Assembling with VR: Dancing in a more-than-human world

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Abstract

In this paper, we consider the claims that constellate around the concepts of immersion, presence and empathy that have been made about virtual reality across many disciplines of study, including psychology, criminology, immersive film and media. These claims are applied to an interdisciplinary, collaborative project: VR Dance; which engaged young people (11-16 years) in hip hop and immersive technology workshops over a six-week period. We discuss the ways in which co-created immersive environments which centre the body offer potential to tune into and re-calibrate our sensitivities and modes of engagement with each other and the environments we are in. We argue that this is not simply as a result of technology's effects on individuals but constituted in wider assemblages of human and nonhuman actors. We make the case for virtual reality, not as a tool for 'becoming other', but as part of wider assemblages in ongoing transformations, relocations, and calibrations.

Keywords: virtual reality; dance; embodiment; empathy; immersion; presence; Barad; intra-action; assemblage

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Introduction

This article, we consider the 'unrealizable promise that we might *become the other* body' (**Jarvis, 2019**) through immersive experiences with virtual reality (VR). '[T]he capacity the medium has to make our bodies part of the experience of a story is what creates a stronger entry point to engage a deeper emotional response and to connect us empathetically to the events being portrayed (**Sánchez Laws, 2017: 125**), is a claim that has been articulated by VR experience makers (**de la Pena, 2016**). In this article, we build on previous critiques and scepticism around the claims and assumptions made on the purported capacities of VR technologies to foster empathy 'in addressing social issues' (**Sora-Domenjó, 2022**) and the ethical implications that arise (**Ramirez, 2022**). We acknowledge the 'considerable amount of attention' (**Sánchez Laws, 2017: 215**) that has been brought to the term 'empathy' across such disciplines as philosophy and psychology, and the problematisation of the term in the complexities of a move from 'a visceral bodily response to a rational understanding' (**Sánchez Laws, 2017: 221**) of another's experience – body and/or world - portrayed through a VR headset. The extent to which the promise of 'knowing' other bodies is ever actuated within [individual] acts of immersion requires critical scrutiny' (**Jarvis, 2019: 4**), with 'little empirical evidence of a correlation between VR exposure and an increase in empathy that motivates pro-social behaviour, and a lack of research covering VR films exposure eliciting empathy' (**Sora-Domenjó, 2022**).

The promise of VR as a means for providing 'participants control and transcendence of (real) bodies, things and distances' (**Gemeinboeck, 2004: 52**) can be challenged, as this author suggests, as 'the dialogue with such technological media and their "virtual environments" … not only transforms but rather provokes issues of presence, identity and embodiment' (**Ibid**). Similarly, authors Bollmer and Guinness (**Bollmer & Guinness, 2020**), unpacking the intersections of art, VR, and physiological reaction through Jordon Wolfson's *Real Violence* (2017), conclude that claims around empathetic exchange through the mechanism of VR lie at the heart of assumptions about the social value of VR. The social justice potentials of VR are limited by the simulated and prescriptive nature of the technology, which removes critical elements that are required in enacting engagements with others.

In this paper, we offer a new perspective on human-VR encounters, which further complicates existing scepticism in the literature about VR's empathy potentials, fore fronting the arrangements and relationalities of bodies, technologies, and perspectives in such encounters, as dynamic assemblages of human and nonhuman elements unfolding via multidirectional 'intra-actions' (**Barad, 2003: 817**). We theoretically, and

uniquely, ground our analysis in feminist philosopher Karen Barad's conceptual framework, which emphasises these entanglements between matter and meaning (**Barad 2003; 2007; 2014**),

> *[t]he world [as] a dynamic process of intra-activity and materialization in the enactment of determinate causal structures with determinate boundaries, properties, meanings, and patterns of marks on bodies* (**Barad, 2007: 140**).

Intra-action posits agency not as an inherent property of an individual or human (body) but as a dynamism of forces constantly exchanging and diffracting, influencing, and working inseparably: 'agency is not an attribute but the ongoing reconfigurings of the world' (**Barad, 2007, 141**). In applying her ideas to body-VR entanglements, we draw particularly on her critiques of *representation* (**2003**) that call for less focus on linguistic representation of phenomena. A rejection of representationalism is evident across Barad's work, who has argued for a perspective that does not force a Cartesian separation between representations and things but is rooted in performativity:

> *Unlike representationalism, which positions us above or outside the world we allegedly merely reflect on, a performative account insists on understanding thinking, observing, and theorising as practices of engagement with, and as part of, the world in which we have our being* (**Barad, 2007: 133**).

Recognising that VR experiences are material-discursive phenomena, not simply matters of language, we find parallels with Barad's critique of cultural representation in many of the more individualistic/ therapeutic claims that are made about the potential of VR and the separation that is assumed between representations in the VR world and the belief that people can somehow translate what is experienced into real world interactions.

Barad claimed this *posthumanist performativity* provided: 'a reworking of the familiar notions of discursive practices, materialization, agency, and causality, among others' (**Barad, 2003:, 811**) and a materialization (rather than representation) of all bodies, whether human or non-human in a relational ontology of *agential realism*: that is an appreciation of co-dependent, entangled and mutually constitutive relations that exist in nature- whereby all matter has the potential to affect (**Barad, 2007**). We argue that this ontology of *agential realism, performativity* and *posthumanism* enables insightful questioning of prevailing notions that immersive VR elicits empathy effects within individual users, shifting focus toward distributed agencies across embodied, technical, and discursive relations.

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The article does not follow a traditional structure and warrants some signposting. In the section that follows (background), we provide contextual information on VR experiences and consider the move from the use of solitary to social VR and some of the ethical issues that arise in this space. The methods section consists of a layered empirical-conceptual methodology. An extensive literature search, and findings from an empirical project 'VR Dance' are diffracted against each other (**Barad, 2007; 2014**) to reveal five themes. The first of these unpacks some of the assumptions around VR and empathy, the vulnerability of bodies placed inside VR worlds follows and leads into issues of framing and representation in VR content, we then explore the residual effects of the technology and opportunities for critical distance, and, lastly, consider the ways in which performance offers modes and sites of disruption through VR experiences.

Background

Virtual reality technology

VR is an emerging immersive technological medium 'in which subjects use a head- mounted display (HMD)/ VR headset to create the feeling of being within a virtual environment' (**Madary & Metzinger, 2016: 2**). The term virtual reality is used to refer to a wide range of technologies which range from simple 360-degree camera systems to fully immersive, interactive, simulated virtual environments (e.g., the latest version of Apple Vision Pro). VR sits within the paradigm of extended reality (XR), which refers to all real-and-virtual combined environments and human-machine interactions generated by computer technology and wearables, i.e. augmented reality (AR), mixed reality (MR) and virtual reality (VR). Each of these technological media offers distinct experiential qualities and affordances. Whilst technologies such as AR and MR layer digital/virtual information (e.g., environments/bodies/objects) over/onto physical environments/bodies/objects or are placed (as objects, screens, or worn as digital items) within acknowledged/seen physical environments, VR, distinctly, replaces the visual environment completely. Researchers, Michael Madary and Thomas K. Metzinger working across the philosophy of mind and the ethics of emerging technology, remark that '[u]nlike other forms of media, VR can create a situation in which the user's entire environment is determined by the creators of the virtual world' (**Ibid: 5**). VR sits at one end of the Reality-Virtuality Continuum as designed by Milgram and colleagues (1995), the levels of virtuality on this spectrum ranging from partially sensory inputs on one end to immersive virtuality on the other. VR technology 'necessitates absolute inclusion within a 360-degree digital environment, the user metaphorically stepping inside the

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computer' (**Dixon, 2007: 365**) and introduces 'dramatic new ways of disrupting our relationship to the natural world' (**Madary & Metzinger, 2016: 2**).

Whilst VR manifests notions of embodiment and immersion, it impedes/ limits modes of sensing and only engages with specific body parts, typically the hands, as 'interaction' devices. Bodies are not 'stable things or entities, but rather are processes which extend into and are immersed in worlds' (**Blackman, 2012**), and, as such, bodies are shaped by and shape worlds. Drawing on Merleau-Ponty's phenomenology of perception, Abram writes about the 'continuous dialogue' between his material, felt sensing body and the material world which 'unfolds far below my verbal awareness' (**Abram, 1997: 52**). This sense of awareness is physical, sensorial, virtual - coalescing with and through the virtuality of the imagination (**Ingold, 2013**). The technological medium of VR problematises 'the relationship between "the real", "the actual" (or "concrete"), and "the virtual" in ways that exceed other media' (**Saker & Frith, 2020: 1431**).

> *The ability to visually simulate something physical separates this technology from the virtual sensibility of a child at play. And the experience of being placed in a virtual space that ocularly appears disconnected from the physical environment is precisely the phenomenological effect of this technology, and what makes it feel distinctive from other media* (**Saker & Frith, 2020: 1431**).

Whilst there is a layering or merging of sensory information derived from the physical world in which the physical body is located, and the digital virtuality – the body and world as seen from within the VR headset, it is typically the visual world inside the headset that takes precedence (due to the visual dominance of the sensory system). The body reacts and the sensory system rallies to 'fill in the gaps' whilst the brain relatively slowly catches up at which point it's too late, as the bodily reactions have already occurred. As VR experience maker, ZU-UK Artistic Director Persis-Jadé Maravala writes: '[t]he body will believe something and the conscious mind can't. Our involuntary systems are stronger' (**Dunne, 2018: 216– 217**). This affordance of VR enables the participant to experience a sense of immersion and presence in the simulated world. This feeling of presence is further enhanced by using additional sense cues, with sonic and haptic technologies (driven by visual cues), and by the production of a body 'there', i.e., through the visual presence or avatar in the virtual environment.

From solitary to social VR

With newer, lighter, faster, and more affordable technologies (such as the Oculus - now Meta-owned - VR Quests), VR is increasingly being used to explore, measure, and capture data around social experiences and interactions. For example, most VR headsets now include integrated eye tracking, leveraged to 'optimize the user experience' (**McNamara & Jain, 2019**). Since COVID-19, there has been a dramatic uptake of remotely shared VR spaces, e.g., for social, work/networking, gaming, and performance events[i]. This shift 'necessitates new explorations of the theoretical and social importance of VR' (**Saker & Frith, 2020: 1428**). Vishal Shah (Head of Metaverse) speaks about a future metaverse as the 'next phase internet', a space in which we can 'feel like we are there with other people…in a way that we can't "feel" in our digital experiences today'[ii]. Whilst these claims around the Metaverse are posited as alternatives to not a replacement of the physical, real world, notions of 'living, working, and socialising in VR (citation) operate to replace / replicate real-life scenarios[iii] . The promissory claims of Meta's Horizon Worlds envision an 'embodied internet' in which we are all 'connected' using multiple sense modalities, with agency to create our own worlds. This is not an insignificant or unproblematic shift, as the envisaged experience moves from the participant body in a VR encounter to multiple bodies in shared, social, collaborative VR spaces. As Roquet explores in his writing on outsourcing the space of everyday social interaction '[w]hat changes with the more "embodied" internet of the metaverse and social VR is that this becomes not just a question of anonymous social media posts, but anonymous bodies interacting in three-dimensional spaces' (**Roquet, 2023: 1505**).

Does what happens in real life simply transfer over into a simulated virtual environment? On one hand, the body's hardwired response to the visual stimuli in a VR headset directly translates from phenomenon experienced in the physical world. For example, the body flinches when a virtual entity is moving towards it. However, VR mediates behaviours that are not possible in 'real-life', expanding and making more fluid the boundaries of what is deemed socially appropriate or acceptable. Farmer and Maister highlight notions of 'bodily' self, as 'the basis of subjective experience', and 'conceptual' self, which 'develops through our interactions of other' - deemed as 'one of the most important concepts in social cognition and plays a crucial role in determining questions such as which social groups we view ourselves as belonging to and how we relate to others' (**Farmer & Maister, 2017: 323**). They also highlight the opportunities and risks of VR for 'harnessing' the 'malleability' of both bodily and conceptual self to 'achieve a reduction in social prejudice' (**Ibid**). Loaded with multiple assumptions around behaviour, in terms of what is deemed appropriate

or acceptable, ethical issues arise in the typically unregulated, spaces of social VR (**Allen & Macintosh, 2022**), with a lack of best practice or industry standards and contextual, cultural insight around those participating. An example of which is the phenomena know as 'griefing' that refers to the act of one player intentionally disrupting another player's game experience for personal pleasure and possibly potential gain (**Achterbosch et al., 2017**).

Issues such as this pose ethical dilemmas, and it is critical is to help mitigate and educate people on the implications of the use of such technologies. Acknowledging these dilemmas take us into the territories of moral theory, moral education, philosophy and philosophy of education which, whilst important areas for consideration, are beyond the remit of this article. Meeting the multiple critiques and concerns outlined so far, we investigate different applications of VR cutting across different fields of research and diffract these insights with our case study *VR Dance*, exploring the outcomes, benefits, and values of the technology. In doing so, we problematise bodies in dynamic intra-actions with VR technologies, attending to more-than-human material-discursive relations at play, as 'it is through specific intra-actions that phenomenon come to matter – in both senses of the word' (**Barad 2007, 140**). We diffract perspective shifting/ enhancing claims of VR, 'affective experiences of a self that hyper-extends beyond the protective layer of the skin to incorporate experiences of otherness' (**Jarvis, 2019: 7**).

Methodology: Diffracting insights of VR

The methodology used in this article links project data to theoretical formulations on distributed agencies. We cover this methodological territory through three sections: outlining the literature review that was undertaken; detailing the empirical work undertaken on our case study VR dance, including the thematic analysis of data; and the 'diffraction' of these data underpinned by Barad's theories.

Literature review

We conducted a robust review of literature drawn predominately from Psychology, Psychiatry, Sociology, Criminology, Film and Performance Studies to understand the claimed value of VR technology and the forms of enquiry and critique within each discipline. Searches were conducted in 2020 and then repeated in 2023 from the year 2000 onwards with a clear search strategy. The databases used were ACM Digital Library, JSTOR, PsychINFO, International Bibliography of the Social Sciences (IBSS), Web of Science, Scopus and Project MUSE. Google Scholar was also utilised as was the [ANON] Library search facility. The search terms were *Immersive Technology* or *Virtual Reality* or *Augmented Reality* paired with one of the

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following applications *Research* or *Social Science* or *Performance* or *Journalism* or *Futures* or *Mental Health* or *Poverty* or *Diversity* or *Social Justice* or *Social Inequality* or *Crime* or *Youth* or *Risk* or *Education* or *Social Work.* Literature was also review via searching the bibliographies of relevant papers. Exclusion terminology included *Treatment* and *Medical and Engineering Education* and *Entertainment* and *Gaming* and *Code and Coding.* The search strategy technique used was truncation. Such as Virtual Reality OR Immersive OR Augmented Reality AND Performance OR Journalism OR Futures. This was continued using various combinations of the search terms as stated above. Examples of these literature are discussed alongside the case study *VR Dance*.

VR Dance case study and qualitative analysis

The *VR Dance* project was developed by East London Dance (ELD), together with technology partners Maskomi X PlayLab.Z, dance organisation, BirdGang and researchers from [ANON], to engage young people at risk of educational exclusion and/or criminal exploitation in two London boroughs, Redbridge, and Newham. The programme was designed across three years and supported from the Lord Mayor of London funding which had an explicit focus on reducing risk of criminal exploitation amongst young people in London.

On securing the funding, ELD were keen to explore the impact of offering technology enhanced dance instruction to young people. Dance brings a physical-sensorial engagement to VR, enabling forms of participation that surface embodied-material experiences and felt relations between bodies, technologies, and spaces (**Thomas, 2022b, 2022a; Thomas & Glowacki, 2018**). ELD have a long history of providing dance in East London, particularly through the genre of hip hop and had identified this as a dance approach that had been previously well received by young people participating in their youth programmes and their perspective reflects claims of the role of hip hop as a form of critical pedagogy (**Campbell, 2022**) and as a form of identity resistance (**Payne, 2024**).

The project aimed to engage young people (herein YP) aged 11-16 years in secondary schools and pupil referral units in creative and co-designed activities comprising hip hop dance instruction, VR, and other immersive technologies (including avatar creation and body motion capture). From a research perspective we also built inartistic reflection for the YP in the form of a weekly journal and creative activities aimed at encouraging reflection. The programmes research aims were to explore whether there were any changes observed in the YP in terms of decision-making, peer relationships and wellbeing and we used the reflective activities to explore these soft outcomes. A central premise of the project was also to support YP in technology and dance skills and to be content creators. They co-

designed dance sessions, collaboratively designed avatars, and made collective decisions about the virtual worlds their performances inhabited.

The programme had three phases and began during the COVID-19 lockdowns with a series of online workshops, followed by two further rounds of a 6-week in-person dance and virtual reality experience. The data presented here is drawn from the second in-person phase. Each phase engaged 60 young people from four secondary schools (two in each borough) and included a mainstream secondary school and a pupil referral unit from each borough. The workshops were delivered jointly by BirdGang dance instructors, technologists from Maskomi X PlayLab.Z and a youth worker employed by ELD. The young people experienced the workshops in school specific groups and were referred to the programme by their school (and provided time off school lessons) if school staff felt they would benefit. Young people who participated had either been excluded from mainstream education or were deemed at risk of exclusion and most had difficulties engaging with traditional lessons. There were nearly equal numbers of young people who identified as male and female with a wide range of ethnicities representative of the local demographics in East London.

The research team from the University of Bristol, together with ELD staff, used the reflective journal and a range of creative methods to assess the experiences of the YP participating in these activities including drawing, vox-pops, postcard creation where they were provided with a series of prompts and materials (see **Figure 1**) for reflection. In research with CYP, arts-based or visual methods have been successfully used to attempt to 'flatten' power dynamics (**Holland et al., 2010**) between the researcher/researched. The project received ethical approval from the School for Policy Studies Ethics Committee (University of Bristol). At the end of the project, individual interviews were conducted with each YP who consented (n=44/60) in which they were asked to bring their reflective journal as a prompt to general questions about their experiences. Their creative reflections provided a focal point or neutral space on which participants could concentrate if they did not wish, or were not able, to hold eye contact throughout the interview (**Banks, 2001**). All YP have been given pseudonyms and other identifying information changed.

Diffraction

Haraway initially defined diffraction as 'a mapping of interference, not of replication, reflection, or reproduction' (**Haraway, 1992: 300**). We have taken these ideas and Barad's (**2007**) claims that diffraction can be seen as a method whereby ontological, epistemological and ethical elements of the world are inseparable and form an 'ethico-onto-epistemology' (**Barad, 2007: 409**). This is important in the context of Barad's rejection of

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representations of reality as she argues that instead of representing an observed phenomenon, a researcher diffracts what is observed and actively constructs reality. This practice of diffraction is only made possible through the relationality of humans and non-humans.

We engaged a diffractive method to (re-)turn (**Barad 2014**) to data produced during *VR Dance* (their narratives in the individual interviews) alongside our mapping of the literature across a number of themed sections. The purpose of this is to trouble assumptions that placing people 'inside' virtual environments may afford 'empathy', provide critical distance, or engineer pro-social behaviour within their minds-bodies and worlds. Whilst we have not directly analysed their reflections recorded in their journals and in creative activities we do draw on some of this material to illustrate the claims made in interviews.

Figure 1: Creative reflection 'kit' supplied to all YP
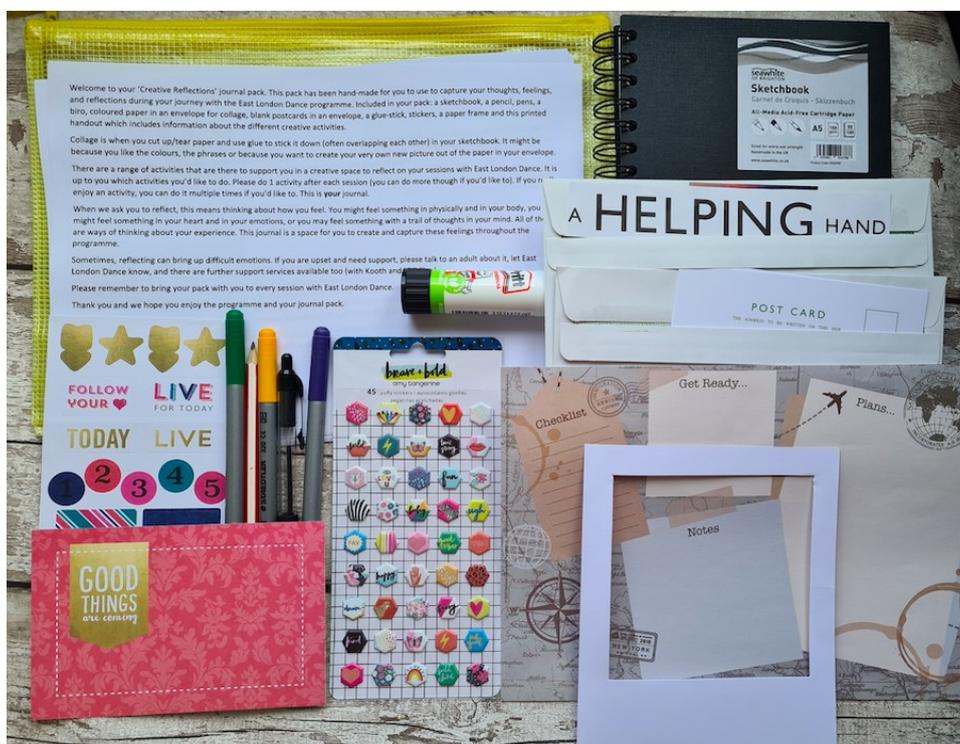
VR Empathy Machine: Assumptions and Vulnerabilities

In many of the articles reviewed in the literature review, the focus was on the production of VR to place viewers inside an event, that might be previously inaccessible, to enhance emotional responses and generate empathetic response, with emphasis on a positive social implication. As mentioned in the introduction, these claims and the ethical issues that arise in response are complex. It was noted in the literature that the vernacular used, and value placed on VR to elicit empathetic responses in the viewer/ participant shifted between disciplines. VR is commonly used in Psychology in individualistic treatment-based approaches, e.g., for

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aversion/ exposure techniques for phobias and anxiety in therapeutically oriented contexts whereby behavioural and attitudinal change is often pinned down to the notions of 'body ownership' and 'full body illusion' (**Banakou et al., 2016; Farmer & Maister, 2017; Schoeller et al., 2019; Tajadura-Jiménez et al., 2012**). There are studies in Psychology and Criminology focused on rectifying prejudice or criminal behaviours through interaction in VR or bodily ownership and a coinciding shift in perspective where 'perspective' 'bias' 'prejudice' and 'behavioural change' are emphasised (**Banakou et al., 2016; Farmer & Maister, 2017; Gonzalez-Liencres et al., 2020; Hasson et al., 2019; Southgate et al., n.d., 2017**). Whereas studies in immersive journalism and film were often tagged with notions of 'empathy' as 'an understanding or connection to the feelings of others', that 'involves caring, validating, and understanding' them, and which always serves a positive outcome, the 'basis for further relief action toward them' (**Sánchez Laws, 2017: 218**).

VR Dance, perhaps unintentionally, drew upon similar assumptions around VR to those found in the literature: the project sought to target vulnerable YP, motivated by the potential for technology and dance experiences to enhance their emotional responses, transform their perspectives of themselves and of others, hopefully resulting in positive social outcomes. Across the media industries, (such as gaming, immersive journalism, and non-fiction film), the premise of transference into another perspective and body that VR affords is used to provoke people into imagining what other people's lives or experiences might be like (e.g., Jane Gauntlet's VR experience *In My Shoes*, 2017). For a body to be 'merged' with another (virtual body) in VR, there requires an openness - to be 'changed', and therefore there is the potential for vulnerability in this merging of the lived body and the VR content. This was a critical factor in considering the needs of the YP in the *VR Dance* project. There was some anxiety from them about using the technology, about engaging in a dance-based activity, as well as the social aspect of the experience. They came with some assumptions, both in terms of what they considered a VR experience entailed: *'the VR was good. Not proper VR (I have that at home)'* (**Nathan, participant**), and in how dance and VR might work constructively together:

> *The VR and Dance...I didn't think it would work because in my head I thought it would be that you would put on goggles and dance with them at the same time but instead of that it was like you dance and then you can watch yourself with the goggles. And you end up in a whole different surrounding...It felt kinda weird but mesmerising at the same time because I'm watching myself through some glasses* (**Dayana, participant**).

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The YP involved in the *VR Dance* project were simultaneously part of the world represented and outside of it: they were able to perform and move with/in their bodies in both the physical and virtual spaces whilst wearing the VR headsets, and to 'step back', accruing distance, whilst watching themselves back through the headsets. The perspective of 'other' was enabled in a less prescriptive way, encouraging a shift or transference of 'self', mediated by the technology:

> *When you watch it back it's like you are really there as an audience member and you get to see how bad it was or how good it was. It made me feel good cos I had done this and I could watch it back* (**Jamal, participant**).

Young people became part of the virtual worlds their dances were situated within, but also, as Jamal pointed out, they became their own audience members. They navigated being inside-outside the physical-virtual environment of the workshops and their bodies in a variety of ways. This was not always a positive experience. For example, Aaliyah commented on the anxiety they felt within the VR-dance workshops:

> *Aaliyah: I'll be real, I did enjoy it but the fact that these certain things played on my mind, that like ruined it init.*
>
> *Researcher: When you say certain things what do you mean?*
>
> *Aaliyah: Like the fact that I feel people just watching and feel like I'm making a fool of myself init.*
>
> *Researcher: I'm sure that you didn't though*
>
> *Aaliyah: No I mean in the end I know that we didn't init, everyone's doing it but it's still that thing that plays on your mind.*
>
> *Researcher: What emotions did you feel?*
>
> *Aaliyah: Anxious.* (**Aaliyah, participant & researcher dialogue**).

For some YP the technology enabled them to engage with the dance elements of the sessions, finding it easier to move their bodies, as bodies that were mediated by or captured through the technologies:

> *I felt like it's easier to dance like whilst doing the technology at the same time because then you feel like no one is watching you and you're in your own little world...you can focus on something else* (**Aaliyah, participant**).

Some of the young people found ways to focus inward on themselves rather than the environment they were in:

> *I don't like being on camera a lot...I just danced like, I pretended that no one, that there wasn't a camera there...just like pretend that there's only you there, and that no one else is there and it's just you dancing* (**Shannon, participant**).

Others used different techniques to disguise themselves and disrupt feelings of discomfort.

> *Lara: when we were putting the dance together you had to think about what everyone wanted to do and what they were comfortable with...a few people were uncomfortable with recording themselves, that was an issue.*
>
> *Researcher: How did you overcome that?*
>
> *Lara: we put facemasks on...everyone did manage to record themselves to see what they were doing by the end of the project*. (**Lara, participant & researcher dialogue**).

Writing from a non-fiction immersive filmmaking perspective, Rose argues that VR may offer a sensory experience of 'other', but 'cannot reproduce internal state' (**Rose, 2018: 142**). Technologies designed to foster empathy presume to acknowledge the experience of another, but inherently cannot. The user of these technologies, instead of acknowledging another's experience, hastily absorbs the other's experience into their own (**Bollmer, 2017: 64**). As the remarks of the YP evidence above, their participation in the performative elements of the workshops occurred as different kinds of immersion, in their be(com)ing with/out others. Through their attempts to be(come) detached from technologies such as cameras and to be(come) de-individualised by creating uniform characters, detaching themselves from the environment or their identity through becoming other, disguised by COVID-19 face masks. The entanglements of bodies and technologies, digital and physical phenomena, disrupted notions of VR 'immersion' as an individualistic practice and challenged binaries of self and other. The YP expected to be dancing alongside an-other, an avatar to duet with, but found themselves as it captured their movements. They were dancing along with themselves, their bodily experience distributed across physical and virtual spaces. The intra-actions between these agential forces at play, made redundant the notion of an experience of empathetic connection to 'other' as distinct from 'self', and opened towards a more playful arena for shared empathetic exchange.

Immersive bodies and sensorial proximities

By bringing the participant into a closer proximity or more direct relationship with the VR content, and by incorporating more of their senses, a more novel effect of 'realness' can be 'achieved', and, with this, a reduction of the discrepancy between 'representational reality versus experienced reality' (**Kool, 2016: 4–5**).

The VR Dance project employed sound and haptic sense cues alongside the visual during the workshops, providing multiple sensory routes into the body, and perhaps a more visceral relationship to the content. The multi-sensory nature of the technologies, the entanglement of sound, vibration, and visual content, was an element which the YP frequently fed back on. Sometimes, the sensory information was overstimulating: *'it made me feel sick [in a good way] ...like pumped up'* (**Nic, participant**). The haptic jacket used which vibrated as it converted electromagnetic signals from objects into pulses and sounds, prompted a variety of responses:

> *Nah that was fun, because you got that thing that you have to put on your back init, and it vibrates, and then you got the VR that you put on with headphones, that was really fun...at one stage I didn't like that backpack thing because it made me feel sick, it was vibrating loads... you can feel it go through your whole body, like your arms, legs, chest, head* (**Hannah, participant**).

> *[I liked] the sound pack where it like vibrates to the sound you are listening to so you get like a great flow* (**Ben, participant**).

> *I wasn't expecting it to be so immersive, you could like feel everything going on around you* (**Agathe, participant**).

Focusing on increased proximity to a situation or social group in a controlled setting, it is claimed a third-person perspective offers a more intimate relationship to the 'action', as this 'decreased psychological distance allows for the manipulation of empathy, which has been found to shift behaviour toward more generous or others' focused decisions, both hypothetical and real' (**Southgate et al., 2017: 73**). Some first-person scenarios, (**Banakou et al., 2016: 33; Tajadura-Jiménez et al., 2012**) explore body ownership over a differently raced body and consider the effects of such embodiment diminishing on implicit racial bias as well as how long a potential 'affect' might last. An example of this can be seen within studies exploring the Palestinian and Israeli conflict (**Hasson et al., 2019**) and the impact of intimate partner violence (**Gonzalez-Liencres et al., 2020**). In the latter study, the authors claim that participants taking the first-person point of view of the female victim experienced a sense of vulnerability, intensity, and sense of realness; whereas they felt more detached and less threatened in the observer role (**Ibid: 341**).

The perspective of the VR participant, their (avatar) presence within the virtual environment, their proximity to events occurring in that environment, and capabilities for interaction there, are key factors in designing experiences which orient around provoking behavioural change. In the *VR Dance* project, it was the processes through which technology and dance came together within the project that enabled the embodied and social shifts that participants made. These were not prescriptive outcomes, but softer changes in bodies and minds, which brought about social shifts. For example, many young people commented on their increased confidence through performing with others in the real-virtual environments, and improved social skills such as communication, trust and decision-making generated from the collaborative practices and interaction which were encouraged in the sessions. Others commented on how the sessions had solidified or encouraged new friendships: '*I bonded with my friends through dance. I bonded with them really well*' (**Agathe, participant**). Whilst we did not directly analyse the creative outputs of young people, their creations in their reflective journals do illustrate some of these outcomes:
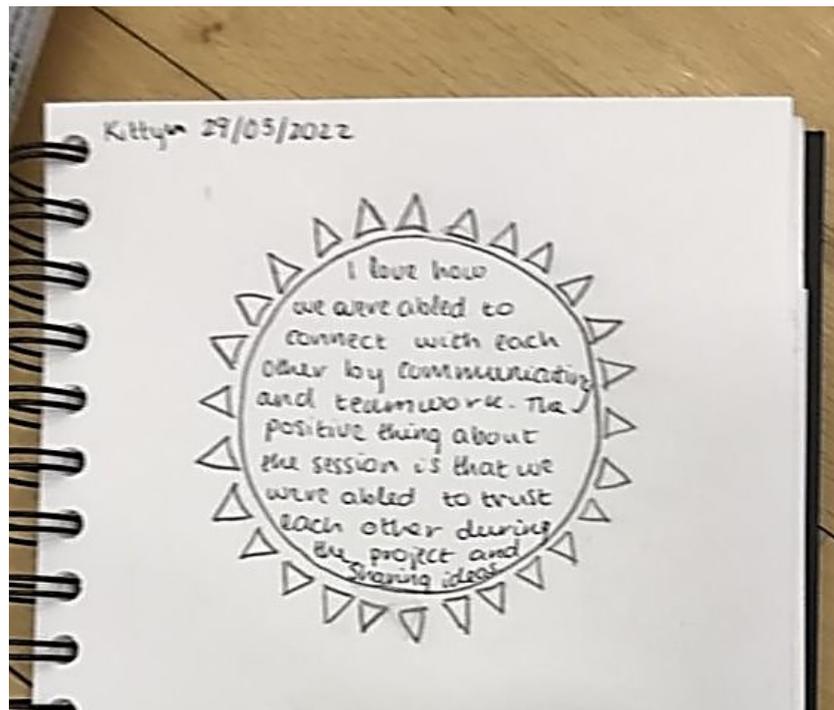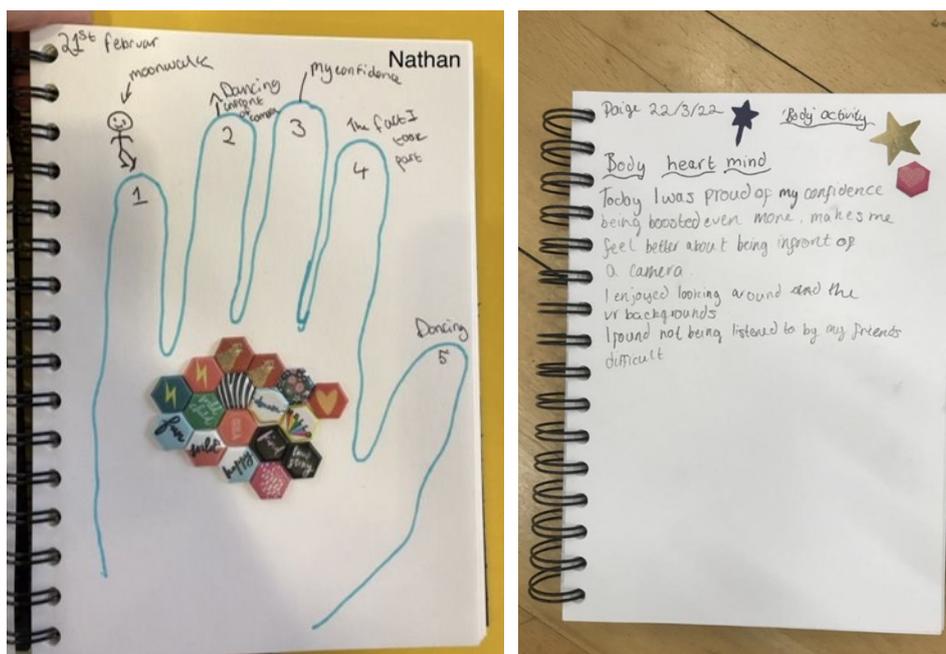
Figure 2: Example reflective journal entry.

Figure 3: Bodies, hearts and minds.

Framing and representation: Non-neutrality, (in)-visibility, agency, and co-production

Questions of framing and representation in VR content and in crafting participation are crucial in examining and reflecting on the capacity for VR to shape perception and, whether and how this offers the potential for behavioural change. Attention must be paid to the contextual processes and agential forces involved in the assembling of human-VR encounters. We consider the invisibility of the designer and experience-maker, and the perceived agency of the participant, and how opaque design processes might be problematic in the context of highly persuasive content. Whilst VR provides an immersive, 360-degree experience, equipping its participants with complete agency to look around and move around the virtual world; everything about that world has been developed through the 'lens' of its creator(s). Furthermore, there are typically visual or aural cues, which are designed to direct the gaze (and therefore the attention) and movement of the participant to 'painstakingly construct highly focused scenarios with socially and technically constrained mechanics of interaction' (**Murray 2020, 24**).

Overestimating the power of VR is problematic, especially when considering it to be a powerful illusionary tool. If we decide to represent VR as an 'ultimate empathy machine'[iv] or take for granted highly speculative claims about the nature of consciousness, we are essentialising the way that VR functions without critically analysing the process of creating scenarios and the proceeding effect on the participant: 'VR environments could very well become incubators for propaganda and

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exploitation, and for this reason, being unaware of the journalist orchestrating highly persuasive content can be dangerous' (**Kool, 2016: 8**). The danger is that we do not take into account the placement of the VR designer, nor framing, nor existing biases in creating 'a situation in which the user's entire environment is determined by the creators of the virtual world' (**Madary & Metzinger, 2016: 5**): '[u]nlike physical environments, virtual environments can be modified quickly and easily with the goal of influencing behaviour'. The technology introduces / affords potential for 'powerful forms of both mental and behavioural manipulation', (**Ibid**) which are exacerbated by the range of political and commercial interests that influence content creation.

In the *VR Dance* project, many YP commented on how the virtual environment seemed 'other worldly', describing an experience of their sense of being transported to another 'place'. The dance, they were doing, in contrast, occupied both the physical and virtual environments, whereby the movement of their bodies was available to them across both 'realities':

> *…it was weird man, because you go into these things, and it takes you to a whole different world but you're still doing dance. It's crazy* (**Ryan participant**)*.*

> *[What will you remember?] watching myself back in a completely different place, it's not like I'm not on earth to be fair, in the VR goggles* (**Dayana, participant**).

The experiences of the participants in their inhabiting of 'another world' raises tensions around the potential stripping of their located-ness and of the physicality and context of the 'real' world around them, the potential for making them susceptible and vulnerable to the influences or perspectives of designers, creators, and other users of the generated content of these spaces. Taking account of the (in)visibility of various actors in the creation of these worlds, the project tried to actively involve the YP in the application of the technologies, including the design of avatars and environments, although this was inevitably limited by some practical aspects such as time, expertise, and access which reduced the extent to which YP could claim control over the content creation.

Figure 4: One of the avatars created by the YP.

Focusing on representational ethics that assert the ultimate unknowability of someone else's experience, Bollmer (**2017**) advocates against any claims that VR serves as a tool for empathy. Alongside the problematics of the invisibility of the maker of an experience, he flags a further concern, in the way in which 'VR leans heavily on a user's own habitual understanding of what they perceive' (**Ibid: 64**), even as users are often prompted to believe they have been 'standing in someone else's shoes'. For those already inhabiting at least part of the 'universal' subject position, the VR empathy machine can provide the comforting illusion that the user's existing emotional perspective is, after all, universally shared, albeit founded on normative assumptions:

> *This familiarity will occur more easily to the degree a user fits into the hegemonic subject position modelled by the system (most often white, male, heterosexual, cisgendered, able-bodied, neuro-typical, with head, hands, and body of average physical dimensions, and so on)* (**Roquet, 2020: 68**).

Roquet argues for a better understanding of how VR channels empathy towards VR creators, and points to the need to ensure a broader range of people can take up the role of 'VR game master' for themselves (**Roquet, 2020**). Is VR less about empathy and more about appropriation? Whose

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perspective is it anyway? VR experiences that claim to give users access to the lives of others, employing their voices, images, and spaces used, often as a form of political activism, claiming that a user has experienced authentic empathy for 'other' is problematic, and arguably a form of 'identity tourism' (**Nakamura, 2020: 47**). As Black feminist theorists have known for some time, the desire to experience empathy for the sufferings of Black people while leaving structural racism in place has long underwritten pleasurable forms of cultural appropriation and projection.

VR imprints and critical distance

In this section, we consider the ways in which the experience of VR can be digested, reflexively and critically in the space of the VR-engagement itself; more reflectively, as 'residual imprints' (**Thomas, 2022a: 14**) in the immediate 'after-space' of encountering the technology; and as a longer-term imprint on the body-mind. Grau raises the critical question, 'whether there is still any place for distanced, critical reflection – a hallmark of the modern era – in illusion spaces experienced through interaction' (**Grau, 2004: 10**) and, in doing so, 'does the 'invisibility' of the VR interface reduce our ability to maintain critical insight?' (**Dare 2019: 234**). If we are to immerse ourselves in VR, what can we do to find criticality and transparency in our understanding of its assembling, the perspectives involved, and the necessary 'return from immersion, [which] implies a dialectical relationship – both a turn to an altered state and return to a more bounded and reflective one' (**Jarvis, 2019: 13**).

Critical reflection was a key principle embedded throughout the *VR Dance* project, with numerous activities providing a mechanism for finding a 'critical distance'. These moments were co-created by, and illuminated through, the entanglement of intra-acting human and more-than-human entities. One young person commented on using a creative journal:

> *Interesting, you know, because I could like express myself in different ways…using different colours to show what different moods I was in...* (**Ben, participant**).

Reflective activities included designing a trainer based on the young person's experience, recording vox-pop style videos showing dance moves, interviewing one another, and writing postcards to themselves in the past/future. These activities highlighted the ways in which a range of human and more-than-human bodies and materialities were involved in the *VR Dance* experience, which stretched beyond the obvious encounters between digital technologies and young bodies: the supporting adults, sketchbooks, stickers, pens, postcards, post-it notes, sports hall floors, cameras and…. In this way and linking back to Barad's thinking around posthuman performativity (**Barad 2003 & 2007**), these activities were not

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about reflection as distance (between knower/knowledge and 'thing' being represented) but the entanglement of materiality, embodied attention, technology, paper, and sticky residues (of the gluey and immaterial kinds) involved in a process of intra-active becoming.

Whilst VR is employed as an agent for shaping behavioural change, the lasting effect of the technological content is not fully understood. Farmer and Maister highlight a series of studies demonstrating that social attitudes towards various social out-groups (e.g., racial groups) can lead to a reduction in prejudice towards that group (**2017: 324**). Whilst this was the reverse in a study exploring sexism that found more sexism exhibited by participants after a VR encounter than in the real world (**Fox & Bailenson 2009**).

Many such studies measure effects of embodiment on attitudes immediately after the VR session with no indication of longer-term effects (**Farmer & Maister, 2017: 343**). In their ethical code for conduct in VR, Madray and Metzinger (**2016**) review initial evidence indicating that immersion in VR can have psychological effects that last after leaving the virtual environment. They argue that VR 'will eventually change not only our general image of humanity but also our understanding of deeply entrenched notions, such as "conscious experience", "selfhood", "authenticity", or "realness"' (**Ibid: 20**). Conversely, Murray argues against the notion of 'VR as a magical technology for creating seamless illusions' (**Murray, 2020: 11**), in which bodies and minds are 'overcome' and changed by the simulated worlds and bodies through their own plasticity. Situating VR, instead, as an emergent medium with evolving media conventions, he writes: 'The future of VR is not an inevitable and delusional metaverse but a medium of representation that will always require our active creation of belief', providing 'new human powers of representation' (**Ibid**).

If engaging with VR technologies (positively and/or negatively) can be conceived as a relational encounter rather than individual pursuit, the ethical arguments made above call into question the power of representation. This becomes important in considering the residues felt by or imprinted on the bodies and minds of the young participants involved in the *VR Dance* project. As outlined, the motivation for the project included supporting behaviour change in disaffected and 'at risk' young people. The hope was that the combination of VR, dance and reflective activities might encourage them to become more empathic, confident, and socially engaged decision-makers through engagement with digital, performative, and creative experiences. Although this wasn't explicit, perhaps the traces of these aims were felt by the YP. As Tabitha

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commented when asked about what they thought about the combination of dance and VR:

> *Mythical! [Researcher: how did it feel?] …exciting to do the VR and dancing you get to experience different things in yourself and when you do them together it takes the bad stuff out of you... I dance to make myself happier* (**Tabitha, participant**).

Whilst this, and other findings from the project, suggest positive experiences and outcomes from the project, critiques suggest that we should be mindful of the longer-term effects such engagements may have and the assumptions surrounding the potential to illicit empathy needs greater consideration for assuming empathy as an individual pursuit afforded by these activities which reveals the desire to humanise (in particular ways) specific groups of people, in this instance YP, through VR (and dance).

Performative disruptions

Whilst the 'empathy machine' narrative is evident and critiqued in earlier sections particularly across literature in Psychology and Criminology, literature in Performance studies tends to move away from binary notions of full body illusion, seeking value in the spaces in between the real and virtual as a site of disruption:

> *Through this disruption there is the possibility for an awakening of non-normative modes of perception, and subsequently a possibility for choices around ways in which the body can re-learn, through its plasticity, new modes of perception* (**Thomas & Glowacki, 2018: 20**).

Puig de la Bellacasa (**2017**) argues for a 'revaluing of touch' in human encounters with technologies of vision, as a way to 'reclaim' these assembled spaces, of bodies and technologies, which are driven through vision-led modes of encountering the world, through processes of reappropriation of the sensory system towards synaesthetic modalities. She writes on touch as a 'neglected mode of relating with a compelling potential to restore a gap that keeps knowledge from embracing a full embodied subjectivity' (**Ibid: 98**) and through 'optic arrangements that generate disengaged distances with others and the world' (**Ibid**).

Through performative rituals and on-boarding and off-boarding processes which centre the user and the body, tooling participants in 'somatic awareness' (**Thomas, 2022b: 24**), and by engaging the participant in a process of critical reflexivity within the artwork itself (e.g., *Can You See Me Now?* by Blast Theory, 2001), VR performance provides opportunities to unpack and to challenge VR empathy claims. These practices and modalities in performance allow us to understand that perception shaping

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does not have to come from an over-emphasis on loosening the boundaries between self and other but can instead be shaped by loosening the boundaries between the real and virtual:

The specific modes of spectator-ship enabled by virtual reality uniquely allows us to relocate ourselves as embodied beings, allowing us to ask questions about embodiment and humanity through the experiences of our individual bodies in a way that has never been possible before (**Popat, 2016: 359**).

On VR Assemblages and Matters of Care

Drawing from a more-than-human perspective, we have suggested that the humanising intentions of VR as an 'empathy machine' are reductive, missing the complexities of entangled human, nonhuman, material, digital, virtual, and discursive elements in the generation of embodied, sensorial, affective, and emotional reactions towards others within VR. We also note that the driver of VR empathy claims lies in the reduction of the senses to the visual, at the expense of alternative, multimodal, and performative ways of seeing, being and caring. By attending to VR experiences as more-than-human entanglements, which traverse not only place but also time, we may enliven/constrain certain possible futures and ways of living in an increasingly sociodigital[v] world whereby: 'The world is an ongoing open process of mattering through which "mattering" itself acquires meaning and form in the realization of different agential possibilities' (**Barad, 2003: 817**).

A recalibration into VR is not a 'becoming other' - it does not reaffirm notions of the unrealisable promissory claims of VR, but acknowledges that transformations, relocations, and calibrations are ongoing, intra-active activities. In the *VR Dance* project, the dance aspect enabled the participants to navigate or loosen (superficial) boundaries between real and virtual - allowing YP to experience embodied engagements across physical-digital-material realities, as well as take on specific 'modes of engagement' (**Popat, 2016: 360**) in spectatorship which disrupted further boundaries between participant and observer. Diffracting the literature and the *VR Dance* data through one another has demonstrated how co-creative practices with participants may offer up marginal stories, disruptive perspectives, and re-configurations of self/other, mind/body, participant/observer. This challenges more simple notions that in placing people 'inside' a VR event it is possible to foster empathetic reactions and behaviour change. Instead, in *VR Dance*, boundaries were loosened and became blurred through the combination of dance and virtual reality technologies which were performed in simultaneously real-virtual spaces by real-virtual (and human and more-than-human) bodies and technologies. As a result of the felt presence of 'others' – including the

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technologies such as cameras, other human participants in their group or their more-than-human 'virtual' selves, the YP negotiated their agential (intra-active) relations of and between 'self' and 'other'. Although these experiences were not exclusively 'positive', with some moments generating anxiety within the young people, their comments relay the need to provide experiences which enliven participants' embodied attention and capacities to flex somatic agency and engage in critical reflexivity. Moving away from individualised and humanistic perspectives of VR as 'empathy machine', the project revealed that practices of care, the 'rituals' of on/off boarding and the negotiation of differences (including different requirements for different bodies), warrant further consideration as:

Situations of care imply non-symmetrical, multilateral, asymmetrical, asubjective obligations that are distributed across more than human materialities and existences (**de la Bellacasa, 2017: 221**).

Acknowledgements

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Lois Peach is a researcher, Graduate Teacher and PhD student in the School for Policy Studies, University of Bristol. Lois' research interests include intergenerational relations, age/ageing, childhood(s), education, health and social care, and social policy. Lois is particularly interested in creative and participatory ways of doing research. She embraces post-qualitative inquiry approaches and more-than-human theory.

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Nina Ross is an ethnographic filmmaker and researcher with an MA in Visual Anthropology. Inspired by the disability arts slogan 'Nothing About Us Without Us' Nina's interest lies in using participatory methods. Her work makes room for a reorientation of the lens, hoping to challenge initial perceptions.

Naomi Clarke is an ESRC-funded PhD candidate at the University of Bristol. Crafting and sewing are Naomi's main areas of focus personally, professionally and within academia. As such, crafting, creativity and material methods are an integral part of everyday life for Naomi whether it be doing it, reading about it or a combination of them both.

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Endnotes

[i] In 2021, the percentage of UK adults to have experienced VR has more than doubled, rising from 10 percent of internet users in January 2021, to 22 percent in December 2021. Almost one in 20 internet-using adults now use VR at least once a week. One in 14 young people (aged 18 – 24) use VR on a weekly basis (Allen and Macintosh, 2022).

[ii] See: https://www.facebook.com/Meta/videos/are-we-there-yet-episode-1-the-metaverse-will-be-built-by-all-ft-vishal-shah/795697994923424/

[iii] See: https://www.youtube.com/watch?v=sziU6-NKiMQ

[iv] See: https://www.ted.com/talks/chris_milk_how_virtual_reality_can_create_the_ultimate_empathy_machine?language=en

[v] The term Sociodigital is used within the ESRC Centre for Sociodigital Futures based at the University of Bristol and refers to the increasing inseparability and entanglement of digital technologies in our social world and lives.

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