

# EXPERIENCE AND IMAGINATION IN TRANSDISCIPLINARY DESIGN: THE FABPOD

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## Abstract

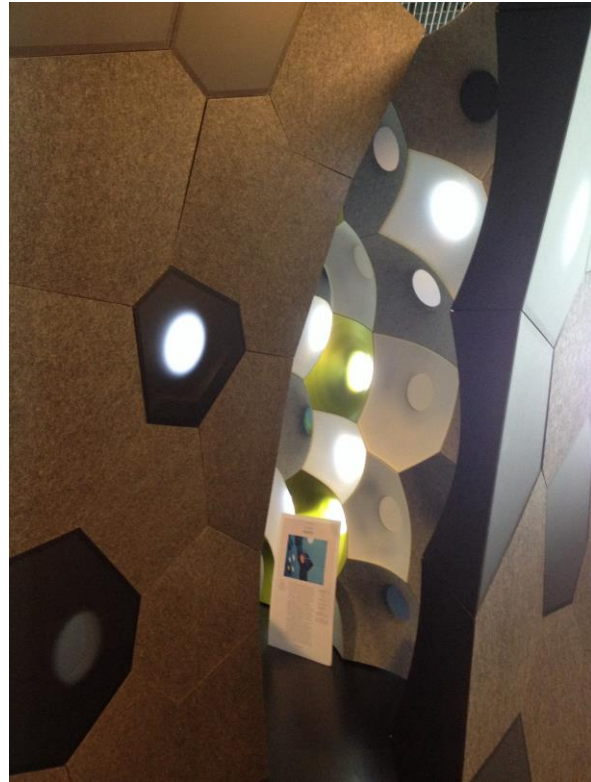
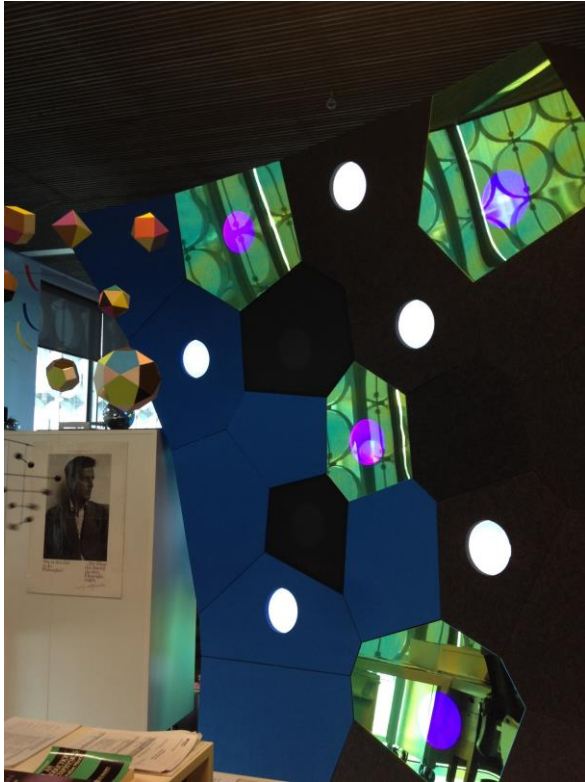
This article advances discussion of transdisciplinary theory and practice by bringing together design anthropology, acoustics and architecture to explore of ‘techniques of imagining’ atmospheres. Building on research into the perception and experience of atmospheres of already existing architectural spaces, we discuss how imagination is engaged in the perception of possible atmospheres by architects and those who inhabit those environments. We explore this through a focus on the design, making, quantitative measurement and ethnographic study of an acoustically designed prototype meeting space, the *FabPod*. We argue that transdisciplinary dialogue and collaboration offers architecture a stronger basis on which to participate in imagining an designing atmosphere.

## Key words

Transdisciplinary design; anthropology; architecture; video ethnography; acoustics; imagination; atmosphere; perception.

## Introduction

In this article we bring together design anthropological and architectural theory and practice to outline techniques for imagining atmosphere. Going beyond the study of how atmospheres of already existing architectural spaces are perceived and experienced, we draw on theories of emergence developed in anthropology of the imagination and design anthropology to examine how the perception of possible (not yet existing) atmospheres might be investigated across anthropological and architectural practice. To undertake this we investigate a set of correspondences between the temporally dispersed and discipline-specific modes of imagining that emerged in the design, making, measurement and ethnographic study of an acoustically designed architectural prototype. Based on our findings we propose that as a theoretical and practical category the imagination offers a mode of bringing together the ways that architects, ethnographers and users experience the affordances of future possible atmospheres.



**Figure 1:** *The exterior of the FabPod, a prototype meeting room in the context of an open plan workspace.* Photo Kyla Brettle. Creative commons license 2014.

**Figure 2:** *The exterior and entrance to the FabPod.* Photo Kyla Brettle. Creative commons license 2014.

We discuss these questions through the example of the FabPod (figures 1 and 2) meeting space, which was acoustically designed for speech privacy and was conceptualized, designed, built and researched at RMIT University, Melbourne, as documented here <https://mcburry.net/fabpod/> (accessed 20<sup>th</sup> August 2017). Using imagination as a category, we bring together the design imagination, decisions and practices through which the FabPod was anticipated, made and measured, and how FabPod user participants showed, discussed and imagined their biographical and possible experiences.

We first establish meeting points between anthropological and architectural interests in human perception, atmosphere and imagination. We then discuss the example of the FabPod and how it was engaged with through different disciplinary approaches, before outlining how imagination was harnessed through user's experience. In conclusion we propose that the category of imagination offers a means for creating correspondences that will benefit transdisciplinary atmospheres research and design.

### **Anthropology, architecture and perception**

Anthropology and architecture share interests in human perception, sensory experience and atmospheres and have been fruitfully brought into conversation through investigations into the

experiential affordances and qualities of architectural space, and ethnographies of architectural or building practice.

Anthropologies of architecture have overlapped with research themes of gender, consumption and embodiment (Buchli 2013), and involve an ‘anthropology of place, space and architecture [that] has, for the most part, been grounded in phenomenological methods or framed by practice theory, both of which emphasize the mutually constitutive relations between embodied subjects and place’ (Marchand 2015: 63). As Marchand has emphasized we should see place as ‘a dynamic state of mind’ and acknowledge a ‘sense of place’ that is ‘grounded in the integral weave between mind, body and environment, and ... it is inflected by, and fully formed in relation with emotional states’ (2015: 63). This approach to place experience along with the work of Casey (1997) and Ingold (2007) has informed Sarah Pink’s sensory ethnography (Pink 2015) studies of experiences of the built environment (Pink and Leder Mackley 2012), which we build on here. There is similarly an appreciation of the sensory experience of architectural design (e.g. Heylighen and Nijs 2013; Malnar and Vodvarka 2004; Pallasmaa 2014) and of the relationship between architecture and atmosphere where: ‘Every space, place and situation is tuned in a special way, and they project specific atmospheres’ (Pallasmaa 2014: 82). Thus putting how we ‘feel’ – sensorially and emotionally - in relation to buildings and the atmospheres associated with them firmly within a shared research agenda.

Both disciplines moreover stress practice and non-verbal knowing. There has been a focus on unspoken and non-textual ways of knowing in skilled practice in architectural design and making (e.g. Heylighen and Nijs 2013), on practice as research in architecture (Rust, Mottram and Till, 2007) and on knowledge in design as being embodied in the process of designing itself (Downton, 2003). Tacit, sensory or non-verbalized, embodied forms of skill and knowing are correspondingly acknowledged in anthropological ethnographies of building and architecture. For instance, in Marchand’s analysis of learning and knowing in building practice in Mali (2003) and carpentry in the United Kingdom (2010), and in construction industry ethnographies (Pink et al 2013).

These existing bodies of work show shared concerns with how built material forms shape or mutually constitute human experience, and with how embodied knowing and experience are invested in and emerge from architects’ and users’ engagements with the affordances of already existing tangible material forms. When combined with a future-focused design anthropological (Smith et al 2016) focus on the *possible* (Halse 2013, Akama et al 2018), this creates a new agenda to attend ethnographically to how the not yet (and perhaps never) experienced atmospheres of future or imagined buildings and objects might be imagined sensorially by architects, users, and ethnographers. The ‘empathetic imagination’ of the designer who imagines with a particular human and ethical dimension (Pallasmaa 2014: 84) and who acknowledges that architecture is not a *fait accompli* whereby the experiential affordances of a future object are known and geometrically pre-determined underpin our agenda. However, we expand this to ask how the ‘empathetic imagination’ might be reconstituted when architects encounter and engage with the sensorial and atmospheric elements of the imaginary worlds of others, and how these

might be made accessible through design anthropological practice. Our study of the FabPod and its acoustics provided an ideal example through which to investigate this because it involved different disciplinary practices of imagining acoustics: through architectural research; through ethnography of users' experiences and perceptions of the prototype; and through users' imaginations of other possible ways of experiencing its affordances.

### **Acoustics, atmosphere and imagination**

Above we have shown correspondences between interests in sensory experience, atmosphere and futures across design anthropology and architecture. We now suggest how processual theories of atmosphere and imagination can be harnessed to create a framework for combining these interests.

Böhme, whose work has influenced thinking about atmosphere in architecture, anthropology and human geography proposed that atmosphere is not 'free floating', but emerges from the relationship between people and materials' (1993:122). Since people and materials are always relational to each other, as has been argued elsewhere (Pink et al 2015), theoretically (if not culturally) atmospheres are ongoing and changing, rather than discrete things that can be present or absent. Of specific relevance for design, Böhme suggested that atmosphere is made through aesthetic crafting, since '[a]esthetic work consists of giving things, environments or also the human being such properties from which something can proceed' (Böhme 1993: 123) and making an atmosphere 'does not really consist in producing a thing, but in making possible the appearance of a phenomenon by establishing conditions' (Böhme 2013: 4). Like the anthropologist Ingold's (2013: 21) proposal that 'making should not be seen as a process of producing a preconceived artefact but as a "process of *growth*" (original italics) whereby the maker is "a participant in amongst a world of active materials"' (Pink and Leder Mackley 2016), this suggests that making atmospheres involves making forms of potentiality rather than creating a particular or fixed state of affairs. Therefore, as argued on the basis of design anthropological research in built environments: '[a]tmospheres are not as such *products* but they are *produced* or *emergent* ongoingly as people improvise their ways through the world' (Pink and Leder Mackley 2016). This emphasis on the relationship between atmosphere and making, suggests that the 'feel' of a place is constituted through the relationship between materials, bodies and perception – as something made possible and emergent. Thus atmosphere can also be conceptualized as emerging not merely from our ongoing experience of the material and social world, but within the realm of the possible, constituted through the imagination.

Imagining atmospheres is also part of the work of the architect. As Pallasmaa has described it, this signifies a particular talent, since 'a talented designer is likewise capable of entering an imaginary room in his or her imagination and sensing the atmosphere and tuned-ness of the space' (2014: 84), and for the architect '[t]his imagination of atmospheres is probably the most demanding task of imagination. It is similar to the composer's skill in imagining an entire musical work, or the writer's task of imagining the characters, spaces and events of a complete novel and creating a literary score for an atmosphere' (2014: 84). While Pallasmaa's rendering of atmosphere aligns it with imagining a complete work or object, our interest is in how atmosphere

conceptualized as ongoingly emergent might be understood in relation to imagination. We explore this further through anthropological theories of the imagination.

A concept of imagination is central to anthropological discussions of both how ideas of past, present and future are generated by individuals and in society and how social scientists construct their understandings of other people's worlds and experiences (e.g. Appadurai 1996; Crapazano 2004). Imagination has been researched in relation to a range of concepts, including memory and our understandings of others in the present (see Pink 2015), here we focus on its relationship to the future-oriented research agenda of design and futures anthropologies (Smith et al 2016, Pink and Salazar 2017). The anthropologists Sneath et al. have critiqued prior anthropological views of the imagination as 'a holistic backdrop that conditions human activities'. They refocus on 'the processes by which imaginary effects themselves come about', as 'an outcome rather than a condition' (Sneath et al 2012: 17), and propose that '[t]o explore "technologies of the imagination", then, is to explore the conditions under which unconditioned outcomes come about' (2012: 17). This means seeing imagination as emerging as an affordance of such technologies, rather than as determined by them. Following their point that 'the imagination is *defined* by its essential indeterminacy' where imaginings 'cannot be fully conditioned' (2012: 24) and it is 'an essentially underdetermined effect of the conditions that bring it about' (2012: 26), we can understand imagination as processual, like atmospheres, whereby both are outcomes of the relationships between people, history, feelings and material things. Thus imagination and the perception of atmosphere may be regarded as relationally constituted and emergent, and the affordances of material and intangible elements of environments are implicated in the constitution of experienced atmosphere and our capacity to imagine the experience of possible future atmospheres.

If theoretically atmosphere is ongoingly emergent it can be seen as constituted and experienced in relation to the same constituents of everyday environments that continually reconfigure to simultaneously become 'technologies of the imagination' (Sneath et al 2012). By theorizing imagination and atmosphere as part of the same emergent processes we therefore create a category for analysis that is inhabited by the imaginary and experiential lives of designers and users alike. This conceptualization of atmosphere accommodates the possibility that an atmosphere does not have to be a complete or whole object, but instead might be constituted through the imagined experiences of environments that are not yet built or used. Taking this theoretical step enables us to investigate possible atmospheres, as well as previously experienced ones and therefore accommodates the aspirations of architects (to imagine the atmospheres of future designs) and of design anthropologists (to understand and empathetically engage the atmospheres of experiences of other people's imaginations). We next demonstrate how this category might be mobilised through a discussion of how the acoustic elements of atmosphere were imagined in our architectural design, measurement, and ethnographic research about the FabPod.

## **Architecture, measurement, and ethnography**

### ***Architecture:***

The FabPod was designed in response to two occurrences: acoustic experiences recounted in Antoni Gaudi's Sagrada Familia church in Barcelona in Spain; and the need for speech privacy in an open plan working space in Melbourne Australia. In 2010 the interior of the Sagrada Familia was completed, following a construction process of 126 years. As the architect Jane Burry described, this completion enabled hitherto unknown experience of the acoustics of the space, brought to life by the influence of choral, instrumental and clerical presence (Burry et al nd). Burry explained anecdotally that the 'musicians report the church has a very diffuse acoustic without the long reverberating echoes and islands of intensity characteristic of similar vast volumes constructed from reflective surfaces' (Burry et al nd: 89). Burry and her colleagues, inspired by how the curved hyperboloid surfaces of the nave walls of the Sagrada Familia diffused light and how the 'surfaces scatters the sound in an ecclesiastically novel way' (Burry et al nd: 89-90), brought this insight and learning to their designing of the FabPod. Through making of the prototype, the architects examined the application of hyperboloid surfaces as 'effective diffusers of sound' (Williams et al 2013: 252). Their ambition was to create an experiential environment, or atmosphere, which would also be functional since the FabPod research intended to prototype a meeting room to be installed in open plan work space. The project responded to an architectural brief to create a comfortable space for eight people, not for complete acoustic privacy but to 'provide a significant barrier to sound transmission into and out of the meeting area and an internal acoustic was conducive to small meetings'. The architectural research team proposed 'design that combined partial acoustic absorption with a degree of sound scattering' (Peters et al, 2013).

Designing the FabPod's acoustics when they could be imagined but not heard or experienced involved a digital design and modeling process, driven by acoustic simulation. The only way that it was possible to qualitatively or quantitatively test or measure acoustics during this process was through the visual and numerical outputs of digital simulations. Wave-based modeling provided a visual but at least conceptual understanding of the sound wave mechanisms in play. Numerical results could be presented as visual colour fields permitting a cool appraisal of 'better' and 'worse' acoustic tendencies in response to different versions of the approximately modeled design. The model was 'iteratively developed towards acoustic performance criteria' through the use of these (digital) simulations (Williams et al 2013). These provided relatively crude feedback against the 'imagined' or projected experience of the acoustic that was completely detached from auditory experience. It needed the interpretation of a seasoned human with enough experience to make this translation between approximate numerical measures and the true experience of sound in other projects and spaces, in this case Brady Peters, an architect who has specialized in designing for fine tuned acoustic experience. The design was pushed backwards and forwards between stages of development when working with the algorithms, but it clearly left much to the imagination (Williams et al 2013). While algorithms could be used to approximate possible acoustic performance, the architects were effectively working with degrees

of uncertainty about how the shapes might generate acoustic experience. Designing often means to work with things that can be imagined but never precisely modeled, known or tested until its actual use by people. Designing is a series of exploratory practice that runs approaching and appraising aspects of the imagined through a series of representations, usually of increasing resolution and verisimilitude to the imagined object or system as knowledge of its nature increases. In this case the distance between the imagined and feedback from simulation and modeling was exacerbated through the need to translate a solely visual representation of an imagined auditory experience. Therefore the imagined acoustics of the atmosphere that would be emergent from a not yet made artefact were integral to the design process. However as the description above suggests here what was imagined was not itself a fixed or determinate future, but one that was always contingent as part of an experimental design.

### ***Measurement:***

Once the FabPod was built and in use, two acoustic measurement and modeling studies were undertaken by acoustic engineer Xiaojun Qiu and his team. These provided quantitative data that offered a particular way of knowing about the performance of the FabPod 's materials and geometry. The acoustic measurements determined if the FabPod achieved standard predetermined levels of reduced sound transmission and hence speech privacy within a complex environment. Speech privacy is affected by multiple factors such as 'speech attenuation from the sound source to the receiver and the level of the background noise' where technically 'the speech attenuation from the sound source to the receiver depends on the height of the wall or barrier, the sound absorption coefficient of the ceiling and the distance between the sound source and receiver' (Qiu 2015: 1). Qiu also measured the speech privacy in the FabPod based on an international standardised Speech Privacy Class (SPC) for closed rooms, which calculated it at about 43. The minimum speech privacy requirement is 60 and SPC values greater than 90 mean perfect speech privacy. The level of sound reduction is nevertheless impressive and significant for a partial enclosure completely open to the ceiling and at the entrance. The Fabpod was designed with the idea of creating sound gradients within an open space and an interest in what is actually necessary with respect to both sound reduction (decibels) and loss of speech intelligibility, in order to reduce the conflict between group meetings and individual knowledge work within the same space. The actual experience of privacy is a subtle concept, depending also on less easily measured or established qualities such as the clarity and articulation of the sound inside the space and the impact of the architecture on human behavior, for instance the volume and mood of the meeting.

Technical measurements for speech privacy within the Fabpod were reported with the intention of providing one source of feedback to inform future designs. The acoustics researchers concluded that the shape and surface of the structure had little impact on the sound field distribution and speech intelligibility, while the hyperboloid cells affected reverberation time (Zhao et al, 2015). They also reinforced that the intended low reverberation in the Fabpod 'may be caused by the open ceiling design' (Zhao et al 2015: 74). However the specific effect of sound

scattering was not part of the evaluation. As such, it was proposed that the designers ‘focus mainly on the room shape and absorptive materials at the design stage instead of small fine surface structures such as the hyperboloid cells’ (Zhao et al 2015: 70). The measurements described a means of detecting and representing invisible fields of sound reverberation and refraction that the architects could not ‘see’ through digital visualization, and that ethnographers and users of the FabPod experienced but could not make explicit. But while the measured acoustic is a much more accurate and higher resolution representation of the acoustic of the space than the digital simulation in design, it remains limited in relation to the subtlety of the many dimensions of human auditory experience (Blessner and Salter 2007). In this example we see how acoustic measurement becomes a technology not only through which to know about sound reverberation, but through which to understand and to imagine the invisible affordances of material structures and how these contribute to the constitution of atmospheres, and the next steps in an architectural design process.

### ***Ethnography:***

The ability of an architectural space to generate a particular acoustic experience is contingent on how it is socially, practically, perceptually and imaginatively engaged with and understood by its users. Therefore to undertake our ethnographic study of the experience of the FabPod, we situated participants’ acoustic experiences in two ways in relation to sensory embodied experience of the environment/artefact and the capacity to imagine beyond. The design anthropologist, Halse describes, such ‘ethnographies of the possible’ as a way of materializing ideas, concerns, and speculation through committed ethnographic attention to the people potentially affected by them’. Like Halse’s agenda of ‘crafting accounts that link the imagination to its material forms’ (2013: 194), the ethnographers, led by Sarah Pink, video-recorded (re)enactments that engaged eight participants with the material and perceptual context of the FabPod while they recalled their first encounters with the building, their experiences of using the FabPod, and their imaginations of unknown and not yet experienced ways of perceiving it. Additionally, in collaboration with non-fiction writer David Carlin, who led a creative writing workshop with eleven participants/contributors (Carlin et al 2015) we extended Halse’s notion of the possible as ‘about creating artefacts that allow participants to revitalize their pasts, reflect upon the present, and extrapolate into possible futures’ (2013: 194), to create narrative artefacts in the form of stories about possible future experiences of the FabPod. Through these activities we investigated the FabPod sensorially and emotionally, how it felt to first encounter it, and the potentiality and possibilities felt by the participants. In these reflective, imaginative and speculative renderings the FabPod did not have to be a meeting room. Instead it became an artifact or a probe (Gaver et al 2004) through which stories were related.

### **Ethnography, acoustics and privacy**

There is a growing literature in sound anthropology and acoustemology that attends to auditory knowing (see Pink 2015). For instance, Feld argues that ‘the experience of place can always be



potentially grounded in an acoustic dimension' (2005: 185) and auditory ways of knowing are acknowledged in the anthropological literature (see Feld 2005; Rice 2006). As for acoustic engineers, from an anthropological perspective, acoustics are part of complex environments, although understood differently. Acoustic perception is always situated and contingent on its relationality to other aspects of sensory, emotional, spatial and social experience. The experience of sound is inextricable from that of other modalities of sensory experience, and sound experience can be understood as constituted relationally to them (Ingold 2000; Rice 2005; 2008). Therefore to investigate experiences of speech privacy in the FabPod ethnographically we defined them as part of the multisensory experience of an ongoingly emergent atmosphere.

To understand participants' relationships with the Design Hub building we asked them to reenact their journeys up to the floor where the FabPod was housed (figures 1-2). Thus we used the sensory embodied experience of walking through this environment as a prompt for participants to recall their emotional and sensory experiences of encountering and inhabiting the building and its aesthetic qualities and affordances. While the Hub's aesthetics were generally appreciated positively, participants raised issues of privacy. For instance, one person said 'it's a nice building', and 'its very vibrant' however, 'you don't have separate offices, so it's very inconvenient, its fine for meetings, but in general for daily work purposes it's not usable, for me'. For another, who deeply appreciated the building's aesthetic, '... working in it doesn't always work as you'd expect, but I do think it's quite beautiful'. Another approach was to use it only for selected tasks, as a designer put it: 'I use the space for production work ... and also for meetings as well' and another participant worked from home when she needed privacy. The Design Hub for these participants was beautiful but ambiguous. The issues and hopes they raised relating to privacy were predictable since they are common to open plan workspaces, and the FabPod had been anticipated as a solution to such issues. Privacy and sound are key concerns in existing literatures in organization studies, regarding open plan offices and their management (Leaman 1992), where lack of worker privacy is 'an unsolved negative aspect' and 'both visual and acoustical types of privacy are needed' (Ding 2008: 146). Qui and colleagues suggest 'it is hard to achieve "acceptable" speech privacy if all design parameters do not have near to optimum values' (2015: 4), which involves social as well as material elements. They propose that a 'successful open office should also include an optimum masking sound spectrum and an office etiquette that encourages talking at lower voice levels' (Qiu et al 2015: 4).

The FabPod was situated in a qualitatively quiet work area, as one participant described:

... you come into the space and your voice drops, and you become aware of where the people are and what other people's conversations are in ways that in public spaces you're not, and you adopt a more focused, what's next you know, that kind of ambling into work kind of space, and that I think occurs there, ... that's the moment of being at work [i.e. entering through the door] ... maybe it's the quiet ... its quite palpable.

Participants were not worried by sound coming *into* the FabPod from the outside, but with sound flowing outside. Open plan working meant they needed to access areas for private meetings, conversations, Skype and phone calls. Since they had expected the acoustic design to be experientially recognizable, questions about privacy were already pertinent for them.

Participants expressed an enduring sense of uncertainty about the levels of privacy afforded by the FabPod. Some foregrounded, privacy and needing to speak quietly in the FabPod. As one said, ‘you might not really speak up very loudly because you know that it’s not soundproof, so people outside can still hear, its not that you are talking secrets that no one can hear, but you know that it’s not 100% sound proof so you do not speak up’. A participant who sat near the FabPod never had confidential conversations in it, she and colleagues had meetings another area, seeing the FabPod as for ‘the kind of meeting we could have had in a coffee shop’, or as if taking place in public. Other participants felt the FabPod offered a degree of privacy above what would be possible otherwise, yet their feelings were ambiguous as they expressed doubt about the actual levels of privacy possible. When we discussed these feelings while inside the FabPod, this generated reflective responses. For instance, a designer participant mulled this over, commenting:

I think it does ... produce a sense of enclosure ... within these larger open plan floors, which works quite well. You do feel that you have a little bit more privacy than you would elsewhere perhaps ...it’s a very open plan. Although it’s not sealed completely, there’s no door you can shut, or you can’t completely seal out the outside environment but it does go towards giving you that feeling that you’re in a private space

The possibility that the FabPod implied more privacy than it offered resonated with other long-term users’ experiences. One participant described how ‘I feel like when you’re in there you actually start questioning the privacy, ... because the roof isn’t actually closed off, and you go, oh hold on a moment, it’s not completely private so how much can I say, how much can they hear...’. It was, for another, never a completely comfortable situation as they were continually in doubt. Similar reflections on privacy were expressed by the shorter term visitors to the Hub, one believed that people could hear her while she was in the Pod, inspiring a sense of uncertainty, since, she told us ‘it feels more contained, private, and the acoustics are softening it a lot’ but ‘I don’t know the extent to which that is just deceptive’. This deceptiveness may be due to the FabPod walls that insulated 75% of the background noise that mainly came from the traffic outside the building. Qui and colleagues describe that this made it quieter inside the FabPod but also ‘a person inside the Fabpod might be more easily distracted by the people talking outside the Fabpod’ (Qiu et al 2015: 5) and they recommend more noise masking to reduce this distraction.

Participants found the FabPod’s acoustics difficult to separate from the wider sensory and emotional environment. Some specifically talked about the acoustic qualities of the FabPod, which we experienced with them when these discussions took place in the enclosure itself. However in practice, acoustics do not matter independently of other aspects of experience.

Therefore while the differences in acoustic measurements have consequences for how the FabPod is experienced, they need to be situated qualitatively as part of more complex experiential fields. Indeed participants' sensory metaphors and categories often overlapped. For instance, one participant was disturbed by the lack of a visual 'escape' from the FabPod, pointing out that: 'this is a sensory space, not just a visual space'. Some referred to the experience of sound: the 'flattening' of voices when they were in the FabPod; the idea that speaking there felt different; the sense that 'there is definitely a lot less static noise ... you can have a more concise conversation ... so thinking is a lot better, there are not as many distractions'; and when asked about the lighting or temperature, another participant used similar metaphors 'It's a bit dark, it's a bit muffled'. The lighting was generally seen to be low, contributing to the flattening of the experience. For example: 'It's a little bit dark, ... you've got to be careful who you take in there, because you don't want to freak them out'.



**Figure 3: Inhabiting the FabPod.** Photo credit: Yoko Akama.

The dark, muffled flattened feel to the FabPod made it feel less like a meeting room, and when we probed participants towards imagining what else it feels like, ideas like a 'den', that it felt cosy and enclosed emerged (Fig. 3). Yet, these qualities were also seen as deceptive in relation to the expectation that it would be soundproof. For instance, for one participant the light 'makes it more den-like', but she 'thought it would be quieter than it is'. She usually worked near the FabPod and described how 'there was someone in there the other day, I couldn't make out precisely what they were saying' but she could hear its rhythm. This contrasted with her expectation that: 'for something that big, and for something that's called an acoustically tuned pod, I would think that you wouldn't be able to really hear what was going on in there. They've

turned it down rather than turning it off and I would have thought it would be closer to off'. Even for a participant who had more actively used the FabPod for meetings, this was a place for focus rather than generative activity, as she put it: 'its good for an intense kind of working meeting, if we want to discuss things and be a little bit more lively, we might go outside to where it's a bit brighter'.

The architects had imagined and sought to design an acoustically private space, and had created a space that had particular acoustic affordances. Yet as participants shared with the ethnographers in situ in the FabPod, what it felt like to converse in there, it emerged that the acoustic affordances of the FabPod were experienced as inextricable from multisensory and culturally specific ways of feeling about privacy, uncertainty, being concise or cosy. Therefore while the acoustic properties that had been imagined by the architects had been designed to contribute to a workplace atmosphere that would be experienced through acoustic privacy, instead the way it felt to be in the FabPod – its atmosphere – was different. It emerged in relation to the materials, their acoustic affordances and the users to include a sense of uncertainty and related discomfort about the privacy of conversations. These experiences of the FabPod also however contributed to how it could be imagined differently – thus as imagination and atmosphere co-emerged, they became 'technologies of the imagination'.

### **Imagining alternative atmospheres**

While participants evaluated their experiences of the FabPod in relation to preconceived expectations of its acoustic properties, they also imagined other possible ways of experiencing it. Situating the possibilities they suggested as emerging between the materiality and sensoriality of the FabPod and human perception – its atmosphere – we explored what the FabPod *could* feel like and what else we could imagine it to be. Its material, sensory and spatial affordances became probes or 'technologies of the imagination'. The meeting enclosure emanates its own atmosphere, and to its users, this varied from being futuristic, cave-like, curious, precious or pompous. Qualities like its cosyness, and its enclosing nest, hive, cocoon or egg-like were emphasised, in contrast to some who suggested futuristic and sci-fi narratives. These included reference to *Dr Who* and to aliens, that it might be a prehistoric dinosaur egg, and allusions to its frogspawn-like circles. Here, we see the participants carry 'anticipatory affects' with them to the FabPod, already primed by their experiences of the past, they are 'freighted with individual and shared memory or experience' (Sumartojo 2014:61), which contribute to atmospheres in certain ways.

Whilst each participant brought 'anticipatory affects' to the FabPod, during the creative writing workshop, the group built collective knowledge about future alterities for the FabPod, which became a resource, before we wrote individual short accounts (see Carlin et al 2015). The atmosphere we shared shifted to a collective lightness when someone imagined a nestling creature, followed by humorous banter among the participants. Many things can shape and take part in atmosphere as they are 'perpetually forming and deforming, appearing and disappearing as bodies enter into relation with one another', but 'they are impersonal in that they belong to

collective situations and yet can be felt as intensely personal' (Anderson 2009:79– 80). Anderson describes how atmospheres require 'completing by the subjects that "apprehend" them', who in turn, contribute to the atmosphere emanating and enveloping the entire group. Nurturing themes were notable. Participants narrated the FabPod itself as caring and themselves as caring for the FabPod. These sensorial and emotional narratives attached to the FabPod were positive and endearing, such as making sure its lights were switched off at night and hoping it would not be destroyed. Participants turned to metaphors and described experiences that would not normally be associated with the atmosphere of a work meeting space, through references to the slowness of gestation (eggs and nests), cosyness, relaxation, sleep or chilling out. By imaginatively departing from their expectations of the meeting room, they allowed the affordances of the FabPod to generate possibilities. The creative writing workshop generated a sense of excitement among the group as to what their collective encounters enabled, acknowledging how the enclosure, their conversations, engagements and creative writing all contributed to altered perceptions and atmosphere, co-constituted by their imagination. As Akama (2015:271) describes, the FabPod's effectiveness as a meeting space seemed to matter little to the participants after this experience by 'letting go of their previous impressions and certainty', creating new ways of imagining and a discovery of something they were unable to know before embarking. Thus demonstrating again how the configuration of things and processes, including the FabPod itself was both generative of the atmosphere of the workshop and the imaginations that emerged from it.

### **FabPod Futures: implications**

The above account has engaged a theoretical category that brings together imagination and atmosphere as part of the same generative configuration in order to reveal the richness and complexity of trans-disciplinary research that bridges design, architecture, acoustic engineering and anthropology, and how users as co-researchers contribute imaginatively to explore something that is always in a state of continual becoming (Akama 2015). This co-exploration of potentiality among differing disciplines, knowledge asymmetry and experience is significant for design because it suggests that we need to go beyond understanding user experience or undertaking evidence-based design to consider how such imaginations might be co-articulated together.

The deep engagement in design demands a level of conviction as well as an open exploratory approach. For the FabPod the design imagination focused on a fantasia of geometry in response to Antoni Gaudi's ideas and pursued through empirical research around the efficacy of hyperbolic surface shape for sound scattering and the possibilities of making and delivering an organic diversity of unique component shapes. The architects' imagination projected a complex and arduous process of realization to consider the eventual user experience. During the design process, imagining the experience of future occupants centered on the perceived sound quality that would be neither dead nor over-bright but very even and diffuse around the space. The cross section was also examined visually to understand whether it might be embracing or intimidating

to the occupants. In this sense, a designer is always striving to test their imagination through representation, experiment, models, prototypes, or dry runs, to the point where imagination bleeds into partial but increasing knowledge of what might lie ahead. Usually, once the project is completed, their imagination has served its purpose. Then the commissioning client, invested stakeholders and potential users continue imagining new possibilities. However in our FabPod research the imaginative speculations of the participants in the ethnography were revelatory for the architects in demonstrating different kinds of imaginings to their own. Pallasmaa notes this difference when he explains that ‘in our role as architects we aspire for a meticulously articulated and temporally one dimensional environment’ he also admitted the limitation of the designer’s one-dimensionality in contrast to the ‘layered, ambiguous and aesthetically less coherent space’ (1994: no page numbers) that as we have evidenced can part of the configurations through which experienced atmospheres come about. Our participants responded to the space in their own and collective ways where their imagination was a conduit for their subjectivity, history, experiences and perceptions that were co-constituted by combining with the material and sensory aspects of the FabPod. Such elements of atmosphere cannot be architecturally designed, and neither can complete atmospheres be designed.

Understanding how the architects who worked on the FabPod created ways of knowing through imagination in the design process was however also illustrative in revealing the inevitable incompleteness of design and the indeterminate nature of an architectural design outcome. It showed an architectural design process that is different to the stereotype of the architect as conventionally liking ‘to think that the complete building stands as the crystallization of a design concept’ (Ingold 2013: 47). Therefore, a focus on the category of imagination shows how if architectural imagination (like all imagination) is not determinate (Sneath et al 2009) then it might become open to other imaginations. The analysis also revealed the FabPod prototype as a dynamic artefact, whose affordances could be engaged as technologies of the imagination, in order to perceive *possible* atmospheres. The implication is that we need to develop future investigations whereby architectural, ethnographic and user imaginations, and acoustic measurement, come into closer, more continuous and explicit dialogue during the design, making and use of a prototypes.

### **Conclusion: towards a transdisciplinary imagination?**

As we have shown in this article, imagination is central to the practice of architects, ethnographers and those who dwell in designed spaces. Because imagination is concerned with the unknown and cannot be pre-determined by the material and human configurations from which it emerges, it offers a category and technique through which to explore possible atmospheres. The question this raises for us relates not to how we might make what is imagined and experienced more certain and easy to predict. But rather it concerns how we might harness the very non-determinacy of the imagination towards creating outcomes that are shared between designers and users. As we have shown by developing a category of the imagination that can be applied across architecture and design anthropology, an analytical space emerges which can

serve as a meeting point for the imaginations of architects, ethnographers and users. This makes possible a transdisciplinary approach to researching, imagining, designing and making the materials, processes and other conditions through which *possible* experiential atmospheres might emerge.

To achieve this, as we have shown however is not straightforward since the category of imagination is complex: first because different disciplinary ways of imagining cannot be directly compared in a practical sense; second because if the future is indeterminate and projected outcomes cannot be grasped, there is no hypothesis to test as there would be in a conventional scientific research process; third because atmospheres are intangible and ongoingly configured, like the imagination they do not stand still; and finally because the work of the imagination in design, measurement and the imagination in user, can happen in different temporalities of the design process. Therefore bringing together these approaches needs to be a transdisciplinary endeavor since it requires in-depth and reflexive interrogation of the ways of knowing and imagining that emerge in the processes of different disciplines, and for the correspondences to be forged within projects.

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