Digital Geography 5 (2023) 100075

Contents lists available at ScienceDirect

Digital Geography and Society

journal homepage: www.sciencedirect.com/journal/digital-geography-and-society

Immersive imaginaries: Digital spaces as post place care

Dara Ivanova [a,*,1], Thorben Peter Høj Simonsen [b,*,1]

[a] Radboud University, Faculty of Philosophy, Theology and Religious Studies, P.O. Box 9130, 6500 ND Nijmegen, the Netherlands
[b] Danish Center for Social Science Research, Herluf Trolles Gade 11, 1052 Copenhagen, Denmark

ARTICLE INFO

Keywords:
Imaginaries
Digital geographies
Immersion
Post place
Care
Healthcare

ABSTRACT

With the spread of digitalization, the spaces and imaginaries of healthcare are fundamentally changing, due, in part, to an increasing uptake of immersive technologies. Building on previous ethnographic work on the nature of placed care (Ivanova, 2020a; Simonsen, 2020) this paper explores two cases of immersive technology advances in the Netherlands and Denmark to better understand contemporary developments in digital healthcare, the virtual environments they afford, and the immersive experiences they seek to evoke. First, we offer 'immersive imaginaries' as a heuristic for exploring how ideas of immersion, placeless-ness, and futurity intersect as key stakeholders in the healthcare innovation industry articulate socio-technical solutions to healthcare problems, and to what effects. Second, and in drawing inspiration from feminist STS on care, we build on Ivanova's (2020b) conceptual work on 'post place care' to analyse the relations between place, technology, and care in experiences of immersion. These two points form the contribution of the paper and its ambition to engage with ongoing discussions in the field of digital geography about how to analyse and theorise digital spaces of care.

1. Introduction

Science and technology studies scholars have considered the multiple socio-technical relations between place and care, concerning themselves with how one is integral to the other in different care settings (Gieryn, 2018; Ivanova, 2020b; Langstrup, 2013; Oudshoorn, 2012; Pols, 2012). With the spread of digitalization, however, the spaces of healthcare are fundamentally changing (McLean, 2020), with immersive technologies[2] increasingly being applied in relation to treatment, well-being, and care. Indeed, healthcare is considered among the top industries that will remain leading adopters of immersive technologies, such as sensory reality (SR) and virtual reality (VR). Virtual reality is considered a key innovation in the continuously expanding landscape of digital (mental) healthcare, with clinical studies on exposure therapy, auditory hallucinations, and automated biofeedback currently taking place (e.g. Arnfred, Thaysen-Petersen, Düring, Fink-Jensen, & Nordentoft, 2021; Legind, Faurholt-jepsen, & Benros, 2022). In the contexts that we consider here – Denmark and The Netherlands – such technologies are increasingly re-configuring practices of care by changing relations of proximity and distance in healthcare delivery and by displacing where care might be given and received. This raises important questions about the problematics of care in the specific case of immersive technologies, such as: how are care places being enacted in the context of emerging 'placeless' technologies, and how do these replacements change the very notions of health and place – both empirically and conceptually? To better understand such problematics, this paper explores two cases of immersive technology advances in these countries, the virtual environments they afford, and the immersive experiences they seek to evoke. The Dutch case explores the Sensory Reality Pod (SRP) – a technology, which aims to simulate complete environments with the aim of relaxing, distracting and entertaining patients. The Danish case explores the experimental use of virtual reality (VR) in healthcare, considering, especially, developments in mental health. Extending previous ethnographic (Ivanova, 2020a; Simonsen, 2020) and conceptual (Ivanova, 2020b; Ivanova, Wallenburg, & Bal, 2016) work on the nature of placed care, we examine the evolving nature of digital spaces of care in these two cases of immersive technology advances.

While scholars have drawn important attention to the digital turn in geography (Ash, Kitchin, & Leszczynski, 2018, 2019), the specific relations between care, place, and digital space that immersive technologies bring forward, remain largely unexamined. To be sure, discussions about the digital are not new in the field of geography (McLean, 2020;

* Corresponding authors.
E-mail addresses: dara.ivanova@ru.nl (D. Ivanova), thsi@vive.dk (T.P.H. Simonsen).
[1] Both authors contributed equally.
[2] We use the term immersive technologies here as descriptive of empirical phenomenon, i.e. technologies and applications such as virtual and mixed reality.

https://doi.org/10.1016/j.diggeo.2023.100075
Received 24 November 2022; Received in revised form 24 November 2023; Accepted 26 November 2023
Available online 30 November 2023
2666-3783/© 2023 The Authors. Published by Elsevier Ltd. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/).

Zook, Dodge, Aoyama, & Townsend, 2004) and much important work has been done in considering the impact of digital technologies on health (Lupton, 2018; Thompson, 2021), the spatialities of 'the virtual' (Bos, 2021; Kinsley, 2014), and in generating the conceptual means to interrogate the relations between the spatial, the digital, and the material (Leszczynski, 2015; Leszczynski, 2019). Geography has long been at the forefront of analytically redefining and insisting on the importance of spatiality in all areas of life (Casey, 1993; Creswell, 2004; Massey, 1994; Massey, 1995; Massey, 2005). Together with more contemporary efforts, this work offers important insights into the spatialities of 'the digital', just as it begins to conceptualize the entanglements of the material with the digital. Kinsley (2014), for instance, urges us to consider the material conditions of the digital, an important call that begins to unsettle the dichotomization of the material from the digital that existing terms – such as 'digital space', 'virtual geography', and/or digital care' – inevitably seem to deploy. Building on this work, and in furthering Kinsley's development of theoretical resources to analyse spaces of digital care, we suggest that we need a stronger sense of the ideas that inform the development of such spaces and a better conceptualization of the role that place plays therein, in order to more precisely name and investigate the implications of immersive technologies in healthcare advancements. We therefore combine important insights from science and technology studies and human geography, in an attempt to conceptualize the place of care in the context of digitalization.

Although the anticipatory narratives of immersive technologies are nested within a broader media and cultural ecology (Bos, 2021, p. 4), for the purposes of this paper, we mobilize the two case studies to consider the 'therapeutic promises' (Pickersgill, 2011) of these immersive technologies and their consequences for care in place (Ivanova et al., 2016). As Henwood & Marent (2019) point out, exploring how digital health is talked into being through promissory discourses and practices may explicate important contradictory virtues and ambivalences within technology advancements in healthcare. Representations of immersive technologies are neither innocent, nor passive, but rather perform certain understandings of place and care that "create anticipatory logics and desires which are constitutive of how, what, for whom and where such technologies are made to matter", as Bos (2021, p. 5) articulately summarizes the issue. Bringing this sense of urgency to the question of how place works – and even what it is – in simulated and immersive environments (see also Bartram, 2020), we propose *'immersive imaginaries'* as a heuristic to explore the spatialities and, in many cases, assumed placeless-ness, of virtual and sensory reality in healthcare.

This furthermore raises questions about how such technologies are envisaged and what kind of spatial promises are linked to their application. Inspired by recent studies of the imaginaries of other emerging technologies (Egliston & Carter, 2020; Hockenhull & Cohn, 2021; Kang, 2022), we analyse how immersive technologies like VR and SR both enable a therapeutic technique of immersive experience and enact forms of spatial imagination relating to particular practices of care. Thinking with the heuristic of 'immersive imaginaries' will allow us to show how technology developers in Denmark and the Netherlands perform particular ideas of the relations between place, care, and technology. As such, our analysis shows how these ideas work to transition places of care into the realm of 'experience', with 'the digital' enabling an immersive infrastructure of care.

To better understand what such places *do* in the production of digital spaces of care, we draw on feminist STS (de la Bellacasa, 2017; de la Bellacasa, 2012) to move beyond the discourse of so-called technologies of placeless care (Cutchin, 2002; Langstrup, 2013; Oudshoorn, 2012; Pols, 2012) and to direct attention toward the importance of the material circumstances (Brownlie & Spandler, 2018; Buse, Martin, & Nettleton, 2018; Kinsley, 2014) that enable the enactment of digital spaces of care. The spatiality of digital care practices is best understood as what Ivanova (2020b) has called post place care – a concept that we apply and further develop as we consider how the relations between place, technology, and care are imagined by technology developers. The term is useful to us here, because it unsettles assumptions between place and care in the context of digital care technologies – an important step in our analysis of immersion as imagined and produced in healthcare. Unsettling place-care ontologies will, as Ivanova (2020b) has argued, open up a "productive space for thinking through the changing landscapes of digital healthcare" and will allow us to interrogate the spatialities of immersive technologies and to critically investigate what Boellstorff (2016) has called a "false opposition between the digital and the real" (see also Kinsley, 2014; McLean, 2020). Author 1 explored these ethical and practical issues elsewhere (Ivanova, 2020b), leading her to the conclusion that post place is distributed, entangled, and layered, which, in turn, poses ethical concerns because it crosses boundaries and charts spaces of care that have so far been unexplored.

This paper aims to: 1) problematize the boundaries being drawn between physical and digital spaces in healthcare, 2) understand how digital spaces of care are being imagined as 'immersive experiences', and 3) provide a vocabulary to think through and beyond dichotomies within digitalized care places. Our guiding question in this paper is *how is immersion being mobilized by tech companies in articulating the future of care and how does this challenge the meaning of place?* We do not propose to move beyond existing conceptualizations of space and place as such, but, instead, propose that we think through specific instances of healthcare technology advancements to better understand the impact they have on already existing conceptualizations. The notion of post place "imagines how our thinking on placed care might evolve" (Ivanova, 2020b, p. 1299) and our two cases are well suited to interrogate these issues, as care, we argue, is an effect of the entanglements of the digital, the material, and – importantly – the imagined.

2. Thinking with care

Our analysis is inspired by de la Bellacasa (2017) suggestion that care can be mobilized as an analytical device or 'provocation', as an invitation to investigate questions of care in technology advancements by standing on ambivalent grounds. As Haraway (2016, p. 1) similarly encourages, we need to 'stay with the trouble', to be present, that is, and draw attention to the "myriad unfinished configurations of places, times, matters, [and] meanings". Resonant with this call to focus on unfinished configurations, Puig de la Bellacasa argues for the importance of looking at 'more-than-human-worlds' and works with three dimensions of care to do so; affective, ethico-political, and practical, arguing that the situated tensions between them should be kept alive in analysis. She (de la Bellacasa, 2017, p. 6) furthermore suggests that these dimensions be studied through 'interrogative oscillations' as it opens a terrain for exploring how the question of care is to be posed. Importantly, this terrain is constituted by, and inseparable from, sociopolitical processes and imaginaries (María Puig de la Bellacasa, 2017, p. 17), with 'the digital' increasingly challenging the way we can think through the changing nature of place in healthcare (Ivanova, 2020b).

For us, these analytical propositions invite us to interrogate the use and application of immersive technologies in healthcare by considering the interdependencies of the material and the digital in the experience of immersion and by focusing on the interconnectedness of technology and place in the production of particular spaces of care. 'Thinking with care' thus invites us to move beyond dichotomizing the material vs. the digital and to engage with the imagined futures that come with the introduction and application of immersive technologies. Following such an analytical proposition will allow us to unsettle contemporary imaginaries about digital spaces of care and show that such places are always already dependent on specific material infrastructures, informed by particular ideas, and enacted by certain people, i.e. they are already to be understood as post places of care.

Drawing inspiration from these feminist scholars will also allow us to address, and slightly move beyond, Kinsley (2014) suggestion to focus on human-technology relations in the analysis of virtual geographies.

While we agree with Kinsley that we need to attend to "how the material fabric and social relations of places are constantly created" in the digital, we suggest that the question of care also requires us to consider the questions: *who* cares and how do they *imagine* care? Including an analytical focus on the 'immersive imaginaries' of technology developers affords us the possibility to also interrogate how ideas about the future shape human-technology relations in the production of digital spaces of care, places that we then mobilize the concept 'post place care' to name and further interrogate. While digital geographies are opening up rich grounds for thinking through the empirical and theoretical consequences of emerging technologies in healthcare, we wish to further fertilize these grounds by bringing the propositions made by Puig de la Bellacasa to bear on the development of new theoretical resources to support analysis of immersive technologies in contemporary healthcare.

Puig de la Bellacasa builds on Tronto (2013) definition of care, which includes "everything that we do to maintain, continue and repair our world so that we can live in it as well as possible." This broad and inclusive definition of care invites us to think about *how* care is enacted and enabled and how to care well, furthermore leaving open the question of who or what may play an important role in actualizing such care. Leading STS-scholars (Mol, Moser, & Pols, 2010) have proposed to think about the practice of care as a "persistent tinkering in a world full of complex ambivalences and shifting tensions", highlighting the everyday work and mundaneity of care in different care settings (Denis & Pontille, 2015). In later developments, especially in feminist technoscience, the politics of care and questions of power have been foregrounded (A. Martin, Myers, & Viseu, 2015), with approaches looking to 'unsettle' easy assumptions about care (Murphy, 2015) by offering situated critiques of care and its politics.

The analytical task of interrogating post place care as partially produced by particular immersive imaginaries must, if following the direction set by these feminist scholars, explicate forms of attachments, commitments, and displacements in established hierarchies of value in order to understand "how divergent modes of valuing care coexist and co-make each other in non-innocent ways." (María Puig de la Bellacasa, 2017, p. 12). Put differently, care and practices of care are always already "shot through with asymmetrical power relations" (A. Martin et al., 2015, p. 627), begging the question: who has the power to care? And, we might add, *where* is care placed?

3. Methods and cases

This paper presents a conceptual argument, based on two cases – one in Denmark and one in The Netherlands. We employ these cases empirically to think through how immersive technologies of care challenge and alter the notion of place and with what consequences. Our analysis is explorative in nature, aiming at creating space for re-thinking and problematizing common assumptions about digital care practices and technological innovations in healthcare. As such, we attempt to "stay with the trouble" (Haraway 2016) that placeless care discourses create and perpetuate.

Both cases are based on ethnographically collected material in the time period 2018–2022. Each author collected data on one case, with both authors discussing the collected material extensively among them. The data was collected by conducting semi-structured qualitative interviews with key stake holders, technology developers, directors, and users, as well as through informal conversations, written material (website, media, and presentations), and by attending company events and workshops. Both authors also conducted auto-ethnographic work (Ellis, 2004), using the technologies under study and writing extensive notes about their experiences. This work allowed the authors to 'be present', in Haraway's understanding, to pay attention to the entanglements of places, times, matters, and meanings. The collected data was coded openly first and then within conceptual themes on place, immersion, and imaginaries separately for each case. All quotes are translated verbatim from Danish and Dutch. Drawing on multiple data sources, while also experiencing the technologies, we attempt to analytically perform the 'interrogative oscillations' that Puig de la Bellacasa (2017) argues opens a terrain for exploring how the question of care ought to be posed.

The discourse of digital innovation in healthcare is prominent and pervasive in both Denmark and the Netherlands, with Denmark considered the most digitalized country in the world. Strategy documents describing the need for better digital healthcare exist in both countries (Oldenhof, Postma, & Bal, 2016; Regeringen & Regioner, 2013; Sundheds/ældre-ministeriet, Finansministeriet, Danske Regioner, Kommunernes Landsorganisation, 2018), with a recent commission in Denmark further calling for digital innovation and increased uptake of digital technologies to ensure a healthcare system that is close to its citizens (Indenrigs- og Sundhedsministeriet, 2023). Indeed, digitalization in these countries is redefining place-care relations in healthcare delivery. Working with the Danish and Dutch contexts in relation to the development of immersive technologies within the broader context of digital health was, therefore, a deliberate choice. Both countries seek to foster innovative environments, where research and technology developers can be brought together to develop high-tech solutions to the healthcare problems these respective countries face. The 'International conference on VR in mental health' held on the ninth and tenth of November 2023 in Groningen, Holland, but co-organized with Danish researchers, being a good case in point. In fact, the technologies considered in this paper were both represented at the conference, which had the stated goal:

> "to create a platform for showcasing what is currently happening in the field of VR Mental Health research and what innovative new horizons are emerging. We aim to provide a space where VR researchers and other partners can meet, creating synergy and fostering new collaboration."
>
> (VR in mental health homepage)

It is obvious here how technology developers are invited to help define what 'new innovative horizons are emerging', with researchers and technology developers brought together in an effort to foster new collaborations.

The Dutch case is a recently developed technology of "sensory reality" (Fig. 1). The technology is also referred to as 'mixed immersive reality' and is claimed to be able to 'trick' the human brain into believing that one is elsewhere. This technology is based on stimulating all human senses simultaneously, thus creating an environment of "total immersion". According to the company behind the Pod – Sensiks: "It is possible to recall memories from the past, to create new stress reducing events or present experiences that provoke a euphoric state of mind" (Sensiks website). Sensiks is a Dutch start-up tech company, which currently has placed SR Pods in several Dutch care organizations, as well as a pilot program in the UK's National Healthcare Service (NHS).

The Danish case considers 'Khora', a Scandinavian virtual reality (VR) and augmented reality (AR) production studio that creates content for a variety of industries and within multiple application areas. Khora, founded in 2015, is a company that seeks to "push the boundaries" of healthcare in Denmark by bridging the gap between material and digital worlds and by offering a "space for people to develop and let loose their wildest imaginations" (Khora website). The company name – 'Khora' – is a concept originally derived from Plato's famous dialogue of Timaeus about the world's creation, something the company highlights on their homepage, and market themselves by at events. From their website we learn, that khôra, in Plato's account, is described as an interval, alike to a non-being shaping into the forms of the sensible realm; a place between the real and non-real that wavers between what we can sense and what is yet to be. According to Khora, they were created to bridge these places, to connect material and digital worlds. In this account, we find a clear separation of the material and the digital. Such separation, together with their ideas about spatiality and experientiality, raise

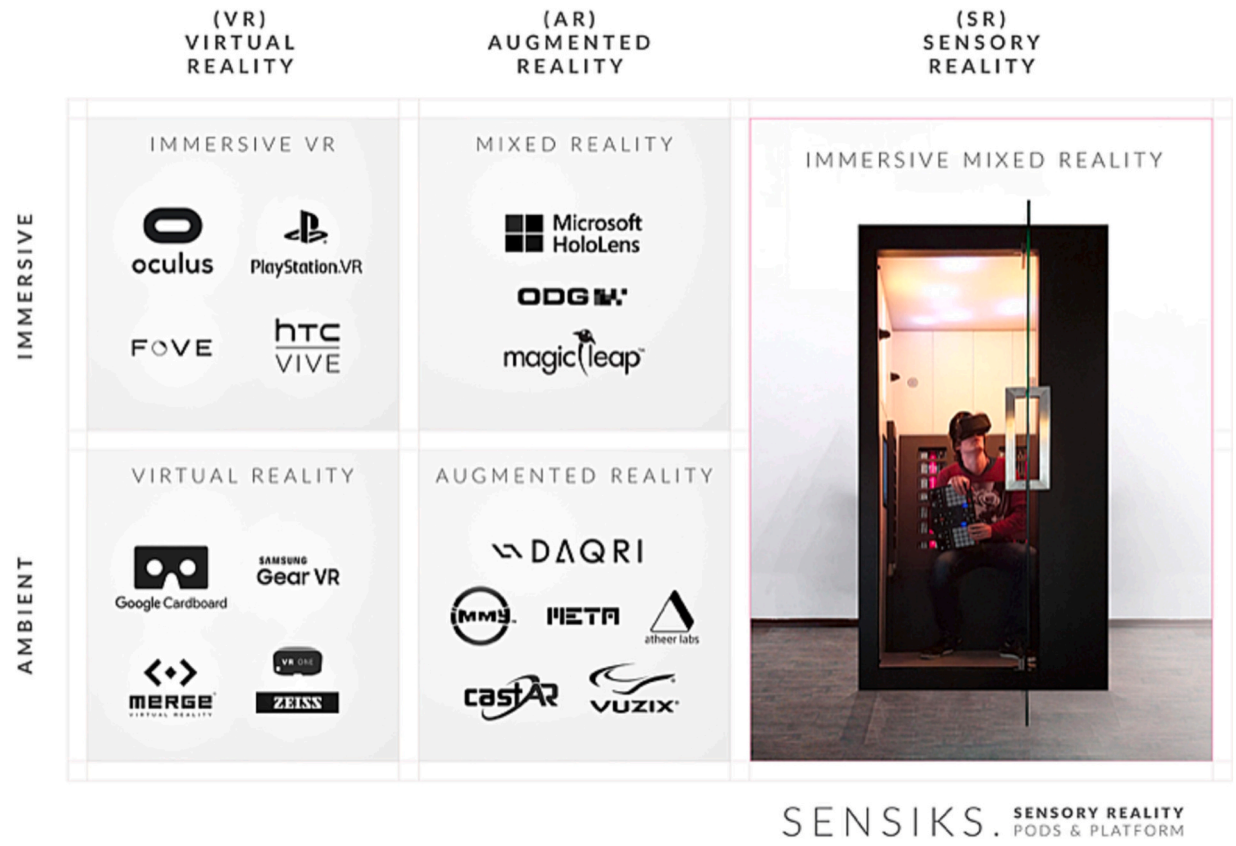


Fig. 1. Visualization of sensory reality as a type of reality. Image from Sensiks website, with permission.

important questions about the significance of place in digital health practices. Indeed, where do these leading developers of immersive technologies imagine care to take place?

4. Analysis

Our analysis focuses on two immersive technologies that have been employed within healthcare contexts and have the ambition to expand their role in this field. We present these cases in three steps: 1) understanding immersion as a technique of experiencing 'elsewhere', 2) describing the imaginaries of immersion that construct (digital) spaces of care as an 'immersive experience' and 3) untangling the assemblage of healthcare digitalization and the articulation of digital space within it by bringing the idea of immersion together with the imaginaries underpinning it. The first two steps present the empirical data collected, while the third step is our attempt at understanding how digital spaces of care are displaced to 'experiences' and, as such, imagined to be placeless. In this way, we unsettle the imagined placelessness by mobilizing the concept of post place care instead, showing the interconnectedness between technology and place in the process of care.

4.1. Part I: Immersion

Immersive experiences are said to be less about where you actually are, but all about where you think you are, with the manipulation of psychological mechanisms producing experiences of 'realness' (Madary & Metzinger, 2016) at the heart of the much sought after experience of complete immersion and sense of presence. Presence is considered the sine qua non of immersive technologies (Bailenson, 2019, p. 19), with virtual reality cast as an 'experience generator' that, according to Stanford Professor and VR advocate, Jeremy Bailenson (2019, p. 46), produces 'actual' or 'real' experiences as opposed to mediated ones. These technologies arguably dis-place care to the space of phenomenology, to experience, that is, and, as such, imagine a placeless place for care to unfold. Indeed, Bailenson insists that the experience of immersion that VR enables does away with the material circumstances and infrastructures that make it possible: "When VR is done right", he argues, "all the cumbersome equipment – the goggles, the controller, the cables – vanishes [and t]he user becomes engulfed in a virtual environment that simultaneously engages multiple senses, in ways similar to how we are accustomed to experience things in our daily 'real' lives." Bailenson takes the point home by stating that; "VR technology is designed to make itself disappear" (Bailenson, 2019, pp. 44–46). Here we find a strong belief in the illusion of non-mediation.

Echoing Bailenson, both Sensiks and Khora highlight that the immersive technology 'disappears' as the immersant is 'fully enclosed' and situated in a place of 'total immersion'. Indeed, once immersed, one allegedly has "no sense of the real world" (see Fig. 2). For us, this raises important questions about the interconnectedness between the material and the digital, especially as 'the real' becomes cast as something outside of the digital.

Interestingly, we encountered Bailenson's work in the arcade at Khora, the shopfront and showroom strategically made visible to any passer-by, exhibiting plants, retro modernist furniture, a variety of posters, an assortment of gadgets and tech paraphernalia, but, most importantly perhaps, the active use of virtual reality by visitors (see Fig. 3). Khora is situated in the meatpacking district in Copenhagen, with white tiles and the somewhat raw aesthetic of the space shaping the entrepreneurial atmosphere of the company.

In one of the experiences offered at Khora, we meet 'avatar-Bailenson', who brings you into several simulations and scenarios that are at the cutting edge of VR, and we are led to understand that this cutting edge is being delivered right here in Copenhagen. While advocates and technologists argue for the 'power of presence' produced by immersive experiences and, by consequence, the disappearance of materiality, in the following we explore how VR and SR experiences seek immersion.

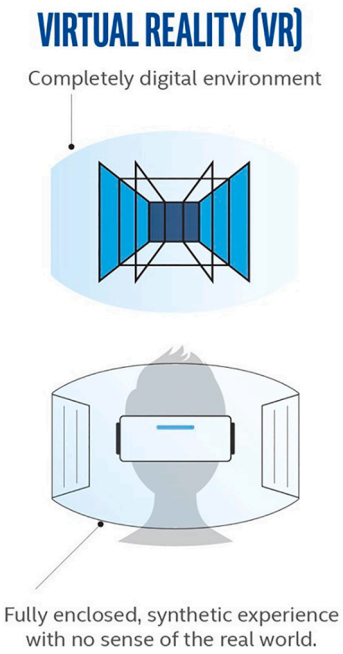


Fig. 2. Image from ppt. Presentation given by the Head of Healthcare, Khora.

By way of auto-ethnographic illustrations, we show how entanglements between the digital space of simulations and the material infrastructures that enable them are in tension, rather than seamlessly separated. We begin with Author 1's experience of the SR Pod.

> "My palms are sweaty. I try to grasp the wooden plank, on which I am sitting, but it slips away. 'This is where I am sitting', I think to myself, trying to picture the dark wood beneath me and the cabin around me. However, my senses seem to work against me – I feel a cool breeze running through me, an unfamiliar smell, and a falling sensation. The strange colorful forms I see and the rhythm they form are mesmerizing. I am in a black abyss, shooting through space and neon orange hoops. 'I am sitting on a wooden bench in a small cabin, in an office in Amsterdam', I tell myself again. But then the sensation changes, as the temperature rises, and I feel warm. The space I am in (or am I?) is beautiful and suddenly calm. It feels like flying – or what I imagine flying would feel like. In a few minutes, the 'experience' is over. I am jerked out of that calm space and find myself on the bench, in the cabin, taking my VR goggles off. On the panel to my right, I see my data – my heart rate is back to normal. A smiley face on the screen asked me to rate my time in the cabin. I press the big smile without thinking – it was amazing to be able to fly."

This auto-ethnographic vignette was jotted down shortly after Author 1 was immersed into one of the Sensory Reality Pod's (SRP) experiences. While trying to write down as much as possible of what she had seen and felt, she wondered – *where* had I just been? Was she inside a wooden cabin in an office space or was she floating in space? Had she been in both places simultaneously or does that distinction even make a difference? How should we think about this as a place for care? Similarly, Author 2 reflects on the breakdowns between the material space of the arcade and the digital space of the simulation during his experience of 'walking the plank' at an organized workshop at Khora:

> "I put on the HMD [Head Mounted Display] and suddenly find myself in an elevator. The doors open and I am standing in front of 'the plank'. In the material space of the arcade, a wooden plank is placed on the floor. In the digital space of the simulation, I also see 'the' plank, except I find myself at the top of a very tall skyscraper. Animated to walk into midair, I am simultaneously able to tap my feet to the ground of the arcade whilst moving slowly forward. At the end of the plank, a phone is ringing, and I am asked by a Khora employee outside the simulation to walk over and pick it up. I keep my balance and focus on walking slowly across the plank, moving simultaneously in both the material and the digital space, achieving a sort of spatial alignment, I think to myself. When I pick up the phone the plank suddenly disappears, and I 'drop' into the abyss."

Throughout the simulation, Author 2 continuously reminded himself

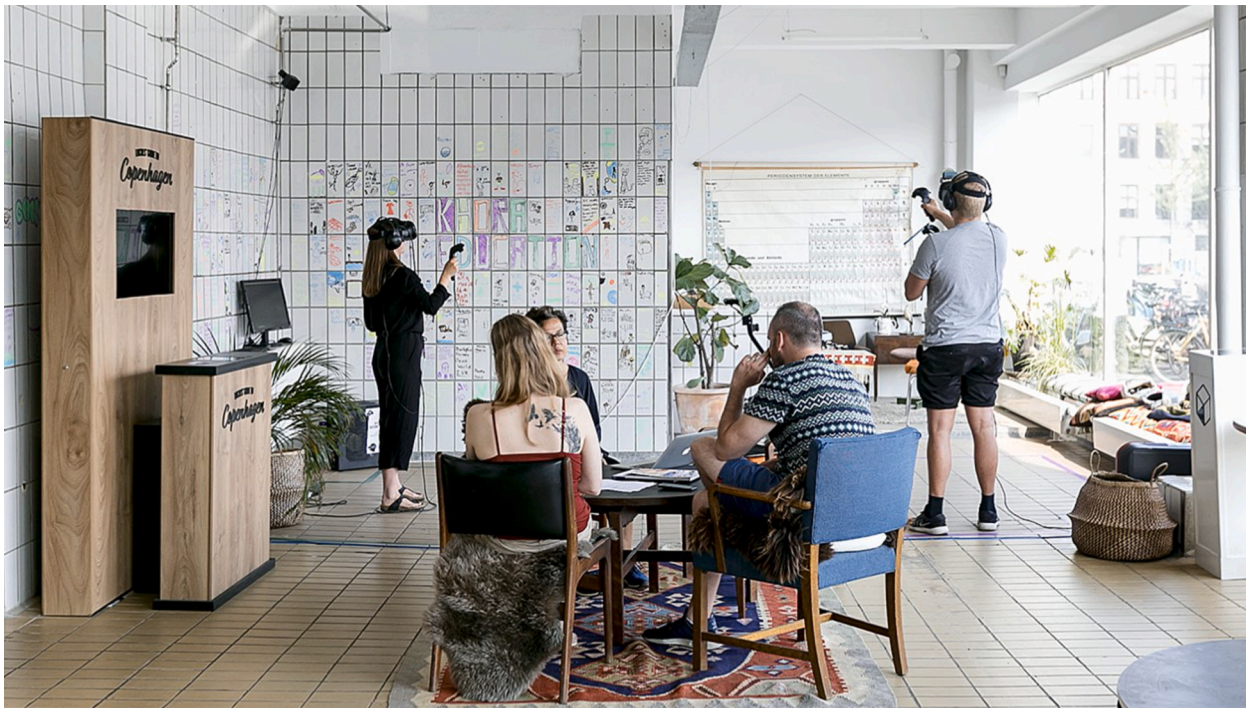


Fig. 3. Photo of arcade, from ppt. Presentation given by the Head of Healthcare, Khora.

that he was standing on the shopfloor at Khora, attempting to trick the trick of the simulation. When the plank disappeared, he therefore managed to keep his composure, despite the VR simulations attempts to provoke otherwise. However, at the very moment when the plank disappeared in the virtual space, the employee from Khora helping him navigate the immersive experience grabbed his arm, preempting his reaction in the digital space. In this moment, Author 2 reflects, it is like the immersive experience collapses or is breached: the simultaneity of being both here and there, both on the shop floor and in the digital space is 'revealed' and relations between the 'real plank' and 'the digital plank' are exposed:

> "Her touch jolts me out of the immersion and reminds me that I am two places at once. I share, that I found it odd when she grabbed my arm, and another Khora employee, interjects and says that her grabbing me was 'an anchor to reality' a 'grounding' that bridges my experience with being both in the room and in the digital space at the same time."

The 'power of presence' arguably produced by immersion is clearly unsettled in both cases, with both authors reflecting on the different spatialities evoked during immersion. Such experiences bring about numerous practical and ethical issues in relation to care practices. To start with, the immersive 'experiences' are heavily structured as they are created by digital developers, who are rarely – if ever – trained in healthcare. Their intentions of allowing people with depression, trauma or anxiety to "disappear into another world" are well intentioned, but there is a lack of an ethical framework for how the respective technologies should be employed – something other scholars have also pointed to (Kellmeyer, 2018; Madary & Metzinger, 2016; Marloth, Chandler, & Vogeley, 2020). The technology developers in our cases navigate these issues by positioning themselves outside the problem, as it were, understanding themselves as content providers, rather than care professionals. They are on the 'technical side' as the Head of Healthcare from Khora says before he explains that "we put the ethical aspect over on our partners". The Head of Healthcare was quite adamant about how Khora were simply solving problems others defined, especially as they don't consider themselves 'experts', as he explains. Resonant with this way of positioning oneself outside the ethical dilemmas, a Sensiks employee described it like this:

> *Interviewee:* We create the content that the patient wants. So, for example, you can create your own experience. We are working on ways of developing this…we want the client to tell us what they want. And then we will make it.
>
> *Researcher:* What about violent content or pornographic content for instance? Would you make anything they order?
>
> *Interviewee:* Well, I don't know…If the patient wants this content, we are there to make it. For people that are ill, I suppose it would depend on their care givers or their doctors. We don't really have a say in this, we are a company that makes experiences…

Practically, the Pod presented problems within care organizations, who were eager to make use of it, but were not quite sure how. In a care organization for assisted living in The Hague, the Pod was placed in a small, dusty room at the end of a long corridor, away from the apartments of the residents. This seemed inconvenient, but there was a reason for it, as the manager explained: "it made too much noise". When initially, it was put in the center of the living space, the experience inside 'spilled over' to the people watching TV or having tea and a conversation there. Putting it far away solved the noise problem, but it made it difficult for the nurses to bring residents to it. Some residents needed assistance to reach the end of the long corridor, to get in and out of the Pod, and to make their way back. Nurses found it to be cumbersome to bring patients up and down, resulting in the Pod being used less than initially hoped. This begs the question – how did we get here, to this placeless care utopia,[3] which does not seem to quite work in practice?

4.2. Part II: Imaginaries

Scholars in science and technology studies have developed the conceptual means to better understand and critically engage publicly performed ideas about the future in relation to technological innovations. Jasanoff and Kim's (2009) work on 'socio-technical imaginaries' has been particularly impactful, moving scholarship on imaginaries beyond the study of social phenomena, to; instead, consider imaginaries as co-constituted through understandings of knowledge and technology in practice. Here, the concept of imaginaries allows you to capture the relations between ideas of futurity and technological development so central to contemporary innovations in healthcare. While Hockenhull and Cohn (2021) have shown how this understanding lends itself well to the study of 'hype' in relation to the production of digital futures in tech, it is the head of healthcare at Khora, whose matter-of-factly articulation of our contemporary situation exemplifies it perfectly: "we are in a post-democratic world", he says, before sharing his premonition that "it [our society] will become…a tech-monopoly".

Such imaginaries are important to explicate and embed, to question and challenge, something scholars have done in recent work on the socio-technical imaginaries of data (Kang, 2022; Ruppert, 2018), algorithms (Bucher, 2017; Kazansky & Milan, 2021), and smart cities (Rahmawan-Huizenga & Ivanova, 2022; Sadowski & Bendor, 2019). Scholars in the sociology of health and illness have also studied algorithmic imaginaries and their role in assemblages of care (Schwennesen, 2019). Relatedly, Pickersgill (2011, 2019) points to the 'therapeutic promises' of neuroscience and digitalization in psychiatry, drawing attention to how biomedical virtues are mobilized to legitimize new technological ventures. Our interest in this paper is on how socio-technical imaginaries of immersive technologies, perform spatialities and infrastructures of care. This interest is resonant with that of Chateau, Devine-Wright, & Wills (2021), who explore the spatial imaginaries of energy futures, identifying different types of spatial imaginary and arguing that socio-technical imaginaries are "themselves always spatial" (Chateau, Devine-Wright, & Wills, 2021, p. 3). In taking this point seriously in our analysis, and in moving beyond what Kinsley (2014, p. 365) has named the "frictionless immateriality of virtual geographies", we examine the relationship between the spatial and the imaginary by focusing on how *immersion* transforms this relationship.

Immersive technologies like VR and SR seek to produce a sense of total immersion and a complete sense of presence, in turn, separating the digital from the material as the immersant is embedded in a virtual reality. However, drawing boundaries between the two are problematic and the authors' own 'immersive experiences' reveal the entanglements between them. Nonetheless, these technologies are cast as enablers of spatial experiences that may move any immersant away – for a moment at least – from circumstances that may be problematic for processes of recovery and healing. For instance, VR is considered by many to open a new therapeutic space, moving patients away from clinical settings considered to be detrimental to recovery. As such, VR facilitates a spatial solution to a spatial problem: by placing patients in the digital space afforded by VR, the negative effects of clinical spaces are alleviated. As the Head of Healthcare at Khora explains:

> VR can be used "to get away from the dry, clinical environment, which is almost as harmful as the illness you have. Be it depression, immobility. These are some of the biggest pathogens. Mental health in a hospital is very low."

[3] Utopia – from Greek οὐ ('not') and τόπος ('place'), meaning literally not a place.

Interview, Head of Healthcare, Khora, 2021

According to the Head of Healthcare, we are at a moment in time where the use of immersive technologies in healthcare is being shown increased interest by healthcare providers and key stakeholders in different healthcare settings. The potential of the technology is increasingly being recognized. For Khora, mental health is going to "be big" he explains. Khora have immersive experiences for exposure therapy and for treatment of auditory hallucinations, allowing for novel treatment practices to take place, as digital avatars and virtual environments replace role play and the risk of engaging actual places. When asked about this particular moment in time and whether the process of maturation is part of a broader digitalization process, the Head of Healthcare replies reflectively: "What is healthcare? Is it bricks, or is it a system?" This leads him to consider that healthcare is "very bureaucratic", with "gigantic barriers" and "regulatory things" that make it difficult to implement and innovate existing medical and therapeutic practices. However, most of all, healthcare is very slow to implement change:

> "It is said that the healthcare system is always terribly slow. It's a slow machine. It takes between 7-10 years from when a new technology comes out until it is close to being able to be implemented. So it's a completely different pace than in much of the rest of society. […] When the iPad arrived, the public health service began to purchase iPads in small innovation projects, without knowing what they would use them for. They just bought them and used it to read PDFs. Totally mind-blowingly conservative and not out of the box thinking. This is kind of what is happening with VR"

Interview, Head of Healthcare, Khora, 2021

Although the technology itself exists, is ready to use, and adaptable, the circumstances into which it is supposed to work need to be considered. Nonetheless, the technology is considered to have massive potential, as the Head of Healthcare explains: "In my eyes, it's not just a technology. It marks a paradigm shift in the way we live and work." Clearly, the promises of VR have yet to be realized. However, the hopes for it to do so are very much alive, with imaginaries of displacement (moving patients 'out of' detrimental clinical settings or placing them in safe and controlled environments) and dispersion (everybody will soon have access to the technology) pacing development forward. "It's like being at the beginning of videogame advancements in the early 80s", as one lead developer explains in a promotional video. Furthermore, because leading technology developers and big tech companies are investing heavily in the development of immersive technologies, the technological capacities are also changing. Biometric and motion sensors, data storage, and retina tracking are just some of the advancements currently being tested. The Head of Healthcare explains:

> "they [Big Tech] care a lot about intentions […] So, it's like reading minds, but they do it just milliseconds before you make a decision […] It will be totally next level on these VR headsets. There will also be eye tracking, biometric censors, you can influence on a completely different level."

Interview, Head of Healthcare, Khora, 2021

Similarly, the SRP was presented by its makers and seen by care organizations in the Netherlands as a technological innovation that will make more efficient, less expensive and will provide more personal care 'experience'. This discourse is predictably promissory (Pickersgill, 2011; 2019) and future-driven ("The Pod *will* solve healthcare problems", "it *will* be available in every building in the future", "people *will not* travel by plane as often"). Importantly, these imaginaries are presented within a larger understanding of 'good care' and values, such as sustainability, climate neutrality (the Pod's cabin – is made of sustainable materials and the design may be printed in 4D, so that it can be put together in place) and ideas about making the world better by creating a different experience for everyone:

> "We are not here to just make money; we want to contribute to making the world a better place. We want people to be happier and less lonely. The Pod is a place that can help people alleviate depression, trauma, burnout. But it is also a place that can help you go back to yourself."

Interview SR Pod creator, 2019

In this imaginary, making the world a better place begins with oneself and by finding a space for connection to the self. We may see this as a spiritual notion of connecting to authenticity, which has been lost. In many of our conversations, Sensiks' employees talked about "finding peace" and a space for connection as a lost art of being:

> *Interviewee:* We live in this concrete jungle we've made for ourselves. All we want is to escape somewhere, go to the beach, go to a faraway place. And of course, we feel this way, look around you – all these cars and buildings, we are so stressed. People are burning out, because they have lost their connection to nature, to who they are. There is depression, anxiety, burnout, but also trauma. […] And the thing is, we can't just fly to Bali every week, you know? All this traveling is killing the planet. So, there must be another way of finding peace.
>
> *Researcher:* We all need to have a personal Pod then?
>
> *Interviewee:* Why not? It will solve a lot of problems. We won't need so many meds and pills and doctors, if we had this way of being; this way that is more natural, more connected.

Interview SR Pod creator, 2019

These imaginaries of connection, authenticity, sustainability, and improving our societies are important to consider in the light of immersive experiences. Immersion seems to be sketched and understood both as a technical achievement, which removes patients from clinical, dry environments to transport them into a caring experience, and a spiritual, ethical achievement, which would make the user 'a good citizens' and perhaps even 'a good earthling'. As we read on Sensiks's website:

> "Pods can be used to conjure 'out of body' experiences that induce euphoria, relive and process memories from the past, and improving quality of live by offering therapeutic solutions, joy, connection, happiness, and play."

'Out of body' experiences are purposefully not placed; we do not know 'where' they happen, yet we are told where they are not – the body. We should note here that these descriptions do not show what the experiences are either, but only emphasize the lack of situatedness – the immersion elsewhere is enough to offer "therapeutic solutions, joy, connection, happiness, and play." Immersion, therefore, is key. The allure of immersive experiences in healthcare is growing, particularly in relation to mental health care. The SRP offers neurological stimulation therapy for PTSD cases of soldiers (see Fig. 4), which is based on "sensory stimulation and biometrics", allowing a patient to relive trauma in a safe environment. The image depicts how placeless-ness and experience (of *another* place) coexist effortlessly within the imaginary of immersion. The promissory discourse of the technology – and its claim to "sensory reality" – is very popular and holds much promise for the future, not only in relation to trauma therapy, but also in relation to burn-out and as a supplementation of behavioural therapy (see also Brandt, 2016). Therefore, scholarly discussions of place as a therapeutic environment (Gesler, 1992, 2005) should be re-examined in the context of such digitalized therapy tools (cf. Thompson, 2021).

Furthermore, the imaginary of connection, to oneself and others, is an attempt to ground the technology into an older pattern of living, one



Fig. 4. PTSD therapy-based visualization. Image from Sensiks website, with permission.

we have inherited by our ancestors. It is not a coincidence that the Pod creates experiences of nature, as it imagines the future as taking a step back: from the concrete jungles we have built to the beach or the lake or the ocean (Fig. 5). Fig. 5 captures this imaginary of transition back to nature in literally depicting a place-transformation happening inside the Pod. These discourses have important consequences, as their ideas of what nature is (green, calm, safe) is a particularly stylized version of the natural world; it is a nature made for humans and it perpetuates a dichotomy between natural as calm and healthy vs. artificial/man-made as toxic. However, such distinctions do not hold to scrutiny, because the SR version of nature is completely man-made and artificial.

Immersion, then, is about displacement; getting away from *this* place to experience *that (or any)* place. But 'that' place is always already contingent upon the material infrastructures that enable digital reality and, therefore, entangled with the material spaces within which any immersant might find herself. Moving care to the place-less place of experience is in this sense utopian. More productively, we argue that these immersive imaginaries may better be understood as post places of care.

4.3. *Part III: Post place care*

The technological affordances of immersion, combined with industry imaginaries of immersive experiences leading healthcare into a better, more efficient, and even more 'natural' future, show that the place of care is currently undergoing important shifts, both conceptually and practically. In this third analytical section, we attempt to make sense of this development through the concept 'post place care'.

As Ivanova (2020b) has argued, healthcare has entered the arena of post place care, where on demand digital places are being created in a top-down manner with little thought or understanding of what these digitally produced and materially placed spaces do to care practices. Post place care is first and foremost a way of talking about care spaces, such as those produced by Khora or the SR Pod, that are located both beyond and within the material-digital dichotomy. Secondly, the concept signifies not only an entanglement of materiality and digital



Fig. 5. Sensiks illustration of the SR Pod. Image from Sensiks website, with permission.

space, but also top-down, proscriptive (cf. Nettleton, Buse, & Martin, 2018), and heavily structured practices. However, as analyzed currently, post place care falls short in one important aspect, namely in how imaginaries of experiencing immersion are taking a lead in emerging healthcare technologies. We show here that post place care is present within particular imaginaries of futurity and care. The companies that produce and present placeless-ness envision the future of care as a deterritorialized space that may happen elsewhere, nowhere, and everywhere, thus driving the development of technologies that are not only placeless, but *totally immersive*. This element of immersion is therefore a key component of post place care, which contains and advances a particular spatial imaginary of *experience*.

Based on the above presented data on immersion and imaginaries, we argue that this displacement of care to a placeless experiential space has consequences for care practices, with these becoming 'experiences'. Let us explore these consequences of displacement. It is rather unclear what is meant by the notion of experience in this context; the therapeutic promise of healing and/or caring through creating experiences must be critically examined. This is particularly obvious when considered together with the notion of 'nature' and 'the natural', and there are parallels here with discussions on the promises of so-called healing architecture (Simonsen, Brown, & Reavey). The SR Pod attempts to recreate what we have lost; the imaginary of nature as healing is a powerful force driving digitalization of healthcare and wellbeing. What is more, both cases presented here point to an urgent need to examine the ethical considerations underpinning care displacement toward digitalized experiences. Post place care by definition lacks ethical boundaries; it almost displaces those back to the material spaces digitalized practices hope to leave behind. This illusion rests on the notion that the ethics of care do not hold in the placeless context of experience, where one only relates to oneself. Yet, there is an urgency to consider the ethical implications of 'immersive experience'. Who may decide what these experiences are to be and who may oversee creating them? Are the ethics we have agreed upon to be applied one-to-one to post places or are there boundaries we are willing and able to cross? Are there patient groups who should not be allowed to inhabit post places? Which guiding principles would we use in making such decisions – those of efficiency, those of profit (the companies we have explored here are for-profit), or those of care and how would we negotiate these if they clash?

Furthermore, our analysis illuminates the mechanism by which this immersive displacement of care is formed. We argue that analyzing immersion in care may best be done by understanding the broader setting of care as post place. Post place care does away with the distinctions between digital and material, focusing instead on how care produced within these spaces should be understood and analyzed. The interconnections we have observed – for instance to be seen/read in our auto-ethnographic notes above sketch 'the place' we inhabited as layered: given form within digital technologies, yet also enfolded by materialities and, experienced fully as an interaction of these layers (remember the author walking the plank and feeling jolted by the hand grabbing him). As Ivanova (2020b) has argued, post place care does not equal digital care, foregrounding instead the interplay of digital and material practices in a process of tinkering (Mol, Moser, & Pols, 2010) to create 'good enough' care. For instance, a healthcare manager decides to move the SR Pod from the main atrium to a far way room, to prevent noise nuisance. In making this decision, the manager deals with more than a digital landscape – she must negotiate the digital affordances of the Pod (immersion through sound, smell, sight, etc.) and the material environment, in which it is situated (the 'box', in which this digital experience is contained is also materiality placed inside a healthcare organization). Importantly, the imaginaries of experiencing 'elsewhere' for therapeutic purposes (PTSD or schizophrenia for instance), for joy or for finding calm and connection (in digitally produced nature), or of saving the world (holidaying in the Pod) are underpinning and constituting the relationship between technology and care in a context of placeless-ness – or, as we may say here, placeful-ness instead.

Inspired by de la Bellacasa (2017) whose speculative analysis focused attention on ethics for 'more than human worlds', we seek to enrich and challenge the notion of the digital as a separate sphere of care and caring. Post place care therefore, is a set of practices of tinkering and negotiation, which are formed in the interplay of material and digital practices, but also the imaginaries that shape and challenge that interplay. In our analysis, we see how Khora and Sensiks produce spatial imaginaries that are based in and depend on the notion of immersion as an efficient caring process. Placeless-ness becomes the point, as experiencing immersion becomes a crucial element in how we think of digital care practices. By delving into these imaginaries of immersion, we have shown how healthcare companies morph the concept of place into experience.

5. Discussion: digital spaces as post place care

Promises about innovative technologies saving and improving healthcare are not new, nor are their mechanisms shifting any medical paradigms. Yet, contemporary understandings of place in healthcare – as placeless, malleable, as healing by design – are making it difficult to discuss how the place of care matters (or not) for patients, professionals, care organizations and health systems. The digital turn in geography (Ash et al., 2018; Ash et al., 2019), which has also found its way into healthcare discussions (Lupton, 2018; Thompson, 2021), has made important points about the ways, in which digital practices have become pervasive and formative in society. However, as we have shown in the analysis above, considering 'the digital' a separate realm – even when presented with the caveat that its boundaries are messy and unclear – often misses the interconnectedness between the digital, the material, and the imagined, which are at the heart of contemporary advancements.

Despite STS scholars insisting that practices in the digital are always and necessarily materially placed and Kinsley (2014) call to consider the material conditions of the digital, we argue that there is a need for richer conceptual resources, which would more precisely grasp the interplay of material, digital *and* imaginary practices that together form post place care. Whereas conceptual advancements in geography on the nature of spatiality put forward and developed important terms such as 'digital care', 'digital space', and 'virtual geographies', these terms assume, and at the very least enact, the digital as distinct. We therefore propose that post place care is a conceptual move that draws attention to the interdependencies and entwinements that produce care in place (Ivanova et al., 2016). Analyzing the material conditions of the digital, as Kinsley (2014) invites us to do, is indeed important. However, the imaginaries that inform such conditions are, as we suggest, equally important. By taking up the propositions made by feminist scholars in STS on how to investigate care, we offer 'immersive imaginaries' and 'post place care' as theoretical resources relevant to the analysis of digital spaces of care. These resources support and build upon work in digital geography as they allow us to unsettle the dichotomy between the material and the digital while also incorporating the importance of the imagined into analysis.

In this paper we took on three tasks: 1) to problematize the (imagined) boundaries between material and digital spaces in healthcare, 2) to understand how digital spaces of care are being imagined as 'immersive experiences', and to what effects, and 3) to provide conceptual resources, helpful for thinking through and beyond digitalization of care.

Firstly, the paper problematized the boundaries of digital spaces by describing our case studies, both of which revealed placed care to be layered and distributed between different types of practices: the SRP had to be placed far away from patients' living space, because of noise issues, for instance.

Secondly, the paper examined what immersion means and how immersion and experience are inextricably linked when using SR and VR technologies. It is by way of this relationship that tech companies

design, develop, and imagine care solutions to take place. As our analysis showed, these solutions are utopian, seeking more efficient, 'natural', and caring futures. Indeed, these are not simply socio-technical imaginaries, but rather are immersive imaginaries that displace care practice toward the experiential. For example, the SRP provides mental care by supplying *an experience* of being elsewhere, while Khora provides experiences of safe and controlled therapeutic spaces. Imagining healthcare as above all experiential raises important questions about what targeting experience means for care, how it unfolds and *where* it happens.

Thirdly, the paper has offered the concepts 'immersive imaginaries' and 'post place care' with the ambition to form a foundation for building a richer analytical vocabulary for the rapidly changing digital care landscape. The goal in producing these concepts is to find words fit to both *describe and analyse* these developments. In particular, our analysis focused attention on the role of imaginaries as a crucial element of post place care; we insist that post place is formed as an entanglement not only of material and digital practices, but also of imaginaries. The notion of immersion as imagined by companies such as Khora and Sensiks enriches the concept post place care, making it more adept for analyzing contemporary healthcare innovations. In a very concrete way, these imaginaries are not ephemeral, but become the grounds upon which care practices are enabled.

This paper also raises important ethical issues, which we hope would be picked up by others and more fully examined with and through empirical work. The most important among these questions is *Who has the power to care and imagine care in post place?* This question is grounded in the understanding that post place care comprises a very different kind of place, producing a very different kind of care as a result. The issues of control, autonomy, and decision-making, which have long been critical in the care literature, are currently undergoing an overhaul. Attention must be focused on who has the power to be a place-maker and what does this mean? Issues of power and inequality may look differently in post place; we therefore need conceptual resources adept at capturing these differences. In more practical terms, while 'the digital' is a space primarily created by technology developers, post place requires more inclusive place making practices and broader participation. This is precisely why it is crucial to systematically and critically examine the imaginaries, which underpin and co-produce post place care settings.

Finally, we would like to return to the notion of care as an analytical frame, advocated by Tronto (2013) and Puig de la Bellacasa (2017) among others. For us, this perspective on care as an engagement and responsibility form the basis of reconfiguring and critically assessing the digital sphere. In our attempt to engage with the 'interrogative oscillations' proposed by Puig de la Bellacasa, we have considered the material, the digital, and the imaginary in thinking about the production of post place care. This spatial perspective of the digitalization of care does not only offer a new and valuable analytical ground for new insights into the relationship between care and place, but it also leads to important questions about our very understanding of health in post place. In the midst of these novel care assemblages, health becomes more subjective, individual and personalized – geared toward the 'experiential' – and thus propagating a phenomenological narrative of wellbeing. Health is constituted differently in the context of post place; its immersive imaginaries enacting forms of spatiality that must be related to care, both analytically and ethically – anew.

CRediT authorship contribution statement

Dara Ivanova: Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Writing – original draft, Writing – review & editing. **Thorben Peter Høj Simonsen:** Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Writing – original draft, Writing – review & editing.

Declaration of Competing Interest

The authors declare the following financial interests/personal relationships which may be considered as potential competing interests:

There are no competing interests, financial, intellectual or otherwise in the research presented in this paper.

Acknowledgement

The authors would like to thank Sensiks and Khora for allowing observations to take place, as well as for their time and interest in our research. The paper has greatly benefited from the feedback of the anonymous reviewers who read and commented on our work. We are grateful for their careful thoughts and suggestions.

References

Arnfred, B., Thaysen-Petersen, D., Düring, S. W., Fink-Jensen, A., & Nordentoft, M. (2021). Brug af virtual reality inden for psykiatrien. *Ugeskrift for Laeger, 183*(15), 1–7.

Ash, J., Kitchin, R., & Leszczynski, A. (2018). Digital turn, digital geographies? *Progress in Human Geography, 42*, 25–43. https://doi.org/10.1177/0309132516664800

Ash, J., Kitchin, R., & Leszczynski, A. (Eds.). (2019). *Digital geographies*. Sage.

Chateau, Z., Devine-Wright, P., & Wills, J. (2021). Integrating sociotechnical and spatial imaginaries in researching energy futures. Energy Research and Social Science, 80 (July). 10.1016/j.erss.2021.102207.

Cutchin, M. P. (2002). Virtual medical geographies: conceptualizing telemedicine and regionalization. *Progress in Human Geography, 26*(1), 19–39.

de la Bellacasa. (2012). Nothing comes without its world": Thinking with care. *Sociological Review, 60*(2), 197–216. https://doi.org/10.1111/j.1467-954X.2012.02070.x

de la Bellacasa, M. P. (2017). *Matters of care - speculative ethics in more then human worlds*. University of Minnesota Press.

Bailenson, J. (2019). *Experience on demand - what virtual reality is, how it works, and what it can do*. In W. W. Norton & Company.

Bartram, R. (2020). The infidelity of place: medical simulation labs and disjunctures in pedagogical places. *Sociology of Health and Illness, 42*(2), 293–306. https://doi.org/10.1111/1467-9566.13002

Boellstorff, T. (2016). For whom the ontology turns: Theorizing the digital real. *Current Anthropology, 57*(4), 387–407. https://doi.org/10.1086/687362

Bos, D. (2021). Geography and virtual reality. Geogr. *Compass, 15*, 1–13. https://doi.org/10.1111/gec3.12590

Brandt, M. (2016). Simulated War: Remediating Trauma Narratives in Military Psychotherapy. *Catalyst: Feminism, Theory, Technoscience, 2*(1), 1–42.

Brownlie, J., & Spandler, H. (2018). Materialities of mundane care and the art of holding one's own. *Sociology of Health & Illness, 40*, 256–269. https://doi.org/10.1111/1467-9566.12574

Bucher, T. (2017). The algorithmic imaginary: exploring the ordinary affects of Facebook algorithms. *Information Communication and Society, 20*(1), 30–44. https://doi.org/10.1080/1369118X.2016.1154086

Buse, C., Martin, D., & Nettleton, S. (2018). Conceptualising 'materialities of care': Making visible mundane material culture in health and social care contexts. *Sociology of Health & Illness, 40*, 243–255. https://doi.org/10.1111/1467-9566.12663

Casey, E. S. (1993). *Getting back into place: Toward a new understanding of the place-world*. Bloomington: Indiana University Press.

Creswell, T. (2004). *Defining place. Place: A short introduction*. Blackwell Publishing Ltd.

Denis, J., & Pontille, D. (2015). Material Ordering and the Care of Things. *Science, Technology, & Human Values, 40*(3), 338–367. https://doi.org/10.1177/0162243914553129

Egliston, B., & Carter, M. (2020). Oculus imaginaries: The promises and perils of Facebook's virtual reality. *New Media & Society, 24*, 70–89. https://doi.org/10.1177/1461444820960411

Ellis, C. (2004). *The ethnographic I: A methodological novel about autoethnography*. Rowman Altamira.

Gesler, W. M. (1992). Therapeutic landscapes: Medical issues in light of the new cultural geography. *Social Science and Medicine, 34*(7), 735–746. https://doi.org/10.1016/0277-9536(92)90360-3

Gesler, W. M. (2005). Therapeutic landscapes: an evolving theme. *Health and Place, 4* (11), 295–297.

Gieryn, T. F. (2018). *Truth-spots: How places make people believe. Chicago*. The university of Chicago press.

Haraway, D. J. (2016). *Staying with the trouble - Making Kin in the Chthulucene*. Duke University Press.

Henwood, F., & Marent, B. (2019). Understanding digital health: Productive tensions at the intersection of sociology of health and science and technology studies. *Sociology of Health and Illness, 41*(1), 1–15. https://doi.org/10.1111/1467-9566.12898

Hockenhull, M., & Cohn, M. L. (2021). Hot air and corporate sociotechnical imaginaries: Performing and translating digital futures in the Danish tech scene. *New Media & Society, 23*, 302–321. https://doi.org/10.1177/1461444820929319

Indenrigs- og Sundhedsministeriet. (2023). *Robusthedskommissionen*. Robusthedskommissionens Anbefalinger.
Ivanova, D. (2020a). *Care/place - unsettling place in healthcare*. Erasmus University Rotterdam.
Ivanova, D. (2020b). Post-place care: disrupting place-care ontologies. *Sociology of Health & Illness, 42*, 1296–1311. https://doi.org/10.1111/1467-9566.13100
Ivanova, D., Wallenburg, I., & Bal, R. (2016). Care in place: A case study of assembling a carescape. *Sociology of Health & Illness, 38*, 1336–1349. https://doi.org/10.1111/1467-9566.12477
Jasanoff, S., & Kim, S. H. (2009). Containing the atom: Sociotechnical imaginaries and nuclear power in the United States and South Korea. *Minerva, 47*(2), 119–146. https://doi.org/10.1007/s11024-009-9124-4
Kang, E. B. (2022). Biometric imaginaries: Formatting voice, body, identity to data. *Social Studies of Science*. https://doi.org/10.1177/03063127221079599
Kazansky, B., & Milan, S. (2021). Bodies not templates": Contesting dominant algorithmic imaginaries. *New Media and Society, 23*(2), 363–381. https://doi.org/10.1177/1461444820929316
Kellmeyer, P. (2018). Neurophilosophical and ethical aspects of virtual reality therapy in neurology and psychiatry. *Cambridge Quarterly of Healthcare Ethics, 27*, 610–627. https://doi.org/10.1017/S0963180118000129
Kinsley, S. (2014). The matter of "virtual" geographies. *Progress in Human Geography, 38*, 364–384. https://doi.org/10.1177/0309132513506270
Langstrup, H. (2013). *Chronic care infrastructures and the home. Sociology of health and illness, 35*, 1008–1022. https://doi.org/10.1111/1467-9566.12013
Legind, C. S., Faurholt-jepsen, M., & Benros, M. E. (2022). *Digital innovation giver nye perspektiver i psykiatrien, 184* pp. 1–8). Ugeskrift for Læger.
Leszczynski, A. (2015). Spatial media/tion. *Progress in Human Geography, 39*, 729–751. https://doi.org/10.1177/0309132514558443
Leszczynski, A. (2019). Spatialities. In J. Ash, R. Kitchin, & A. Leszczynski (Eds.), *Digital geographies* (pp. 13–24). Sage.
Lupton, D. (2018). *Digital health - critical and cross-disciplinary perspectives*. Routledge.
Madary, M., & Metzinger, T. K. (2016). Real virtuality: A code of ethical conduct. Recommendations for good scientific practice and the consumers of VR-technology. *Frontiers in Robotics and AI, 3*, 1–23. https://doi.org/10.3389/frobt.2016.00003
Marloth, M., Chandler, J., & Vogeley, K. A. I. (2020). Psychiatric interventions in virtual reality: Why we need an ethical framework. *Cambridge Quarterly of Healthcare Ethics, 29*, 574–584. https://doi.org/10.1017/S0963180120000328
Martin, A., Myers, N., & Viseu, A. (2015). The politics of care in technoscience. *Social Studies of Science, 45*(5), 625–641. https://doi.org/10.1177/0306312715602073
Massey, D. (1994). *Space, place, and gender*. University of Minnesota Press.
Massey, D. (1995). The conceptualization of place. In D. Massey, & P. Jess (Eds.), *A place in the world? Places, cultures and globalization* (pp. 45–85). Oxford University Press.
Massey, D. (2005). *For space*. Sage.
McLean, J. (2020). *Changing digital geographies*. Palgrave Macmillan.
Mol, A., Moser, I., & Pols, J. (Eds.). (2010). *Care in practice - On Tinkering in Clinics, Homes and Farms*. Bielefeld: transcript Verlag. https://doi.org/10.14361/transcript.9783839414477.
Murphy, M. (2015). Unsettling care: Troubling transnational itineraries of care in feminist health practices. *Social Studies of Science, 45*(5), 717–737. https://doi.org/10.1177/0306312715589136
Nettleton, S., Buse, C., & Martin, D. (2018). Essentially it's just a lot of bedrooms': architectural design, prescribed personalisation and the construction of care homes for later life. *Sociology of Health and Illness, 40*(7), 1–16. https://doi.org/10.1111/1467-9566.12747
Oldenhof, L., Postma, J., & Bal, R. (2016). Re-placing care: Governing healthcare through spatial arrangements. In E. Ferlie, K. Montgomery, & A.R.P (Eds.), *Oxford handbook of healthcare management*. Oxford University Press.
Oudshoorn, N. (2012). How places matter: telecare technologies and the changing spatial dimension of healthcare. *Social Studies of Science, 42*(1), 121–142.
Pickersgill, M. (2011). Promising" therapies: Neuroscience, clinical practice, and the treatment of psychopathy. *Sociology of Health and Illness, 33*(3), 448–464. https://doi.org/10.1111/j.1467-9566.2010.01286.x
Pickersgill, M. (2019). Digitising psychiatry? Sociotechnical expectations, performative nominalism and biomedical virtue in (digital) psychiatric praxis. Sociology of Health and Illness, 41(S1), 16–30. 10.1111/1467-9566.12811.
Pols, J. (2012). Care at a Distance - On the closeness of technology. In *Care & Welfare series*. Amsterdam University Press. https://doi.org/10.1163/9789460910838_003.
Rahmawan-Huizenga, S., & Ivanova, D. (2022). THE URBAN LAB: Imaginative Work in the City. *International Journal of Urban and Regional Research, 46*(4), 542–557. https://doi.org/10.1111/1468-2427.13123
Regeringen, K., & Regioner, D. (2013). *Fællesoffentlig strategi for digital velfærd 2013–2020- Digital velfærd - En lettere hverdag 24*.
Ruppert, E. (2018). Sociotechnical imaginaries of different data futures: An experiment in citizen data. In *van Doorn leerstoel, Erasmus Universiteit Rotterdam, juni 2018*. Erasmus University Rotterdam.
Sadowski, J., & Bendor, R. (2019). Selling Smartness: Corporate Narratives and the Smart City as a Sociotechnical Imaginary. *Science Technology and Human Values, 44*(3), 540–563. https://doi.org/10.1177/0162243918806061
Schwennesen, N. (2019). Algorithmic assemblages of care: imaginaries, epistemologies and repair work. Sociology of Health and Illness, 41(S1), 176–192. 10.1111/1467-9566.12900.
Simonsen, T. (2020). *The spatial organization of psychiatric Practice - A situated inquiry into "healing architecture."*. PhD Thesis. Copenhagen Business School. https://doi.org/10.2307/j.ctvpj7b7z.9.
Simonsen, T.P.H., Brown, S.D., Reavey, P., n.d. Vitality and nature in psychiatric spaces: Challenges and prospects for "healing architecture" in the design of inpatient mental health environments. Heal. Place.
Sundheds/ældre-ministeriet, Finansministeriet, Danske Regioner, Kommunernes Landsorganisation. (2018). *Ét sikkert og sammenhængende sundhedsnetværk for alle - Strategi for Digital Sundhed 2018–2022*.
Thompson, M. (2021). The geographies of digital health – Digital therapeutic landscapes and mobilities. *Health & Place, 70*, Article 102610. https://doi.org/10.1016/j.healthplace.2021.102610
Tronto, J. C. (2013). *Caring democracy: Markets, equality, and justice*. NYU Press.
Zook, M., Dodge, M., Aoyama, Y., & Townsend, A. (2004). New digital geographies: Information, communication, and place. *Geogr. Technol.*, 155–176.

Web references

Khora Website. https://khora.com/. last accessed 15.11.22.
Sensiks Website. https://www.sensiks.com/. last accessed 15.11.22.
VR in Mental Health Website. https://vrmentalhealth.nl/en/conference/. Last accessed 16.11.23.