociability' for refugees and asylum seekers. *Geoforum* 106, 125–134. <https://doi.org/10.1016/j.geoforum.2019.07.014>.
- Roe, J., Aspinall, P., 2011. The restorative outcomes of forest school and conventional school in young people with good and poor behaviour. *Urban For. Urban Green.* 10 (3), 205–212. <https://doi.org/10.1016/j.ufug.2011.03.003>.
- RSPB, 2010. Every child outdoors. children need nature. nature needs children. http://www2.rspb.org.uk/Images/everychildoutdoors_tcm9-259689.pdf. (Accessed 15 August 2019).
- Rudd, M., Vohs, K.D., Aaker, J., 2012. Awe expands people's perception of time, alters decision making, and enhances well-being. *Psychol. Sci.* 23 (10), 1130–1136. <https://doi.org/10.1177/0956797612438731>.
- Sack, W.H., Him, C., Dickason, D., 1999. Twelve-year follow-up study of Khmer youths who suffered massive war trauma as children. *J. Am. Acad. Child Adolesc. Psychiatr.* 38 (9), 1173–1179.
- Sempik, J., 2010. Green care and mental health: gardening and farming as health and social care. *Ment. Health Soc. Inclusion* 14 (3), 15–22. <https://doi.org/10.5042/mhsl.2010.0440>.
- Skar, M., et al., 2016. Why do children not play in nearby nature? Results from a Norwegian survey. *J. Adventure Educ. Outdoor Learn.* 16 (3), 239–255. <https://doi.org/10.1080/14729679.2016.1140587>.
- Slee, B., 2002. Social exclusion in the countryside. *Countryside Recreat.* 10 (1), 2–7.
- Söderström, Ola, et al., 2016. Unpacking 'the City': an experience-based approach to the role of urban living in psychosis. *Health Place* 42, 104–110. <https://doi.org/10.1016/j.healthplace.2016.09.002>.
- Soga, M., Gaston, K.J., 2016. Extinction of experience: the loss of human–nature interactions. *Front. Ecol. Environ.* 14 (2), 94–101. <https://doi.org/10.1002/fee.1225>.
- Sugiyama, T., Leslie, E., Giles-Corti, B., Owen, N., 2008. Associations of neighbourhood greenness with physical and mental health: do walking, social coherence and local social interaction explain the relationships? *J. Epidemiol. Community Health* 62 (5). <https://doi.org/10.1136/jech.2007.064287>.
- Tam, K.-P., Lee, S.-L., Chao, M.M., 2013. Saving Mr. Nature: anthropomorphism enhances connectedness to and protectiveness toward nature. *J. Exp. Soc. Psychol.* 49 (3), 514–521. <https://doi.org/10.1016/j.jesp.2013.02.001>.
- Tarr, J., Gonzalez-Polledo, E., Cornish, F., 2018. On liveness: using arts workshops as a research method. *Qual. Res.* 18 (1), 36–52. <https://doi.org/10.1177/1468794117694219>.
- Thomson, R.M., Katikireddi, S.V., 2018. Mental health and the jilted generation: using age-period-cohort analysis to assess differential trends in young people's mental health following the Great Recession and austerity in England. *Soc. Sci. Med.* 214, 133–143. <https://doi.org/10.1016/j.socscimed.2018.08.034>.
- Tolia-Kelly, D., 2004. Locating processes of identification: studying the precipitates of remembrance through artefacts in the British Asian home. *Trans. Inst. Br. Geogr.* 29 (3), 314–329.
- Tuan, Y., 1980. *Landscapes of Fear*. Oxford: Blackwell. Ulrich, p. 2003.
- Ulrich, R.S., et al., 1991. Stress recovery during exposure to natural and urban environments. *J. Environ. Psychol.* 11 (3), 201–230. [https://doi.org/10.1016/S0272-4944\(05\)80184-7](https://doi.org/10.1016/S0272-4944(05)80184-7).
- van den Berg, A., Maas, J., Verheij, R., Groenewegen, P., 2010. Green space as a buffer between stressful life events and health. *Soc. Sci. Med.* 70 (8), 1203–1210. <https://doi.org/10.1016/j.socscimed.2010.01.002>.
- Wakefield, S., McMullan, C., 2005. Healing in places of decline: (re)imagining everyday landscapes in Hamilton, Ontario. *Health Place* 11 (4), 299–312. <https://doi.org/10.1016/j.healthplace.2004.05.001>.
- 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. *Landsc. Urban Plann.* 105, 221–229. <https://doi.org/10.1016/j.landurbplan.2011.12.015>.
- Ward Thompson, C., Aspinall, P., Roe, J., 2014. Access to green space in disadvantaged urban communities: evidence of salutogenic effects based on biomarker and self-report measures of wellbeing. *Procedia Soc. Behav. Sci.* 153, 10–12.
- Ward Thompson, C., Traviou, P., Roe, J., 2006. Free-range Teenagers. The Role of Wild Adventure Space in Young People's Lives. Final Report Prepared for Natural England. Edinburgh College of Art and Heriot-Watt University. OPENspace.
- Wells, N.M., 2000. At home with nature: effects of "greenness" on children's cognitive functioning. *Environ. Behav.* 32 (6), 775–795. <https://doi.org/10.1177/00139160021972793>.
- Wells, N.M., Evans, G.W., 2003. Nearby nature: a buffer of life stress among rural children. *Environ. Behav.* 35 (3), 311–330. <https://doi.org/10.1177/0013916503035003001>.
- Wen, M., et al., 2013. Spatial disparities in the distribution of parks and green spaces in the USA. *Ann. Behav. Med.* 45 (Suppl. 1), 18–27. <https://doi.org/10.1007/s12160-012-9426-x>.
- White, M.P., Alcock, I., Grellier, J., Wheeler, B.W., Hartig, T., Warber, S.L., Bone, A., Depledge, M.H., Fleming, L.E., 2019. Spending at least 120 minutes a week in nature is associated with good health and wellbeing. *Sci. Rep.* 9 (1), 7730. <https://doi.org/10.1038/s41598-019-44097-3>.
- Wilson, K., 2003. Therapeutic landscapes and First Nations peoples: an exploration of culture, health and place. *Health Place* 9 (2), 83–93. [https://doi.org/10.1016/S1353-8292\(02\)00016-3](https://doi.org/10.1016/S1353-8292(02)00016-3).
- Wolch, J.R., Byrne, J., Newell, J.P., 2014. Urban green space, public health, and environmental justice: the challenge of making cities 'just green enough'. *Landsc. Urban Plann.* 125 (C), 234–244. <https://doi.org/10.1016/j.landurbplan.2014.01.017>.
- Woolley, H.E., Griffin, E., 2015. Decreasing experiences of home range, outdoor spaces, activities and companions: changes across three generations in Sheffield in north England. *Child Geogr.* 13 (6), 677–691. <https://doi.org/10.1080/14733285.2014.952186>.
- Woolley, H., Pattacini, L., Somerset-Ward, A., 2009. Children and the Natural Environment: Experiences, Influences and Interventions - Summary. Natural England Commissioned Reports. Number 026.
- World Health Organisation, 2017. Urban greenspace interventions and health: a review of impacts and effectiveness. A full report. <http://www.euro.who.int/en/health-topics/environment-and-health/urban-health/publications/2017/urban-green-space-i>

- interventions-and-health-a-review-of-impacts-and-effectiveness.-full-report-2017. (Accessed 8 August 2019).
- Wray-Lake, L., Flanagan, C.A., Osgood, D.W., 2010. Examining trends in adolescent environmental attitudes, beliefs, and behaviors across three decades. *Environ. Behav.* 42 (1), 61–85. <https://doi.org/10.1177/0013916509335163>.
- y Garcia, E.F., Duberstein, P., Paterniti, D.A., Cipri, C.S., Kravitz, R.L., Epstein, R.M., 2012. Feeling labelled, judged, lectured, and rejected by family and friends over depression: cautionary results for primary care clinicians from a multi-centered, qualitative study. *BMC Fam. Pract.* 13 (1), 64.