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Co-Constructing "Third Spaces" for Engagement with and for Minoritized Community Groups and Environmental Scientists

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The demographics of environmental and Earth scientists are not representative of the UK's multicultural society. We sought to widen diversity and engage equitably through two related engaged research projects, "Walking the Walk" and "Landscape Stories." This paper offers a critically reflexive account, based on the methodology of duoethnography, of how we co-constructed a "third space" with and for minoritized community groups and environmental scientists. We sought to create the conditions for inclusive leadership informed by connectedness, respect, humility and intentionality. We argue that for environmental and Earth science research to be more equitable and inclusive, members of project teams should be engaged and more representative of wider society. Following this, collective work to create third spaces requires: respect for diversity and different forms of expertise, knowledge starting points, power dynamics and esteem; a willingness to make connections across disciplines and sub-cultures, actively listening and (un)learning from different (knowledge) cultures; and a commitment to be respectful of hidden and manifest difference, exploring purpose and gaps in knowledge in more holistic ways.

Keywords: environmental sciences, Earth sciences, engaged research, duoethnography, critical reflexivity, third space, inclusive leadership, geoscience communication and ethics

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THE CONTEXT FOR OUR REFLECTIVE STUDY

The UK's Natural Environment Research Council (NERC) acknowledges that "environmental sciences are not as diverse as we would wish them to be" (NERC, 2021: 3). Increasing inclusion for minoritized[1] people, in relation to race and ethnicity, highlights long-standing structural, educational, and cultural inequalities, and the need for ongoing systematic change to address them.

In a similar vein to arguments made about exclusionary practices in the informal learning sector (Dawson, 2018), the combination of unreformed university curricula (Anadu et al., 2020;

[1]By "minoritized" we mean groups of people that have been, and continue to be, excluded and oppressed by dominant sections of society (Milner and Jumbe, 2020).

Giles et al., 2020) and a lack of diversity among high-profile environmental scientists and related organisations, reconstructs inequalities for minoritized groups by creating 'invisible' barriers to inclusion:

> "The stereotype of a geoscientist as a White[2] man, compounded by the perception that geoscience is an outdoors-only activity [. . .] is particularly discouraging to those from minority ethnic backgrounds" (Dowey et al., 2021: 256).

For many people currently working in Earth and environmental sciences, their first spark of interest came from experiences in nature (Dowey et al., 2021). Whether walking, hiking, climbing or visiting the coast, immersion in the natural world can plant the seeds of curiosity that lead to a lifelong desire to know more about our Earth and the environment (Giles et al., 2020). It is therefore striking that Natural England (2023) recently reported that ". . .woods/forest were more commonly reported as being in easy walking distance by children and young people from White (39%) or mixed/multiple (33%) ethnicities than those from Asian/Asian British (18%) or Black/Black British (15%) ethnicities."

Inequitable access to nature is an ongoing problem: Office of National Statistics (2017) data showed that people from minority ethnic groups are less likely to visit and engage with the natural environment. Financial, cultural and opportunity barriers to accessing the outdoors are also recognised by both environmental organisations and grassroots community groups (e.g., Anadu et al., 2020; National Trust, 2022). And when students, particularly those from racial and ethnic minorities, consider further study in the environmental sciences, financial, practical, and cultural barriers persist (e.g., Fox et al., 2022 Submitted to ESCubed; Dowey et al., 2022 Submitted to ESCubed).

We argue that the lack of embedded diversity practices in environmental and Earth sciences presents a major problem for natural history and conservation, and for wider society, as: 1) environmental impacts such as those driven by climate change affect everyone, but disproportionately affect members of minoritized groups (e.g., Schlosberg and Collins, 2014); 2) homogeneity increases the potential for privileged, hegemonic groupthink, limiting broader, creative thinking with diverse voices (e.g., Stevenson, 2016); and 3) exclusion limits opportunities for minoritized groups to experience the health and wellbeing benefits of spending time in nature (e.g., Saraev et al., 2021). A lack of embedded diversity practices also limits the potential for diverse groups to work together in creative ways. Exploring how minoritized community groups and environmental scientists can engage equitably, paying attention to the power dynamics at play across research interactions, is the focus of this paper.

The Significance of Culture, Hybridity, and the "Third Space"

This paper is grounded in ideas about culture and change. We started our engagement from the premise that the UK is an intercultural society - one society and diverse cultures. Individuals' understanding of different cultures within a given society is influenced by multiple factors, including family histories, immigration, identities, beliefs, expectations, interests, language and dialect, norms and conventions, protected characteristics, and intersectionality.

An individual can understand and be part of more than one culture, e.g., a White privileged academic geologist can leave work to go to a predominantly White, middle-class swimming club and move effortlessly from one sub-culture to another. Moving between cultures that are already understood and embodied is usually straightforward to the point that we do not always realise that we are making these transitions.

> "As we move from the one subculture to the other, we intuitively and subconsciously alter certain beliefs, expectations, and conventions; in other words, we effortlessly negotiate the cultural border [. . .]" (Aikenhead and Mitchell, 1996: 6).

There can be challenges and discomfort in moving between cultures that are less familiar to us. A student of geology spends years training to become an academic geologist so that they can work in that culture. They are encultured into the practices of geology (e.g., Bowen and Roth, 2002). In a similar way, they will be socialised into how to behave as a member of the swimming club.

Cultures can also be exclusive, because of specialised languages, conventions, practices, etc. Not everyone who starts to train as a geologist chooses to become a geologist. And, as we have shown in the section above, not all students feel welcome to start this journey in the first place.

We have argued above that environmental sciences are routinely exclusive spaces and exclusionary to parts of society (e.g., Black and Brown students) whilst being welcoming to others (e.g., White middle-class students). We sought to address some of the power dynamics embedded in these historical narratives by bringing sub-cultures together through two related projects, see below. We have used Bhabha's (1994; 1990) concept of the "Third Space" to reflect on the conditions that we feel enabled us to explore a space of cultural hybridity, not Black, Brown or White, but a more intercultural dialogic space where we reimagined "[. . .] the continuity and security of the existing social, cultural, and racial order" (Marotta, 2020: 1).

The activities that we undertook through these two projects are not the focus of this paper. Instead, we offer a critically reflexive account of how the members of these teams engaged

[2]We have used capitals for White, Black and Brown to acknowledge the equivalence of these terms as identifiers of culture, race and ethnicity (Mack and Palfrey, 2020). We have reformatted quotations to use capitals consistently throughout this article.

with each other over the period of the two projects, while also focusing on our ongoing engagement with Dadima's Community Interest Company (CIC).[3]

Inequitable Access to Nature

This paper offers a critically reflexive account of how teams for two related projects, Walking the Walk and Landscape Stories, co-created a "third space" Bhabha's (1994; 1990) for upstream and downstream engagement.

"Walking the Walk" was funded by NERC[4] and ran from December 2021 to June 2022 as part of a programme to make environmental science more diverse, equitable and inclusive.

Through this project we:

- Co-developed resources with minoritized community group leaders to support walking in nature in ways that felt meaningful to them, sharing different forms of knowledge and questions about the environment.
- Produced a map of relevant "publics" (Reed et al., 2009; Reed et al., 2024) to represent the range of minority ethnic community groups currently walking in nature.
- Explored walk leaders' and walkers' perspectives of walking in nature through an interview study (Holliman et al., 2023).

Over the 6 months of this project we collaborated on eight walks with three community walking groups led by minoritized (minority ethnic) people, engaging 10 walk leaders and around 50 walkers.

"Landscape Stories" was a public engagement project funded by NERC[5] (July 2022–February 2023), with the aim of training Earth and environmental science researchers to co-design and trial storied walks that highlight aspects of geology, landscapes and ecological evolution.

The project involved Dadima's CIC, an intergenerational walking community based in the Chiltern's Area of Outstanding Natural Beauty, a freelance expert in science communication, and academics (geologists, ecologists and social scientists) from The Open University.

Through this project we:

- Built capacity of walk leaders and researchers to engage innovatively with each other.
- Co-created stories about the natural landscape to enable walk leaders and researchers to share stories about the natural environment.

Over the six funded months of the project, we collaboratively organised, promoted and ran three walks, each involving three linked stories. Three scientists: an ecologist and two Earth scientists, co-created stories for each of the three walks.[6]

Co-Constructing "Third Spaces" for Equitable Engagement

We have used "duoethnography" (e.g., Norris and Sawyer, 2012), which we describe in the Methodology, to explore how we co-constructed team members' contributions to these projects, reflecting on our approach to collaborative working and inclusive leadership, and our efforts to revise-in-process our equitable partnership.

In documenting these reflections, we seek to: 1) share our (un)learning with other project teams to inform their practices; 2) encourage them to reflect and share their learning; and 3) contribute to theoretical understandings of how to:

> "[. . .] empower minorities as respected epistemic agents to critique and contribute to the assumptions that drive research, including researched dialogues and spaces in communities. Existing calls to include minority individuals and groups in research projects are a superficial solution to the pressing need to re-theorise and understand diverse experiences [. . .]" (Esmene et al., 2024).[7]

Our theoretical contribution in this paper combines ideas about: 1) upstream engagement by which we mean prior to proposal submission, and downstream engagement during project funding period engagement, as elements of research design where different forms of expertise and (lived) experience as seen as resources, and the assumptions that drive research can be explored to develop shared agendas (Holliman, et al., 2022); and 2) the concepts that support the co-construction of a "third space" (Bhabha, 1990; Bhabha, 1994) for engagement throughout the research process through negotiation of sub-cultural "borders" between under-recognised (Nwangwu, 2023) and privileged groups.

METHODOLOGY AND METHODS

The seven dimensions of "engaged research design" (**Figure 1**; Holliman et al., 2022), combined with a

[3]Our engagement with other minoritized community walking groups through Walking the Walk did not engender the same level of ongoing partnership working. We explore the reasons for this through the concept of "connectedness"; see below.

[4]NERC, "Diversity, equity and inclusion research in environmental science," https://www.ukri.org/news/diversity-equity-and-inclusion-research-in-environmental-science.

[5]NERC, "Engaging the public with environmental science: 2022," https://www.ukri.org/opportunity/engaging-the-public-with-environmental-science-2022.

[6]For descriptions of the three walks, see: https://www.open.ac.uk/blogs/per/?tag=landscape-stories.

[7]Whilst Esmene et al. (2024) were reflecting on wellbeing, we contend that their core argument is applicable to all forms of research that involve engagement between minoritized and privileged groups.

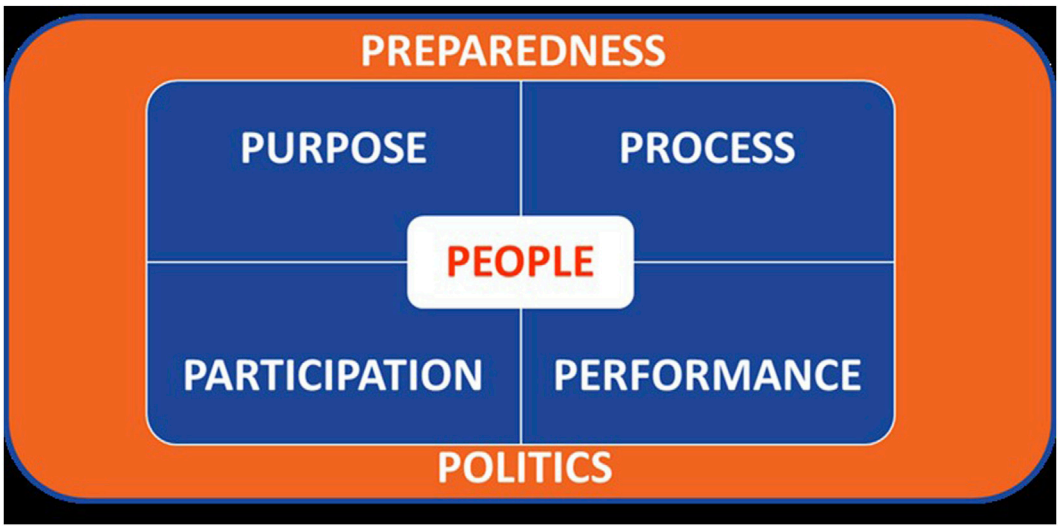

FIGURE 1 | The seven "dimensions" of engaged research design represented as a rectangular schematic. The schematic can be read from the outside towards the centre or from the centre towards the outside. People, those who can and should participate, are at the centre of the schematic. The People dimension is surrounded by four further dimensions, which, from top left and clockwise, are: Purpose, the aims and objectives of the research, and how they are negotiated and agreed by participants; Process, the methods by which the engaged research is undertaken, and in ways that are appropriate for different constituencies; Performance, measures for exploring how wider constituencies have contributed to the research; and Participation, the changes, effects and benefits of the engaged research. Two further dimensions surround the other five, completing the seven dimensions: Preparedness, familiarisation with ontologies, epistemologies, theories, networking and partnership building, and horizon scanning for funding opportunities; and Politics, the wider "political" context for engaged research, including local, regional, (inter)national, cultural and historical factors [adapted from Holliman et al. (2022)].

principled commitment to "fairness in knowing" (Medvecky, 2018) as a counter to forms of "epistemic injustice" (Fricker, 2007) experienced by minoritized groups, informed the conception and proposals for "Walking the Walk" and "Landscape Stories."

Equitable approaches to engaged research design require the active involvement of interested and affected parties 'upstream' during the design phase (e.g., Wilsdon and Willis, 2004; Facer and Enright, 2016),[8] then continuing downstream throughout the research process (Holliman et al., 2022).

One dimension of the engaged research design framework, performance, was embedded in both projects (in effect from December 2021 onwards) and therefore has particular significance for this paper. To undertake this critical reflection of performance we employed the principles and practices of duoethnography (Hestad Jenssen and Martin, 2021; Al-Serhan and Ogbemudia, 2022; Burleigh and Burm, 2022; Valdez et al., 2022; Delacruz Combs and Cepeda, 2023).

Employing the Principles and Practices of "Duoethnography"

Duoethnography is described by Hestad Jenssen and Martin (2021: 61-2) as "a collaborative methodology where two or more researchers engage, share, and draw from their life experiences to provide understandings of a social phenomenon (Norris and Sawyer, 2012)." It is a methodology that "invites researchers to act as sites of inquiry" (Burleigh and Burm, 2022: 1), whilst emphasising "the relational character of research across people and practices" (Valdez et al., 2022: 92).

Drawing on the principles of duoethnography, we sought to "meaningfully self-study in the presence of *others*" (after Burleigh and Burm, 2022) by reflecting on the "performance" of our approach to these projects. Our emphasis on *others*, as opposed to other highlights that, whilst the literature on duoethnography emphasises the "polyvocal dialogic nature" of this methodology (Norris and Sawyer, 2012: 13), the vast majority of published examples that we have identified focus on two researchers in dialogue. Our approach is different, involving eight co-researchers, and similar in practice to the approach outlined in Valdez et al. (2022).

We were particularly interested in whether and how duoethnography could surface learning to inform our - and other's - future practices in equitable approaches to engagement. We recognised deep value in using this reflexive methodological approach because it offered us a way of reflecting: 1) on the work we undertook on the two projects as eight contributors with different forms of expertise, experience and disadvantage/privilege; and 2) on how we addressed questions of positionality, power dynamics, etc., to co-construct the project teams. Significantly, we also saw similarities in the nine tenets of duoethnography (Norris and

[8]We discuss this issue in more detail under "Connectedness."

Sawyer, 2012)[9] and how we began our work on the "Walking the Walk" project which began with an exploration of disadvantage, privilege, purpose and power dynamics within the project team (see the section on Intentionality for more detail).

Duoethnography is a flexible and adaptable methodology. It offers contributors a degree of methodological pragmatism in its application (Morgan, 2014). Like Burleigh and Burm (2022: 3) we, "engaged in generative and critical dialogue across several modes of communication" to make meaning through our duoethnography. Data were initiated and collected through digital technologies and over an extended period (more than 6 months). The lead author and Dadima's walk leader initiated most of the reflective and theoretical activities, sharing questions, provocations, and papers with the other members of the team. These initial provocations led to discussion with members of the team introducing further discussion points. Most of the responses were sent individually to the lead author who collated them and selected pertinent extracts, with permission, for inclusion in the draft manuscript. Authoring the manuscript also had the effect of stimulating deeper reflections, most of which were added directly into the draft paper. Quoted material exemplifies issues that we consider have particular significance. Where more than one contributor made a comment on a similar issue, we have represented these perspectives. Where authors agreed on a comment, we have included one illustration. Where a contributor made a comment that could be deemed to be sensitive to them, this was either discussed as a team or on a one-to-one basis. Some of the comments from authors have not been included in the paper to protect the author. Each author is represented.

The issues we reflected on through this process were wide ranging; our shared responses are reflected in this paper. Questions and issues included: how did we first come to know each other; who were our key connectors and how did they connect us; what issues were important to us when we first started to engage, and how did these change over time; what were our purposes for engaging; were we co-producing or co-creating; were we cooperating or collaborating; how did we co-create a meaningful and supportive space for engagement?

Coming together after the funded projects were completed was significant for us, particularly in the process of co-creating blog posts, presentations and in producing this paper, making meaning from varied sources: project meetings and notes generated through them; training in storytelling; co-developing equitable approaches for engaged research; preparations for walks, promotional materials and the stories ecology and Earth science researchers shared with walkers; collaboratively authored blog posts; online meetings; emails; contributions to social media; text messages; voice notes[10]; and this collaboratively authored paper, which was co-constructed as a shared online document.[11]

Replicability is not the purpose of duoethnography (Norris and Sawyer, 2012), in the main because this methodology is profoundly contextual in its application.

> "Duoethnographers are encouraged not to place themselves as either heroes or victims but, rather, to situate themselves as pilgrims [. . .] they are read as individuals trying to make sense out of past events and the stories of others. [. . .] Truth and validity are irrelevant. What exists is the rigo[u]r of the collaborative inquiry that is made explicit in the duoethnography itself." (Norris and Sawyer, 2012: 16, 20)

We have outlined some of the conditions for our duoethnography in the preceding sections: further details are listed in what follows. Here we highlight key moments in our reflective journey and how they influenced the detail in the following sections.

In effect, our duoethnographic journey started prior to December 2021, although we did not start with this methodology in mind. The conception phase (**Figure 2**, Point 1) for Walking the Walk is where our reflective journey began. Those initial connections were profound but could have been where our story ended. Our construction of a "third space" began because we each showed the potential to learn through active listening and, we believe, because we took account of the related imperatives of intentionality, respect, and humility.

Each interaction, since we first made connections with each other, has influenced our work, none more so than the introduction of duoethnography as a methodology for critical reflection, embodied in the co-authoring process of this paper.[12] As such, these four concepts, Connectedness, Intentionality, Respect and Humility, have been used in the sections that follow to coordinate our reflections. These concepts were derived through reflexive interrogation of our discussions, manifested through the various "texts" listed above, but with an eye on how these concepts could find resonance with others engaging in analogous conditions.

[9]Norris and Sawyer's (2012: 12-23) nine tenets are: 1. Life as a curriculum, a mutual and reciprocal journey; 2. Polyvocal and dialogic, the voice of each duoethnographer is made explicit; 3. Disrupting metanarratives, no single position can claim universal truth; 4. Difference is encouraged and expected; 5. Dialogic change and regenerative transformation will be different and differ in extent for contributors; 6. Trustworthiness is found in self-reflexivity, not validity and truth claims; 7. Audience accessibility, stories without conclusions, not lectures or dissertations; 8. An ethical stance is a negotiated space; 9. Deep layers of trust grow over time and allow disclosure and rigorous conversation.

[10]Voice notes and text exchanges between the Dadima's walk leader and corresponding author offered a significant dialogic space for capturing nuances of our participatory research, informing core arguments in this paper.

[11]For the purposes of this paper, we define all forms of symbolic expression as "texts" (Phillips et al., 2004).

[12]We recognise the contributions of the editor and anonymous reviewers in the process of co-creating this paper.

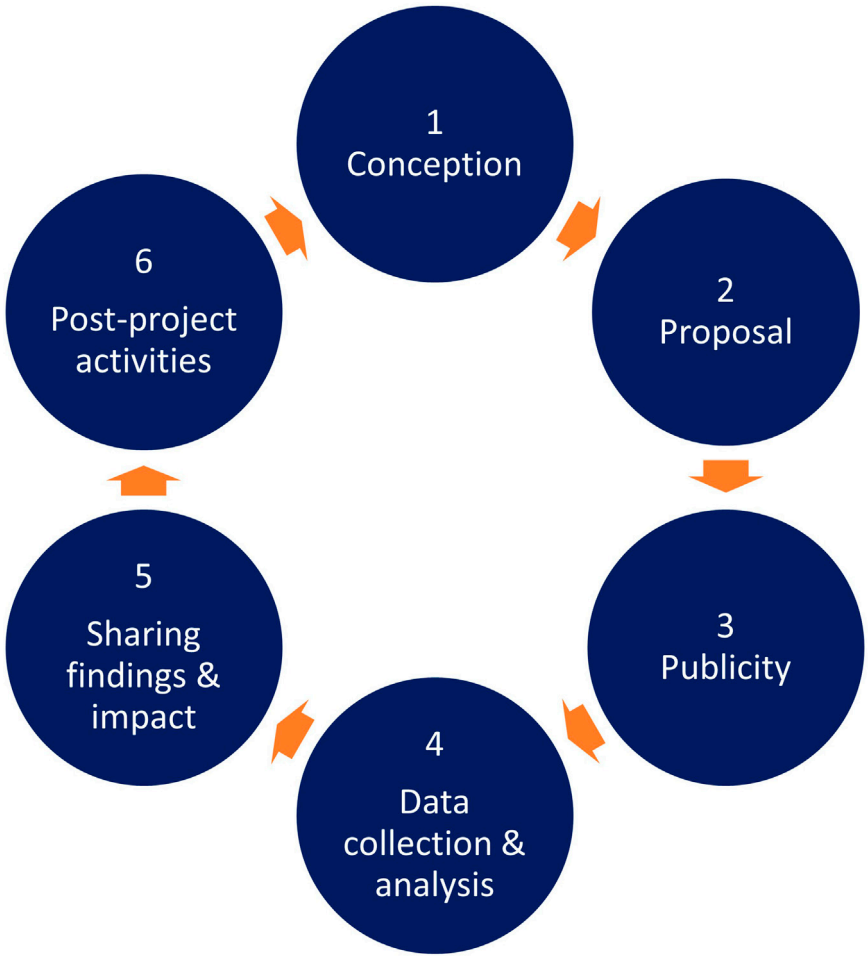

FIGURE 2 | A schematic, showing key elements in an idealised research cycle represented as six numbered circles. The circles are linked in the order that they would typically be undertaken by researchers and research teams: 1) Conception, the identification of a new research project, information about it, funding sources, and the construction of a proto-project team; 2) Proposal, the codification of the aims, questions, methods, etc., typically submitted to a funder for peer review; 3) Publicity, communication of key elements of the proposal, adapted for particular constituencies; 4) Data collection and analysis, involving information gathering activities and analytical tools that are appropriate for the research to deliver valid findings; 5) Sharing findings and impact, involving forms of reporting, publication and socio-economic benefits, effects and/or changes that have been derived from the research; 6) Post-project activities, including wider sharing of learning, seeking new opportunities for further research, and other forms of partnership working. Point 6 may furthermore link back to Point 1, with the conceptualising of a new project or the development of a partnership [adapted from Holliman (2023)].

MAKING MEANING FROM OUR DUOETHNOGRAPHIC REFLECTIONS

Burleigh and Burm (2022: 3) argue that it is important to offer "a clearer definition of the roles and relationships of duoethnographers." We have chosen to represent our duoethnography through collaborative authorship to offer a degree of anonymity to any one of the eight authors on this paper (Valdez et al., 2022). Contributions by different authors are represented by letters, A, B, C, etc.

We, the "Walking the Walk" and "Landscape Story" teams, are eight people. We are five women and three men. Five of us are academics; one is a professional member of staff in a university; two are self-employed. We represent the academic disciplines of geology, ecology, education and sociology. Six of us hold PhDs in one of these disciplines, whilst a further member of the team holds postgraduate qualifications and expertise in communication, science engagement and environmental management. At the start of the project, five of us worked in the same academic department. As a result of working together on these projects, the other three contributors accepted visiting positions in this academic department. Five of us represent the "cultural hybridity" of diaspora (Bhabha, 1994) through UK citizenship allied with a rich understanding and/or lived experience of wider geographical locations and cultures. Two of us routinely commute to work together through a car sharing scheme. We all enjoy walking in nature.

We explored our contributions to the two projects through the "Contributor Roles Taxonomy" (CRediT, 2024), "a high-level taxonomy, including 14 roles, that can be used to represent the

roles typically played by contributors to research." Whilst not all the 14 roles apply to the two projects, and a list such as this cannot adequately capture the depth or influence of individual contributions, this reflective exercise did demonstrate changes in how we cooperated and collaborated. Dillenbourg et al. (1996: 190) cite the work of Roschelle and Teasley (1995) in making the following distinction,

> "'Collaboration' is distinguished from 'cooperation' in that cooperative work"... is accomplished by the division of labour among participants, as an activity where each person is responsible for a portion of the problem solving . . . , "whereas collaboration involves the"... mutual engagement of participants in a coordinated effort to solve the problem together.

Eight of us contributed to "Walking the Walk," of which six returned to work on "Landscape Stories" - a smaller pot of funding was available through the second call. From the outset of both projects, we were transparent about the funding allocated and paid collaborators for their contributions. The issue of fairer payment for public contributors involved in research has been discussed in relation to public patient involvement (NHIR et al., 2022). Addressing this issue is essential to increasing diversity in engagement and improving opportunities to promote "fairness in knowing." We acknowledge, therefore, recent initiatives by public funders, including NERC, to support co-creation of grant applications with funded contributions from public intermediaries, citizens, etcetera, e.g., see Engaged Environmental Science.[13]

Notably, contributions to the conceptualisation, funding acquisition and methodology of the second project, Landscape Stories, were more responsive to the needs of community partners (Raman et al., 2014; Seale et al., 2014), but remained largely cooperative in nature. We argue that this demonstrates a shift from project working to partnership working: the earlier project, Walking the Walk, developed deeper trust relationships with Dadima's CIC, informed by greater knowledge and respect of individuals' expertise and lived experiences. Together, this supported cooperative approaches to upstream engagement in research design for Landscape Stories.

Our roles and contributions to the two projects and this duoethnography have varied, but we argue that each of us has influenced our partnership as equitable engaged practice. Through this reflexive exploration we have surfaced four inter-related concepts that have influenced and been influenced by our engaged practices: connectedness, respect, humility and intentionality. We document our reflections on these concepts in the following sections.

[13]https://www.ukri.org/opportunity/engaged-environmental-science

Connectedness

The work from conception to funded proposal on these projects (**Figure 2**, Points 1 and 2), required different members of the team to act as "brokers" and "intermediaries" for making connections across the team and with external partners (Knight and Lyall, 2013). We argue, in line with others (e.g., Wilsdon and Willis, 2004), that research design needs to begin "upstream,"

> "...the nature of a research programme is not simply determined by those who fund it and by its historic conditions, but also by those who enter a programme at its earliest stages" (Facer and Enright, 2016: 50).

The negotiations that take place at Point 1 in **Figure 2**, the conception of a proposal, when the contributors are identified and ways of working are negotiated, are particularly significant to what we mean by "upstream" engagement (Holliman et al., 2022). These initial decisions are codified in the form of a proposal (Point 2, **Figure 2**). How these decisions are enacted can be characterised as "downstream" engagement (points 3 to 6 of **Figure 2**).

We connected through several iterative stages to co-construct the Walking the Walk project team. Initially, this process involved informal office and corridor discussions within the same academic department.

> A: "It was a serendipitous aligning of events and opportunities - Black Girls Hike was getting some exposure, so were Muslim Hikers, the Dowey et al. (2021) report and the NERC funding stream just made it natural to think, Why don't we, as geologists and environmental scientists, go walking with these groups?"
>
> B: "I think it was a casual discussion with A in the office amongst other things. I think, if I remember right, it was about the bid opportunities. [. . .] When A mentioned the Walking the Walk project and the inclusive aspects of it, it appealed me, and I was really keen to be involved. I think the follow on 'storytelling' was also something I was keen on."

The initial contributors, A, B and C, had a shared professional and departmental identity, whilst also representing different disciplines (geology, ecology and environmental sciences). The initial contributors then sought contributions from other university colleagues, bringing in theoretical and methodological expertise of equitable approaches, following discussions while car sharing (C and F), and through practical experience in co-producing resources to support engagement (H).

> F: "I get asked to join engagement projects all the time, but often after the big decisions about a proposal have been made. Walking the Walk was different for two reasons: a) I was asked early in

> the design process and given opportunities to genuinely contribute; and b) the commitment to equity on the part of A, B and C was clear from the start."
>
> H: "When I was invited to be part of the Walking the Walk project team, I was excited by the challenges as well as possibilities for cross disciplinary collaboration amongst the team and the community walking groups."

Shared values played an important part during the early stages of assembling members of the team; the university contributors were each committed to the principles and practices of equity, diversity and inclusion (EDI), and two of them represented the "cultural hybridity" of diaspora. Each member of the team was therefore sensitized to the NERC call, and the need for positive change in relation to how minority ethnic groups access and experience nature.

With a nexus of academic staff in place, committed to exploring how to improve access to nature for under-recognised groups, planning turned to how to create connections with prospective external partners, minoritized community walking groups.

There are a range of strategic approaches to identifying "interested and affected parties" for research (e.g., Reed et al., 2009; Mahony, 2015). We have used the term "interested and affected parties" to reflect current discussions about the language of engagement in a post-stakeholder world (Reed, et al., 2024).

The addition of a social scientist to the team (F) led to the application of Mahony's (2015) guidance on "creating publics" for engaged research.

> D: "I was so pleased to see F's presence on the team. I was initially sceptical of him as a White male professor, but I welcomed the way in which he took on the role of learner and listener and posed gentle questions at the right stage without influencing."

By addressing questions of representation (e.g., who should have a voice in a given research topic?) and utility (e.g., who has (lived) experience and/or expertise related to the research topic), this offered us a justification for making connections with minority ethnic community walking groups, to amplify different perspectives, ways of knowing and nature connectedness.

One connection was of particular significance, involving an EDI and science communication expert (E) and an academic (C), both female and trained geologists. This connection was made through social media.

> C: "I knew of E from Twitter™, and I reached out to her. We had a conversation and then she put me in touch with D, Mosaic Outdoors, Black Girls Hike, and a team in Scotland. I had conversations with D, [name of contact], then G, and passed on to A. I then joined a Dadima's walk because D invited me and met D and E there. The personal connection was absolutely vital."
>
> E: "I was really pleased to be approached by C to advise on the project. I have seen and experienced tokenistic projects in the natural heritage sector, where minoritized communities are used to embellish the EDI credentials of organisations. Although well-meaning, these approaches create lasting damage through unequal power sharing and decision making. I was mindful of this as I began to connect the team to the walking groups. It mattered enormously that C showed interest and enthusiasm through listening and empathising with the minoritized experience in nature."

The connection between E and C was crucial to everything that followed in our partnership. E, a known, well-networked and trusted contributor among minoritized groups within the discourse of environmental equity, acted as a significant "cultural broker" (Baas et al., 2023) in making connections, drawing on agreed text from the draft proposal to "pitch" the possible of working together. (To a lesser degree, D, B and H also helped to make connections.)

> D: "I was already connected with E and had met her before in person via walks. E and I hit it off from Day 1 and really connected at several levels."
>
> A: "D was introduced to me via C, [name of contributor] via G and C, and [name of contributor] via H. As the project developed, we had a reasonably standard boilerplate describing it, which was largely taken from the text we used in the grant proposal."

The Walking the Walk project would not have been possible if we had not made connections with external partners through a combination of "structured" (Palinkas et al., 2015) and "snowball" sampling (Parker et al., 2019), supported by a "cultural broker" with recognised symbolic capital (Pellandini-Simányi, 2014).

E's role in making initial connections with minoritized community walking groups cannot be underestimated. Her work in making connections was essential.

> D: "It did matter that E made this connection/ forwarded my details, as some ethical vetting had already been done if that makes sense. I really trusted E and felt that she would only refer me if she saw merit/points of connection. Also, I made up my own mind when having an online meeting with C and A. It was an honest and open meeting where I shared any questions and concerns."

The White academics on the team were not connected to the thriving, if fragile, ecosystem of minoritized UK community walking groups.

> C: "I distinctly remember arriving for my first Dadima's walk having only met E and F online. I think I was the only White person at that walk, and I suddenly really got what it feels like to be the visible minority. I was really grateful for that experience so early in the project discussions."

Black and Brown colleagues supported White members of the team as well as making meaningful "insider" connections with community leaders on a timescale that would have been impossible for White contributors given the deadline for submission of a project proposal to NERC.[14] It is through this process of establishing connectivity that we introduced the possibility of what Bhabha (1994) and Bhabha (1990) conceptualised as a "third space." We have applied this concept to engagement,

> "an unfamiliar location of differences, where lived experiences are shared, social and community interests are emphasized, and cultural values are negotiated" (Pathak and Melville, 2023: 14).

The degree to which connections were maintained in person and through cooperative working were key distinguishing features between Walking the Walk and Landscape Stories. Walking the Walk involved connections between university staff and three minoritized community walking groups. Connections with two of the walking groups were largely transactional, e.g., university colleagues provided advice on walking routes and resources on aspects of geology and ecology. Further, one of these groups was set-up to walk with members of these groups and not external contributors, including university staff. (It is important to highlight that no criticism is implied or intended in how connections were established, maintained or lapsed with these different groups. Engagement with each of the groups was productive, but also different.)

In contrast, the third group invites people from diverse backgrounds to cooperate in developing routes and resources, and to walk together in nature.

> D: "It's not a 'them against us' approach, which is one of the reasons that at Dadima's - we haven't set it up it as an exclusive South Asian space, and this rationale has opened other doors and tapped into creative intercultural knowledge. [. . .] I recognize that some spaces need to feel 'safe' just for Black only, or South Asian only, women only groups, for a whole wealth of valuable reasons."
>
> E: "I have lived in the rural county of Dorset for over 20 years and have become accustomed to being perceived as an outsider. These thoughts melt away with the warmth of companionship as I mingle with the Dadima's walkers. By the very act of walking in nature, we are taking control of where we are not expected to be but equally belong. [. . .] What is especially appealing to me about Dadima's is that the group attracts people from a wide variety of backgrounds, and that some of the walkers are elders in our community."

The opportunity for university staff to work together and spend time in nature with this community walking group established deeper connections, respect and empathy that informed our collaboration through Landscape Stories, and the connections still thrive today. We continue to walk together in nature and support each other in new ways.

Intentionality

Intentionality emerged as another key dimension through our duoethnographic reflections. We explored issues of disadvantage, privilege, purpose and power dynamics (see also MacGregor et al., 2024) to establish whether our intentions were shared and meaningful. The possibility of co-creating a third space for engagement would not have been possible without consideration of intentionality.

The primary aim of Walking the Walk was to engage with minoritized community groups to support walking in nature in ways that felt meaningful to them. This required a level of confidence on the part of minoritized community walking group leaders that the intentionality of university contributors to engage on equitable terms was genuine and not extractive.

> D: "I didn't want 'parachute scientists' swooping in on short-term projects for personal gain."

In this light, we note that external partners conducted "due diligence" on the university contributors and sought assurances before committing to working together.

> D: "I did some basic online searches but warmed to them [A and C] and welcomed their willingness to listen to my concerns and they felt genuine. [. . .] We had honest and uncomfortable conversations at the start of our partnership. We discussed language, power operations, 'partnership' working and knowledge transfer hierarchy between us as White and Brown academics. [. . .] I raised how their White privileged positions could play out in this project - two senior White OU staff leading an EDI project? I didn't want another case-study that exploits our communities. I had to feel confident that this partnership was genuine. I remember saying/requesting, probably insisting, that I look at a draft proposal before submission and add my feedback. They were both very open to this and welcomed/embedded my feedback into the submitted bid."

[14]It is a moot point whether White academics could have made these connections if they had more time to do so.

This raises a pertinent question; how can privileged university contributors show that their intentions are virtuous and trustworthy when seeking to engage with new minoritized community partners? In the case of Walking the Walk, university staff demonstrated their commitment to equitable practices, in part, through previous actions, e.g., one as a departmental EDI Lead for Race Equity, one as an EDI Lead for a learned society, one as an academic lead for the co-development of equitable approaches to recruiting postgraduate research students, and another with experiences of conducting engaged research with a range of minoritized groups. Collectively and individually, these track records demonstrated an established commitment to, and practical experience of, "fairness in knowing." However, we also recognise that track records on their own are not enough when engaging with external partners for the first time (see our points about the significance of cultural brokers under Connectivity).

The intentionality of university staff was also demonstrated through a willingness to engage in early and often uncomfortable conversations about academic White privilege before external partners agreed to participate.

> A: "I was expecting there to be suspicion of our motives and of the nature of our institution. I was clear about my privilege and consciously reminded myself that even The Open University are not 'the good guys' as many within seem to think."
>
> F: "It was perfectly reasonable for external partners to question our intentions. I would encourage any external partner to do the same when they're contacted by a university researcher, to record the responses, and to reflect on them as the project progresses."

The intentionality of contributors continued to be explored through our engagement during these projects. For example, we explored questions of opportunity and disadvantage through the "wheel of academic privilege" (**Figure 3**), "as a framework for reflecting on our intersecting identities across multiple domains" (Elsherif, et al., 2022: 8).

Through this exercise, White members of the team and university staff acknowledged and engaged with how their privileged positions may affect the dynamics of the partnership. Together, members of the team agreed that change was possible, but only if we work together with humility and respect to challenge deeply embedded structural inequalities. As a team, we were (and remain) committed to anti-racist approaches (Chaudhary. and Berhe, 2020), demonstrated through our actions, to promote greater access to nature. There was always a recognition that we may get things wrong, and we were all open to being challenged and questioned in respectful ways.

Respect

Each of us sought to translate our intentions into "living our values" through inclusive leadership and procedural justice as the projects progressed (Cenkci et al., 2021), which we explore here through the dimension of respect.

> D: "My initial connections with C and B felt kind and genuine. They built further over time as I got to know them better. The trust was built through seeing the actions they took, including going beyond the remit of the NERC projects. They are now both Dadima's Ambassadors. I'll never forget when C saw first-hand how a rural café didn't want to host the Dadima's group, approx. 15 South Asian walkers, for lunch. We looked very different to their usual customers and C was shocked; the café was pretty empty. I had experienced this before, hence always vetted countryside places ahead of a group walk. She hadn't this time. This, amongst other things, led to conversations around rural racism and microaggressions. As a result, I asked C to contribute to a panel discussion about her journey as a White ally, of learning and unlearning what White privilege means as a female professor when working in partnership with groups like Dadima's. I never thought that I'd have such great friends as a result of this research."
>
> F: "The lack of egos on the team was refreshing, in combination with respect for the different types of expertise that each of us brought to the projects. No one contributor had all the relevant expertise to make the project a success. In cooperation, everyone made an important contribution."
>
> H: "The bits I enjoyed most were informal sharing, critical thinking and reviewing progress. As a Black professional woman in academia, involved in both engagement and research, it was refreshing to be involved in research where my personal perspective and cultural background were taken into account, having an impact and resonating throughout the different stages."

Contributors to the projects each brought different forms of expertise and (lived) experience that had relevance to addressing the complexities and nuances of what it means to increase access to nature for minoritized groups. Finding connections between these forms of expertise and experience was important at the start of Walking the Walk, and we created space within the project timelines to acknowledge and discuss these.

> A: "I think that [geology] also helped link E and me, as we both shared the common ground of geology. I think we all have a fairly common view of the world generally actually, and are all in the same sort of life stage? Each of those helped to cross the boundaries that might otherwise have been there. It was also a semi-active process building a team that wasn't all beardy-White men, i.e., while nobody was asked to be involved on the basis of race or gender, we kept a

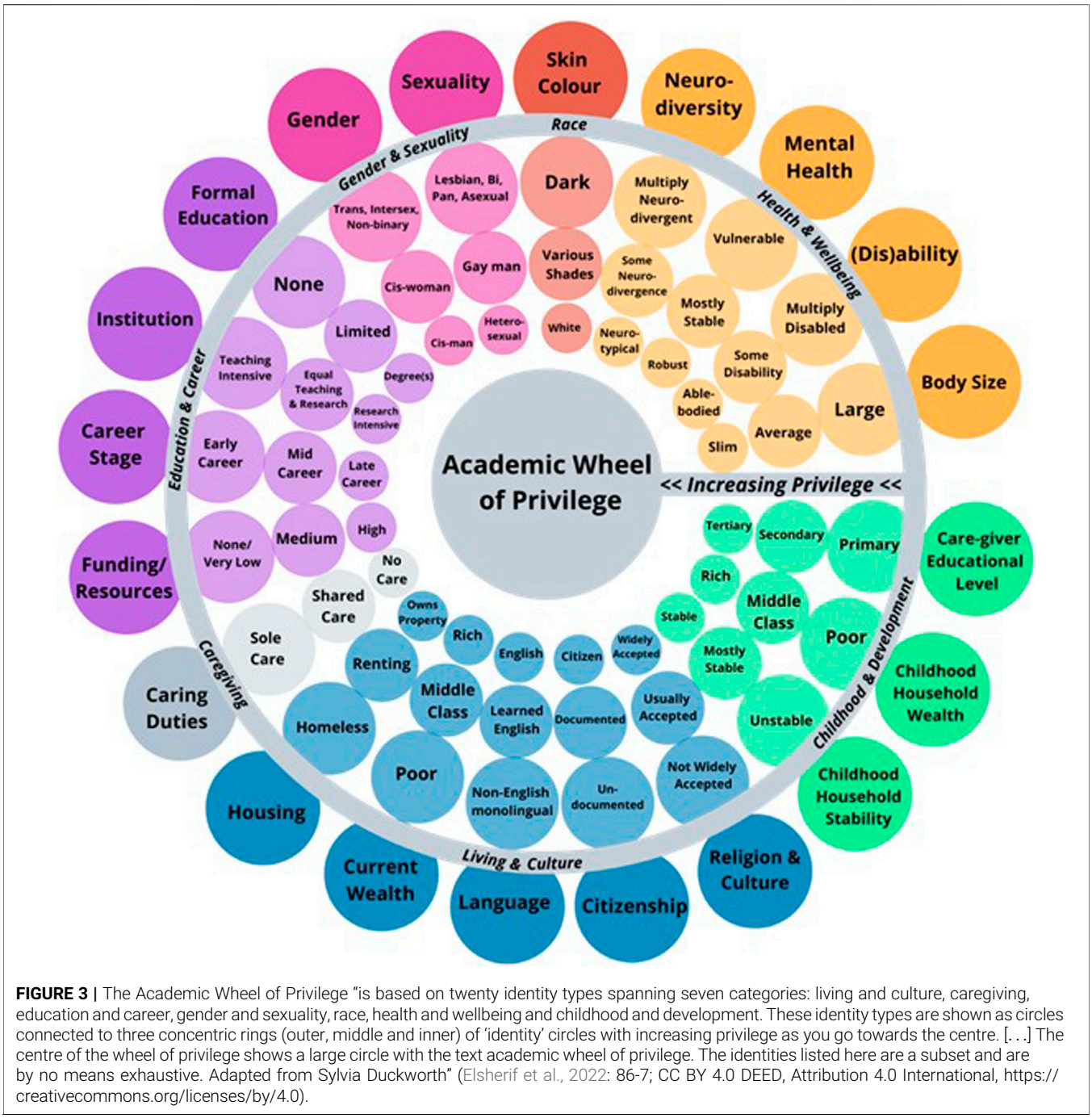

FIGURE 3 | The Academic Wheel of Privilege "is based on twenty identity types spanning seven categories: living and culture, caregiving, education and career, gender and sexuality, race, health and wellbeing and childhood and development. These identity types are shown as circles connected to three concentric rings (outer, middle and inner) of 'identity' circles with increasing privilege as you go towards the centre. [. . .] The centre of the wheel of privilege shows a large circle with the text academic wheel of privilege. The identities listed here are a subset and are by no means exhaustive. Adapted from Sylvia Duckworth" (Elsherif et al., 2022: 86-7; CC BY 4.0 DEED, Attribution 4.0 International, https://creativecommons.org/licenses/by/4.0).

vague eye on it and were pleased what had naturally come together."

F: "Connecting with D was a pleasure as we have complementary interests in how epistemic justice can drive positive change for minoritized groups. She suggested duoethnography as a methodology of reflection, and it's been a powerful tool."

E: "Spending time in conversation with D about race equity in nature and intersectional feminism has given me a sense of consciousness that I have not had before. In addition, drawing on A's vast knowledge and experience on Earth Science has given me a renewed passion for areas of geoscience I had previously overlooked. These interactions have impacted me immeasurably, enriching my professional work."

In practice, we challenged pre-existing hierarchies of symbolic power and prestige (Pellandini-Simányi, 2014) to

reconstruct (over time) the parameters of our third space. Contributors were considered "equal partners" in how we operationalised our research design, recognising that equitable partnership working needs critical engagement throughout the process. For example, the methodological design of the Walking the Walk project involved planning interviews with walk leaders and walkers, to rehearse potential concerns beforehand. Contributors representing minority ethnic groups on these projects requested that interview protocols were designed to explore positive aspects of walking in nature, so that traumatic experiences such as racism and discrimination should not be the focus.

> D: "Our connections and knowledge of/with nature are a lot deeper and richer than our racialised and historical traumas. My hope was that White members of the team would see and learn this as they developed relationships with Dadima's walkers and learnt through our stories in new ways."
>
> F: "When I reflect on these projects I obviously think of the people, special people. But then I think of the food and drink we've shared, particularly on that really cold walk in January. 15 hardy souls, Brown, Black and White, walking in the Chilterns, amazing frost patterns everywhere and that wonderful chai. D's aromatic, warming chai. That memory conflicts in every way with the abuse that I've seen Brown and Black members of the team experience on social media."

In focusing on the positive (whilst always being mindful of the lived realities faced by racially minoritized groups), we adopted a principle that informed all aspects of our engagement on these projects: "Do no (more) harm." Through this guiding principle we acknowledged the historical harm that has been done (and continues to be done) to minoritized communities (Mackenzie et al., 2007).

Respect (and creating "safe spaces") for different ways of knowing and learning was another significant aspect of how we included diverse contributions to the projects, and this added to the creative knowledge creation.

> F: "I was conscious that the members of the team with PhDs in environmental sciences might not be comfortable with accepting different ways of knowing. Don't be afraid to 'loosen the straps' was my way of saying, 'give this a chance'. In practice, it wasn't an issue. In my experience they were always willing to listen and learn, as was I. E's and B's ability to weave together cultural and scientific ways of knowing of geology and ecology blew me away. I have learnt such a lot from listening to them and reading their work."
>
> D: "Humility is really important, because it's about not always centring that dominant academic or scientific narrative throughout."
>
> E: "Existing in both worlds, as a minoritized Earth Scientist, I was conscious of a conflict within myself. That of disseminating scientific knowledge whilst recognising my spiritual and cultural relationship with the natural world. Through the project, I learnt that both can co-exist and complement each other, and I actively supported this approach as the work progressed."

The importance of integrating different ways of knowing, understanding and listening into projects that seek to make meaningful connections across multi-disciplinary teams and with minoritized groups cannot be overstated.

> "We need to come to terms with pluralistic ways of knowing. [. . .] The very nature of co-construction is a recognition that cultural knowledge is different" (Tandon, 2023).

A pluralistic approach to ways of knowing offered each of us new tools to interpret and seek solutions to a complex challenge (Lawrence, 2020). This approach also offered opportunities for the interdisciplinary team to co-produce richer, more authentic stories, and to hear the stories of other walkers (Khatwa, 2019). As an example, on the "festive celebration" walk, D made connections between a book quote from A's talk and the Panjabi cultural festival of Lohri where fire, the changing of seasons and harvesting are celebrated. Walkers welcomed this inclusive approach to storytelling, and could add their stories as a response. In this way, a pluralistic approach felt organic, authentic and richer.

We held joint planning meetings with the walk leader to discuss the nature and content of stories to be shared, and how they would better connect with the audience's lived experiences. A participatory approach to training, led by E, combined with ongoing support and "dress rehearsals," helped the scientists to understand how inclusive stories could be told, offering constructive feedback for a more inclusive approach. D and E's contributions, exploring their lived experiences and D's knowledge of convening the Dadima's group, was key to making connections between culture, history, faith and science.

We argue that, by working cooperatively and respectfully through "active listening," we surfaced and shifted power dynamics within the team. This was an ongoing process that required regular "checking-in," in critically reflexive ways, throughout stages of the project. This weaving of knowledges helped us to make connections by embracing cultural hybridity (Bhabha, 1994) within the team, and with different people on the walks.

Humility

As we reflected on our contributions to the two projects, humility resurfaced as an important characteristic of our third space. We actively reflected on our positionality in contributing to different activities within the project. For White members of the team, walking with minoritized

community groups offered a small, partial insight into being minoritized through reflections from walk leaders and participants.

> F: "Once you see what it is like to be minoritized, you can't unsee it."
>
> D: "Yeah, you can't unsee. But once you feel it, you can't unfeel it as well. The difference between me and C is that she will feel it differently as a dominant White woman of privilege. She won't have those historical lived experiences of racism or have experienced it growing up like I have, and still experience discrimination today. [. . .] The word trust is really important. I'll never forget a moment when we walked up a hill in the Chilterns. Me and C, it was on the second or third walk and C said: 'Thank you for letting me in and trusting me. This is your space that I've entered.' I am a 'safe space' holder and before letting C in I built a relationship with her to ensure that her motives and approach felt ethical, honest and kind. She showed a real sense of empathy and it felt genuine."

Whilst each of us was "comfortable," at least to some degree within our "home spaces" for these projects, and for some of us that notion of 'home' is obviously complex, we each made "excursions" to "territories" into other spaces where our colleagues felt more at ease. This helped us to create a shared third space where we could acknowledge when we were vulnerable, knowing that we did not know, or that we were in an unfamiliar space, exposed our humility.

> D: "I was keen to learn more on the geology/landscape side and felt that the partnership would feel safe and non-threatening to me as a non-scientist. I did feel out of my depth at several points with the geology side but was equally fascinated and felt like I was going back to school in a way, but this time in a fun way with real purpose."
>
> F: "I've spent most of my working life outside of my academic home. That has had its challenges and its rewards. Working on these projects has been similar in some senses to that, but the degree of difference has been amplified, and so have the rewards."

These excursions across "borders" were significant in co-constructing a "third space" for these projects. This process of co-construction started with Walking the Walk, where we co-created "sheltered" conditions for a third space. It was uncomfortable at times because the third space we co-constructed was challenged by our complex identities and by making explicit issues of power, privilege, and discrimination. It required courage and resilience for members of the team to make multiple "border crossings" between (sub)cultures (Aikenhead, 1996) to perform "the art of bridging" (Tandon et al., 2023) in a multi-cultural context. The work of co-construction continued through Landscape Stories, and through co-authoring this paper.

Creating a supportive environment for border crossings has required each of the contributors to be respectful of hidden, unspoken and manifest difference within the project team and to show generosity in how we supported each other when engaging in contexts that were unfamiliar to us. Importantly, this required consideration of positionality, humility and empathy (rather than sympathy). We acknowledge that the feelings of isolation will not be the same for a Brown or Black person in a space full of White people.

DISCUSSION

This paper has explored "partnership as practice" (Tandon, 2023) through duoethnography, a reflexive methodology that we applied to two related projects with the common aim of improving access to nature for minoritized groups. We started our journey to co-create a "third space" for equitable engagement from what at first seemed like a simple premise: if we cannot engage in equitable ways within our project team, why should minoritized community groups have any confidence that we can engage equitably with them? As the research and interactions evolved, we encountered and embraced the complexities of genuine co-creation. Why, therefore, should a geologist or an environmental scientist seek to become more equitable? Most academics accept that research is hard; equitable engaged research is also hard. Whilst our engagements have sometimes been challenging, the rewards have been much greater. We have learnt and unlearnt in ways that far exceed the personal outcomes of any other project we have been involved with.

The focus in this paper has been to reflect on how we co-created a "third space" for engagement with and for minoritized community groups and environmental scientists. This retrospective analysis has shown the value of connectivity, intentionality, humility and respect in moving beyond tokenism to co-create a meaningful, equitable partnership. This approach, which has the potential for application in other contexts, requires a commitment on the part of all contributors to inclusive leadership and procedural justice (Cenkci et al., 2021).

We argue that our use of duoethnography in this paper illustrates what Tanden (2023) describes as "action-oriented learning" through engagement, represented through forms of inclusive leadership, un-learning, re-learning and in combining ways of knowing to deliver positive change. The process of self and collective reflection has helped us to understand the potential for greater "symmetry" in how we conduct engaged research in more equitable ways (MacGregor et al., 2024). We argue that, if we are to operationalise epistemic justice through engaged research (Holliman et al., 2022), contributors should reconsider every aspect of the way "they" plan and conduct research, with a particular focus on "they"; the People (**Figure 1**) who are included/excluded throughout the whole process.

Having diverse representation in project teams is not sufficient to make the research process more equitable. This, for us, was simply the starting point. Our critical reflections demonstrate that equity is embedded from "conception" to "post-project activities" (**Figure 2**) and beyond, where projects like this have today grown into embedded partnerships.

Whilst the teams for the two projects brought intercultural dimensions to the research, drawing on different forms of academic and lived experience, the influence of this cultural hybridity (Bhabha, 1990) would have been lost if there had not been uncomfortable upstream conversations and ongoing acceptance of different ontological, epistemological and methodological approaches within an overarching pluralist paradigm. Diverse voices, (lived) experiences and interdisciplinary knowledge perspectives, offered a creative and meaningful third space, where there was a rejection of pre-existing, encultured ways of knowing. We accepted that new ways of making meaning allow for the co-creation of diverse knowledge.

> D: "I think we underestimate friendships in research because it's always seen as clinical. Those friendships that emerge in that third space are where you can tap into each other's knowledge in a way that doesn't feel hierarchical."

Adopting the principle of "Do no (more) harm" we crossed borders into shared learning territory (Aikenhead, 1996), co-constructing what Bhabha (1990: 211) conceptualised as a "third space,"

> "The process of cultural hybridity gives rise to something different, something new and unrecognisable, a new area of negotiation of meaning and representation."

This was not an easy or straightforward process. Our 'third space' has been disruptive and uncomfortable, but a positive place of (un)learning through critical listening and a deep investment in the labour of learning. Through cooperation, our partnership has become a 'sheltered space' for profound and deep learning. We have un-learnt and re-learnt as we have seen how connectivity can be enhanced through equitable practices, characterised through intentionality, respect and humility.

> D: "It's also that third nuanced space - it will be created in different ways depending on the project and the partners, depending on their belief systems, values and ethics, the terms and conditions they draw up and what I/we agree to; we need to move away from a 'them and us' hierarchical approach. We can't give you a prescription for what your third space is going to feel like because it depends on what you're willing to put in and your purposes for the research."

During the review process we shared a draft of this paper with our colleague Andrea Berardi, who has spent more than 20 years engaging with communities from the Borneo and Amazon rain forests (Berardi et al., 2017). He responded in the following terms,

> "In terms of our work with Indigenous communities, it seems to me that our situation is significantly more extreme in terms of the Academic Wheel of Privilege - you could probably add another three or four circles and another 5 or 6 categories, so I don't feel that the easy resolution of internal group dynamic issues that your paper implies through two 6-month projects could be replicated in Guyana."

In this light, it is important to acknowledge the contextual nature of our reflections. The relative depth of disadvantage and structural inequality will profoundly influence the potential for co-creating a 'third space' for engagement.

Whilst we look forward to continuing our journey across borders into our evolving third space, our hope is that these critical reflections resonate with "allies." We encourage those yet to make these journeys, to explore the rich possibilities that can be opened up through intercultural, interdisciplinary and intersectional ways of working in equitable, engaged research projects. What we have outlined in this paper, has required a willingness to (un) learn, critically listen and invest in new learning, feel uncomfortable as we step out of historically privileged ways of doing research, so that we actively challenge notions of what equitable engagement looks like for environmental and Earth sciences.

DATA AVAILABILITY STATEMENT

The original contributions presented in the study are included in the article, further inquiries can be directed to the corresponding author.

ETHICS STATEMENT

This study was approved by the Human Research Ethics Committee, HREC/4299/RH/MB, The Open University. The study was conducted in accordance with the local legislation and institutional requirements. The participants provided their written informed consent to participate in this study.

AUTHOR CONTRIBUTIONS

MB: Principal Investigator, conceptualization, funding acquisition, investigation, supervision, project administration, resources, writing: original draft; review

and editing. RH: Conceptualization, funding acquisition, investigation, methodology, data curation, formal analysis, supervision, resources, writing: original draft; review and editing. CW: Conceptualization, funding acquisition, investigation, resources, writing: original draft; review and editing. AK: Conceptualization, funding acquisition, investigation, supervision, writing: review and editing. YA: Conceptualization, funding acquisition, investigation, resources, writing: review and editing. KS: Investigation, data curation, writing: review and editing. JA: Conceptualization, funding acquisition, resources, writing: review and editing. Contributions to Landscape Stories: CW: Principal Investigator, conceptualisation, funding acquisition, methodology, investigation, project administration, resources, data curation, writing: original draft; review and editing. RH: Conceptualisation, funding acquisition, methodology, validation, investigation, resources, data curation, formal analysis, writing: original draft; review and editing. GL: Conceptualisation, funding acquisition, data curation, methodology, investigation, resources, formal analysis writing: original draft; review and editing. AK: Conceptualisation, methodology, resources, writing: review and editing. YA: Data curation, resources, writing: review and editing. MB: Conceptualisation, data curation, methodology, investigation, resources, writing: original draft; review and editing.

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CONFLICT OF INTEREST

Author GL is Director of the Dadima's Community Interest Company (CIC). Author KS is Director of the Black Tri Tribe (CIC). (A CIC is a limited company which exists to benefit the community rather than private shareholders.)

The remaining authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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