# Exploring deeper connection to landscape using a locative media deep map app

# A Cornish Case Study

## Lucy Frears and Erik Geelhoed

In this chapter we explore whether locative media can develop a deeper connection with landscape. In the context of our research, locative media is defined as multimedia content delivered through users’ mobile phones dependent on a user’s geographical location. The chapter draws on the analysis of and reflection on data collected from users of the *Hayle Churks* app (2013) created by Lucy Frears using app-making software *AppFurnace* by *Calvium*. The development of the app was partly funded by a *Heritage Lottery Fund* (HLF)grant and created as part of inter-disciplinary practice-based research supported by the *European Social Fund* (ESF) and *Falmouth University*. *Hayle Churks* was published on *iTunes* in December 2013 and won a national *Collections Trust* award in June 2014. The appcan be downloaded over Wi-Fi onto an *iPhone* and contains over an hour of audio content that plays automatically, triggered by GPS as the participant walks (walking includes wheelchair movement in this document) around the Hayle landscape. The audio content is accompanied by images such as archive photographs, old maps and a painting. In addition, there is an on-screen map that geo-locates the ‘listener-walker-participant’ (Myers 2010: 70) at all times.

The audio content itself includes oral histories from the archive of the *Hayle Oral History Project* (coordinated by Lucy in 2008-10), in addition to recordings made specifically for the app; a seven-part narrative called *Minnie’s Story*; a layered field recording loop (with sounds recorded around Hayle); a musical loop (also containing Hayle field recordings) and three original songs. The binaural background loops open up a hyper-real three-dimensional aural sphere (Miller in Cardiff, Miller and Christov-Bakargiev 2012) around the participant’s body pitching the senses out into the landscape to aid embodiment and the intertwining and interaction of human and landscape. The loop also performs the function of confirming the app is still working, but most of all it provides texture by mixing ambient environmental sounds (such as seabirds calling and waves) that bleed in past the headphones to mix with the recorded digital sound to create what George Bures Miller refers to as ‘a third reality’ (Miller in Cardiff, Miller and Christov-Bakargiev 2012). Reid and Hull describe the ‘synaesthetic confusion caused when you are not sure if a sound is real or virtual’ (2011:197) as a ‘magic moment’ (2011).

Walking with the app, the participant experiences an overlap between the landscape: the physical present and the digital past, pre-recorded oral histories, sound effects and archive images. The participant slides through levels of immersion between physical and digital realities, both experienced simultaneously.

Three-dimensional *Merz* collages by Kurt Schwitters (1887-1948) are a methodological inspiration. The artist, sound poet and sometime Dadaist used *Merz* to juxtapose, overlap and layer diverse elements and materials creating a textured, sculptural object to which others could add (Dietrich 2006). As a methodological tool, *Merz* reaches through the practice into data gathering. On two of the three occasions data were gathered, qualitative and quantitative data were layered, overlapped and juxtaposed to compare, complement and draw out meaning.

Locative media, emerging as a mobile art form in the late 20th century, is still evolving rapidly and has yet not reached its potential (Stenton 2011). Wireless invisible computing, locatedness and GPS technology behind locative media can be traced back to Mark Weiser, who imagined ubiquitous calm computing – quietly active out of sight enhancing our peripheral or sensory reach and available, or visible, when needed (Weiser 1994; Weiser and Seely Brown 1995). Invisible computing and the portable technology containing it – in this context, the mobile phone – combine to create the potential for an embodied locative media experience.

Although more recently associated with social and commercial apps, it is the more poetic and creative locative media experiences that this chapter concentrates on. There are claims that those experiencing locative media can ‘gain a deep connection’ (Farman 2015: 6) with location. These claims, made by artists working in this field, those experiencing the artworks and recently theorist Jason Farman (2015), are more anecdotal in nature. The primary contribution of this chapter is to provide empirical evidence in this area. The practice and research around the *Hayle Churks* app uses systematic analysis, unusual in the arts and therefore distinct. Experimenting through practice and building on insights from others’ artwork, experienced live or through documentation, includes revisiting empirical research on locative media containing audio narrative such as in *Riot!* *1831,* made in 2004 (Reid et al 2005; Blythe et al 2006; Geelhoed et al 2008; Reid and Hull 2011). Since GPS technology was incorporated into smart mobile phones in 2008, what Goggin refers to as the ‘*iPhone moment’* (Wilken 2012: 244), locative media has changed significantly, highlighting the need for new research at the confluence of landscape, locative media and art.

New embodied explorations in landscape by geographers (see Wylie and Lorimer 2010; Cresswell 2014 and Hawkins 2015), urged on by Crang (2003: 501), have bridged the gap, however temporarily, between human and landscape, a gap which has been articulated as a tension (Pearson and Shanks 2001: 151; Wylie 2006:1 and 2007: 475). Since the 1990s, embodied engagements with landscape using audio and walking have proved rewarding for artists and performers such as Janet Cardiff, Teri Rueb, Duncan Speakman, Graeme Miller and Mike Pearson. Historians and geographers are also making artful MP3 audio walks using gathered field recordings and oral histories. Toby Butler’s *memoryscapes* (2005), memory walks along the banks of the River Thames, London,and *Kilmahew Audio Drift* (2012), a wander or drift around a ruinous site near Glasgow by volunteers and geographer Michael Gallagher, are two notable MP3 examples. The *Hayle Churks* app, using audio and image, is the first multimedia locative media research in geography’s investigation of place and intends to inform not only current dialogues in geography, performance and locative media, but other disciplines with an interest in region and its reanimation through the articulation of its histories, for example, history, archaeology, anthropology, heritage and tourism.

The *Hayle Churks* app aims to reanimate a deteriorating post-industrial landscape undergoing rapid transformation through rebuilding. In addition to reviewing memory archives, diverse sources were explored enabling community members and experts to share local knowledge, myths, personal stories, gossip, photographs and documents. Gathering, selecting and layering mixed and sometimes unexpected materials and media can be described as ‘deep mapping,’ a notion developed and articulated by performer Mike Pearson and archaeologist Michael Shanks (1997, 2001: 162) and experimented with further during the project *Stalking the San Andreas Fault* (2001)by their friend and colleague Clifford McLucas (1945-2002).

Deep map content appears in the app as strata: layered multivocal histories of place. App participants hear personal memories through headphones that bring voices into intimate proximity with the listener, right into the ear, words as close as a lover’s breath touching the ear (Myers 2011: 75). After the second test, a female writer wrote:

*‘These are the human real stories and I felt privileged that they wanted to share them with me. The drunken father and the shame over a half-Italian baby were extra moving because of this closeness that having them in my ears affords – more than written text.’*

Locative media can juxtapose varied deep mapping content, layering contested and non-hegemonic histories with a region’s dominant narrative revealing new perspectives. Within the app, memories from different decades, from past and present, come and go as hauntings without introduction or contextualisation. Often, location is the only link between voices speaking of different decades and themes.

Having no need to press a button to start the stories, the participant can control the audio by tapping the screen to replay, skip or pause stories. An archive image or occasionally a sequence of images can be viewed on the phone as each track plays. A participant can tap the screen at any time to switch to the map (appearing as a human shape on the map) to check navigation. The large number of archive images and historical map detail can be viewed on site during the experience and/or afterwards at home.

Cornwall has been voted *Best UK Holiday Destination* 2009-2014 in the *British Travel Awards.* St Ives, an ex-artists’ colony of around 11,000 residents, with cobbled streets surrounded by attractive beaches, is a top attraction and received over 750,000 visits in 2012 (The South West Research Company Ltd 2012).

Hayle, located on the other side of the bay, is different. The three-mile beach is hidden from view and still has fragments of World War II defences littering the easiest access point from the town. Once an industrial town with two foundries whose inventions spurred on the Industrial Revolution, it lacks the chocolate-box quaintness and scale of its popular neighbour. Most of its historic buildings have been demolished, although debris was left for decades before the surge of rebuilding in recent years. An Asda supermarket opened on the prominent South Quay in late 2014 blocking the view along the estuary (Hayle, or *heyl,* is Cornish for estuary) and dwarfing the terraced houses, viaduct and surviving historical buildings. The supermarket’s placement nearly displaced the *Devon and Cornwall Mining World Heritage Site* status for the town and whole region (Smith 2014). The derelict North Quay has been raised up on flood defences: promenades on different levels have been created between the working quay and large gravelled waterside real estate plots. Discovered heritage artefacts have been re-positioned and decontextualized, concreted in and left without explanation for passing strollers.

During Hayle’s regeneration, Lucy tagged North Quay with GPS and invisible aural graffiti. Just as ghosts are described as haunting sites, walking through walls built since they died, wading waist-deep through the road they walked on before it was re-laid, disembodied audio memories now appear like revenants. By placing the memories in relevant locations, oral histories are returned to the community and escape archive opening-hours restrictions and permissions. Improving community access could increase understanding of the historical significance of neglected areas, perhaps encouraging more sensitive local planning decisions, soon to be devolved to Hayle Town Councilonce its Neighbourhood Plan is approved.

Unlike an MP3 tour, the app does not follow a linear narrative. Neither does it stick to the town’s standard narrative: the warring between two foundries at either end of the town in the early 19th century still tangible today. Participants instead overhear traces of the fraternisation between residents and US soldiers stationed in Hayle during World War II. Between happy tales of love, friendship and childhood pranks other stories rise up to be heard: racism against African-American servicemen by their white countrymen that shocked the town, women’s experience of inequality at work, what the most respected and powerful employer in town was really like to work for, plus murder, illegitimate children, betrayal, and cruelty. Could hearing the past and present encourage a listener to reflect on the future and their legacy in the town and community?

## App evaluation process

The main focus of this chapter is on what the 108 participants drew from the locative media experience in the app’s evaluation, especially in relation to connection with landscape. This will be addressed here separated into three evaluations conducted between 2012-15.

### Introduction to the First Evaluation

For the first evaluation the app was a work in progress. The area for the drift (no set route) started on an old bridge. Once over the bridge, the road forked, and one way led to North Quay. In derelict neglect during the evaluation, the quay once was extremely busy with large ships loading and unloading cargo and many different industries based along it. The right fork followed a speed-controlled road with ornamental tropical gardens to one side and Copperhouse Pool on the other – once the location of Hayle’s biggest day, the Regatta, and still a popular promenade.

The app was evaluated against a control measure, a professionally produced and scripted MP3 historical walk (Audiotrails 2012). Although the app was developed for use on a smart phone, we decided to carry out the evaluation of both audio walks on the same device, a larger iPad.

In addition to the app content – oral histories, narrative, live located map and field-recording background loop that played between clips – questions appeared on the screen that the user could reply to by text within the app. There were ‘guerrilla interruptions.’ Sounding like an incoming telephone call, the participant rejected or accepted the caller, *Counter Tourist* (Smith 2012), an alter ego of performer Crab Man (Phil Smith), by pressing a button on the screen. The *Counter Tourist* encouraged alternative approaches to the heritage site through interactions and imagination.

For the first evaluation, during an unseasonably cold March 2012, there were 25 participants. On the first day, eight students (two male) and a female lecturer from a second-year site-specific theatre module at *Falmouth University* participated. On the second day, 15 students, nine female and six male plus their female lecturer, came from a *University of Exeter* heritage site geography module. Three of the female participants were over age 37, the others were all 18 to 25. Each group walked both the app and the control measure (the MP3) on the same day, with lunch in between. Users were split into groups at the beginning of the day, order 1 (app first then MP3) and order 2 (MP3 first then app).

Although all students studied modules that included investigation of different sites, none had previously downloaded an MP3 walk onto their device or investigated a site using an app.

All evaluators completed a pre-visit questionnaire (two sides of A4) and one immediately after the evaluation or MP3 walk (four sides of A4). Drift direction and button usage were logged within the app and we observed the students at intervals during the app walk, noting comments and behaviours.

Text boxes eliciting qualitative responses were embedded into the questionnaire but the majority of questions were in a graphic rating scale (Stone et al 1974) format. The advantage of graphic rating scales is to attenuate cognitive interference. In other words, it records more immediate, spontaneous responses by marking a line between two extremes rather than choosing a number or phrase that matches respondents’ experience. Below is an example of a graphic rating scale question:

Fig 1: (*graphic rating scale example)*

The mark on the line indicates this respondent found the app easy to use.

The questionnaire data were analysed using SPSS (Statistical Package for the Social Sciences, IBM) to identify statistical descriptions. Analysis of variance (ANOVA) was used to explore differences while correlations analyse similarities. Geelhoed used this type of questionnaire and analysis successfully in the empirical research on locative media narrative *Riot!* *1831* (Reid et al 2005; Blythe et al 2006; Geelhoed et al 2008).

Key findings from the first evaluated app: a high and close agreement that it was easy to use; that it was good (although unfinished); and it received a significantly higher enjoyment rating than the published MP3 walk, which from qualitative feedback relates to the magical hands-off appearance of stories and enjoyment of the memories. App users felt less lost than they did walking with the MP3, although the app had no set route or directions. Participants using the app and MP3 noticed more than walking around without a gadget, but the MP3 scored higher because it informed users where to stop and look while explaining why they should do so. Of significance is that participants felt they had learned more with the app despite directions, context and facts scripted into an over-arching narrative in the MP3 experience, against traces of stories in the app that often had no connection between each other except place.

To summarise the correlations: those who felt more deeply immersed in the oral histories felt they learned more; those who learned more liked the app experience more; and those who felt they learned from the app also noticed more using the app. Some found the sudden appearance of media uncanny or disconcerting. Those who found the app disconcerting liked the overall app experience and felt deeply immersed in the app’s oral histories. Theatre students linked stories to the location and were more immersed in them than geography students.

Themes emerged from the first app evaluation analysis, of which embodiment and levels of immersion will be discussed here. The experience of walking in landscape with a portable gadget and open app (computing and process invisible to the user) encourages an embodied and sensory experience of the physical world. Listening to the pre-recorded app content, mostly memories, some walkers simultaneously embody the physical landscape and the digital space – the space within the story being listened to. Smart phone and app use have become integrated into many users’ lives. Experiencing and embodying two places at once is common with a mobile phone, of being *there* – with the person speaking at the other end of the phone or while viewing online content – as well as *here*. Straddling digital and physical worlds to enhance both is becoming the norm. This research adds a nuance, that contained within the ‘*hybrid space’* (de Souza e Silva 2006) of ‘*being aware of two places at once’* (Hight 2006: 5) or ‘*doubling-of-place’* (Moores 2012: 14) are levels of immersion between physical and digital ends of the scale rather than staying equally immersed in both. What is in the foreground or background shifts; for example, a person speaking on the phone or speaking next to you while one is on the phone, changes the level of engagement with the digital conversation or physical presence (Meyrowitz in Moores 2012: 5). If one is too deeply immersed in the app’s digital content, for example, an oral history, one can lose the connection with the physical present, as this participant in the second evaluation describes:

*‘Because it was so good and immersive I felt disorientated and separated from the here and now*.’

Stories encouraged some participants to look around, although immersed in both the digital memories and the physical landscape, as this theatre student explains:

‘*Enjoyable matching stories to the landscape and seeing change’*

In 2004 a panel of practitioners, researchers and theorists[[1]](#footnote-1) who gathered in Bristol defined locative media immersion as:

‘that quality of the experience which held them in an imaginary or imaginative world, and left them feeling removed from the everyday surroundings of the experience.’ (Dovey and Fleuriot 2011: 101)

Immersion occurs more readily in art experiences that separate a participant from others physically or by using headphones, for example, during sound walks pioneered by artist Janet Cardiff (Christov-Bakargiev in Cardiff, Miller and Christov-Bakargiev 2012). One of the male geography students became separated from his friends during the first evaluation and enthused, ‘*Amazing, when you’re on your own you get really involved in it*.’

App participants were asked if they experienced a feeling of solitude, as it can be an indication of immersion, as Mauer describes:

‘Isolation is a state of separateness while solitude is a state of intimacy with oneself and the universe’ (2010: 103).

When asked if solitude was experienced, a geography student scribbled next to the rating scale: ‘*very much but in a good way.’* Reid and Hull’s research illustrates that users flick in and out of immersion regularly during locative media experiences (Reid et al 2005: 1736; Reid and Hull 2011: 202). Reasons they identified are supported in our evaluation and broadened, including different modes of address and narrative, experimented with in *Hayle Churks.* Who is speaking and in what way they address the listener affect immersion, connection to landscape, enjoyment, and whether the participant is inspired enough to want to pass on the stories.

Rather than feeling solitude, but still connected with immersion, a conviviality or companionship is felt by participants due to the close-up and intimate nature of some of the stories. Two theatre students explain: ‘*feeling like I had company with the app stories* ’ . . . ‘*I enjoyed the company of the tracks AND felt I was part of a group*.’

Whether the evaluators felt *connected* to the landscape is of importance. Interested in whether connection to landscape emerged as a theme without prompting, participants were not asked about it explicitly in the first evaluation questionnaire. Evaluators certainly connected with the *stories* from the landscape, which was the most liked aspect of the app and one many wanted to share with others. Some felt an increased connection to the landscape as these theatre students describe:

*‘I felt more connected to the place and people and I felt a part of the history.’*

*‘Allowed me to understand presence and structure of older buildings as well as appreciating what is no longer there.’*

80% of app evaluators said they would come to Hayle again and see it with different eyes, compared to only 53% after the MP3 walk. After using the app, 56% would think about the future of the area, while 48% would pay more attention to planning proposals in the area.

### Introduction to the Second Evaluation

In 2013, from the opening day of the *Hayle Heritage Centre*, 29 August, through 22 September, members of the public were invited to evaluate the app using *iPhone* or *Android* during a long looped walk of approximately two hours wearing headphones. Participants were self-selecting and invited via a *Facebook* page (reach of 2,000), local press (newspaper and radio), posters around town, requests forwarded through friends and organisations, and some of the *Heritage* *Centre* opening publicity. Sixty evaluators, 33 women and 27 men between ages 13 to 69 (87% over were over 36), completed questionnaires that once again required users to both mark the graphic rating scale and write reflective answers, to provide quantitative and qualitative data that could be layered and compared. There was only one strongly significant result involving gender. Responses to the question ‘Do you feel more connected to the landscape now?’ showed a variation between male and female responses. Women were in close agreement about feeling more connected to the landscape. Only a quarter of the evaluators (15 people) lived in Hayle.

The app now started at the entrance of the *Hayle Heritage Centre,* based in the old office of one of the town’s two powerful, long-closed foundries. Participants walked along the harbour and edge of town to reach North Quay and Copperhouse Pool, experienced in the first evaluation, and onto the Towans (the Cornish word for *dunes*) and coast. A shopping street became part of the route in order to pass the location of the rival foundry. Here, participants strained to hear the recordings, and some struggled with being conspicuous by wearing headphones and walking slowly. A Hayle resident felt embarrassed by the *‘she’s listening to music on one of those ‘fangled gadgets’ looks from the general public,’* and a local couple, retired teachers, told me of their amusement when someone stopped in front of them, wearing their headphones, and shouted ‘*rock n roll’* !

In this app version, the changes included new interviews with younger voices to draw in contemporary Hayle, audio marked by dots, and a home page with a button called ‘listen at home.’ Once published, this ‘armchair mode’ would enable stories and images to be experienced at home (but it was not yet functioning).

Findings from the second evaluation follow. First, the story from the quantitative feedback will be told, focusing on the differences between the answers and then the similarities between pairs of answers and what they reveal. Examples of quotes and findings from the qualitative data will then follow.

## Quantitative data: differences

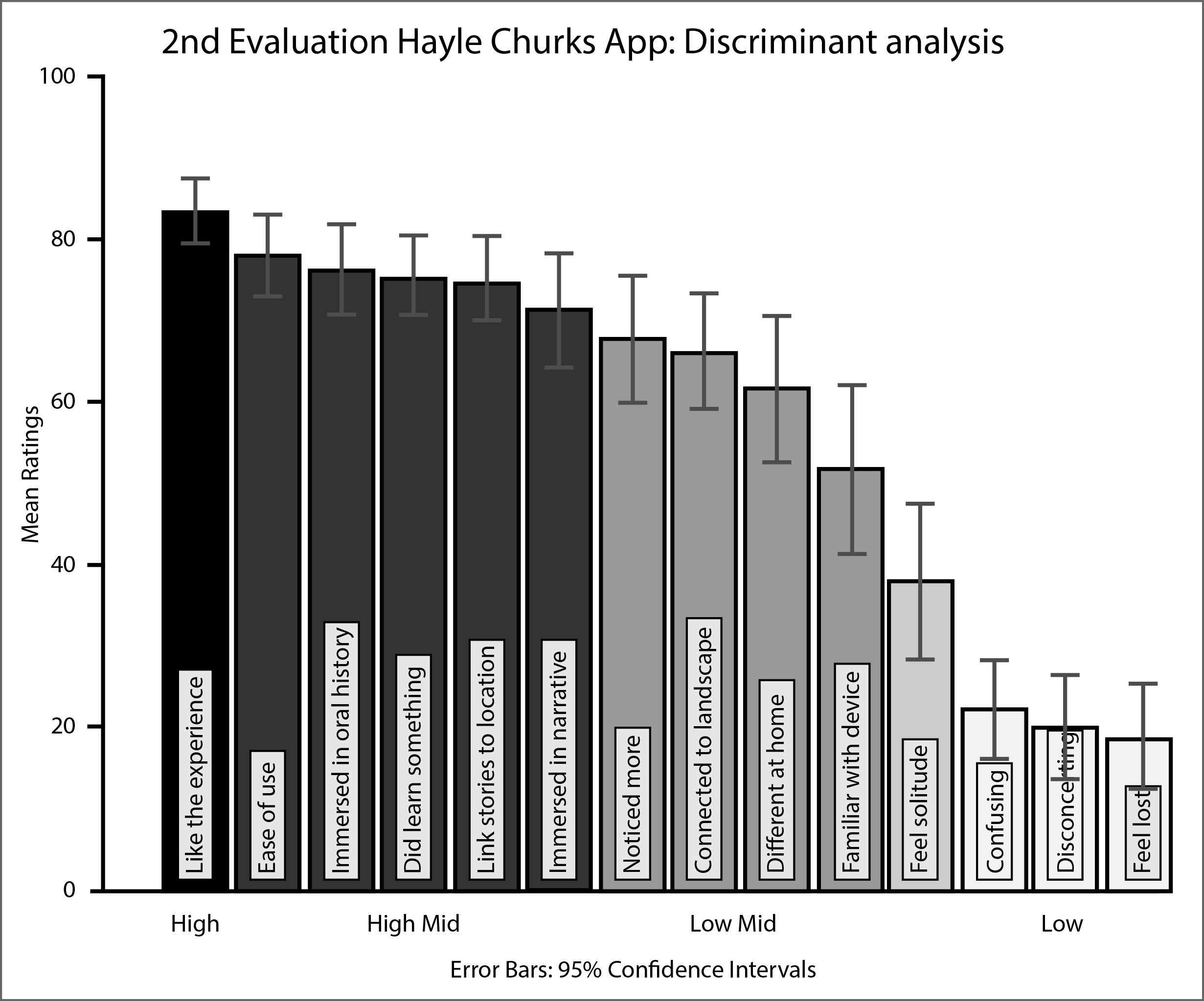


Figure @: Mean Ratings 2nd Evaluation *Hayle Churks* App

The bar-chart (figure @) shows the means in descending order. In addition, table @ shows the standard deviation.

Table @: Descriptive statistics of the 2nd Evaluation of Hayle Churks

|  |  |  |  |
| --- | --- | --- | --- |
| **Band** | **Item** | **Mean** | **Standard Deviation (SD)** |
|  | Like Experience | 83.8041 | 14.27053 |
|  | Ease of Use | 78.2558 | 17.83731 |
| Immersed in History | 76.3188 | 19.52584 |
| Learn | 75.7278 | 17.63785 |
| Link to Location | 75.3250 | 17.99512 |
| Immersed in Narrative | 71.3847 | 24.71554 |
|  | Noticed More | 67.9309 | 28.11735 |
| Connected to Landscape | 66.4015 | 25.21415 |
| Different at Home | 61.6913 | 31.06762 |
| Familiar with Device | 51.7451 | 36.65427 |
|  | Feel Solitude | 37.9503 | 33.53204 |
|  | Feel Confused | 22.2027 | 21.59264 |
| Disconcerted | 19.9091 | 22.57037 |
| Feel Lost | 18.7442 | 22.74821 |

We were able to delineate five significantly different bands of scores (indicated by the different grey shades, from black to light grey). For details of how these bands were delineated, please contact the authors.

**High ratings** (mean 83.80)

Liking the experience was rated highly by participants. In addition to the high mean 83.80, there is a low spread of the ratings (Standard Deviation = 14.27), indicating a high concordance amongst the participants. Enjoyment was rated significantly higher than all other ratings. In other words, it is not an exaggeration to say that the app was enjoyed tremendously.

**High Mid ratings** (means 78.26 – 71.38)

This band of high mid ratings (around the 75% mark) is made up of five items: *ease of use* of the app, being *immersed in oral history*, feeling that they have *learnt something*, feeling a strong *link between the stories and the location,* and being highly *immersed in the narrative*.

Usability-wise, the app is very easy to use (mean = 78.23, SD = 17.84). Given the nature of a prototype this was very positive feedback. The ease of use helped participants engage with the content without the technology being a barrier. The spread of the ratings around the means was mostly narrow (most SDs are below 20), which means high agreement amongst participants.

The high ratings in this band relate mostly to being highly engaged with the app and deeply immersed with the narrative situated in the location where the story takes place. However, this connectedness to story and location does not necessarily translate into feeling connected to the landscape. As we shall see next, the ratings for feeling connected to the landscape were significantly lower than this band of high mid ratings.

**Low Mid ratings** (means 67.93 – 51.75)

The next band of ratings, consisting of four items, is significantly lower than the previous band (high mid). There were relatively lower ratings for the app making one *notice more* in their environment and feeling a *connection to the landscape*. However the ratings were, on average, still above the 65% mark.

In this band we also see a higher spread around the mean with SDs ranging from 25 to 36, indicating less agreement amongst the participants. The participants did rate that experiencing the app in situ would be *different from* experiencing the application *at home*, but the mean was lower than one might expect and in addition there was low agreement amongst the participants, some rated it much higher (than the mean rating of 61.69) and some much lower.

This is an odd finding, since one would expect a greater difference between being seated at home and roaming around with a mobile device during an embodied experience. As discussed later, some participants were so immersed and unaccustomed to hearing the spoken voice while walking that they kept their head down rather than looking around, which could have connected the content and themselves to the environment.

Comparing the high mid versus the low mid rating, we could speculate that the immersion in the oral accounts strongly linked to its location produces an experience more akin to those of experiencing a site-specific theatrical performance, that it deepens the connection to the *people* and *their stories* that are grounded in that location rather than being able to describe it as a deepening of connectedness to the landscape.

Finally, participants rated *familiarity with the device* significantly lower than ease of use of the app. Almost half the evaluators (26) borrowed an *iPhone*. In spite of the appliance being unfamiliar, the app was still very easy to use, with very positive feedback about its design.

**Low ratings** (means 20.20 – 18.74)

We received more positive feedback about the app, as there were very low ratings for possible negative aspects, such as *feeling lost, disconnected* and *confused* by the experience.

Interestingly, *feeling solitude* took up a statistically significant intermediary position between the low and low mid ratings. In addition, the SD was over 30, indicating a relatively wider spread around the mean. Maybe the notion of solitude has different ramifications for different participants? It could be a more meditative state for some, whereas for others it could be more related to a more negative feeling of being isolated: loneliness.

## Quantitative data: similarities

In the previous section, we looked at where ratings differed and delineated five separate bands of ratings. It is equally insightful to analyse where responses to questions are similar, i.e. how pairs of questions co-vary, calculating 91 correlations between pairs of questions. Such a large correlation matrix is difficult to describe and interpret, so we used

Multi Dimensional Scaling (MDS), a technique that allows the depiction of a large correlation matrix as a two-dimensional plot. Figure @ shows how close (or not) questions relate to each other. For consistency reasons, we use the same grey-scales as in the bar chart showing the differences (Fig. @).

The size of the circles relates to the strengths of the correlations. For those questions where there were five or more significant correlations, we entered the number of correlations in each circle.

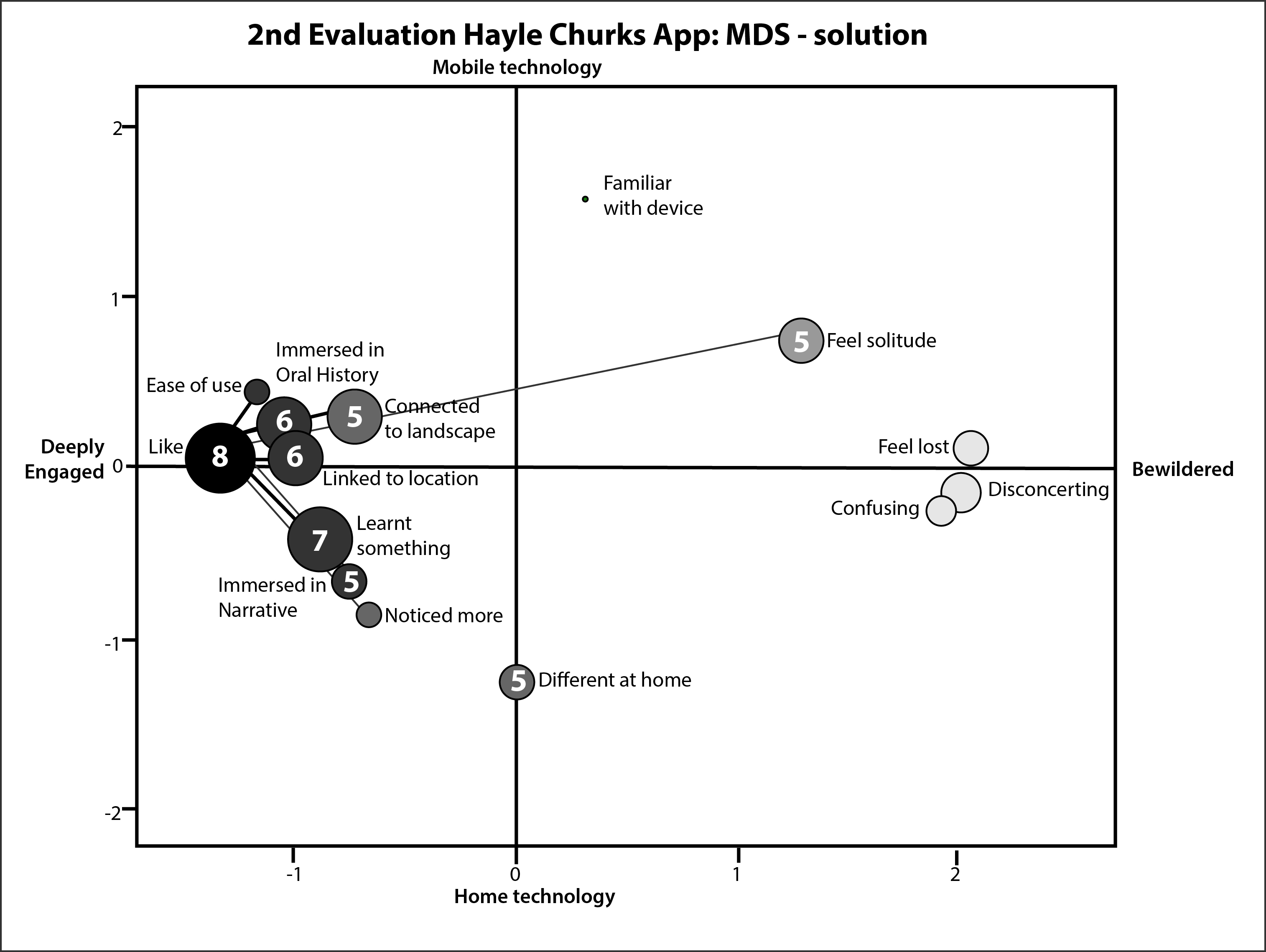


Figure @: Multidimensional Scaling, 2nd Evaluation *Hayle Churks* App

The question that correlated strongest with other questions was ‘*Liking the experience.’*  There were five significant correlations at p<.01 (depicted as thick lines) between *Liking the experience* with *Ease of use, Immersed in oral history, Connected to the landscape,* stories being *Linked to location* andhaving *Learnt something*. There were three (slightly less) significant correlations at p<.05 (depicted as thin lines) with *Immersed in narrative*, *Noticing more* and (oddly enough) *Feelings of solitude*.

Although correlations only show how responses co-vary and are not necessarily indicative of a causal relationship, it seems that those who gave high ratings for ease of use, being immersed and connected to the landscape as well as for the, possibly, more meditative feeling of solitude, find their culmination in expressing a high level of enjoyment.

We have interpreted the MDS scaling, the *Hayle Churks* design space, as follows. Most of the items are positioned relatively close to the X-axis. On the left, we find all those items that relate to being immersed in the audio app and connected to the geographical location, i.e. deeply engaged with the app (including ease of use). On the right-hand side, we see items that indicate a level of bewilderment, even though this level was low, signified by feeling lost, confused, disconcerted and, slightly separate, a feeling of solitude. As such, the X-axis runs from ‘Deeply Engaged’ to ‘Bewildered.’

For the Y-axis we have not much to go on. At a stretch and only based on the location of ‘familiar with the mobile device’ near the top of the Y-axis and ‘different at home,’ we tentatively describe the Y-axis as one that relates to (experiencing) the technology.

## Qualitative comments

As illustrated in the quantitative data above, liking the app scored highly with all ages and genders. ‘Liking’ was unaffected by people walking alone or with others.

*‘It added a depth and colour that I was not aware of’*

‘*Feeling a different kind of connection with the familiar landscape through the stories’*

*‘The app added another layer onto my encounter/experience of the place’*

*‘I felt part of it, the place, the history, the people’*

The stories were, again, well liked; 42 out of 60 mentioned them favourably:

‘*Range of stories: detail, personal, scientific and all the lovely Cornish accents’*

*‘[It’s like] going through a living museum – almost an abstraction, it becomes poetic, removed from reality* […] *Unusual because you used your imagination and intelligence to make sense of it. We think we want facts but they are quickly forgotten’*

More facts and context were requested by some participants:

‘*The stories were good: I think we felt some contextualising e.g. direction of attention, place, dates, relationships etc would help relate the stories to what is there now’*.

Images viewed while listening to the stories helped some participants make the link between past memories and the contemporary landscape:

*‘I liked how the images overlapped with what you saw’*

*‘It allowed me to see the landscape in a completely different way and create pictures in my mind of how it was and visualise the detail of what went on there in the past. This would not have happened having not had the images in front of me on the phone and listening to the details in the stories at the same time’*

The disjuncture between the past – brought to life through memories – and the present became more of an issue as the area underwent change through building projects. 71% of walkers reported that after the experience they would think about the future of the area as well as reflect on the past.

‘*The experience made you concentrate on the surroundings and the history of the area and its future’*

‘*Being here, hearing the voices and walking made me aware of the dangers implicit in managing change’*

*‘It […] makes me more inclined to preserve what we can and avoid developments that will change how Hayle looks and feels’*

The app exposed participants to long-term effects of local and personal decisions, which encouraged some participants to think about their own legacy and could encourage land stewardship.

‘*It was curious to think that where I was standing/walking, people had stood before and will do again (with many similar themes e.g. family life), and it was great to have an insight into what happened in the past, and made me think about what memories I would leave to future generations of today’s time.’*

### Introduction to the Third Evaluation

The app was published on *iTunes* late 2013. In addition to new clips and mixes, the dots marking audio points on the walk disappeared when played so that the map detail would become clearer. The route was adapted. The last section, through Copperhouse, the shopping area, was dropped, which forced participants to double back along the tropical gardens by the Pool instead of completing a loop. As an artist academic pointed out, it should have been made clearer that ‘*it’s what people in Hayle do, they promenade along this’ to* make retracing steps more acceptable.

From May 2014 to April 2015, 25 people (eight male, 17 female) agreed to semi-structured recorded interviews after evaluating the app. Two female teenagers emailed their comments. From a group of 19 walking artists who evaluated the app, some of them makers of MP3 audio or filmed walks, eight returned additional comments about their connection to landscape after a six-month interval of reflection. Six of those questioned evaluated the first version of the app and 19 evaluated the second edition, which included small changes: code change to make the fades smoother and a second background soundscape loop. This multitrack soundscape of field recordings – birds in the air, cave acoustics under the earth and under the surface of the sea, for example – was layered with overlapped fragments of stories. Influenced by Glenn Gould’s (1932-1982) counterpoint experiments with multiple voices played simultaneously in *The Idea of North* (1967)*,* the collage of voices attuned the participant to an unfamiliar way of listening while transmitting the ghostliness of the disembodied voice. The *Merz* audio collage reminds listeners of many unheard stories and voices and the intangible nature of memories, which were noticed by this male geographer:

*‘I quite liked the voices fading in and out* – *it was a bit like the past was there and it was gone* – *it didn’t give you that false sense of I’m really knowing this. It was still that thing that you couldn’t quite grasp, just given a glimpse of*.’

In this app version, the walker encounters (‘*the voices came to me*’) 38 sound clips. The sound clips last from between 11 seconds to more than four minutes, containing one voice or multiple voices, some with sound effects or music.

#### Qualitative data from third evaluation

The initial interview topic was left to the evaluators. Many mentioned technology and its functionality first. The qualities unique to locative media, the appearance and disappearance of audio and being able to locate oneself on the map at all times, were especially liked:

‘*The freedom and accidental meeting feeling*”

*‘The fact that I could walk and it could locate me and allow me to tap into the story of that site was really wonderful and I’ve not had that experience before so in that sense it was a really user-friendly application actually’.*

Various modes of address were still being evaluated in the published app. Traces of oral histories were still well liked. *Minnie’s Story* was pre-recorded and scripted to drive the walker towards the next episode. Minnie’s ‘black steps’ episode often resonated because they could be seen, touched and stood on, though it also raised the issue as to whether some participants realised it was a scripted story:

*‘There is an extra power when you think that in this very spot these people stood and this was happening […] a bit uncanny […]. You’ve also got that distance from it as well* – *talking about the ICI and power station, all that stuff that’s not here anymore, so you’ve also got that slightly weird feeling of, my god, this was a really industrial landscape.’*

The ‘*most immediate link to the present’* was through the voice of factual interviews. Human effects on the immediate environment, such as water pollution, dune erosion and climate change, were described, and more recent oral histories, such as with a younger fisherman, received a mixed response:

‘I liked those more contemporary things [...] could definitely have had more of those factual things in.’

‘Contemporary heritage of the fisherman that couldn’t wait to go out and see his basking sharks. There was something really nice about that in the mix with the history that was very .. that resonated.’

*‘The woman talking about the dredging and the* Surfers Against Sewage *[SAS] they were fine but they were so different that it was jarring as well […] The other voices are sort of more intimate or something. They’re not talking at you, they’re just […] going inwards to give you the memory whereas the SAS guy he was just telling you some stuff.’*

In addition to the different voices within the app, Lucy introduced Hayle to the *Walking Artists Network* (2007-) group and the town’s contemporary themes (such as the Asda build controversy) before walking the app. Although it added another layer to their experience, the preamble exposed participants to the gap between the recent transformation of Hayle and the app content and initiated reflection on the difference between recorded and live voices.

‘I was actually enamoured by being shown by a person who lives and breathes and knows the stories of Hayle. So I had this kind of dilemma all the way through about the lived experience and the live voice and the mediated voice.’

*‘[We experienced]* *your whole pre-narrative […]and then we’ve got these kind of sepia voices - where’s that voice going ‘oh they built that and that went wrong ‘ […] If you could find the voices that linked bits of it maybe that would bridge that gap from the sepia into the now.’*

Hayle inhabitants’ daily activities passed by the walkers mirrored those in the oral histories and linked the past to the present for many participants:

‘. . . *bathing and having fun and being with their families, that was all happening around me.’*

For participants looking for physical reference points to match the voices, Hayle locals became part of the app experience:

*‘I had this kind of overlapping of the voice in my head and the people I met on the way.’*

Engagement with Hayle’s residents involved conversation and other acknowledgements. *‘I smiled at him because I thought he was the one telling me the story,’* said a performer who passed an old man on the quay.

*‘I sensed my own person-ness in doing this and also the other people who spoke and it made me more inclined to engage with other people that we randomly met, like the children who were catching crabs on the side of the quay. They were great and I think if I hadn’t had this kind of immersive sense of being part of a performance – it felt they were actually choreographed into it – I would never have engaged with them.’*

Headphones made some walkers feel they ‘*couldn’t properly say hello’* but the effect of removing headphones surprised this participant:

*‘I felt kind of lonely […] I felt like I’d had a companion with me and my companion had left me […] It was a much richer set of experiences that were going on while I was listening than when I just took them off and was walking.’*

As in all evaluations, immersion was frequently commented on. ‘*There is something really nice about the solitude of it,’* said a performer academic. Others, all women, found parts of the route isolated. Discomfort experienced by female walkers has been written about by Heddon and Turner (2012; see also Solnit 2001) and was compounded during the *Hayle Churks* experience by ambient live sound being distorted and reduced by audio played into headphones. Women spoke of listening to their surroundings when alone in an outlying location in order to detect danger. Headphones immediately made them more vulnerable. In response to hearing about a reaction close to a panic attack, a male performer empathised:

*‘The whole thing asks you to be hyper-sensitised so that’s what will kick in. If you make that invitation you’re going to get that response.’*

Walking while listening to an individual’s stories in headphones opened up the landscape and community to some participants rather than cut them off from it. An artist academic reflected on the experience six months after walking with the app:

*‘I certainly think more warmly of Hayle because of using the app. I walked alone and the combination of solitude and the companionship of the voices made for a very intense, sensory experience of the place –* *the experience was intensified by the collaging of material.’*

The embodied sensory experience and app content forged a connection between the participant and landscape as this female geographer explains:

*‘I was also getting a connection to landscape by really looking deep into it […] I was trying to look at the pictures and compare them to what I was seeing. I felt connected to the landscape, I feel much more connected to the landscape than if I hadn’t done this.’*

To encourage and enhance a more embodied exploration or sensing of place, strong stimulation of hearing through app audio content aimed to reduce the dominant sense of sight. Using the body to hear but also move, balance, experience different temperatures, weather and textured surfaces heightened senses. Sound – invisible, immaterial but affective – creates atmosphere and animates the landscape that moves past the walker like frames of a film. Composer and sound artist David Prior compares the binary of passive *listening* and ‘active engagement’ during *hearing* (2010: 95) to the increasing scale of attention in the sight descriptive terms ‘seeing’, ‘looking’ and ‘watching’ (2010: 95). Concentration or effort to understand (*entendre* means to listen *and* to understand in French [Iddon 2010:7]) implies cognition during *hearing*. With ‘*no separable, disengaged and disembodied ‘mind*’’ (Moores 2012:40) in the phenomenological experience, mind and body act together during the app, described as ‘mindscape landscape bodyscape,’ extending a geopoetic notion of ‘mindscape landscape’ (White 2004: 63; Legendre 2011) by inserting the corporeal.

Active listening is needed to catch and process a live layered mix while moving – fleeting traces of external sounds, recorded sound effects, recorded narrative and sometimes internal narrative, although this was silenced for one female geographer:

*‘The experience of listening to the voices, it throws you out of yourself into the landscape because you’re trying, you’re listening to someone and not listening to yourself […] you don’t have that little white noise of your own narrative going on.’*

Unfamiliarity with listening cognition, the immersive quality of the work combined with the ‘newness’ of the locative media experience, were given as reasons behind those that experienced ‘*the head down listening thing’* rather than looking about them to connect with the landscape, a primary aim of the app. ‘*I suspect I listened and didn’t look,’* said a female artist academic. A male artist described why he enjoyed sitting down and listening to the tracks rather than walking:

*‘I […] was able to listen to them properly rather than listen to the contradiction between them and the environment I was in, or trying not to be in two places at once […] but that’s possibly my dyspraxia […] having to really concentrate on what I’m hearing to be able to hear it properly.’*

The sensation of being in two places at once, physical and digital, is part of the locative media app experience – but, as the comment above indicates, this is disconcerting and difficult to process for some people. The contradiction between the embodied physical reality and the (sometimes embodied) digital storied place was also hard to process. From a tourist’s perspective, a participant commented, Hayle looks ‘*twee and peaceful’* so that it is

*‘a bit weird thinking of it as a really industrial landscape because that’s not what you’re sensing.’*

There is a clash between the busy industrial or wartime Hayle in the app and the transformation of Hayle through new buildings, popping up late in the app-making process.

## Conclusion

After a brief summary of the app and data collection process, the chapter discussion and conclusions from the data will be described and future research identified.

After collecting different media and content that can be described as deep mapping, an original layered multimedia app (rather than solely audio, the usual focus of audio walks research) was created during practice-based research. Locative media research is most usually found in urban environments with good Wi-Fi and mobile phone network connections. Instead the *Hayle Churks* app was developed in a challenging site off the main tourist trail: a marginal coastal area on the edge of a post-industrial town from which many visible historical traces, which could have linked past and present, had been removed.

During the evaluations the participants walked into GPS zones triggering multimedia content. The combination of the physical experience in landscape and a digital layer, stories and archive images, shifted participants between physical and digital worlds simultaneously.

*‘[The] app certainly introduced me to the landscape and stories of Hayle in an embodied way.’*

As a unique contribution to research in this inter-disciplinary field a deeper connection to landscape using locative media has been explored through three evaluations from a total of 108 participants. The app experience was quantified and supported with quotes from which these conclusions have been made.

Located oral history traces produce a very enjoyable immersive experience. Nostalgic experiences make participants feel good and have deep effects on well-being, according to evidence cited by Robinson et al (2015: 185). The more nebulous notion of feeling connected to the landscape definitely contributes to the enjoyment. Interestingly, being immersed in oral history and narrative, the performative aspect of the app, as well as feeling a (close) link between a particular story and its location, is rated significantly higher than feeling connected to the landscape. The app has a stronger (possibly temporary) effect around the performance and deepens the connection with the landscape, a more longitudinal philosophical effect, to a lesser extent.

*‘Not so much 'more connected'… as differently connected…. connected to a landscape that is historical as well as present; connected to a landscape that is storied and narrated and animated…. connected to a landscape that is layered with meaning.’*

There is intensity in the response to the oral histories and their connection to specific locations. Therefore the main connectedness was to the stories of Hayle grounded in the landscape:

‘*there was definitely a grounding or rooting (in history) going on.’*

Access to and participation with stories of place using locative media extends the potential of deep mapping, its exhibition and dissemination through rich media *Merz* layers and textures accessible on a mobile phone as demonstrated in the *Hayle Churks* app. The ‘*narrative archaeology’* (Hight 2006: 2) of people’s memories and place are played through the app in layered, sometimes binaural three-dimensional sound.

*‘The landscape feels so dense when you’re doing it. When I took my headphones off it sort of flattened.’*

The performative aspects of the work, which kept participants listening and walking for around two hours or more, outweighed the deeper connection with the landscape. Participants felt connected to the location through the voices and stories of its community; digital (pre-recorded residents) and physical passers-by became companions along the route:

*‘It is incredibly potent. From my previous visit to Hayle I found it a run-of-the-mill, standard Cornish town. During (and after) the experience I feel as though I have discovered my own familiar connections. The town feels three-dimensional, or somehow more solid, now I have heard these stories, memories and seen the photos. I wasn’t expecting such a strong reaction but walking back once the app had finished I told my friend ‘I feel at home here now.’*

To increase the connection to landscape for others, a stronger link with the location that encourages associating the story with the present could be trialled. Many mentioned the ‘black steps’ scene in *Minnie’s Story* because it placed them in the same spot as Minnie’s grandmother:

‘*The really interesting parts were where the audio directly related to the location you were in.’*

Using oral history recordings from an archive created before an app was dreamed of meant that the detail needed for exact locatedness, of mentioning something still visible that could link the story to the present, was not recorded. Without viewpoints, one relies more heavily on ‘earpoints’ (Myers 2010: 59; Myers 2011: 70). From feedback it can be said that deep listening cuts off the physical world for some participants, which results in a more passive immersion such as that experienced while watching a film, reading a book or listening to a radio play – a disconnection from location. Until mobile phone development allows more mobility while physically moving, rather than needing to ‘stop and interact’ (Marshall and Tennent in Robinson et al 2015:98), verbal cues that draw participant’s attention to ‘viewpoints’ are needed to bring the present physical world into focus. With faces up, eyes looking around, women might feel safer. Reid (2013) encourages interviews done on location so that description of place is included.

The recent landscape change in Hayle and the controversies around it were not articulated in the app but were appreciated by those introduced to the site before trying the app. More content that bridges the gap between past and present could pull faces up away from the screen or users out of deep thought to look for clues. Expert voices in the app could have been encouraged (more) to speak from a personal perspective. Being spoken *to* rather than chatted *with* disrupted an intimate immersive experience for some. Interactivity might increase a connection to landscape. By uploading their own stories (unfortunately, not yet possible in Hayle due to network connections), participants place themselves within the experience and landscape. Co-authoring from those familiar with the landscape would build on the original work deepening the layers of the *Merz* app.

Comparing how the app stands up to an initial aim, increasing awareness of history to encourage more careful town planning and land stewardship, it could be useful to review Hayle-area residents’ words:

*‘Thinking about the past, particularly North Quay and how busy it was, gave me goose bumps.’*

*‘Hayle is an area that needs developing, hopefully this can be done sympathetically incorporating its historical industrial past.’*

*‘I grew to appreciate more what Hayle represented to people long ago [and it] meant more to me than before.’*

*‘The walk has made me feel closer to the area having walked those places before but without the stories.’*

‘*Made me appreciate more about where I live [Hayle].’*

‘*Reaffirmed my love of Hayle.’*

Many spoke of feeling connected to *here, Hayle*, its people and histories. As this wasn’t always supported by the quantitative data, we reviewed the language used in the questionnaire. We hypothesise that the term ‘landscape’ could have been an issue. There is more understanding of the term ‘location’ used in one of the questions, compared to ‘landscape.’ Perhaps unaware of academic debates on ‘landscape’ articulated in, for example, Wylie’s *Landscape* (2007), the word for many participants could conjure up a distant view rather than the environment or location around them, whether urban or rural, causing some confusion.

Participants said they would be more likely to come back to Hayle, so there is a further opportunity of deepening the connection or attachment to landscape sparked by the app through what Tuan identifies as ‘repetition and return’ (Tuan cited in Moores 2012: 30).

## Suggestions for Future Research

A number of aspects have been identified for future practice and research including exploring understandings of the term ‘landscape.’ Throughout this research there has been evidence gathered relating to voice and immersion. Further research needs to be done on why more women felt more connected to landscape after using the app than men. Could this be related to immersion in the voice and certain modes of address and how they have been recorded and played back? Discovering which participants find embodying physical and digital hybrid spaces easier or more challenging would be insightful. Whether this will change, as apps are designed for ‘face on’ bodily interaction so that participants can ‘maintain eye contact with the world around them’ while on the move rather than ‘heads down’ tapping and swiping with digits (Robinson et al 2015: 131), requires further investigation.

## Bibliography

Audiotrails, 2012. *Audio Trail: Hayle*, Hayle: audiotrails. Available at: <http://www.cornish-mining.org.uk/areas-places-activities/audio-trail-hayle#overlay-context=>.

Blythe, M. et al., 2006. Interdisciplinary criticism: analysing the experience of riot! a location-sensitive digital narrative. *Computer and Information Science Behaviour Information Technology*, 25(2), pp.127-39.

Butler, T., 2005. *Memoryscape: Drifting and Dockers*, River Thames, London. Available at: <http://www.memoryscape.org.uk/>.

Butler, T., 2011. The Historical Hearing Aid: Located Oral History from the Listener’s perspective. In *Place, Writing, and Voice in Oral History*. New York, USA: Palgrave Macmillan, p.231.

Cardiff, J., 1999. *The Missing Voice (Case Study B)*, London: Artangel. Available at: <http://voyager.falmouth.ac.uk/vwebv/holdingsInfo?bibId=195745>.

Cardiff, J. & Miller, G.B., 2012. Janet Cardiff and George Bures Miller - Werke aus der Sammlung Goetz. Available at: [http://www.hausderkunst.de/index.php?id=83&no\_cache=1&tx\_ttnews[tt\_news]=1961&cHash=28f270641d7cc5c22020eb79d5095c4d](http://www.hausderkunst.de/index.php?id=83&no_cache=1&tx_ttnews%5Btt_news%5D=1961&cHash=28f270641d7cc5c22020eb79d5095c4d).

Crang, M., 2003. Qualitative methods, touchy, feely, look-see? *Progress in Human Geography*, 27(4), pp.494-504. Available at: <http://dro.dur.ac.uk/200/1/200.pdf>.

Cresswell, T., 2014. The Fence Furthest North. In *Geopoetics II*. AAG Annual Meeting. Tampa, Florida.

Dietrich, D., 2006. Hannover. In *Dada: Zurich, Berlin, Hannover, Cologne, New York, Paris*. Landover: National Gallery of Art, p.519.

Dovey, J. & Fleuriot, C., 2011. Towards a Language of Mobile Media. In M. Rieser, ed. *The Mobile Audience: Media Art and Mobile Technologies*. Amsterdam, Netherlands; New York, USA: Rodopi, pp. 97-108.

Farman, J., 2014. *The Mobile Story: Narrative Practices with Locative Technologies*, NY, Oxon: Routledge.

Frears, L., 2013. *Hayle Churks*, Available at: <https://itunes.apple.com/gb/app/hayle-churks/id777596532?mt=8>.

Gallagher, M., 2012. *Kilmahew Audio Drift No. 1*, Kilmahew. Available at: <http://www.theinvisiblecollege.org.uk/AudioDrifts>.

Geelhoed, E. et al., 2008. Probing Experiences: Logs, Traces, Self-report and a Sense of Wonder. In F. Toolenaar et al., eds. *Probing Experience From Assessment of User Emotions and Behaviour to Development of Products*. Philips Research. Netherlands: Springer Verlag, pp. 57-68.

Gould, G., 1992. *The Idea of North*, Toronto, Canada: CBC Records/Les Disques SRC. Available at: <http://www.cbc.ca/player/play/2110370208>.

Hawkins, H., 2015. Creative geographic methods:knowing, representing,intervening. On composing place and page. *cultural geographies*, pp.1-22.

Heddon, D. & Turner, C., 2012. Walking Women: Shifting the Tales and Scales of Mobility. *Contemporary Theatre Review*, 22(2), pp.224–36.

Hight, J., 2006. Views From Above: Locative Narrative and the Landscape. *Leonardo Electronic Almanac*, 14(7), pp.1-10.

Iddon, M., 2010. Plato’s Chamber of Secrets: ON eavesdropping and truth(s). *Performance Research*, 15, p.3.

Legendre, T., 2011. Landscape-Mindscape: Writing in Scotland’s Prehistoric Future. *Scottish Literary Review*, 3(2), pp.121-32. Available at: <http://thomaslegendre.com/landscape-mindscape/> [Accessed February 18, 2012].

Lorimer, H. & Wylie, J., 2010. LOOP (a geography). *Performance Research: A Journal of the Performing Arts*, 15(4), pp.6-13.

Mauer, B., 2010. Glenn Gould and the New Listener. *Performance Research*, 15(3), pp.103-08.

McLucas, C., 2000-2001. *Stalking the San Andreas fault*, Available at: [http://metamedia.stanford.edu/~mshanks/threelandscapes/Map-on-a-wall-video.html](http://metamedia.stanford.edu/%7Emshanks/threelandscapes/Map-on-a-wall-video.html).

Miller, G., 2003. *Linked*, Available at: <http://www.artsadmin.co.uk/projects/linked>.

de Souza e Silva, A., 2006. From Cyber to Hybrid: Mobile Technologies as interfaces of hybrid space. *Space and Culture*, 9(3), pp.261-78.

Mobile Bristol, 2004. *Riot! 1831*,

Moores, S., 2012. *Media, Place and Mobility*, Hampshire, UK; New York, USA: Palgrave Macmillan.

Myers, M., 2011. Vocal Landscaping: The Theatre of Sound in Audiowalks. In *Theatre Noise: The Sound of Performance*. Cambridge: Cambridge Scholars Publishing, pp.70-81.

Myers, M., 2010. “Walk with me, talk with me: The art of conversive wayfinding”,. *Visual Studies*, 25(1), pp.59-68.

Pearson, M. & Shanks, M., 2007. Performing a Visit: Archaeologies of the Contemporary Past. *Performance Research*, 2(2), pp.41-53.

Pearson, M. & Shanks, M., 2001. *Theatre/ Archaeology*, London: Routledge.

Prior, D., 2010. The Cochlea Unwound: A case study for a listening aid using a sonic crystal array. *Performance Research*, 15(3), pp.95-103.

Qualman, C., 2011. Walking Artists Network. *Walking Artists Network*. Available at: <http://www.walkingartistsnetwork.org/about/>.

Reid, J., 2013. Keynote. In Expanding Narratives. Plymouth: University of Plymouth. Available at: <http://www.expandednarrative.org/symposium/>.

Reid, J. et al., 2005. Parallel worlds : Immersion in location-based experiences. In G. van der Veer, ed. *Late Breaking Results: Posters*. CHI 2005: Conference On human Factors In Computing Systems. Portland, Oregon, USA: CHI 2005, pp.1733-36.

Reid, J. & Hull, R., 2011. What Makes Mediascapes Compelling? In M. Rieser, ed. *The Mobile Audience: Media Art and Mobile Technologies*. Amsterdam - New York, NY: Rodopi, pp.193-204.

Robinson, S., Marsden, G. & Jones, M., 2015. *There’s Not an App for That*, Amsterdam, Netherlands; Boston, USA: Elsevier/Morgan Kaufmann.

Smith (CrabMan), P., 2012. *Counter-Tourism: A Pocketbook 50 odd things to do in a heritage site (and other places)*, Devon, UK: Triarchy Press.

Smith, G., 2014. Supermarket “poses no risk to Hayle heritage” says UNESCO. *The Cornishman*. Available at: <http://www.cornishman.co.uk/Supermarket-poses-risk-Hayle-heritage-says-UNESCO/story-21450216-detail/story.html>.

Solnit, R., 2001. *Wanderlust*, London: Verso.

Stenton, P., 2011. Fusing the Physical and the Digital: the art and technology of pervasive media. Available at: <http://www.falmouth.ac.uk/>.

Stone, H. et al., 1974. Sensory Evaluation by Quantitative Descriptive Analysis. *Food Technology*, pp.24-34.

The South West Research Company Ltd, 2012. *Cornwall Towns 2012: Tourism Volume and Value Estimates*, Cornwall: Visit Cornwall. Available at: <https://www.visitcornwall.com/sites/default/files/generic_files/Cornwall%20Towns%20impact%20of%20tourism%20research%202012.pdf>.

Weiser, M., 1994. The World is not a Desktop. *Interactions*, 1(1), pp.7-8. Available at: <http://www.ubiq.com/weiser/WeiserPapers.html>.

Weiser, M. & Seely Brown, J., 1995. Designing Calm Technology. Available at: <http://www.ubiq.com/weiser/WeiserPapers.html>.

White, K., 2004. *The Wanderer and His Charts: exploring the fields of vagrant thought and vagabond beauty*, Edinburgh: Birlinn Polygon.

Wilken, R., 2012. Locative media: From specialized preoccupation to mainstream fascination. *Convergence: The International Journal of Research into New Media Technologies*, 18(3), pp.243-47.

1. Constance Fleuriot, Phil Stenton, Jo Reid, Richard Hull, Jon Dovey, Martin Rieser, Teresa Dillon, Clodagh Miskelly and Mark Jacobs. [↑](#footnote-ref-1)