



Vertical connection: an exploration of the possible social
benefits of a pro-environmental indoor farming event among
South Manchester community members

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Lay summary

Why did we do it?

Nature-based social prescribing is an approach that aims to improve mental health and social connectedness by directing lonely, isolated, or mentally ill individuals to local activities, groups, or events. However, we have a weak understanding of how this has an impact on loneliness, isolation, and mental health.

We know that seeing something as being ‘natural’ and feeling a sense of community are important for improving social connection and mental health in these interventions, but most of this research has been shown in outdoor spaces like gardening or planting trees.

This study is the first to look at how an indoor farming event run by Farm Urban Manchester to educate the local Community about the environmental benefits of indoor farming might impact how connected the local community feel.

What is new?

The study included 8 people from various aspects of the community with different connections to gardening, like community gardeners, nature therapists, artists, volunteers, and a voluntary youth worker. Community members were interviewed about their experiences at the event.

The study found that community members:

- Saw Farm Urban as both 'artificial' and different from outdoor spaces, but at the same time as increasing connection to nature by making nature more accessible for some, being fresher than traditional growing methods, and connecting people with the story of food
- Found the cost of Farm Urban systems as stopping them from having a local impact in the Community, but at the same time found Farm Urban's openness and sharing of information made them feel like Farm Urban was ‘giving something back’
- Felt connected to other attendees who also aimed to make a positive difference in their communities, gave and received support to help each other to make a positive difference, and experienced emotions around their ability to support each other.

Why is this important?

Our findings suggest that people’s values and beliefs might be as important as the environment for how people understand nature. If this is true, educational events in these indoor spaces might help change the values and beliefs people hold, and then, over time, change the way they make sense of indoor nature.

Our findings also suggest that the cost of Farm Urban technology might stop people in the Community feeling connected to Farm Urban. Whereas the way Farm Urban shares its information might help them feel more connected. If Farm Urban reduces costs and keeps sharing their methods, this might help them feel more connected.

Finally, meeting various types of community members at the event might help the community to help each other make positive impacts, and feel more connected. Farm Urban Manchester events could give the Community a meeting place for creating these relationships

What is next?

Future research should look at how more educational events might change the way people make sense of indoor nature and feel connected over time

JOURNAL MANUSCRIPT

Vertical connection: exploring the role of social identification and perceived naturality in connecting **UP** the community through vertical farms

Prepared for Frontiers in Psychology

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Abstract

Key words: **social connection, loneliness, mental health, social prescribing, nature, nature based social prescribing**

Introduction: Nature-based social prescribing (NBSP) has received interest for addressing the interlinked issues of social disconnection and mental health. Emerging evidence suggests social identification and ‘perceived’ naturality are important for NBSPs effects; however, a paucity of research has explored mechanisms, with the majority looking at outdoor environments. Indoor farming is a growing response to urbanisation and has the potential to deliver numerous social benefits. This study aimed to explore how community members in South Manchester experience social identification and perceptions of naturality within an indoor ‘Farm Urban Manchester’ event. **Methods:** Eight online interviews were conducted, with attendees affiliated in some way with community gardening, and subject to Reflexive Thematic Analysis (Braun and Clarke, 2021). **Results:** There were three themes: ‘*Overarching theme: ‘Restoring balance through nature’*’, which describes how participants’ perceive a loss of nature connection and fair share in Manchester alongside their attempts to meaningfully restore balance through nature, ‘*Making sense of Farm Urban*’ which describes participants sense making of Farm Urbans indoor nature in relation to their values and beliefs and has two subthemes: ‘*Making sense of Farm Urban: as nature connection*’, which describes how participants experience Farm Urban as ‘unfamiliar’ and ‘artificial’, yet also as meaningfully increasing nature connection in several ways and ‘*Making sense of Farm Urban: as accessible to the local community*’ which describes how participants view Farm Urban technology costs as contradictory to the grassroots nature of community gardening presenting a barrier to meaningful implementation locally, but simultaneously how Farm Urban's sharing of methods created a sense of giving back. And ‘**Symbiosis and Shifting perspectives**’, which describes how, through a shared goal to make positive change in their communities, attendees connected with each other, allowing for the symbiotic giving and receiving of support and the experience of emotions in relation to their ability to contribute to Symbiosis. **Discussion:** The findings are discussed in relation to the literature on the role of values and beliefs in perceptions of indoor growing alongside possible factors relating to social identification at the event. Implications are discussed regarding future indoor farming events and the need for further well-designed longitudinal research.

Introduction

Social disconnection and mental ill health are two major, interconnected health issues facing modern society (UK, 2023; Hammond et al, 2018). Social connection is a broad construct encompassing three dimensions – 'structural', 'functional', and 'quality'. Loneliness is a functional aspect of the construct social connection (Holt-Lunstad et al, 2015) and is characterised as a negative state experienced when there is a mismatch between the quality of relationships which a person possesses and the quality of relationships which they desire (Perlman & Peplau, 1981). Loneliness has been found to impact close to a third of industrialised countries (Lee et al, 2023), with 1 in 12 people experiencing levels harmful to health (Surkalim et al, 2022). Social isolation is a related but distinct construct considered a structural aspect of social connection, which encompasses the size and diversity of one's social network. The effect of social isolation on mortality is believed to be greater than that of smoking or obesity (Holt-Lunstad et al, 2015; Tilvis et al, 2011). Likewise, a state of persistent loneliness has been linked to multiple chronic conditions (Lee et al, 2023), with inflammation potentially providing a common pathway for these outcomes (Holt-Lunstad, 2022). Furthermore, research has linked numerous dimensions of poor social connection with common mental health disorders such as social anxiety and depression (Erzen & Çikrikci, 2018; Teo et al, 2013). Different theoretical perspectives connect the construct of social connection to inflammation via both promoting health and buffering stress. For example, a leading model by Cohen and Wills (1985) known as the 'stress-buffering model' suggests that social relationships attenuate the impact of stressful life events.

Social prescribing (SP) is one of the UK government's responses to tackling the growing overlapping issues of social disconnection and mental health. SP is an umbrella term outlining an approach that aims to improve social disconnection and mental health, through the referral of an individual to groups, services, or activities within their Community (NHS England, nd). Despite investment, the evidence base surrounding SP efficacy and possible mechanisms is seriously underdeveloped, with critical issues complicating research and evaluation, such as a lack of conceptual clarity and agreement on how to measure 'social connection' (Vidovic et al, 2021; Cooper et al, 2022; Husk et al, 2019)

Nature-based SP (NBSP) is a subset of SP involving the connecting of individuals to nature-based activities, groups, or services. Research demonstrates that NBSP may reduce depression and anxiety (Menhas et al, 2024; Haywood et al, 2024). However, the efficacy of NBSP for increasing social connection and reducing loneliness, similar to SP, is not well understood again due to methodological limitations in the literature (Sachs et al, 2024). Despite these issues, some qualitative research has shown that group-based nature activities may increase belonging and connectedness, which are critical processes for decreasing loneliness (Sachs et al, 2024). For example, a recent ethnographic study by Aughterson et al (2024) longitudinally explored mechanisms behind the impact of various SP modalities, including a gardening group, on individuals with severe mental health issues. They found that at 12 months, members describe experiencing an increased sense of Community, increased social support, lasting friendships, and reductions in loneliness. Furthermore, a literature review of factors that improve social connection in NBSP by Lavell et al (2019) proposed a model suggesting that NBSPs broadly increase social connection and reduce mental health through activating 'interpersonal' and 'intrapersonal' processes. In line with these findings, the most methodologically robust available evidence on SP mechanisms has found using longitudinal mediation that SPs broadly may improve social connection and mental ill health

through increasing group memberships, which increases ‘belonging’, and subsequently reduces loneliness among lonely or anxious individuals (Kellezi et al., 2019; Wakefield et al., 2022). That being said, the studies included in these reviews employ vastly different contexts for interacting with nature, such as conservation, park visits, simply growing or maintaining plants, with only three studies exploring indoor nature e.g in the form of virtual reality or house plants (Fan et al, 2022; Lin et al, 2020; Tse, 2010). However, collectively, this research points to social identification as a plausible general mechanism. Social identification is a component of social identity theory. Tajfel defined social identity as ‘the part of a person’s self-concept that comes from knowing they belong to a social group’ (Tajfel & Turner, 2004), and research demonstrates that individuals with more social identifications experience less depression (Sani et al, 2015). Furthermore, a shared identity has been shown to be a precursor for both receiving and giving social support (Haslam et al, 2012), suggesting that identification predetermines any of the ‘stress buffering’ effects of relationships (Cohen and Wills, 1985). Likewise, Haslam et al, 2024 explains that identifying as ‘us’ as opposed to solely ‘me’ is the basis of self-esteem, meaning, self-efficacy, sense of control, and purpose (Jetten et al., 2015; Greenaway et al, 2015; Cruwys et al., 2014; McNamara et al., 2013; Junker et al., 2019). Considering Lavell et al, (2019)s model, this framework positions ‘interpersonal processes’ in part as facilitating ‘intrapersonal ones. In light of a lack of a strong evaluative theoretical framework for evaluating SPs' effects on loneliness and mental health, alongside the above arguments, Haslam et al, 2024 suggests using social identity theory going forward. For clarity, I will, from here on, conceptualise ‘social connection’ and thus the ‘stress buffering’ effects of social relationships as a byproduct of social identification.

Environmental enhancement interventions could be considered a subset of SP, which encompass pro-ecological, group-based community activities aimed at improving both the environment and the participants' wellbeing. Typical environmental enhancement interventions are litter picking and habitat restoration (Baker et al, 2024). Beyond identification, the UK’s Mental Health Foresight review found that taking part in activity’s that reflect deeply held values are highly correlated with wellbeing (Huppert, 2009). Furthermore, separate research has demonstrated that meaning in life (operationalised as a desire to preserve nature's benefits for future generations) fully mediates the effect of pro-environmental activities on loneliness and depression (Jia et al, 2021), indicating a potentially critical role of meaning in reducing loneliness within the context of ‘pro-environmental’ NBSPs. Scoping and systematic reviews investigating the effects of environmental enhancement interventions similar to the broader SP & NBSP literature found significant heterogeneity among studies, and variable quality and methods (Husk et al, 2016; Baker et al, 2024). However, they found that majority of studies report positive outcomes in participants' mood, mental wellbeing, or distress reduction (Baker et al, 2024). Likewise, participants describe gaining a sense of purpose, belonging, and achievement (Baker et al, 2024), which align with the social identification framework. Similar to broader NBSP, no studies included in either of these two reviews looked at indoor farming interventions. Furthermore, Haslam et al (2024) hypothesize that what matters most in forming a social identification within an SP is that the group is subjectively meaningful for participants. In line with this, Scheerer et al. (2004) suggested that experiences of meaning facilitate initial engagement in an activity, this creates motivation, which ultimately sustains engagement and thus the future development of social outcomes. Collectively, this research highlights the foundational role of exploring the subjective experiences of meaning at an SP as foundational for continued engagement and subsequent social identification.

Alongside ‘intrapersonal & ‘interpersonal’ processes (or perhaps more accurately social identification), Lavell et al (2019) also highlights that ‘environmental processes’ are uniquely important for facilitating social connection within NBSPs. Research has found that spending time in nature has been shown to independently reduce loneliness (Soga et al, 2021) and increase social connection by facilitating perspective taking (Goldy & Piff, 2020). Nature's ability to independently improve human health and wellbeing is believed to be in part due to its impact on attentional processes and evolutionary psychology. Two leading theories provide insight into how ‘environmental processes’ affect wellbeing. The Attention Restoration Theory suggests that nature can refresh our attention and promote wellness by negating attentional fatigue (Kaplan & Kaplan, 1989), whereas Ulrich’s Stress Reduction Theory suggests features of the environment support psychophysiological stress recovery (Ulrich et al., 1991). However, the effects of ‘environmental processes’ such as Attention Restoration Theory on emotional wellbeing have been shown to be mediated by the concept ‘perceived restorativeness (Marselle et al, 2016). Furthermore, perceived naturalness is one factor that has been shown to mediate the effect of ‘perceived restorativeness’ on emotional wellbeing (Marselle et al, 2016) and, given Lavell et al.'s (2019) review and associated evidence, possibly also social connection. Furthermore, research into perspectives on indoor growing methods has primarily focused on consumer perspective and demonstrates that they generally perceive indoor growing methods as unnatural (Yano et al, 2021; Mina et al, 2023), with no currently identified research on the perspectives of growers or individuals affiliated with gardening. However, research demonstrates that the perceived naturalness of indoor growing methods is linked to an individual's values, beliefs, and income (Yano et al, 2021; Mina et al, 2023) indicating that different groups will hold different perceptions on the naturalness of indoor growing methods which thus may theoretically influence the possible effect of indoor nature on wellbeing.

Indoor farms (such as ‘Farm Urban’) are likely to increase in the coming years due to their pro-ecological, economic, and societal benefits (Wang et al, 2025) and could partially counteract an increasing decline in green space within cities (Fuller & Gaston, 2009). Likewise, these farms have been identified as offering potential to create new spaces for social engagement and to counteract exclusion (Mina et al, 2023), highlighting their strong potential as an environmental enhancement NBSP. However, the social benefits of indoor farms have not been established (Mina et al, 2023), and there is currently no research exploring the potential of indoor farms as an environmental enhancement NBSP. Furthermore, Mina et al (2023) highlights that to ensure the provision of any social benefits, indoor farming initiatives should include the relevant actors of the local communities in which they are based. Clearly, there is a need to explore how important theorised processes such as social identification, subjective meaning, and perceived naturalness may be experienced by local community members attending an indoor farming event to understand any possible social benefits.

This study, therefore, aims to explore how community members (affiliated with gardening in some way) at an indoor farming event aimed at educating attendees about the pro-environmental impacts of indoor growing experience (a) social identification with the host organisation/community in relation to subjective meaning and (b) perceived naturalness.

Research Questions - How do attendees at a Farm Urban Manchester event experience naturalness and social identification in relation to subjective meaning.

2.0 Materials and methods

2.1 Participants

Eight participants were purposively sampled from a pool of 15 individuals who attended a Farm Urban Manchester community event. All participants were somehow associated with gardening. Participants were between the ages of 25 and 61 years. Three were males, two were female, and three preferred not to say. Two participants were nature therapists, one was a project manager, two were volunteers, one was an investor/youth club leader, one was a community garden manager, and one was an artist. The only inclusion criterion was to have attended the recent Farm Urban Manchester event.

2.2 Design and materials

Eight semi-structured online interviews were conducted remotely via Microsoft Teams.

Semi-structured interview schedule

A semi-structured interview schedule was created, including five open-ended and nondirective questions that encouraged participants to discuss their experiences at length. Questions explored their connection with nature/gardening, reasons for attending, and broadly their experiences at the event (See Appendix B). The interview began with the question 'Can you tell me a bit about what got you into gardening/what gardening means to you' to establish rapport and ease in. Typical questions included 'Can you talk me through what you did from arriving to leaving?', 'Why did you decide to attend the recent farm urban Manchester event?' 'Did farm urban Manchester do anything at the event to make you feel as if you fit in?', 'Was there any moment when you felt part of something at the event?'. The interview schedule was developed and piloted on a community gardener who was part of the larger Farm Urban project.

Prompts were additionally used to explore experiences further, such as 'how did that make you feel?', 'Can you give me examples?' and 'why?'. Likewise, additional prompts were prepared to provide direction for the participant, E.g., for the question 'why did you decide to attend the recent farm urban Manchester event?', additional prompts included 'were you looking for something practical, social, or emotional?'

Demographic questionnaire

A basic demographic questionnaire was created to gather information on age, ethnicity, gender, employment status, affiliation with gardening, and an open-ended box to explain their role further.

The Farm Urban Manchester event

The Farm Urban Manchester event was designed in collaboration with the Farm Urban Events team. Advice from the 'nature on prescription handbook' (Fullum et al, 2021) around 'making a difference' and 'being in a group' was applied to the design of a farm urban Manchester event (See Appendix B for full mapping) through incorporating smoothies to allow for creativity, framing tasks to emphasize meaning (e.g. Framing smoothies as creative

in a personalised way), creating numerous stations to allow participants to self-select groups and provide opportunities for ‘group processes’ (e.g. building a aquaponics system, discussion groups and multiple activities to allow for self-selection).

The event lasted three hours and took place in an event space on the campus of the University of Manchester, where an edible wall was installed. It began with an Introductory talk and Q&A session around hydroponic growing. Next, four stations were set up, comprising a smoothie making, compost in a jar making, tasting session to develop a taste profile of different produce, and an Edible wall demonstration/harvesting, where participants could move around activities and engage at their own pace. Following this, participants were placed into discussion groups and asked to reflect on the values they attribute to gardening. Finally, participants were placed into groups and built a miniature hydroponics system (Hydroponics is the process of growing without soil) before ending with a final Q&A.

2.3 Procedure

Interviews

Research ethical approval was granted for the study by the University of Manchester Ethics Committee (2025-22339-41339). Emails to participants were sent via the Farm Urban Event's organiser. The emails outlined the study and its purpose, with an attached recruitment letter and information sheet. Participants had the option of participating in one-to-one interviews held either in person on the premises of the University or online via Teams. Interested participants contacted the researcher directly via email or through the event organiser, and a date and time for an interview was arranged. A link to the consent and demographic form was then emailed to participants to complete via the Qualtrics platform. All interviews were conducted online by the researcher (a white male postgraduate student). A pilot interview was conducted with a supervisor to practice prior to collecting data. Upon entering the team's call, prior to recording, participants were given the opportunity to ask questions about the study. Following this, the audio recording was started, and the researcher asked questions from the schedule. The schedule provided a structural guideline; however, the interviewer was free to explore areas if they arose earlier. Probing questions were asked to find out more about important things (relating to experiences at the event – with a focus on group processes, their experiences of nature and meaning). The interviewer provided brief summaries throughout the interview and at the end to make sure they had a clear understanding of what the participant was saying and allowed them to add additional information. The interviewer was careful to allow participants to tell their own story in their own words. The recording was stopped upon completion of the interview, and the participants were thanked for their time. A participant debrief form (See Appendix A) was emailed directly to the participant. Interviews lasted around 1 hour, and there was a £20 Amazon gift voucher provided as recompense for participating. Interviews were transcribed verbatim under the guidelines of RTA and then anonymised; the researcher appointed pseudonyms for each participant prior to commencing analysis.

2.4 Reflexivity and positionality statement

The project employed a contextualist epistemology and a critical realist ontology, which posits an existence of a reality, but simultaneously understands that any reflection of this are characterised by participants’ language, culture or political interests (Ussher, 1999). These

stances were chosen because they fit well with an intentional theory of language where language is theorised to be broadly reflective of participants cognitions and social contexts. Thus a hermeneutic of empathy, allowed for the exploration of the attendees' experiences through language at the Farm Urban event through the taking of an experiential orientation.

The researcher is a 27-year-old straight white middle class male from Scotland attending a liberal university, studying psychology at a privileged institution, and may see the world in a specific way through the Lens of their gender biases, economic/class positioning, and theories and models of psychology. They were also socialised in a Western country/ education system and internally hold Western values and beliefs. The researcher had no prior experience or expertise within the community gardening space and would be considered an outsider to this topic area. A reflective journal was kept throughout the data analysis process. The researcher's specific perceptions of class & psychological theories were reflected on such as social identity theory (Tajfel & Turner, 2004) and how they may have impacted the analytic interpretation of participants' data. Likewise, the researcher practiced reflexivity within their interpretation to ensure representational ethics and their 'telling of a story that does not do harm' (Braun and Clarke, 2021)

2.5 Data analysis

Interviews were transcribed verbatim and analysed using Reflexive Thematic Analysis (RTA) as outlined by Braun and Clarke (2021). Transcripts were read and re-read to help build a working model of the interview for familiarisation. Likewise, the researcher recorded himself recapping key ideas from each interview to facilitate memory and immersion. Initial interpretations of the data and other insights gained from studying the literature, alongside salient interpretations of the participants' characteristics/persona/identity/politics, gained through interviewing, were audio recorded in a reflective journal before commencing analysis of the data. The critical contextualist RTA approach centred around an inductive mode and shifted between semantic (i.e., 'Farm Urban as unfamiliar') and latent orientations (i.e., 'Symbiosis'), applying codes to textual data that represented perceived key aspects of the participants' perspectives and beliefs. Codes were initially clustered into 10 patterns of meaning (complexity exclusion and meaning,, connection through food systems, connecting through taste, connecting through extension, making a difference with Farm urban, making a difference together, connecting with others, group dynamics and curiosity, connection and counterculture (See Appendix B for list of initial codes and coding labels) which broadly reflected the participants experiences at the event. The researcher recorded reflections around their feelings and perspectives following interviews and throughout coding, using audio recordings to provide context around the subjective analysis.

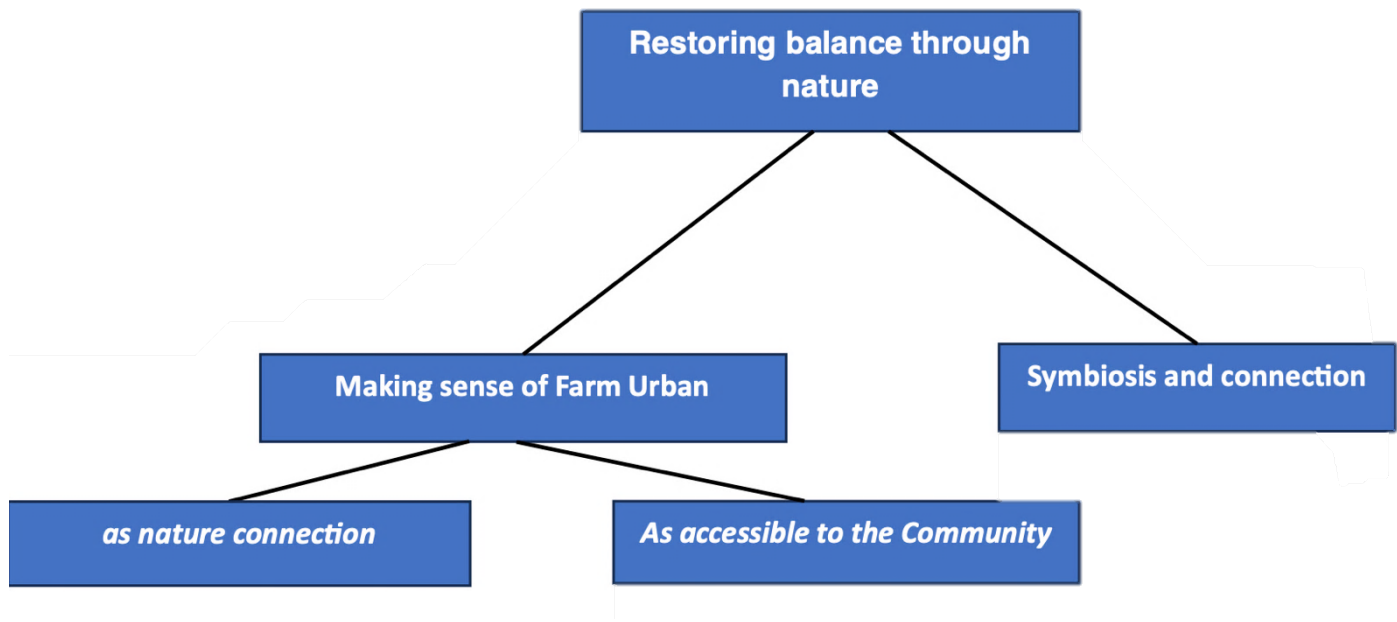
Following the initial thematic mapping (See Appendix B **Figure 2.**), clusters were refined by identifying overlaps between them and merging some, while removing others. Themes were iteratively refined in the write-up process, developing five themes through merged codes. After reviewing the themes and broader dataset, I became most interested in participants' experiential accounts and using language to explore their experiences of social identification in relation to subjective meaning and perceived naturality at the event. I settled on an analytic structure with five themes, which captured different aspects of the participants' experience: Restoring balance through nature, Symbiosis and connection, Making sense of Farm Urban (with two sub-themes), Making sense of Farm Urban as nature connection, Making sense of Farm Urban as accessible to the Community (See Appendix B **Figure 3.**). The researcher's interpretation of themes and their underlying codes was checked against their supervisor's

interpretation. The subsequent result is the production of tentative truth claims resulting from a 'dialogical, systematic and rigorous process' of subjective analysis.

In writing up of the analysis [...] is used to indicate where parts of a sentence have been omitted. Likewise, where extra context is needed context is provided inside square brackets e.g. [example]

3.0 Results

Figure 1. *Thematic map of participant experiences.*



This article reports five themes (See **Figure. 1**): ***Overarching theme: Restoring balance through nature*** describes how participants perceive a loss of connection to nature and a lack of ‘fair share’ in modern society and attending the event as an extension of their desire to help restore balance through nature. ***Making sense of Farm Urban*** describes how participants make sense of Farm Urban in relation to their existing values and beliefs, which has two sub-themes. ***Making sense of Farm Urban: ‘as natural’*** describes how participants struggle to make sense of indoor gardening in relation to their understanding of outdoor gardening. However, they also describe how indoor gardening can increase nature connection by extending the benefits of nature, form a new connection to nature, be fresher/more connected than current farming methods, and connect people with the story of food. ***Making sense of Farm Urban: ‘as accessible to the Community’*** describes how participants perceive the cost of Farm Urban's growing systems as undermining their local implementation and contradicting the grass roots/working class nature of community gardening. However, participants also describe how Farm Urban's openness and sharing of information created a counter to money-oriented development and a sense of giving back to the Community. ***Symbiosis and shifting perspectives*** describes how participants experienced a sense of relatedness to other participants who were making positive contributions to their communities. Meeting these people symbiotically provided collaboration, information for overcoming challenges, ideas, and moral support in relation to their initiatives, alongside emotional experiences related to their ability to contribute.

Table 1. *Participants demographic information*

Pseudonym	Gender	Age	Ethnicity	Employment status	Affiliation with community gardening
LYNN	Female	43	White: English, Welsh, Scottish, Northern Ireland or British	Retired	Nature therapist
NAHH	Prefer not to say	45	White: English, Welsh, Scottish, Northern Ireland or British	Part time	Nature therapist
KIEE	Prefer not to say	43	Prefer not to disclose	Prefer not to disclose	Artist working to connect people with green spaces
HASS	Male	34	Asian, Asian British or Asian Welsh: other Asian	Unemployed looking for work	Community garden manager
YAKK	Female	61	White: English, Welsh, Scottish, Northern Ireland or British	Employed full time	Project manager at a charity
MASS	Male	25	White: English, Welsh, Scottish, Northern Ireland or British	Unemployed looking for work	Community garden volunteer
NIEE	Male	50	White: English, Welsh, Scottish, Northern Ireland or British	Employed full time	investor and youth club garden volunteer and
QUI	N/A	N/A	N/A	N/A	Volunteer gardener

3.1 Restoring balance through nature

Participants contrasted a felt loss of nature connection and fairness in Manchester with efforts that ‘give back,’ and at a latent level, position their own nature-based initiatives as a way to meaningfully restore these imbalances, and attending the event as an extension of this.

A problematic loss of connection to nature in modern society was frequently evident across participant accounts, for instance.

’ [discussing farm Urban] it feels [] almost like a solution for a problem that should never have existed in the first place, i.e., humans being not very connected with nature because of the way we now all live in urban environments or so many of us do" (NIEE)

’[talking about fresh/quality food] I kind of feel like modern society sort of robbed us of something that used to be available to us, you know, naturally, like it almost feels like it's a basic right" (HASS)

As the above extracts show, participants actively position a loss of connection to nature in a negative light, describing it as a 'problem that should never have existed in the first place' (NIEE) and feeling 'robbed' (HASS). This language suggests they perceive nature connection to have been wrongly taken away by modern society and something that should be meaningfully restored.

Some accounts contrast this decrease in nature connection with an increasing ‘focus on selling’ (NAHH), money-oriented development and a lack of ‘fair share’ (LYNN) and giving back to the Community in Manchester.

’[Discussing Manchester] the last 10 years have been crazy in terms of development, but a lot of that development has just been like really money orientated, so it was just really nice to be in a space and connect with people that was... that felt like it was giving something back to the world and the community rather than just being a place to kind of make money’’ (KIEE)

’I like the fact that permaculture was kind of looking at things like fair share, earth care, and people care because I felt that was something that was lacking in the systems that I could see around me’’ (LYNN)

Whereas other accounts evoke a broader issue of a lack of fair share in society surrounding access to healthy, quality food, for example

’ It’s such an unjust society [].. [Discussing the ability to make errors while cooking fresh meals] you can’t afford to do that... you need to be a sure thing. Everyone will eat those chicken nuggets (referencing McDonald's), so we've got a problem there (YAKK)

Similarly, participants evoke how nature can meaningfully impact wellbeing and wider society by galvanising people to cooperate, facilitate ‘kindness’ (KIEE), provoke people to ‘look after their world’ (NIEE), experience ‘meaning’, overcome financial barriers to accessing fresh food, and receive social support from others, for instance

“[describing how community gardens are different from street trees] They actually involve cooperation [...]... and people can actually get a sense of belonging from that space its not like they're walking through it [...]... they're getting food from it and a better sense of meaning" (MASS)

“”[Discussing the scientific evidence] the natural world inspires awe or wonder and then that in turn inspires kindness, which is like super interesting" (KIEE)

As the above extracts show, participants describe nature in a way that positions it as meaningfully improving wellbeing and society, holistically suggesting in part they perceive it as being a way to meaningfully address issues with nature disconnection and fair share. Likewise, participants work/volunteer across various community contexts that aim to use nature in some way to increase the benefits of nature connection or address social issues, e.g., tending community gardens, running a socially engaged art practice, investing in prosocial initiatives, volunteering at a youth club with a community garden, and conducting nature-based therapy (see demographic table). Whereas other accounts explicitly evoke a collective sense of meaning, for instance

“ We've all got slightly different communities that we're trying to serve [...].... I think underneath it all, there are lots of parallels and you know things that are meaningful to all of us, which is we're all seeing people suffer" (YAKK)

This suggests that participants value making a meaningful difference in their communities through their nature-based initiatives as a way to ‘reduce suffering’. Likewise, participants describe attending the Farm Urban event as an extension to their own initiatives and values through making the central messages ‘more relevant to people’ (YAKK), learning about gardening methods, or to collaborate or ‘build that connection with farm urban’ (NIEE), for instance,

“I came to learn more ideas, inspiration, see if there’s something I can even get involved in” (HASS, a local community garden manager who grows fresh food for a local food bank on a soil-free site),

“ [discussing why they attended] just wanting to work collaboratively with other organisations, and it felt like a really exciting way to do that” (NAHH, a local nature therapist)

3.2 Making sense of Farm urban

Participants describe making sense of farm urban indoor methods in relation to their existing values and beliefs.

Making sense of Farm urban: as nature connection

Participants negotiated naturality, comparing Farm Urban’s indoor/technological setting with outdoor, soil-based images of ‘being in nature’

Participants describe Farm Urban as being ‘*artificial*’ (NIEE), ‘*hyper real*’ (NAHH), and distinctively different from being outside and having their hands in the earth/soil (QUI,

NAHH), alongside unknowns regarding indoor air quality and nutrition (KIEE, NAHH). For instance,

'it's a very different way of connecting with nature and not one that felt familiar []... I'm so used to just getting my hands in the earth and growing that way'' (NAHH)
"We breathe like different chemicals when we're in nature that are really good for us, so it'd be interesting to know like what the air in that space is like []... "
what's in the nutritional mix'' (KIEE)

Some accounts describe Farm Urban's futuristic appearance, technology, and the business context as being unfamiliar

'I think when you look at things like that (vertical wall) that look quite technological and futuristic, you kind of maybe think, oh I can't touch that because I wouldn't know what to do with it and I wouldn't know how to use it' (KIEE)
'It's kind of like a very long way from community, I don't know that area, but it seems like a very much a business area'' (QUI)

Others explicitly contrast Farm Urbans 'clean and clinical' (NIEE) appearance & vertical growing with 'being in nature' (NIEE) and 'the idea of natural' (NAHH), for example

'I think a lot of what gardeners enjoy is being in nature, working with nature. And farm urban, it's all very kind of clean and clinical and feels like more like you're in a lab''(NIEE)
I would feel confident growing lettuce in my allotment, but I wouldn't know quite the process of where to begin in that context of growing vertically, so it's just sort of that new knowledge, I suppose. But I think, I don't know if it's just to do with it being so different and this idea of natural maybe'' (NAHH)

As the above extracts show, participants described a psychological gap between Farm Urban's indoor, technological, business setting and their existing image of nature as outdoor, soil-based, and community-oriented

Contrary to 'naturalness' issues, accounts also describe how Farm Urban's novel indoor environment has the potential to increase the accessibility of nature for numerous populations, for instance

' [discussing their eco therapy allotment] you couldn't access the allotment if you're in a wheelchair, but you could do if you're indoor gardening'' (NAHH)
"for some people that's going to make it more accessible because they might not feel comfortable working with soil, you know, being outside for whatever reason"
(LYNN)]

Whereas others describe pondering the psychological benefits of indoor vertical growing and existing theories of how nature exposure impacts psychology through 'awe' and 'biophilia', and how it could potentially create a 'new connection' with nature

'you know there's all these theories about kind of like awe in nature [] how the natural world inspires awe and wonder and then that in turn inspires kindness which is like super interesting [] thinking about the lettuces and how they're displayed in that

really beautiful way could definitely be something that connects people and get them to I guess, form a new relationship with vegetables and greens” (KIEE)
"You see a side of the allotment that you don't see in spring and summer when everything's coming into growth (in the winter), whereas you see that more all around with the indoors [] so you get that sort of I don't know the green biophilia sort of feeling in the indoor environment" (NAHH)

Some accounts describe how actually tasting the produce created a sense of ‘optimism’ (HASS) & inspiration (LYNN) for ‘persuading people’ and the freshness becoming a food quality standard one day

HASS: " The potential of it sort of becoming a standard one day and having that level of fresh greens of, you know, carrying kind of flavours and texture more widely to anybody. So thinking about that, as you know, as a potential seed towards something like that kind of gave me a sense of optimism”
"Like the tasting activity. []. I thought that was quite inspirational in terms of trying to kind of make cultural change and trying to kind of persuade people (that these growing methods are better quality) ” (LYNN)

Other accounts describe how Farm Urban's novel growing methods can combat society's nature disconnection by connecting people with the 'story of food' (NIEE)

It's definitely a step closer to nature than just buying a lettuce, you know, in a plastic wrap or whatever in a supermarket and not thinking about the process at all of what's gone on and not being part of that process, so it definitely goes somewhere towards making a more of a relationship with nature (LYNN)
“Some of the boys that don't like working outside can still connect with the story around food and the environment, but in a nice warm space" (NIEE, youth club leader)

As the above extract show, participants positioned Farm Urban as a way to help reconnect with nature's benefits (e.g., freshness, calm, ‘story of food’, biophilia, awe). Likewise, participants describe how Farm urbans indoor and technological approach can function as an extension of nature by providing ‘biophilia’ all year round’ (NAHH), and awe, possibly provoking a ‘new connection with vegetables and greens’ (KIEE) suggesting a partial integration between the indoor, technological approach and the outdoor soil based approach specifically in relation to their understanding of how indoor ‘artificial’ (NIEE) methods can meaningfully ‘increase nature connection’ (accessibility, biophilia, awe, freshness, the story of food)

Making sense of Farm urban: as ‘accessible’ to the Community

Participants negotiated farm urbans accessibility to the Community.

Participants explicitly describe how Farm Urbans technology (the growing systems) are not 'accessible' (NAHH) to specific populations & how this cost barriers undermines the system's implementation, for instance,

“the only concern with technology is it becomes like accessible in some ways and less accessible in others, can’t it?” (NAHH)

“My other desire would be just to see these more common place, obviously there’s like a cost to setting these up” (KIEE)

Other participants describe noticing attendees being ‘perplexed’ (YAKK) & sceptical (LYNN) about the benefits of the systems and costs involved

“If I remember anything, I think I remember one of the participants being quite sceptical about the system. [...] They gave some scepticism around it, I guess, like the scale of it or the cost of it or whatever you know” (LYNN)

[discussing other participants] They were a little perplexed, I would say, in the conversations I had about the expense of the equipment (YAKK)

Some accounts explicitly highlight how the cost of the technology directly contradicts the ‘grass roots’ (MASS) or ‘working class (YAKK) nature of community gardening.

“They were a little perplexed, I would say, in the conversations I had about the expense of the equipment that was involved, you know, because I think the reason why people grow their own food in allotments have always been thinking, you know, a tradition of working-class culture” (YAKK)

“ I thought that was kind of an interesting contrast because community gardening is more like having more like grass roots initiated and I think a couple of people were talking to were just discussing about like the energy consumption, how much like energy that the hydroponic system used, and I think they might have mentioned like it’s better to like to grow it yourself outdoors” (MASS)

Participants outline the issue of accessibility of Farm Urban systems and how the cost contradicts the nature of grassroots and working-class community gardening: ‘What are the farmers getting out of it?’ (NIEE). This may suggest that they perceive Farm urban as contributing, in part, to an increasing focus on selling as opposed to ‘giving back’ in Manchester. Likewise, cost is described in a way that presents it as undermining local implementation, suggesting they may perceive this as a factor inhibiting Farm Urban from having a meaningful impact locally.

Contrary to financial barriers participants describe how farm urbans ‘openness’ (LYNN) & sharing of their methods as opposed to commoditising or gatekeeping this information created a sense of ‘countering to the flow’ (NAHH) and taking it to the ‘next level’ (HASS) characterised by ‘giving something back to the world and the community rather than just being a place to kind of make money’ (KIEE)

“I think that kind of openness and the fact that the way we were being righted it was a feeling of a desire for collaboration, and rather than it being like a purely commercial sort of enterprise [...] it made me feel comfortable being in that kind of environment rather than like a very corporate environment” (LYNN)

It’s just like, countering to the flow, it feels like there is such a focus in the centre of Manchester, you can’t really be in many places without being sold anything, and it felt a bit like an altar, a potentially alternate food economy going through the city. (NAHH)

Participants' positioning of Farm Urban as providing a 'countering to the flow' of a focus on money by 'giving something back' suggests that they perceive Farm Urban as in part working against a dominant culture of selling and making money in the city, which either takes away or does not provide benefit to 'the community'

3.3 Symbiosis and connecting

Meeting others with similar goals to make a positive impact in the Community provided a sense of relatedness, which served as a basis for giving and receiving symbiotic support and experiencing emotions in relation to furthering their common goals.

Participants describe feeling 'bonded' (YAKK) and a shared common desire to make a positive difference within their communities, for instance.

'I think that's what probably bonded all the groups that they all had Initiatives and community groups, and that they were all from a setting that was dealing with the cost of living crisis that was acknowledging that people are struggling'' (YAKK)
[discussing other attendees] " A lot of them were focusing on doing good for the Community they volunteer in or work in, and gardening was kind of like the method, while for others it was kind of the main focus, that's at least my impression of it, like the Community first aspect" (HASS)

Whereas other accounts describe how interacting with other similar initiatives aimed at doing good in their communities made them feel like 'you're not on your own' (NIEE), 'more connected to the centre' (NAHH), and a sense of 'operating together' (HASS)

'especially considering you know with the community garden that I'm managing. I kind of know that if I need to consult, if I need information or help, then I've got contacts there now. So yeah, in a way it did feel like you know all of those initiatives are sort of operating together if that makes sense'' (HASS)
'That was really nice just to learn about new projects, and they're not new, they're just new to me, you know. You feel you know a city and when you've lived here for quite a while and then it's nice to be refreshed. []... so going to kind of the event felt really nice because actually I felt more connected to the centre'' (NAHH)

As the extracts show, participants position learning about initiatives directly in relation to 'feeling less alone' and 'more connected', suggesting emotional and social connecting benefits to these interactions. Participants describe how meeting other people doing similar projects also provides insight into how to overcome 'some of those challenges (YAKK), gain ideas/inspiration, opportunity for collaboration, and moral support, for instance.

'[so in terms of meeting new people, why is that important?'] It's just proven very helpful during my journey with this newly established community garden. It's just you know, exchanging information, ideas, even practically, you know, I have an excess of that, you have an excess of that, let's trade. Or opportunities for collaboration. Yeah, just you know, you never know what might come up'' (HASS)

"Meeting other people that are doing similar projects is so useful in terms of just you know, looking at how they've got over obstacles, you know, gaining ideas and just inspiration, you know, even if it's just like moral support. Talking to Someone who's working in the same sort of area, and obviously, you'd hope that further down the line from that, you might be able to kind of share resources" (LYNN)

As the above extracts show, participants position meeting other community members as important for addressing challenges, furthering their goals, and providing moral support. This suggests that these relationships provide important practical and emotional benefits. Likewise, they point out the utility of meeting others to further their aims through 'collaboration, ideas, overcoming challenges and inspiration', suggesting that meeting others is an intrinsically meaningful avenue for furthering their initiatives.

Some participants describe experiences of bringing knowledge and a desire to go 'deep into the detail' (HASS)

'I like to go deep into the detail of things and know that, knowing that there were people there that were kind of the same made me feel like yeah, those are my kind of people' (HASS, leader of community garden)

"You get some really interesting insights into what people are doing, and I think you can bring a bit of your knowledge. [...]... I don't think any grower knows it all '" (YAKK, project manager)

whereas those with less experience/knowledge describe being 'insecure' or self-conscious (MASS)

'Maybe I was a little bit insecure about my own.... like I volunteer weekly, but I'm not necessarily like on the same level'" (MASS, a volunteer community gardener)

'It probably did make me think, oh, I've got lots to learn and feel there's loads of people here with more, more experience than me, so I suppose it brought that up a little bit" (NAHH, a new to the role nature therapist)

Participants directly describe feeling insecure or relatedness in relation to an ability to go to or be on the 'same level'. This intertwined use of language and emotion suggests that the ability to contribute to the symbiotic exchange of knowledge within the group may relate to how participants experience emotions in relation to interacting with other attendees.

Likewise, the hydroponics task provided an opportunity to 'work with other people' (LYNN), bond over incompetence, signify a need for diverse perspectives, and provided an opportunity to 'feel that you are making a contribution (LYNN)

'The hydroponics, definitely felt part of something cause we're like doing something practical together, a lot of groups were sharing the same experience of just not really being able to set up correctly'" (MASS)

'It was quite interesting observing how we all put things together differently and learn differently. I think that's quite interesting because it's then like a real reminder of like the need for diversity' (NAHH)

This suggests the hydroponics task offered an opportunity for integration and a platform to contribute to something together among participants.

Across themes, participants described meaning ('accessibility'/'giving back,' nature connection), social identification (belonging, support, collaboration, relatedness, insecurity), and perceived naturalness (outdoor/soil/quiet vs indoor/technological) as they made sense of Farm Urban and interacted with other attendees.

4.0 Discussion

The mechanisms behind how environmental enhancement NBSPs work to increase social connection are not well understood. This research is the first to explore how important theorised mechanisms like social identification and perceptions of naturality may operate in relation to meaning within a pro-ecological, indoor farming setting among community members affiliated with community gardening.

The findings show that participants view indoor farming methods as unfamiliar, artificial, and in contrast with ideas of naturality. However, contrarily, they also perceive these methods as meaningfully increasing nature connection by extending the benefits of nature to various populations, alongside being fresher, higher quality, and more connected to the 'story of food' than current food systems. Likewise, individuals affiliated with gardening perceive the costs involved in indoor methods as a barrier to local implementation and as contradictory to the grassroots nature of community gardening. However, conversely, they also perceive Farm Urban's openness to share methods, collaborate, and give back to the Community as a meaningful counterbalance to the increasing focus on selling and money-oriented development within Manchester. Participants describe experiencing a shared sense of meaning and desire to make change within their communities, how meeting other community members provided information to overcome challenges, ideas, inspiration, and moral support, and experience emotions in relation to their ability to contribute to the symbiotic sharing of knowledge around common aims.

This study offers a qualitative account of how an indoor farming event (or environmental enhancement NBS) is made sense of by community members affiliated with gardening. It identifies perspectives on nature connection, fair-share, and the restorative role of nature as contextual factors that may shape attendees' social identification and perceptions of naturalness, clarifying opportunities and barriers for 'successful' indoor NBS design.

4.1 Identification with Farm Urban

The findings show that participants perceived the cost of farm Urban systems as a barrier for community grassroots initiatives accessing the benefits of these systems. Thus, this barrier undermines Farm Urban's meaningful community impact. Existing evidence has similarly found that as indoor produce is sold at a high price, these products are largely inaccessible to the communities that the factories generally operate within (Mina et al, 2023), reflecting participants' concerns. Furthermore, Haslam et al (2024) outline key factors for facilitating social identification. In this framework, they hypothesize that social prescribing will be more effective to the extent that social prescribers engage in 'identity leadership' to create a social identity-based alliance between the attendee and the organisation. They highlight two aspects of identity leadership - 'identity entrepreneurship' and 'identity prototypicality', characterised by the identity leaders (Farm Urban) crafting a sense of 'us' and being 'one of us' among community members. Given our finding that costs present a barrier for community members accessing Farm Urbans systems and their meaningful local benefits, alongside participants explicitly describing Farm Urbans high costs as 'contradictory' to the nature of grass roots initiatives. One interpretation of this data is that there may be a dual financial and psychological barrier to community members viewing Farm Urban as meaningful, seeing Farm Urban as 'us' or becoming 'one of Farm Urban'. However, findings also show that participants perceive farm urbans openness and sharing of methods as 'giving back' to the

Community and providing a counter to an increasing focus on selling in Manchester. Likewise, Haslam et al (2024) highlights that another important part of identity leadership is 'identity advancement', where they promote the interests of the shared identity and are thereby seen as 'doing it for us'. One interpretation of our data is that Farm Urbans' sharing of methods and openness may have created a sense of 'giving back' and countering to the flow of a lack of giving back to the community, and thus 'doing it for us'. Therefore, there may be potential mixed effects of Farm Urban on promoting social identification within the local Community, with financial and implementation barriers undermining it, but the sharing of information and methods promoting it.

4.2 Identification with the Community

The findings show that meeting other community initiatives provided them with collaboration, ideas, inspiration, and moral support. Grassroots initiatives largely depend on internal resources (community members and volunteers), and research has found that social relationships are critical to a community garden's continued survival (Glover et al, 2005). In line with social capital theory, social relationships provide a form of 'credit' that can be cashed in at a later stage to facilitate practical action, and this thus forms a key part of resource mobilisation for these associations (Coleman, J.S., 1988; Glover et al, 2005). Parallel to the practical benefits of social capital, a social support network is believed to reduce stress through providing various forms of support. For example, instrumental support, which takes the form of practical and financial assistance, informational support, which provides information to facilitate coping with potentially stressful events, and emotional support, which offers self-worth and a sense of acceptance (House, 1981). One reading of our data is that meeting others may provide instrumental support in the form of trade & collaboration, informational support in the form of inspiration, ideas & knowledge for overcoming challenges, and emotional support in the form of moral support. Furthermore, our findings show that participants describe feeling as if they were 'operating together', were 'bonded', and shared a common desire to create a meaningful impact in their communities. Participants' use of language suggests that they share a sense of 'us' which is founded upon a common desire to make positive local change. Social identity theory highlights that the stress reduction benefits of relationships are based on social identification with that group (Haslam, 2004) indicating that a shared sense of bonding or operating together to make a positive difference in their communities may provide a basis for a shared sense of 'us' potentially facilitating the access of the intertwined social capital and stress buffering benefits of social connection.

Furthermore, our findings show that participants experienced affiliation in relation to their competence and ability to contribute to the symbiotic sharing of knowledge. Previous research investigating community gardens found that the sharing of knowledge and resources provided them self-worth as they could help others whilst also being noticed doing this (Lucke et al, 2019; Ong et al, 2019). One interpretation of this is that the ability to contribute to other community members' goals may be an important factor influencing social experiences at indoor community events. Furthermore, our findings show that the hydroponics task was framed in a way that allowed individuals to experience contribution, inclusivity, and relatedness. Research demonstrates that strong performance in an activity is linked to building identity (Christiansen, 1999). The hydroponics task may therefore have provided an opportunity to contribute and build a sense of collective identity among community members.

4.3 Perceiving naturalness and individual psychology

The findings show that participants demonstrate a psychological gap between their understanding of outdoor and indoor nature, with indoor nature being perceived as unfamiliar, artificial, and contrasted with naturalness. This finding aligns with research on consumer perspectives, which has found that high technological food production methods within indoor environments are seen as artificial and unnatural (Mina et al, 2023). However, our findings also show that participants made sense of indoor farms as increasing nature's accessibility, pondered its overlap with existing nature, and understood it as more natural and fresher than current food systems, which all frame farm urban 'artificial' methods as counterintuitively helping to meaningfully restore the benefits of nature connection in society. These mixed and somewhat contradictory findings suggest a complicated relationship between perceptions of indoor gardening and naturalness. A 2023 systematic review of consumer perceptions of indoor methods found that the perceptions of these methods are influenced by participants' beliefs and values, particularly their opinions on sustainability and environmental issues (Mina et al., 2023). Likewise, a study on consumer perceptions of indoor methods in Russia found that those making above 60,000 Rubles/month viewed them more favourably (e.g., safe and tasty) whereas those making less viewed them less favourably (e.g. unnatural & bad tasting) (Yano et al, 2021). One interpretation of this is that farm urban perceived naturalness and thus its possible link to a 'restorative experience' (Marselle et al, 2016) may depend in part on the individuals' values, and beliefs about nature and food systems and where this indoor method sits in relation to these (e.g being an extension of nature, creating a new relationship with nature or being fresher/more natural than current systems). Mina et al, (2023) highlights that to increase perceptions of naturalness, farms need to convince the public that the products are safe, of good quality, and natural. Therefore, further exposure, education, and contact with Farm Urban may shift perspectives on naturalness and thus potentially impact indoor nature's 'restorative experience' (and thus perhaps also social connection).

4.4 Limitations and future research

This study included a wide array of community members such as volunteers, investors, youth club leaders, initiative managers, artists, nature therapists, and community garden managers. As different groups may have different values, beliefs, and perceptions, the inclusion of a wide array of community members captures an array of different perceptions. However, this study did not utilize the naturalness perception scale, which has been linked to perceived 'restorativeness' (Marselle et al, 2016), potentially providing more accurate insights into perceptions of naturalness and restorativeness. Furthermore, the length of time between the interviews and the event may have impacted the contents of participants' memories and thus the results. Similarly, the small number of attendees at the event led to a small sample size at interview; that being said, this size is in line with achieving information power as 8 out of 15 is likely representative of the event (Malterud, Siersma, & Guassora, 2016). Furthermore, as there is no agreed way of conceptualising social connection, our discussion provides a speculative mapping onto the best practice guidance on how an environmental enhancement NBS may hypothetically promote identification through 'identity leadership'. Future research should aim to establish causality by measuring social identification longitudinally within a randomised controlled design using quantitative identification measures such as in Sani et al (2019) alongside employing belonging measures like Kellezi and Wakefield to investigate change over time, and map findings onto the most robust existing evidence within this field. Furthermore, a longitudinal design could also measure stress buffering

effects by measuring salivary cortisol levels alongside changes in perceived naturalness by using the naturalness perception scale to investigate if and how changes in 'social connection' and perceived naturalness might occur or co-occur over a course of education and exposure to indoor methods.

4.5 Implications

This study has numerous provisional implications for embedding indoor farms into communities and increasing their social impacts. Firstly, further education and exposure may influence community perceptions of naturalness and increase nature connection and thus generally increase the 'restorative' impacts of these spaces within communities. Likewise, Farm Urban's openness and sharing of methods may help facilitate identification among community members. Identification could be increased further through receiving funding to implement systems locally or using income from selling systems to commercial businesses to subsidize the cost of the systems for local grassroots initiatives, facilitating a sense of 'us' and 'being one of us' between Farm Urban and the local Community, promoting identification. Furthermore, opening Farm Urban as a communal space and hosting events for community members may facilitate identification with the community and facilitate the intertwined stress-buffering and social capital benefits of these relationships. However, more research is needed to establish these provisional social benefits of indoor farms, specifically well-designed longitudinal work.

Ethics statement.

This study was approved by the University of Manchester Research Ethics Committee (ID: 2025-22339-41339). All participants provided written informed consent prior to participation.

Author contributions.

MM: conceptualization, methodology, investigation, formal analysis, writing original draft, writing review & editing. TE: supervision, conceptualization, review and editing, formal analysis

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Nomenclature

Nature based social prescription (NBSP)

Social prescription (SP)

Environmental enhancement NBSP

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The author declares no commercial or financial relationships that could be construed as a potential conflict of interest.

Data availability statement.

Interview excerpts relevant to the conclusions are included in the article/Supplementary material. Full transcripts are not publicly available to protect participant confidentiality.

Generative AI statement

The author declare that no generative AI was used in the generation of written or visual content

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APPENDIX A – Ethical approval

Ethics approval



Ref: 2025-22339-41339

21/05/2025

Dear Michael McCormick, ,

Study Title: Exploring Experiences of Farm Urban Manchester Events

Thank you for submitting your low risk ethics application for the project named above which has now been approved by your supervisor and logged with the Ethics Administrator.

If anything untoward happens during your research or any changes take place then please inform your supervisor and/or programme director immediately.

Please accept this email as confirmation that your low risk Ethical Approval application has been approved by your supervisor and you are now able to carry out your research.

Please let us know if you have any additional queries by emailing: wai.kan@manchester.ac.uk

Yours sincerely,

Psychology & Mental Health Division Panel

Psychology & Mental Health Division Panel

The University of Manchester

Manchester

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APPENDIX B – Event design and data collection materials

Mapping event design to ‘Nature on prescription handbook’ and interview schedule

Station	Activity	Mechanisms/framing during event	Interview questions
Aquaponics	Build system in groups	<ul style="list-style-type: none"> - peer support - Prompt sharing of engineering knowledge/aquaponics experience - Invite people to consider where the system could be used/who could benefit (not just humans!) - Symbiosis 	<p>What did you expect to get out of the event? “Were you looking for something emotional, social, or practical?”</p>
Smoothie and Salad making	Make smoothie or salad for your community group	<ul style="list-style-type: none"> - Invite knowledge sharing of knowledge- nutrition, food as medicine, community tastes - Frame as creative in a personalised way e.g. ‘feel free to experiment or create something you’re familiar with’. Artistic v practical - Making labels/branding- drawing out community attributes. Danger of creating an ‘in’ group? 	<p>From the best of your memory – can you talk me through what you did at the event from arriving to leaving?</p> <p>What do you think other community gardeners would particularly like about the event</p>
Produce testing - vocab	Using senses, creating a ‘flavour scale’	<ul style="list-style-type: none"> - Invite sharing of food stories - Frame as slower activity, time alone with the senses - Place no demands on contributing to flavour scale 	<p>Did you think we did anything that would help people feel a sense of belonging or maybe that they fit in at the Farm Urban Manchester event?</p>
Edible wall	Learning how it works, harvesting and plug planting	<ul style="list-style-type: none"> - Highlight the contributions that growers make to their community, noun ‘community growers’ - Frame around having a responsibility- to maintain the wall, care for produce, engage with new ways of farming in a changing climate - Highlight familiarity of indoor environment, reduced ‘unknowns’ - Invite future thinking- where could you see this in your community? Who would use it? Introduce FUs plans to put in businesses 	<p>Did you think we did anything that would help people feel there was a purpose to being involved with Farm Urban Manchester?</p>

Interview schedule

Can you tell me a bit about yourself, like the kind of gardening you're involved in/what got you into it? What does gardening mean to you?

1. Why did you decide to attend the event?

Prompts:

- “Did anything draw your attention specifically or did anything about the cause or community appeal to you?”
- *What kind of people do you think will want to attend events like the one you attended? And “What do you think people are looking for in events like this?”*
- “Why do you think it appeals to that group and do you see yourself as part of that group?”

2. What did you expect to get out of the event? “Were you looking for something emotional, social, or practical?”

Prompts:

- “were there specific things you were interested in e.g. topics, activities, skills?”
- did you expect to feel any way in particular at the event? E.g, connected, nervous, inspired?”
- “Did anything surprise you—either in a good or bad way?”
- “What would have made the experience more enjoyable or relevant for you?”

The next question is designed to explore things that were memorable to you at the event – so,

3. From the best of your memory – can you talk me through what you did at the event from arriving to leaving?

Prompts:

- “are there any moments that really stood out to you?”
- How did you feel throughout the event
- “What part felt most meaningful or enjoyable?”
- “Did anything feel unexpected, unfamiliar, negative?”
- “did any part make you feel creative, connected, accomplished?”
- “Do you think the event allowed for creativity, personal growth/achievement, connection with nature?”
- “How did being in a group or the group work affect your experience?” (shared life experience?)

4. What do you think other community gardeners would particularly like about the event?

- “What kind of activities do you think appeal most to them?”
- “Do you think the event aligned with the other community gardeners' values or interests?”
- “Was there anything you felt was missing?”
- “What would have made it more appealing to them?”

5. Did you think we did anything that would help people feel a sense of belonging or maybe that they fit in at the Farm Urban Manchester event?

Prompts:

- “Was there a moment where you felt part or even not part of something?”
- “Was there anything that you think may have given you a shared sense of purpose?”
- “Were there opportunities to share your views, experiences or achievements?”
- “What would help someone feel more welcome or included do you think?”

6. Did you think we did anything that would help people feel there was a purpose to being involved with Farm Urban Manchester?

Prompts:

- “Did the event show how someone could actively make a difference in their community through farm urban?”
- “Were there clear ways for people to get involved?”
- “Did the activities connect with any of your wider goals or values?”
- “Would more explanation have helped?”
- “How could we better show people how they could get involved and make an impact?”

Demographic questionnaire

- What is your age?

- What is your gender

- Male
- Female
- Non binary
- Other
- Prefer not to disclose

- What is your ethnicity?

- Asian, Asian British or Asian Welsh: Bangladeshi
- Asian, Asian British or Asian Welsh: Chinese
- Asian, Asian British or Asian Welsh: Indian
- Asian, Asian British or Asian Welsh: Pakistani
- Asian, Asian British or Asian Welsh: Other Asian
- Black, Black British, Black Welsh, Caribbean or African: African
- Black, Black British, Black Welsh, Caribbean or African: Caribbean
- Black, Black British, Black Welsh, Caribbean or African: Other Black
- Mixed or Multiple ethnic groups: White and Asian
- Mixed or Multiple ethnic groups: White and Black African

- Mixed or Multiple ethnic groups: White and Black Caribbean
- Mixed or Multiple ethnic groups: Other Mixed or Multiple ethnic groups
- White: English, Welsh, Scottish, Northern Irish or British
- White: Irish
- White: Gypsy or Irish Traveller
- White: Roma
- White: Other White
- Other ethnic group: Arab
- Other ethnic group: Any other ethnic group
- Prefer not to disclose

What is your employment status?

- Employed part time
- Employed full time
- Unemployed, looking for work
- Unemployed, not looking for work
- Retired
- Disabled, unable to work
- Prefer not to disclose

What is your role in community gardening?

- Volunteer
- Organiser
- Other

Please say more here if you would like to

APPENDIX C – material supporting analysis

Extended quotes centred around key analytic points

Restoring balance through nature

<p>Loss of nature connection</p>	<p><i>' [discussing farm Urban] it feels [] almost like a solution for a problem that should never have existed in the first place, i.e. humans being not very connected with nature because of the way we now all live in urban environments or so many of us do'' (NIEE)</i></p> <p><i>'' we've got Lovley parks and things but somewhere that you can kind of really just go and be completely quiet can be quite difficult to access'' (NAHH)</i></p> <p><i>''[talking about fresh/quality food] I kind of feel like modern society sort of robbed us of something that use to be available to us, you know naturally like its I almost feel like it's a basic right'' (HASS)</i></p> <p><i>''I felt a lot of anxiety about things that were happening at the ecological level and the societal level and I felt like there are lots of positive things that could be done for the way that we grow things and the way that we can reimagine our community so that kind of I guess that was my way in'' (LYNN)</i></p> <p><i>'there's a real lack of connection with real food'' (YAKK)</i></p>
<p>Increasing focus on selling</p>	<p><i>''[Discussing Manchester] the last 10 years have been crazy in terms of development, but a lot of that development has just been like really money orientated, so it was just really nice to be in a space and connect with people that was... that felt like it was giving something back to the world and the community rather than just being a place to kind of make money'' (KIEE)</i></p> <p><i>''I like the fact that permaculture was kind of looking at things like fair share, earth care and people care because I felt that was something that was lacking in the systems that I could see around me'' (LYNN)</i></p> <p><i>''In the city centre of Manchester, you can't really be in many places without being sold anything. [] It feels like its becoming more and more.. it feels quite alienating and homogenous as a city'' (NAHH)</i></p>
<p>Lack of fair share</p>	<p><i>'food poverty, food injustice and you know access to nutritional food, which I think are big social issues. We shouldn't be living in a world where people don't, you know in our country we should be in a situation where people don't have access to fresh nutritious food'' (KIEE)</i></p> <p><i>'' It's such an unjust society []. [Discussing the ability to make errors while cooking fresh meals] you can't afford to do that, you need to be a sure thing. Everyone will eat those chicken nuggets (referencing McDonalds), so we've got a problem there (YAKK)</i></p> <p><i>''Its like all this kind of amazing kind of knowledge, resources and equipment right at our doorstep and Its really hard to get you hands on it because its like a privileged institution'' (KIEE)</i></p>

	<p>'You're constantly preaching at people all day, getting the message about being eco-friendly and all the products, the green products and services are more expensive, that's always a challenge (NIEE)</p> <p>'It's such an unjust society, you've got lots of people who are really struggling and have kind of given up almost '' (YAKK)</p> <p>(discussing ability to access tasty affordable food and eat health) I would say its class based at some level (YAKK)</p>
Nature as restoring balance	<p>''[describing how community gardens are different from street trees] They actually involve cooperation [] and people can actually get a sense of belonging from that space is not like they're walking through it [] they're getting food from it and a better sense of meaning'' (MASS)</p> <p>[discussing community gardening] ''people are very stressed generally because of money and the news and all the rest of it. So that just being in a green space, whatever it is you're doing [] all of that makes you feel connected and in the moment [] it's a medium to get people together and then they support each other [] its not just about the food'' (YAKK)</p> <p>''[Discussing the scientific evidence] the natural world inspires awe or wonder and then that in turn inspires kindness which is like super interesting'' (KIEE)</p> <p><i>[discussing compost in a jar activity] '' In an urban environment you don't notice these things unless you've got a compost heap [] having it there in a jar that you can see it the process over time just makes you realise that everything's connected which I think people feel a bit more connected they're more likely to look after their world.</i></p> <p><i>There was a bit of excitement of what could happen if this gets if this works as s system if you know if in Manchester we could start producing lots of food this way. There's like some really interesting opportunities so its sort of stimulating'' (LYNN)</i></p>
Attending the event as an extension of restoring balance	<p>''I came to learn more ideas, inspiration, see if there's something I can even get involved in'' (HASS, a volunteer community garden manager which grows fresh food for a local food bank on a soil free site),</p> <p>''I was more interested in that presentation and that message, and you know how we make it relevant to people'' (YAKK, a manager of a nature-based project targeted at the cost of living crisis)</p> <p>''people that work as community growers, that was I wanted to meet a few more people like that and people that have set up their own community gardens, as I'd really be interested in, like doing something similar in the future. So, I think networking was definitely like a top priority for me'' (MASS)</p> <p>''I went along to see if there were some ideas about activities, we could do with the youth club or just build that connection with farm urban'' (NIEE) (51 year old business owner and youth club volunteer)</p> <p>''Community growers, I wanted to meet a few more people like that and people that have set up their own community gardens as id really be interested in like doing something similar in the future'' (MASS) (25-year-old MSc student studying sustainable development)</p> <p>'' I've been working on various projects to integrate that with art (forest bathing). [] Id really love to do an artist residency for farm urban'' (KIEE) (43 year old artist)</p> <p>''I was interested in that message'' (YAKK)</p>

	<p>“I think and just wanting to work collaboratively with other organisations and it felt like a really exciting way to do that” (NAHH)</p>
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Making sense of farm urban: as connection to nature

Unfamiliar	<p><i>it's a very different way of connecting with nature and not one that felt familiar [] I'm so used to just getting my hands in the earth and growing that way" (NAHH)</i></p> <p>'we breathe like different chemicals when were in nature that are really good for us so it'd be interesting to know like what the air in that space is like []... " what's in the nutritional mix and you know how. Yeah, how it all operates. (KIEE)</p> <p><i>'it's a very different way of connecting with nature and not one that felt familiar [] I'm so used to just getting my hands in the earth and growing that way" (NAHH)</i></p> <p>'we breathe like different chemicals when were in nature that are really good for us so it'd be interesting to know like what the air in that space is like []... " what's in the nutritional mix and you know how. Yeah, how it all operates. (KIEE)</p>
Not natural	<p><i>'I think a lot of what gardeners enjoy is being in nature, working with nature. And farm urban, it's all very kind of clean and clinical and feels like more like you're in a lab" (NIEE)</i></p> <p><i>I would feel confident growing lettuce int my allotment, but I wouldn't know quite the process of where to begin in that context of growing vertically, so it's just sort of that new knowledge I suppose. But I think, I don't know if it's just to do with it being so different and this idea of natural maybe" (NAHH)</i></p>
More accessible	<p>“ [discussing their eco therapy allotment] you couldn't access the allotment if you're in a wheelchair, but you could do if you're indoor gardening” (NAHH)</p> <p>“for some people that's going to make it more accessible because they might not feel comfortable working with soil you know, being outside for whatever reason” (LYNN)]</p>
Extension of nature	<p>“you know there's all these theories about kind of like awe in nature [] how the natural world inspires awe and wonder and then that in turn inspires kindness which is like super interesting [] thinking about the lettuces and how they're displayed in that really beautiful way could</p>

	<p>definitely be something that connects people and get them to I guess, form a new relationship with vegetables and greens” (KIEE)</p> <p>“ you see a side of the allotment that you don’t see in spring and summer when everything’s coming into growth (in the winter), whereas you see that more all around with the indoors [] so you get that sort of I don’t know the green biophilia sort of feeling in the indoor environment” (NAHH)</p> <p>“”[Discussing the scientific evidence] the natural world inspires awe or wonder and then that in turn inspires kindness which is like super interesting” (KIEE)</p>
fresh	<p><i>“ the potential of it sort of becoming a standard one day and having that level of fresh greens of, you know, carrying kind of flavours and texture more widely to anybody. So thinking about that as you know as a potential seed towards something like that kind of gave me a sense of optimism ” HASS</i></p> <p>“ like the tasting activity. []. I thought that was quite inspirational in terms of trying to kind of make cultural change and trying to kind of persuade people (that these growing methods are better quality) ” (LYNN)</p>
Connection to food systems	<p><i>Its definitely a step closer to nature than just buying a lettuce you know in a shrink wrap or whatever in a supermarket and not thinking about the process at all of what’s gone on and not being part of that process, so it definitely goes somewhere towards making a more of a relationship with nature (LYNN)</i></p> <p>“some of the boys that don’t like working outside can still connect with the story around food and the environment but in a nice warm space” (NIEE, youth club leader)</p>

Making sense of Farm Urban: as ‘accessible’

Cost barriers to accessibility	<p><i>NAHH: the only concern with technology is it becomes like accessible in some ways and less accessible in others, can’t it? ”</i></p> <p><i>KIEE: ” my other desire would be just to see these more common place, obviously there’s like a cost to setting these up ”</i></p>
Scepticism	<p><i>If I remember anything I think I remember one of the participants being quite sceptical about the system. [] They gave some scepticism around it, I guess of like the scale of it or the cost of it or whatever you know ” (LYNN)</i></p>

	<i>[discussing other participants] “they were a little perplexed I would say in the conversations I had about the expense of the equipment (YAKK)</i>
Contradictory to grass roots associations	<p><i>“ they were a little perplexed I would say in the conversations I had about the expense of the equipment that was involved, you know, because I think the reason why people grow their own food in allotments have always been thinking you know, a tradition of working-class culture” (YAKK)</i></p> <p><i>MASS “ I thought that was kind of an interesting contrast because community gardening is more like having more like grass roots initiated and I think a couple of people were talking to were just discussing about like the energy consumption, how much like energy that the hydroponic system used, and I think they might have mentioned like it’s better to like to grow it yourself outdoors”</i></p>
Giving back	<p><i>“I think that kind of openness and the fact that the way we were being righted it was a feeling of a desire for collaboration and rather than it being like a purely commercial sort of enterprise [] it made me feel comfortable being in that kind of environment rather than like a very corporate environment” (LYNN)</i></p> <p><i>“it wasn’t just you know, here’s who we are, here’s what we do. It was like here’s who we are, here’s what we do, here’s how we do it. And that third part was, you know was I guess what took the event to the next level. (HASS)</i></p> <p><i>Its just like. Countering to the flow, it feels like there is such a focus in the centre of Manchester you can’t really be in many places without being sold anything and it felt a bit like an altar, a potentially alternate food economy going through the city. (NAHH)</i></p> <p><i>“it really gave me the impression that, like some great things are happening in Manchester because I think I’ve lived here for 17 years and the last 10 years have been crazy in terms of development, but a lot of that development has just been like really money orientated. So it it was just really nice to be in a space and connect with people. That was. That felt like it was giving something back to the world and the community rather than just being a place to kind of make money. (KIEE)</i></p>

Symbiosis and connection

Symbiosis	<p><i>“[so in terms of meeting new people, why is that important?] it’s just proven very helpful during my journey with this newly established community garden. It’s just you know exchanging information, ideas, even practically you know, I have an excess of that, you have an excess of that, lets trade. Or opportunities for collaboration. Yeah, just you know, you never know what might come up” (HASS)</i></p> <p><i>“ meeting other people that are doing similar project is so useful in terms of just you know looking at how they’ve got over obstacles you know gaining ideas and just inspiration you know even if it just like moral</i></p>
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	<p>support. Talking to Someone who's working in the same sort of area and obviously you'd hope that further down the line from that you might be able to kind of share resources'' (LYNN)</p> <p>'' it's useful to know what's going on across Manchester and you know, how people are meeting some of those challenges and it's you get some really interesting insights into what people are doing and I think you can bring a bit of your knowledge'' (YAKK)</p> <p>''people that work as community growers, that was I wanted to meet a few more people like that and people that have set up their own community gardens, as I'd really be interested in, like doing something similar in the future. So I think networking was definitely like a top priority for me'' (MASS)</p> <p>'When you bring them together, they will go or you know this is what I do that what you know that something you could try and I don know, exchange notes on different types of soil composition or something'' (NIEE)</p>
<p>Noticing commonality and operating together</p>	<p>'I think that's what probably bonded all the groups that they all had Initiatives and community groups, and that they were all from a setting that were dealing with the cost-of-living crisis that was acknowledging that people are struggling. That's what we all had in common'' (YAKK)</p> <p>''We've all got slightly different communities that were trying to serve, also engage with, but I think underneath it all there are lots of parallels and you know things that are meaningful to all of us, which is were all seeing people suffer'' (YAKK)</p> <p>[discussing other attendees] '' A lot of them, were focusing on doing good for, for the community they volunteer in or work in and gardening was kind of like the method while for others it was kind of the main focus it's at least my impression of it, like the Community first aspect'' (HASS)</p> <p>''it was just really nice to be in a space and connect with people that was... that felt like it was giving something back to the world and the community'' (KIEE)</p> <p>''especially considering you know with the community garden that I'm managing. I kind of know that if I need to consult if I need information or help then I've got contacts there now. So yeah, in a way it did feel like you know all of those initiative are sort of operating together if that makes sense'' (HASS)</p> <p>'There was a chap from a community garden I think he was maybe sharing his plans for their space so and it's always nice when you realise, you're not on your own, there are other people doing similar stuff in other you know nearby places'' (NIEE)</p> <p>'that was really nice just to learn about new projects and they're not new, they're just new to me, you know. You feel you know a city and when you've lived here for quite a while and then its nice to be refreshed. [...] so going to kind of the event felt really nice because actually I felt more connected to the centre'' (NAHH)</p> <p>''it's really nice to think that that's going on in north Manchester or wherever it is. We're from where I know there's probably less activity</p>

	than there is in south Manchester where were based, so yeah, I think that bringing people together is really important” (YAKK)
Competence and experience	<p>‘I like to go deep into the detail of things and know that, knowing that there were people there that were kind of the same made me feel like yeah, those are my kind of people’” (HASS) (31-year-old leader of community garden)</p> <p>‘Maybe I was a little bit insecure about my own like I volunteer weekly, but I’m not necessarily like on the same level’” (MASS) (25-year-old volunteer community gardener)</p> <p>“It probably did make me think, oh, I’ve got lots to learn. I feel there’s loads of people here with more, more experience than me, so I suppose it brought that up a little bit” (NAHH) (.. new to the role Eco therapist)</p> <p>“ people were asking a lot of questions and were a little bit confused and I was answering questions” (YAKK) (60-year-old garden project manager).</p> <p>“There’s a satisfaction in knowing that what you’re trying to do is right for your community and that other people are applauding that and other people recognise those efforts, so I think that’s a really nice thing to bring people together” (YAKK)</p>
Hydroponics task	<p>‘the hydroponics, definitely felt part of something cause were like doing something practical together, a lot of groups were sharing the same experience of just not really being able to set up correctly’” (MASS)</p> <p>‘It was quite interesting observing how we all put things together differently and learn differently I think that’s quite interesting because its then like a real reminder of like the need for diversity’ (NAHH)</p> <p>“it’s nice to actively do things and engage all your senses and work with other people and and feel that you are making a contribution as well. I think maybe that’s part of it as well” (LYNN)</p> <p>“the most fun was kind of like it was. It was building the aquaponics just because you kind of like, you know, you’ve got to work together and and people get things wrong, which is quite funny. And then you get them right” (QUI)</p>

Example of initial codes and coding categories

Group dynamics and curiosity

Outsider

Outsider

Outsider
outsider
Superficial
Kay evaluating FU message
Evaluating FU
Curious, awkward at ease
Insecurity – not on the same level
Different goals – insecurity
Looking silly
Group intimidation
Kay evaluating
Relatedness – my kind of people

Connecting

Shared bonding experience – hydroponics
Living vicariously
Shared levelling experience – hydroponics
Moving from outsider to insider
Bonding over confusion
Inclusion through discussions
Meeting likeminded people
connecting over nature
connecting over likeness
realising other doing good
Making a difference together – sustainability
Relatedness
Becoming connected
Relatedness and connecting – go to that level
Living vicariously is a sign of togetherness
Sharing = welcoming
Likeness – noticing others doing good
Bonding with others over targeting cost of living
Shared meaning and bonding
Living vicariously
Gaining satisfaction/recognition of doing good
Recognition from other
Receiving/giving recognition
Bonding over tasing
Kay evacuating
Kay facilitating
Warm glow, empowerment theory
Making a difference together
Insecurity
Insecurity
Outsider
Outsider evaluating

A counterculture

Counterculture – community hall vs research
A new relationship with nature – the environment and counterculture
A new relationship with nature – research vs town hall

Counterculture – free smoothies
Art as a counterculture
Counterculture
Counterculture
New perspective on the city
Counterculture (fresh nutritious food – human right)
Counterculture
Counterculture – inspiring
Community first -counterculture
Counterculture – regenerate
Counterculture
Community first
Connecting over counterculture
Bringing people together
Counterculture and connection
Collective action
Counterculture
Collective action
Fu and counterculture (buying into)
Counterculture – depth of questions
Community first counterculture
Fu and counterculture (buying into)
Counterculture – not selling
Counterculture – eco caring together
Counterculture – here’s how we do it
Counterculture
Counterculture in design
Changing perspectives of city (counterculture) – exciting
FU counterculture – selling to orgs
Counterculture – solution to problem that shouldn’t have existed in the first place
Staring counterculture
Shifting perspective on city – others doing good
Counterculture – connecting with anything but capitalism
Making a difference together – refreshing
Refreshing
Senes of community desire to do good
Feelings of positivity about community first
Connection to the city
Contradicting capitalism and excluding homogeneity
Connection to the city (counterculture)
For the people
Feeling positivity about community first

Making a difference together – symbiosis

Making a difference together
Making a difference together
Interesting people and places
Interesting people and places
Making a difference together exploring values
Making a difference together exploring values

Making a difference together variety
Curiosity and coming together (hydroponics)
Sharing info = gratitude
Practical social supp – seeing system
Bridging gap via social supp – visiting attendee system
Desire to Newtok though curiosity and interesting people
Depth and learning through other (working together)
Noticing others interested in cost, ethics and sustainability
Curious attendees
A unique place to meet interesting people
Noticing interesting people and places
People doing good = interesting
Networking for knowledge and support
Knowledge, trade, ideas, collaboration
Perceived social support
Making a difference together – community effort
Symbiosis
Community though sharing
Learning about initiatives
Making a difference with others
Futureproofing
Symbiosis
Good people
A curious group
Making a difference together – mucking in/variety
Curious people
Making a difference together
Learning about verity
Supporting the community
Facilitating goals of others
Recognising people addressing issue
Conversations as key
Seeing familiar faces and community
Verity of takes and solutions to problem,
A platform for social support
Reducing costs vs encouraging health – variety
Helping others overcome challenges
Symbiosis
Complexity and the need for verity of perspectives
No one way to grow – community growing
Sharing knowledge
Age/class and perspective
Different perspectives on the issue
Sharing knowledge
Learning about challenges
A platform to learn about verity
Sharing tips/growing as inherent community
Eco/people caring together
Kay as a facilitator
Seeking conversations

Complexity, exclusion & meaning

Fu and exclusion – making a difference
Complexity and meaning – exclusion
Fu and exclusion
Fu and exclusion s- working class
Fu vs grassroots
Fu and exclusion working class
FU and exclusion – technology
Fu and complexity -intimidation
Fu and exclusion
Fu and exclusion – technical
complexity and alienation
fu and exclusion – knowledge/tech
complexity, competence and alienation and nature binary
fu and exclusion grassroots not going to by
fu and exclusion
complexity and exclusion
complexity and exclusion
complexity and isolation (tech/knowledge)
fu and isolation
working class vs elite – injustice
complexity and exclusion
fu and exclusion
knowledge/difficulty
cost of living and implementation
not addressing community needs
addressing community needs
fu vs working class
working class vs fu – exclusion
knowledgeable/accessibility as a barrier to use
fu and exclusion – cost
exclusion, alienation and practical implementation
exclusion and meaning – perplexed

Making a difference

The real issue – urban greening
The issues – food poverty, food injustice and access to fresh nutritious food
making a difference – plants as therapy for those with MH
loss of therapy calm space in cities
making a difference – combining plants and art as therapy
making a difference learning about hydroponics
gardening and environmental behaviour
deep commitment to making a difference
fu and identification
identification with fu creative approach growing without soil
growing without soil
identification – my kind of thing
fu and making a difference (inherently meaningful)
economy and health
purpose – setting up aquaponics initiative

a sick society – senna tablets
a sick society – loss of connection and achievement
the real issue – schools
a sick culture – unjust society
its not just about the climate
the real issue – education
strong conviction to food waste issue
society expectations for food to look good
promoting consciousness around food systems
the real issue – connection food and meaning
fresh food a human right
the issue food systems and the environment
the issue sustaining wellbeing
the issue mental health
affordability and accessible food
youth development
 freshness becoming a standard
the issue – food quality
a sick society – a basic right to have fresh food
the issue – making fresh food available for all
the issue – urbanicity and disconnection
healthier eating plant based, quality, agricultural model, collective action, grass roots
 inspiring eco-friendly behaviour
sustainability
a sick society
a sick culture
addressing skills an behaviour a sick society/injustice
the real issue – privileged and skills
eco caring – climate change, food security & covid and economy and health
cost of living
its not just about food
the real solution -upskilling
availability of food as unnatural and creating waste behavioural aspects of issue
the real issue – upskilling alongside the journey of food
the issue of food systems
making a difference

Making a difference with Farm Urban

fu and inclusion – Lego hydroponics
counterculture
exploring values
exploring values
making a difference with fu Lego hydroponics sustainability
fu message received through task
fu potential
fu potential to address inequality
extending the benefits of plants as therapy all year excitement
with fu nature workshops
with fu Natasha
with fu art workshops

art residency
taking a different approach
with fu involvement
making a FU into an artwork
making a difference bringing clients to the event
technology accessibility and sustainability
potential = lovely
clients along excitement
becoming a guardian
clients along
clients along
upskilling, jobs and addressing sustainability
fu plants as therapy all year round
with fu accessibility and inter
with fu supporting more people
with fu compost in a jar as a teacher
with fu compost in a jar as a teacher
with FU – scout pet
with fu scout green consumption smoothie
fresh in urban environment
and excitement
inspiring actives
message and method
extending benefits of nature (responsibility and care_
insider knowledge
influencing scouts
I'm here let's talk
sharing local knowledge
new levels of freshness/inspiration
freshness and optimism/inspiration
mind blown, inspiring
flavours and inspiring
making a difference (excitement)
making a difference – new ideas
making a difference – food quality and optimism
fu and inclusion
complexity and inclusion
making a difference with fu
fu and inclusion
fu potential for inclusion
the value in fu
fu potential for inclusion
a place for fu – awareness
fu potential to upskill using practical format
fu potential for inclusion cheaper in mass nutritious
interested in delivering that message
lettuce for the poor
eco – not addressing the main issue
not addressing the main issue
making a difference with fu - therapeutic effects of nature

making a difference with fu – volunteers to tend v wall
making a difference with fu – learning about realities of growing vertically

Connecting through food systems

local and fresh vs industrialised
a new way of connecting
food systems as nature connection
a new relationship with nature – research lab
culture = lack of connection with real food

Connecting through taste

connecting with nature – taste
connecting with nature – taste
connecting via taste
connecting through awe
connecting through attention restoration
making a difference with FU
connecting through taste
flavours and awe
flavours and connection
new flavours and perspectives
new ways of connecting

Connecting through extension

plants as therapy – harvesting lettuce
extending the reach of therapy – winter
extending the reach of therapy – kids/muddy
extending reach of therapy – audience
increasing reach of gardening as therapy
extending plants as therapy
new ways of connecting (responsibility for fish)
composting in a jar therapy/responsibility)
hydroponics – connecting with nature in urban environment (accessing
therapy/responsibility)
new bridges (story around food)
extending benefits
all year round
extending benefits of plants all year round

Figure 2. *Early thematic mapping*

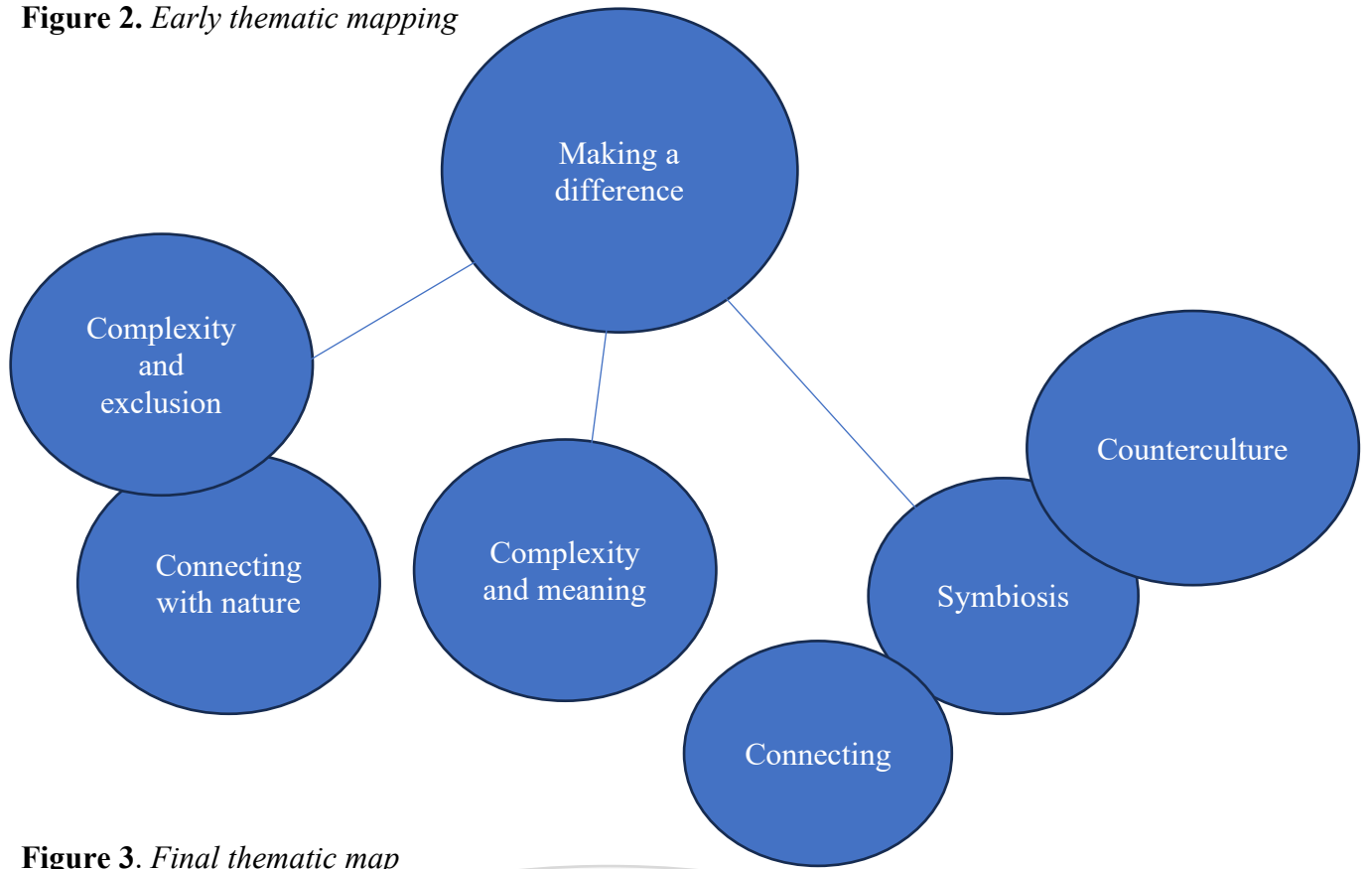
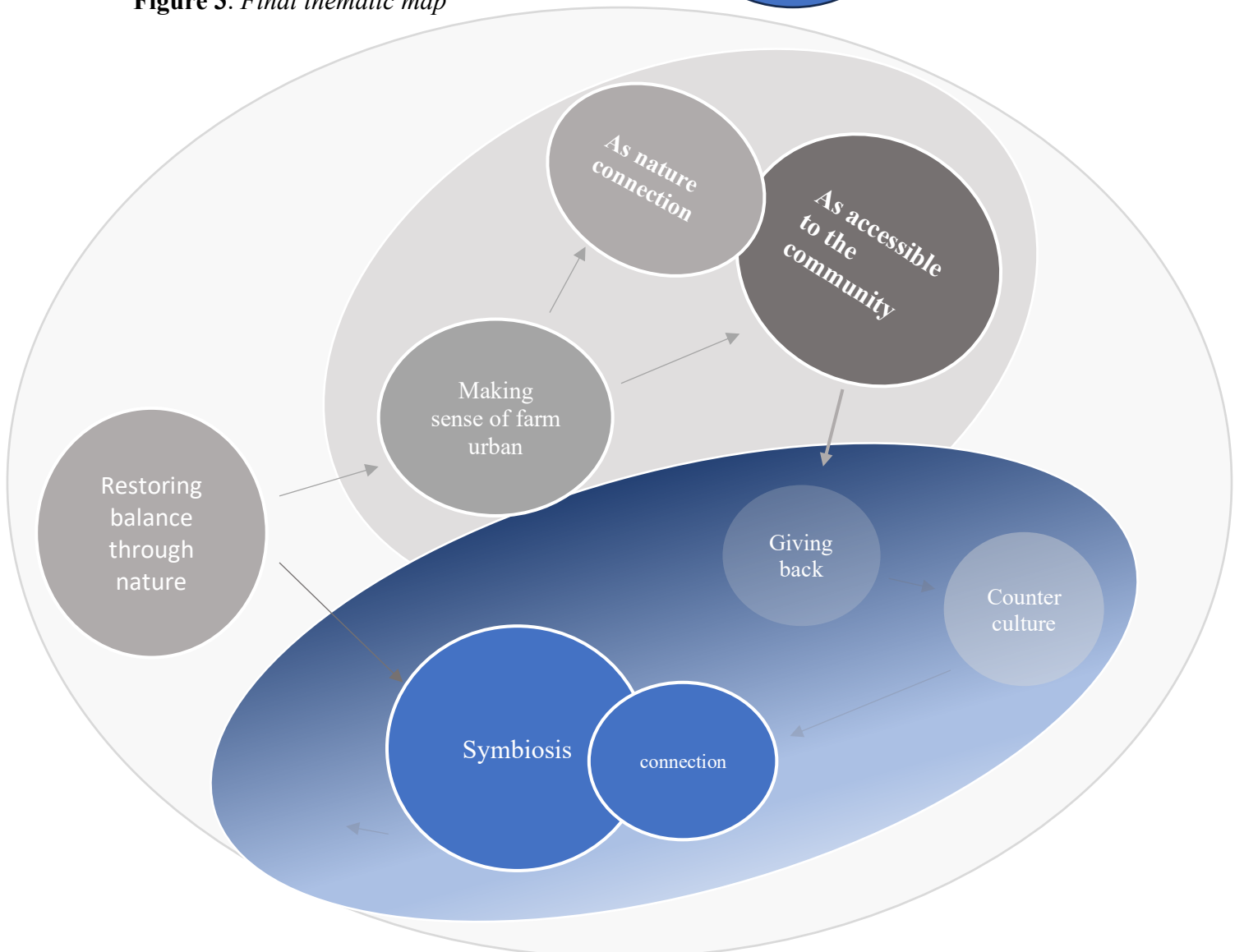


Figure 3. *Final thematic map*



APPENDIX D – journal formatting guidelines

Link - <https://www.frontiersin.org/journals/psychology/for-authors/author-guidelines>

Guidelines for authors

Writing and formatting

Title

The title should be concise, omitting terms that are implicit and, where possible, be a statement of the main result or conclusion presented in the manuscript. Abbreviations should be avoided within the title.

Witty and creative titles are welcome, but only if relevant and within measure. Consider if a title meant to be thought-provoking might be misinterpreted as offensive or alarming. In extreme cases, the editorial office may veto a title and propose an alternative. Authors should avoid:

titles that are a mere question without giving the answer

unambitious titles, for example starting with 'Towards,' 'A description of,' 'A characterization of' or 'Preliminary study on'

vague titles, for example starting with 'Role of,' 'Link between,' or 'Effect of' that do not specify the role, link, or effect

including terms that are out of place, for example the taxonomic affiliation apart from species name.

Abstract

As a primary goal, the abstract should make the general significance and conceptual advance of the work clearly accessible to a broad readership. The abstract should be no longer than a single paragraph and should be structured, for example, according to the IMRAD format. For the specific structure of the abstract, authors should follow the requirements of the article type or journal to which they're submitting. Minimize the use of abbreviations and do not cite references, figures or tables. For clinical trial articles, please include the unique identifier and the URL of the publicly accessible website on which the trial is registered.

Manuscript length

Frontiers encourages the authors to closely follow the article word count lengths given in the 'Article types' page of the journals. The manuscript length includes only the main body of the text, footnotes, and all citations within it, and excludes the abstract, section titles, figure and table captions, funding statement, acknowledgments, and references in the bibliography. Please indicate the number of words and the number of figures and tables included in your manuscript on the first page.

Sections

The manuscript is organized by headings and subheadings. The section headings should be those appropriate for your field and the research itself. You may insert up to 5 heading levels into your manuscript (i.e.,: 3.2.2.1.2 Heading Title).

For Original Research articles, it is recommended to organize your manuscript in the following sections or their equivalents for your field.

Introduction Succinct, with no subheadings.

Materials and methods This section may be divided by subheadings and should contain sufficient detail so that when read in conjunction with cited references, all procedures can be repeated. For experiments reporting results on animal or human subject research, an ethics approval statement should be included in this section (for further information, see the 'Bioethics' section of our policies and publication ethics.)

Results This section may be divided by subheadings. Footnotes should not be used and must be transferred to the main text.

Discussion This section may be divided by subheadings. Discussions should cover the key findings of the study: discuss any prior research related to the subject to place the novelty of the discovery in the appropriate context, discuss the potential shortcomings and limitations on their interpretations, discuss their integration into the current understanding of the problem and how this advances the current views, speculate on the future direction of the research, and freely postulate theories that could be tested in the future.

For further information, please check the descriptions defined in the journal's 'Article types' page, in the 'For authors' menu on every journal page.

Language editing

Frontiers requires manuscripts submitted to meet international English language standards to be considered for publication.

For authors who would like their manuscript to receive language editing or proofreading to improve the clarity of the manuscript and help highlight their research, Frontiers recommends the language-editing services provided by the following external partners.

Note that sending your manuscript for language editing does not imply or guarantee that it will be accepted for publication by a Frontiers journal. Editorial decisions on the scientific content of a manuscript are independent of whether it has received language editing or proofreading by these partner services or other services.

Editage We recommend the language-editing service provided by our external partner Editage to authors who believe their manuscripts would benefit from professional editing. These services may be particularly useful for researchers for whom English is not the primary language. They can help to improve the grammar, syntax, and flow of your manuscript prior to submission. Frontiers' authors will receive a 10% discount using this link: editage.com/frontiers.

The Charlesworth Group We recommend the Charlesworth Group's author services, with a long-standing track record in language editing and proofreading. This is a third-party service for which Frontiers' authors will receive a 10% discount using this link: www.cwauthors.com/frontiers.

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Language style

The default language style at Frontiers is American English. If you prefer your article to be formatted in British English, please specify this on the first page of your manuscript. For any questions regarding style, Frontiers recommends authors to consult the Chicago Manual of Style.

Inclusive language

Frontiers is an inclusive publisher and we ask that all submissions are in line with our inclusive language policy. When preparing your manuscript for submission, take a mindful approach towards personal biases and a concerted effort to limit their influence. Authors should remove any suggestion or implication of superiority or inferiority of one person over another based on age, gender, race, ethnicity, culture, sexual orientation, disability, religion, or socio-economic class. We ask authors to use inclusive language practices and awareness of diversity, equity, and inclusion into their research and keep it at the forefront during the composition of their findings.

External guidance that may be useful is available at C4DISC's Guidelines on Inclusive Language and Images in Scholarly Communication.

Furthermore, when drafting your work, please take into account the following considerations

In general, seek to avoid:

language that could be deemed insulting, profane, or derogatory.

descriptors that identify personal attributes such as age, gender, race, ethnicity, culture, sexual orientation, disability, or health conditions, where they are not critically relevant to the discussion.

any form of language that suggests a particular culture or group as the default or standard.

And where feasible:

proactively ask individuals or groups how they would prefer to be referenced.

adhere to the SAGER guidelines for reference to sex and gender in research.

Remember, the language we use can influence perceptions, evoke emotions, and shape perspectives. Let's work together to nurture an inclusive, respectful, and empowering discourse in science.

Search engine optimization

There are a few simple ways to maximize your article's discoverability and search results.

Include a few of your article's keywords in the title of the article

Do not use long article titles

Pick 5-8 keywords using a mix of generic and more specific terms on the article subject(s)

Use the maximum amount of keywords in the first two sentences of the abstract

Use some of the keywords in level 1 headings

Alt text

As part of our commitment to make science open for all, we are dedicated to accessibility in our publications. One way you can make your manuscript more accessible is by including alternative text (alt text) with all figures or images.

What is alt text?

Alt text is a short visual description of the contents of an image. Alt text is not the same as a caption, as it provides a description of the entire image. It is included in the manuscript alongside the image, but in the background, not visible on the page.

Good alt text will be specific, concise, and not overly descriptive. It should include any essential text or data that appears on the image and would be lost if a user couldn't see it.

See Harvard University's guide for more tips on writing good alt text.

Why is alt text important?

It allows people using screen reading technology to clearly understand the contents of an image, therefore making your manuscript more accessible for readers with visual impairments. This is also useful for anyone else who can't view the image - if it doesn't load quickly, for instance .

Alt text can also provide better descriptions to search engine crawlers, helping with article discoverability and indexing.

For more support, our partner AuthorMate offers an alt-text writing service.

Guidelines for artificial intelligence

These guidelines cover acceptable uses of generative AI technologies such as Large Language Models (ChatGPT, Jasper) and text-to-image generators (DALL-E 2, Midjourney, Stable Diffusion) in the writing or editing of manuscripts submitted to Frontiers.

Use of AI to create written or visual content

Authors should not list a generative AI technology as a co-author or author of any submitted manuscript. Generative AI technologies cannot be held accountable for all aspects of a manuscript and consequently do not meet the criteria required for authorship.

If the author of a submitted manuscript has used written or visual content produced by or edited using a generative AI technology, this use must follow all Frontiers guidelines and

policies. Specifically, the author is responsible for checking the factual accuracy of any content created by the generative AI technology. This includes, but is not limited to, any quotes, citations or references. Figures produced by or edited using a generative AI technology must be checked to ensure they accurately reflect the data presented in the manuscript. Authors must also check that any written or visual content produced by or edited using a generative AI technology is free from plagiarism.

If the author of a submitted manuscript has used written or visual content produced by or edited using a generative AI technology, such use must be acknowledged in the acknowledgements section of the manuscript and the methods section if applicable. This explanation must list the name, version, model, and source of the generative AI technology. We encourage authors to upload all input prompts provided to a generative AI technology and outputs received from a generative AI technology in the supplementary files for the manuscript.

The entire document should be single-spaced and must contain page and line numbers in order to facilitate the review process. The manuscript should be written using either Word or LaTeX. See above for templates.

Abbreviations and nomenclature

The use of abbreviations should be kept to a minimum. Non-standard abbreviations should be avoided unless they appear at least four times, and must be defined upon first use in the main text. Consider also giving a list of non-standard abbreviations at the end, immediately before the acknowledgments.

Equations should be inserted in editable format from the equation editor.

Italicize gene symbols and use the approved gene nomenclature where it is available. For human genes, please refer to the HUGO Gene Nomenclature Committee (HGNC). New symbols for human genes should be submitted to the HGNC here. Common alternative gene aliases may also be reported, but should not be used alone in place of the HGNC symbol. Nomenclature committees for other species are listed here. Protein products are not italicized.

We encourage the use of Standard International Units in all manuscripts.

Chemical compounds and biomolecules should be referred to using systematic nomenclature, preferably using the recommendations by the International Union of Pure and Applied Chemistry (IUPAC).

Astronomical objects should be referred to using the nomenclature given by the International Astronomical Union (IAU) provided here.

Life Science Identifiers (LSIDs) for ZOOBANK registered names or nomenclatural acts should be listed in the manuscript before the keywords. An LSID is represented as a uniform resource name (URN) with the following format:

`urn:lsid:<Authority>:<Namespace>:<ObjectID>[:<Version>]`

For more information on LSIDs please see the 'Code' section of our policies and publication ethics.

References

Preparing and formatting references

Submissions to Frontiers must be grounded in relevant and up to date peer-reviewed, academic research, and this should be reflected in the accompanying reference lists.

Authors are welcome to use online referencing tools in preparation of their manuscript. Some useful resources include RefMe, Zotero, and Mendeley.

The citation of non-academic and non-peer-reviewed sources (e.g. blog posts, website content), as well as anonymous sources or commercial websites should be avoided or kept to a minimum

Authors should avoid citing content that is not directly relevant to the scope of the article and the journal

Reference lists should reflect the current status of knowledge in the field, avoid bias, and not include a high proportion of citations to the same authors or sources, school of thought, etc.

The length of the reference list should be appropriate depending on the article type, covering the relevant literature through sufficient referencing

Authors should ensure that references are accurate, that all links are accessible, and that the citations/references adhere to the reference styles outlined below

Frontiers' journals use one of two reference styles, either Harvard (author-date) or Vancouver (numbered). Please check our help center to find the correct style for the journal to which you are submitting.

All citations in the text, figures or tables must be in the reference list and vice-versa

The names of the first six authors followed by et al. and the DOI (when available) should be provided

Given names of authors should be abbreviated to initials (e.g., Smith, J., Lewis, C.S., etc.)

The reference list should only include articles that are published or accepted

Unpublished data, submitted manuscripts, or personal communications should be cited within the text only, for article types that allow such inclusions

For accepted but unpublished works use 'in press' instead of page numbers

Data sets that have been deposited to an online repository should be included in the reference list. Include the version and unique identifier when available

Personal communications should be documented by a letter of permission

Website URLs should be included as footnotes

Any inclusion of verbatim text must be contained in quotation marks and clearly reference the original source

Preprints can be cited as long as a DOI or archive URL is available, and the citation clearly mentions that the contribution is a preprint. If a peer-reviewed journal publication for the same preprint exists, the official journal publication is the preferred source. See the preprints section for each reference style below for more information.

Harvard reference style (author-date)

Many Frontiers journals use the Harvard referencing system; to find the correct reference style and resources for the journal you are submitting to, please visit our help center.

Reference examples are found below, for more examples of citing other documents and general questions regarding the Harvard reference style, please refer to the Chicago Manual of Style.

References should include the full last name and first name initials of the first six authors, followed by et al. and the year of publication in brackets.

Alphabetical order is followed for the reference list.

Reference examples

Article in a print journal Sondheimer, N., and Lindquist, S. (2000). Rnq1: an epigenetic modifier of protein function in yeast. *Mol. Cell.* 5, 163-172.

Article in an online journal Tahimic, C.G.T., Wang, Y., Bikle, D.D. (2013). Anabolic effects of IGF-1 signaling on the skeleton. *Front. Endocrinol.* 4:6. doi: 10.3389/fendo.2013.00006

Article or chapter in a book Sorenson, P. W., and Caprio, J. C. (1998). "Chemoreception," in *The Physiology of Fishes*, ed. D. H. Evans (Boca Raton, FL: CRC Press), 375-405.

Book Cowan, W. M., Jessell, T. M., and Zipursky, S. L. (1997). *Molecular and Cellular Approaches to Neural Development*. New York: Oxford University Press.

Abstract Hendricks, J., Applebaum, R., and Kunkel, S. (2010). A world apart? Bridging the gap between theory and applied social gerontology. *Gerontologist* 50, 284-293. Abstract retrieved from Abstracts in Social Gerontology database. (Accession No. 50360869)

Website World Health Organization. (2018). E. coli. <https://www.who.int/news-room/fact-sheets/detail/e-coli> [Accessed March 15, 2018].

Patent Marshall, S. P. (2000). Method and apparatus for eye tracking and monitoring pupil dilation to evaluate cognitive activity. U.S. Patent No 6,090,051. Washington, DC: U.S. Patent and Trademark Office.

Data Perdiguero P, Venturas M, Cervera MT, Gil L, Collada C. Data from: Massive sequencing of Ulms minor's transcriptome provides new molecular tools for a genus under the constant threat of Dutch elm disease. Dryad Digital Repository. (2015) <http://dx.doi.org/10.5061/dryad.ps837>

Theses and dissertations Smith, J. (2008) Post-structuralist discourse relative to phenomenological pursuits in the deconstructivist arena. [dissertation/master's thesis]. [Chicago (IL)]: University of Chicago

Preprint Smith, J. (2008). Title of the document. Preprint repository name [Preprint]. Available at: <https://persistent-url> (Accessed March 15, 2018).

Vancouver reference style (numbered)

Many Frontiers journals use the numbered referencing system; to find the correct reference style and resources for the journal you are submitting to, please visit our help center.

Reference examples are found below, for more examples of citing other documents and general questions regarding the Vancouver reference style, please refer to Citing Medicine.

In-text citations

In-text citations in the Vancouver reference style should be numbered consecutively in order of appearance in the text and identified by Arabic numerals in parenthesis

Use square brackets for physics and mathematics articles

The abbreviation 'Ref' should not be used, e.g.: [e.g., (1)] should NOT read [e.g. Ref. (1)]

Style for comparing a citation should follow the number format, e.g. [cf. (1)]. The same applies when using 'see', e.g. [see (46)]

References should be numbered and listed chronologically, according to the order they appear in the text

Reference examples

Article in a print journal Sondheimer N, Lindquist S. Rnq1: an epigenetic modifier of protein function in yeast. *Mol Cell* (2000) 5:163-72.

Article in an online journal Tahimic CGT, Wang Y, Bikle DD. Anabolic effects of IGF-1 signaling on the skeleton. *Front Endocrinol* (2013) 4:6. doi: 10.3389/fendo.2013.00006

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