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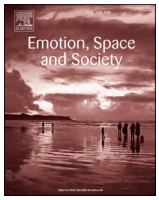

Digital atmospheres of mental health apps: A new materialist exploration of the experience of managing mental (ill)health using an app

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ABSTRACT

Apps are an increasingly commonplace source of support and authority for managing mental (ill)health symptoms. This article analyses their increasingly agential role in support practices through their capacity to reconfigure individual and collective understandings of mental health. New materialist research acknowledges the agency of both human and non-human actors and considers the on-going relations of bodies and technology within social contexts. We apply the concept of digital atmosphere to trace the material-affective forces constituting the experience of using a mental health app. Our findings demonstrate the multiplicity of ways people improvise with their use, situated within their own unique contexts and environments, and the influence of relationships on individual perceptions and engagements with the apps. Furthermore, we consider the different ways in which participants perceive their mental (ill)health, sometimes in fractious conflict with the apps. Finally, we highlight that features of for-profit apps can reshape understanding of mental (ill)health needs and perceptions of responsibility, resulting in the capacity for apps to be simultaneously disciplining and liberating. The findings provide insight of significant value to mental health policy and practice.

1. Introduction

Despite limited evidence, mental health apps are afforded a range of putative benefits, including improved access to support, flexibility of engagement and their anonymity as encouraging difficult to reach groups to engage with mental (ill)health issues. There are currently 4000 available in iOS and Android stores (ORCHA, 2021) with no regulations for their development and release thereby enabling anyone to distribute an app. A review of popular anxiety apps found only 19% involved input from a professional mental healthcare expert (Drissi et al., 2020) and, of 100 apps claiming to be based on CBT, only 10% followed the evidence-based principles (Huguet et al., 2016).

Data from the United States in October 2020 indicated over 19 million monthly active users of mental health apps, with 83% using unguided self-help apps, of which over 90% were using Headspace and Calm (Wasil et al., 2022). Each has extensive libraries of meditation programmes based on themes, for instance 'emotions series' and 'mindful eating'. Psychoeducation videos on topics such as 'feelings vs emotions' or 'mental fitness' are available, as is the ability to 'check-in' and track feelings and mood over time. Both apps display these reports alongside stats on average meditation lengths, number of sessions, minutes of meditation, number of 'mindful days' and your 'streak' which records the longest number of days in a row the individual has completed activities in the app. Finally, notifications and emails encourage people to return to the apps, both of which can be tailored to personal preference.

The rapid supply and adoption of mental health apps requires both policymakers and mental health professionals to understand their impacts and effects. At present there is a lack of evidence regarding long-term efficacy, or indications that engaging with an app is better than other approaches for supporting mental (ill)health (Gál et al., 2021; Goldberg et al., 2022; Lau et al., 2020). Despite encouraging clinical trial results for their role in the management of anxiety and depression symptoms (Khademian et al., 2021; Lecomte et al., 2020), app heterogeneity limits generalisability of findings. Additionally, analyses can assume people use apps in accordance with their intended use, which we know is not always the case. For instance, although they are designed for daily engagement, people often have extended breaks with no use and actual time spent engaging with an app is low (Aziz et al., 2022), but the reasons for these behaviours are not typically captured in clinical trial results. Finally, despite their consumer-oriented focus, many apps are for-profit, meaning their targets to maximise engagement and

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conversion may contradict with their mission to improve users' mental health. Hence, it is important that analyses of the impact of mental health apps include contextual sets of relations constituting the everyday environments in which their use is embedded. This is the aim of the current article.

Existing qualitative research considers mental health apps a complex social phenomenon with capacities to create novel relations and practices which co-create the environments in which people manage their mental (ill)health. For example, their role in (re)configuring knowledge, (Fullagar et al., 2017a), the production of mental (ill)health categories, and in the formation of processes by which people manage symptoms (Crosby and Bonnington, 2020; Henwood and Marent, 2019). Using the concept of "digital atmosphere" (Tucker and Goodings, 2017), this article addresses how mental health apps operate in and through affective forces constituted as relations between bodies and the non-human materialities of apps-as-technologies embedded in individuals' everyday environments. Specifically this article considers.

a. How individuals' experiences of using mental health apps to support their mental health are grounded in their everyday environments.
b. The affective capacities of apps to shape experiences, expectations and ownership of personal and collective mental (ill)health.
c. The value of the concept of digital atmosphere aligned with new materialist research conventions for capturing the real-life impacts of mental health apps.

1.1. New materialist approaches

New materialist approaches have highlighted how young people's experiences and understanding of mental (ill)health operate through complex arrangements of lay and professional expertise, discourses, technologies and sensory-embodied actions (Fullagar et al., 2017a, 2017b). The value of these approaches is that they address the distributed nature of agency in the practices in and through which experiences of mental (ill)health operate. In everyday life, agency is considered not solely a human capacity, but a distributed force that *acts* through relational networks of bodies, technologies and spaces (Barad, 2003; Braidotti, 2019). In this view, apps are not conceptualised as ontologically distinct entities with an impact entirely reducible to their functionality by design (Marent and Henwood, 2023). Instead, the body and technologies are considered relational and situated within assemblages of 'matter' (things, objects, bodies, spaces, and places), only becoming meaningful as a result of on-going 'intra-actions' (Barad, 2003). All matter is recognised as having the agential capacity to affect or be affected (Braidotti, 2019), which shifts the analytic starting point to focus on the on-going relationality of body-technology connections within specific social and cultural contexts.

In the field of digital health, this approach has highlighted how the app Happify elicits a sensation of a permanent 'not-yet-ness' of happiness, a reduction in affective registers to conform to the limited emotional spectrum offered by its categories, and facilitates the modification of organic states such as breathing (Martínez-Guzmán and Lara, 2019). Additionally, Tucker and Goodings (2015) highlight how engagement with an app designed to reduce stress involved a reconfiguration of the body to transition from 'body-using-app' to 'relaxed--body'. Finally, engaging with self-tracking devices can produce both enabling and disabling sensorial responses (Lupton and Maslen, 2018). The concept of digital atmosphere facilitates analysis of the affective capacity of mental health apps to modulate and bring the body into new affective states, including embodied sensorial feelings manifesting as intensities whilst engaging with the apps (Andrews and Duff, 2019).

1.2. Digital atmospheres

Tucker and Goodings (2017) developed the concept of *digital atmosphere* to trace the individual and collective affective experiences of an online forum for mental health peer support. The current article draws on this conceptual insight to analyse how forms of 'matter' are drawn together and 'intra-act' (Barad, 2003) in the *digital atmospheres* of mental health apps. Atmospheres do not pre-exist engagement, they are unique, constantly changing, and emerging (Anderson, 2014; Brown et al., 2019). They can be considered a perpetually open assemblage, an envelopment of matter and forces in a specific space-time (Anderson, 2014) whereby the intra-actions within radiate affects. In analysing mental health apps as atmospheres, we recognise them as fundamentally porous, and we can consider the unique weave of matter and intra-actions constituting an individual's experience.

The elements of atmospheres combine to create affective fields that invoke feelings and thoughts, influencing perceptions, behaviours, and social interactions (Ellis et al., 2013). That is not to suggest an atmosphere invokes a universal, determinate affective state. Rather an atmosphere can be experienced in different ways depending on the individual, their mode of engagement and the elements of the atmosphere they are responding to (Brown et al., 2019; Lupton, 2017). Gibson's (2015) notion of 'affordance' captures the relational possibilities of an atmosphere, how it directly 'summons' or invites an individual to engage in a particular way. It follows that affordance requires 'attunement', the multisensory capacity to hear the invitation, for it to resonate and consequently feel the relational possibilities and potential ways of living in or through things (Stewart, 2011). Therefore, we need to consider an individual's 'attachment', namely the specific set of relational forces at this point of intra-action, that accommodates attunement to the atmosphere, and modulates the affective affordances of engagement (Brown et al., 2019).

It is important to highlight how atmospheres take spatial and temporal forms and as such do not exist as forms of spatial fixity, e.g the atmosphere of a specific place remaining consistent over time. Atmospheres operate in and through the relations between bodies and non-human materialities that are subject to change and transformation over time (Tucker and Goodings, 2017). The current article highlights how the impacts of mental health apps are shaped by the operation of the digital atmospheres that constitute individuals' everyday engagement with apps.

2. Methodology

2.1. Participants and procedure

Seven individuals ranging in age from their 30s–60s participated in the study. All were recruited via the first author's social media accounts and the University of East London's channels for the recruitment of student research participants. Participants identified as currently engaging in use of an app to manage their mental health, with all except one using Headspace or Calm. Online semi-structured interviews were conducted, with open-ended questions covering participants' decisions to download the app(s), how they choose to engage with the apps and how they feel about managing their mental health digitally. Participants were asked to discuss moments that they were conscious of physical sensations; this was most relevant when they were asked to open their app and explain how they typically choose to navigate through it. Pseudonyms were used in the transcripts and all identifying features removed. Ethical approval was provided by the University of East London (UEL).

2.2. Analytical approach

Data analysis was informed by Braun and Clarke's (2022) reflexive thematic analysis. The approach's accommodation of broad theoretical frameworks and data orientations offered the necessary flexibility to adopt a range of the research conventions applied by new materialist researchers. The conceptual framework of a 'research assemblage'

invited a constant examination of the dynamic relational entanglements and intra-actions of human and non-human actors, discursive elements, socio-cultural context, and methodological approaches, constantly influencing the research (Fox and Alldred, 2015).

This began a coding process. To ensure analysis remained situated within the assemblage, a visual diagram of the digital atmosphere(s) and physical sticky notes were used to organise codes and test candidate themes. The themes were developed by using the diagram to re-address the data as a verb, to consider how the data *data* (Nordstrom, 2018), how it was moving, re-structuring, morphing, doing, and cultivating, and by looking for the 'glow' (MacLure, 2013) within fragments of data.

The next phase involved refining each central organising concept by mapping out what each theme was doing and adding the relevant data extracts. The first author re-listened to the recordings of the transcriptions at this stage to check they had not incorrectly interpreted the tone or intention. Final abstracts of each theme were then collated to ensure that how they were moving together and how they intra-acted reflected what the first author felt the overall data and research assemblage was doing.

In discussion with the second author, the final phase involved refinement of themes whilst returning to the analytic concepts underpinning the research and refining the literature review. This enabled a review of where the findings had similarities or differences to those identified in previous literature and to reflect on how this research was moving with the overall research assemblage of which it is part. It also ensured the analytic concepts that were drawn upon had been reflected and applied in their intended way.

3. Analysis and discussion

The analysis settled around the following i) 'curating atmosphere(s)', reflecting the incorporation of the participants' unique environments and body configurations required to use the apps, ii) 'connected atmosphere(s)', in recognition of the role of relationships in experiences of using an app and iii) 'the expert well being', split into two sub-themes, 'I know what I want' and 'I know what I want, don't I?' which highlight the different ways in which participants handled their understanding of mental health, sometimes in fractious conflict with the apps.

3.1. Curating atmosphere(s)

Within all participants' accounts, attachment to their digital atmosphere was temporally and spatially bound, involving folds of material objects and forces and a movement and (re)positioning of their bodies in relation to them. Participants improvised with their environments in a series of intra-actions to engage with their app. Some of the configurations were by choice whilst others were to conform with what the app required.

The process of attachment involves adjusting the body to move it into a state of readiness, which sometimes could be laboured.

> Zoe: Yeah, it's very much … I don't want to say like a chore, but it's not as strong as a chore, but I definitely feel like this is something I have to do. Umm which I suppose can be, can be a bit of a chore but I know … for myself, that that is what I need to do like to make, to help me and to make me feel calm during the day.

Zoe refers to the initial struggle she goes through to move herself to engage with the app. Attuning to the atmosphere feels like an obligation and in response her body resists. This highlights that the act of engaging with a mental health app in the present incorporates an anticipation for how it will be felt in the future (Tucker and Goodings, 2015). Similarly, on exiting the app, Zoe carries the affective residues of the atmosphere which contribute to a future feeling of calm. Despite Zoe knowing she wants these future feelings, her account suggests that the process of getting there via the app is something driven by a sense of obligation rather than desire and as such she struggles with the motivation to engage.

Later, Zoe describes how her body has adjusted to attaching to the atmosphere, specifically for meditation:

> Zoe: Umm … and when I first started meditating, I think, I think I was just quite nervous of it. So, I was very aware of it [her heartbeat]. But now … I don't think it happens? I think like the more I've done it, the easier it's become and the more my body's gotten used to just having that calm space and now it, yeh, now it doesn't happen I don't think.

Here Zoe is more explicit about the sensations she negotiated whilst acclimatising to the atmosphere, such as understanding her awareness of the strength of her heartbeat as nervousness and her unfamiliarity with the setting. Despite describing this as something she felt in the past, she explains this with a level of uncertainty which suggests that they may still feel uncomfortable. This goes some way to understanding why using the app remains a 'chore' for Zoe as the memory of this affective intensity still sticks to the atmosphere (Ahmed, 2009). Therefore, despite responding positively to the affordances of the atmosphere, Zoe finds her initial attunement and consequent attachment requires negotiation with an underlying bodily resistance. More generally, it demonstrates that a technology designed with calmness and relaxation in mind has the affective capacity to generate negative intensity and produce opposite results.

Although each participant raised portability as beneficial, each described choices that temporally, spatially, and physically bound their use. For some, the space where they used the app was a function of the time of use, e.g. a sleep story at night whilst in bed. Others, including Zoe, described a conscious curation of spaces, objects, and their physical position within them to use the app.

> Zoe: Yeah, so … umm … I have a chair that I like. I've tried lots of different umm places in the house that I liked. But I found this chair that I liked because I can put my feet flat on the floor and it makes me feel really grounded. Umm … and it's in the spare room, it's just quite nice and quiet and out of the way. Erm and I, because I try, I'm trying to fit it into my day. I do find that [pause] for me … I need to be quite timely with it, like I need to do it a certain time or a certain point of the day. So I do try and fit it into my morning.

This demonstrates that attaching to the digital atmosphere(s) of apps is contingent on everyday settings of use. Zoe has intentionally considered the time she engages, the curation of her space and the physical configuration of her body within it. This attests to the importance of understanding the experience of using a mental health app as on a 'continuum of digitality' (Tucker et al., 2023), that the experience is multi-layered and involves the setting of use and the app itself. We are made aware of the various forms of matter co-constituting Zoe's digital atmosphere, highlighting that the movement of affect is not only between an individual and the app but instead incorporates a multiplicity of spaces, places and things, each with their own affective capacity.

Even exiting the app involves a conscious incorporation of personal environments and unique settings.

> Lewis: Umm one where I'm in right now because you can umm … err face towards the sea. So that when, when, I open my eyes again, I've got the view of the sea straightaway, which is nice.

For Lewis, his exit and the potentially abrupt return to what he needs to do next is tempered by the enjoyment he gets from his view of the sea. This view enables holding on to the affective intensities afforded by the atmosphere, facilitating its capacity for future affective transformation (s).

Overall, these decisions demonstrate how the benefits of the portability of the app are less about its constant availability and more that it offers participants ownership and agency in choosing exactly when and how they want to engage. However, although this affords people options, the app demands some conformity of physical position that is not always comfortable.

Zoe: Yeah, my back, so I get umm back problems anyway so that can be quite difficult, just the posture. Umm … and sitting there. But sometimes, sometimes it's fine. Sometimes I can sort of feel like my, my, upper back umm like knots up then I guess. Even though I'm quite relaxed, it just knots.

This passage demonstrates how using the app can force Zoe to remain in an uncomfortable position that contradicts with the goal of being calm, and the choice she has made to facilitate engaging with the app in comfort. Perhaps the affective memory of the discomfort she has previously felt and knowing that the app will demand this of her again contributes to her initial resistance to engage in the app. This highlights that although the app is intended to facilitate positive psychological change, it demands bodily configurations and an awareness of them that directly oppose this goal. Zoe feels she must conform with what the app wants rather than what her body is telling her. It seems surprising that she reports feeling relaxed despite this awareness, pointing to the multiple other factors that facilitate her end goal and why she trusts the app to dictate her position.

3.2. Connected atmosphere(s)

Despite the seemingly impersonal nature of engaging with an app for mental health, the significance of historical and current relationships, memories of therapeutic moments, and the unseen but known presence of the collective were woven into people's experiences. This sense of connected atmosphere(s) and the range of actors involved were present at various intra-actions, with the capacity to be both enabling and disabling. Often the decision to use an app was entangled in a previous experience of having had therapy.

Lewis: Erm so I think it's that, that, that relationship [with his therapist], sort of, I guess got me to … think of it as another thing, as one thing … that I can actually, that I can do, an activity that I can do that will help me with my general mental health and will make me more able to deal with things. With a lot of different things, all, all sorts of different things.

Whilst Crosby and Bonnington (2020) found failings of formal support could lead to use of an app to find a better alternative, all participants in this research who referenced previous therapeutic relationships regarded them as enabling their current use of an app. In the above passage, Lewis states that his therapist helped him to consider using an app. This implies that Lewis's memories operate as positive intensities woven into his present use of the app, which intra-act to generate affective transformations to 'deal with things' in both the present and future. This intra-action can be both enabling and disabling. The combination contributes to a positive outcome where he feels motivated and empowered to undertake a positive activity for his mental health, however it may discourage him from seeking other support unless it is recommended by an expert.

Relationships with friends are also (re)enacted within the app.

Laura: You see when I first was using it, my friend who, as I, who I mentioned uses it all the time, and we were sort of you know, you can give people um like, you can give people like nudges and thumbs up and stuff like that. And um, she was very good at like giving me whatever it is […] I think it was good, yeah, because it made me … it was sort of a … yes, I suppose it felt like a nice connection to somebody … to somebody else … within the app.

Laura's use of the app is both for her mental health and for maintaining a connection with her friend. Whilst the app does not facilitate conversation or collaborative activity it is enough for Laura to feel the affective traces of a sense of community and comfort from her friend having also used the app. This changes Laura's attunement to the affordances of her digital atmosphere from a solely individualised to a collective experience, which can be interpreted as an act of resistance to individualised framing of app use.

Laura and Lewis's (re)enactment of relationships and their associated memories gives insight into how individuals improvise with the apps to emplace meaning and personalise the experience. The persistence of these affective intensities suggests that relationships, their meaning, and memories have a 'stickiness' (Ahmed, 2009), meaning they cling to the digital atmosphere(s). This results in them continually shaping experiences and having a lasting effect on behaviour and choices surrounding the app, so much that they become inseparable.

Relationships appeared to intra-act with feelings of hesitancy and doubt surrounding the apps, resulting in re-establishing their use as valuable.

Lewis: Possibly I'm just seeking out like, is this worth doing still, you know, am I still gonna get something from this? Is it gonna be useful? But even just like having positive conversations with people that I'm … that are friends of mine, and I trust like, they're like, oh, yeah, I, I meditate all the time. Being like, OK, this is something that's good to do. I will keep going with this. So I think it is for me, it is like … yeah, those … relationships with people that I … get on with and trust and you know, erm bond with … encourage me to keep going with it, yes, I would say so.

Here Lewis clearly indicates that he has felt doubt in the value of using the app indicating that there is something, or things, about the app that do not feel valuable or do not produce the results that he hopes for. Discussing his use of the app with friends encourages him to continue and change his attunement to the atmosphere, disregarding his hesitancy. Again, we can see the threads of connection to friends that weave through experiences of using apps, extending an activity in solitude to a shared experience situated within a community. More broadly this highlights an undertone of an individual and collective moralistic sense of duty to be using mental health apps and the individual is required to overcome their hesitation to conform.

3.3. The expert well being

In this section the question of expertise regarding mental health featured in participants' accounts, with a resistance to managing mental health as something to be 'good' at, performed and measured by the gamified elements of the app. Some participants were steadfast in their position whilst others were more hesitant and (re)negotiated ownership of their needs in a fractious relationship with the app(s).

Nicole's extract below portrays app usage as wholly determined by her in relation to her needs, demonstrating a confidence in herself as expert over her mental health:

Nicole: So I kind of, I'm kind of already in the space where these things [mental health practices] are important. And … I, if I didn't do this, what would I do, probably something. But I think what this has done is help. It just provides such an easy tool and structure that for me, as a very structured person, a very kind of, you know, my day is split. I don't know if you've ever seen that 'About a Boy' [film]. My day is like split into units of 30 minutes. And whereas he's like idling away his time. I'm like, right, I've got this amount of time and this amount of time and this amount of time. And it's like oh yeah, 10 minutes I can do this. So I think it is, I think whoever invented it has done us a great favour. And it feels quite charitable.

Nicole engages in her digital atmosphere having already established her mental health needs. Her app use is determined by how she fits it into her daily schedule rather than the app dictating her usage. Unlike Zoe's feeling of engagement being a chore, Nicole is pleased to find the time. Hence Nicole is receptive to the summons of the atmosphere from an established and confident position that she is in control. Nicole referring to the app as a 'tool' indicates that she feels a sense of control in using it to support her mental health. The affective intensities circulating her atmosphere are positive ("I think whoever invented it has done us a

great favour. And it feels quite charitable"). Moreover, despite paying a subscription, she perceives having access as an act of generosity of which there is no expectation to give anything in return, including conforming to what the app might want.

Later we begin to understand why Nicole approaches using the app in this way.

> Nicole: The worst-case scenario is I've given myself a break and I'm not around anybody else and no one else is making any demands of me. Umm the best-case scenario is I'm actually kind of … focused on the moment and you know, hearing what the meditation is saying and kind of in a neutral mind.

Nicole is comfortable that sometimes she uses the app just to move out of her daily life rather than having to engage in an activity. Doing meditation is a positive potential outcome, but she defines the parameters of her use and is wholly compassionate and fluid on what they are. Moreover, there is no sense of having a successful or otherwise engagement, it is less about doing meditation or considering her mental health but a place for letting go in what she perceives as a private space.

> Nicole: And you know, to some extent, so I suppose you can look at it one way, you're holding yourself to account. You know, I'm doing the meditation and it gives you all those stats to help you with that. But it's also … I don't know, if I want to sit in the meditation say, and shout, you know shout and swear it's a bit like, well I could do that couldn't I, whereas you couldn't do that in a public meditation class.

As much as Nicole enjoys relinquishing a sense of responsibility to others and having time where no one will ask anything of her, she values the time to resist pressure to perform a role conforming to societal expectations. The app is liberating, and she revels in the agency and the potential of what she can choose to do in the privacy of her confined space. She does not have to listen to the app and conform but, if she does, it is her choice, and she enjoys that the app affords her mechanisms to track her accountability.

Laura also uses the app to relinquish control, but she can achieve this because she chooses to listen to the app and follows what it suggests.

> Laura: I think the last time I probably used it was to listen to the slow train Sleepcast, which is like my absolute favourite one and it's about a train. Umm … obviously, that you're sort of on. Umm I think what I get from it is … I can feel it immediately relax my body. And there's also a bit in it where it says about like, you know, it's the end of the day, there's nothing left to do. And I think I find that particular thing quite soothing, um, in terms of actually then being able to yeh relax my, my, body and then it takes you through the different bits of your body that you're sort of, you know, like closing down, umm, shutting down for, for, the night.

Laura uses the app to draw a line under her day and she takes comfort and relief from allowing the app to dictate what happens next. The immediacy in which she relaxes indicates that she happily succumbs to being enveloped by the atmosphere in the knowledge that it will help facilitate her body unwinding.

Both Nicole and Laura's accounts carry a weight of what life demands of them. They express an unfolding of responsibility and letting go but there is equally a sense of preparedness and the requirement to use the apps to be able to perform and deal with life's expectations. These affordances materialise because Nicole and Laura attach to their atmosphere(s) from a position of letting go and succumbing, what they can hear is an invitation to relax in an environment that is theirs with no expectation to give anything back.

3.3.1. I know what I want, don't I?

Some participants had a more contentious relationship with the app, portrayed by having a perception of there being an ideal way to manage mental health defined by the app.

> Lewis: Yeah umm … Yeah, well, what I'm, what I'm, when I'm doing it properly, I kind of go through waves of erm, of using it like, on a daily basis, umm where I'll be really … umm disciplined about it. And so I'll get up in the morning and it'll be kind of part of my routine before I start work.

Lewis perceives 'properly' engaging with the app as requiring 'discipline' to use it daily before work. Therefore, he takes responsibility for the usefulness of the app in terms of his pattern of usage. For Lewis there is a need to achieve a frequency of app usage that is demanding, which to an extent makes it difficult for him to consider his usage as 'successful'.

Attaching to the atmosphere involves negotiating between the app's suggestions and his, which generates negative intensities that require management.

> Lewis: So I'm clicking on the Headspace app, now. Erm [pause] so it, it comes up with there's like a start bit which … it's like a start, it does like a schedule of your day. I think it's to try, it feels like ah you know, you should be doing this 1,2,3,4,5,6 different times in the day and I'm like, sure [laughs]. That's not you know, I'm like, let's get off that, I just wanna do this little, little, little thing for now, and I'm sure that that will be something that I will engage with in the future. It's almost, it's a bit like, I almost feel a bit like … it's the opposite of ah, I guess ah you know, they're trying to get you to do it more because doing it more actually does help more. Erm but for me, I'm like, it has to come from me, so I just feel a bit like, almost frustrated with that. Erm … and then I'll click on meditate. There's all these other buttons there's like sleep, move, music, podcast, so it just goes on for quite a long time actually. And search for advice and all this stuff and I'm like no, I know what I'm doing, meditate.

On opening the app, Lewis is immediately presented with the app's desire for him to complete six daily activities, which creates a sense of what optimum engagement means. His initial pause marks the generation of negative intensities (e.g. potential feelings of disappointment and regret) before he laughs at what he feels is an unreasonable expectation. While explaining the homepage he renegotiated his intentions, portraying movement from a position of vulnerability to one of ownership. He re-asserts his position as expert through intra-acting with the gamified design of the app defining mental health practices in terms of frequency of engagement. On reaffirming his goal, he acts to placate the app in terms of stating he will conform to its suggested frequency of use in the future. Interestingly, he continues to afford the app reasoning and authority over knowing how he should be engaging with it and what the right level of use is, despite knowing he wants to use it on his own terms.

This passage demonstrates some of the negative intensities that swirl around the app's navigation and through to Lewis. He responds with acts of resistance against managing his mental health in the way the app wants him to, but a lingering sense of not being good enough, or being a 'bad' user, remains. We can see that Lewis is vulnerable to the commercial goals of the app and his complex relationship with its definitions of effective management of his mental health.

In addition to feeling like using an app requires cooperation, it can also generate concern for not wanting to disappoint it.

> Lewis: Erm and it'd be the next episode and again, like I've it's, sort of, look feeling a bit like urgh bit guilty like, because it's been a while since I've been on the second one … Erm as in I'm, I'm, on number 3, but it's like you know in today's and yesterday we did this and I'm like err it wasn't yesterday, it was ages ago, i'm sorry [laughs].

At this point Lewis has made it to where he wants to be, but this again generates negative intensities which he explicitly expresses as guilt. This could either mean that he feels bad about not meeting the app's expectations, or that he has failed to meet his own standards. Either reason conveys how creating a sense of positive mental health can be achieved through being a 'good' app user, meaning that engaging under the

parameters defined by the app has become a measure of mental health. Moreover, these standards are heavily loaded onto the user as their responsibility which generates blame for intermittent use and a perceived need to apologise for failing to meet the demands. Overall, this establishes a sense that by using the app more you would feel better and yet what is deemed enough feels unachievable, similar to the permanent 'not-yet-ness' of happiness identified in the Happify app (Martínez-Guzmán and Lara, 2019).

Later in the interview Lewis reflected on the ways in which the app defines mental health.

> Lewis: So it's like, hmm … and I don't think that [pause] it's not part of [pause] you know, the … teachings of mindfulness to feel disappointment, that you haven't done it right, or, you haven't done it day after day after day. It's like … it's OK, it's more about like, learning the skills and being able to use it in your everyday. It's just a few seconds on the bus. You just like, close, close your eyes or just have a quiet moment, you just do a few breaths and sort of bring yourself to attention. That sort of thing, it's not just like, I have to use the app in order to be told that I'm doing umm … doing it right, doing it enough, doing it, you know, in a certain way, etc, etc, etc, so yeah.

When outside the atmosphere of the app Lewis is relaxed, articulating his own understanding of his mental health as aligned with the principles of mindfulness rather than how they are applied in the app. Lewis establishes himself as the expert, demonstrating compassion, flexibility and awareness of his mental health needs. This is in stark contrast with the process he had been through earlier when describing his navigation of the app.

Overall, Lewis's account demonstrates the tension between trying to attend to the app's suggested frequency of usage, which can lead to feelings of stress and guilt when not achieved, and resistance through re-establishing ownership of individual needs. This raises concerns with how mental health apps can redefine what mental health practices are under narrow parameters of engagement and self-responsibility. At the extreme, this could result in vulnerable users feeling worse from not meeting the demands of the app, reinforcing the idea that poor mental health is in direct relationship with their choices and therefore an issue that comes from them and thus should be resolved in them.

4. Conclusion

By analysing how people attach and attune to the atmosphere(s) of self-guided mental health apps this article examined the relational affordances that constitute the contributions of apps to individual and collective experiences of mental (ill)health. Informed by a new materialist approach, the paper offers significant empirical insight regarding the real-life implications of using a mental health app and the nuanced choices surrounding how and why people engage with them. The concept of digital atmosphere provided a valuable analytic frame to capture the movement of affect between human and non-human actors, how apps can create new affective states, and to address the sensorial experience of app use. Hence the findings contribute to new materialist research in digital mental health by highlighting how the concept of digital atmospheres captures the ways that the impact of apps is dependent on the multiplicity of body-technology relations through which individuals' everyday app use is constituted (Lupton, 2017; Tucker and Goodings, 2017).

The different ways in which people attuned and attached to the digital atmosphere(s) depended as much upon the settings of use as the content of the apps themselves - and oscillated between apps as disciplining and apps as liberating. While apps had the capacity to transform bodies into relaxing states, both in the present and future, they can also lead to discomfort, with some participants describing having to hold their bodies in uncomfortable positions resulting in the body maintaining an affective memory of this state. The apps afforded participants a sense of agency in being able to take control of their mental health, but this clashed with the sense of duty made apparent by the apps demands. This resulted in accentuating feelings of personal responsibility; if only they used it more, they would feel better. Finally, despite the solitary experience of engaging with an app, participants enjoyed feeling part of how others were managing their mental health. Knowing that friends were also using the app afforded possibilities to (re)enact relationships and connections. However, these individual relationships, and the perception that this is what the collective does, intra-acted with feelings of hesitancy to re-establish an app's value. Hence, they have the potential to become sites for the collective to perform their moralistic citizen responsibilities.

Mental health apps can subtly reposition mental health as something knowable and improvable through high engagement. Despite each participant expressing their own definition of their mental health needs, to a greater or lesser extent, this did not change an app's affective capacity to create a sense of moralistic duty to manage mental health under its parameters. Even when participants expressed enjoyment from the experience and an ambivalence to the app's manipulative potential, we can still see this as an act of 'pleasurable self-surveillance' (Whitson, 2013).

This research has demonstrated that the experience of using a mental health app is heavily contingent on assemblages of various forms of matter including objects, environments, spaces, and other users. Participants improvised with their environments and memories to emplace meaning and a sense of community through their engagement with the apps. The complexities of an app's role are where the features of for-profit apps intra-act within the atmosphere(s) to generate negative intensities and (re)shape responsibility and the definition of mental health. Hence this research demonstrated that apps can be both liberating, in affording people choice and flexibility, as much as they be disciplining, in generating a sense of self-responsibility and restricting agential capacities.

The findings have implications for mental health services, app developers and researchers in the field of digital mental health. They demonstrate the value of undertaking in-depth qualitative research that can capture and unravel the diversity of people's experiences of using apps to support mental health (Fullagar et al., 2017b). The tension between apps as liberating and apps as disciplining is evidence of this. Furthermore, addressing how the impact of app usage on mental health depends on both the content of the app itself and the setting of use is important (Tucker et al., 2023). Undertaking research that can capture data regarding patterns of app use over time (e.g. in-depth qualitative ecological momentary assessments) would be valuable for gaining further insight. Finally, integrating these approaches into large-scale clinical trials would deliver more in-depth understanding of the impact of apps on mental health (Tucker et al., 2023).

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CRediT authorship contribution statement

Harriet Simpson: Writing – original draft, Project administration, Methodology, Formal analysis, Conceptualization. **Ian Tucker:** Writing – review & editing, Validation.

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