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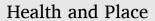Link to publication record in Explore Bristol Research
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Beyond landscape's visible realm: Recorded sound, nature, and wellbeing

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ABSTRACT

This article draws on an AHRC/EPSRC funded project called 'A Sense of Place: Exploring nature and wellbeing through the non-visual senses'. The project used sound and smell technologies, as well as material textures and touch, to ask: what does 'wellbeing' mean for people in relation to the non-visual aspects of nature, and how might technology play a role in promoting it (if at all)? This article takes recorded sound as a case study. It argues that recorded soundscapes should be understood on their own terms rather than as 'less than' or a simulation of natural environments. They have specific value in creating space for imagination, particularly when delivered with care and as part of the co-creation of sensory experience. Overall, the article argues that the value of emerging immersive technologies is not to simulate nature better. An 'immersive experience' is richest when it allows for – and reveals – the nuances and complexities of individual responses to natural environments.

The perceived connection between 'being in nature' and wellbeing has a long social and cultural history. Capaldi et al. argue that 'evidence suggests that connecting with nature is one path to flourishing in life' and that spending time in nature is therefore a 'potential wellbeing intervention' (2015, p. 1). Many studies, as Hartig et al. note, provide evidence to support a general idea that nature is 'good for health' but 'we have more to learn about for whom, when, how, and in which contexts it offers benefits' (2014, p. 222). The links between nature, health and wellbeing also often rest on a number of assumptions, many of which would benefit from more critical interrogation. One such common assumption is that the value of nature is grounded in the ability to see it. Despite some growing interest in multi-sensory approaches, discussed further below, the value of nature is still most commonly examined through the visual signifiers of 'green' and 'blue' space such as aquatic environments, parks and gardens (Alcock et al., 2015; Finlay et al., 2015; Lee and Maheswaran, 2011; Pitt, 2018; van den Berg et al., 2015; Ward Thompson et al., 2016; Wood et al., 2017). The beneficial effects of nature for wellbeing are also often considered to be greatest in situ (for example Carrus et al., 2015; Doherty et al., 2014). Literature on healing environments does engage with the potential value of

photographic or artistic representations of 'green' and 'blue' space, but typically does so in relation to people with limited access to 'real' nature (Bates, 2018).

This article draws on an AHRC/EPSRC funded project called 'A Sense of Place: Exploring nature and wellbeing through the non-visual senses' in order to examine such assumptions about nature and wellbeing. It does in two ways: firstly, the article turns away from the visual components of landscape towards the sonic; secondly, it focuses on the implications of *recorded* sound (rather than in situ listening) for the perception of wellbeing. We start with a deliberately broad and inclusive definition of 'nature' and 'wellbeing', but also seek to acknowledge and problematise the often uncritically broad use of these terms. As Lovell states, wellbeing is a complex term that is conceptualised in many different ways and one that is often reliant on assessments made by the individual, sometimes in conjunction with more universal measures (2018, p. 5). Therefore, it is important to consider the role of diversity in how individuals perceive and find meaning in their relationship to natural environments, whether simulated, recorded, or real.

The article starts from the premise that recorded sound offers something different from engagement with nature in situ, rather than

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just a pale imitation thereof. It asks what recording technologies might offer, not only to people with limited access to nature but as a specific type of encounter with the 'natural' that has its own value. We also consider modes of delivery, arguing that people engage more with audio technologies when recorded soundscapes are interactive and delivered with care.[2] Overall, this article is not interested in identifying one-size-fits-all therapeutic soundscapes. Instead, it considers how sound functions. Instead of asking which soundscapes are 'good for you' we are interested in exploring what recorded soundscapes *do* for different people. Sounds function in very different ways depending on individual bodies, relationships, memories and cultures. Recorded soundscapes have particular implications for imagination and memory. We argue that recorded sound should not be dismissed as inauthentic or secondary to 'real' experiences of nature, but rather must be understood as fundamentally different. Recorded sound has its own implications for wellbeing, which come from the stimulation of imagination rather any realistic simulation of the experience of being outdoors. Recorded sounds offer potential for control, individualisation, imagination and change, or removal of undesirable aspects of a recorded soundscape.

This work is in line with an emerging, more critical approach to 'nature' in scholarship. In particular, it aligns with recent work that has sought to de-homogenise nature, for example showing the range of aesthetic properties of different birdsong (Ratcliffe et al., 2018), or the differential aesthetic qualities of the sounds of landscape beyond the constraints of 'pleasing' or 'displeasing' sound (Prior, 2017). It also builds on work that explores 'nature' as a multi-sensory experience (Franco et al., 2017). In particular, it links to a growing body of scholarship interested in the effects of the non-visual aspects of nature on health and wellbeing; examples include examining the olfactory qualities of 'therapeutic landscapes' (Gorman, 2017), the effects of natural sounds on stress levels (Alvarsson et al., 2010), and going 'beyond green space' to explore biodiversity or ecological connections (Wheeler et al., 2015). There is also a growing body of work on the embodied nature of connection that includes mobility through space and other less static relationships with the natural world (Gatrell, 2013; Bell, 2019). We seek here to provide data to build on and develop this emerging scholarship, showing additionally the particular role of non-visual senses and the control offered by recorded sound in stimulating emotion, imagination and memory. We also emphasise the importance of delivering such technologies with care.

1. Methodologies

This data was gathered through the testing and development of different research processes, rather than using any one methodology on a large scale. The project team sought feedback on people's engagement with natural sounds and in turn with recorded soundscapes in three main ways, adopting an iterative process, which involved ongoing data analysis. Firstly, through crowdsourcing of data by asking questions to anonymous members of the public in person and online; secondly, through asking for reactions to prototype sounds, using affordable and mobile technologies; and thirdly, by creating a more comprehensive 'immersive experience' using recorded soundscapes and personal guides through a range of spaces, with data gained from observation, feedback, and interviews. Although we focus on sounds in this article, we also explored the use of smell technologies. The research project was carried out in Bristol, in the United Kingdom, though it brought together a team from across the UK. At all three stages these methods allowed the project

team to explore the perceived relationship of sound, alongside other non-visual aspects of nature, to wellbeing. Stages two and three also enabled consideration of the particular function of recorded sound. Although the team did not conduct fieldwork for this project, we situated its findings in comparison to an already thriving field of research on the function and benefits of listening to nature in situ.

The first stage of the research sought to pay more attention both to the multisensory aspects of nature and wellbeing and to the individual nature of these relationships. Its methodologies were designed in line with this goal, beginning with a small-scale exercise in crowdsourcing of qualitative data. We use the term 'crowdsourcing' here to refer to methods that allow for gathering responses on as large a scale as possible; although typically understood to refer to the sourcing of data online, this project combined in-person interviews and social media. All of these sought answers to the same questions, or prompts: 'Place yourself at a moment in time in which you felt happy and well. Describe this environment'; 'Describe an environment that makes you feel calm. What sounds do you hear there? What do you smell there?'; 'Natural environments that I enjoy being in contain: The smells of … The sounds of … '; 'Natural environments that I don't enjoy being in contain: The smells of … The sounds of … '; and 'The qualities of a healthy environment are: … '.

These early questions sought to identify common soundscapes that people associated with 'wellbeing' in broad terms, and areas of difference or individual preference. The project team gathered responses to these questions using four methods over the course of a two-week period. From the most resource-intensive to the least resource-intensive, these methods were: one small-scale workshop at which two project team members talked through the project and its questions over two hours with eight residents of an extra-care facility; two surveys of 58 passing members of the 'general' public at selected sites; leaving – and later collecting – five postcards in one local community centre; and circulating a survey on social media to elicit online responses to the survey.[3] We asked all participants the same five questions. Most participants wrote their own answers, apart from the workshops at which we listened to people's responses and wrote them down. Through these four methods, the team received between 79 and 98 responses to the five questions. Each method for gathering responses offered different opportunities for researchers. Twitter allowed us to reach a larger geographical range, opening up questions about the influence of local cultures, climates, and geographies on ideas about nature/wellbeing. Over two thirds of our responses were acquired more locally, from workshops and surveys conducted in person. In some cases we worked with groups with whom we already had a working relationship and with whom we had spent time building trust and rapport. This made it easier to negotiate access, but also allowed us to establish an informal atmosphere and to build on existing relationships. We found that sites where we had existing relationships were more likely to engage in telling us longer stories and sharing memories with us, in comparison to other settings. Relationships of trust and rapport established over time lend themselves to richer data collection in relation to this type of study. More traditional crowd sourcing techniques such as public surveys may not yield the same quality of data here (Facer and Enright, 2016).

Based upon these responses, we collaboratively created three 'sensescapes'. With specific regard to the recorded soundscapes – or the auditory components of these sensescapes – the first soundscape included recorded archetypal 'beach' sounds, including waves breaking on the shoreline, gulls, and, importantly, the presence of other people, reflecting the number of our respondents who placed emphasis on

having company in their happy memories of natural environments. The second soundscape evoked a transition from a forest (woodland bird calls at dawn, wind through trees), to a meadow (the hum of insects, the trickling of a stream, and the distant call of swifts), in order to evoke a sense of movement; this decision responded to the emphasis that many respondents placed on being active and mobile, rather than passively absorbing soundscapes. The final soundscape was more abstract and drew upon, but significantly transmorphed, natural sounds; for this we wanted to explore the value of something that was unrecognisable as a specific natural environment.[4]

Each of these was first tested in a small communal workshop with participants who had contributed to the first stage of data collection. We returned to the same extra-care facility to play the soundscapes and discuss them, using a small set of portable speakers and noise-cancelling headphones, and recorded participants' responses. We also designed an 'immersive experience' using larger and more professional speaker systems, to get in-depth feedback on a one-to-one basis from a more targeted group of participants considered to be stakeholders in this research. This experience was located in three adjacent rooms in the Centre for Innovation and Entrepreneurship, University of Bristol. It was composed of edited field recordings played through stereophonic loudspeaker systems; scents distributed via automated diffusers; and a series of tactile and haptic interventions, ranging from fans to produce a sense of air movement, to objects for participants to hold and feel, including sand, stone, and foliage. This analysis focuses on participants' responses to the recorded soundscapes, although they cannot be understood entirely in isolation from the rest of this multi-sensory experience in the final qualitative data set.

A small group of participants were guided through all three rooms as a curated multi-sensory experience. This 'immersive experience' was not designed to be a simple straightforward output or a 'sensescape of wellbeing', but rather part of the research process. This approach links with literatures on, for example, the value of walking and accompanied walking as research methods for eliciting responses to natural environments (Rishbeth and Powell, 2013; Bell, 2019; Miaux et al., 2010; Gatrell, 2013). Immersive experiences offered opportunities for data collection (including observation) and opened up different ways of talking about the senses, nature, and wellbeing. Rather than using immersive experiences to simulate nature, we used immersive technologies to explore difference in the ways that people responded to non-visual sensescapes that *evoked* certain 'natural' environments. We sought to situate these findings in relation to the rich existing literature that explores the ways in which people engage with natural environments through listening, but without claiming that in situ natural sounds and field recordings are comparable. The team started from the premise that recorded sound is not a direct representation of sound and should not be treated as such (see Gallagher, 2019).

Twelve people in total participated, in a much more in-depth research process than the crowdsourcing mentioned above. Each was invited as a potential beneficiary of the research, including researchers, arts and health practitioners, hospital patients, and local community members, and only two people were immersed in each sensescape at any given time. After each room, people reflected on their experience either through writing or art, before conducting a short final interview with one of the project members, after all three experiences. Members of the research team also observed the reactions of participants during the experiences, for example noting how they interacted physically with sensescapes or any comments that they made. The remainder of this article draws upon all of the data gathered across all stages of the research, but focuses primarily on responses to the immersive experience due to the richness of this data.

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[4] These recorded soundscapes can be listened to at https://soundcloud.com/user-610124585/sets/a-sense-of-place.

2. Findings

2.1. Sound, senses, and wellbeing

Initial responses to questions demonstrated a high degree of unity in terms of the sounds and soundscapes deemed of value for human wellbeing. To take one example: of 91 responses to the free-text prompt: 'natural environments that I enjoy being in contain: The sounds of …', 58.2% mentioned birds and 34.1% mentioned running water such as waves or rivers. Some of these responses were specific, with 'birds' ranging from pigeons to owls, but more commonly responses simply took the form of 'birds', 'birdsong' or 'birds chirping', which our team came to understand as a type of social or cultural 'script'. Without denying that these repeated 'scripts' may reflect genuine positive experiences of certain natural sensescapes, they also reveal broader cultures of wellbeing – that is, embedded expectations of what is presumed to be of value. Such 'scripts' may mislead in implying homogeneous experiences of 'nature'. As Bell et al. note 'people's encounters with particular settings can change over time according to the habits we develop and the relationships we enter into, both in the moment of encounter and through the life course; sensorially, emotionally, materially, and cognitively' (2019, p. 7). Similarly, perceptions of nature and landscape are not uncontested but rather are built on, and find meaning through, broader concepts of national identity and memory, as well as personal experience (Matless, 1998; Daniels, 1993; Schama, 1995).

The questions that focused on real experiences in people's lives – such as happy memories of particular environments – went beyond these 'scripts'. Participants' responses to such questions indicate that natural sensescapes combine with other factors in the making of emotional states, including positive ones. One such factor is memory. While 'cut grass' came up repeatedly in our direct answers, for example, the direct question missed the fact that one respondent 'enjoyed' the smell because it was entwined with a memory of success on the horse racecourse in his youth. These outcomes support the work of scholars working on place and memory, many of whom have identified the importance of memory in creating the 'restorative' properties of particular environments (see Ratcliffe and Korpela, 2016; Ratcliffe et al., 2013). It also speaks to the benefits of establishing personal relationships and of the importance of trust and rapport during research, in order to get past embedded 'scripts' about nature, place, and wellbeing.

The different stages of data collection also show that a variety of meanings can be attributed to the same category of sound. Waves and the beach were common responses to questions about the sounds that people enjoy, or which make them feel calm. Once we immersed people in the soundscape of a beach, however, it became clear that people had very different and specific ideas of how a wave should sound; weather, the strength of the waves, and the time of year shaped the apparently ideal sound of a wave. To quote one participant's written reflection after the 'beach' experience, as an example: 'I would have liked the sound of the sea to be stronger'. The importance of allowing space for such visualisation is an issue to which we will return to below, but this in itself highlights the impossible task of creating a universal 'sensescape of wellbeing'. Even apparently straightforward and repetitive categories of sound can have very different memories associated with them, or can take a range of forms within that category, such as crashing waves versus more gently lapping water.

Participant responses indicated that no recorded soundscape - or individual sonic component of a given soundscape - is inherently associated with 'wellbeing'. The variety of responses in itself warns against any attempt to create a 'one size fits all' soundscape to promote wellbeing, meaning that we cannot assume that any single natural soundscape is universally therapeutic. This is not to deny that sound is of value for people, as nearly all participants emphasised the importance of sound for their emotional states; rather, we need to develop a better contextual understanding of the variety of ways that sound shapes people's affective relationship with place and, in turn, wellbeing. This

finding is in line with recent scholarship that challenges the idea of a single type of 'healthy dose' of a natural sensescape, which does not allow for difference or agency (Bell et al., 2014, 2018). It also supports the findings of a recent literature review, focused on soundscape and ecological/human wellbeing, which recommends further research 'in order to develop a more comprehensive understanding of the associations between soundscape and wellbeing, such as information generated by non-western societies, and exploration of the ecological and socio-cultural aspects of wellbeing' (Moscoso et al., 2018, p. 24).

2.2. Identity, imagination, and memory

Certain types of recorded sound can positively enhance these links between sound and emotion. Non-visual senses and technologies offer particular types of immersion. While the visual is, of course, also always open to interpretation, sound encourages a form of embodied visual*isation* which is a particularly open process. It allows for the making of sensescapes that map onto individual memories and life stories, allowing participants to place themselves in spaces of personal significance. The power of somewhat generic 'wellbeing' soundscapes (birdsong, waves) might therefore not be in their inherent therapeutic qualities but because they are recognisable – both culturally and individually. People can fit them into their own life stories; everybody who participated in our research had been to a beach and heard a dawn chorus at some point in their lives, even if the beach or birdsong that they visualised varied greatly depending on geography, life histories, and personal preferences.

Instead of using visual technologies or images of specific places, leaving space for such visualisation and imagination is part of the crucial function of 'healthy' or 'happy' sensescapes. Recorded sound has particular value in its lack of association with a specific location. As Michael Gallagher notes, writing on field recording, '[p]honographic technologies are inherently acousmatic, ripping sounds out of context and displacing them from their source, scrambling the meanings and associations they had in situ' (2015, p. 566). Gallagher argues that there is particular value when sound recordings are decontextualized, as they invite attention to 'the aesthetics of recorded sounds rather than trying to discern their sources' (2015, p. 566). Our evidence supports this argument. It further indicates that the lack of context to recorded soundscapes might allow for a process of deliberate re-placement, rather than displacement, in terms of encouraging individuals to make meaning and imagine sites of natural soundscapes. This is a different process to that identified by those who study the effects of natural encounters in situ, with their specific emplacement and unpredictability (for example Bell et al., 2018). It should not be seen as a diluted or diminished version of that experience, but as a fundamentally different kind of auditory encounter and place-making process.

The project data showed that auditory immersion can strongly evoke memories and visualisations of landscapes. Non-visual senses and recorded soundscapes provide particular opportunities for creativity – for example, allowing participants to visualise specific places and sensescapes from their own memories. This is particularly important given the 'ocularcentrism' in modern Western approaches to understanding how landscapes of various types are supposed to be 'conceived, encountered and managed' (Macpherson, 2017, p. 251). It also encourages a consideration of the 'plurality of embodied human experience' (Bell et al., 2019, p. 10), which moves beyond the idea of the average embodied experience and a simple shared Western 'visual mode of observing and knowing' (Wylie, 2007, p. 5). This self-created visualisation offered by the gaps in soundscapes – and particularly in recorded soundscapes taken out of context – should be viewed as an opportunity, rather than as something lacking in comparison with more comprehensive or 'realistic' technologies such as Virtual Reality. Taking the beach soundscape as an example, we can see how people used it as a prompt to visualise particular beaches from their own lives. The following transcript is taken from the follow-up workshop at an extra-care facility, within which low-resolution prototype soundscapes and portable speakers or headphones were used:

Person A: That was quite nice actually, because I could actually hear children, playing by the shore.

Person B: Yes, you can see a … make a … picture

Person A: Yeah. I could actually hear and see kids playing on the shore. At the seaside. I was … I was actually there.

Person B laughs

Person A: I was slowly nodding off as well. That's the problem.

Interviewer 1: That's not a problem … to go to sleep on the beach?

Person A: Oh I used to.

Interviewer 1: Yeah

Person A: Then I'd get a soaking wet Alsatian … uh … shaking all over me, waking me up. Little madam! … I used to have two, I had a pair of bitches I used to, we used to take down to uhh Weston or Clevedon. First thing they'd do, as soon as we get down there, straight in the water. So … they got soaked. But yep. No, I actually saw loads of kids on the seashore. The next thing all I heard was a load of waves coming up, and they were putting me to sleep. Thank God they didn't, it's nearly dinner time!

… Person C: Well I wasn't sure what it is, what it was. There was children and waves.

Interviewer 2: Yeah, and how did it make you feel? Did you like it?

… Person C: I liked it you know, because when the children were little we used to go … we would go to the beach

These participants found themselves transported to very specific memories in their own lives. They 'liked it' because it evoked happy memories of being with children and pets on the beach, not because the waves in and of themselves were therapeutic. The transcript above, particularly the comment 'I was actually there', emphasises that we should not only view these effects as the triggering of memory or images, but as a form of embodied experience. The tone of other qualitative feedback from the 'immersive experience' points to a similar interpretation: both in their private written reflections and in interviews, participants often used a more literal phrasing ('I was in the forest', 'I was "there"') or spoke of feelings ('it made me feel like I was back in that place').

Such findings point to some of the potential value of this kind of data for understanding sensory memory, and how it feeds back into sensory experiences. It might add to our understanding of how and why particular non-visual sensescapes operate to promote a sense of well-being, rather than having inherent therapeutic properties. This approach helps us to see heterogeneity of experience even in the homogeneity of a 'therapeutic environment'. Many people linked their listening (and other sensory) experiences back to specific places in their life: ''I love birds. I grew up on Morecambe bay … ' or 'I go on holiday to a place with a pebble beach - so I was "there".' Others similarly wrote or spoke of where they grew up, and it may be significant that some positive feedback on the sensescapes spoke of feelings of safety, warmth, and of being child-like. Some struggled to reconcile our recorded soundscapes with 'their' places. In written reflection after the 'beach' room of our 'immersive experience', one participant commented: 'I wouldn't usually go to such a busy beach for relaxation … the beach I feel most happy and relaxed on is huge, generally empty of people and sandy.' Others felt that the recorded soundscape did not adequately represent the wildness and unpredictability of real nature: 'Manufactured. None of the grubbiness of the beach, sounds too perfect, no fluctuations in cool breeze, didn't smell like the beach'; 'Not really what the beach feels like … all a

little too perfect'. Although a lot of people answered 'waves' in relation to early questions about sounds that made them feel happy and relaxed, this feedback emphasises that 'waves' do not mean the same to everybody. People wanted to be given the space in a soundscape to create *their* own beach. Stripped back recordings might offer such space for imagination, as might technologies that allow people to control elements of a soundscape (an issue to which we will return).

Filling in too many gaps in the soundscapes, or offering something approximating a 'simulation', limits the potential for open interpretation. During the immersive experiences, there were some strong negative responses when recorded soundscapes were brought together with smells and textures to create a complete picture of the sensescapes we were evoking. Textures such as that of fake grass, rather than adding to the power of visualisation evoked by sound, detracted from it. For example, because the 'plants felt irritating … feeling of being cheated from real experience of grass underfoot', one participant then started to question the authenticity of the bird song. Another noted that 'I couldn't engage with the sound, because all I could feel was the cold plastic' in one experience. Other participants noted that they struggled to immerse themselves within the provided soundscapes, due to the presence of uncontrollable extraneous sounds, such as vehicular sounds outside of the Centre for Innovation and Entrepreneurship. Such an experience made participants aware of the limits of the sensescape. As one noted, they 'longed for authentic experience' instead. Recorded soundscapes worked best when participants did not feel that they were over-directed, and when there were no claims made to authenticity or simulation. Again, as Gallagher argues, recorded soundscapes taken out of context create a 'new hybrid space' when a recorded soundscape is auditioned and it ' … melds and mixes with the acoustics of the playback location' (2015, p. 569).

Participants seemed somewhat preoccupied at times with questions of authenticity. One participant commented that: 'I spent a lot of time thinking about whether it was "realistic" and if not - whether it mattered'. Others did not address this issue of authenticity quite so directly, but implied that it shaped their experience. In relation to the 'green space' recorded soundscape, for example, one person observed that 'you could tell it wasn't recorded in a pine forest' and another noted that 'the sound of the water is coming from too high up'. These kinds of thought processes took people out of the experience. Others did fully immerse, as in the dialogue about the beach above, but this problem of authenticity was a recurrent theme and raises questions about the purpose of such technologies. Removing the opportunity to overthink questions of 'realism' and 'authenticity', with experiences that were less complete or directed, actually functioned to create more successful immersion. The more abstract soundscape offered no opportunity for participants to analyse their visualisation, and participants did not feel that the experience was misleadingly claiming authenticity. Some participants wanted to adjust the soundscape or remove certain elements when given the choice, as discussed further below, and generally all appreciated that the space allowed for creativity and participation. To quote some participant feedback: 'It was a totally another world. I was in another world' and 'didn't "think", just felt, smelt and listened'. Another participant even specifically addressed the problematic issue of simulation, noting that the more abstract experience was 'the one where I relaxed the most. I think because it wasn't trying to simulate anything else, I didn't sit there being hypercritical'. This participant had apparently enjoyed this room as the only one in which they did not feel that they were being 'lightly tricked' by the sensescapes. These findings speak to the value of using sound in a stripped back or even abstract way, allowing space for imagination and not feeling the need to fill gaps in simulated environments.

A very small number of our participants also drew upon unpleasant memories, which must be acknowledged as a potential outcome of such a strategy. One participant, who had previously lived outside of the UK, associated forests with a sense of danger that was evoked upon encountering the recorded forest soundscape: 'not a good place, for me,

not a good memory'. Some participants also raised the issue of the dangers of simulation for people who are unwell or suffering from delirium: as one noted, the successful simulation of natural soundscapes 'could be hyper confusing'. Such unpredictability of responses to sound, especially where gaps are left deliberately for participants to fill, is also a risk and – as we will discuss in the article's final section – such immersive experiences must be presented with care.

Overall, this data showed the importance of recognising that listening is not a passive experience. Natural sounds (and recordings thereof) can function effectively to promote feelings of 'wellbeing', albeit a broad term that here ranged from evoking positive memories to facilitating embodied transportation to a 'happy' place. However, they do not function to this effect when natural sounds are presented as something therapeutic that are simply 'out there' to be received. They also do not function to this effect when imagination is blocked off or inhibited, by sensory overload or attempts at simulation or authenticity. Natural sounds function best in relational, dynamic, and interactive terms, which allow people to respond, adapt and visualise in relation to their own life experiences and definitions of 'wellbeing'. Field recordings or abstract soundscapes offer particular opportunities in this regard.

2.3. Care, co-creation, and participation

To this point, we have argued that recorded soundscapes should not be considered equivalent to the experience of listening in situ. We have also argued that to seek authenticity of experience is counterproductive; participants in our research responded most positively when we acknowledged the *dis*placement of recorded sound and gave them the opportunity either to embrace a soundscape's ambiguity or to re-place it in a meaningful way. In this final section, we further suggest that a collaborative approach to designing immersive soundscapes allows more space for participants to engage creatively and meaningfully with the experience.

The 'immersive experiences' stage of our research – in which participants moved through different sensescapes – used sensory guides, whose role involved building bodily trust and a sense of being cared for between participant and guide.[5] The responses to these environments must be understood in relation to this process, again in terms of the creation of a 'hybrid space' that differs from the experience of walking through a real outdoor environment. Previous research has pointed out the importance of multisensorial embodied ways of knowing in the everyday practices of healthcare workers and the subtle, dynamic interplay involved in collaborative encounter in these settings (Hindmarsh and Pilnick, 2007; Pink et al., 2014; Mol et al., 2010). In a similar way our sensory guides focussed on the participants' experiential meaning-making, through 'being with' them and collaboratively exploring ways of knowing, being, and doing together.

The guides introduced themselves by name to the participant and explained exactly what was going to happen through the experience. This engagement, and the delivery of the experience with care, was crucial for some participants in fostering trust. As one participant noted in the post-experience interview:

> I think it's really important that we met the people first, and we trusted them, and they were really nice people, you know, and that was, you immediately, you know, you knew you could trust these people.

The sensory guides enabled a co-creation of a meaningful and positive experience, rather than the passive reception of a soundscape. One

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[5] This process of co-creation builds on the work of our partners BitterSuite who create multi-sensory concerts for classical and contemporary music. The focus is choreographing sensory experiences that can be adjusted and adapted to the needs and senses of each audience member.

participant suggested that the feeling of 'being cared for' worked alongside the designed sensescape to contribute to a feeling of wellbeing:

> I felt really cared for, like, all those people trying to provide me with complex sensory experiences to make me feel nice, well etc. How lovely of them!

Others imagined how these caring elements would be particularly important if they were already feeling vulnerable or fragile:

> … if I was a person, you know, particularly an elderly person in a hospital setting and somebody was doing all this stuff to make me feel good, it would be the sheer kindness of them taking the trouble to guide me around in this incredibly caring way.

No sensory experience operates in isolation. The guides' use of touch worked to enhance participants' experiences of the recorded soundscapes; one participant noted the 'sense of security of being led by another person', which enabled them to engage in personal reflection and to immerse more fully. This echoes Pink et al.'s (2014) work on the 'material culture of safety' that is associated with the use of hands in the tactile sensory and affective engagements of healthcare workers. However, the sense of security created in relation with the guide was not experienced by all participants. Some participants found it difficult to relax into the process of being guided, although ultimately entered an embodied relationship with the guide and responded 'not just to the exact directions that she was giving me, but to kind of, tensions that I felt in her body.' These findings link to extensive scientific work on the importance of touch in healing, caring, and building trust (see, for example, Rolls, 2000; Goldstein et al., 2017; Herdtner, 2000; Senderovich et al., 2016; Tabatabaee et al., 2016; Woods and Dimond, 2002). Responses to our guides further indicate the importance of a more socially-orientated use of touch and embodied interactions, which allow for guides to empathise imaginatively with and attune to participants' sensory worlds.

'Being cared for' and a focus on building trust with a sensory guide was not generally seen by participants as placing themselves in a passive position. Rather, through creating a safe environment the guides allowed participants to pay active attention to detail and to the non-visual. The care practices of guides were important in giving participants implicit permission to explore their own memories and to engage in imaginative play. One participant stated that the guide supported their imaginative engagement with the recorded soundscapes: 'the guide whispered something like "perhaps this reminds you of somewhere else" … this took me to another memory'. For another participant the experience was seen as a kind of relational play:

> We had quite a nice little play … we played a game where I was trying to poke my toe at the front end, and then I wanted to see if I could touch the ground at the back, but the chair wouldn't go.

The guides asked if this participant wanted to change the bass sound, when it became obvious they were not enjoying it, which for them made it possible to continue to enjoy the playful experience and to engage in a more personal way with the soundscape:

> I didn't like the bass sound and then she said, "Shall I change the sound?" And it was like, yeah get rid of that bass it's horrible. And then we could play some more. 'Cause, for me, I don't like it when it's very passive, I don't like it when I'm being led through an experience, um, and I can't co-create it.

This engagement speaks to the importance not only of care, but of giving participants control, and of the relationship between the two. It further highlights the particular opportunities offered by recorded sound and sound technologies, if delivered with care. In addition to the opportunities for imagination provided by stripped back soundscapes, with their lack of context or displacing effects, listeners can also edit or remix

recorded soundscapes to evoke either a particular place or the auditory features of their individual wellbeing. Some craved this ability to choose what they did or did not engage with during the immersive experience: 'perhaps give people an element of control in timing, like, unobtrusive light or sound every 10 min so people are in control (but not preoccupied with how long they've been in)'. For others, relaxing into a sensory 'experience [that] is curated for me' and *not* having to choose was part of the pleasure. The role of a person that can provide such experiences with care, or co-create it by getting the level of autonomy right for each participant, is crucial but difficult to balance.

Agency is not necessarily as simple as having rational control over the recorded soundscape; it should be recognised as an embodied and relational process. To quote one participant:

> It's absolutely crucial that … [the experience is] co-created in the moment … The liveness of it is its responsiveness … what makes the therapeutic experience precious is when its one-on-one care … and they know the person is there, for them.

This suggests the need to consider carefully how we make sense of the value of such non-visual immersive experiences, and indeed support a model of wellbeing as a relational process rather than a static end goal. Rather than measuring an experience as 'good' or 'bad' it may be important to make careful, detailed descriptions of participants' experiences, and the role of the facilitator or guide, in order to understand the messy situatedness and specificity of it. It is in this diligent attention to detail that it might be possible to 'meticulously explore, test, touch, adapt, adjust, pay attention to details and change them, until a suitable arrangement (material, emotional, relational) is achieved.' (Winance, 2010: 111).

Offering the 'choice to choose' is the key to creating a space that cares. There is potential value in material, embodied practices of care of the sensory guide in the design and use of sensory and immersive experiences for wellbeing. The sensory guide supports the creation of an enhanced space for personal visualisations and embodied experience that enable the participant to connect recorded soundscapes with their own memories and life experiences, or indeed take a person away from those experiences if that is what they want.

3. Conclusions

Taking sound as a case study demonstrates that there is no inherent 'sensescape of wellbeing' and not all 'nature' is good for everyone; even the terms 'nature' and 'wellbeing' are imbued with personal meaning. This project has highlighted the value of leaving space for imagination in curated sensory experiences of nature, rather than trying to recreate or directly simulate natural sensescapes. Non-visual or more abstract sensescapes show the range of ways that people think about and engage with nature through the interwoven processes of visualisation, memory, emotion, and thought. This article has also argued that recorded or designed soundscapes based on natural sounds can offer particular opportunities for personalisation. They should be judged on their own terms, rather than simply dismissed as inauthentic or 'lesser than' the real experience of being outdoors. This finding has implications for the way that such soundscapes are designed and delivered, indicating that attempts at simulating outdoor environments are not only futile but potentially counter-productive in the pursuit – or, rather, process – of wellbeing.

This research has shown the importance of providing opportunities for active listening, and technologies that can support these processes, rather than creating more passive and homogenous 'doses' of nature for the purposes of promoting wellbeing. In line with this, it demonstrates the value of guides and the importance of care in co-creating sensory experiences and responding to individual needs in a given moment. Sound does not operate in isolation, and sound technologies are best delivered with an element of human interaction and care; these

conclusions can be extended to the other senses that we investigated during this research. Our findings are particularly important given the increasing use of VR experiences in healthcare settings that often 'deliver' nature in a packaged and homogenous manner. Overall, we did not find that the value of emerging immersive technologies is to simulate nature better. An 'immersive experience' is richest when it allows for – and reveals – the nuances and complexities of individual responses to natural environments.

Data availability statement

Data in the form of workshop and interview transcripts are available, to researchers and by request, at the University of Bristol data repository: data.bris at https://doi.org/10.5523/bris.9em905yphiha2512slz77lp58.

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