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Turning over a new leaf: The health-enabling capacities of nature contact in prison

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ABSTRACT

In this paper we explore the potential applicability of evidence of health-enabling effects of elements of the built environment – particularly access to nature – deriving from research in healthcare facilities to evidence-based design in the custodial context. Drawing on comparative qualitative research conducted in the UK and the Nordic region, we argue that although available data lack direct comparability, there is evidence that access to nature generates the same health-enabling effects in custody as are recognised in healthcare facilities. Reflecting on the differing political contexts of imprisonment in the two study areas, we conclude by advocating further research both to better understand health-enabling elements of the custodial built environment, and to better enable robust findings from healthcare facilities to be applied in custodial contexts.

1. Introduction

Various 'health-enabling' characteristics of the built environment, including views of and access to green spaces, have been recognised and evidenced in healthcare facilities (HCF). These insights have then informed Evidence-Based Design (EBD): the intentional deployment of such features to support delivery of the intended outcomes of HCF. In this research context, 'health-enabling' refers to health in the sense that a healing and 'psychologically supportive' environment helps patients cope with the stress that accompanies illness, thus supporting them in clinical recovery.

Although this cycle of research-informed EBD is relatively well-established in HCF, it is almost entirely absent from custodial facilities (such as prisons) despite the fact that many prisons share key characteristics with many HCF. For example, buildings tend to be large in scale, with 24hr operation and accommodation, and many prisoners have complex healthcare needs, including requiring treatment for substance misuse. The relative absence of health-enabling EBD in the custodial sector is remarkable because the benefits recognised in HCF might also be beneficial in prisons. Enabling prisoners' recovery from clinical illness, although obviously desirable, is not the primary purpose of imprisonment. However, ensuring that prisons are safe and secure environments for both prisoners and staff, and supporting rehabilitative activities with a view, ultimately, to reducing reoffending, are key purposes of prisons. All of these would be facilitated by reducing levels of stress, argued to be the key mechanism via which health-enabling design elements support clinical recovery.

Although prisons and HCF share some characteristics, they differ in two significant ways. First, prisons are extremely (perhaps uniquely) challenging research environments in which the types of studies common in HCF are almost impossible to replicate. Second (but relatedly), prisons are viewed differently from HCF in terms of the perceived legitimacy of a 'healing' custodial function. As a result, there is a not only a significant data gap around the potentially health-enabling characteristics of custodial built environments, but there may also be a lack of motivation to deploy insights from HCF to inform EBD for the custodial estate.

The purpose of this paper is therefore to consider, drawing upon our recent research on views of/access to green spaces in newly-built custodial facilities in the UK and the Nordic region, whether and how the health-enabling characteristics of HCF might have utility for the EBD of custodial facilities.

We first review recent literature on health-enabling environments, focusing on the recognised effects of views of, and access to, green spaces. Next, we consider prison environment research, including in the burgeoning sub-discipline of carceral geography. In drawing these two literatures together, we reflect on the different methodological approaches utilised and explore differences between these types of institutional settings, both in terms of intended function and types of prior studies. We then move to consider our own study of access to nature in prisons, describing the research rationale and methodologies. In the subsequent discussion of empirical data we explore the tensions

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around inclusion of green spaces in newly-built prisons; the reported beneficial effects of green views/spaces; and ways in which management of custodial facilities may influence the potential beneficial effects of nature contact.

2. Health-enabling built environments

Recent years have seen a proliferation of research into potentially health-enabling characteristics of the built environment. Much work traces its origins back to Ulrich's (1984) study of the positive effects of views of nature on patients' recovery from surgery. Subsequent studies have demonstrated the effects of a variety of built environment features, such as acoustics, ventilation, ergonomic conditions, layout, and lighting, on health and wellbeing in HCF (Salonen et al., 2013a, 2013b; 2014; Huisman et al., 2012; Iyendo et al., 2016; Zhao and Mourshed, 2017; Cooper-Marcus and Barnes, 1995; Chang and Chen, 2017; Andrade and Devlin, 2015). Nature contact is often identified as a health-enabling feature, found to produce calming effects, to reduce levels of stress and tension, and to improve health outcomes. Explanatory theoretical frameworks advanced include the biophilia hypothesis and Environmental Restoration Theory (ERT). Biophilia holds that humans have an intimate emotional attachment to nature, especially living biota, and that because humans evolved within nature, we still display inherited adaptations making us likely to function well when exposed to natural environments (Wilson, 1984, 1993; Soga and Gaston, 2016). Within wider arguments about benefits of nature contact in a range of spatial contexts (Keniger et al., 2013; Hartig et al., 2014), built environment research suggests that natural elements are calming because of these longstanding innate connections. Similarly, ERT suggests that nature contact enhances humans' coping resources, perhaps by stimulating underutilized portions of the brain and relieving more fatigued areas (Largo-Wright et al., 2016; Kaplan, 1995; Ulrich, 1991).

Studies of prisons as built environments have recently emerged in the new subdiscipline of carceral geography (Moran, 2015; Moran et al., 2017). Informed by and in dialogue with criminology, carceral geography shares elements of a criminological approach concerned with the hardships of imprisonment and the ways in which confinement in space is experienced. In work on embodied and gendered carceral experiences (Moran, 2012, 2014; Rosenberg and Oswin, 2015), political-economic impacts of carceral spaces (Conlon and Hiemstra, 2016; Mitchelson, 2014; Shabazz, 2015a, 2015b) negotiations of mobilities and boundaries (Sibley and Van Hoven, 2009; Moran, 2013a, 2013b; Turner, 2016; Turner and Peters, 2017), and in theorisations of the carceral (Martin and Mitchelson, 2009; Moran et al., 2017), the oppressiveness of conditions and circumstances of incarceration is a recurring theme. The highly stressful nature of life behind bars is demonstrated by high levels of self-harm, violence and suicide in custody (e.g. in England and Wales, where incidents stand at their highest rates since 1978 (Ministry of Justice, 2017)). Although studies of levels of stress for prisoners are sparse, Massoglia (2008) found that individuals with a history of incarceration are consistently more likely to be afflicted with stress-related illnesses; and numerous studies evidence the high levels of stress experienced by prison officers (e.g. Rutter and Fielding, 1988; Keinan and Malach-Pines, 2007). Carceral geography's predominantly qualitative and ethnographic methodologies, and attention to carceral spaces, have complemented prior criminological understandings of the hardships of imprisonment, bringing to light the role of prison *environments* in amplifying, mitigating or otherwise mediating these effects (Moran and Jewkes, 2015; Hancock and Jewkes, 2011). In other words, we have known for some time that prison is a highly stressful place; we are now beginning to understand the role that the built environment plays in producing that tension.

A key difference between these thematic literatures lies in the methodological approaches deployed. Research into the health-enabling characteristics of HCF tends to be highly quantitative, using biological measurements to access physiological responses to environmental stimuli through experimental approaches, such as: measurements of blood pressure and pulse rates to determine levels of stress amongst blood donors watching nature scenes on TV (Ulrich et al., 2003) or pulse rates alongside electromyogram (EMG); or measuring muscle tension via electrodes placed on participants' foreheads to determine response to audio recordings of nature sounds (Largo-Wright et al., 2016). Some authors contend that users' own perspectives are under-researched (Zhao and Mourshed, 2017). Although sometimes deployed alongside a single-item self-report question (such as 'How do you feel right now from 1 to 10 with 1 being *totally relaxed* and 10 being *totally stressed*?'), primacy is placed on institutionalised psychophysiological measurement of stress, producing quantifiable data analysed to determine measurable effects of stimuli.

Whereas HCF research has demonstrated empirical evidence of causal relationships and generated experimental data evidencing immediate stress-reducing effects, scant comparable data exist for the custodial sector. Not only is it difficult to establish causality between in-custody conditions and either in-custody outcomes such as violence, or post-custody outcomes such as reoffending rates (e.g. McGuire, 2017), but data pertaining to the potential impact of individual built environment features are almost completely absent. With the exception of Moore's (1981) study, in which he reported fewer sickness calls made by prisoners with a view of nature from their cell, we know very little about the impact of nature contact either on prisoners' immediate wellbeing or longer term outcomes like reoffending rates. The numerous studies of prison horticulture programmes (e.g. O'Callaghan et al., 2009; Robinson & O'Callaghan, 2008; Brown et al., 2015), do not – perhaps cannot – differentiate between the effects of nature contact and of the purposeful physical activity undertaken.

One reason for this difference in data availability is that prisons are subject to strict regulations in terms of research conduct. Although HCF are of course also challenging, physiological measurements are commonplace in HCF studies of wellbeing, whereas restrictions on research equipment in prisons mean that this kind of data has, to the best of our knowledge, never been collected. And whereas deployment of Bluetooth-enabled body-worn biosensing devices now make blood-volume pulse, skin temperature and electro-dermal activity data much more widely accessible to researchers (Osborne and Jones, 2017), these types of broadcasting devices are prohibited in prisons and, even if permitted for research, would generate significant concern about potential security implications. The kind of data generated in prisons is more often qualitative and ethnographic – there is a growing body of evidence drawing out 'user experiences' of prisons' built environments – the kind that Zhao and Mourshed (2017) considered underreported in HCF – but the corresponding biosensed data is lacking.

Underlying these research circumstances, of course, are different perceptions about the legitimate function of these institutions. The healing function of hospitals is relatively unquestionable. Use of terminology such as 'therapeutic' would rarely be queried in relation to HCF, where there is no intent to 'punish' users usually viewed as deserving of assistance. Conversely, there is little perceived public sympathy for prisoners, and policy rhetoric usually reflects a perceived public demand for prison conditions to be as basic as possible. As a result, there is rarely the political appetite to consider prisons as therapeutic facilities, or to enable research of this kind – with its attendant methodological challenges - to be carried out.

3. Case study and methods

Our empirical data were generated through an ESRC-funded comparative project in the UK and Nordic region in 2015/16 investigating how penal aims and philosophies (that is, what prison is 'for') are expressed in design of new prisons (completed in or after 2010); and how those prisons are experienced by prisoners and staff. Data availability and security did not allow the project to test the statistical relationship between elements of the built environment and either in- or post-

custody outcomes. We draw here upon data generated at a prison in the UK, for adult male offenders and adult and young offender females, and one in the Nordic region, for adult male offenders. Under the terms of research access, no further identifying information can be given. Rates of imprisonment per 100,000 differ significantly between the UK and the Nordic region, with the latter perceived to be more liberal and humane in its approach to imprisonment under the 'Nordic exceptionalism' thesis (Pratt and Eriksson, 2011). The comparative approach enabled us to explore how the different punitive philosophies of the UK and the Nordic region informed the design of prisons. In practical terms, new prisons in the UK and the Nordic region tend to differ in size (larger in the UK) and build-cost per place (higher in the Nordic region). In the UK, green spaces within new-build prisons tend to be minimal patches of closely-mown lawn, whereas in the Nordic region pre-existing wooded landscapes are more commonly preserved and incorporated into prison grounds, or designed by landscape architects.

Prison research is always challenging. Ethical considerations are always paramount, and researchers must develop strategies for managing boundaries and emotions during data generation (Drake and Harvey, 2014; Sutton, 2017). Research access is notoriously difficult to negotiate, data generation activities must be designed around day-to-day institutional schedules and regulations, and researchers must comply with local codes of conduct in order not to jeopardise their own safety or the security of the establishment as a whole. During our study, data collection included: ethnographic observations; 29 focus groups in the UK prison (of between two and six prisoners, including 75 participants in total); and interviews with staff (36 in the UK, 14 in the Nordic prison; 50 in total) and prisoners (42 in the UK, 16 in the Nordic prison; 58 in total). The combination of focus group and interview methodologies is recognised to be fruitful in custodial contexts where issues of power and disclosure – which are of course present in any research context – may be amplified (Pollack, 2003). Focus groups took place on prison wings; interviews took place in small off-wing meeting rooms usually set aside for consultations between prisoners and psychologists, social workers and other professionals. The different numbers reflect the different prisons' population of both staff and prisoners. The mixed-methods approach enabled understandings of collective experiences to be developed in the focus groups, alongside the more personal and individual accounts generated through the interviews, and for both to be supplemented by ethnographic observations – of cells, wings, special care units, heath centre, visiting suite, education spaces, outside spaces, and workshops – made at both prisons . Aligned with prison ethnography more broadly (e.g. Drake and Earle, 2013; Ugelvik, 2014), these observations (made in research diaries) were designed to produce rich and detailed accounts of people and the social processes and spatial contexts in which they were embedded. There is limited space here to reflect on the researchers' positionalities and the ways in which they intersected with the various research contexts, the diverse research participants, and the topics under investigation; however, as Brown and Bos note, researchers 'are rarely neutral, objective bystanders in the work we undertake' (2017, 7). Nineteen architects, landscape architects, contractors and justice sector professionals involved in prison design and construction were also interviewed across both contexts, and interviews took place in their offices. Within wide-ranging discussions about the design of all elements of a new prison, all interviews covered the inclusion, experience and significance of green spaces. Audio recordings were transcribed and analysed using NVivo, using an inductive coding method which sought to identify respondents' descriptions of green spaces and their significance. An anonymous paper-based survey was also distributed at the UK prison (n = 85, response rate 22.6%). Since green spaces were just one of a wide range of architectural design elements under study within a much broader overall project, we consider it unlikely that a biased sample of respondents (i.e. those disproportionately interested in nature contact) could have been recruited.

4. Results

4.1. Tensions surrounding green space in the carceral setting

What prison is thought to be 'for' influences priorities for the design of new facilities. In the Nordic region, it is politically acceptable to articulate a vision of prison as a therapeutic space intended to enable prisoners to heal – going to prison *as* punishment, not *for* further punishment – in conditions which are intended to resemble 'normal' life as far as possible. In the UK, this has not been the case. A triple bottom line of cost, safety and security has meant that UK prisons are comparatively austere, harsh and sterile environments (Moran et al., 2016), with public opinion perceived to demand that prison conditions should be worse than those available to low-paid workers outside. As such, provision of green spaces is severely limited in UK prisons. Interviewees involved in prison design in the UK drew attention to the perceived security risks of large, green areas, explaining that state authorities viewed grass, soil and shrubbery as ripe for concealment of contraband such as drugs and mobile phones. One participant outlined the reasons why green spaces tended not to be included:

> [S]hould we have garden areas where they [prisoners] look out of their cell windows? That really only benefits those on the ground floor anyway, but that then causes yet another risk because it becomes an easy area for items to be thrown into the establishments over fences …. The grassed areas and these nice areas with shrubs and that sort of stuff become just hiding places … You have to then search and clear that area before you can then start letting prisoners out there. (Design evaluator, UK)

This excerpt demonstrates that the concerns about green spaces included their limited perceived value; the risk of concealment of contraband; the cost of staff time in searching these areas before prisoners could be allowed into them; and the disruption to prison schedules while these searches took place. The overall sense was that green spaces were more trouble than they were worth. Trees were usually absent from UK new-builds because of the fear that they would obscure sight lines, and therefore enable smuggling of contraband, and also for their potential to be climbed, thus creating an 'incident at height' (invoking a specific and staff-time-intensive response protocol). One UK buildings engineer saw the natural landscape as unpredictable, with risk-averse prison authorities exercising a duty to prevent both potential security breaches and other risks:

> Well they [trees] could grow. And people could climb up them, then chop them down and then they could escape. I mean we've had all those discussions over the years … and you know, are they a suicide risk more than anything else? (Buildings Engineer, UK)

Some senior prison staff were open to the presence of trees but, again, framed their responses in terms of risk, rather than potential benefit:

> People would probably hide things in the tree, but there's no difference from hiding things in a tree than hiding things somewhere else. It's all down to location, I'd suggest. There are locations in the jail where under no circumstances would you plant trees. One or two times I would suggest yeah, if there is an area set aside I can't see why not. (Senior staff member, UK)

Similarly, when considering the potential retrospective introduction of green areas, others were keen to reiterate security issues and stress that if plants and grass were to be included, they should be kept away from prisoners:

> ..we could put stuff outside the fence [of an exercise yard], there's a bit up the back where the rubbish cages are, these areas tend to be free of any sort of materials that they could use. You know what I mean, you could put in planters or whatever all over the place, but if

anything happens they could use that as weapons and stuff. You know they would … It's always going to be a security issue thing. But as far as plants and that go, as I said, put them on the other side of the fence, not a problem.

(Prison officer, UK)

Cost was also a significant issue. All green spaces were perceived to increase construction and operational costs. Lawns in 'sterile zones' out-of-bounds to prisoners would have to be mowed by paid contractors, rather than by prisoners themselves. Additionally, the provision of green spaces for prisoner horticulture programmes was often discouraged either due to the additional cost of a longer perimeter wall, or the perception that prison horticulture could not provide enough work spaces to keep enough prisoners occupied. As one architect explained:

… horticulture takes up a lot of space and doesn't employ a lot of people, so it tends to go down the scale. Classes, education classes are more productive in terms of using prisoners up, as it were. I shouldn't use that phrase, but that's the way it works. Classes, large-scale workshops and you are able to educate or occupy large numbers of people.… (Architect, UK)

Landscape engineers and architects also perceived a wider societal distaste for prison spaces that were "too nice". Discussions of green spaces paralleled those around innovative heating/cooling technology, or 'en-suite' sanitation, with a concern that these could viewed as a luxury by the tax-payer. As an engineer with a significant prisons portfolio explained, the presence of trees was about more than security:

… Well the conversation normally goes, well that's okay we can live with [trees] from a security perspective but we can't give them anything too nice because the people who are living in the area around will see that they've got something better than *they* have. So we've kind of got to downgrade it, okay. … I guess the conclusion I've come to over time is that it's just really hard to do the right thing in the face of probably public opinion because it's quite counter to your view. (Engineer, UK)

In summary, the consistent impression given by architects, buildings engineers, civil servants, and prison staff was that green spaces were costly in terms of cash, time and labour, and that they created unwelcome potential for risk. Although some recognised potential benefits, they concluded either that these did not outweigh the costs and risks, or that those whose decisions counted would not be persuaded that they did. In comparison, when architects involved in prison design in the Nordic region were asked to speak about their aspirations for new-build prisons, they not only positioned landscaping as central to the 'resocialisation' of prisoners, but were able to point to experiences of including these elements in final designs with the full support of relevant government bodies. For one, this meant:

… a very varied and stimulating environment of different spaces and landscape features – hopefully this will contribute to the re-socialisation of the individual and to create renewed confidence in the community and mutual respect for society as a whole. (Architect, Denmark)

Expanding these intentions further, a member of a Nordic prison design team considered the explicit relationship between a prison sentence and the presence of green landscaping, articulating exactly what they considered the benefits of access to nature to be, in this context:

And of course the green elements must be so important in a situation like this where you are in the same place in a strong fence for many years. So to have the light, to have the green, to have the changes at the year, all this, and just to have the simple human feelings outdoors, it's very important. (Landscape architect, Denmark)

They were of the view that access to green spaces was necessary to mitigate the effects of confinement, especially in relation to enabling prisoners to sense the changing of the seasons and feel connected to the world outside. Although Nordic architects did recount occasions where they faced obstruction from prison authorities who expressed security concerns resonant with those in the UK, they then discussed the ways in which these concerns were addressed. For example, in order to deliver an intended orchard for a new prison in the Nordic region, the landscape architect discussed the time-consuming process of mapping sight lines and CCTV 'video spots'. Rather than worrying (as had the UK buildings engineer quoted earlier) that trees might grow and become a problem, they projected trees' potential growth patterns before designing the planting scheme:

But just to have so many trees in this space, it has really been a long argument. And it has been a long argument because it's very, very easy to take away all the green because of the security. But we did very close work together with the engineer who made the video spots, so we planted a lot of trees in this area. And then we told him to okay you put the video and we will put trees, because then we could exactly put the trees where it was not disturbing the whole view. (Landscape architect, Denmark)

Fig. 1 provides an example of the variety of flora and fauna that landscape architects were able to achieve in one prison. Presented with a sloping, forested build site with rocky outcrops, the design team preserved many stands of woodland in their original form. Given the foregoing debates about the cost and risk of introducing trees into a new prison, this use of pre-existing woodlands might seem a cheaper option. However, the design team told us that it would have been much cheaper to have levelled the site to remove the incline, stripped it of trees, and replanted after the build. Nestling the prison amongst the rocky outcrops and natural woodland without damaging them came at considerable financial cost – and new plants and shrubs were still introduced into 'garden' areas.

In other words, and as is evident in these examples, although trees cause arguments and cost money, it was considered worth going to great lengths to make them 'safe' because architects and design evaluators were firmly of the view that the presence of trees would have a therapeutic effect on incarcerated individuals. Trees were considered to helpfully 'soften' view of perimeter walls (see Fig. 2) and to lend the landscape a certain sense of permanence or stability:

We can be in prison or not or we can kill someone or not, but still trees are still just trees and they have sort of a stability in them. (Design evaluator, Nordic region)

It's important for the inmates also to know that they are part of something bigger in a very isolated world … Nature shows us how

Fig. 1. Rocky outcrops and a view towards the prison' forest' from one of the outside exercise areas in the Nordic prison.

Fig. 2. Trees and shrubbery used to 'soften' the perimeter wall in the Nordic prison.

the time goes by. (Architect, Nordic region)

Between these two regions, then, we see a difference in the ways in which green spaces in prison are viewed. Although respondents in both regions perceived some risk associated with the presence of nature – trees in particular – this risk was assessed differently. Whereas in the UK, the perceived risk outweighed any putative benefits, in the Nordic region there was much greater appreciation of the therapeutic effects of nature contact, and accordingly, more willingness to explore ways to incorporate green spaces to minimise risks whilst maximising benefits. In a later section we consider how effectively these risk-mitigation strategies worked. It is worth noting that in neither context did architects or designers refer to insights in relation to EBD. Even in the Nordic region, designers did not justify their inclusion of green elements with recourse to 'evidence' of the effects of access to nature (e.g. drawn from HCF). Instead, their opinions tended to reflect personal preferences for presence of trees, and a sense that they were self-evidently appropriate for a humane living environment, regardless of who would be living in it.

4.2. The grass is always greener

We next explore views of prisoners and staff in both study prisons, about access to and views of nature, in order to consider whether the qualitative evidence generated in these sites indicates that the health-enabling effects identified in other institutional contexts are also to be found in custodial environments.

The data we present are indicative of the majority of opinions expressed – although the differences between the sites affected the nature of the observations respondents were able to make. In the survey at the UK study prison, 81% of respondents reported that there was not enough grass and 83% that there were not enough plants and flowers. Given this overwhelming sense of *absence* of green spaces, at interview prisoners reflected most on what they did *not* have access to, how that lack made them feel, and sometimes, how it felt if they *did* finally come into contact with nature. UK prisoner interviewees commented upon the predominance of concrete and mused upon the potential difference green landscaping might make. Daniel[1] articulated the potential benefits of the presence of wildlife attracted by trees:

> You don't necessarily need to see the outside world, but something like some nature outside, what a difference it makes, to see birds or that and squirrels flying up in the trees. (Daniel, UK prisoner)

Ryan talked about the relative absence of grass, and the inability to touch any grass that was present:

> I find it weird to feel it, if I touch it or anything like that. You're not used to touching it now. It'd be odd to get the feeling of lying on grass. It sounds stupid but … But even just feeling it …. just the feeling of grass on your hands. I can't remember what that feels like. (Ryan, UK prisoner)

Patrick also missed the 'feel' of grass:

> … we've just got tarmac and big high fences. And even the grass, even if you just got to lie on the grass. I don't know, there's just something decent about lying in some grass. (Patrick, UK prisoner)

Karen, who reflected on her previous experiences in other custodial facilities, explained the impact of having access to green spaces when these had previously been unavailable:

> So when I finally went from [Prison A] to [Prison B] I was sitting at the window … And someone said to me, 'What are you doing?' I said 'I'm smelling the grass, which I haven't smelt for like two years', just a simple thing like grass on the ground. And I hadn't seen a tree, you know, it's really daunting, daunting. (Karen, UK prisoner)

These and many other prisoners' views resonated with the biophilia and ERT hypotheses in terms of the negative effects of lack of access to nature. However, one or two UK prisoners denied that green spaces had any therapeutic effects, sometimes displaying a wry humour when gently mocking the idea:

> Dominic: Look out your window and go, 'Ah I seen a tree so I'm feeling better today.' It's not like that. You see a tree, you don't see a tree, it doesn't matter.
>
> Karl: You see a tree … you'd be more excited seeing a car, because you never see cars. (Prisoner focus group, UK)

In these focus group exchanges, there was a slight sense of reluctance to acknowledge potential benefits of nature views – almost as if these were something of a weakness that should not be revealed. However, these sentiments may reflect what Soga and Gaston (2016) have called the 'extinction of experience', in which physical separation from nature leads to lack of familiarity with it, an inability to recognise any beneficial effect from it, and eventually, lack of interest in the natural environment more generally. We do not know the pre-custody biographies of the prisoners we interviewed, but many are likely to have lived in urban areas where they may already have become accustomed to a lack of nature contact in their daily lives. Most prisoners in the Nordic facility did not share these sentiments, being much more likely to independently express a 'biophilic' view that nature was 'good for' them – which may reflect a higher level of nature contact in their earlier lives before coming to prison. Even though Nordic prisoner Bjørn agreed with UK prisoner Dominic in that he could not personally pinpoint a tangible benefit from his green view, he did not want to lose it:

> I really enjoy nature so for me … you don't really think about these things, I don't necessarily sit there and analyse 'oh there's trees there, oh because of the trees now I feel a little bit better'. But I think the trees and I think the nature have a positive effect on anybody, I

[1] Pseudonyms have been used throughout.

> don't see anything negative that can come from that. And I think if you took away the window I think the room would become much more depressing. (Bjørn, Prisoner, Nordic region)

In the Nordic prison, where green spaces were varied and abundant, prisoners reported deriving from them exactly the kinds of benefits – suggested by biophilia and ERT – that could only be imagined by our UK respondents. Hans described the landscape around his prison cell and related his feelings of 'homeliness' and happiness directly to it:

> In the exercise yard … you sit down on a table, there's grass around you. There's fences, not walls, fences which you can look through and see all the shrubbery and the trees and the greenery around you. … Even though it's only an hour a day that you get to be outside, it's still a very important hour. … You also [look through] the windows at the end of the common room, which all face out towards that exercise yard so even though you aren't in it all day, you see it all day. … Well it might be a stupid thing to say but it reminds me of home, because … my own house is … surrounded by a garden. … I actually had a rhododendron right outside the window, obviously I was on the … first floor, so it was a couple of metres down. But this spring when it started to blossom that was an immense feeling because I have several rhododendrons around my own yard, my own garden and being able to watch that grow, blossom … (Hans, Prisoner, Nordic region)

Hans was one of several Nordic prisoners who spoke eloquently and at length about their affection for the exercise yards – irregular-shaped spaces dotted with trees, grassed areas, gravel paths, shrubbery, wooden seating and flowerbeds with a variety of different plants. As he explained, these spaces were enjoyed by lying on the grass – exactly the activity that had become a distant and wistful memory for prisoners in our UK study site:

> All of the inmates love that exercise yard. I don't know if they all see what I see but they do love it. For instance in the summer when we have good weather – I'm not much of a sunbather myself – but most of them throw off their shirts and lay down on the grass and stay there for an hour, just enjoying it … (Hans, Prisoner, Nordic region)

Staff at the Nordic prison were aware of these prisoner benefits and also articulated the benefits they felt themselves, as individuals spending a significant portion of their time in the prison:

> … when I either am outside walking because I have to go get something or someone or following somebody to a visitor, or just having my break, stepping out for five minutes to clear my head, trees, the cleanness … It feels more calming. (Prison officer, Nordic region)

As might have been expected, given the robustness of findings of beneficial effects of nature contact in other institutional contexts, our qualitative evidence supports the conclusion that these benefits are also likely to occur in prisons, and that the biophilia and ERT theorisations used to explain these effects elsewhere, are also likely to be relevant here.

4.3. Biophilia and ERT in the custodial context

We now consider these effects in more detail. In this section, we explore the specificities of health-enabling nature access in prison; in particular, the ways in which management of the custodial context may mediate these benefits.

For prisoners in the Nordic study site, there was a critical distinction between green views (which were almost ubiquitous across the prison site) and physical *access* to green spaces. As discussed earlier, prisoners could access the well-kept green spaces of their exercise yards for a specific period each day. However, for security reasons, they were not allowed to enter the more densely forested, natural wooded areas which bounded internal roadways between different areas of the prison. As one officer explained:

> So they also sometimes say when they look out the window they see the trees, and it feels so close, but it's so far because they're not able to use the woods. (Prison officer, Nordic region)

Christian, a prisoner at the Nordic site, described this tension between the tantalising presence of the woodland, and prisoners' inability to enter it:

> Well it's a little bit disappointing actually because I can't actually walk in the woods; I just have to look at it. That's more painful actually because you know I miss the smell and the touch and how it affects me, it makes me calm generally. … it doesn't look like a prison, it makes it more look like a park or something like that, so it makes you calm but it also makes you want to, you know, be there instead of just looking at it. (Christian, Prisoner, Nordic region)

In this extract Christian clearly expresses exactly the kind of calming, restorative effect of nature contact hypothesised under biophilia and ERT, but tempers this with his reflection that the proximate visibility-yet-inaccessibility of the forest may be counterproductive. Christian does not say that he would prefer the forest not to be there at all, but the sense that it is so-near-and-yet-so-far seems to deliver a significant negative effect.

Some of the interviews conducted at the Nordic study site were mobile – walked interviews in which participants took researchers (and a member of prison staff as an escort) on a walking tour of the prison, taking in places of significance to them. During these tours, the issue of inaccessibility arose several times. The following exchange occurred on passing a small orchard:

> Morten: Yes, but this is a spot we [prisoners] don't like.
>
> Interviewer: No?
>
> Morten: No, because they [the apples] … look so good. We can't touch. It's like the Garden of Eden.
>
> Interviewer: Oh, are you never tempted to go and get one [an apple]?
>
> Morten: Yes, every day.
>
> Staff member escorting: You're allowed now.
>
> (Morten, Prisoner, Nordic region)

Morten's pleasure at being able to pick and eat an apple straight from the tree was immediately apparent. We soon reached the prison 'forest': our intended destination. Seeing Morten standing on the roadway, wistfully pointed out his 'favourite tree', the staff member allowed him to enter the woods. He walked a few feet to the tree and wrapped his arms around it (Fig. 3). Morten told us that these moments, in the forest and orchard, and with the tree, would count towards one of his 'best days' in prison.

In addition to the evident tension between seeing and touching the forest, the presence of trees also represented precarity; that is, they were viewed as being at risk of removal should prisoner behaviour deteriorate. Stig talked about his expectations about likely management responses to potential escape attempts, communicating a sense of the green landscape as fragile and under threat:

> These trees, they're going to cut it down. … You have the wall, the outer wall, the [outer] fence, and between the [outer] fence and the inner fence there are some trees, and I told another guy "soon they're going to cut down these trees". [And] not long after they cut these trees down … they're going to cut down all the trees there. First escape, they cut down all the trees, because this is how it works. (Stig, Prisoner, Nordic region)

Prison management techniques often include the earning and

Fig. 3. Morten hugging a tree in a restricted area of the Nordic prison during a walked interview (Morten gave his permission for publication of this photograph, aware that he would be recognisable in the image).

removal of privileges in response to prisoner behaviour. Although this was not formally an element of punishment, at both study sites removal of privileges involved denial of nature contact. None of the exercise areas in the UK study prison provided physical access to green spaces, but prisoners being reprimanded took their exercise in yards from which a distant grassed area, visible from the usual exercise yard, could not be seen. In the Nordic prison, the distinction was starker; equivalent exercise areas were concrete enclosures, without any of the grass, trees and shrubbery common elsewhere. For prisoners, the difference was marked, as Hans explained:

> … walking into that exercise yard belonging to this unit, the walls are suddenly just, well you lean against them, there's no grass. Obviously you can see the trees above the courtyard, so to speak, but you're on asphalt, concrete walls surrounding you and there's a gate into the exercise yard which is closed after you go through it. So you really get the sense of being locked up. … most of the time [when] you're inside this prison, the only wall you see is the wall surrounding the entire complex, and that's far away. And then, … suddenly being inside a wall, just 20, 30 feet to each side, that's the tragic feeling because you are trapped, you are literally trapped completely. … It's that feeling, it's that contrast that's making it tragic. (Hans, Prisoner, Nordic region)

The sudden lack of the 'softening' effect of trees in relation to the perimeter wall (explicitly intended by the designing architects, as we saw earlier) was an abrupt reminder to Hans of the reality of his imprisonment. Rather than exercise in this concrete enclosure, Hans chose not to go outside at all. At the time of interview, he had not been outside for over two weeks.

These findings suggest that access to nature has the potential to be used in a range of ways, to serve a variety of intentions. They indicate, perhaps, that the notion that green spaces are a therapeutic element provided for the innocent and deserving (e.g. patients and pupils) but not the guilty and punished (prisoners) has resonance even within individual prison facilities. Whilst green spaces in prison may have a health-enabling effect, the nature of management of the custodial environment means that their withdrawal – either literally, as Stig feared, or through denial of access *to* them – can be deployed punitively. Prisoners who exhibit poor behaviour – arguably those who are most in need of calming and healing environments – are denied access to nature. This logic of provision is at variance with the therapeutic deployment of nature in healthcare and education contexts, where nature contact is likely to be considered most beneficial for those patients and pupils at highest risk of negative effects of stress and anxiety.

5. Conclusion

Our intention in this paper was to consider the extent to which health-enabling characteristics of HCF are applicable in the custodial context. Using data generated through a comparative project concerned with punitive philosophies and lived experiences of incarceration, we found that the calming, de-stressing effects of nature contact, observed via a range of experimental and empirical studies in HCF, were also observable in qualitative data from two study prisons. Across the two study sites, one much 'greener' than the other, respondents denied nature contact wanted to have it and could articulate the benefits it would bring, and those provided with green spaces valued them highly and described the health-enabling effects they derived from them.

The small scale of this study means that the two conclusions we draw from this work are primarily oriented towards potential future study. First, although our insights pertain to only one of the wide range of health-enabling characteristics evidenced in HCF, our findings suggest that more serious consideration should be given to the application of EBD, derived from HCF, to the custodial sector. Although design processes and intentions differ between the UK and Nordic contexts, in neither was transfer of health-enabling EBD knowledge from HCF explicitly considered in the design process, suggesting that there is a significant scope for adjustment of process. Future changes might conceivably include support for greater access to and views of green spaces for prisoners, and perhaps deployment of other well-evidenced health-enabling elements of HCF such as better natural lighting, noise-reducing acoustic treatments, and non-institutional internal fittings and fixtures (Salonen et al., 2013a; b).

The lack of robust biosensed data is a significant drawback for health-enabling custodial EBD; restrictions on prisons research perhaps mean that we will never know whether findings in HCF are replicable in custodial environments. Our second recommendation is therefore twofold. There would undoubtedly be value in attempting to replicate the types of study conducted in HCF, and such research should be pursued as far as possible. However, a more realistic aspiration is perhaps for future prisons research to focus on generating a better understanding of *how* insights derived from HCF could be translated to the custodial estate. In our final analytical section, we briefly explored the ways in which, in a custodial setting, almost any aspect of prison life which is valued by prisoners, and to which access is not protected in law, can be transformed into a privilege to be earned or punitively removed, and this management tendency would need to be carefully considered in future knowledge transfer.

Prisons are contexts in which inhabitants' environments are completely controlled, and they therefore offer perhaps unique opportunities for extension of research into the health-enabling outcomes of nature contact in general. We noted earlier that some of our respondents might have been exhibiting effects of 'extinction of experience' in refuting any beneficial effects from nature contact. Our study design did not allow us to judge whether their lives before custody had influenced this circumstance, and neither could we say if they were still receiving calming effects from the minimal nature contact they *did* experience. Extant literature is relatively silent on the topic of whether persons who deny any conscious benefit from nature contact still derive such benefit when their experience is analysed physiologically. Should

the necessary research techniques be permitted within prison, this would be an apposite setting in which to probe this question.

All of our recommended courses of action would require political will, and the extent to which they are possible is related to the political expediency of different conceptualisations of the purpose of prisons and imprisonment. In the UK in particular, the shift in thinking necessary to move from viewing green space as a threat or a risk, to a potentially therapeutic custodial landscape element, is not insignificant.

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