



How properties of urban greenspaces shape well-being across age groups: A qualitative study

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ABSTRACT

The prevalence of poor mental health among younger and older generations is rising. Urban greenspaces (UGS) can provide well-being benefits and are used by all ages, so it is important that these spaces provide benefits across the life course. So far, studies tend to focus on one age group and lack focus on properties of these spaces which shape well-being across generations. Our aim was to explore what properties of UGS can shape well-being across age groups and to what extent are UGS for social interactions across age groups. Qualitative semi-structured interviews were conducted online with 20 participants in four age groups: adolescents, young adults, adults, and older adults. Interviewees were asked about visits to UGS, preferences for multi-sensory components, and how spaces shape their well-being. Using thematic analysis, four themes were identified which were common across all age groups: UGS can provide a sense of escape; there are practical needs surrounding access and contact with UGS; being a space to share with other users; and the importance of seasonal multi-sensory components. Whilst findings showed that there are properties of UGS which are valued across multiple ages, differences were also revealed regarding interactions across ages. By researching qualitatively across ages, the complex similarities and differences between ages can be understood. Future research should also explore interactions between age groups as well as the views of non-users of UGS and their reasons for not visiting UGS.

1. Introduction

There is a current mental health crisis amongst youth (Thomson and Katikireddi, 2018), in addition to a growing older population with increasingly poorer mental health (United Nations, 2013; World Health Organization, 2018). Further, living in poor environmental and social conditions can lead to poor mental health, as well as increased morbidity and mortality rates (Becker and Kleinman, 2013). Mental health has a significant impact on individuals and communities and is associated with high economic burden globally (Doran and Kinchin, 2019). In 2022, mental health problems cost the UK economy at least £118 billion with 10.3 million reported cases of mental ill-health in one year (McDaid et al., 2022). One risk factor for mental health problems is urbanization and a move from rural to urban living (Ventriglio et al., 2021). By 2060, it has been estimated that 80 % of the world's population will be living in megacities (Bhugra et al., 2019). One suggestion to reduce the stressful factors associated with urban living is to improve access to

green areas (Ventriglio et al., 2021).

Urban greenspace (UGS), such as parks, green corridors, and residential greenery, are used by all age groups and can provide multiple benefits for mental health (Reece et al., 2021; Callaghan et al., 2021; Corazon et al., 2019; Lee and Lee, 2019). Roe and McCay (2021) outline these specific benefits as: (a) protection for mental health (as nature exposure as a child can reduce the risk of later mental health problems); (b) improved cognitive health including increased memory recall and mental alertness; (c) increased social well-being including social interaction and place attachment; (d) improved stress regulation; (e) improved emotional well-being including reduced depression and anxiety; and (f) the management of mental health problems including symptom management of severe mental health problems. This wide evidence base has led to the expansion of 'green prescribing', encouraging people into nature to help those with mental health problems to manage their symptoms (Wood et al., 2023; Roe and McCay, 2021; Van den Berg, 2017). Going out into UGS could be a non-pharmacological

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option for addressing the burden of mental health at a population level.

Multiple age groups visit UGS, and the well-being benefits gained have been extensively documented (Callaghan et al. 2021; Derksen, 2012; McCormack et al., 2010). However, research shows that preferences for particular properties of UGS vary according to age group (Rivera et al., 2021; Veitch et al., 2021, 2020, 2020a; Ayala-Azcárraga et al., 2019; Nordh and Østby, 2013). For example, children have different needs in a park than adolescents, adults, and older adults (McGrath et al., 2015). For children in Australia, there is emphasis on the presence of play equipment, water features, sports courts, and picnic areas (Veitch et al., 2020). Similarly, adolescents in Australia aged 13–18 years old enjoy the presence of sports features, playgrounds, seating, picnic areas, open space, good maintenance, and accessible locations (Rivera et al., 2021). Further, university studies in Norway describe ‘lots of grass’, flowers, and water features as being features which are restorative and is defined as aiding in renewing depleted psychological resources (Nordh and Østby, 2013; Hartig et al., 1997). Adult users of nine various sized parks in Mexico City were quantitatively surveyed where results showed that well-being in an UGS is influenced by favourable social interactions and trustworthy users of a space (Ayala-Azcárraga et al., 2019). They also found that spatial components (size, accessibility, and distance to the park) were important predictors of use of the park and self-reported well-being. They concluded that properties of parks can influence well-being if they are focused on favouring social interactions, rather than being aesthetically pleasing. Further studies found that older adults aged 65+ years old stated that a well-maintained, peaceful, and attractive area encouraged visits, as well as the presence of shady trees, birdlife, other people, seating, facilities, and water features (Veitch et al., 2021, 2020a).

The findings of previous literature tend to focus on specific age groups, while there seems to be a lack of research aimed at exploring differences and commonalities across several age groups. One study by Sundevall and Jansson (2020) in Sweden did incorporate park users of different ages (children, adolescents, and older adults), however their main focus was on management of UGS and creating a multifunctional inclusive park space. Using walking interviews, they found similarities across ages in relation to appreciating contact with nature, social places for their own age groups, clean and safe areas, and having a variety of atmospheres within the park. It is important to focus research across multiple age groups because UGS are used by all ages and so need to be explored in an inclusive way which considers opinions across the life course.

Researchers have typically invoked two key theories when discussing associations between experiences of UGS and health and well-being outcomes: Attention Restoration Theory (ART) (Kaplan and Kaplan, 1989), and Stress Recovery Theory (SRT) (Ulrich, 1983). Firstly, ART posits that there can be recovery in attentional fatigue through the components of ‘being away’, ‘extent’, ‘soft fascination’, and ‘compatibility’ (Kaplan and Kaplan, 1989). Whilst all four of these components can be also be found in urban spaces, ART states that they are more common in natural spaces. Overall, these components need to be perceived by individuals in order for an environment to be restorative. Moreover, the psycho-evolutionary theory, or SRT, states that being in a natural space can help recover from stressful situations (Ulrich, 1983; Ulrich et al., 1991). This theory explains that psychological stress recovery involves a positive change in emotional state, and physiological recovery relates to a change in parasympathetic nervous activity (Ulrich et al., 1991). Further, more recent frameworks have emphasized the importance of use of greenspace on the causal pathway to health benefits (Hartig et al., 2014; Nieuwenhuijsen et al., 2017). It is important to understand what all age groups want and need from UGS so to encourage use which can then lead to health benefits.

Going beyond the conventional narrative of theories of restoration, Hartig (2021) presents new theories which describe (1) the restoration of relational resources between close social groups (relational restoration theory; RRT) and (2) the restoration of social resources in a larger

community or population (collective restoration theory; CRT). Behaviours can be viewed at the level of a smaller group (RRT), or a wider community (CRT), and depletion and restoration can also occur at these levels. These theories are important to recognise as people visit UGS as individuals as well as in social groups of varying sizes and types (e.g., different ages). If UGS can address the needs of the community, they could help restore depleted resources held within smaller groups and larger communities. A better understanding of shared perspectives among diverse community members on the properties of UGS which could enable such restoration is therefore required.

So far, studies have tended to focus on one age group meaning there is limited intergenerational research in the field. Despite some initial studies, there is a gap in the literature regarding interactions across UGS users of different ages. Here, the term ‘intergenerational’ is used in the same way as in a review by Nelischer and Loukaitou-Sideris (2022), defined by Pain (2005) as relating to intergenerational practice. As opposed to multi-generational, intergenerational practice focuses on creating relationships between individuals of different generations (Cushing and van Vliet, 2016; Nelischer and Loukaitou-Sideris, 2022). Taking a policy and practice approach that aims to promote social inclusion and cohesion, and health and well-being across generations, there is a need to understand what physical characteristics and patterns of use are important to users, as positive perceptions of these can explain the links between UGS and social cohesion (Wan et al., 2021; Clarke et al., 2023; Jennings and Bamkole, 2019). It is well documented that social contacts and having increased social cohesion are important mediators in the relationship between greenspace and health and well-being (Hartig et al., 2014; Rios et al., 2012; Cattell et al., 2008). Therefore, understanding how UGS and their properties can shape such intergenerational interactions is required. A further aim of this study is to investigate social interactions across different age groups within UGS. This is particularly important to look at, as some previous literature around UGS has shown there can be conflicts (Groshong et al., 2020; Mak and Jim, 2018). For example, adults self-excluding themselves from UGS due to the presence of unsupervised, unfriendly younger people and potential anti-social behaviour (Seaman et al., 2010).

Another gap is regarding multi-sensory properties of UGS. Research focused on the benefits of UGS tends to concentrate on vision, with some arguing sight as the most important sense when it comes to experiencing landscapes and influences on health (Velarde et al., 2007). Not only can this approach be problematic for individuals with sight impairments, if spaces are researched and designed with only one sensory input in mind (Bell, 2019), but studies show that other sensory properties can also have a positive impact on well-being (Van Houwelingen-Snippe et al., 2021; Zhang et al., 2019; Ratcliffe, 2021; Hall et al., 2013; Grahn and Stigsdotter, 2010). In fact, UGS have been described as places which are perceived in multiple sensory dimensions and that perception should be viewed as a holistic experience (Bell, 2012; Grahn and Stigsdotter, 2010; Abraham et al., 2010; Herranz-Pascual et al., 2019). However, limited research has examined a combination of sensory stimuli in UGS and the multi-sensory effects that they can provide for well-being. Multi-sensory perception can affect the restorative effect of an UGS, which is shown through a theoretical framework developed by Zhang et al. (2019), and applied to an urban park in China. The framework explains how visual, auditory, and tactile perceptions are linked directly to the restorative effects of parks, as well as being mediated through emotional response and behavioural activities. Similarly with smells, the olfactory pleasantness of a space has been found to be linked with perceived restorativeness and can be just as meaningful as visual contact with nature (Martínez-Soto et al., 2021).

Participatory approaches which amplify the public’s voice are key to the success of UGS design projects which benefit the well-being of diverse communities. It is important that all ages have access to UGS in order to benefit their well-being, acknowledging that each age group may have different needs. This aligns with a global movement which recognizes the diversity in cities and is moving towards designing age-

friendly, child-friendly, and overall inclusive urban spaces (Roe and McCay, 2021; Brown et al., 2019; Fitzgerald and Caro, 2014). For example, with ‘active ageing’, where there is the aim to enhance quality of life and create opportunities for older adults in relation to health, security, and participation (WHO, 2013). Interactions across age groups can contribute to active ageing and be highly important (Fitzgerald and Caro, 2014). In the literature, a systematic review by Levy-Storms et al. (2018) recommended that opinions of older adults should be included in urban park design as they have specific needs in regard to properties of UGS. Also, children have particular needs for a space and some projects are involving children in community greening projects (e.g., in Canada) and co-designing of spaces as it has been shown children have a strong desire to shape their own environments (Campbell and Musa, 2018). By involving all of the community, it allows for the design of spaces with the user’s needs as a main focus and for the community to take ownership of a space. Qualitative research is particularly well-suited to this aim as it allows for involvement from the community, with people being able to share their in-depth opinions about their experiences of UGS. A qualitative approach, such as individual interviews, can uncover detailed insights which quantitative methods alone cannot achieve.

The aim of this study was to explore how properties of UGS shape well-being across age groups. It is important to identify the commonalities across ages and in particular what multi-sensory properties of UGS are important for multiple ages. Furthermore, the aim of this research was not to establish a comprehensive set of greenspace correlates of well-being among different generations, but instead to understand how properties of UGS contribute to shaping well-being across ages to inform UGS design. By involving participants across multiple age groups, this study will contribute to the literature and provide an element of novelty. For the current study, the following research questions are proposed; (1) What common properties of UGS shape well-being similarly across age groups?, and (2) How do UGS support social interactions across different age groups? In order to address these aims and research questions, a qualitative semi-structured interview study was conducted.

2. Methods

2.1. Participants

The study was approved by the University of the West of England’s Faculty Research Ethics Committee. A total of 20 participants (n females = 14 (70 %); median age = 25 years old; age range = 12 to 80) were purposively sampled in Bristol (UK) across four age groups: adolescents 11–16 years old, young adults 17–24 years old, adults 25–64 years old, and older adults 65+ years old. Five participants were recruited for each age group. Additionally, two more participants were recruited in the adolescents age group for the purpose of piloting. Most participants were White British, with two being White Other (non-British), and one participant of Pakistani ethnic background.

Due to the range of targeted age groups, participants were recruited through multiple pathways (Table 1). Organisations relevant to the age groups were contacted and asked to advertise the study to their

Table 1
Recruitment strategy for each participant age group.

Age group	Recruitment strategy
Adolescents (11–16 yrs)	Public Health West of England (PHWE) Young People’s Advisory Group (YPAG).
Young adults (17–24 yrs)	The University of the West of England’s psychology participant pool.
Adults (25–64 yrs)	The University of the West of England’s psychology participant pool, snowball sampling.
Older adults (65+ yrs)	Age UK Bristol, Bristol Old People’s Forum, snowball sampling.

Table 2
Participants profiles.

Pseudonym	Sex	Age (yrs)	Age group	Ethnicity	Type of UGS visited
Nathan	M	12	Adolescents	White British	Park
Amber	F	14			Park
Paige	F	14			Park, fields
Sophia	F	16			Park, fields
Olivia	F	16			Park, fields
Alisha	F	18	Young adults	Pakistani	Cycle path, park
Aaron	M	18		White	Park, streets
Claire	F	20		White British	Park, woodland
Nicole	F	22		White	Cycle path, park
Thomas	M	23		Other	Park, woodland
Harry	M	28	Adults	White Other	Park
Bethany	F	31		White British	Cycle path, woodland
Melanie	F	55			Park
Caroline	F	56		Park, school playing field	
Steve	M	60		Allotment	
Esther	F	72	Older adults	White British	Community garden
Julia	F	72			Park, woodland
Dawn	F	72			Community garden, park
Elizabeth	F	75			Park
Simon	M	80			Playing field

organisation members. The only eligibility criteria for participants were that they were regular users of UGS, which was defined as visiting UGS at least once a week for leisure. This was necessary so that participants would be able to discuss their experiences of using these spaces. Participants reflected on visiting a range of UGS including parks, playing fields, cycle paths, allotments, school playgrounds, community gardens, and woodlands near their homes (Table 2).

2.2. Procedure

Semi-structured interviews were conducted between September and December 2022. Volunteers interested in the study initially contacted the researcher via the email provided in the study advert. Participants then received a participant information sheet outlining the full details of the study. After confirming a suitable day and time, participants joined a link to a Zoom call where the interview was conducted. Before commencing the interview, participants provided informed consent online via Qualtrics (Appendix 1). For adolescent participants (minors), additional verbal consent from a parent or guardian prior to the interview was an ethical requirement. Participants were given the opportunity to ask any questions regarding the study. All participants that took part were identified with a pseudonym (Table 2). Interviews were audio-recorded and automatically transcribed through the Zoom software. Participants were rewarded with a voucher or a university course credit (university students) for taking part. Once the transcripts had been edited for accuracy, audio recordings were destroyed.

The open-ended questions asked participants about their visits to UGS, what components they like and dislike about the space, how the spaces impact their well-being, what sensory components they notice in these spaces, whether they visit UGS with other people, if they mix with people of different ages when visiting UGS, as well as their reasons for visiting and what their hypothetical ideal UGS includes (Appendix 2). Semi-structured interviews were chosen as they are suitable for exploring topics that people have personal circumstances to, allowing them to elaborate on their experiences through open-ended questions (Braun and Clarke, 2013).

Additionally, participants were asked to verbally state their age, gender, and ethnicity at the beginning of the interview so that the

findings could be contextualised (Table 2). It was important to pilot the interview questions with the adolescent age group in order to check the language was understandable. Interviews were conducted remotely using the software Zoom and lasted between 30 min to 1 hour. Online interviews were adopted due to uncertainty around the COVID-19 pandemic and risk of transmission.

2.3. Analysis procedure

After transcription, the datasets were analysed using thematic analysis (TA) (Braun and Clarke, 2006). TA was adopted due to its flexibility in identifying patterns of meaning in any type of data (Braun and Clarke, 2013). This was ideal in the current study as participants discussed various types of UGS they visited. All analysis was conducted using NVivo software. The first stage of analysis involved familiarisation with the data by re-reading all transcripts and becoming immersed in the data. Coding was then conducted using a bottom-up approach (inductive coding). This approach was taken so that codes were not dictated by pre-conceived ideas, expectations, and theories (deductive coding), but instead were solely generated based on what participants had said during their interview. TA and this coding approach allowed for a deep dive into the data without any presumptions and for the meaning to come out once the data was being coded. Further, it allowed for the identification of similarities and differences across the age groups and for themes to be identified across groups. After coding was complete, codes were grouped based on age groups. As the aim of this research was to explore commonalities across age groups, themes were formulated from the codes that were only present across all age groups. A similar method has been conducted previously in a study looking at categories across age groups (Sundevall and Jansson, 2020). Initial and finalised themes were discussed between all authors.

3. Results

Four main themes were generated on the commonalities across all age groups: adolescents, young adults, adults, and older adults (Table 3). The first theme is that UGS can provide a sense of escape from everyday life. A second theme illustrates the practical needs surrounding access and visits to UGS. The third theme is about social cohesion and sharing a space with other UGS visitors. A fourth theme explains the importance of seasonal multi-sensory components in an UGS. Alongside the four common themes, there were also some important differences regarding interactions across different age groups in UGS. These will be highlighted at the end of the results, after description of the four common themes.

3.1. UGS provide a sense of escape

Interviewees from all age groups explain that UGS provide a sense of escape from everyday life. This theme is divided into two sub-themes which describe how an UGS can provide a sense of escape; (1) the spaces need to be big enough, and (2) there needs to be different types of space within the greenspace.

Firstly, interviewees explained to provide a sense of escape from everyday life, spaces need to be physically large enough to accommodate this by avoiding over-crowding, so that users have the ability to get away from other visitors in the space. Multiple interviewees, including Olivia, speak about visiting UGS with the aim of getting away from other people:

“I think definitely something that would put me off [...] if it was busy. If there were a lot of people there and it didn’t really feel like you were getting away from like the busyness of everyday life.” (Olivia, 16 yrs.)

By having a large enough space, it means that even if there are a lot of visitors, everyone is not crowded next to each other. Whilst some interviewees described how an over-crowded UGS would impact their

Table 3

Table of themes and sample codes.

Theme	Sub-theme	Sample Codes
1. UGS provide a sense of escape	1.1 Spaces need to be big enough	Crowdedness impacts well-being and visits Spaces need to be large enough for everyone Getting away from people Preference for large open spaces
	1.2 Spaces within a space	Various environments within a space Different routes through the space Nature is a place to explore Spaces are inclusive
2. Practical needs for visiting UGS	2.1 Spaces need to be accessible	Living in close proximity to greenspace Accessibility needs Driving to access greenspace Pathways are important
	2.2 Weather dependency	Bad weather is not a deterrent to going outdoors Preference for dry weather Visit greenspace more during summer Visits are weather dependent
	2.3 Safety concerns	Lighting impacts visits Interactions with strangers Safety concerns
3. Sharing a space with others		Social cohesion Meeting new people Enjoy listening to other people A space to meet a variety of people
4. Seasonal sensory components		Appreciation for seasonal changes Smell of spring Multi-sensory enjoyment of flowers Water is relaxing

visit, for others, it was a reason to avoid a space altogether:

“If it’s too much and too busy then I prefer to go somewhere else.” (Melanie, 55 yrs.)

Secondly to size, UGS allow for a sense of escape by having different spaces within the space itself. Interviewees across age groups were opposed to open bare fields but instead preferred a space which had varying environments within it which made it intriguing:

“You’re not always in the same space, you can travel through different areas and not just walk through an open field. You can go through the open field and then be by the lake and then up by the woods. I guess it makes it more interesting and less boring.” (Aaron, 18 yrs.)

Having a changing environment with areas that are more ‘wild’, allowed for exploration of nature within the space, which was especially important for Sophia:

“It feels kind of like you’re an intrepid explorer or something. I think I quite like having a wild bit (of the space) because it almost feels like it’s there for you, it feels like you’re the one exploring it.” (Sophia, 16 yrs.)

Further, different routes through a space allowed for variation in walking, and the freedom to move in a way which was different to being in an urban space:

“There are paths and stuff, but I don’t always stick to them. I might go through the grass, go find a tree and suddenly I am able to move exactly the way I want to move. Which isn’t usually possible in the city.” (Harry, 28 yrs.)

It was clear from Harry's account that an urban city space felt constricting, whereas being in his local park allowed for him to move through the space how he wanted. This allows individuals to express themselves how they want and use the space in a way which is best for them. Building upon this, variation in a space meant that multiple visits to an UGS were different and new experiences could be had:

"...they've got all sorts as you're walking around to make it so that everytime we go you can find something new." (Julia, 72 yrs.)

3.2. Practical needs for visiting UGS

A second theme common across all age groups was about the practical needs for visiting UGS. This theme describes the physical attributes of an UGS which are important and is broken down into three sub-themes; spaces need to be accessible, safety concerns, and weather dependency.

Visits to UGS increase when there is good accessibility. Interviewees stated that spaces need to be accessible, whether that was living close by or needing physical pathways within the space. Firstly, interviewees described the importance of living near greenspace which made it is easy to access without being reliant on transportation:

"On a regular basis I normally would just go somewhere close by that I can walk to, because it's just easier, and I'm not like sort of relying on a bus, or my mum to take me." (Olivia, 16 yrs.)

Further, Claire described pathways as a positive aspect of her local greenspace and further emphasised the importance of these features for wheelchair users and push chairs:

"It's got a nice tarmac path all the way through the middle, so it makes it more accessible for the push chair or people in wheelchairs. It's great because you can go off the path with the dogs but if you've got people who need it to be flatter, they can also enjoy it." (Claire, 20 yrs.)

The sub-theme of weather dependency occurred across all ages however, opinions were varied. For most interviews, bad weather was not a deterrent to going outside, as quoted by Melanie:

"The weather doesn't put me off at all, I still go [laughs]. Even if it's raining, I've still got my umbrella, wellies, the dogs got his coat on, and off I go." (Melanie, 55 yrs.)

Additionally, whilst bad weather did not stop visitors from going to UGS, interviewees did experience the space differently depending on the weather. Numerous participants preferred visiting on a sunny day, but Sophia identified inclement weather as heightening the naturalness of the space:

"It is nicer on a sunny day I'll say that, but even when it is raining, it's still quite nice to be out in nature on your own, kind of experiencing the weather and I appreciate the naturalness of it." (Sophia, 16 yrs.)

Sophia thus appreciated the wildness of nature and the naturalness of her surroundings. The inclement weather enhanced her experience and produced an increased feeling of wildness.

The final sub-theme here is concerns for safety. All ages spoke about it as a factor which influences the spaces they visit and at what time of day. Quite broadly, Nicole and Elizabeth shared safety concerns about walking alone. For example:

"When it comes to stuff like parks or greenspaces... sometimes I don't feel as safe walking by myself." (Nicole, 22 yrs.)

Focusing on physical properties of a space, UGS were avoided in the dark due to the lack of lighting and fear of conflict:

"When it's getting dark, and they feel a bit eery and ominous. I don't actually feel very comfortable at all. I would rather take a street where

there are shops and street lights and perhaps more people. Just because I don't want to have to deal with any kind of conflict." (Harry, 28 yrs.)

3.3. Sharing a space with others

A third theme identified was about sharing UGS with other visitors. On one side, interviewees spoke about being in an UGS with the aims of being away from people and actively avoiding interactions with strangers. For example, Paige said:

"Sometimes a dog owner might stop and talk to me. Apart from that, I don't go out of my way to talk to people." (Paige, 14 yrs.)

On the other hand, visiting an UGS was an opportunity to meet a variety of new people. It can also be a space that is 'common ground' and somewhere people can meet on equal terms:

"It brings together people from several different areas, it's sort of an apex, there's several different sub-areas and we meet on equal terms. There's a bit of mutual exploration." (Dawn, 72 yrs.)

Interviewees unveiled that their experiences differed when visiting UGS alone compared to visiting with others. Specifically, Claire stated that visiting alone was a more peaceful experience:

"When you go on your own, you get that slightly more peaceful feeling." (Claire, 20 yrs.)

3.4. Seasonal sensory components

Finally, the fourth theme identified was regarding the seasonal multi-sensory components of an UGS. Interviewees discussed various multi-sensory components of the spaces they visited; however, they were in relation to the season they were visiting in and expecting. The changing seasons influenced the number of visits throughout the year, with some participants preferring to visit during the summer months due to the better weather, like Olivia:

"... (to visit) especially in the summer and when the weathers nice. It's nice to go and sit and have a picnic and chat (with friends)." (Olivia, 16 yrs.)

Whereas other interviewees preferred to visit in spring to see the regeneration of plants and the smell of cut grass, or autumn for the colours of leaves. Caroline described spring as her favourite time of the year for visiting her UGS:

"I think my favourite season is spring. Because everything is shooting and you get the nice bright coloured green leaves on the trees and it all looks fresh and new and everything is shooting and... especially on a nice blue-sky day, it's lovely. So, I think spring is my favourite time of the year." (Caroline, 56 yrs.)

Other noticeable sensory components included hearing birds and running water:

"I hear all of the birds. There's something about the birds, the noise as well as the wind in the trees and it's to do with my emotional well-being and physical well-being because I'm out there actually walking." (Julia, 72 yrs.)

"I think it's kind of hearing the water, kind of trickling, it's almost freeing, but also seeing it. The smell is quite refreshing, and it feels like it washes away your stresses and things." (Sophia, 16 yrs.)

3.5. Key differences between age groups

There were several differences between the age groups around having interactions with UGS users of different ages. Firstly, there was a difference in opinion about visiting with people of the same age.

Adolescents and older adults both spoke about using UGS as a space to meet friends, and if not visiting alone then they would normally visit with people of the same age. Interestingly, this tendency was not shared with the young adults or adult age group. It was also identified that seeing younger children in UGS was important for adolescents, adults, and older adults, but not mentioned by young adults. Adolescents, adults, and older adults all shared positive views and found it encouraging to see children being actively involved in nature:

“With the forest schools and things, it’s really important because you could teach children about how important it is, and like grow vegetables and things.” (Sophia, 16 yrs.)

A final difference that was apparent in this study was that adolescents expressed wanting separate spaces for different age groups within their local UGS, however this opinion was not shared amongst the other age groups. Finally, feeling a sense of community with all users and having community involvement in UGS was important for young adults, adults and older adults, however younger interviewees (adolescents) did not mention this. For example, Dawn spoke about a charity operating within their local UGS which aims at bringing together all members of the community:

“It’s specifically geared towards bringing together people who might not otherwise meet. Across cultures, religions, ethnicities, languages even.” (Dawn, 72 yrs.)

4. Discussion

Through qualitative interviews, this study took an in-depth approach to explore the properties of UGS which are important and influential for well-being across multiple age groups. By understanding preferences of UGS, this can help understand use of UGS which has been shown on the causal pathway to lead to health and well-being benefits. Overall, the findings showed that there are many common preferences across age groups about properties which can influence well-being in both positive and negative ways. More specifically, the study found that UGS provides a sense of escape and is a space to share with other users, but that there are practical requirements for visiting UGS, as well as important seasonal sensory components. These can all influence how UGS can shape well-being. Additionally, some differences were found between age groups regarding interacting with UGS users of different ages. The two research questions proposed for this study were (1) What common properties of UGS shape well-being similarly across age groups?, and (2) How do UGS support social interactions across different age groups? Whilst some common themes were identified that answer research question 1, no clear commonalities were identified to answer research question 2. However, research question 2 can be answered with some key differences between age groups.

With the first research question, this can be answered with the common themes and preferences across age groups; *UGS provides a sense of escape, Practical needs for visiting UGS, and Seasonal sensory components*. The theme, *UGS provide a sense of escape*, explains how UGS can impact well-being through feeling less stressed and escaping the busyness of other public spaces, which is consistent with previous findings (Home et al., 2012). This preference overall is in line with the restorative environments literature in that natural spaces are a space for solace and refuge from everyday life (Ulrich, 1983). In greenspaces, individuals can avoid the overcrowding and invasion of personal space that comes with urban spaces. Additionally, this finding relates to the natural environment component of Hartig et al.’s (2014) framework, in that the physical size of the space is important. Some previous research states that larger UGS are preferred over small UGS (Macintyre et al., 2019), however the findings in this study suggests that whilst this can be true, there may be more value in the spatial complexity and diversity of the space (Massoni et al., 2018). The first theme explains that an UGS which has diversity and various spaces within it, can allow for exploration, a feeling of

independence and having a more personal experience with nature. This can all contribute to the feeling of escapism within an UGS. This is a helpful finding for policymakers and planners as it shows UGS users as wanting a structurally diverse space and the benefits that come from diversity within the space, and this has also been shown in other studies (Sundevall and Jansson, 2020). By applying this preference to the design of UGS, then this can lead to increased use in UGS which is an important part of the causal pathway to health benefits.

The second theme that helps answer the first research question, *Practical needs for visiting UGS*, explains that accessibility, safety concerns, and weather dependency are all important to visitors of UGS. Referring back to the aspect of exploration described in the first theme, pathways are of importance in UGS as they allow for more movement within the space. Paved trails have also previously been highlighted in the literature as being important facilities in parks which improve accessibility (Kaczynski and Henderson, 2008). Additionally, proximity to greenspace is an important factor for accessibility, and is associated with health-related outcomes (Fouad et al., 2023). The importance of accessibility has also been previously suggested as an important factor for adolescents and adults (Rivera et al., 2021; Ayala-Azcárraga et al., 2019). Regarding safety, perceived safety is an important aspect of UGS (Zhao and Huang, 2021) allowing restoration in these spaces (Gate-ersleben and Andrews, 2013). Literature shows that being in the company of others enhances restoration when there are safety concerns, but if safety is not a concern, the absence of company can enhance restoration (Staats and Hartig, 2004). Lighting is also well-documented as being an important component in relation to safety, with higher illumination being associated with higher levels of perceived safety (Zhao and Huang, 2021). Previous research with older adults has also highlighted perceived safety and the contribution of lighting in a park (Veitch et al., 2020a). Interviewees also spoke about weather dependency and its impact on visits to UGS. The preferences for dry, warm weather were not surprising, as one of the main reasons individuals visit greenspace is to enjoy the weather when it is good (warm and sunny) (Schipperijn et al., 2010). Additionally, the perspective of inclement weather as heightening the naturalness of the space aligns with previous research which describes weather as being able to invigorate the experience of nature (Bell et al., 2019).

Another theme that contributes to answering research question 1; *Seasonal sensory components*, explains people’s diverse multi-sensory experiences and how this shapes well-being. Interviewees referred to multiple senses (sound, smell, sight) and how this positively impacted their well-being through feeling free, calm, and refreshed. This is consistent with research which has shown well-being to be impacted by multi-sensory components (Zhang et al., 2019; Ratcliffe, 2021; Grahm and Stigsdotter, 2010), and that other sensory modalities can be restorative (Ratcliffe, 2021a). In this study, it became clear that UGS users noticed and enjoyed various sensory components of UGS, and not just the visual elements. These multi-sensory components were also discussed in relation to the season and what people expect and experience in different seasons, e.g., expecting and enjoying the smell of freshly cut grass in summer. Previous research has shown that certain seasons are preferred, including autumnal and floriferous seasons (Kuper, 2018), in addition to there being an impact of greenspace on mental restoration which varies in the seasons, with greenspace positively impacting on physical activity in the summer only (Zhou et al., 2022). And, similarly to seasonal changes, diurnal patterns and ephemeral phenomena have been found to influence the perception of urban and natural spaces (Smalley and White, 2023). Knowing the importance of multi-sensory components, it is recommended that future research includes this focus.

In terms of answering research question 2 (How do UGS support social interactions across different age groups?), the first (*UGS provide a sense of escape*) and third (*Sharing a space with others*) themes, explore both the more social aspects of visiting UGS and going to these spaces to avoid people. These findings contribute to answering research question

2, which is about interactions across different age groups in UGS. The theme *Sharing a space with others* included varying opinions, with some people preferring to visit alone to get away from the busyness of life, whereas others described their UGS as place to bring people together. These findings provide insight into the complex relationship between greenspace and social cohesion and adds to previous literature which suggests that physical characteristics of greenspaces intermingle with environmental perceptions and use patterns (Wan et al., 2021). In answer to research question 2, there were more differences across age groups than commonalities. Adolescents and older adults both spoke about using UGS as a space to meet friends, and if not visiting alone they would visit with those of the same age. This is consistent with previous research which describes UGS as a space for older adults to spend time socialising with others of the same age (Gaikwad and Shinde, 2019), and the general importance of other people being present in urban greenspaces (Veitch et al., 2021, 2020a). Similarly, adolescents visiting UGS with friends is a well-documented finding (Rivera et al., 2021; Van Hecke et al., 2016). Additionally, adolescents, adults, and older adults all shared positive views in that they found it encouraging to see children being actively involved in nature. Although adolescents expressed wanting separate spaces for different age groups within their local UGS, this opinion was not shared with the other age groups. This is a similar finding to Sundevall and Jansson (2020) who identified this for children, adolescents, and older adults. However, in the current study, this opinion was only expressed by adolescents. Finally, feeling a sense of community with all users and having community involvement in UGS was important for young adults, adults, and older adults, while adolescents did not discuss this. These findings build upon previous research on social cohesion as it provides the perspective of younger age groups as well as highlighting the need to explore their views more.

4.1. Limitations and research recommendations

Whilst a strength of this research was involving a wide range of participants including adolescents, no individuals under the age of 12 were interviewed. Going forward, research could also involve this younger age group as they are also users of UGS (e.g., using play equipment, meeting up for play groups etc.). Having their perspective, alongside their parents/guardians, would be additionally valuable as it would involve their views in the design of UGS. More generally, future research should continue to take an intergenerational approach as it has been shown that UGS users share many similar views and experiences, as well as disagreements. A community-led approach to understanding the important properties of UGS would be a more inclusive way towards understanding and designing UGS for everyone, rather than considering the views of different age groups as distinct. More could also be learnt about social interactions. While we expected comments on social interactions to be elicited throughout the interview, questions specifically focused on this were concentrated towards the end of the interview, perhaps resulting in participants giving less rich comments on this topic given the length of the interview and potential fatigue. Research could also explore interactions between age groups, as well as views of non-users of UGS. Exploring reasons for not visiting these spaces could highlight what properties are not beneficial for well-being or a reason for avoiding UGS. The interviewees in the current study did express some negative opinions, such as safety concerns they had when visiting UGS, but overall, there was very little discussion about conflicts or intergenerational tension in urban greenspaces. Although a specific question about conflicts was not asked, it is surprising that the topic did not emerge due to previous literature having noted interpersonal conflicts (Groshong et al., 2020; Mak and Jim, 2018; Seaman et al., 2010). This may have been a result of the interviewees being regular visitors of urban greenspaces and holding mostly positive views of the spaces they visit. By interviewing individuals that avoid UGS altogether, future research may provide some more insight which could inform how UGS are designed and what properties that need prioritising in order to be

beneficial for well-being. Additionally, the representation of views from underserved and marginalised populations was lacking in this research; previous research has uncovered the distinct and varied ways in which, for example, disability groups (Bell and Foley, 2021) and low-income minority ethnic groups (Cronin-de-Chavez et al., 2019) perceive the benefits of UGS and consideration of these views is vital to addressing inequalities in access and use of UGS as well as in designing truly inclusive UGS. A final limitation of this study would be that participants' opinions may have been impacted by the recent COVID-19 pandemic and how public space is utilized (Lemyre and Messina, 2023). How participants use and perceive the potential benefits of UGS may have changed since the pandemic (Stock et al., 2022). Enthusiasm in the post-pandemic period may have led to more positive than expected opinions in the interview.

Despite limitations, there were several strengths to the current study. Firstly, this study was able to identify common opinions across multiple age groups, as well as some key differences, and hence provide an intergenerational lens to the research topic. This provides valuable insight into how spaces are used as a collective, rather than for a sole user in mind. This study was able to capture the insights into the properties of UGS which influence the well-being of UGS users. Conducting qualitative interviews allowed for in-depth discussion around the reasons why certain properties were more or less influential for well-being and social interactions than others, rather than simply listing physical components that users liked or disliked.

5. Conclusion

The current study focused on the properties of UGS which shape well-being across generations. It was found that there are mostly similar opinions across age groups regarding such properties, but some distinct preferences from adolescents who may prefer spaces within UGS specifically designed for them. Overall, users of UGS explained that these spaces provide a sense of escape, there are practical needs for visiting, there is importance around sharing UGS with other users, and there is recognition of seasonal sensory components in the space. Whilst this is encouraging and shows that UGS are catering for a wide range of ages, this study is a starting point for future research which takes intergenerational approaches to exploring UGS use by multiple marginalised communities as well as the views of non-users. By confirming these findings, it could influence how UGS are redesigned in a community-led way, and therefore improve social cohesion between generations and the overall well-being of local residents. The findings of the current study are helpful for local neighbourhood landscape planners and designers as it will enable UGS to be designed to be beneficial for all generations within society and align with aims of current policies, e.g., age-friendly, child-friendly cities. Policy recommendations include involving members of the community, of different ages, in the design of UGS, as well as encouraging community members to use their UGS which can then lead to health benefits. For example, policymakers and landscape planners could hold meetings with community members to gather their perspective and enable their views to be heard. By actively engaging the community in the design of a space, as well as encouraging all groups within the community to use the space, it would allow for a sense of ownership which could lead to increased visitation and maintenance of the space, and therefore have a positive impact on health and well-being.

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Ethics statement

The study was approved by the University of the West of England's Faculty Research Ethics Committee (UWE FREC no: HAS.22.04.091).

All participants involved in this research provided informed consent before taking part (see consent form below).

Consent form

Researching which aspects of urban greenspaces are important for younger and older people.

You are invited to take part in an interview as part of a research project at the University of the West of England. The purpose of this study is to identify and understand which features of urban greenspaces (e.g., a park or a community garden), are preferred and valuable to your mental well-being.

Please ensure that you have read and understood the information contained in the Participant Information Sheet and asked any questions before you provide consent. If you have any questions please contact a member of the research team, whose details are set out on the Participant Information Sheet.

If you are happy to take part in this interview, please click the next arrow at the bottom of this page. By clicking this, you are providing consent and agree to the following statements:

- I have read and understood the information in the Participant Information Sheet which I have been given to read before asked to sign this form.
- I have been given the opportunity to ask questions about the study.
- I have had my questions answered satisfactorily by the research team.
- I understand that I will be audio-recorded, and the recording will be destroyed once the data has been transcribed for analysis.
- I agree that anonymised quotes may be used in the final report of this study.
- I understand that my participation is voluntary and that I am free to withdraw at any time until the data has been anonymised, without giving a reason.
- I agree to take part in the research.

CRediT authorship contribution statement

Rebecca Reece: Conceptualization, Data curation, Formal analysis, Funding acquisition, Methodology, Writing – original draft, Writing – review & editing. **Lewis Elliott:** Conceptualization, Methodology, Supervision, Writing – review & editing. **Isabelle Bray:** Conceptualization, Methodology, Supervision, Writing – review & editing. **Anna Bornioli:** Methodology, Writing – review & editing.

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.

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Supplementary materials

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