Encountering Creative Moments within Interactive Environments

Richard Kearns

PhD by Research

The University of York
Theatre, Film, Television and Interactive Media
April 2019

Abstract

This thesis investigates the impact of implicit frameworks that were observed to shape the nature of public engagement within two interactive artworks. It is argued in the thesis that by replacing the perception of institutional authority with that of permission, the implied structures that are presented by installation content combine with the encultured frameworks of visitors. Factors can then be established that encourage and sustain embodied interaction and social participation in those that visit this genre of environment. The arguments that are presented in the thesis root theoretical paradigms into visual arts theory from a number of disciplines that include neuroscience, psychology, sociology and video game theory, among others.

In order that public engagement with interactive content could be better understood, two bespoke and adaptable art installations were constructed specifically for the research process. The first of these, titled *Soundweb*, was a sensor-driven experience that responded to visitor movement by projecting the images and sounds of wildlife into a darkened room. The second, titled *Interplay*, streamed live video images of visitors onto the walls of an enclosed space through an array of cameras and projectors. Each installation was presented as an artwork at Playeum's Children's Centre for Creativity, in Singapore, a venue that provides open-ended experiences for children up to the age of twelve and their adults. Factors that encouraged and sustained visitor engagement within *Soundweb* and *Interplay* were identified by observing physical relationships that emerged during their encounters. Levels of interaction were evaluated by measuring the duration and complexity of embodied responses as individuals engaged with the content of the artworks and with each other. This thesis contributes to knowledge by identifying fundamental factors that are necessary to sustain interaction and social participation in visitors, and presents a re-theorised approach to understanding their engagement within interactive installations in public venues.

Contents

Appendices

List of Figures

Acknowledgements

Declaration

I declare that this thesis is a presentation of original work and I am the sole author. All sources are acknowledged as references and all ethical procedures have been duly followed. I also declare that parts of this research have contributed to conference presentations, book chapters, journal papers and public engagement talks. A full list is included below.

Kearns, R. *Selfie Booth: Expectation*. Theorem 2018 Cambridge School of Art, Anglia Ruskin University, Cambridge. 5th July 2018. (Presentation)

Kearns, R. *Soundweb and Interplay: Context, Meaning and Play in Interactive Artworks*. Humanities Research Centre Doctoral Fellowships Finals 2018. University of York. 26th June 2018 (Presentation)

Kearns, R. *Audience Interaction and Agency, What Does it Cost?* A Participatory Museology. School of Fine Art, History of Art and Cultural Studies, University of Leeds. 25th June 2018. (Presentation)

Kearns, R. *Art, Technology and Narrative Agency*. Digital Stories: Narrative and Aesthetics in Post-network Media. Department of Film Theatre and Television, University of York. 21st June 2018. (Presentation)

Kearns, R. *Playspace the Audience and the Artwork*. Theorem 2017, Cambridge School of Art, Anglia Ruskin University, Cambridge. 6th July 2017 (Presentation)

Kearns, R (2017) The Audience in the Playspace: Developing Interactive Art Installations. In: Boyer, J. (Ed) (2018) *Theorem 2017*: *Doctoral Research in the Visual Arts and Design: Theory as Practice and Practice as Theory*. Cambridge: Ruskin Arts

Kearns, R. *A Methodology for Participation: The Artwork and the Audience*. The Tenth International Conference on the Inclusive Museum. Manchester Museum. 17th September 2017. (Presentation)

Kearns, R (2017). A Methodology for Participation: The Artwork and the Audience. In: *The International Journal of the Inclusive Museum*. 2017

Kearns, R. 2017 *Playspace: Navigating Interactive Art Environments*. Children's Centre for Creativity: Playeum, Singapore. 20th April 2017. (Presentation)

Kearns, R. (2016). Bedding the Pixel: From Press to Expanded Theory. In: Chance, V., Ganley, D. (Eds) (2018) *re:print*. London: Marmalade

Kearns, R. (2016) Are You Watched: Theory, Practice and the Influence of the Audience. In: *Theorem 2016: Theory as Practice and Practice as Theory*. Cambridge: Cambridge School of Art

Kearns, R. (2016) *Click to Add Title*. Anglia Ruskin University. 16th November 2016 (Presentation)

Kearns, R. (2016) *Soundweb in a Dark Space*. A Matter of Nature. Children's Centre for Creativity: Playeum, Singapore. 20th August 2016 (Presentation)

Kearns, R. (2015) Creativity in the Classroom 2015 *The Advanced Methodology Training Workshop on Creativity for Pre-schoolers*, Hanoi, Vietnam 28th-30th October 2015 (Presentations)

Kearns, R. (2015) *RE:Print/RE:Present*. Cambridge School of Art. Anglia Ruskin University, Cambridge. 9th July 2015 (Presentation)

Kearns, R. (2015) *RE:Print/RE:Present*. Cambridge School of Art. Anglia Ruskin University, Cambridge. 9th July 2015 (Presentation)

Chapter 1

Encountering

1.1 Research Context

This chapter provides a context for the thesis by introducing key principles that underpin the arguments within it. Relationships with previous research are established before introducing salient questions that organise the enquiry into three connected areas of investigation. Each question explores a different aspect of interaction. The first question explores the potential for the identification of fundamental elements that might be required for engagement to take place within interactive environments. The next question asks how, as behavioural models, engagement might be adjusted, and the final explores how these processes might be re-theorised. The chapter then presents a brief synopsis of the methodological approaches that were adopted in the research. It explains where each element was sourced and why they were considered the most appropriate to address the research questions. It explains how two interactive artworks were developed, and why it was an important method in assessing and understanding the activity that occurred within them. The chapter includes an explanation of the observation processes that were used to gather the analysis data, and why the adopted method was considered the most suitable means of collection. The contribution to knowledge presented by this research is then discussed to provide further context for the findings and to explain why the research and its contribution are relevant. The chapter concludes with an over-view of the thesis' structure and provides a summary of what is contained in each of its chapters.

This is an interdisciplinary thesis that provides insight into the experience of users that encounter situations offered by publicly accessible immersive interactive art installations. The term 'interdisciplinary' is used to indicate that no specialism is given priority over another and a number of pertinent fields will be drawn upon with equal credence throughout the thesis. Installation art is by nature immersive because a visitor becomes enveloped within its environment, and once inside they are separated from their everyday narrative, a process that is termed 'de-centring' (Bishop, 2005). Ilya Kabakov's (1999) claims that there also exists a perceived absence of authorship within these environments, which he asserts presents visitors with a psychologically heightened experience. Examined in the research is how visitors of two interactive art installations, one titled *Soundweb* and the other *Interplay,* built relationships with the installation content and with each other through physical and psychological engagement. It investigates how interactions between individuals, artefacts and environment colluded to result in creative encounters.

To encounter is to unexpectedly experience a situation that produces a sense of uncertainty. Alain Badiou (2015) regards the encounter as an essential trigger for fundamental emotional and psychological experiences. While incidental contact with an event in daily existence might go unnoticed, an encounter engages the power of affect, the underlying pre-cognitive emotional drivers that bridge corporal experience to feeling. In his introduction to Gilles Deleuze and Félix Guattari's *A Thousand Plateaus* (1988), Brian Massumi positions affect as an embodied process of transition that occurs as a consequence of an encounter between two bodies.

While two- and three-dimensional physical objects are considered important aspects of interactive environments, so are their non-tangible constituents, including moving image, sound and performance. These are the integral components of the installations and are described as 'artefacts' throughout this research. User engagement with provocations stimulated by the artefacts of such environments are considered as components that emerge within a system of relationships, and an argument is made that those must be incorporated into a design process through incremental development. The term 'engagement' is used in this thesis to describe periods that visitors were actively responding to situations presented by the installations' provocations. In this context, a 'provocation' is a stimulus for thought or action such as an object, or an audio

or visual projection that within a relational context of physical environment provides what Gibson (1979) names an 'affordance'. In other words, an affordance is a set of agreed rules that provide a perceivable function for an object, event, or situation, in relation to an individual.

Soundweb and *Interplay* were constructed by the author in support of this study to investigate the extent that visitor encounters within installation environments are defined by physical space, artefacts, psychological relationships, or composites of all of these. Visitors comprised mostly children entering an enclosed environment where they were presented with opportunities to engage with provocations without any 'facilitation', a term that refers to supervision within the installation spaces, including scenarios that might be suggested through textual or verbal instruction. In this respect any affordance that might be perceived as belonging to the artworks was left open-ended and no restrictions to methods of interaction were imposed. While each artwork offered an experience to the user, they also provided observational data into catalysts for participation within situations that require forms of 'embodied' engagement. The term 'participation' is used to describe a visitor taking part within a situation that is instigated by the research artworks and can include interaction with other visitors. The term 'embodied' denotes physical encounters that utilise the somatosensory system which include the sense of movement, position and touch.

Because *Soundweb* and *Interplay* were conceived and presented as artworks, this thesis has innate allegiances with art theory and practice. Each installation was designed to invite interaction by utilising technology that responded to movement through their spaces by triggering a variety of sound and light outcomes (see Chapter 8.1.1). Each environment contributed an integral role in producing empirical observational data to evaluate levels of visitor engagement through embodied and physical interaction and social participation. In addition to the collected primary information, this thesis employs existing concepts from a variety of non-art related fields, whose findings were seen to be reflected in the interaction of individuals within *Soundweb* and *Interplay*. They include among them alignment strategies between artefacts and the perceived presentation of choice that is often used to retain player attention in video-game design, although avoiding linear narrative structure. Also incorporated are existing investigations into behavioural effects of the mirror neuron from neuroscience, behavioural contagion theory in crowds from sociology, relationships between somatic and imagined responses to environment from psychoanalysis and the importance of play in constructing context out of uncertain situations from pedagogic theory. Existing concepts were innovatively stitched together to extrapolate underlying catalysts occurring in the actions of visitors while inside the research installations *Soundweb* and *Interplay*. Approaches from User Experience Design (UX), particularly its use of incremental development strategies that address user needs, were key components of the design methodology. Changes were continually made to the installations in response to observations on visitor interaction, which enabled comparison between their development phases to be continually assessed. Initial decisions to adjust the structure of the installations were based on the duration of an encounter between an individual and the content of the artworks, which is described as dwell-time. Only what was observed to be physical active engagement was considered, and as time could be measured it offered evidence of how a system (in this case, an artwork) might be described as successfully engaging its users. It was a principle of evaluation that was adopted throughout the research and constituted a fundamental aspect of the criteria for measuring engagement introduced by this thesis.

Cécile Prado and Stéphane Natkin (2011) argue that user engagement increases with a sense of control, or personal agency, which according to John Sharp (2015) only needs be perceived to increase levels of absorption. Sharp claims the provision of a few variable routes through which a game's objective can be fulfilled presents enough choice to give players a sense of agency, even though they are often predefined. The term 'agency' is exemplified by Alfred Gell (1998) as the potential ability of a representative to affect change on a natural cause of events. It not only applies to individuals or groups of people, but to animals, plants, objects and even situations. In human society agency is often characterised through the ability of an individual to make a free choice within a situation. Agency is now a widespread assumption of many individuals generally, and has been normalised through persistent familiarity with the many applications made available

through mobile digital interfaces, particularly social media. The expectation to affect an outcome has become increasingly prevalent within the field of art, and according to Manovich (2013), is even changing the expectations audiences have within situations traditionally intended for reflexive contemplation.

This thesis argues that in addition to agency, aspects permission and ownership interrelate to produce the key elements of sustained engagement within interactive art environments. Together they are responsible for embodied processes of transition that can occur as a result of participation. In the research artworks *Soundweb* and *Interplay,* agency emerged from the permissive environment which, when all of the contingent elements were aligned, became a positive force that led to exploratory engagement and ownership through acts of gamification. This was where someone interacting with the artwork generated a framework for decision-making, and is described in this thesis as positive-agency because factors within the installations led to physical acts of participation. To differentiate them, instances where visitors chose not to actively engage with provocations have been termed negative-agency. Progression from agency to participation is not linear, and Handley (2006) argues that it is through participation that agency emerges as part of a process of identity construction within a learning situation. While this argument is not contested here, this study found evidence that physical and psychological factors in the environments were required for the process of either the emergence of agency, or for participation to begin.

In order to foster an environment that encourages visitors to participate in interaction, this study found that established 'rules' of an encounter must be adjusted from ones of authority to ones of permission, in particular, the power relationships, argued by Claud Gintz & Judith Aminoff (1993), to be commonly adopted by institutions to validate then fetishize cultural objects. They are often hierarchical and didactic modes of presentation which must be replaced for ones that allow meaning to emerge through embodied engagement (see Chapter 4). Participatory processes challenge attitudes that have emerged in contexts that present traditional object-based artworks, which Kester (2004) claims function to aid reflection and provide greater understanding of human relationships with the world. According to Sholette (2011), this desire to educate a viewer's understanding anchors pedagogical control by an institution over an assumed unenlightened viewer and relies on maintaining hierarchy between processes of production, distribution and consumption. Sholette positions the hierarchy as a system that is both sustained as a meritocracy, and bound to financial markets by a network of peers working in related sectors, and who are perceived to have failed as artists. In contrast, participatory processes destabilise this pyramid by bringing what was an audience in receipt, into a shared discourse of co-creation. Kester makes the point that differing theoretical frameworks between producer and consumer change how these artworks function which, he claims, sever them from specificity, in what Eco (1989) describes as the open work. Van Heeswijk (2007) argues that it is a process that stimulates anxiety by questioning the perception of authorship (see Chapter 4.5). It is argued in thesis that this polemic is not possible outside a permissive environment, where permission, and its perception by users, is proposed as a fundamental condition that encourages the positive-agency that leads to interaction. It involves enabling visitors with the freedom to respond to content in a democratised manner even when it does not necessarily align with the original intentions behind the situation that is being presented. Permission within *Soundweb* and *Interplay* had been agreed with the hosting venue at the development stage of the artworks, through negotiation, and was signalled to visitors through the absence of any textual or verbal instruction, or of any physical supervision or facilitation.

In the introduction to their second edition of their post-Marxist theory, *Hegemony and Socialist Strategy,* (2002) Laclau and Mouffe argue that democracy is progressed through agonistic debate that shows respect for the Other which, according to them, is how it differs from antagonism. It is from this perspective that Claire Bishop (2012) published her anthology of participatory art, *Artificial Hells, Participatory Art and the Politics of Spectatorship*. In the book Bishop defines 'participatory art' as an umbrella term that includes collaborative art, contextual art, community-based art, dialogic art, experimental communities, interventionist art, littoral art, socially engaged art and social practice. She classifies participatory practice as art that "connotes the involvement of many people" (2012: 1). Van Heeswijk (2007) suggests that when different parties collaborate to create crossovers

between activist, artistic and curatorial practices they are more accurately described as collective projects that involve social participation. Graham (2012) insists that a more definitive framework is necessary describing participative art practices as enclosed systems that incorporate the audiences into a work. When artist, institution and public all become stakeholders in the authorship of an outcome, even though the framework might have been constructed before any activity begins, Graham warns that contentions over ownership are raised. However, this is not always the case in practice, and an example is the art group Fluxus (see Chapter 3.4) the members of which assumed authorship over artworks works they may have conceived but never created or saw. Ken Friedman (2009) observes that precedence was given to the potential for affordances within an artwork and not the final object. In this thesis authorial devolution is considered to lead to 'ownership taking' by visitors over the situations that emerge when positive-agency is engaged between individuals and affordances, and manifests as interaction and social participation. In addition to permission, ownership is argued in this thesis to be a vital condition that sustains engagement within interactive art environments.

It is important to note that the term 'interactive' within the gaming industry has come to describe the required relationships between a technology and a user. For Graham (2012) this is inadequate in application to an art context because different forms of interaction imply different systems, which affects how they are described and interpreted. She argues for a more exact definition, given that the term 'interactive' means agents acting upon each other. She appears to base her position on Turing's (1950) test designed to differentiate a programmed reaction from autonomous thought, which is conducted through a process of questions, answers and free response. A fundamental aspect of Graham's version of interactivity includes the potential for contextual rules to change at any moment to offer the possibility of altered, or new affordances. These are not random changes, but ones that relate to emotional, situational and psychological factors of all the parties involved to affect the course of conversation. Everything else, according to Graham, is reactive, because different systems interacting with each other, including humans, must be able to initiate responses with each other outside predefined ends. She argues that this happens regularly between individuals but is very rare in scenarios that include technological systems. Graham argues that at best technology can only host interactive discourse between humans.

In addition to the visitors of *Soundweb* and *Interplay* engaging with the artefacts and space within the installations, they also interacted with each other. Forms of social participation were observed developing explicitly through the emergence of games that provided users with functional rules that enabled them to navigate the environments. It appeared to be the form of social learning that Wenger (2010) locates in what he describes as communities of practice. He proposes that human environments are navigated through social interactions that enable functional meaning to be attached to a situation. Within the research environments this process also involved non-verbal communications that ranged from excited involuntary movements to synchronised behaviours that were identifiable as patterns through their emergence in different groups throughout the duration of each installation's presentation to a public. For the first time, this thesis brings together the contagious nature of certain behaviours that has been documented in the fields of neuroscience, psychology and sociology, with re-theorised visitor relationships constructed through their encounters with immersive interactive environments.

Art spaces are witnessing a functional shift as many of the conventionally assumed boundaries between a spectator and an object are affected by the growing prevalence of interactive processes (Groys 2010). The shift is also reflected in the relationships between individuals and their wider environments through mobile smart networked technologies that increasingly augment the daily lives of a growing number of people. Whole generations are often permanently connected in a global digital culture through the applications on mobile smart phones. Contemporary society has seen the advent of progressively affordable products that have developed increasingly symbiotic relationships with their users. Readily available digital machinery is reshaping the way individuals socially participate with each other, and interact with the objects and structures that comprise the space they occupy. As a result, many day-to-day relationships between people and information appear to have become democratised by the ability of the individual to expand upon articles by addition, subversion or recontextualization, before re-posting to a next recipient

network. The applications that manage these flows of information are often facilitated through private corporations that track and observe users concurrently, gathering their data to aid future software development and, according to Zuboff (2019), to build on a growing culture of surveillance. Data is also monitored by users themselves in an increasing number of forms that include wearable fitness tracking devices, social media providers, online shopping sites and video games. Tracking software is commonly loaded on to personal computers and devices by websites that are visited, in the form of programmes called cookies. Increasing informational democratisation has altered individual expectations and normalised participatory acts to the extent that when not a part of a presented situation's initial intention they are often explored through participation socially on digital networking sites through photographs and comments.
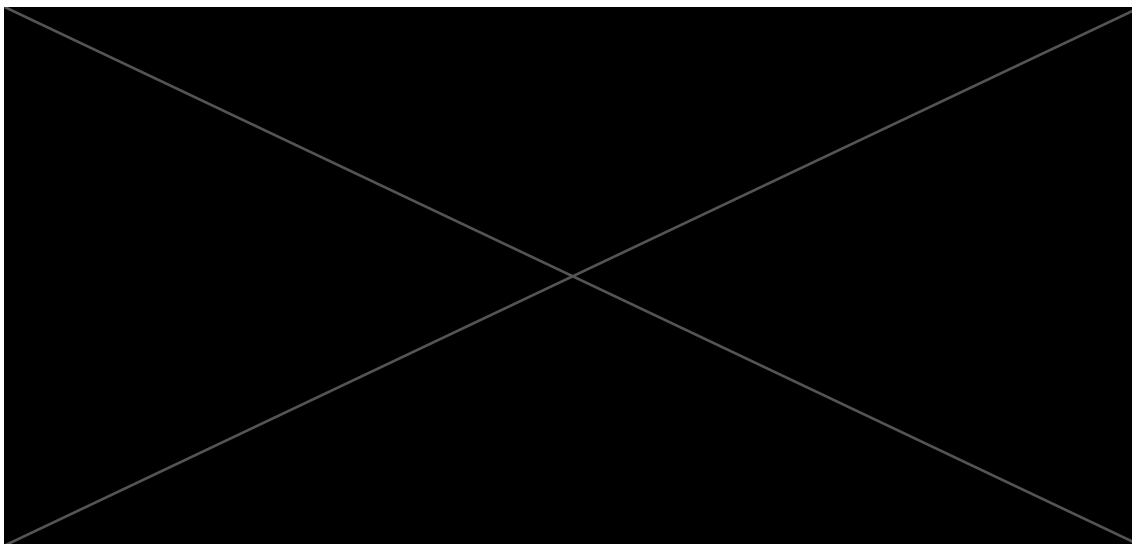
Figure 1.1 Rhine II. *Andreas Gursky, 1999*

There are an increasing number of verbal accounts describing static artefacts within museums being handled and moved by audiences misinterpreting them as propositions for participation. A recent publicised example recounts an artwork by Arthur Köpcke, in the form of a crossword puzzle that was defaced by an individual mistaking it for an interactive piece by completing its answers (TNO Staff, 2016). The tactile relationship artists have had with their own artworks historically is also altering through their use of technology. This can be seen implicitly through the effect of programs at the design stage, such as Photoshop and After Effects (Manovich 2013). While both are digital post production tools for still and moving images respectively, they can also be employed in the generation of artworks, as well as manipulation of a still or moving image. Andreas Gursky, one of the world's highest valued photographic artists in terms of commodity price (Christies, 2011), provides an early example, and has openly acknowledged that since the 1990s his images have gone through processes of digital modification. For example, in *The Rhine II* (1999) he removed all the buildings from the original photograph so that his formal and subjective intentions could be realised in the final image (Tate 2016) (see figure 1.1). It echoes the National Geographic Magazine's infamous early and clandestine foray into digital manipulation when the relationship between Egypt's pyramids was manipulated to fit the format of their February front cover in 1982 (Goldberg 2016). More explicit use of technology has seen reactive agency offered to audiences through the skeletal tracking of the Xbox Kinect, such as Random International's (2012) *Rain Room* (see figure 1.2). This is an installation artwork that opens a path in front of audiences walking through a room of replicated rain produced by water jets. Artists are also developing mobile applications to create work that bypass traditional gallery spaces completely. Blast Theory's smart phone app artwork *Karen* (2015), for example, is disguised as a digital life coach that mines data from a potentially global user base, through its international availability in online digital application stores. Many examples of this type of artwork owe a debt to the increasingly collaborative approach that networked computers encourage in generating and modifying the shared information that began with the introduction of what DiNucci (1999) described as Web 2. It enables Internet users to interact with each other

in ways that include commenting on other people's posts, live chat, and file sharing, among others. It contrasts with the World Wide Web's previous iteration that was primarily a text and image-based system where the user was not able to input data onto an existing web page; they could only observe it. This is perhaps a key development contributing to audiences of artworks transitioning from a position of recipient to one that can be argued as a partner in the production of knowledge through their simultaneous acts of embodied interpretation.

Since the 1960s increasing numbers of artworks have required the presence of an audience to complete, or become part of the final output, a shift which has been extensively covered by Bishop (2012), Bourriaud (1998), and Kwastek (2013). Altering the mode of engagement between visitor and artwork destabilises many of the expectations that might be held by all of the parties involved in that encounter. Where an audience may once have accepted a role subservient to the authority of an institution without question, artworks that require physical participation involve more than a willingness to be open to received information. Morris, Hargreaves and McIntyre in their theory of *Culture Segments* (2016) have begun to address this change by attempting to identify the motivations of visitor groups to cultural attractions. According to them audiences engage with the arts and heritage to fulfil a variety of needs, among which are: affirmation; stimulation, enrichment and entertainment. However, their manifesto is far more aligned with the economic requirements of facility providers than it is with identifying the intrinsic factors that incentivise visitors to interact with environments that is central to this thesis. Vom Lehn (2001) has argued that audiences' experiences are also unconsciously influenced by the words and actions of others that are witnessed responding to objects and environments in his study of their trajectories. The term 'Trajectory', as it is applied in this study, describes an individual's movement, as user, through an experience, such as the floor space of a museum or gallery (see Chapter 4.7).
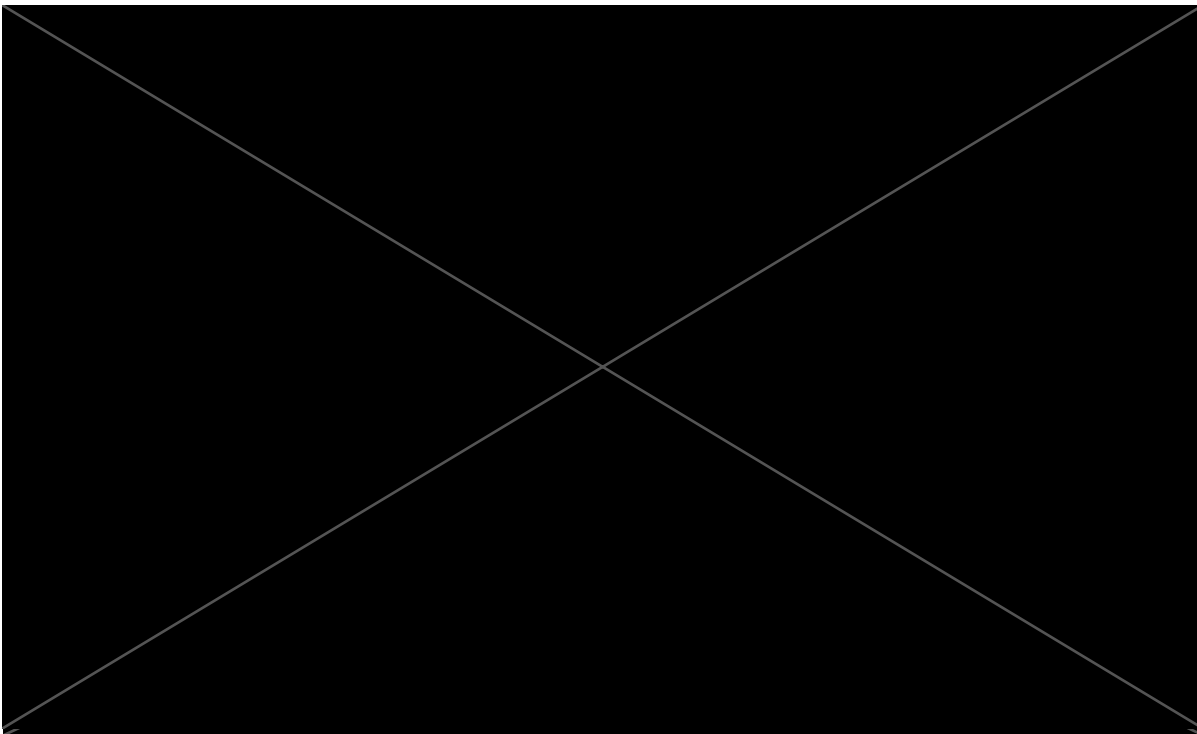
Figure 1.2 *Rain Room*, Random International, 2012

Soundweb and *Interplay* were open-ended artworks and as such no pre-existing definitive message was intended to be transferred through acts of physical participation. Each installation explored relationships that were built between individuals, artefacts, scenarios and other visitors who inhabited the spaces. In doing so functional meaning is argued here to have emerged democratically through embodied interaction with the installation artefacts and through social participation among individuals. Contrary to Hantelmann's (2010) proposition that embodied interaction can only provide an experience void of meaning-making, the claims presented in this

thesis align with Heidegger's (1977) proposition that engagement generates ideation rather than describes it, and operates in a manner similar to those the linguist John Austin (1962) argued was a condition of certain phrases. He named these 'performative utterances'. According to Austin these phrases have the transitioning function of actions in that they cause difference between one state of perceived reality and another through their ability to bring into existence what they describe. He famously uses the example of Christian wedding vows that once uttered, transform couples from one state (singular) into another (binary). Judith Butler (1988) developed Austin's ideas through her feminist theory by arguing that frequentative speech and gesture are responsible for constructing personality traits. According to her, the notion of gender, for example, is distinct from sex in that it is constructed through the effect of performative language and actions.

Barbara Bolt (2004) discusses at length the performative potential of art in her book *Art Beyond Representation*, taking as her main source of inspiration Heidegger's *The Question Concerning Technology* (1974). She claims that traditional static visual artworks produce generative experiences particularly when audiences are also the subject of an artwork. It reflects a general shift, or fragmentation, of the term that Florian Malzacher and Joanna Warszer (2017) have argued has emerged in disciplines that include economics, the humanities and philosophy. They make the important observation that although Austin initially used the term to convey the ability of language to create a new state of being through description, the term 'performative' has also become synonymous with performance-based live arts as a means to describe actions, and the terms are often wrongly intertwined. Performance is performance, whilst performativity is the capacity of language to perform a type of being. Malzacher (2017) argues that actions or enactments have equal reality-making properties to those of language, to the extent, they argue, that culture is performatively reinforced through its physical rituals. Since its introduction as a paradigm in the 1960s the performative has undergone its own transition to include realities that are constructed through embodied description, or enactment, alongside those initiated through language. Because interaction within the immersive environments of *Soundweb* and *Interplay* required physical movement through them, they initiated 'embodied' encounters, in that the experiences they offered were shaped by the body and its sensory functions, as opposed to cerebral deduction (Meier *et al*. 2011). Salter (2015) draws on Latour's (1990) constructivist position and argues that the ability for causal events to bring themselves into being has extended through a number of human experiences into the quantum world of Barad's *Agential Realism* (2007). This is a place of entanglement where relationships are constructed from commonalities, or fundamental allegiances between agencies, rather than distinct separations, and, according to her, are *intra,* rather than *inter-related*. Barad (2003) argues that the performative is an act of mind, not language, implying that representation is engaged with performativity through its association with encounters of alterity, proposing that representation is not confined to one mode of expression but all, including text, image and action. In this sense, as Butler (2010) implies in relation to gender and economics, and Bolt (2004) proposes in visual art, the performative also adopts an agency of its own. Embodied performativity is explored in this thesis as the means visitors adopted to create meaningful experiences out of uncertain situations, and in doing so generated transitional processes that changed the relationship individuals had with the spaces, their contents and with other people.

In scrutinising transitions that have occurred through somatic acts of participation, the thesis proposes that the altered relationship between modes of consumption and production affect how those mechanisms interrelate. Extrapolating from the data provided by *Soundweb* and *Interplay,* it argues that embodied engagement shifts the responses of individuals to artwork, from ones that reflect on the experiences of others, such as artists through the observation of phenomena made by them, into ones that generate experiences through interaction that can lead to new understanding. Transition is identified in this thesis as a condition of sustained engagement within interactive environments.

1.2 Relationship with Previous Research

This is interdisciplinary research that has built new relationships with previous studies conducted in several subject specialisms. Above all it draws on a long history of emerging audience, and

visitor participation in visual art (see Chapter 4). In addition to theoretical paradigms that emanate from the visual arts and philosophy, the sources that are referenced in the thesis include overlapping interests in behaviour from biology, psychology, sociology, and video game theory. These intersect with user experience strategies from the engineering sector that were modified and applied to the development process of the installations *Soundweb* and *Interplay*.

Research into the influences of movement by a public through gallery and museum spaces dates to Melton's (1935) investigations. this research shares a similar interest but includes interests shared with Hall's (1966) studies into proxemics, and the contagious flight or fight responses established by Porges' (2009) research into Polyvagal Theory. It was not until Porges' studies were published that conjectures on response to uncertain situations were established as fact. Research on audience trajectories was re-invigorated with vom Lehn's (2001) investigation into visitor movement within museum spaces and has since been developed by Benford (2011), and Flintham's (2011) exploration into reactions of visitors to their own creative content (see Chapter 4.7). These later studies into audience behaviour have concentrated on influences that may direct an individual through an exhibition space. This research differs by investigating how a framework might be constructed out of an open-ended situation that then leads to a positive act of interaction or social participation by a visitor. Where previous studies have orientated their inquiries from the perspective of a provider (artist or institution), this study explores democratised events that incorporate how the outlook and creative needs of visitor feed-back into a situation that is instigated by the affordances of content. It explores user involvement with the generation of context through actions that combine to construct a framework for engagement.

Research into audience experience by Ben Walmsley and Anna Franks (2011) correlates with some of the claims presented here on user-generated input. They acknowledge the changing roles that are emerging in the relationship between the delivery and receipt of creative experience, although they do not elaborate on what these may be. Walmsley and Franks urge organisations to empathise with their audience's needs, which is a critical first step in encouraging the permissive environment, discussed at the beginning of this chapter (see 1.1). However, while their research is much needed, it is a general discussion that does not focus on specific mechanisms that encourage positive-agency in visitors.

A prime component of the interaction between visitor and artefact within the research environments was through play. It was not located within any one individual, but was seen to emerge through various modes of shared transmission between visitors within the spaces. The ability of one person to exert an influence silently over another within an immediate vicinity has been known to affect the dynamics of crowds since Gustave Le Bon's 1895 studies (see Chapter 4.8). Although the theory is related to behavioural changes adopted by individuals within crowds, similar patterns of infectious behaviour were observed spreading between individuals within the installations. Comprising of non-verbal transmissions, they flowed from one individual to another without those involved necessarily being aware of the process. Vom Lehn's (2001) research, which is arguably related, investigates the effect that verbal conditioning within museum spaces has on other visitors. However, the extent of non-verbal communication, and its effect within environments containing interactive content has not been researched. Corroborations were found in biological fields with the discovery of the mirror neuron (Fogassi and Ferrari 2007), and Eilam's (2012) study into anxiety contagion in animals. Porges' (2009) Polyvagal Theory has been widely accepted to subconsciously affect the mechanisms of social interaction, particularly in situations loaded with uncertainty (see Chapter 8.3.1). Evidence from these fields build a compelling argument that the interactive events that occur in this study are a result of intersections between biological and psychological frameworks, but are ones that remained within a structure defined by each of the environments.

Although play has been explored in several existing studies it is still generally an under-researched area. Renewed interest in the valuable contributions made by Piaget (1958), Vygotsky (1978) and Gadamer (1960) were explored again recently by Whitebread (2012). Much like his predecessors, Whitebread's interest is in its pedagogic potential. Kirby and Graham (2016) claim it is pivotal in building relational understanding between individuals and the world. A history of

play in relation to art is examined by Cranfield (2014). His paper focuses on key theorists about play rather than modes of engagement. Stott (2015) also explores relationships between play and art and concentrates on play's ability to transfer agency to an audience. The primacy of play in the research installations *Soundweb* and *Interplay* was clearly visible, and this research adds to that discussion (see Chapter 5.2), particularly in the correlations made between play and democratised creativity (see Chapter 5.4) There has been much interest in the nature of creativity within several disciplines and this thesis also engages with those dialogues that explore it (see Chapter 5.4).

The connections that emerged between this study and research conducted by others were often as unexpected as the study's findings. Interdisciplinary research is a relatively new approach to analysing data, although past forays dating back to World War Two have proven invaluable (see Chapter 2. 6). The process undertaken during this doctoral research has built a solid foundation for much future examination (see Chapter 9.6).

1.3. Research Questions

Many artists have explored, and continue to explore dialogues between production and consumption. They deliver critical propositions by adopting content found within disciplines as diverse as engineering, chemistry, biology, economics and politics, among others. This is a crucial point because it illustrates that the precedent for interdisciplinary approaches within art is an established one. Preceding the divide between object and concept that culminated in 1960s conceptual art, many artists that were exhibited in public institutions adopted expressive media, such as paint on canvas, clay or stone to deliver arguments through physical manipulations. It was common for these objects to be subsequently presented to audiences for reflective contemplation in an exhibition space, such as a State-sponsored museum (nineteenth century French salons, for example), member-orientated establishments (including religious institutions) or the private residences of patrons. The aesthetic value of these works was commonly attached to notions of truth and beauty that were agreed upon by representatives of the authorities of State and Religion. The criteria commonly adopted until the 20th century date back to Immanuel Kant's (1790) *Disinterested Judgement* which is rooted in translations from ancient Greek of the *Theory of Forms*, attributed to Plato (380 BCE) (see Chapter 6.2). Also known as the *Theory of Ideals*, it argues that every observable phenomenon is a base version of a perfect counterpart existing in a place inaccessible to mortals. Part of the process of reflection inside many institutional museums and galleries prior to the 1960s was to agree or disagree with the prevailing paradigms of truth and beauty. It is also arguable that the implicit power embedded within these institutions through their status as sanctioned archives, reinforced agreed attributes of truth and beauty by legitimising artworks through public display. In other scenarios it is a process that might be described as propaganda (see Chapter 7.4).

History is filled with divergent narratives and multiple trajectories and not all art practitioners followed the aesthetic values established by Kant. In the early twentieth century artists explored technology and forms of presentation far removed from skill-based and market-led practices (see Chapter 3.4). While many were still developing their ideas through the production of singular objects of reflection, some began exploring whole environments. Kurt Schwitters, for example, is credited for constructing the first installation artwork in 1933, which he titled *Merzbau*. Artworks developed as settings through which visitors are required to move have since developed histories and theories of their own. Bishop (2005) suggests that an installation artwork immerses a visitor in an experience that is presented rather than represented. As a result, art as an enclosed environment creates a condition where the viewer is not placed in a contextual position central to a composition, implied by perspective and vanishing points. Consequently, a situation is produced that Bishop argues heightens physical and emotive senses. A similar quality is offered by cinema, theatre and the black cube environments that house digital and video art works (see Chapter 5.3).

The context of installation art was considered the most appropriate for this research for its propensity to decentre and isolate individuals from external influences. The reactions of visitors could then be analysed in direct relation to the location of provocations within the artworks.

Soundweb and *Interplay* both had strong affiliations with black cube environments due to their design which facilitated projected imagery (see Chapter 7). Both were interactive artworks made specifically for this research that encouraged visitors to navigate their initial uncertainties about the spaces through a combination of physical and psychological reactions (see Chapter 8). Their exploration involved a process of concept-building that resembled play through gamification of the artefacts (see Chapter 8). However, for engagement to occur alignments were required between the artefacts and the inhabitants of the spaces. It is these contingencies that this research was developed to explore, its underlying objective being encapsulated in the following three questions.

The research questions that are presented here are driven by my own interest in interactive processes and social participation as a researcher and practitioner in the visual arts. My current practice began as one that produced two- and three-dimensional objects for an audience to reflect upon in what can be described as a traditional relationship between a viewer and artwork. Over many years of reflecting on this spectator-artwork relationship my practice has evolved to consider an audience as a transient participant, or user, who can engage in meaningful interactions through embodied encounters. The experiences offered to visitors in my later practical research, particularly those created for this research, construct meaning that is shaped by the body and its sensory functions, as opposed to cerebral deduction in line to that suggested by Meier *et al*. (2011). As my interest has shifted from generating static objects to situations requiring interaction, my need to understand the underlying mechanics of these processes has become more imperative, particularly why in one scenario interaction might occur, while in another it might not. Empirical data explaining this is conspicuously absent in the visual arts and is argued by Catherine Elwes (2015) to be desperately needed, and by Jan Sowa (2016) to be absent. Consequently, the study is aimed primarily at those with an interest in developing immersive interactive creative content. However, the research concerns with the interdisciplinary complexities of interaction affords it potential impact along several routes outside visual art. My need to understand the mechanics of interaction are addressed in the following questions.

1. What factors are required to extend engagement with participation in interactive environments?

2. To what extent can public behaviour be modified to facilitate sustained engagement, embodied interaction and social participation within interactive environments?

3. Given how little is understood about the trajectories of participants during periods of physical interaction with artworks, how could interaction be re-theorised within a context of unpredictable public interactive environments?

Each strand of enquiry is an interrelated part of the whole study, and as such has been explored simultaneously in a process connected to the incremental development of the installations. In addition to investigating the elements of an interactive artwork, as a system that is capable of procuring responses from visitors, the research investigates the developments necessary to prolong and intensify activity, a part of the study that is encapsulated within question one.

Combinations of influences between people and objects are examined in question two, which explores how individuals as elements of an emerging visiting group construct relationships with each other, in social participation, in addition to interacting with the installation artefacts. The study considers how the combined activity of individuals within the installations might become central to their interpretation of their encounter, and to what extent that is predictable. The final question scrutinises the degree to which activity might be mediated without the introduction of didactic instruction, or facilitation. It probes the extent to which adjustments to frameworks, supplied by the constituents of the installations, might influence behaviour.

The study's concern with interaction in art environments can be replaced by a variety of scenarios requiring an embodied encounter between individuals and a reactive system. Practices of this nature are increasingly prevalent under the term 'play-based learning'. The arguments that are

presented in this thesis are intentionally placed outside explicit specialties. Explanations have been provided for readers who may not be familiar with subject-specific terms and concepts, to offer accessibility wherever possible. A framework has been developed to locate the research within an agenda that probes intersections between audiences as consumers, and artists and exhibiting venues as producers of content, but not necessarily context.

1.4 Research Methodology

From its outset, an interdisciplinary approach was applied to this research to better enable the inclusion of theories that might fall beyond the traditionally accepted borders of visual art. The methodological approach reflected that decision and was constructed from a combination of normally unrelated sources that were deemed to best facilitate installation design, development and presentation, and the collection, analysis and evaluation of the activity that occurred within them. The sources that were chosen are reflected in the author's own practice as an artist, which has evolved to incorporate aspects of engineering, science and sociology alongside methods more traditionally associated with the visual arts that include painting, photography, performance, printmaking and sculpture.

By utilising the author's existing experience as a creative practitioner, two interactive environments were constructed, *Soundweb* and *Interplay,* that functioned to present provocative situations to visitors and to provide observational data on how each installation was engaged with. Both artworks were presented at Playeum's Children's Centre for Creativity, Singapore between April 2016 and October 2016 and February 2017 and June 2017, respectively. Each was introduced to the public as a functioning environment, but in an intentionally incomplete form. Incremental changes were then made to the installations in response to visitor activity. This approach is not usually found within visual arts production, where artworks are more often fully developed prior to their presentation within a public forum. There is an acknowledged absence of measured information on relationships between visitors, artefacts and their enclosing spaces in the visual arts (Elwes 2015). For this reason, iterative design methodologies, more commonly found in engineering sectors, were merged with techniques adapted from video game theory to explore correlations between embodied visitor engagement and levels of absorption (see Chapter 6).

Information on visitor interaction within the installations was collected in the open-ended randomised way advocated by Grounded Theory. Developed by the sociologists Glaser and Strauss (1967), it is designed to enable observed models of behaviour to be related with often unanticipated results. Grounded Theory advocates that retrospectively sourced relevant literature be positioned as comparative data and compared with findings generated through an observation process. It is through the correlations found during the observation and analysis process that previously unforeseen directions of investigation often emerge. For this research the majority of data was collected by recording visitor engagement within the two interactive environments on video using wall mounted closed circuit television cameras, enabling re-viewing and re-analysis where necessary. It was through the adaptation of Grounded Theory by its amalgamation with engineering and video game strategies, alongside those of visual art praxis, that the decision to position this research as interdisciplinary was maintained as a driving force for continual investigation.

1.5 Contribution to Knowledge

This thesis provides a broader understanding on how encounters within immersive spaces are navigated. It delivers a new measurement framework to evaluate the behaviour of visitors that is drawn from interactional intricacy and duration, alongside a methodology which has been constructed from approaches originally developed for sociology and engineering. The study proposes that audience engagement within participatory immersive art environments, of the type produced for this study that are facilitated by media artefacts, are subject to a number of specific criteria. These are identified in the thesis to emerge out of alignments between physical artefacts and psychological processes. The first of these is a permissive environment that enables the emergence of visitor agency and their sense of situational ownership, which leads to a transformative experience. 'Situational

ownership' is a new term that is being introduced by this thesis to describe a state of perceived propriety over a mode of embodied engagement that occurs in a specific place at a particular time. No studies have been found that attempt to identify these criteria. Equally, no method that evaluates levels of interaction based on dwell time and engagement complexity has been found. In establishing an argument that supports the principles for self-determined embodied interaction, important paradigms from several divergent fields have been combined for the first time. These relate to psychological and physiological processes that are initiated when visitors choose to engage with interactive environments and are in control of their actions. It is important to stress that the mode of public engagement being discussed here is that which requires a conscious decision to participate on the part of a visitor. The thesis does not discuss participatory scenarios that incorporate audiences into systems without their knowledge, consent, or do not require shifts in physical behaviour in response to a provocation. It argues that the audience is an integral element of a larger system which combine to produce dynamic relationships that emerge between artefacts, visitors and the spaces in which they are situated.

The framework developed in this thesis is to both evaluate and develop more sustained visitor engagement through embodied interaction and social participation for interactive artworks and environments within art spaces and museums. Its intended readership are creative practitioners and those working in the museum and gallery sector, to better evaluate audience engagement with interactive content. The research is significant because it comes at a time when the connections between individuals and their environments are undergoing rapid change. Numerous sectors of global society are increasingly gaining access to mobile networked technology, which shows no signs of abating. As a result, changes in the way information is produced and consumed are inevitable. This research seeks to investigate how these shifts are affecting the production, display and receipt of creative content that offers high levels of embodied user participation.

1.6 Structure of the Thesis

The thesis comprises nine chapters, each reflecting on different aspects of the investigation. Following this introduction, Chapter 2 begins a review of literature that constructs an overall context for the research. It is introduced with an overview of how culture has been conceived of over the preceding century. It is important to include because it establishes who during that period has been considered to have had sufficient 'value' to contribute to culture, and how that in turn has influenced the interpretation of its artefacts. The chapter introduces Complexity Theory as a related paradigm and positions it as an important illustration of how widely divergent factors can interrelate. Complexity is aligned with Deleuze and Guattari's (1980) Rhizomic Theory which is argued to underpin contemporary social models that have become globally entwined through digital connectivity.

Chapter 3 explores how shifts in the way culture is assumed to operate by its inhabitants in the West is reflected in a legacy of participation that was established by a century of exploration in art movements engaged with notions of political change. It is not an extensive survey, which can be found in Claire Bishop's (2012) *Artificial Hells* and Anna Dezuze's (2012) *The 'do-it-yourself' Artwork* among others, but the chapter does incorporate historical frameworks behind key concepts that are considered to have vital connections with the artworks developed for this thesis. The chapter covers important developments in art along a journey that has seen it positioned as a luxury commodity separated from an audience, to one that includes visitors as an essential element of its being. The chapter then considers how the notions of the audience as a 'passive' or 'activated' responder has been shaped. Technology is explored as a key component in a continued democratisation between audiences and the art event.

Chapter 4 examines the concepts and theories of participatory art practice more closely by investigating how the spaces that exhibit artworks affect their interpretation. It discusses the tacit power hierarchies that can impact the behaviour of audiences and are important considerations in understanding key points of the research findings (see Chapter 9.1.1). Relationships between authorship, interpretation and participation are also surveyed in Chapter 4, where key concepts from existential philosophy are considered to locate encounters with the creative moment outside of

artefacts. The new term 'creative moment' is being introduced to describe the point at which creativity occurs, or emerges from a situation. The chapter repositions the creative moment from the production of objects to points of engagement that facilitate shared authorship through open-ended dialogues taking place in relation to audience trajectories within a space. The investigation is informed by studies in sociology and animal behaviour that examine non-verbal communication, how it is enacted and its implications.

Chapter 5 scrutinises tools for participation by dissecting emerging interactional gestures within uncertain situations and allies them with patterned play behaviour. It makes connections between play as a context-building activity for interpreting the unfamiliar, and as a mechanism that injects creativity into an encounter. The discussion develops by exploring connections between embodiment and psychic projections of the Self. It is a key section because it synchronises the topics discussed previously and relates directly to the behaviour observed in the artworks *Soundweb* and *Interplay*.

Chapter 6 provides a detailed explanation on how methodologies from different disciplines were combined to generate the overarching methodology to this thesis. It clarifies how each is intended to operate in its parent field, why they were considered relevant here and how they were combined and applied to this research.

Chapter 7 presents a detailed description of the installations *Soundweb* and *Interplay*, and explains how their design and operational methodologies were interrelated. The chapter begins by explaining how the collected data was analysed. It discusses data collection and explains how the chosen method proved to be the most appropriate.

Chapter 8 describes and evaluates visitor interaction within the installations *Soundweb* and *Interplay*. It explains how investigating correlations between processes used to engage visitors related to how those groups managed their interpretation of the environments. It achieves this by examining how the development of the artworks affected the behaviour of individuals, and to a certain extent, vice versa. Theories are introduced here from fields as diverse as psychology and neuroscience to explain the processes adopted by visitor groups in their interactions with the artworks. The chapter concludes with a discussion on the research findings.

The thesis is summarised in Chapter 9 and its contributions to knowledge reiterated. Then follows a discussion of the potential impact the research findings might have in several disciplines. The study's possible limitations are also highlighted. The interdisciplinary approach adopted in the study resulted in connecting paradigms from fields not usually associated with each other. As a result, several new areas of research have emerged, a discussion of which concludes Chapter 9.

It is important to acknowledge the bias toward Western art histories considering that the data was gathered in Singapore. Although the island is located within Southeast Asia, it retains strong affiliations with European cultural heritage. The most likely explanation are affiliations established during its colonial past, even though Singapore has constructed a strong identity of its own since independence. Regional theoretical texts on the development of art appear curiously absent, even though a rich visual art culture clearly exists. In a recent un-published interview with the curator Magdalena Magiera by the researcher (see Appendix B), she suggests that, contrary to popular belief, this is not because literature is absent from the region, but because it is written in local dialects. To date, no attempts have been undertaken to translate them into a universal academic language (2016). It is an area that presents a significant opportunity for new research. According to Magiera, the main difference between Southeast Asian and Occidental paradigms is one of linearity. Western art theory tends to develop by reacting to preceding standards, whereas Southeast Asian art theory evolves by responding to political upheaval. Secondly, this author's research background is embedded within three decades of European art as a practitioner, educator and theorist, creating an inevitable bias towards those discourses.

The research is positioned as an interdisciplinary study and part of its contribution are the links made between theories that are relevant but not always shared beyond their specialist fields. It is their connection that provides a foundation for interpreting the findings presented in the final

chapter that delivers a broader understanding on how encounters within immersive spaces are navigated and evaluated.

Chapter 2

Contexts for Interpretation

2.1 Introduction

This thesis is allied with the position that culture is a culmination of affordances that result from negotiations between objects, environments and subjects. These are interlocked with associations that can include conditions such as migration, employment, or the gender associations that Butler (1988), and Lave and Wenger (1991) argue are responsible for generating a sense of Self, or identity. This is a view closely aligned with actor-network theory developed by Bruno Latour (1990), among others, and involves complex relationships between physical and mental representations of the world. The current chapter explores two models that have been widely used to define culture and society over the preceding two centuries, and that are still relevant in understanding how information is shared and understood today. Each aspect is intertwined with the other through their relationship with notions of human universal traits. The first model is known as Ethnocentrism, and involves building systems of analysis based on standards derived solely from an assessor's heritage. At its most extreme, Ethnocentric views have been encapsulated within a framework of pseudo-scientific racism extrapolated from Charles Darwin's (1859) theory of natural selection (Boas 1907). Ethnocentric world views have historically fuelled the behaviour of colonisers and conquerors of what were commonly regarded in Europe and the USA as territories inhabited by less evolved societies, which often lead to genocide of the indigenous inhabitants. Examples can be seen in Tasmania, the Americas, Germany and Africa, which Docker (2004) points out did not begin to be considered as an ethical issue until the mid-1930s, and was even then challenged in the UK parliament.

Over the course of the twentieth century, a thesis of relationships that are globally relative to local conditions began to supersede the prevailing ethnocentric views, at least in the West. It is an opinion that argues any social or cultural system can only be evaluated from within its own philosophical environment (Krausz 2010). The term describing this paradigm, 'Cultural Relativism', was born out of research conducted by Franz Boas (1908) at the turn of the nineteenth century. His thesis argues that societies are built on complex dialogues between human traits common to all, or universals, in combination with elements only understood by a culture in its localised environment. Language is a good example of this because it fulfils both criteria. On the one hand, communication through spoken word is common to all human societies, and on the other the meaning that is attached to those vocal sounds is geographically localised. However, within this model are principles that some maintain should be absolutely enforced across all societies, one such as Macklin's (1999) argument for ethics. Studies in ethics show wide discrepancies across cultural boundaries, not just in the treatment of women and children as Macklin highlights, but also, as Phau and Kea (2007) point out, in the complex manner everyday business is conducted.

Sociocultural models are included here because they appear reflected in the way information has been frequently presented in archival spaces, such as museums and art galleries. Institutional interpretation of artefacts has been, and often still is transmitted to audiences from singular perspectives that relate finite narratives. However, in apparent opposition, participatory processes that require modes of embodied interaction appear to accommodate the relative needs of those that engage with them. In addition, many sociocultural artefacts that for a long time have been fairly localised are being rapidly extended through the increasing use of interconnected information distribution technologies. As information travels through a network it becomes inevitably subject to levels of control that are introduced at intersecting nodes that include the State, through censorship, in targeted advertising by corporations but also through adaptation by individual citizens using social media. The trajectories that govern these flows of information are examined here through Warren Weaver's (1948) Complexity Theory as well as Gilles Deleuze and Félix Guattari's (1980) Rhizomatic paradigms. Both have roots in Edmund Husserl's (1913) Phenomenological exploration of the structures of experience, where processes of interpreting the external world are amalgamated

with internal factors, through a delineation of their territories (Günzel 2014; Tassone, 2017). Deleuze and Guattari claim that embedded within the term 'territory' are antagonisms between decolonisation and colonisation because leaving one habitat implies annexing another. This is an important point, because this thesis will later argue that embodied interpretation stems from tussles between the physical and psychological (see Chapter 8).

Complexity and Rhizomic theories each present a case for accepting and working with unpredictability as an outcome. The effects of this are explored in this chapter through unpredictable but retrospectively traceable examples of social change caused by the introduction of the printing press and its contemporary equivalent networked communications technology. They are included to establish difference between the unforeseen and the un-thought-through and to illustrate that any unfacilitated participative interaction is difficult and perhaps impossible to determine at the outset. Unpredictable visitor responses became apparent in the research art works and were an important aspect in addressing the research questions.

Despite similarities between the theoretical models of Complexity and Rhizomatic theories, Massumi (2002), among others, maintains that it is Deleuze and Guattari's argument that constitutes the primary contributor in the development of postmodern thinking within the art practice and theory of the late twentieth century, and continues to the present day. This is a paradigm that Bauman (1992) suggests is reflected in the multicultural pluralism that has emerged in many economically advanced societies. Pluralism is viewed in this chapter through a lens of technology and its mass distribution, primarily in the form of software that Schiller (1999) describes as digital capitalism. This is in view of its culturally homogenising effect within global societies through neo-liberal models of market creation and consumerism as a process of colonisation. Connections are then made with regard to how artworks are interpreted, both now and retrospectively, especially in the light of the Western domination that writing on art has assumed over the last century. Expanded distribution networks alongside rapidly developing and technologising economies have been identified by Zdenka Badovinac (2010), Lee Choy (2010) and David Teh (2016) as an obstacle in developing critical art narratives that are independent of Western Europe.

2.2 Human Universals and Cultural Difference

Culture was succinctly described from an anthropological viewpoint by Edward Taylor (1871: 139) in the latter half of the nineteenth century as a 'complex whole, which includes knowledge, belief, art, morals, law, custom and any other capabilities and habits acquired by man as a member of society'. Taylor's definition has been broadly accepted since the nineteenth century, along with his key point that culture consists of structures that are learnt from an individual's network of social environments. Within those interlocked mechanisms, the process of enculturation occurs in an array of situations that include the familial home, the workplace, the classroom, peer groups and distributed media. Frames of reference are generated out of relationships with these sources for the purpose of interpreting shared experiences through the use of abstract symbols, such as language, sounds and images, which is known as semiotics. Individuals perpetually build upon such a framework through social interaction within their groups, causing it to change continuously. Joseph Tainter (2016) proposes that the rate of this change is dependent on the complexity of the society in which it occurs. For example, a non-technological remote society, which has low access to generated energy through sources, such as fossil fuels or solar voltaic cells, will have a slow rate of change. In this instance transformation is primarily led by a combination of environmental fluctuations, or a slow influx of community members from other geographic areas through marriage, migration, invasion or trade. In comparison a technological society with ample access to energy production, connectivity and material resources will develop its cultural modes at a much faster rate, which can be witnessed in the rapid homogenisation of contemporary societies with access to smart technologies. There have, and continue to be, several models through which such social systems are viewed. They are important to acknowledge here because each affects the manner in which information is digested by its inhabitants, users or consumers.

Regardless of the model adopted, all cultures have sub-divisions that can be grouped in any number of ways, for example: gender, sexual preference, occupation, musical taste, superstition or food

predilection to name just a few. Each of these classifications involves enculturation through a system of symbols that must adequately describe the shared core principles that comprise a particular group's ideology. The collective mutability of these groups can be driven by the effect of social or technological innovation, acquisition, loss or education of sub-group members. However, arguments by protagonists, such as Noam Chomsky and Richard Dawkins, insist that regardless of learnt experience the individuals within these sub-sets remain linked together by commonalities driven by innate biological constraints. It is a factor relevant to this thesis that will later be argued to underpin systems of embodied interpretation regardless of culture (see Chapter 4.1).

2.3 Universal Traits

Similarities between diverse human populations have been attributed by Donald Brown (2004) to shared anthropological conditions. According to him, all societies have acquired similar attributes to survive particular environments that are moderated within human biological limits. He narrows the causes for universal traits down to biological characteristics that focus on the evolution of the human mind, and its reflective capacities. He claims these develop within a framework of natural selection, and probable commonality in ancient ancestry. While culture is often considered in opposition to nature, in that its artefacts are learnt, Brown reminds us that many of these universals are likely to have arisen out of rational responses to regularly occurring natural conditions, such as the need for food and shelter. He argues that over time these have given rise to meaning being attached to facial expression, gesture, and limb preference, alongside degradation risks managed through strategies such as incest avoidance.

Noam Chomsky (2015) goes further, proposing that the act of acquiring a culture based on the availability of limited informational models is itself a universal. He agrees with Brown and Richard Dawkins (1978) that universals are also conditioned through human genetic encoding. Using the example of vision, Chomsky (2011) points out that variance in colour perception alongside ocular focus operates within specific biological limits. He does accept that the process of conceptualising a colour is a complex balance between biological and cognitive processes that include factors ranging between reflexive visual comparison and modification through learning and language development (Averill 2012; Özgen; Thierry *et al*. 2009). Even so, Chomsky maintains that the potential for cognitive variance is ultimately limited by the number of cone types physically present in the eye, which enforces similarity.

While hundreds of universals have been identified, Brown (2004) claims many more are expected to emerge as anthropological study changes from that which explores difference to the exploration of similarity. William Catton (1960) claims that it is through over-accentuating similarity that social segregation is manifested. This results from a function he claims promotes loyalty between individuals, binding them into social groups and proposes that it is also a continually functioning universal trait that when applied as a national social model generates ethnocentric world views.

2.4 Psychology, Ethnocentrism and Relativism

Husserl (1931) used the term 'Other' as a phenomenological concept to distinguish differences that are constructed by individuals in order to maintain a sense of identity, which in philosophy, psychology and sociology is also termed the 'Self'. The components of the Self are built from psychological affiliations that include values, beliefs and emotional responses among others which, according to Husserl, are central to an individual's affirmation of being real. In contrast, the Other is considered to constitute values that differ from those of the self, and is therefore alien. Psychoanalyst Jacques Lacan (1949) explores the genesis of alienation in his theory of the *Mirror Stage*. Lacan argues that 'Otherness' emerges from the sudden realisation that there is a Self that is different from the body. According to him, this estrangement emerges the moment an individual, usually an infant, recognises their own reflected image for the first time. This is a feeling that, according to Donald Winnicott (1958), can remain with an individual if, during their childhood, rigid behavioural restrictions are imposed on them.

Until the middle of the twentieth century value placed on emotional response was generally regarded as a weakness in Western society. Parents were discouraged from responding to their children's emotional needs, and physical contact was generally thought to be damaging. Through the lens of John Bowlby's (1969) *Attachment Theory*, the psychological distance that emerged, although at the time customary in everyday life, might be re-positioned as reflecting endemic disjuncture prevalent within the structures of society. It may well have contributed to the atrocities committed during periods of colonial empire building, and the emergence of arguments of difference between races based on theories of evolution. Propositions of this nature tended to equate racial variance with disparity between species, such as Lucien Lévy-Bruhl (1910:18) likening ethnographic diversity with the difference between invertebrates and vertebrates. Bowlby's research into separation anxiety had significant impact in the middle of the last century, enough to move the British government of the time into changing its recommendations on parental interaction with infants that had prevailed since at least the nineteenth century. Catton (1960) suggests that ethnocentric Othering is a means of identifying unfamiliar structures that occupy the outer boundaries of shared values, and it functions to reinforce group identity and produce a sense of belonging. However, on a larger scale, he warns that it can lead to xenophobic forms of nationalism.

The rise of nationalism in the early twentieth century has an important role in the development of participatory, and socially engaged practice in art. Nationalism has a long and complex history, which Benedict Anderson (1982) attributes to the birth of the printing press in Europe in 1440. Although a similar technology had been developed in Korea a hundred years earlier, it was Gutenberg's European press that first led to the mass production of books and newspapers. Publications were initially printed in Latin, but according to Anderson, their market was small because there were a limited number of people who were fluent enough in Latin to read them. Manuscripts were soon produced in vernacular languages to access wider markets and generate economic sustainability for the publishing houses. By the nineteenth century, a greater homogeneity emerged in State populations through the unifying effect of standardised language, which, Anderson and Elizabeth Eisenstein (1968) claim, was primarily led by sustained 'print' capitalism. Eisenstein proposes that a once-illiterate European peasantry were now in receipt of education through the accessibility of texts printed in vernacular languages at low cost. Fred Robinson (1981) cautions against the real impact of this, taking as evidence the apparent inability of the majority to write their own names on marriage records. He argues that this continued into the mid-nineteenth century, particularly amongst women, with over half being unable to write. Nevertheless, Eisenstein estimates that book production increased from approximately two hand-copied editions per year, to publishing houses outputting editions of up to a thousand in an equivalent period. In contrast to changes often made by the copyist's hand, each of these publications was now identical. Eisenstein claims that production moving from the church into the jurisdiction of the early capitalists prompted a change in the power structures controlling output. Hand-written manuscripts that were first supplied by the church as education resources were rapidly superseded by the State and private enterprise (Gillard 2011). This was not a gradual process but a sudden one that stimulated social change. Metal workers and cabinetmakers were commissioned to engrave and carve the image plates used on the printing presses, outside of ecclesiastic control. The information that was encapsulated in printed matter begun a slow process of secularisation through its mediation by artisans and educators who were independent of the church. Eisenstein argues that two changes were spurred by this. Reading ages broadened to include children, and education transferred learning by doing, into learning by reading, which as a consequence re-established society as text-based. Increasing quantities of secular text, including the introduction of advertising, then changed the nature of book formatting and presentation. According to Eisenstein, despite the move away from the church, religiosity also intensified through standardisation of dogma. This was accelerated by Protestant propaganda strategies used in disputes with Catholicism, through the publication of their ideologies in the vernacular language and making it available to the masses (Anderson 1982).

The notion of the masses, also described by Gayatri Spivak (1985) as the 'Subaltern', and often referenced in European literature, has been argued by John Carey (1992) to be a backlash against a newly educated underclass by the intelligentsia of the 1900s. It is important to include a brief chronology of how people have been socially categorised here because it underpins contemporary attitudes on how audiences are conceptualised to this day. Carey argues that Modernist writing,

which first appeared in the 1850s, was an elitist attempt to mystify the arts and make certain social levels inaccessible to individuals from more deprived educational and social backgrounds. However, Edward Said (1978) proposes that this was less an intentional motivation than an almost subconscious reinforcement of prevailing arch-narratives by the engineers of cultural output, to which the artists, writers and philosophers belonged. Tussles between perceptions of high and low forms of art, literature and music, were believed by social segregationists to be defined by genetic inheritance, in a Darwinist sense. This was a popular Victorian belief that continued into twentieth century education policy and was reinforced by Cyril Burt's (1969) research into genealogy, social class and intelligence, although the reliability of his data is widely disputed (Tucker, 1997).

In a similar vein, conservative literary critic Frank Leavis (1933) drew up lists of approved authors, famously attacking Charles Snow for suggesting that contributions offered by the sciences should be regarded as culturally equal to those of the arts. His influence was such that some of his lectures were filmed, one of which the BBC included in their documentary *Great Thinkers: In Their Own Words*, (2011). Leavis took the view that culture would be polluted if it was made accessible to a wider populous, a polemic that many agreed with at the time. With arguments derived from Kant's relationship between aesthetics and morality, Rodger Scruton (2010) continues to differentiate between high and low art forms arguing that aesthetic beauty, which according to him is fundamental to art, was somehow removed by the advent of contemporary modes of practice. Conservative values have also been attributed to popular culture by Dominic Strinati (1995), who draws on the writing of Queenie Leavis (1932) to build a foundation for his argument. Both Scruton and Strinati tend to draw on the triumvirate of church, family and tradition to construct arguments for identity built on an alleged moral certainty.

Richard Hoggart (1957) and Raymond Williams (1958), on the other hand, both argued that culture expanded beyond territories defined by a privileged few to include the behaviours of all sections of society. For the first time both Hoggart and Williams incorporated the activities of classes from non-privileged economic and educational backgrounds into the edifice of culture. Postcolonial thinkers such as Said (1978) have since developed this argument by scrutinising global meta-narratives, arguing that dominant cultures have also been weaponised to subdue and indoctrinate colonial territories into thinking and behaving in pre-defined ways. During the 1970s and 1980s in Europe, and particularly in Britain, immigration from these territories grew while most of the countries concerned had attained autonomous governance by then. The cultural subsets that developed within the new communities in Europe began to witness a new pluralism emerging within the social networks of their large cities. 'Pluralism' is a condition in which more than one set of principles concurrently operates inside a system. However, multicultural society requires compromise to function or a negation of personal will similar to that described by Georg Hegel (1894) and Jean-Paul Sartre (1943) in order to achieve a shared understanding (see Chapter 4.5). If the values of a dominant culture and the imported or emergent standards of a subculture do not consciously and equally interlink contextually, understanding drowns in the process of an individual's attempt to externalise their own values. According to Homi Bhaba (1991), these values often become warped through a process of cultural mimicry that undermines a sense of identity and maintains colonial power relationships between dominant and subordinate cultures. This is further complicated by its obfuscation through the tacit assumption that societies are built on similarities not difference, which according to Boris Groys (2012), is what qualifies them as societies.

This monocentric uniformity is positioned by Émile Durkheim (1912) as a useful mechanism that operates inside a culture to mediate a variety of social functions including its output, such as its music and ritualistic artefacts. Claude Levi-Strauss (1978) disagrees, arguing that cultural production is dependent on difference and a sense of superiority. According to him, it is difference that drives progress and prevents a society from falling into consumerism. In their theory of democracy as antagonism Ernesto Laclau and Chantal Mouffe (2001) agree with this polemic, stating 'antagonisms are not social relations, but relations which reveal the limits of objectivity. Society is constructed around these limits, and they are antagonistic limits' (2001: xiv). In other words, they argue that confrontation and dialogue between sub-groups is what defines prevailing social narrative. However, Catton (1960) warns that at the root of this appears to be the desire to transform group principles into absolute moralities, which potentially leads to conflict. An early twentieth century antidote to

confrontation was to seek a framework that allowed a pluralist approach to looking at what might appear alien. Historically its emergence pulled thinking away from the anthropological Darwinism favoured in the nineteenth century. Considering value as relative to specific social networks transformed the notion of culture from an intrinsically exclusive system for the consumption of the elite, to an inclusive organism to which all were a part (Perusek 2007). Until Tylor's expanded definition of culture began to be accepted in Europe, societies had been assumed to consist of hierarchies where a class of elite Europeans inhabited the apex of a societal pyramid. An increasingly irrelevant internal population occupied lower strata, and racial stock determined the position of societies outside home territories. Generally, those outside Europe were placed lower down the hierarchy, and were competitively defined by degrees of alignment with dogma derived from monotheistic European value structures centred on notions of universal truth.

Cultural Relativism asserts that there are no absolute mechanisms that can evaluate the principles of a society. Notions of ethics, law, taste or behaviour can only be defined from within the group to which those values apply. The interpretation of relativism here is a general one; Michael Krausz (2010) points out there are numerous variations on its specific definition. However, he goes on to differentiate relativism from pluralism, which is an important point because pluralism implies subjectivity in the interpretation of a particular frame of reference, allowing more than one interpretation. For example, different standards defining appropriate dress can exist simultaneously in a pluralist society. Relativist theory argues that it is the differing frames of reference themselves that lead to interpretive variance, and that the conditions that have shaped those frames share little to no commonality and never will. For example, the O sign made by placing the thumb and forefinger together signifies OK in some countries to express positivity, and is used in the official sign language of diving, but in other countries it is a lewd sexual gesture. The relativist paradigm does not argue that they manifest in opposition, or that one may hold more truth than another; they are simply untranslatable (Krausz, 2010).

Many viewpoints exist within the Relativist camp. One faction maintains absolute denial of any universal cultural paradigm, including biological maternity, for example, because the presence of cloning technology introduces the possibility of biological parental absence. From another faction comes a voice supporting certain biological or constructed commonalities, and even arguments, such as Ruth Macklin's (1999) that condones forcibly implementing absolute universals, particularly with regard to human rights and medical ethics. To illustrate this argument Macklin uses the examples of infant sacrifice, genital mutilation and the public execution of women by hand-grenade. She argues that the point at which an individual is subjected to physical harm builds a case for the need of absolute cross-cultural ethical laws regardless of any reference frame that may be in operation. Macklin's argument is not intended to refute relativist theory but to introduce frames of reference, albeit artificial ones, that function within a global society. This has echoes of nineteenth century cultural evolutionism, the notion that culture develops from primitive origins, through stages, to a more advanced or intelligent manifestation. Macklin's argument, however, is based on the Enlightenment Paradigm of natural rights that was put forward by European philosophers to challenge the divine right to absolute rule by monarchs, which eventually led to social reform within Europe and America. Natural Rights proposed by philosophers including Thomas Hobbes (1651), Jean-Jack Rousseau (1762) and John Locke (1824) argue for the basic rights of life, liberty and property ownership, to be awarded to every individual regardless of status divined through birth. It was these that became the founding principles of Human Rights that are at least familiar to Western democracies, although not always practiced by them. Nevertheless, from a relativist point of view Macklin's argument appears problematic because it attempts to encompass a complex and culturally diverse global system within a singular model of values.

One of the major issues in adopting a purely relativist model in interpreting information is that it conceives culture as a sealed cyclical unit referring only back to itself. Failure to acknowledge it as a temporary manifestation of notions invested in heritage also implies inability to expand or mutate. Heritage is constructed by the material and data contributed by all the individuals who join a society. Their contributions occur continually and randomly and are led by a variety of factors including economic markets, associated artefacts, storytelling and cultural migration. The paradigm presented by relativism implies that added data do not modify a cultural system. Said (1978) explores examples

of this arguing that Arab 'Oriental' culture was largely a Western invention fed back to the Middle East through colonial policy. Nicholas Mirzoeff (2015) claims that this can also be observed in other territories where artists have lacked confidence in their own legitimacy and constructed identities based on colonial stereotyping to compensate. He uses the example of Cameroon photographer Samuel Fosso's (see figure 2.4.1) constructed self-portraits caricaturing Eurocentric projections of African culture to illustrate what he tags the 'White Gaze'. Said questions whether categorising in terms of culture rather than analysing through socio-economic positioning or political history, is in any way useful. David Perusek (2007) points out that while the relative nature of culture makes it difficult, impossible even, to understand a group as an outsider, relativism has become policed through the emergence of gatekeepers who construct difference. Anderson's definition of imagined nations that are fixed by the volumes of printed anthologies describing them, are then reinforced. According to him, they are not necessarily false descriptions, but comprise of imagined connections between people who never meet. Records of cultural boundaries almost instantly become societal imitations that replicate objective culture with subjective material in the form of images, and texts, hidden in the term 'authenticity'. This is what Katherine Hayles (1999) claims reinforces the paradigms within them, while simultaneously undermining what they are referring to, in the way that patterned plastic can be used to imitate a block of timber (a skeuomorph). In other words, the narrative that defines a group's value system, or culture, also constructs its members' identities (Ricoeur 1991). Once this culturally skeuomorphic narrative is committed to text, the descriptive anthology assumes the function of collapsing cultural mutability.
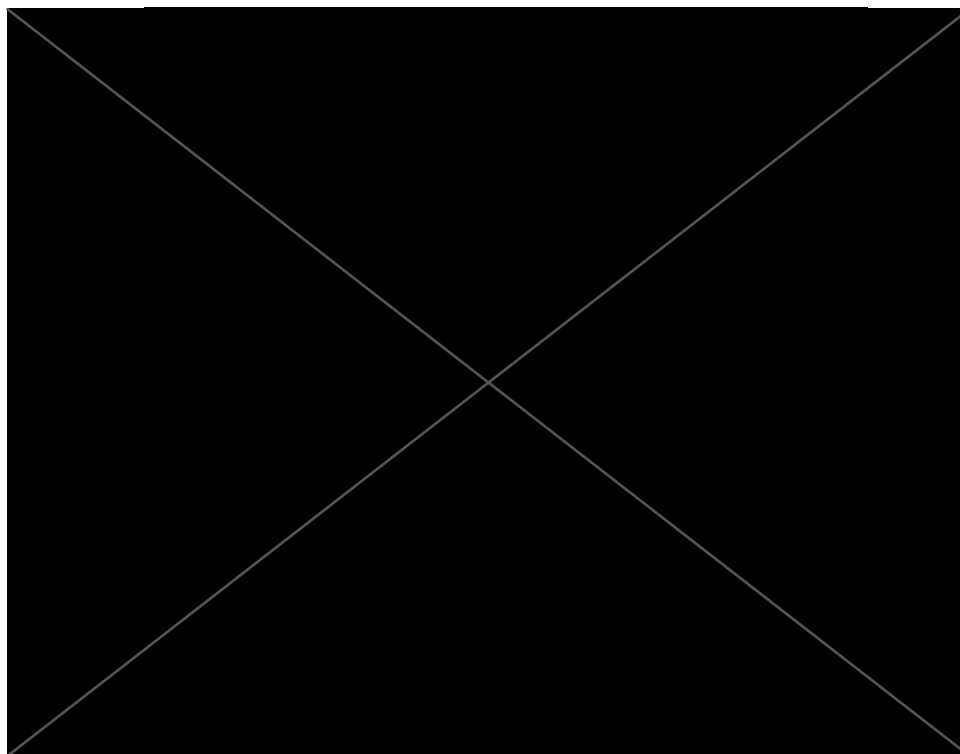
Figure 2.4.1 *The Chief (the one who sold Africa to the colonists)*, Samuel Fosso, 1997

2.5 Technology and Collapsing Culture

The complex exchange between cause and effect was reiterated by Marshall McLuhan (1969) in the late 1960s in relation to the effect technology has on the human mind. McLuhan discusses the relationship between introduced technology and the collapse of established social hierarchies. He uses the example of missionaries supplying women in Australian aboriginal communities with steel axes that caused the disintegration of established hierarchies based on possession of stone axes by men. Paul Ricoeur (1991) describes this process not as a destruction but a reconfiguration of cultural narrative. Chomsky (1998) points out how a social system can be equally collapsed by the removal

of technology. Using the example of India's de-industrialisation in the nineteenth century to open markets to products manufactured in the West, he exposes the devastating effect an enforced agricultural economy had in impoverishing what had been an economically buoyant nation. This was reflected both in Cambodia, in the 1970s under Pol Pot's dictatorship, and China's Great Leap Forward of the late 1950s and early 1960s. It was a programme that sought rapid industrialisation and increased food production for export. Nick Smith (2015) proposes that the ensuing famine in China was not caused by underproduction but by a complex relationship between the fear of violent punitive action for underproduction and delayed data gathering.

The assumed causal relationship between punitive action and productivity increase has its roots in Newtonian logic, or an assumption of linear cause and effect. Leslie Henrickson & Bill McKelvey (2002) propose that the belief that complex systems can be reduced into simple constituents prevailed well into the twentieth century. According to them, frameworks for interpreting information require challenging linear paradigms by acknowledging a more complex interlocking of relationships. Complexity theory is a relatively new methodology for unravelling non-linear information, which David O'Sullivan (2004) claims is rapidly gaining credence in both the Sciences and Humanities, including financial markets (Matutinovic 2010), and law (Hornstein 2005). However, as Shun-Yun Ma (2007) indicates, it is difficult to define precisely because researchers have yet to assign it a paradigm. Thomas Kuhn (1962) explains that this is because existing systems that are superseded by new models enter a preliminary undefined phase prior to their general acceptance, which he identifies as a paradigm shift.

2.6 Complexity

In 1948 Warren Weaver published a paper that sought to probe the future function of science. He began by praising scientific methods that had grown out of the Enlightenment and highlighted their importance in developing the methodologies that built the industrial revolution. In particular, he applauded the understanding and implementation of control and evaluation methods that led to the development of powered technologies, such as the engine, telephone and television. This is described by William Rasch (1991) as a control of Newtonian paradigms that require the application of mathematic universals to reduce a problem enough to generate a predictable outcome. Much of this technology was binary and operated as a switch does, in that it is either on or off. Combinations of switches connected to arrays of swinging arms or electrical currents can generate functions, such as motion or communication. Weaver contrasts this knowledge with the prevailing lack of understanding in the operation of biological systems in which quantitative analysis, in his opinion, had failed. He proposes that biological organisms operate through interconnected structures that are in states of arbitrary flux. Furthermore, as John Von Newman (1966) observes, these systems contradict the Newtonian assumption that a mechanism cannot create a structure more complex than itself. To illustrate the complexities of non-linear thought, Weaver cites the success of interdisciplinary operations teams that were implemented by the British during the Second World War. These were groups of individuals whose function was to analyse secure strategies across multiple combat zones. The team members came from a variety of disciplines that included mathematics, biochemistry, psychology and the social sciences. Although Weaver acknowledges the importance of specialised private research, he argues that it is as part of a larger complex whole that new interpretation and analysis can flourish. According to him, in order to progress, a shift in the way problems are unwound is required, one that that transcends reductionist notions of nationalism, subject and culture.

Weaver argues that highly complex and disorganised systems can be analysed as a whole by dramatically increasing the number of variables. Using the example of a super-sized billiard table containing millions of balls he proposes that while the movement of individual balls may remain unknown, the system as a whole can be understood through the statistical analysis he names *Disorganised Complexity*. However, Weaver argues that sliding between binary analyses and Disorganised Complexity is not a full account of how things operate in the world and suggests there is also a middle ground. He notes that areas of organisation appear within this middle ground, which complex probability cannot account for. In fact, he goes further to claim that this complexity requires simultaneous calculations that must be applied to an interlocked animate whole, a phenomenon he

describes as *Organised Complexity*. Weaver does not offer any methods to understand Organised Complexity; he admits they do not yet exist and states that it is the project that must occupy science over the next century.

A number of diverging accounts of complexity have emerged since Weaver's paper and it is important to include Robert Rosen's (1986) point that interaction between an observed system and the observer's individuality is itself part of the complexity structure, a situation Hayles (1999*)* identifies as *Reflexivity,* or to put it another way, an awareness of subjectivity (or ethnocentrism) in interpretation. Hayles' vision is of a complex *Post-Human* world in which individuation has been converted to data flow (1999). *Post-Humanism* is a paradigm that proposes a new framework built on arguments emanating from Humanism, which came out of the Enlightenment, and is a largely secular system putting the human at its centre. Post-Humanism differentiates itself by acknowledging anti-Humanist accusations that Humanism is a Eurocentric worldview with *man*-kind at its centre (Braidotti 2013). Hayles' society is no longer built on biological interaction but on information transfer through interconnectivity.

Interdisciplinarity is fundamental to these theories, and is central to Ludwig Bertalanffy's (1968) related thesis of *General Systems Theory*. Again, taking a lead from the field of biology, he investigated nonlinear interrelationships between different systems as interlocking units. He developed his theory to encompass Complexity alongside several other allied fields including Cybernetics (the study of communication) and Game Theory (strategic interaction), among others. Bertalanffy argues that his proposal encourages 'unity' between subject fields through a 'vertical connection between them' (1968: 38). However, where Bertalanffy maintains that hierarchic order is central to his thesis and positions it as a humanist theory of organisation, Complexity Theory does not.

2.7 Rhizome

During the 1980s, interdisciplinary approaches to knowledge, and by affiliation interpretation, were re-defined through Deleuze and Guattari's (1980) theory of the *Rhizome*. Bertalanffy set out to produce a taxonomy of his theory and the fields it incorporated, but the result was more an analysis of how interlocking occurred between connected subjects. To describe the process, Deleuze and Guattari developed the phrase 'Bodies Without Organs' (1980). Their term was intended to symbolise arbitrary flows of potential within an encompassing framework. In botany a rhizome is a horizontal interconnecting stem that vegetates laterally underground. It intermittently sends up shoots along this structure to break the surface and generate a new flower stem (see figure 2.7.1). They are very resilient and can regenerate as new systems after levels of destruction that would prove fatal to other flora. Their root structures differ from other plants in that they do not fix their location to a specific position. Rhizomes can also be seen in ant and bee colonies through their ability to rapidly produce new queens and manage population explosions and hive attacks. Deleuze and Guattari's organs are the systems of control, and their metaphoric removal releases agents to move freely within a body without restraint. According to Deleuze and Guattari these forms, or systems, also flow and move amongst each other in an equally uninhibited manner. They argue that the bodies can include anything from organic or inorganic singularities, communities, language or data. Deleuze and Guattari apply these representations to their commentary on Western society's engagement with capitalism and consumption. Their argument is presented in a publication that does not follow the linear model usually associated with textual argument. Its chapters are designed to be read in any order, and although the book has an introduction, its conclusion is a glossary of their main ideas. John Cage (1961) had experimented with this free structured approach nearly two decades earlier in an essay on the work of the artist Rauschenberg, and both texts are intended to build rhizomatic relationships with the sections within them, and their reflexive interpreter – the reader.

Deleuze and Guattari's publication became a key text in postmodern thinking within the arts (Best and Kellner 1991; Massumi 2002), creating a framework for unrelated, or de-territorialised, sources to be patch-worked together to create new meaning. A good precursor to their theory might be the Structural/Materialist films made in the 1970s (see Chapter 4.3), although no claims are being made that they are aligned with Deleuze and Guattari's thinking. The films were intended to draw meaning

from non-hierarchic relationships that include their material form, run-time, their representations and associations made by spectators as individuals (Gidal 1976). In the visual arts Deleuze and Guattari's influence is often manifested in appropriation of source material. Re-contextualised again in the gallery space, new associations are free to emerge between the artist, the source origin, the audience and the hierarchies prevalent in the exhibition space (Serpentine Gallery 2008).
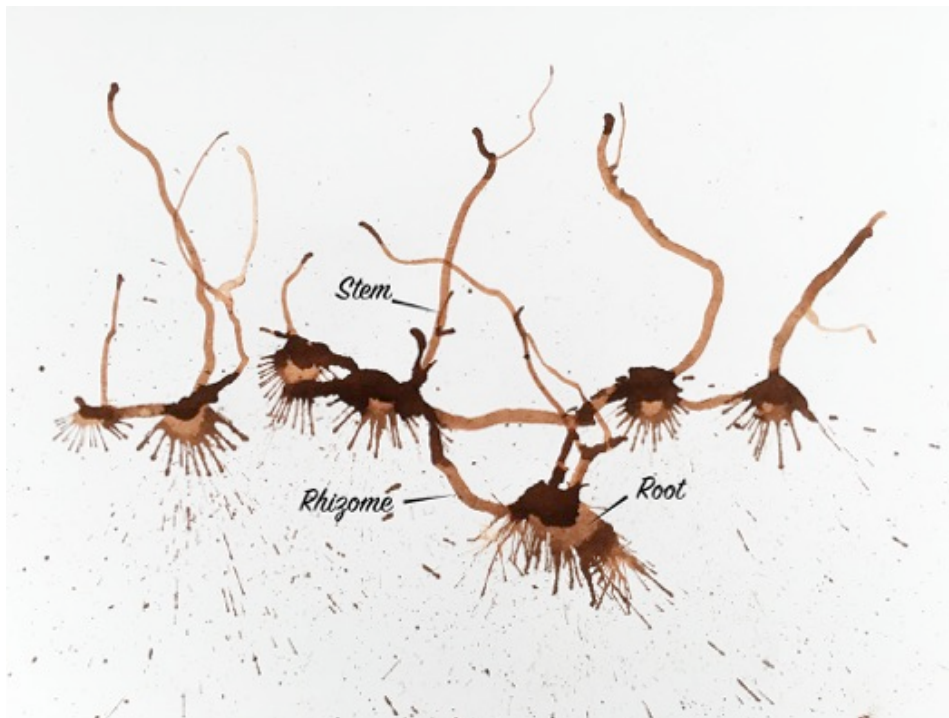
Figure 2.7.1 A representation of a botanical rhizomatic system, including a break where a new structure has emerged (drawing by Kearns)

Evident in Deleuze and Guattari's thesis is its exercise in both Complexity Theory and General Systems Theory. A number of correlations throughout the text, such as the nature of rhizomes and an interest in multiplicity, echo the concerns of both Bertalanffy (1968) and Weaver (1948). It attempts to dismantle many of the obstacles that prevent free flowing connectivity between seemingly unrelated parts, but this does not come without its own inherent dangers. Janet Murray (1998) points out that the endless non-linear possibilities offered by early hypertext in computing, for example, were criticised for losing users in a labyrinth of potential, rather than adding functionality to digital connectivity. This could be due more to the lack of a perceivable framework to contain digital movement, than to the ability to make connections causing a failure. However, it is interesting to note that Deleuze and Guattari's theory has been particularly aligned more recently to 'net art' and artists' work using digital technology, hence the name given to Rhizome, an arts organisation founded by Mark Tribe that 'champions born-digital art and culture through commissions, exhibitions, digital preservation, and software development' (Rhizome 2018).

A context is the most basic element in interpreting a situation which, according to James Gibson (1972), is provided through a series of relationships he calls affordances. Unless enough information is available to offer clear meaning, affordance involves arbitrary agreement based on common needs and comparable histories. This is exemplified in his example of a knee-high object with a flat surface suggesting, or affording, a seat, which, in any society that used chairs, may be a logical conclusion. Full accord will never be fully reached, if Ludwig Wittgenstein's (1953) argument is followed, because the necessary references that point to meaning are unlikely to be identical. These are the semiotic structures such as words, symbols or objects that he claims are not interpreted universally, even by those speaking the same language. Historically, general consensus has tended to be enforced using threats. The emergence of printed paper as currency is a good example of this because of the tacit ties between art production and economic exchange (see Chapter 3.2).

Paper money had already had a 500-year history in China before the concept of it reached in the West via Marco Polo's travel writing in the fourteenth century (Davies 1994). According to Glyn Davies, hyperinflation created by over-production as a form of currency debasement, ended its use in China. Nevertheless, printed currency began to be circulated in Europe in the early eighteenth century. Initially it was based on the gold standard, a system where notes can physically redeem a certain amount of the metal, but are used in its place as a means of exchange. This was replaced during the course of the twentieth century by a system based on fiat money (Selgin 2003), which means by decree of the State. George Selgin points out that this was also a model first seen in twelfth century Song Dynasty China, where note to coin conversion was suspended and enforced with heavy punitive legislation. According to his examination of currency, the method of introducing fiat standard has remained the same ever since. An imposed perception of value eventually becomes encoded into the medium, as a mode of exchange, by its users, echoing McLuhan's (1967) famous observation 'the medium is the massage'. In the book he produced in collaboration with Quentin Fiore (1967), McLuhan argues that the sensorium through which information is received by an individual, affects their interpretation of content. An image and a text pointing to the same lexicon is decoded in different ways, differentiating meaning through a sensory 'massage' produced by qualities specific to a medium. It differs from McLuhan's (1964) earlier claim, 'the medium is the message' where the vehicle transmitting information becomes encoded into meaning. In one instance, content is affected by the experience of its receipt, in another by its mode of delivery.

Overlaying one system with another is a process Jean Baudrillard (1981) terms 'hyperreality'. He describes it as a condition where a representation of what is real, such as a reflection in a mirror (1981: 166), becomes convincing to the extent that it is accepted as tangible reality. According to him, the finest example of this type of simulation is described by Argentine author Jorge Borges in his one paragraph long story *On the Exactitude of Science* (1946). The story relates how a life-size map (one mile on the map equates to one mile of land) was constructed to describe the terrain of a State in precise detail. The tale appears to be a development of one by Lewis Carroll (1893), in whose narrative a similar map is made but never opened for fear of it covering the land. In Borges' plot, however, the map is opened but due to its scale is seen as useless. Subsequent generations let it lie over the land and forget about it, never realising that it is the map they are living on and not the land. A similar concept also appears in Plato's analogy of *The Cave* (380 BCE). In it he relates an account in which a group of people are shackled into a position where only its rocky back wall can be viewed. They have been there since early childhood and know nothing else. Behind them flowed an array of day-to-day activities that due to the modulating effect of the cave walls they could only hear as distorted echoes. In addition, a large bright fire projected shadows of this daily activity onto the rocky surface in front of the prisoners. Since there was nothing else to challenge this perception of reality, they began to assign meaning and names to the sights and sounds they experienced. On a random day and for no particular reason, one of the inmates is released from bondage and ventures outside the cave into a world of bright sunlight. Once he had emerged he realised that his conception of reality had at best been fractional and at worst utter illusion. Although Plato's intention may have been to support his theory of forms, arguing that all perceivable phenomena are base versions of an ideal that exists in a metaphysical space, his argument has affiliations with Baudrillard's thesis. It is important to note that Plato's concepts are mediated through modern monotheistic translations from ancient Greek, which was the language of a pantheistic culture. Plato uses this allegory to describe the transformative effect of education, and as can also be seen with the introduction of fiat currency, simulations need not be gradual.

Plato's medium in his account is vision, which is the vehicle that catalyses a new meta-narrative to decode the affordances offered by an unfamiliar environment and brings about transformation. Europe underwent a similar metamorphosis during a period occurring shortly after the introduction of the printing press in 1439. This remained the primary means of distributing ideas until the beginning of the twentieth century, when its dominance was challenged by wider reaching and more instant distribution technologies. First was the invention of radio broadcasting, then the television, both eventually offering the capability to transmit over vast distances. More recently mediation is being proffered through accessible portable digital technology disseminated through rhizomes of cellular networks and the Internet. Cultures within any society are in a state of constant flux and are

moderated either by their members, or by external bodies that attempt to govern boundaries. This includes forcing changes in patterns of behaviour and belief structures under the threat of punitive legislation, as was seen with the introduction of the Fiat Standard. Rosi Braidotti (2013) describes this as Social Constructivism, which he claims concentrates on separating nature and nurture to identify modified learnt systems from universal natural ones.

The introduction of new technologies, particularly those that engender connectivity, are already initiating change within societies. This can be seen in the Telecommunication Development Bureau's Report (2015) advocating the initiation of literacy programmes within developing countries to open up new markets for their industry. There is a correlation with the history of the printing press that resulted in increased literacy in Europe, which in turn led to a variety of social changes. A contemporary example can be seen in the spread of the global uniformity that is required in accessing connective technologies. Social media sign-in pages offer an example, such as Facebook's identical log-in process across multiple countries, with the only difference being the language in which it is published (Figures 2.7.2, 2.7.3 and 2.7.4).
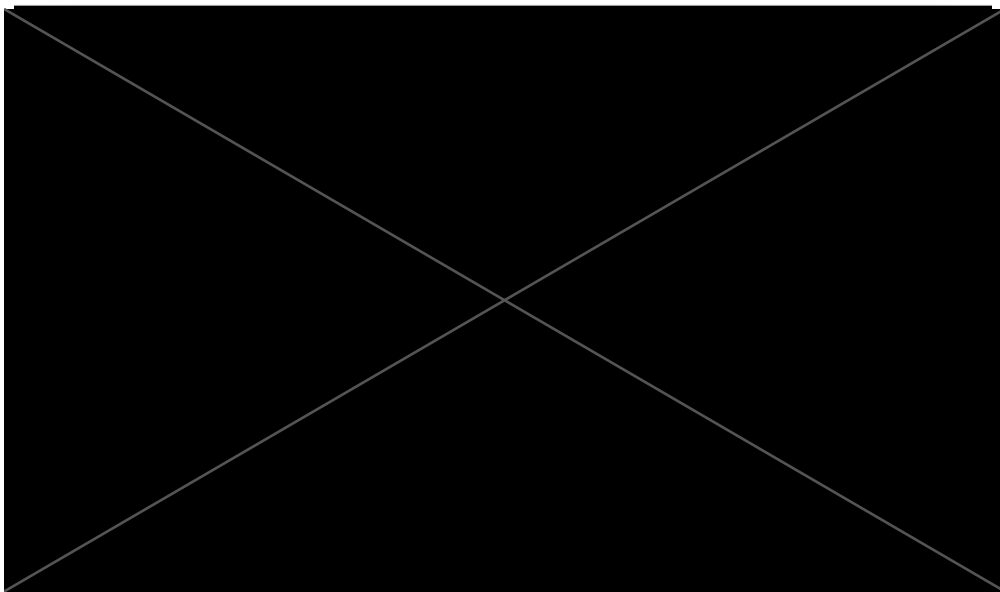
Figure 2.7.2 Facebook login page, Assam
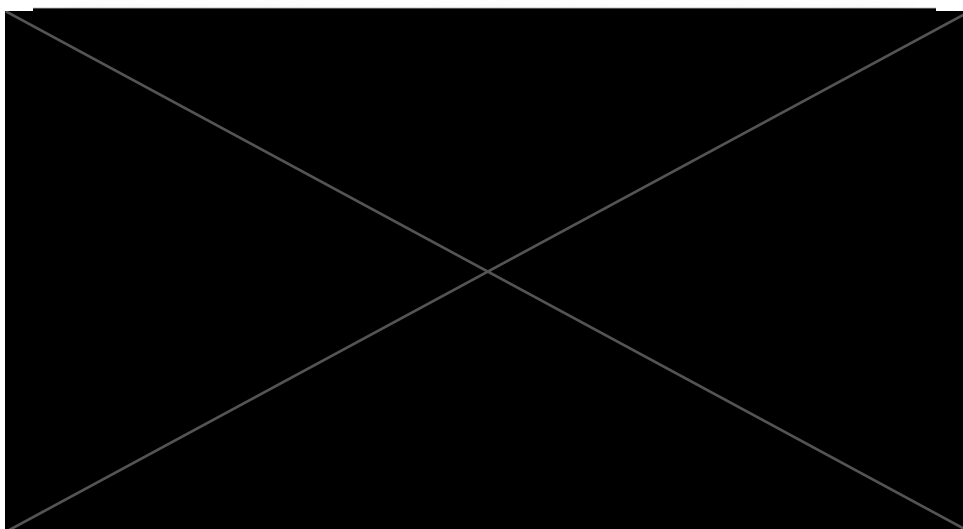
Figure 2.7.3 Facebook login page, UK
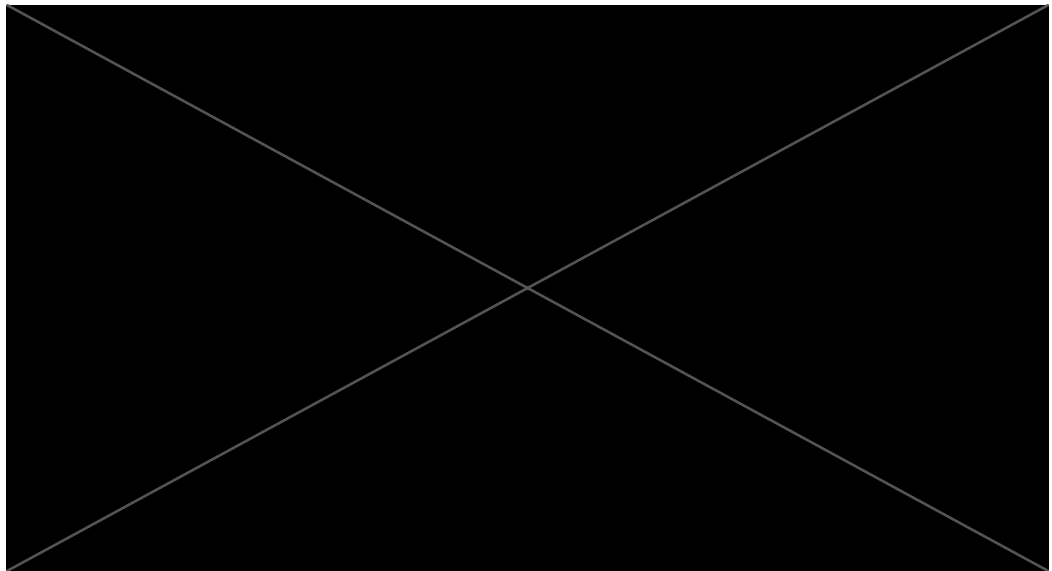
Figure 2.7.4 Facebook login page, Indonesia

At the beginning of the twentieth century Ferdinand Saussure (1911) established language to be less a method of describing objects and more a mode of transmitting meaning. Although the meaning of the words on the Facebook login page may carry differing associative values in different languages, its affordance remains the same. If McLuhan's (1964) earlier argument 'The medium is the message' is transferred to the sign-in process, then surely it is engendered with functionality similar to that ascribed to Saussure's notions of language. If this is the case, global societies are mediated and therefore encultured through the affordances of standardised technologies, in a complex relationship with their accumulated localised heritage. As a result, new commonalities in both interaction and interpretation are inevitable.

Unlike the examples of print or audio/visual broadcasts, smart technologies do not rely on an audience that is solely a recipient of transmitted information. Data spread by social networking applications is done in the knowledge that a user may mutate it through addition, subtraction, contextual shifting or transcoding (Manovich 2001). Devolution does not have to consist of a physical change to transmitted information. Each upload to an online forum by an individual or an organisation carries with it a narrative constructed from the user's previous history, which in turn affects the potential affordances of the new post. This form of social collaboration has already been adopted in journalism through the emergence of spot news agencies that specialise in mobile phone images supplied by members of the public from flash zones. It is being appropriated in new models of personal banking systems such as the *Grameen Bank*, that operates through smartphones and offers loans to individuals not eligible for standard bank accounts in countries with large un-industrialised rural areas such as Bangladesh. Communication technologies have also been used by activists in the organisation of smart protest mobs, an early example of which was seen in the Philippines in 2001 when text messages were used to guide protesters eager to oust president Joseph Estrada (Goggin and Clark 2009). These decentralised digital networks are instantly restructured through user activity as they are moulded into numerous forms of collective communication (Sweeney 2004), and like the root structures found in certain plants, construct very resilient rhizomes. Mirzoeff (2015) estimated that 65% of the planet's population would be connected through communication technologies by 2020, in what he describes as the world's 'first universal medium" (2015:6). The transition is happening faster than he anticipated. According to Groupe Spéciale Mobile Association's (GSMA) (2019) report 67% of the global population already possess mobile phone contracts. Nevertheless, Mirzoeff argues that as connectivity increases we will no longer navigate our understanding through a primacy of textual language. His argument suggests a reversal of the shift that Eisenstein (1968) identified was caused with the introduction of the printing press in the fifteenth century. However, there is a potential for similar transformative social implications through the ability of individuals to communicate in numerous ways, in addition to their instant access to a vast store of diverse information.

2.8 Visual Culture

The comparatively new discipline of *Visual Culture* operates under the assumption proposed by Nicholas Mirzoeff (1998) that individuals in a globalised world contextualise relationships between themselves and their environments through visual media. It is an interdisciplinary field incorporating imagery from all sectors of all cultures that are available for interpretation. Not just limited to screen or print-based images, still or moving, *Visual Culture* also encompasses popular cultural outputs such as the Barbie doll, and codes of dress (Mirzoeff 2015). Differentiating the academic field of *Visual Culture* from iconographic studies in a historical context is its focus on the interaction between the image and the individual within a social environment. In this context, Mirzoeff argues that it includes the affordances offered by our extension into the networked digital environment that Gibson (1984) described as cyberspace.

Manuel Castells (2009) argues that the most significant change in the relationship between cultural artefacts and the individuals that interact with them is one of personal autonomy. According to him, while access to communication networks remains relatively unhindered by institutional and governmental bodies, parties can by-pass traditional information gatekeepers to form mobilised groups. His thesis claims that fundamental principles on how we perceive the world are changing as a result, including, our understanding of space and time (1996). The gradual dissemination of political power in a networked society is transforming our modes of operation within the world, because hierarchies are beginning to shift. However, Castells (2009) also warns of emerging corporate organs whose aim is to transform a participative audience into a passive one, through the control of imagery and the associations allied with them. Joasia Krysa (2015) agrees and points out that Mirzoeff's argument that passive consumption is being replaced by participative engagement, is under constant attack, because the systems that host connectivity are under the consolidated control of private ownership. However, the relationship between the providers and consumers of digital services is not only rhizomatic, but a highly complex one that has evolved through interlocked affordances between all the stakeholders involved in its development.

2.9 Conclusion

The operation and evolution of culture is complex and intricate and directly affects the way that individuals bound up in its social systems behave. It creates a framework that facilitates the interpretation of events and defines social norms that are often mistaken for universal truths, which in turn set the foundation stones for what are considered to be ethical actions. As social systems are affected by external agents, such as technological revolutions, those standards are sent into flux and become subject to the transformation of the framework that defines their context. This chapter aimed to illustrate this by describing some of the systems that have prevailed over the last century. The intention is to indicate how current revolutions in networked digital technologies mediate human interaction in global contemporary societies, by affecting criteria for interaction between people and things. It is an important point because it is these volatile systems that define the behaviour within the interactive installations made for this research.

The chapter began by examining sociocultural systems through two lenses that, although different, are interlocked by their overlap in Western polemics of how they interrelate. This is particularly important to this thesis because central to those debates are issues on who has access to cultural outputs and to what degree any input they may have is considered valuable. In addition to issues of inclusion and exclusion, the chapter explored how culture constructs contexts of affordance by directly affecting the manner in which information is transmitted and received within it. This applies to localised environments, such as art galleries and museums, where information can be read in relation to sameness or otherness with a tacit function of reinforcing hierarchy through emotional distancing. Winnicott's (1958) Attachment Theory was introduced as a convincing argument for explaining why persistent emotional disjuncture has prevailed in explanations of aesthetic experiences.

Uncertainty embedded within evolving systems that include sociocultural ones was examined through Complexity Science and allied in the chapter with Deleuze and Guattari's Rhizomic Theory

(1980). Their paradigm was included for its usefulness in explaining how the flow of decentralised information can affect the structures of established cultural hierarchy. The introduction of the printing press and its relation to printed money was used to illustrate how introduced information technologies rapidly changed the way society operated in the past, and that in addition to their destabilising effect, the consequences of change were unpredictable. The transformative power of information and its delivery was considered through the allegory of Plato's cave, not only for its usefulness as a tale of a rapidly changed world view, but also because the narrative was one of the themes being explored in the research artwork *Soundweb* (see Chapter 7.3). The chapter went on to argue that similar conditions of cultural shift are being replicated in contemporary times in new environments of universal affordance that are being cultivated across global societies by information that is mediated through digital networked technology.

Because enculturation is so critical in building a framework for interpretation, which in a participatory context manifests as an embodied response, it is important to understand and acknowledge how socially constructed systems interrelate with universal biological ones to generate a reaction. This is particularly important if each is informed by the other, as appeared to be the case in the research artworks *Soundweb* and *Interplay*. As communicative technologies continue to ingress the daily lives of citizens around the globe, the manner in which they are interacted with inevitably has an effect on how an individual may physically participate within an interactive environment.

Chapter 3

A History of Participatory Art

3.1 Introduction

The following chapter comprises a brief history covering practices in the visual arts that are relevant to the installations made for this research, and positions them in a broader historical context. The chapter illustrates how from the beginning of the twentieth century the introduction of participatory practices challenged many of the principles that were established by the systems discussed in the previous chapter, such as differentiation between what was perceived as elite and mass culture.

The word *participate,* is rooted in the Latin verb *participare*, which itself is an amalgam of the words *pars*, meaning part and *capere*, meaning to take, or catch. According to the Oxford Dictionary, the word 'participate' entered the English language in the late fifteenth century, and its definition is *take part*. Over the last few decades there has been a number of attempts to clarify the relationships between audiences and participation, particularly in the arts, as both political and technological developments continue to affect the way art is presented, and how it is defined.

New technology has always expanded the traditional modes by which art is made. The relationship between the introduction of innovation and its adoption of it by creative practitioners over the last century is useful to consider alongside its coincidence with the more direct inclusion of politics and political activism into art theories. The use of new mediums is initially explored in this chapter in the context of an expressive 'platform', where the term is used to refer to particular technologies in the production of an artwork. However, because the manner in which art is consumed continues to evolve and the possibilities of expressive media as art are potentially endless (Kenyon 2014), the word platform requires more clarity. Toward the end of the chapter the term is repositioned to refer more to the manner in which a work is presented, rather than to the choices employed in its construction.

Art has served a variety of functions over the millennia and strikingly apparent among them is the disjuncture between the its output, and access to it by a general public. New means of expression introduced throughout the nineteenth century, such as the birth of photography in 1835, disrupted the traditional relationships between an artwork and its audience, which Benjamin (1936) argues had endured since pre-history. According to him, the high status of the art object began with the magical significance attached to cave paintings, which was intensified by their limited visibility, and restriction on access to them. Benjamin claims that decisions made by the artists to locate artworks in places that were difficult to view initiated a framework of contemplation in those who encountered them, which has remained to the present day. According to him, restrictions continued throughout history in the accessibility of temple sculptures and religious icons, to more modern artworks that are regulated either through size and importability, or private ownership. It was through these routes that Benjamin claims a ritualistic contemplative engagement from audiences emerged. He goes on to argue that the mass distribution of photographic images through newspapers eventually changed relationships between artworks and audiences, which then resonated into the spaces where those encounters took place.

What had changed was the sense of 'here and now', through a new awareness of position in time and space. The act of paying homage to an artwork within a specific location made sacred through the authority of a museum, private collection or temple had been reversed. Images became transportable and entered the home in newspapers and in public spaces through the cinema, which by the 1950s also flowed further into domestic spaces when the cost of televisions reduced. The shift is described by Benjamin as a move away from individual contemplation, to a distracted mass absorbing the work into itself, but is argued by Groys (2008) and Kester (2004) to signify the death of the artist as unqualified pedagogue.

The reach of radio and television far surpassed the revolution brought about by the introduction of Gutenberg's printing press in 1440 because it did not rely on prior initiation information through any kind of education, such as an ability to read. These new media crossed traditional class boundaries and coincided with two military world war conflicts that by necessity further stripped social class divides and helped transform the 'masses' and 'proletariat' into the public. Guy Debord (1967) described this process as a 'spectacle' that mediates the minds of populations and nudges contemplative space toward entertainment. This is a key point because it marks a change in the traditional relationship audiences have had with the artworks they encounter, and is one that is directly related to this study. However, where Debord was critical of the changed relationship that he observed and saw it pejoratively, this research considers how the comparatively recent introduction of smart technology has affected the dynamics that emerge between the production, presentation and consumption of interactive creative content as a positive development.

3.2 Participation: A Paradigm

In 1849 the German composer Richard Wagner published his essay *Artwork of the Future* in which he introduced the notion of *the total artwork*, or *Gesamkunstwerk*. The three main points he raises in his thesis centre on an interdisciplinary approach, anti-commodification and the integration of the audience within the art event itself. The 'event' was since theorised by Alain Badiou (1988) as a singularised point existing within a historical situation. Wagner proposed a synthesis of the plastic arts (involving physical manipulation of material), music and drama. His proposal came at the time of increasing social divide that was spurred by the drive to base a social system on capital. Urbanisation, industrialisation, and commoditisation contradicted the growing values of individual emancipation offered by the Enlightenment, motivating critical works from a number of commentators, including poets such as Wordsworth and Baudelaire. The Romantic movement, to which these cultural observers belonged, grew in opposition to the effects of increasing industrialisation. It is evident that Wagner shared their sentiments when he declared that the production of art necessitated the subjugation of the ego. It was Wagner's response to the lure of luxury and fashion, which he claimed most artists of his time were engaging with. He accused his contemporaries of producing work that debased the nature of art, which he argued resided within the mind of a consumer, rather than within the object itself.

Wagner insisted in his essay that art production should move away from serving luxury markets, his version of commodity fetishism, to involve participation by the audience instead. 'Commodity fetishism' is a term introduced by Karl Marx (1886) in Das Kapital to describe a perceived value that is shaped by the dynamics of economic exchange. It is a state in which projected worth becomes concrete through belief. The polemic also became important in the argument of Debord (see Chapter 3.4), and to Baudrillard's theory of consumer society which is discussed later (see Chapter 3.5). Wagner insisted that through his paradigms an artwork's conceptual nature can be explored through the audience and not through an object relating a narrative that is ultimately linked to its perceived value. He maintained that this is integral to all artistic expression for an art of the future to be realised. Groys (2008) argues that this is one of the seminal points of the essay, and artists must recognise it is the public that are the only true creators through their processes of interpretation. Wagner proposed that artistic experience cannot be mediated through a pedagogy delivered via object gazing, or recital appreciation, an argument echoed in Barad's positioning of the performative as an act of mind rather than language (see Chapter 1). For Wagner, experience must be first hand and through all the senses and must include a creative role in the form of direct action by the audience.

3.3 The legacy of Ubu Roi

In 1896 Alfed Jarry's symbolist play, *Ubu Roi ou les Polonais* (King Ubu of the Polish), was performed to an invited audience for two nights at the *Théâtre de l'Œuvre* in Paris. At that time the symbolists were emerging as a group of artists attempting to represent notions of purity and truth through the plastic arts (material form), literature and performances. Purity, in this context is not to be confused with notions of the chaste, and according to Jarry (1896) the hero of his play, Ubu, often translated as King Turd, is endowed with every contemptible characteristic conceivable. The play critiqued authoritarianism and the social divides prevalent in emerging capitalist societies. The actors

wore masks with the intention that they impersonate puppets, which Jarry claims as an intentional contrast to puppets impersonating people. Bell (1997) points out that this was also likely to have been inspired by his teenage experiments with the theme of the play using marionettes. The play was written and performed nearly thirty years after the publication of Marx's (1867) *Das Kapital*, which addressed many of the same issues. Audiences reacted to the play by jeering and walking out, culminating in its closure on the second night (Bell). Nevertheless, *Ubu Roi* became, and continues to be a legendary precursor to anti-establishment movements that have incited audiences into angry protest as a strategy to draw them into unwitting participation.

3.4 Futurism, Dada, the Surrealist Dream

The Futurists emerged as a movement in 1909 with the publication of Filippo Marinetti's manifesto in the French newspaper *Le Figaro*. Celebrating speed, technology, nationalism and war it was the first manifesto to be published by an artists' group (Danchev 2011). The provocative language used by Marinetti proved a successful strategy that Alex Danchev argues ensured its wide circulation. Excerpts of it were printed in newspapers all over the world, and it was quickly followed by a tide of publications from artists' groups contending for attention. Previously, these pamphlet style texts had been the preserve of political tacticians, having emanated originally out of Protestant utilisation of the printing press to mass produce propaganda in its struggle against Catholic supremacy. The allegiance between the Futurists as an emergent art group, Mussolini and the new Fascist movement in Italy reflected a general swing towards what Anthony White (2011) suggests was a general aestheticisation of politics. Straddling all disciplines, Futurism championed antagonism, and in the tradition of *Ubu Roi*, invested heavily in theatre. The Futurists embraced improvisation and rejected preparation, building on the criteria for antagonism set out in another of their manifestos *The Futurist Synthetic Theatre* (1913). In Futurist Foot Theatre, for example, the stage curtain was raised a few inches above floor level to reveal only the performers' feet and ankles for the duration of a play. This resulted in rotten fruit being hurled at the stage, albeit sometimes supplied by the performers themselves. Marcel Fabre (1914) produced the film *Amor Pedestre* in the same vein, which, at the time of writing, is available to view through online platforms such as YouTube.

Figure 3.4.1 Luciano Chessa performing with his reconstructed Intonamouri at the ArtScience Museum, Singapore 2015 (photo by Kearns)

The Futurists' predilection for publishing manifestos extended to many mediums that included the radio broadcast, in their 1933 manifesto La Radia, where they criticised the medium's adherence to entertainment based on narrative. Its authors, Marinetti and Masnata, sought to abolish existing relationships between the broadcaster and audience arguing instead for an exploration of the medium through sound and silence. Luigi Russolo (1913) had already published a manifesto in which he argued that noise had been born with the advent of the industrial revolution's machinery, and in order to remain relevant he claimed music needed to undergo a similar coup. He insists that this is not through imitative reproduction, but through analytical restructuring by gifted musicians. It is clear from his manifesto *The Art of Noises* (1913) that he assumes equivalence between industrial noise and arranged musical scores. Russolo constructed musical instruments that he named *Intonarumori* to investigate the sounds of modernity. Although these instruments were destroyed during the

bombing of Paris in the Second World War they have since been reconstructed by Luciano Chessa and have been performed in a variety of venues including the ArtScience Museum, Singapore early in 2015 (see figure 3.4.1). By exploring new methods to represent the sound of the machine age he began to close the gap between visual and aural disciplines, and helped establish a premise for noise as a medium for art. It is a strategy that the research installation *Soundweb* explored by using recorded natural sound as one of its components that was triggered by the physical movement of visitors (see Chapter 7.3)

The significant influence the Futurists had on both their contemporaries, and subsequent developments in art has perhaps been underplayed due to their close association with the fascist movement. The political ideology of Fascism was complex and it developed in Italy towards the end of Europe's obsession with colonialization, and at a time when its bordering neighbours were at war. Fascism, as Benjamin (1936) points out, strove to organise the public without altering the hierarchies controlling the means of production (the opposite of communism). It shared ideological disassociation from the past with the artist group, and according to White (2011) worked closely with them until increasing politicisation of art in Italy led to it being absorbed by the State as a means of communicating its authority to the Italian people.

The Futurists responded to the surge of innovative technology that was introduced at the end of the nineteenth and beginning of the twentieth centuries by rejecting what they perceived to be traditional values. Instead they championed new paradigms that were being revealed through scientific discovery. Much of their output initially concentrated on depictions of new machinery through painting and sculpture, but members of the movement rapidly began to explore new mediums. The Futurists' ideal was to disassociate themselves from the institutional values reinforced through tradition and hierarchy, in favour of an alliance with the promise of a technological future (Marrinetti 1909). Mechanisation had transformed commodities into mass-produced multiples through factory production lines, which led to changes in the relationship between the consumer and objects they used (Benjamin 1936). Bearing in mind that most twentieth century technology was built on nineteenth century innovation (Smith 2015), industrialised societies were experiencing huge change at this moment in history. Maria Stavrinaki (2016) claims that it was this transformation that was seized by groups of artists that were seeking a clear break from their past relationships with production and economy. It is important to realise that the development of artists' groups is often rhizomatic, and as Leah Dickerman (2003) observes, linearity is often applied retrospectively through academic re-evaluation. Futurism, for example was exported to Russia, where it evolved into Constructivism, whose approaches Gennifer Weisenfeld (1996) traces to the work of the Japanese Futurists. These new forms were then re-appropriated by increasingly political post-Futurist artists, such as Lucio Fontana, who White (2011) argues adopted them in aestheticizing Mussolini's State ideology.

With similar aims to break with the hierarchies of establishment, but with a different political agenda, Hugo Ball initiated Dada in Zurich in 1916 (Tate, 2019), borrowing antagonistic performance and publicity through the production of manifestos from Marinetti (Danchev 2011)). Where the Futurists worked towards a unified vision of a new order, the Dada artists did not. They rejected the past and the future, politics and rationality by embracing the absurd (Kristiansen 1968). More of an association than a group in the strictest sense, they rejected logic, arguing that it was founded on predefined authoritarian codes and had less validity than spontaneous impulsive action. Donna Kristiansen (1968) suggests this paradigm was borrowed from propositions in the emerging field of psychoanalysis. For example, Tristan Tzara experimented with chance and free association by making collaborative poetry. He cut sections of text from newspapers and invited audiences to select fragments and reassemble them to construct their own verse. It was perhaps this changed relationship with the audience that introduced the first open-ended artworks, and began a lineage to which both of the research installations, *Soundweb* and *Interplay* belong.

Although Helen Molesworth (2003) argues that the Dada movement did not achieve its principle aim, which according to him was to destroy art (its association with establishment), it did manage to dismantle the traditional relationship between the artist and the object of their output. Over its ten-year life, their rejection of art and even themselves (Tzara 1918), Dada's influence resonated across

Europe from Zurich to Berlin and with shock waves across the globe, from America to Japan (Kristiansen 1968, Stavrinaki 2016). Majella Munro (2009) identifies the Japanese group Mavo that emerged in the 1920s, as a Futurist/Dada mutation who were engaged in an often-violent political struggle against institutionalised art, morality censorship and notions of individuality, which Weisenfeld (1996) claims led to their eventual demise.

Dada's most direct descendant was Surrealism, which Dickerman (2003) suggests is often erroneously considered a maturation of Dada's adolescent paradigms. However, where Dada was the first international artists' group operating as an anarchic rhizome with no appointed leadership, at least officially, this was not the case with the Surrealists (Dickerman 2003). There were strong affiliations between the two and the group's founder and leader Andre Breton prioritised ideologies over unified stylisation and above all advocated freedom of thought. Taking this lead from Dada, and importantly responding to the works of Sigmund Freud (1899) on psychoanalysis, Breton (1924) claimed that mental liberty and truth are only to be found within the dream, where they are unhindered by constraints of logic. Where Dada engaged with acts of nihilism against hierarchies of established art practice and morality, Breton (1929) called Surrealists to arms against consumerist culture and capitalism through an embrace of Marxist theory and revolution (San 2003). However, they were eventually accused of succumbing to the pressures of market capitalism, despite Breton writing a third manifesto with the exiled communist dissident Trotsky.

In 1949 a new generation of artists led by Jean-Isadore Isou broke away to form the Lettrist movement, that Jean-Michel Mension (2002) claims was in response to Breton's authoritarian grip on the Surrealist group. A further split in 1952, instigated by Guy Debord, led to the formation of Lettrist International, which five years later he developed into the more political Situationist International. A number of key practices in the development of participatory processes in art emerged out of this triumvirate of movements, not least their quest to replace object production with an investigation of the situation in which artistic expression could occur.

In 1957 Debord published his manifesto *Report on the Construction of Situations* announcing a new framework for the group of artists he had allied with. Although there is a popular belief that the manifesto catalysed the Paris riots of 1968, Tom McDonough (2002) refutes the notion with evidence that those involved were not part of the group. Nevertheless, art students were producing silk-screened posters using Situationist International slogans and distributing them to the streets which, according to Debord, was just the kind of participation the Situationists sought to propagate. Many of the tactics adopted by the group were developed from practices established by Lettrist International, such as the Dérive (Debord, 1956), an aimless stroll or goalless locomotion through urban environments, sometimes using maps of other cities, an activity they eventually named Psychogeography (Coverley 2006). Another key concept they developed was Détournement which, according to Debord (1956), is the appropriation of existing original material into fresh contexts to generate new meaning.

In his Situationist International manifesto Debord acknowledges a debt to Futurism, Dada and Surrealism, but also criticises them for having failed to realise their initial objectives and demolish systemic social hierarchies. Instead of absorbing revolutionary politics into their spheres of activity, he accuses them of becoming ensnared within the commoditised structures they had intended to dismantle (1957). However, he still considered Situationist International to be a descendant of the Dada and Surrealist movements (McDonough 2002), referencing the Dada mantra that any difference between art and life was illusory (Marcus 2002). Debord described the central purpose of the movement as "the construction of situations, that is, the concrete construction of temporary settings of life and their transformation into a higher, passionate nature" (Debord 1957: 44). He developed this argument in his publication *Society of the Spectacle* (1967), emphasising Marx's (1886) observation that it is commodity fetishism that causes alienation (Marcus 2002). This is the perception that an object's importance is mediated through the relationship that both consumer and vendor have with money (Marx 1867). However, Debord argued that the commodity was now also arbitrated by its relationship with mass media in what he named *The Spectacle* (1967). The Situationist manifesto criticises emerging relationships between the spectacular commodity and the individual, looking instead to elevate human interaction to replace the art object, just as the Dadaists

had tried to do (Marcus 2002), and as Wagner had proposed (Wagner 1849). Debord's intention was for individuals to think for themselves rather than accept a sentence of corporate-induced passivity (Debord 1967). The Situationists were a highly politicised secular group who sought to engage individuals in participation with acts of the everyday, elevated to what was understood to be art. Here, Debord (1958) agues, the object relationships that generate the spectacle are no longer relevant, and the individual is free to revolt against their conditioning (Vaneigem 1967).

By the 1960s the art object began to change its function, having been disempowered by Dada, politicised by Surrealism then revolutionised by the Situationists. Traditionally art had reinforced a pedagogic polemic entangled in the luxury end of the capitalist market system, as Wagner (1849) had claimed. Ken Friedman (2009) argues that for a number of artists art was becoming a stimulus for action seated between a concept and an audience (or an affordance). At this time the composer, John Cage, was questioning the assumptions that are involved in producing sound from musical instruments. He did this through exploring chance, electronic music and noise in the tradition of Dada and Russolo's Futurist manifesto (Touchon 2009). He is perhaps best known for his now legendary *4'33"*, (1952), which was a composition for any combination of instruments, in which the musicians are instructed not to play, but sit in silence in order to highlight the sound of the environment including those made by the audience. Cage experimented with radio and tape collages using the book of *I Ching* to determine his compositions (Ross 2007), such as *Williams Mix* (1951-1953) where he used it to order spliced audio sequences of the final piece. Also known as the *Book of Changes*, the I Ching is an ancient Chinese text used for divination, which involves producing random numbers from coin tosses that are then used to select pre-defined passages of text, much like Tzara's chance Dada poetry that was discussed above. Silke Krohn (2013) attributes the use of collage as an art production strategy to the Surrealists and it was transferred by Cage to music scores, using the I Ching as a methodology for in his exploration of chance. In his *Imaginary Landscape No. 4* (1951), 12 pairs of performers operate 12 radios, taking it in turns to change the station and adjust the volume according to the composition's score. Numbers placed on the radio tuning and volume dials are linked to the numeric sequences that emerge from the *I Ching* process (Cage 1958). Broadcasters from stations on the selected frequencies then unwittingly participate in a piece which, while can be replicated sequentially, remains unique. Cage's development of this into a compositional methodology was quite loose, according to Jensen (2009), and only intended to introduce elements of chance into his work. Collage was a strategy adopted in both research artworks for its ability to stimulate association through uncertainty. In *Soundweb* and *Interplay* the audio and visual media artefacts were collaged by the audience through their embodied participation.

Cage taught at the New School for Social Research in New York, where a number of young artists were attending his classes. What eventually bound many of these artists together was the notion of working to a score, but one adapted beyond just the confines of music (Friedman 2009). In this sense, it could instruct the replication of a scenario, or set of actions (see figure 3.4.2).

To be realized:
1. Find a red circle with nothing in it
2. Go outside
3. Stick a red circle with nothing in it onto something

Figure 3.4.2 *Red Circle Event*, Allen Revich, 2008 (re-created by Kearns)

In what he named *time scores*, the artist George Brecht re-contextualised every day noise, such as in his *Drip Music, 1962,* where he poured water from a watering can into a bucket while standing halfway up a portable ladder. Works of this character not only test the boundaries of what music can be, they test the expectations of the audience which, according to Julia Robinson (2005), challenges them to let go of their egos and experience the work as it is. In doing this the gap between art as a purely visual experience begins to shift to one that is more concerned with exploring meaning

through actions and performance. The score became significant for its ability to transmit an initial concept and was considered an artwork in its own right, even if the project that was laid out in it never materialised. According to Freeman (2009), an Event Score, as it became known, is an authored intention in a state of volatility, or flux, but one that remains outside interpretation. By following the directions set out in a score, an artwork can be owned without being mediated through market channels, and without losing the artist's authorial input, regardless of whether they ever see the outcome (Friedman 2009).

3.5 Fluxus

Fluxus, which is sometimes referred to as Intermedia (Friedman 2009), is an international interdisciplinary group that was initiated at the beginning of the 1960s by George Maciunas. Allen Bukoff (2006) states that one of their key aims is to destabilise audience-performer relationships by swapping their traditionally held roles. On the *Fluxus Portal for the Internet* (2006), Maciunas recounts how in 1972 he and Ben Vautier constructed an art event that involved stranding participants and leaving them to walk home in the dark, after bussing them out of town for several kilometres. During the interview he acknowledges a number of influences, giving particular attention to the antagonism incited by Futurist's Foot Theatre (see section 2.11.2). Fluxus' own manifesto, hand-written by Maciunas in 1963, reflects paradigms put forward by the Dada movement that celebrated anti-establishment art, which to the Dadaists meant pulling art practice out of the market economy. Performances by Fluxus often invited spectators into direct and confrontational interaction with an event. Yoko Ono (1964), for example, in her *Cut Piece* (see figure 3.5.1) invited the audience to cut away her clothing while she sat passively on the stage. Although it had no official membership, Galliano (2006) points out that the Fluxus movement was influenced by a number of contemporary practitioners, particularly Allan Kaprow who, in 1958, began performing what he named *Happenings*. These were partially improvised affairs that drew small audiences but that generated subsequent retrospective interest. Michael Kirby (1995) suspects that the low attendance may account for the myths that grew around what Happenings were and how they were orchestrated. In a trajectory clearly traceable to Tzara's (1922) assertion that the sublime is to be found in the diversity of the everyday, Kaprow elevated the ordinary in an attempt to make it extraordinary. Galliano (2006) reminds us that Maciunas had also acknowledged the Japanese artist group Gutai among his influences, declaring them a Proto-Fluxus movement. In the early 1950s Gutai began exploring psychophysical relationships between perceptions of the trivial, the refined and materials, an important concern that is shared with this study (see Chapter 8). Their performances pre-date both Fluxus events and Happenings by several years.

The lack of official membership, and according to Dick Higgins (1992), uncertainty over whether it is even a movement, provides Fluxus with undefined boundaries that enables them to explore art that exists primarily in a state of intention, or affordance, both for the audience and the artist. Without rigid boundaries imposed by member personalities, the culture developing within affiliated artists is less likely to become fixed, which is the point of their name - Flux means fluid, or flow. Objects have been produced, such as George Brecht's *Games and Puzzles* that date between 1962 and 1978, and have invariably acquired collectable value over the years. These are works designed to look like games, but they subvert normal relationships with rules to encourage open-ended experiences through the curiosity of a participating audience. They were created by Brecht, and other Fluxus artists, to explore expanded psychological relationships with the everyday, intending to subvert what might otherwise be a mundane, or familiar encounter (Brill 2010).

By the 1970s the sociologist Jean Baudrillard who stated admiration for the Situationists, although he was critical of them (Baudrillard 2001), was beginning to re-evaluate the claims made by Marx (1886) in Das Kapital and question whether he had mis-located where in the relationship between commodity and individualism, fetishism emerges. Where Marx had situated it in the economics of production, Baudrillard (1970) re-located it in the relationships between consumption and construction of the Self. He argued that the symbolic value of an object lay in the relationships that are built with other subjects.
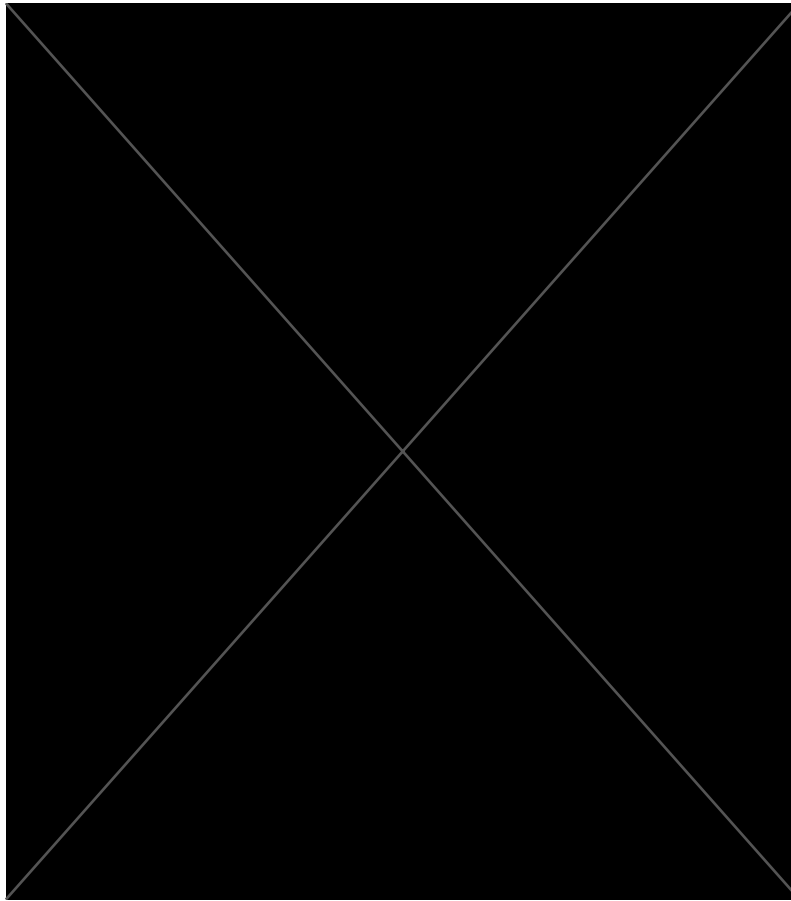
Figure 3.5.1 *Cut Piece*, Yoko Ono, 1964

By not presenting any clearly defined rules that could be adopted as a strategy for interaction, the research artworks *Soundweb* and *Interplay* encouraged visitors to explore similar relationships through the de-centring effect that installation environments produce. They generate a heightened psychological awareness that transforms the ordinary into uncertainty (see Chapter 7), which in *Soundweb* were recorded audio and images of wildlife common to the local area. With *Interplay* it was the representation of Self in relation to others through live video feeds. According to the artist Dan Graham (1979) when video is a live feed it shares time with its viewers, a comparable quality presented in performance art. Through shared time, Catherine Elwes (2005) claims that video artists are able to represent the Self as others see it, and by implication break the implied dualism, that Watts (1960) argues exists between the two, through a present and observable Self as Other. It is this encounter that produces a state of alterity through objectification of an assumed identity, usually invisible to an individual, that has been revealed. Cornelius Castoriadis (1975) defines Otherness as a social relationship and implies that through its definition, Self is defined. It is an important distinction and one that is key to the research artwork *Interplay* because it did not have an implicit narrative. Instead, it generated a dialogue between Self(ness) and Otherness through its continual live overlapping video streams (see Chapter 7.4).

Exploration into the relationships that develop between the artist, the artwork and the audience that video artists like Dan Graham, and some of the Fluxus artists were exploring, caught the attention of curator and art critic Nicolas Bourriaud (1998). He acknowledged the contribution they had made in building a theoretical framework for participation, but criticised their role in expanding fields of interactivity and multi-media as generating a "society of extras" (1998:26). According to him, this has led to experience not only being mediated through images as with the spectacle, but through interactivity brought about by new communication technologies. Bourriaud argues the Internet and multimedia are examples of systems that project the illusion of a democratic relationship with the physical world, and in particular with other people. His concern is that the functions required in

building successful relationships, the nuances of body language and touch, for example, have been replaced with digital hardware and the systems that drive them.

3.6 Relational Aesthetics

Attempts to re-define the audience's role within art practice re-emerged in 1998 when Bourriaud introduced his ideas of an aesthetic built on human relationships, rather than artefacts. He took inspiration for this model from the Situationists' endeavour to re-direct artistic expression from artefacts to lived experience, but criticised them for not investigating egalitarian relations between individuals. In his bid to update these ideas Bourriaud (1998) advocated works by artists that facilitated forms of social interaction between audiences within a situation, rather than with them responding to a situation they manufactured, such as a performance. For example, Rikrit Tiravanija's *Pad Thai* (see figure 3.6.1), exhibited at the Paula Allen Gallery, New York in 1990 consisted of the artist cooking a traditional Thai stir-fried rice and noodle dish for all who were present in the exhibition space. For the artwork to be completed the food is then eaten (or otherwise interacted with) by the audience. In Thailand, Pad Thai is often sold in cheap food halls and by street venders, and has become a national dish much like fish and chips is in England. However, in a New York gallery the cultural relationship between the food and audience is likely to be less familiar.
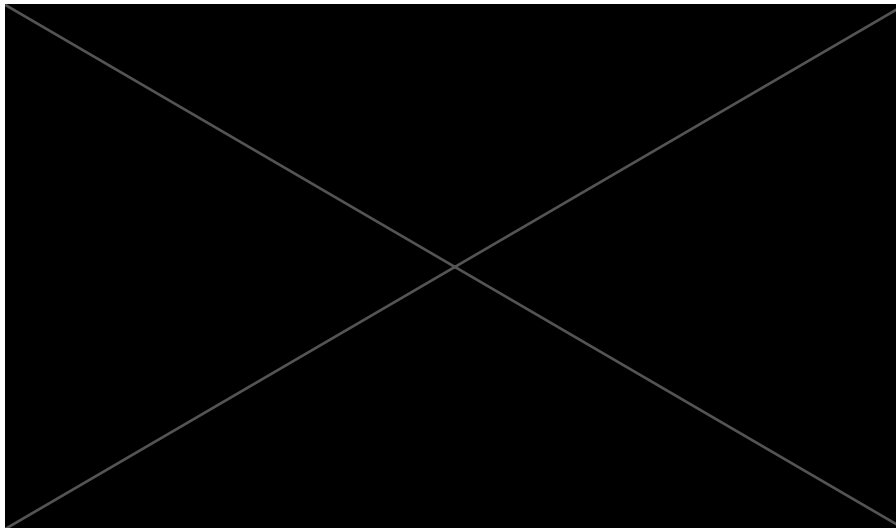
Figure 3.6.1 *Pad Thai*, Rikrit Tiravanija, 1990

Bourriaud locates the idea of *supreme separation* at the core of Relational Aesthetics. This is derived directly from the Situationist argument that relationships are now experienced through commodity marketing, and no longer directly through human interaction. Jacques Rancière (2011) elaborates on this by positioning the spectacle not as an object of contemplation, but as an activity that has been stolen from the observer and made alien through its objectification. According to Bourriaud an aesthetic based on relationships requires a substantial re-focus of values embedded within the existing system of modern art. He argues that it must be one in which social interaction between individuals becomes the beginning of art, in relation to the context in which that is happening. This, according to Bourriaud, contrasts with an art that is either a context or an interaction in isolation within a specific location, such as the gallery space.

Claire Bishop (2004) argues that it is unclear who it is that gains from Relationally Aesthetic encounters, and questions whether power has been returned to a participative audience, as Bourriaud claims, or becomes more firmly lodged with the curator. Foster (1996) suggests that what motivates an institution is always its own economic development, which is usually relative to the artist's. Bishop's chief criticism of Bourriaud's thesis is that the artists he chooses to illustrate his argument lack any of the social or political antagonism that was present with Futurist, Dada, Surrealist, Mavo, Gutai, Fluxus or Situationist paradigms. She claims that Relational artists' work tends to generate convivial interactions built from audiences with similar interests who share common experiences and

are locked into polite social discourse. The audiences attending Relational events that take place in museum and gallery spaces, tend to come from particular educational backgrounds. Fiona Candlin (2010) argues that these comprise nearly 60% higher and intermediate, managerial, administrative, professional occupations, or AB income class brackets. According to UK's National Readership Survey (2016), this group constitutes 22.17% of the UK population. Candlin (2010) and Ian Burn (1991) both argue that a detailed familiarity with the recent avant-garde tradition in art was essential for viewers to appreciate Relational works of art. Bishop (2004) also points out that along with an audience that is largely pre-defined by background, the consequences of a theory that revolves around human relationships within a museum space will inevitably be predefined by its implicit conventions - outcomes, Bishop presumes, that would inevitably differ if a collection of homeless people turned up for a free meal at such an event as Tiravanija's *Pad Thai*.
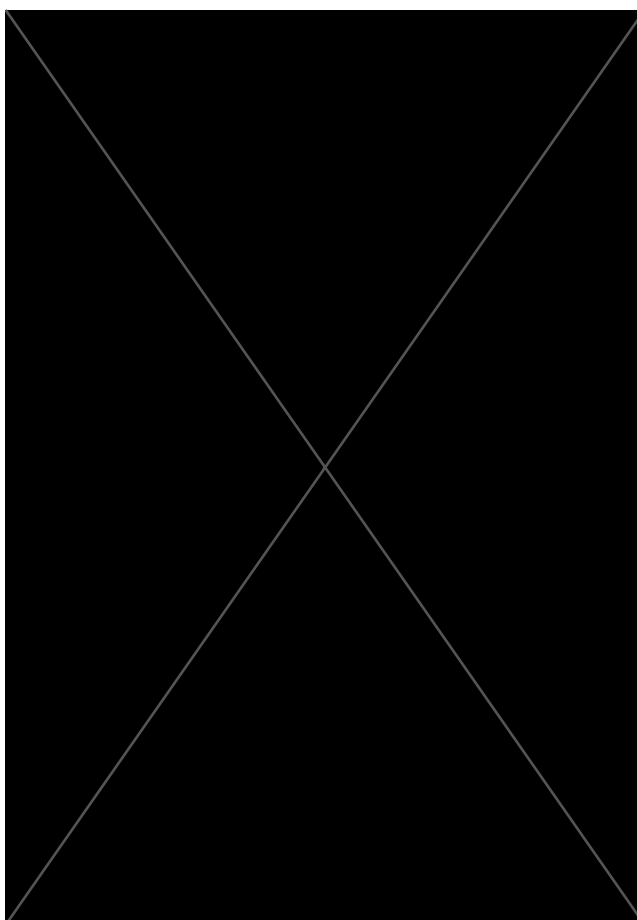
Figure 3.6.2 *Hand Dialogues* Lygia Clark,1966

Bishop and Candlin position Relational Aesthetics more as a development of an existing theoretical lineage, rather than new paradigm, pointing out that artists were making relational works long before Bourriaud's thesis. Lygia Clark's 1966 *Hand Dialogues* (see figure 3.6.2), for example, was designed to generate a physical interactive relationship between two participants, rather than a critical bond between an object and an audience. It was the experience of psychological and physical sensation that produced artwork. It consisted of an elastic strip that bound the hands of two people together, leading them into a relationship of haptic discourse. Perhaps a much closer example to Tiravanija's was hosted in 1970 by the Oakland Museum of California, when Tom Marioni, under the pseudonym Allan Fish, facilitated *The Act of Drinking Beer with Friends is the Highest Form of Art*. The piece consisted of residual artefacts, such as beer bottles, left after a drinking session with the artist and sixteen friends in the gallery space (see figure 3.6.3), which for him 'defined Action rather than Object as art' (Frieling 2008).
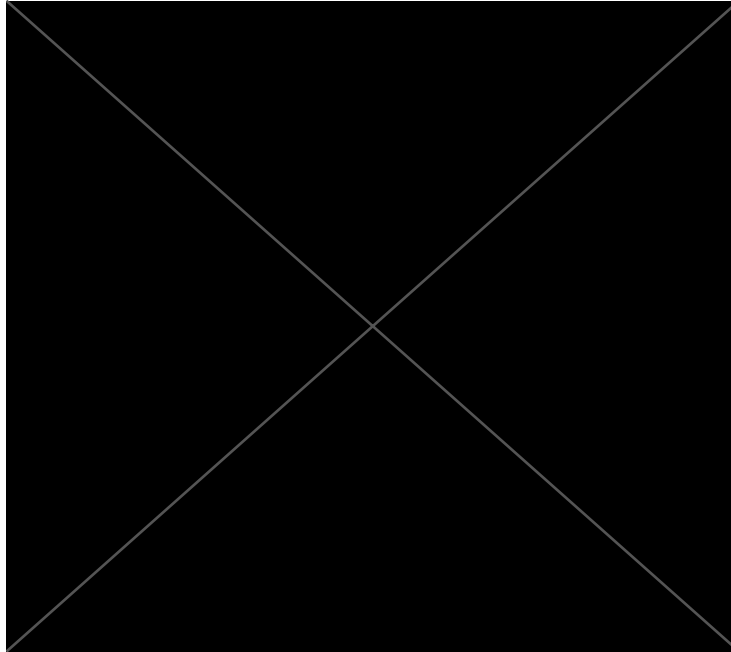
Figure 3.6.3 *The Act of Drinking Beer with Friends is the Highest Form of Art*. Detail of the event, Tom Marioni, 1970

Participatory art projects have often sought to test relationships between situations and audiences by operating within a scenario designed by the artist to elicit a finite number of responses. At the simplest level this can be a choice to either physically engage with a proposition by performing an action, or critically engage with it through observation of others. Of course, this produces added complexity by transforming one type of audience into performer and another to voyeur. Felix Gonzalez-Torres' pile of candy *Untitled (portrait of Ross in L.A.)* (1991), for example, urges audiences to help themselves to a wrapped boiled sweet from a constantly replenished pile. Their mass is sustained at 79kg, equal to the body weight of Gonzalez-Torres' partner Ross Laycock, when he died of acquired immune deficiency syndrome (AIDS) in 1991. Candlin (2010) argues that this emblematically grants Laycock immortality through its reiteration of the Christian Sacrament of the Eucharist. This is a metaphorically cannibalistic practice of consuming the body of a man whose flesh and blood have been transubstantiated into bread and wine. Other piles of sweets by the artist with different titles and weights, have their own interpretations. What remains uncertain is how the public will interact with the offer of candy. Will they take one, eat one, keep one or watch what others do?

It is this kind of antagonism that Bishop (2004) claims is absent from Bourriaud's proposition for an aesthetic based on relationships. She bases her argument on Laclau and Mouffe's (1985) thesis that democratic frameworks are established through confrontation and dialogue. In referring to their arguments, Bishop (2012) cites Thomas Hirschhorn and Santiago Sierra as examples of artists who create relationships in their work that are loaded with antagonism, but who are never mentioned by Bourriaud. Bishop (2004) maintains that a democratic society is one in which relations of conflict are sustained not erased, arguing that without antagonism there is only the imposed consensus of authoritarian order, which she infers is provided by the curator. Davis (2013) criticises Bishop's paradigm as being limited, but fails to explain how it is limited. Lind (2007) suggests Bishop misinterprets Laclau and Mouffe's aims, which Lind argues are to move beyond antagonism towards dialogue.

Robert Atkins (2008) points out that many artists have removed the institution from their practice, and illustrates his argument with Les Levine's *Canadian Kosher Restaurant* (1969), an actual restaurant owned by Mickey Ruskin and re-named in collaboration with Levine. Bourdon (1969) reviews its menu offering a mix of Irish, Jewish and Canadian food in LIFE magazine. However, in New York Magazine's 1969 review there is no mention of it being an artwork, nor of it offering any art experience. It is described purely as a restaurant. Levine had a series of cameras and screens positioned at the eatery's centre, enabling patrons to observe each other consume food. In his

argument of institutional removal Atkins also cites Bonnie Ora Sherk's *Crossroads Community (The Farm)* (1974-80), where he claims Sherk developed the first farm garden, although city farms predate this in the UK with the first established by the charity Inter-Action in 1972 (Kentish Town City Farm 2018). Nevertheless, Sherk describes her project as a "place for people to come together with plants and animals… a place for a collaborative community to learn about natural systems, each other, and art". Social practice, argues Sholette (2012), should be seen less as a means to survive the "creative strip-mining" of neoliberalist enterprises and more as a critical engagement within the nature of the social. Davis (2013) agrees, adding that social practice should be seen as something like a radicalisation of a recent trend that adopts the intellectual armature of Relational Aesthetics, while attempting to give it a more explicitly political edge (or antagonism) to escape incorporation into the art industry, and inevitable commodification.

Bishop's (2012) point is that without antagonism certain art practices can all too easily become subsumed by the State. Kester (2004) goes further, arguing that initiators of social art practices are being duped into addressing the failures of government in tackling poverty and inequality through an unofficial system of untrained and unaccountable practitioners. According to Rudolf Frieling (2008), artists who facilitate philanthropic practice risk their contribution vanishing into community work. This is because, Bishop argues, an activist position of collective art practice, as an expanded field of relational practice, sits in between anti-capitalism and the 'Christian good soul' (2006:181), and is rooted in the argument that art should extricate itself from functionless aesthetic activity and ally itself with purposeful social praxis instead.

Bishop's (2012) observation that increasing governmental appropriation of participatory social-art practice echoes the anesthetisation of politics in the early 1900s in that distinctions between collaboration and authoritarianism become blurred. An example of this is the UK's largest festival of global contemporary art, the Liverpool Biennial where social practice contributes significantly to what is offered. Billed as part of the 2014 Biennial was the project *Homebaked*, a community run bakery. According to Tallant (2015), the project was motivated through a dialogue between the Biennial research team and a local resident group, following their request to save their community by renovating a disused bakery. The artist Jeanne Van Heeswijk was then engaged to facilitate the community action, which she did by incorporating the task of renovation into her *2Up 2Down* project. She describes the main objective of her art practice as enabling communities by creating "situations" that provide opportunities for self-empowerment (2014). Sholette (2011) claims there is a correlation between the appropriation of a subject that is re-presented as art, and the practice of Détournement, which re-contextualises existing paradigms within a new framework to generate shifts in meaning.

The caution that Bishop, Frieling and Kester raise against an aesthetic centred on community relations is one of functionality. It is a question that has re-emerged since the mid-nineteenth century when Wagner (1849) began to challenge the relationship between art, commodity and consumer in his *Artwork of the Future* (see 3.2). Today this commodification takes a different form that is in danger of operating within another economy. In other words, does participatory art function successfully as a provider of services without exploring the assumed outer boundaries of social paradigms, as Fluxus, the Futurists, Dada, Gutai, Mavo and Situationist International did? Each of these groups, among others, explored normative assumptions through antagonism that provided art with a new set of vocabulary. In many instances these then fed mainstream media outcomes, such as film or theatre, but this was never an overt intention. It was a by-product.

3.7 Electronic Participatory Art

The introduction of new technologies has always blurred traditional boundaries that have existed between art practices and mainstream media. Many of these divisions have been perpetuated by similar institutional establishments that artists' groups have opposed in the past (see Chapter 3.4 – 3.6). As this process of technological ingress continues, the nature by which members of society expect to participate with them also undergoes transformation (see Chapter 2.4). The 2014 exhibition at the Barbican Art gallery in London, *Digital Revolution*, contained many examples that bore witness to this gradual territorial shift. *Digital Revolution* looked at the effect technology had

generated across the arts and entertainment sectors including computer gaming, film special effects, music video and interactive art. The exposition illustrated a loss in status for the art object and a shift in how the aesthetic is experienced from one of reflection to situation, or even entertainment, as predicted by Walter Benjamin in 1936 in *The Work of Art in The Age of Mechanical Reproduction*. Tate Britain (2015) also experimented with this in their *Sensorium* exhibition where four paintings were accompanied with smell, touch, taste and sound. The exhibition proposed that interpreting art relies on the stimulation of an array of cogitative faculties with the visual being only one of five. They explored the use of technology, such as ultrasound, to stimulate a physical perception of touch, comfort and discomfort within the audiences (Tate Britain 2015). In doing so the Tate appear to have made an attempt at repositioning artworks that were designed as contemplative objects existing in isolation, to ones that engage more physically with the body of the viewer (see figure 4.7.1). The sense of uncertainty that is produced through combinations of sensory stimulation and movement was also explored in the research artworks *Soundweb* and *Interplay*. Such artworks reach out to audiences that are being encultured with new expectations through changing processes of daily interaction with their environments. At the forefront of this is a democratisation in access to information that has been brought about through the widespread availability of mobile networked communication technology.
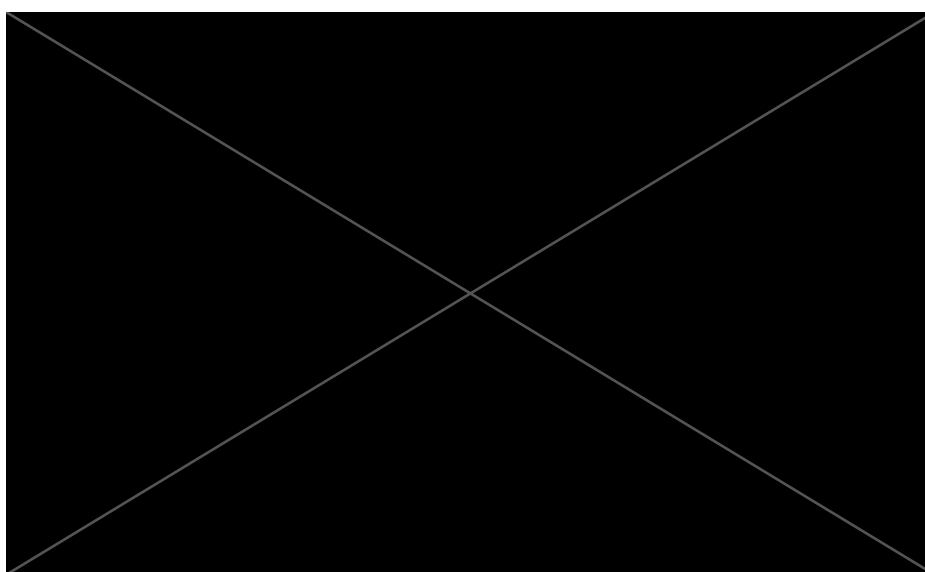
Figure 3.7.1 *Sensorium*, Tate Britain, 2015

The introduction of the mobile phone and its evolution from a communication device using voice and short message services (SMS) into smart hardware, radically altered engagement of participating audiences. It has perhaps also shifted their position from one of recipient to that of a user who is less likely to be co-opted into non-consensual participation. Blast Theory's (2006) *Day of The Figurines* is an example that attempted to capitalise on this changed relationship. It was an interactive text messaging (SMS) game designed to run over a period of 24 days in a constructed model town. Each day was represented by one hour in the town's timeline *"as it shifts from mundane to cataclysmic"* (Blast Theory 2006). Players, and there could be up to 1000 of them, were invited to create a physical plastic figurine to represent themselves, which was then placed in the model town. The game then proceeded through text messaging with the players needing to complete a variety of tasks that could also involve communicating with other players in the game. This long-term commitment between artwork and audience is also a feature of Blast Theory's *Karen*, released in 2014 as a phone app. Disguised as a life-coach and made believable through a series of video phone calls that attempt to build a virtual friendship, Karen tests a participant's responses to a variety of social boundaries with the objective of mining their data in much the same way that Shoshana Zuboff (2019) claims many of the online providers do, such as Apple, Facebook and Google. In Blast Theory's case they offer this data to the participant at the end of the process as an in-app purchase, where Blast Theory (2014) state Karen's data mining ends.

One of the key features of smart devices is their ability to geotag. This is the addition of time, date, latitudinal and longitudinal coordinates, and sometimes even altitude and direction, within the meta-data of a digital file. More recently, technology of this nature is being built into smart watches, such as the *Sony SmartWatch*, which when running the *iFit outside* app (iFit 2016) will track a wearer's routes, times and even cardio-vascular performance. Geo-tagging often happens automatically and is now applied to most digital cell-phone files, for example photographs, videos and sound recordings. Locations can also be logged and manually applied to a file's meta-data at a later date.

Figure 3.7.2 *8 Forgotten Histories*, Installation detail at Substation, Singapore, 2015 (photo by Kearns)

The artworks constructed for this research, *Soundweb* and *Interplay,* were developed from earlier investigations by the author into participating audiences, one of which was titled *8 Forgotten Histories* which was presented to a public in Singapore in 2013 (See figure 3.7.2). Latitude, longitude and direction were added to physical artefacts so that a participating audience could identify a location that had been presented to them as a dismantled jigsaw puzzle. Each part of the work, one of eight jigsaw puzzles, documented a different environmental condition that evidenced forms of causation, some induced by human activity on nature, and some documenting nature's activity on human habitats. The intention behind this piece was to enable a participating audience to re-visit any of eight represented sites. Subsequent environmental changes brought about through a variety of contributing factors could then be re-recorded and compared to the images revealed by completing the puzzles. Participants were able to add sound, video and still images to a library of documented environments via the social media site Facebook. Stephen Wilson (2002) points out that Global Positioning Systems (GPS) have given unprecedented ability to know where people are, adding potential for both mapping in real time and space, but also surveillance and control. It is usual for gathered information to be sent back to the software developers allowing them to track usage and further develop the operating applications. Individuals are not always aware they are data sources in these subversive forms of open-source participation and under corporate surveillance. Privacy protection laws vary widely across national borders and are difficult to enforce (Zuboff 2019).

According to the Groupe Spéciale Mobile Association's (GSMA) (2019) report, 67% of the world's population have a mobile subscription, with 47% of that being 4G networks that enable advanced interactive capability. It represents a 33% increase since 2015 when over 80% of the global population were serviced by voice only 2G networks (GSMA, 2015). Mobile broadband has a much slower global growth, particularly in developing countries, but this, the GSMA predicts, is likely to change as much cheaper devices become available. Of course, using a smartphone requires a certain amount of literacy so the global barriers to these markets still need to be addressed. The impact smartphones are going to have on global social structures is only just beginning. For example, within

the developing world, mobile money markets are rapidly growing for populations that do not hold bank accounts; consequently, service providers will need to invest in literacy programmes to make their products both marketable and usable (GSMA 2015). It is safe to predict that mobile smart devices that will evolve out of the cell phone in the future will increasingly embed themselves within global societies, and as they do will continually alter sociocultural relationships with the provision and consumption of information (see Chapter 2.5).

New technologies also continue to have a visible effect on the mechanisms that generate notions of cultural identity. They alter the way individuals address their needs, navigate environments and communicate with each other. The same information is accessible to populations in an increasing number of countries. While the availability of data is tied to digital capitalism and corporate wealth-accumulation, it also offers choice. Individuals within permanently networked societies inevitably develop new expectations from the creative content that is presented to them. The artists of the early twentieth century embraced change and attempted to coerce their audiences into participation. Today, networked digital communication is changing behaviour, and interaction is no longer an unusual proposition.

3.8 Film and Video

The research artwork *Interplay* was developed to specifically explore social participation by using live video technologies, so it is useful look at the history of the medium within visual art because it locates the research installation within a filial trajectory. Film and video have not been widely considered as interactive media until recent technological developments have changed how audiences are able to engage with it.

On the surface, both video and film appear to be closely related with many common elements, but they have complex histories that are also seen as very divergent. Yvonne Speilmann (2004) argues that film differentiates itself through its inherited lineage that presents recorded facts and fiction that are tied to analogue chemical processes. She implies a fracture between the acts of filming and reception which, alongside photography, Vilém Flusser (1991) and Helen Westgeest (2016) attribute to a spatial format that is in contextual dialogue with the history of painting. Video, on the other hand, operates by modulating electric signals and does not require a recording mechanism to view its image (Spielmann 2004). Its history is tied to the development of television (2006), both technologically and, on occasion, as a platform for distribution. In 1976, for example, the BBC hosted the *Arena Video Art* programme that included works such as David Hall's *This is a Television Receiver*, a broadcast of a well-known news-reader subjected to gradual signal degradation that rendered it back to an electronic pulsing signal (Luxonline, 2018). These broadcasts were more interventions than programmes because audiences were not given a prior introduction to the screenings. Funding from main stream media distribution channels has remained low for experiments in film and video, and interventions of this nature are now rare (Cubitt 2015).

Despite initial reticence, it was through art galleries that video was explored as an expressive medium (Rogers 2013), made possible by artists such as Bruce Nauman and Vito Acconci having broken ground with experimental works in film first. This is an important point, particularly in relation to expanded cinema in which artists/film-makers sought new dialogue with audiences by testing the conventions of traditional cinema, such as visitors' shadows being incorporated into the film space of Lis Rhodes' *Light Music* (1975). This was originally presented as a performance at the Serpentine Gallery, London, using video. It was then screened using 16mm film in Paris in 1977, and for the Tate Modern in its *The Tanks: Art in Action* series in 2012 (Lux 2018). As Gene Youngblood (1970) explains in his seminal book *Expanded Cinema*, what is expanded is the experience of the immersive encounter with this art form, and not necessarily the media used for capture and playback, although these were often experimental as well. It is important to clarify 'Expanded Cinema' as a specific term that describes a film, video or multimedia performance as one that pushes the boundaries of cinema as an immersive environment. It is this lineage particularly that *Interplay* shares.

Although drawing some parallels with the temporary and temporal nature of performance art (London and Biesenbach 2003), the combination of video's poor image quality and the fragility of

the magnetic tape used to store the recorded data initially placed it outside the interest of the museums and collectors. However, its adoption by experimental artists such as Acconci, Graham, Jonas, Nauman and Paik, all seeking to question the relationship between the audience and the authority of cultural venues made it difficult to ignore. Spielmann also uses the artwork of Robert Cahen to argue that video explorations into synergies between image, text and sound also laid the contextual foundations for the development of interactive 'hypermedia'. This term describes text, images, or audio that can link to each other in non-linear ways such as those found on Internet web pages. Cahen's videos often explore how unrelated overlaid images, sound synchronisations and video signal modulations build narrative and meaning without needing clear linear connections between them.

Constructed meaning through association, often with explicit reference to time, is also a fundamental attribute of structural film theory. One of the most celebrated examples of structural film is Michael Snow's 1967 *Wavelength* in which a tracking shot of a room is shown for a duration of forty-five minutes from a single camera position. As the film progresses the camera gradually zooms onto a point on the far wall of the room, until it fills the frame of the screen. Westgeest (2016) points out that amongst video's divergent histories is also its development as a surveillance tool, making Snow's seminal film particularly poignant now. The use of video for surveillance highlights issues of data ownership and control (Mathiesen 2013), which is itself a rich tool for critical art and one that is connected to both of the artworks that were created as part of this research project. Surveillance was integral to both of the installations, *Soundweb* and *Interplay,* as forms of data collection and as part of their operating structure. However, *Interplay's* relationship to structural and expanded film is an important one because it explored user generated narrative in real-time through a video system that could not record or playback any of the interaction events between the visitors and the cameras. However, a secondary system comprising the studies' observation cameras could record the events, and can be argued as a constituent part of the artwork.

While convergences between film and video clearly do exist and are inevitable, they have not become hybridised. Similarly, their divergences as 'film' (in the cinema) and as 'art' (in the gallery) must be acknowledged equally. In terms of their representational differences, Flusser (1991) argues that video represents rather than presents, because, it is *in* dialogue with what it depicts, whereas film is a dialogue *about* what it depicts. This is not necessarily always the case in relation to structural and expanded film-making though, such as the works produced by the London Film Makers Co-op, which are often overlooked in these dialogues. Malcom Le Grice's (1972) *Threshold*, a thirteen-minute film with no clearly defined narrative thread, explores a variety of colour fields accompanied by a minimal musical score. Half way through, footage of what appears to be a border post and guards is superimposed onto the abstracted colours. Another of his films, *Berlin Horse* (1970), explores narrative linearity using edited film footage of a horse that switches between it running forward in time and backwards, by reversing sections of the footage. Spielmann (2004) makes the critical point that while a filmmaker may use video for economic reasons, a video artist adopts its characteristics as a medium of expression, such as its signal's ability to bypass a recording process and be fed straight to an output device, as was the case with the research artwork *Interplay*.

During the 1970s a number of artists amongst whom were Bruce Nauman, Dan Graham, Nam June Paik and Vito Acconci, began expanding conventional uses of video and film. Their practices often utilised live video feeds of audiences to explore specific separations between the psychic and somatic self to jolt them out of reflexive reaction within the gallery into physical activity. Westgeest (2016) argues that the images transmitted back to visitors on screens, or as projections, emphasised the performed role of the visitor within that situation. Diverting attention from a preoccupation with how visitors were viewed by others exposes what Hal Foster (2015) describes as an alienation between body and mind that is plastered over with imagined narrative. In Nauman's (1970) iconic *Live-Taped Video Corridor,* for example, two video monitors are set on the floor, one on top of the other, creating a barrier at the far end of a long narrow passage. Above the entrance to what is actually a constructed space half-a meter-wide and ten meters long, is a video camera that surveys the space and channels its feed to the upper monitor. The lower screen displays a pre-recoded loop of the same space. As a visitor enters and passes underneath the camera and into its field of view they appear on the upper monitor, filmed from behind. As they

approach the display their distance from the recording lens increases and their video image reduces in size. Comparatively, their physical presence begins to increase and obscures the display sets from the camera's view.

In Nauman's installation the ephemeral manifestations of Self on the screen generate discourse between such things as an individual's true posture in opposition to their imagined one, in ways that can challenge the constructed Self. Ute Eskildsen (2008) places the beginning of these dialogues in the nineteenth century through the emerging middle class's need to document itself using what was then the new technology of photography. The underlying function of portraiture had for centuries been to project an idea of a person's status, and for a long time had been achieved using paint. This was an expensive process and beyond the means of many. The appearance and rapid spread of photography, on the other hand, made portraiture increasingly affordable. Even so, the early technology was slow and cumbersome, involving large fragile components with exposure times running into tens of minutes. Clients having a portrait produced were often required to be clamped into position with uncomfortable armatures to hold them still and prevent a blurred photograph caused by their movements. It was this early technological limitation that Eskildsen argues initiated dialogues between what appeared to be 'staged' and what passed as 'natural' in the finished image.

Camera technology developed quickly and by the end of the nineteenth century it had spread from Northern Europe across the globe. The speed at which a photograph could be taken and the portability of the equipment had vastly improved, and it was this that Susanne Holschbach (2008) argues was responsible for the self-conscious pose to manifest so strongly in the psyche of so many cultures. According to her, the continuing success of the photograph as a form of personality propaganda is evidenced as early as the nineteenth century in the production, distribution and collection of celebrity photographs. It was used by States for identification, famously led by Alphonse Bertillon's use of photographs with which he measured distances between facial features to aid in the identification of criminals. The photograph was also utilised as documentary evidence in arguments both for and against eugenics, exemplified in August Sander's (1929) book *Antlitz der Zeit: 60 Fotos Deutscher Menschen* (*Faces of our Time*), which antagonised the ruling Nazi party into destroying his photographic plates (glass negatives). He photographed German citizens from a variety of economic backgrounds and professions, many of which he stripped of personal identity through objectified titles, such as *Bourgeois Family, Worker Family* and *Unemployed*.

The photographic 'pose' is a discourse rooted in photography's early days during the period it was developing as a visual language. It has since re-emerged with vigour in the 'selfie' as a constructed form of projected identity. Taking a self-portrait that is added to a narrative displayed through social-media has become a normal activity for many people (Kearns 2018). The selfie has become a language that can affect social discourse. It is these dialogues that are brought into the research artwork *Interplay* through the presented self as a live video feed projected onto a screen that is shared with other visitors.

Before the development of the World Wide Web, artists began to explore the interactive potential of the video signal across larger distances than a gallery space. To circumvent broadcast licensing restrictions many examined the reduced image quality offered by lower bandwidths than those required for a standard commercial transmission. Known as Slow-scan television, it was utilised in Tom Klinkowstein's project *3 Artists On-Line On Slow-Scan-TV* (1980), in which video images were mapped to sound and transmitted between Amsterdam and Cambridge, Massachusetts. Projects using this technology are also documented in the Budapest-based archive project Artpool between 1980 and 1985 but with sparse written references (Artpool 2013:169), among which is *Kunstfunk* by Blix (1984). It was also displayed on its own website with a description of events that took place over a series of seven days. The project included one room that had been made available to participants to engage with the broadcast technology and another, a studio, from which live events were transmitted using shortwave radio frequencies and Slow-Scan TV. To extend the project into the USA, Blix made use of the amateur radio satellite Oscar 10, which had been launched a year earlier (*Kunstfunk* 1984). While this technology has been superseded by the distribution of the personal computer, Slow-Scan

TV is still popular among amateur radio enthusiasts, and open source code, for example, is being shared on the Internet to turn Raspberry Pi computers into Slow-Scan TV transmitters that, according to the website Instructables (2016), can give ranges currently in excess of ten kilometres. However, certification in the UK, and in many other countries too, officially limits content and broadcast range on anything more powerful than a baby monitor (Ofcom 2016). What it enabled in its short life was an exploration of transatlantic interactive practice that has since evolved global potential through the continual evolution of the Internet.

3.9 Institutional Spaces and Participatory Artworks

Central to issues raised by the integration of technology into art, is how practitioners creating participatory artworks are finding the means to engage audiences with their work, and how traditional venues, such as museums and public galleries, are increasing their audience reach. It is a continuing problem that Richard Sandell (2005) claims is responsible for turning museums into places of exclusion by reinforcing outmoded cultural hierarchies due to their traditionally conservative values. Recent years has seen the growth of Programmes departments that exist solely to find means of engaging multiple audiences with their venue's exhibition events. These differ from Outreach departments which specialise in reaching non-traditional museum audiences and disadvantaged communities. Programmes have a greater authorial input into an institution's public events, with a view of affecting every visitor's experience but without superseding curatorial decisions. These departments are beginning to position participatory art between its archaic cultic status and its more recent flirtations with entertainment. In an unpublished interview (Appendix A) by the author with the Chief Executive of Playeum's Children's Centre for Creativity, Singapore, Anna Salaman (2015), she predicted a "dramatic and rapid acceleration of Programmes for museums and galleries that want to survive in this current climate", arguing that "it is not just children that want hands-on participative activities, it's humans". In the interview Salaman traces the origins of Programmes to the birth of museums as cabinets of curiosity and the guided tours that accompanied visitors wishing to see these early collections. She observes that more recently they have evolved into departments with more expertise in audience development. In some institutions Programmes can intervene in curatorial processes through specialised authorial powers of their own. However, where a curatorial team may prioritise the intentions of the exhibiting artworks and artist, Programmes tends to prioritise the philosophy of the institution. This may affect how work is shown in the light of its accessibility and how it is made in respect of its durability, particularly if it is interactive. The influence of Programmes within the museum hierarchy is likely to increase because their input is designed to cultivate audiences' discursive relationships with the events they attend both physically and through collective digital networks, post-visit. A continuing process that Christopher Marshall (2005) identifies is connected to museums realigning their primary function from one of cultural acquisition to that of education. He claims that didactic approaches to delivering experiences in these situations are also changing to ones that explore creative inclusion. However, Donald Preziosi (2001) questions what that education points to, and implicates art history in a conspiracy of fabricating pasts as a strategy for introducing political agenda and shaping opinion. It still remains to be seen what form inclusion takes in Programmes, and where its relationship with education lies. Unless the voice of the user is allowed more than just being heard, there is a danger of replicating the same hierarchies between providers, as gatekeepers, and a public, as recipients, that have existed for a long time. It is in these emerging scenarios that this research into mechanisms of interaction can contribute valuable dialogue. If artists wish to use public institutions as platforms for accessing audiences, they should take note of the evolution already occurring within those institutions, taking into consideration how their work is made, how audiences will interact with it and who is gaining credit from it.

3.10 Conclusion

There are numerous forms of participation that have been utilised in the production and presentation of artworks, and those that have been mentioned in this chapter offer only a fragment of that catalogue. Those that were included comprise an ancestral trajectory of art movements that have contributed to building a context for the modes of participation within this study's research artworks, *Soundweb* and *Interplay*.

Technology has played a major role in transforming the artwork from an object of reflection to a 'thing', or situation, that emerges out of engagement. Among the most significant historical players in this change were the Futurist artists and their introduction of the manifesto as a methodology for practice. Publication of those texts often called for new technology to be explored as a medium in its own capacity. The inventions of the late nineteenth, and early twentieth centuries were adopted relatively quickly by artists interested in exploring new modes of presentation. Inevitably innovative forms of practice produced their own legacies to how art was presented, what it might communicate and how audiences might respond to it.

Encouraging a public to physically engage with objects and environments that constitute an artwork has commonly included elements of rebellion toward assumptions of cultural normality that are often embedded within institutional hierarchies. Insurgence by artists has sometimes taken the form of radical political opposition to prevailing modes of governance, as seen with the Futurists, Mavo and the Situationists. Whether that opposition has been explicitly political or not, it has been accompanied by a relocation of 'art' existing primarily as a luxury object, to it emerging out of an interaction and existing as a moment. This is reflected in the research installations *Soundweb* and *Interplay,* which located the 'art' encounter to reside in the visitor's moment of engagement, rather than the physical artefacts or environments that were constructed to generate situations and events.

Challenging accepted methods of engagement destabilises cultural assumption by questioning traditional values. Although a discourse reaching back to Wagner in 1849, it is an on-going process that in modern times is tangled with a rapidly technologising society. It has become a multidirectional dialogue because audiences have begun to change culturally through the democratising effects of the new technologies they are consuming (see Chapter 2.5). While technology is also frequently packaged as a luxury item in a society where consumerism shows no signs of abating, it is one that is not an end in itself but one which facilitates experience.

Visitors to spaces that contain open-ended interactive situations, such as *Soundweb* and *Interplay,* appear ready and willing to participate. However, participating in events afforded by a proposition is also subject to a combination of interrelated external and internal mechanisms. While some of these can be universally informed, they are connected to an individual's relationship with alterity, which will be discussed in the following chapter in relation to the production and consumption of participatory experiences.

Chapter 4

Concepts and Theories of Participatory Art Practice

4.1 Introduction

Any encounter in a public space will be inevitably subject to relationships that are constructed with conditions supplied by its environment, in what Gibson (1972) termed 'affordances' (see Chapter 2.7). Within the research artworks *Soundweb* and *Interplay*, a combination of physical, psychological and emotional connections was observed to contribute significantly to the behaviour of visitors. This chapter presents those as key concepts and theories of participatory art practices that are pertinent to this study. The chapter begins by examining the implicit rules inherent within the spaces that art has been traditionally presented within, and how over time those controlling codes have been exposed and made overt. New modes of engagement invariably require appropriate language to differentiate the types of activity that are involved. By investigating aspects of cultural conditioning, the chapter extrapolates theories from psychoanalysis and applies them to explanations of why in the past individuals have related to the objects that constitute art in an emotionally distant manner. The chapter proceeds to examine why that has begun to change, and how that is addressed in relation to the language frequently adopted by institutions to described public interaction within them.

The chapter argues that examining the dynamics of location in connection to embodied interaction is directly linked to personal agency within that space. The role of agency is investigated in relation to its pivotal role within acts of participation that were observed in research installations *Soundweb* and *Interplay*. Creative content that engages the agency of those who visit through acts of participation is, by the same process, relinquished from the control of those who present it. The chapter examines procedures of changed power relations that destabilise established assumptions of authorial control in its triumvirate capacity of author, authenticity and authority. With increasing inclusion of visitor participation in contemporary art practices, authorship is still a polemic that arouses contention. Although easily considered as primarily referring to text, the term 'authorship' applies to any number of expressive mediums and is synonymous with the term 'creator'. It is an important element to this thesis, and the chapter explores authorial relationships that emerge between the production and consumption of interactive creative encounters within the research artworks.

The discussion provides clarity on the behaviour of visitors within the research artworks because it helps to clarify how visitors were influenced to move through the spaces in specific ways, and in doing so how they affected the trajectories and behaviours of others that were also present. In exploring audience movement within the art environments, the chapter examines existing research on audience trajectories, and includes Gustave Le Bon's (1895) studies into the behaviour of crowds which he conducted in the nineteenth century. His theory of behavioural contagion is then allied with the more recent discovery of the mirror neuron that is claimed to predispose individuals to behavioural mimicking.

4.2 Participation and Location

The spaces in which artworks have been presented to the public started to morph before the emergence of conceptual artists, and others before them began questioning what art was, whom it was for and what function was embedded within it (see Chapter 3). Hans-Ulrich Obrist (2014) attributes the practice of exhibiting to opportunities presented to artisans by an increased flow of people celebrating seasonal festivals in the late Middle Ages. He argues that these displays of wares followed the same formulae until an exhibition of Monet's impressionist works in 1960 in which the curator, Seitz, removed the physical frames from the paintings. According to Obrist, this is not so much a removal as a replacement, because it contextualises the white-washed chambers within the Museum of Modern Art, New York, as the borders between artworks instead of gilt frames. At a similar time, Rauschenberg was building constructions he called combines that began to push the traditionally vertical picture plane (see figure 4.2.1), into the horizontal through a juxtaposition of

objects, paint, walls and even the audience in what Steinberg (1968) famously called the *Flatbed Picture Plane*. He argued that painting had ceased in its attempt at mimicking a vision through a window and began instead to refer to its manner of construction, which according to him changes the way it functions. Brian O'Doherty (1976) claimed that removing the physical boundary between a painting and its environment shifts the emphasis away from the subject of the work to its edges. The walls, ceilings and floors of the exhibition space then become mediators in a territorial conflict between one work and another as they vie for presence on walls that also arbitrate between the physical domain and a psychic extension into infinite voids.
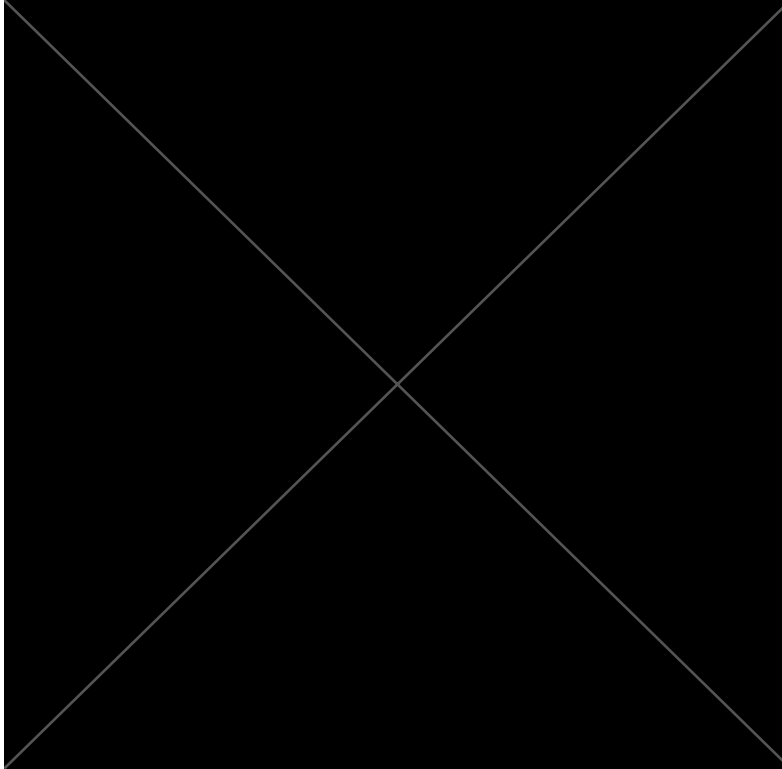
Figure 4.2.1 *Canyon*, Robert Rauschenberg, 1959

Even empty of works this mediating function continues to operate within exhibition environments because the material boundaries have been primed with an illusory history of other worlds and impossible places in constant collision with the present. This new space now has the power to evangelise any source material into art solely through the act of placement. Furthermore, in an environment that references the interior of churches and courtrooms, as O'Doherty claims, the rules implicit in those institutions transfer and maintain control over audiences by replicating similar power hierarchies.

Although in the traditional sense these spaces appear not to be interactive, on a psychological level they are, because a series of negotiations is continually taking place. These power structures and their effect on the cognitive response from audiences viewing art is a subject of investigation for conceptual artist Michael Asher. By re-contextualising existing objects within archival environments, Asher developed a system he termed 'Situational Aesthetics' where exposure to the implicit rules that are present within an institution create an artwork, rather than the introduction of a new object to that space. Claud Gintz & Judith Aminoff (1993) suggest that for the same reason these rules are destabilised by the artwork's temporary nature, which can undermine the primary function of the museum's institutional status as an official archive. In one example Asher repositioned an eighteenth-century bronze sculpture of Jean-Antoine Houdon, normally situated outside The Art Institute of Chicago, to the inside of a classical gallery (see figure 4.2.2). Passers-by were now able to gaze at the exterior of the building without the bronze hindering the contemporary image the museum wanted to project. At the same time visitors to the period gallery could experience the sculpture in relation to Houdon's contemporaries (Lewis 2012). By acknowledging location as a

deciding factor in the interpretation of art, Situational Aesthetics discloses the hierarchy operating within archival environments.

Institutions that present artefacts are themselves encapsulated within a relational contract between national narratives which are influenced by both funding and political paradigms. While certain degrees of autonomy can be maintained within institutions that offer public access to any of the arts in Western style democracies, this is not a global norm. David Teh (2016) points out that within Southeast Asia, for example, tight control tends to be maintained over the display of artistic output. Keng Ong (2015), in writing about the gay movement within Singapore, claims that State conservatism is perpetuated by the influence of the extremely wealthy Pentecostal and Evangelical churches within the political arena. According to him, it is they that advocate strong punitive action against deviations from their own founding narratives. Although Singapore is a secular State, it is surrounded by countries holding radically conservative religious factions that Lee Choy (2010) points out tend to respond with threats of violence and death when they perceive offence.
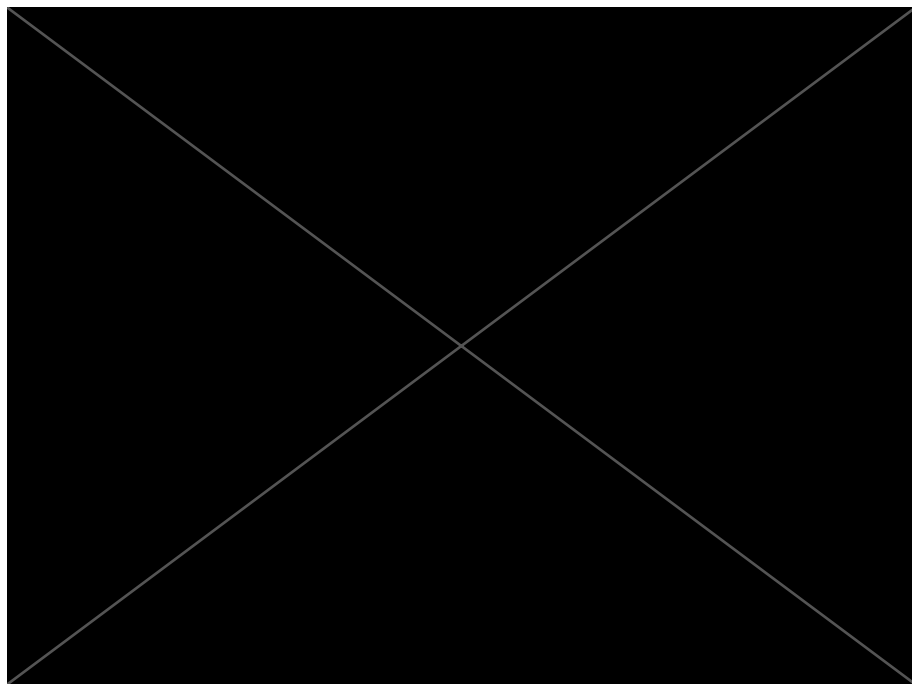
Figure 4.2.2 The Art Institute of Chicago, *73rd American Exhibition*, Michael Asher, 1979

Another contributing factor to the contextual framework between national narratives, art institutions and audiences in Southeast Asia, is a distinct lack of discourse, which Teh (2016) attributes to the absence of critical historicising within arts disciplines. However, there are a number of small independent archival initiatives, often run by artists, that are attempting to address this. Overt censorship by both the State, and by the artists themselves in non-Western environments underlies many of the misaligned assumptions drawn by occidental audiences when they engage with art within public galleries. Ong (2015) points out the that penal code relating to acts of homosexuality in Singapore, for example, can result in up to two years in prison, but the extent that it is enforced is debatable. In 1994 artist Joseph Ng was prosecuted under Singapore penal code for trimming his pubic hair in a public performance that also resulted in a decade of fund withdrawal from all performance-based artworks in the country (Xuan 2015).

An established gallery space is not the only venue in which art can be presented. Increasingly, artists are looking at ways to disentangle themselves from these structures. This has sometimes been politically motivated, as with past groups including Dada, and the Situationists, but has also been the effect of new distribution channels, being explored by increasing numbers of practitioners. Alongside traditional alternative spaces of disused buildings and shop fronts. Attempts to democratise these environments have involved transposing exhibiting platforms to other media where prevailing power relationships have been destabilised, and even dismantled, such as the Internet.

In the West, the physical, mental and temporal expansions to how an exhibition space is viewed that were developed in the 1960s through conceptual art's conversion of creative output from material depiction to ideas, remained intact (Obrist 2014). Nevertheless, an exhibition space is also a locus in which representation is still assumed to occur, particularly in terms of what is placed within it. O'Neill (2012) suggests that the complex relationship these spaces have had with artefacts, particularly their transition into the conceptual, has also affected these environments' functionality as representational arenas. Both Obrist (2014) and O'Neill (2012) argue that contemporary spaces are increasingly incubating projects that would otherwise remain un-conceivable to artists, rather than publicly cataloguing archives of work produced by individuals. As a consequence, curatorial presence has strengthened and at the same time begun to separate from the institutes that traditionally display art.

The rise of the curatorial voice has been a comparatively recent development, and according to O'Neill (2012), one that has been gradually increasing in volume since the late 1980s. New affordances offered through fragmented environments are argued by O'Neill to author Rhizomatic dialogue between artworks, their production, audiences, cultures and situations. He suggests it has had a democratising effect on the way art has been presented to audiences, particularly in terms of the spaces it is now beginning to occupy, and within an increasingly Post-Colonial context. This incorporates arguments by thinkers such as Spivak (1985) who claim that an image is not the thing it represents, but is intertwined with complex political and social meta-narratives that construct a context for interpretation. As a result, the new exhibiting forums that are being explored, reposition time/space shifts, cultic/legal hierarchies and dominant/subordinate cultural relationships into arenas that have their own generic systems of navigation. According to O'Neill (2012), this is repositioning the significance of singular artists and their output from pedagogy to one of complex critical dialogue within the situation that is being presented to a public. He positions this Post-Colonial curatorial discourse as an antidote to the culturally relativist thinking that prevailed up to the 1990s. Krysa (2015) warns that the new power structure the curatorial field represents is becoming increasingly institutionalised. Within that emerging hierarchy, increasing power is being offered to artists in artist-led and artist-curated exhibitions (Doubtfire 2015). However, it is worth remembering that the success of a museum space is not generally measured by the quality of experience it provides or by the ability of content to generate knowledge, but by its footfall, which is often bound to the economics of funding (Psarra 2005). This has become particularly relevant in traditional white cube exhibition spaces because funders are also represented within the power structures of display and distribution.

The venue in which the research artworks were presented to a public existed between these polemics. Playem's the Children's Centre for Creativity had no inherent motivation to showcase artworks as a primary institutional function. They aimed to develop creative thinking in their users through open-ended play and hands-on learning. However, in order to achieve this, curatorial responsibilities were offered to invited artists and specialists from creatively applied disciplines to develop artworks, environments and activities in accord with a central theme. The authors of these works were all experienced professionals and aware that the shift in rule structures native to their disciplines was a necessary negation to encourage agency in the prospective user base. The ensuing situation offered all parties the opportunity to witness new dialogues emerge between users, producers and presenters in a highly democratic environment.

4.3 Institutional Language and Participatory Processes

As institutional interest in participatory processes by artists has increased, new dialogues have emerged that attempt to differentiate activity employed by visitors when they engage with these practices in comparison to traditional static art forms. It is particularly important to elucidate the terms 'active' and 'passive' that are often used by institutions and point to their origins because it affects how *Soundweb* and *Interplay* might be contextualised by readers of this thesis, and how the installation users positioned the artworks. It is common within institutional dialogues describing interactive art and participatory processes to classify visitors to museums and galleries in the language of Edmund Husserl's (1931) 'Other'. An Other is considered to constitute values that differ from those of the Self, and is therefore an alien, or in a state of alterity (Levinas 1999). Components of the Self are built from psychological affiliations that include values, beliefs and

emotional responses, and are central to an individual's affirmation of being real. The Othering of the audience echoes nineteenth century references to the 'masses', a term that was used to describe sections of the population that were considered cultureless (see Chapter 2.4). In contemporary institutional language describing spectator groups, Otherness is often concealed behind the term 'educate' and the use of the descriptor 'passive', in contrast to 'active' which is used to label groups that engage in participatory processes. Literature that adopts this stance has included recommendations for control in concert halls by closing doors to discourage spectators from entering late, or leaving early (Thompson 1902). More overt suggestions include educating audiences in aesthetic appreciation (Nicolucci 2010), and promoting a culture of acquisition (Botstein 1998), which includes the overt display of attendance numbers at arts venues, in addition to artefact collection. This has been extensively covered by Thorstein Veblen in his *Theory of the Leisure Class* (1899) where he proposes that artefacts within private collections signify wealth, power and status rather than the aesthetic judgement of their owner. Veblen proposed that social display is particularly the case with art objects because their material value often equate to very little compared to their economic costs as cultural commodities, and their power lies in the disparity between material value and economic worth. It is a display of power that currently may be undergoing a dislocation by forms of cultural acquisition that seem to favour experience rather than the acquisition of material objects. Public presentation of where individuals go and what they do, through images and text that are posted on social media sites today, appear increasingly to possess a similar function to that proposed by Veblen. It is worth noting that it is still in the commodification of the art-object that the art market sustains itself, and this is tacitly (and explicitly) linked to the material culture that sustains the majority of museums.

The institutionalised alienation that often persists between audiences and the artworks presented to them is also likely to be partially rooted in Edward Blough's (1912) influential theory of Psychical Distance. He proposes a paradigm for the appreciation of art in which he argues an individual must separate from their emotional responses to perceive the ephemeral aesthetic qualities that exist in an encounter. To exemplify this, he uses the example of a situation that contains a threat, and proposes that conceptual distance subdues natural responses such as the flight or fight caused by fear (Worth 2001), and replaces them with a growth in aesthetic appreciation. According to him, this is a variable self-regulated detachment that can be subject to factors such as time, intellectual accessibility and ethnography, as well as physical proximity. German sociologist Theodore Adorno (1952) reinforces the notion of distance and suggests that passivity in the audience is required as a function to separate the act of human labour from the object in order to elevate it into art through a process of mystification. It is a polemic upheld in American art critic Clement Greenberg's (1939) differentiation between what he termed 'high' art and what he branded as 'kitsch'. His position was similar to British literary critic Frank Leavis' views on literature (see Chapter 2.4) who argued against what he considered a degeneration of culture led by mass consumerism. Greenberg centred his arguments for elitism on abstraction, particularly abstract expressionism, as his proponent against an aesthetic formulated through consumerism. However, Adorno (1970) later took a different view, suggesting the ordinary everyday object can be transformed into an artwork by dislocating it from processes of manufacture in a procedure that echoing Bullough, requires a state of disinterest in the audience.

The function of a space, and the way it is arranged, can affect the way the audience behaves. For example, in a theatre or cinema a seated audience is often locked in for long periods dependent on programme times. In contrast, within an art gallery the average time an individual spends in front of a painting is ten seconds (Smith and Smith, 2001). The experience of the visitor is often linear and prescribed by a set entrance, exit and a route through the space. Observable physical interaction is limited to travelling by foot through a space in which artworks have been arranged by a third party in any number of theoretical frameworks. It is this apparent lack of visible action in the agency of the audience that is described in institutional language as passive. A passive audience is one that does not take control over overt causality of their physical relationships with either the artefacts or the space they are engaging with (Gell 1998). In *The Emancipated Spectator* (2008), Jacques Rancière proposes that it is a requirement of art that the audience is not only alienated, but initially also passive so that it can be activated. However, he also claims that the spectator is also an active interpreter and such 'passivity' is not a malady in need of activating,

but normality. Foster (2015) does not agree and argues that the polarities of passivity and activity are maintained by institutions because they function as dialectic measures for arts institutions' own observers, and are ultimately related to the economics of their survival, which Alfred Gell agues is how institutional agency is manifested.

Framing audience groups within passive and activated contexts increased with the emergence of Relational Aesthetics (see Chapter 3.6). The artists that were grouped into this movement attempted to introduce new methods of engagement, through direct physical action by an audience. In 2007 Carsten Höller, for example, installed a series of large slides into the Tate Modern titled *Test Site* where visitors could slide from various floors to the cavernous entrance, known as the Turbine Hall (see figure 4.3.1). According to Mark Windsor (2011) the audience of this work was lured out of passivity into co-authorship through their interaction. He argues that Höller does not define the artwork as existing in the physical presence of the objects (the slides), but in the response an individual might have on engaging with the work. As can be seen from the installation images, *Test Site* was a very large construction comprising several inter-related forms that an audience to an art gallery would be able to reflect upon regardless of whether they engaged with it physically or not. Emma Mahony (1999) argues that works of this nature are less about the role of the audience and more a comment on the ability situational dynamics has as a legitimising force.
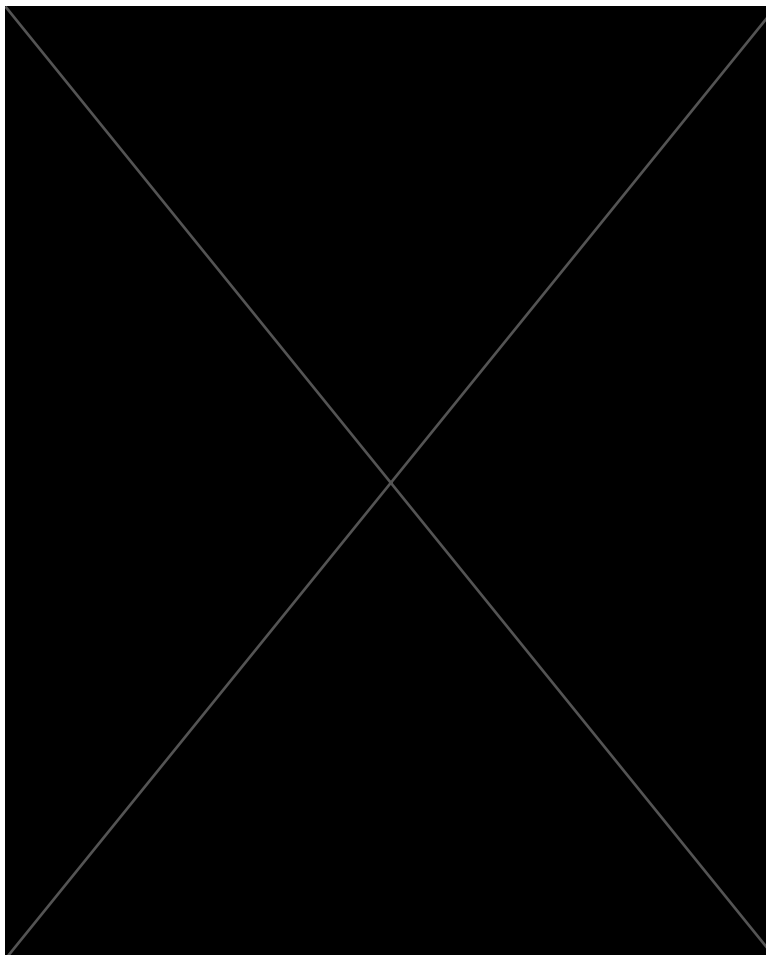
Figure 4.3.1 *Test Site,* Carsten Holler (2006)

Clarifying how audience behaviour is often labelled is important because the complex relationships that exist between individual agency and the institutional power hierarchies can affect visitors' interactions. Many audiences familiar with archival spaces are implicitly aware of these dynamics and they are key in understanding why decisions are made by individuals to react to scenarios in different ways when permission is either granted or withheld (see Chapter 4.2).

Soundweb and *Interplay* were not artworks tied to cultures of acquisition and the artefacts that were encountered by visitors were ephemeral audio and visual projections. The research installations did exist in a wider context of art production and display, and it is important for the reader to have some knowledge of the history of emotional detachment that has been prevalent in its field. However, contrary to this, the installations *Soundweb* and *Interplay* encouraged visitors to engage with them using all of their faculties, and emotions were particularly evident in the observed behaviour, which in *Soundweb* appeared to explore forms of shared catharsis (see Chapter 8.2).

The research artworks did not attempt to educate visitors. They were encouraged to self-author their experiences in relation to the installation media artefacts and other inhabitants. Permission to self-author experiences was particularly important in determining the extent to which actions within the installation spaces might have been descriptive, or performative. Whether visitors imitated or brought into being what they were representing through embodied interaction was a route for them to arrive at a threshold of becoming. 'Becoming' is an ontological term explored by Friedrich Nietzsche (1872), among others, that positions Self as a process of continual development, and is contrasted to Being, which is static, or fixed. Navigating interactive scenarios is rarely an isolated event and establishing relational links between artist, artefact, environment and Self, also incorporates an awareness of performative-agencies operating with Others. Visitors were at no point regarded as passive, even if they chose not to engage with the installations.

The emerging narrative dynamics that are at play between visitors and the interactive creative content were particularly important to this thesis. In an open-ended environment, such as those provided by the installations *Soundweb* and *Interplay,* audience authorship as a form of agency shapes physical responses that enable individuals to engage with provocations. For this reason, understanding that origination never resides entirely in source material helps to answer this thesis' second research question; to what extent can public behaviour be modified to facilitate sustained engagement, embodied interaction and social participation within interactive environments? Interactive engagement is a characteristic that is democratically negotiated between the agencies of individuals and artefacts. It is an event brought forward through a discursive process that emerges from gestural and verbal communication between all the individuals involved in shared occupancy of an interactive space, in reaction to a situation that is presented by the content.

4.4 Agency

One of the most important aspects of a participatory environment is the sense of agency that can be offered to individuals. The ability to be affected was a fundamental aspect of the research artworks *Soundweb* and *Interplay* and without interaction between installation affordance and visitor agency, the artworks were non-functioning. There are several manifest forms of agency and those enabled in the research artworks were done so in the full knowledge of the participants and as a consequence of choices they made. It is an important point to iterate because extrapolating upon Alfred Gell's (1998) original definition, agency need not be the product of a decision-making, or even conscious, process. In *Soundweb* and *Interplay* it was visitor agency that was measured because it comprised the activity that occurred within the spaces, and in this thesis is described as 'positive-agency'. Any system that courts choice also invites non-engagement as a potential outcome, and the term 'negative-agency' is used in this study to describe situations where visitors have chosen to negate interaction. It is not intended to be a pejorative phrase, and negative-agency was used as a measurement descriptor in gauging alignment issues between aspects of the interactive environments that once adjusted, encouraged positive-agency .

Based on observations from their interactive sound installations, Cécile Prado and Stéphane Natkin (2011) claim that for visitors to participate, the perception of a goal must also be offered in addition to a sense of agency. With this in mind, they propose that the design of a system must balance the relationships between the author/designer, the interactor and the system, and they use a triangle for illustration (see figure 4.4.1). According to them, if too much emphasis is placed upon any one of the components, then interaction will not occur. For example, if too much weight

is allocated to the system it becomes a spectacle and not an interaction. John Sharp (2015) has also observed that this strategy is used within the video game industry in an attempt to encourage longer periods of absorbed engagement.
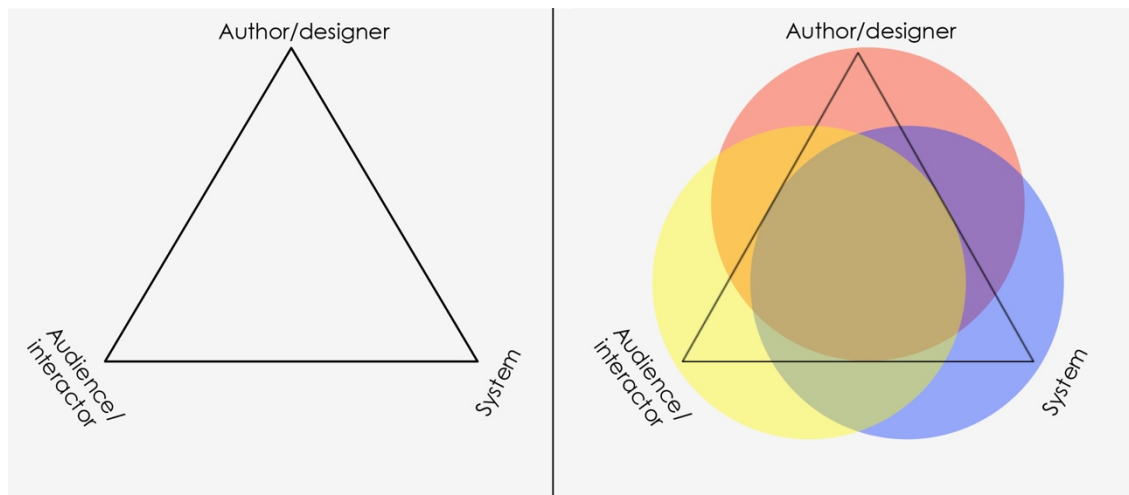
Figure 4.4.1 Prado & Natkin's triangle illustrating relationships within interactive environments superimposed onto intersecting circles to illustrate crossovers (adapted by Kearns)

In video games produced within an art context, Sharp claims that narrative, agency and goal are often subverted to allude to meanings beyond a participant's initial experience. For example, in the 2006 exhibition *Controller: Artists Crack the Game Code,* Myfanwy Ashmore hacked and made changes to the video game *Super Mario*. In the un-tampered version, the protagonist, Mario, has to fight various characters and discover secrets that enhance his performance within a time limit of just over two and a half minutes, or he loses a life. In Ashmore's version, these goals have been removed and Mario is left to wander around the game environment filling time until he dies (Sharp 2015). The *Mario Trilogy* included two more versions of Ashmore's hacked games. One in which Mario was trapped in an under-water environment, *Mario is Drowning*, and another in which he was incarcerated, *Mario doing Time*. In all of these games a sense of existential hopelessness was instilled by severing the connection between the limits of time and its relationship with a sense of progress through the game.

In software environments developers sometimes provide license-free programmes termed 'open-source' that enable individuals to access editable source code and tailor applications to their own needs. Open-source systems such as *Pure Data* or Raspberry Pi's *Raspbian* are examples intended as research tools, but commercial software is often also released in this manner to benefit from collaborative crowd development. Some video games are also designed with collective development in mind and are known as *Game Mods*. Changes can either be minor, such as background scenes, to complete contextual overhauls, perhaps responding to early hacks as seen with Ashmore's *Super Mario*.

Open-Source software and hacked hardware forms the operating structure of the interactive artwork *Smile and I will keep you in my heart forever* (2015) developed by the author (see figure 4.4.2). Using a *Raspberry Pi* computer and a modified computer keyboard to trigger a camera, the artwork, which appears to be a poster, takes a photograph of its observer, which it stores on a memory drive. The interactor is not able to access this photograph, and the artwork is a comment on the uncertainties surrounding authorship, agency and ownership in a surveillance society. Another work in the same series titled *Smile and I will sing to you* (2015) transposes a video feed of the audience into sound. A surveillance camera within a similar poster routes the video information through open-source *Pure Data* code which converts the colour channels into sine waves. Sound is generated by a vibration transducer that converts the surface of the artwork into a loudspeaker.

Both artworks were parts of a series called *Smile* that contributed toward the conceptual origins of *Soundweb* and *Interplay*. The ideas first explored in the *Smile* series were developed in the research artworks into enclosed installation environments. These early renditions of interactive works utilised media artefacts and highlighted the important relationship between agency and goals that are being explored further in this study. The *Smile* series were exhibited in a business environment at the German Centre, Singapore, within a designated gallery space called Red Dot Creativity. The exhibition space also comprised a main thoroughfare to all of units within the third floor of the Centre. The exhibition space offered the opportunity to gauge how interactive artworks were received in a non-traditional art venue were the implicit rules governing art space that were discussed above (see Chapter 4.2) were not as certain. A further artwork in this series titled *Smile* was exhibited in the exhibition *Re/Print: Re/Present* in 2016 at the Ruskin Gallery in Cambridge. It comprised a similar image to that shown in Figure 4.2.2. In place of each eye was a QR (Quick Response) code that if scanned with a smart device, linked the interactor with a CCTV camera. The *Smile* works highlighted the need for permission as a factor necessary for the emergence of participant agency within the interactive scenarios. In this context permission is a representative of the explicit suspension of rules normally attached to institutions that display art (see Chapter 4.2) and authorises a visitor to interact physically with what is being presented.

Figure 4.4.2 *Smile and I will keep you in my heart forever*, Richard Kearns, 2015

The operational difficulties inherently present in participatory systems are acknowledged by Beryl Graham (2012) who claims that for success they require at least a moderately devolved authorship to enable agency. To illustrate her point, Graham cites Joseph Beuys' 1972 experience in his *Bureau for Direct Democracy* during *Documenta 5*, the fifth international contemporary art exhibition that is held in Kassel in Germany every five years. The work offered an opportunity for visitors to engage in direct conversation with Beuys, but very few did so. Graham attributes the cause of this to a perceived failure in transferring authorship to the audience. Prado & Natkin (2011) also argue that in addition to the perceived presence of a goal, devolution is a fundamental principle for successful interaction, and a work must offer more than a mere participatory experience. *Soundweb* and *Interplay* investigated alignments between agency, permission and authorship by allowing visitors to generate their own goals.

4.5 Participation and Authorship

Who authors the outcome of a participatory process remains an important and contentious issue that is bound within the actions of those engaging with a provocation, and with those involved in the production and distribution of those as systems. Seán Burke (2008) argues that the subject of authorship began to emerge into its own field of research with Roland Barthes' (1967) publication *Death of the Author*. Barthes sought to re-define the relationship a text has with its interpretation through an investigation of the roles played by its writer and its reader. He argues that what is known about the producer skews genuine interpretation and veils the true author, which he argues is language itself. For example, a play is interpreted, in part at least, through what is known about its author as a person, and whatever controversies that may surround that. Barthes claims that all texts have been extracted and re-arranged from a variety of pre-existing sources emanating from numerous histories and due to these multiple tacit citations, he reasons that it is not possible for a line of text to reflect a singular truth.

Barthes' essay echoes Nietzsche's (1883) proclamation on the death of God which itself echoes Hegel's (1807) paradigm that understanding truth is dependent on the relationship between the individual (the *I*) and their position in space (the *Now and Here*). He argues that cognition results through the relationship these elements have in combination with the ability to discard habitual assumptions, a process he calls *negation*. According to him, at the point this occurs an individual relates only to themselves, whom he termed 'the One', and meaning is fixed before it expands into a greater diversity. The term 'the One', also ascribes to what is being observed, and suggests that while the 'truth' of it as a thing is deeply subjective, its interpretation is dependent on it being part of a matrix of universals. In other words, perception is the point at which elements of the environment are perceived as universal symbols, but before they have been coloured by associative assumption.

Sartre (1943) expanded on the notion of universality arguing that existence is not preordained but governed by choices that can be replaced at any moment, by any individual, with new choices. According to him, this frees the individual from the dogmatic chains of theology and the God-Author, but also exposes a caveat of personal accountability, reliant on what he describes as *facticity* (1943:494). Resulting from an individual's accumulated experiences the term 'facticity' is used to denote limitations of freedom, and for defining a person's present. It also forms the difficulties that arise in the relationship between an orator, a situation, a sentence and an audience. Sartre claims that the rift between intention and reception is caused by all the choices each party has made up to that point, because moments are intangible and subject to change (1946:518). Jacques Derrida (1972) points out that there is also a dichotomy between a writer's point in time, and a text's break with the writer through its continued existence. This, he argues, is because words point to other words, not to meaning. He claims that each sentence carries a certain amount of freedom, as does the individual reading those words. Michel Foucault (1969) had made a similar point by positioning the writer of a text in a place that both precedes, and extends beyond a finished work. He argues that different types of text attract different forms of what he termed 'Author Function' (1969:11). According to him, the ability for a manuscript to extend beyond a specific discipline relates to how it is established within a classified genre. He makes a distinction between literary and scientific texts, giving more functionality to the latter arguing that they are likely to have more impact beyond the subject's speciality.

Artworks that have incorporated participating audiences as a necessary function of their completion are often assumed to negate original authorship. Looking again to Wagner's (1849) thesis *Artwork of the Future*, he too argues for the death of the author (1849:189), but a symbolic one that ends the connection between the artist's ego and the work created. Wagner insists that the suspension of Author Function is essential to permit an artwork to exist in its own point in time. This enables a participant, to become what he describes as "the Poet" (1849:200), and take on authorial accountability. As part of this process, the performer must also negate a large part of their personal facticity as a necessity of participation. However, their participation is temporary and is ultimately annihilated by the artwork, which in contrast has more permanence because it equates to a Game Theory's infinite horizon, where participants are interchangeable components of an on-going system (see Chapter 5.3). Groys (2008) points out that the perceived authorial abdication in participatory

works can actually be viewed as an extension of authorial power through the process of drawing an audience in to complete it, or function within it. Janet Murray (1998) calls this 'procedural *authorship'* (1998:152), where although a system may provide multiple consequences, these are finite and remain within a pre-defined architecture of engagement that establishes limitations.

Within the research artworks it was clear that interpretation of the environments was dependent upon a network of influencing factors that included situation, time, space and personal history. Sartre's (1943) proposition that each condition is finite and has a context outside of itself, also acknowledges the freedom of the *Other* (other people) to go through processes of their own. In order that these parties can communicate on any level, nihilation of personal freedom is necessary. Without it a tree could be interpreted as a cat by one individual, and as a bicycle by another. In participatory processes, such as those within *Soundweb* and *Interplay,* meaning is revealed through action, and not by reflective analysis of signs (Heidegger 1977).

The number of potential outcomes to the research environments was subject to a syntax defined by their design and contents. These were physical laws that operated as universal limitations. However, visitor behaviour within the research artworks indicated that these comprised only a part of a conditioning framework. In addition, were elements of a larger dialogue that included cultural and personal histories originating outside the confines of *Soundweb* and *Interplay*. They contributed toward the visitor authoring procedure through communication processes that were often non-verbal and transmitted tacitly.

4.6 Participating with Others

The relationship between the audience and performer has been under scrutiny since at least 335 BCE where it is recounted in what survives of Aristotle's *Poetics*. In it he argues that the function of tragedy in the arts is to enable an emotional purification, or release of pent up psychological stresses among spectators. According to him, all art forms are imitative. However, the aim of tragedy is to recreate qualities that arouse fear or pity through the characters of a scripted plot, not to mimic particular individuals. He argues that by engaging with these simulated sentiments a therapeutic process is generated that either purges the actual manifestations of these emotions, or leads to a greater sense of empathy for others who are experiencing them in the everyday world. The theory of catharsis through enactment re-emerged in the second half of the nineteenth century when, as a young man Nietzsche (1872) built on work initiated by Schopenhauer and Wagner and wrote his *Birth of Tragedy*. In retrospect this appears to have been part of a trajectory of investigations into the emotional aspect of the human psyche that had been largely absent from day to day life. Widely agreed to have begun with Sigmund Freud's exploration of the unconscious, it is an area that was subject to increasing exploration in the first half of the twentieth century and continues to be today.

Forty-one years after Freud coined the term 'Psychoanalysis' in his *Interpretation of Dreams* (1899), Jacob Moreno developed what he initially called Spontaneity Theatre (1940). In this embodied examination of trauma, which he later renamed Psychodrama (1946), Moreno utilised unscripted role-play to explore hidden aspects of the self. This has remained a form of group therapy where protagonists alternate between performers and audience in an unscripted cycle of exploration within a collective whose boundaries between audience and performers are undefined.

Interpersonal engagement between the audience and performer, or audiences as performer, or even audience as user has been subject to a complex entanglement with a number of historic examples. One such is the participative practice found in English pantomime that was introduced by John Weaver's *Tavern Bilkers* at the dawn of the eighteenth century (Sweeny 1984). These performances encourage a level of semi-scripted audience participation in the form of vocal crowd response and sometimes dance-like movements from participants standing in the aisles. Its influence on an audience's behaviour along with Antonin Artaud's *Theatre of Cruelty* and the work of Berthold Brecht, has been mapped in Gareth White's *Audience Participation in Theatre: Aesthetics and the Invitation* (2013). There are increasing incursions of these practices as

productions slip into the mainstream over time, such as Pina Bausch's 1982 *Nelken*, where at a point during the dance, the audience is requested to stand, while performers leave the stage to hug and thank random members of the audience (Esplanade, Singapore 2016).

The complexity of pantomime-type productions and their influence on audience behaviour within art environments is not transparent enough to be included in more detail here. It is, however, important to acknowledge the non-linearity involved in historicising audience behaviour. For example, Antoine Pickles (2016) links onlooker participation to street theatre, fairground theatre and even the antics of market vendors performing to sell their wares and drawing in members of the public. He claims that these practices have evolved into what is now termed 'performing art in public spaces'. There is a quantity of shared history between participation in theatre and the visual arts. A part of this is the traceable trajectory flowing via Futurist and Dada art movements, among others, that encouraged seated audiences into a variety of improvised actions, which included hurling rotten fruit at the performers on stage (see Chapter 3.3). Subsequent artists took this a step further by encouraging viewers into unscripted participation within environments that include the theatre but were not limited to them, such as Yoko Ono's previously mentioned *Cut Piece* (1964), that invited audiences onto the stage to cut the clothes from her kneeling body (see figure 3.5.1). Hal Foster (2015) argues that integrated relationships between audience and artwork are further complicated by a number of institutions recently re-enacting participatory pieces from past decades to audiences separated from their original participatory role, in what he describes as a 'zombification' of the performance space. He quantifies his use of this term in a footnote where he draws parallels between neo-liberalism, commodification and the audience as capital. According to Foster this heralds the emergence of what he describes as the grey cube, in reference to the colour of the environment these enactments tend to occur. There is little literature on how an audience that addresses its own needs and incentives functions as a mechanism within hierarchies of the manufacture, presentation and consumption of art. It is one of the key areas that this thesis is contributing to.

The environments that comprised *Soundweb* and *Interplay* possessed inevitable crossovers between theatrical practices and those emanating from the visual arts due to relationships that emerged between watching and performing in visitors to the artworks. Consequently, the terminologies used to describe activity within them may have different meanings to readers more familiar with either of the disciplines. It is useful to distinguish between the terms used to describe behaviours within the artworks and clarify how engagement, interaction and participation relate to this thesis. In describing activity within the installations, the term 'engagement' is used to denote activity within the installations quite generally, but where visitors have appeared to make a conscious decision to remain within the spaces. Interaction is used to describe a development of engagement where visitors employ embodied actions to explore the effects of the media artefacts within the spaces. Although these artefacts were pre-coded, such as the audio and visual projections in *Soundweb* and the live video in *Interplay*, they could be responded to in multiple unpredictable ways. Interaction within the research spaces was 'embodied' because it required physical movement from visiting parties. Engagement through embodied interaction is allied to Martin Heidegger's (1977) argument that understanding is generated through physical engagement with the world and is linked to processes of transformation through its relationships with performativity (see Chapter 1.1). It is an embodied version of the performative that was first coined as a term by John Austin (1962) to describe the ability certain linguistic phrases have to bring into existence the object of their description. The term 'performative' is often incorrectly applied to performance and it is important to emphasise that there is a difference. A performer's state of being is not automatically changed through an enactment, it occurs under certain conditions. One of these is permission (see Chapter 4.4), which affords an individual the potential to engage their agency with uncertainties presented by an encounter (see Chapters 3.4 and 3.5), such as those within *Soundweb* and *Interplay*. Heidegger argues that physical action within an environment often transcends description. Participation is used in this thesis to describe interactions that occur with media artefacts while at the same time responding to the presence of other inhabitants occupying the art installations at the same time. Forms of social participation are not always a result of conscious decisions to communicate with others, and can be initiated through the activation of neurological mechanisms such as the fight or flight response, or

behavioural mimicry stimulated by the mirror neuron (see Chapter 4.8). Forms of participation are numerous and can include scenarios in which individuals remain unaware that they are engaging as part of a creative outcome. Within *Soundweb* and *Interplay* visitors were always explicitly aware that they were interacting with a system, and the choice to take part, or not was left to them. Decisions by visitors to physically engage with the artworks were integral to the measurement process because the duration of activity was used to indicate successful alignment of the components within the installations (see Chapter 8.6).

In addition to the embodied responses that occurred within the research artworks, there was also an exploration of visitors' emotional psyche, which often appeared to be cathartic, and was observable in the type of overall activity that emerged within the spaces (see Chapter 7). Because the installations were most often occupied by several visitors at the same time, these interactions inevitably comprised a combination of responses to the media artefacts and to others who were visiting at the same time. *Soundweb* and *Interplay* were seldom occupied in isolation and the embodied experiences of the visitors were also subject to the trajectories of each other. It was through the blend of interaction and social participation that visitors were able to transform their physical actions within the spaces into coherent meaning, a conclusion that was extrapolated from the duration and complexity of their engagement.

4.7 Audience Trajectory

Trajectory is applied in this study to describe the movement of an individual through an experience, such as a museum, an art gallery and the floor space of *Soundweb* or *Interplay*. The passage of people in these scenarios has often been considered difficult to predict because it is subject to complex influencing factors (Baker 1999). This was recognised by Arthur Melton (1935) in the first half of the twentieth century and was the subject of his seminal study into visitor behaviour in museums. More recent research presents a strong argument for the unconscious modelling of experiences through the suggestive power of third-party reactions. For example, Dirk vom Lehn (2001) argues that a statement by one onlooker such as "I can't look at that", when overheard by a second spectator, can pre-construct a response framework before they have had time to reflect on what they are experiencing for themselves. In the same way, others observed touching objects or artworks in a gallery can mediate the physical interactions of the Self. This is an ongoing process that is entangled with multiple relational associations that are in a state of continual flux between an individual, and such factors as the nature, position and accessibility of artefacts within a space. It is an area that shares common ground with Edward Hall's (1966) *Proxemics,* which explores how culturally defined relationships with space are used by individuals to communicate. Hall's theory focused on cultural differences he perceived in the use of non-verbal inter-personal communication, such as levels of touch, and the physical distance between two individuals in dialogue. Although, the rigour of his research was questioned (Gillespie and Leffler 1983, Baldassare and Feller 1975), it is generally accepted that the field is one that has much to offer (Watson and Hall 1969). Hall's arguments on the relationships between space, situation and an individual's fight or flight impulses are important to acknowledge for their relevance to both of the research artworks for this study. Hall's claims add valuable dialogue to studies into the relationships that visitors have with spaces that present situations, such as art galleries, or interactive environments.

There has been a resurgence of interest in the movement of individuals and their trajectory through hybrid spaces (also known as blended space), particularly within the field of human computer interaction (HCI). Hybrid, and blended space usually describes an experience that augments what is assumed to be 'real' three-dimensional space and its relationship to time in the physical world, with a digital version. It can be achieved either by adding an overlay to what can be seen, termed 'augmented reality', or by replacing it completely, known as virtual reality. A simple example of this is the screen of a portable smartphone, or tablet, generating a view of a scene that is mediated through a camera application, such as Niantic Inc's *Pokémon Go* (see figure 4.7.1). Not quite a rendition of Jean Baudrillard's (1981) *Simulacra,* where a newly constructed reality subsumes or replaces what was once accepted primacy without being noticed, augmentation is more an addition to, or extension of known, or accepted, three-dimensional space.

The unseen constructions of audience experience as near, or complete simulacra are prevalent in both traditionally reflexive art experiences and ones that involve HCI. Steve Benford *et al.* (2011) and Martin Flintham *et al.* (2011) have developed an argument they name *Interactional Trajectories* as an explanation of the controlling factors that govern user experiences with artworks. Echoing vom Lehn, they propose that an individual confronting an artwork for the first time is given clues on how to interact by observing those already in active engagement.
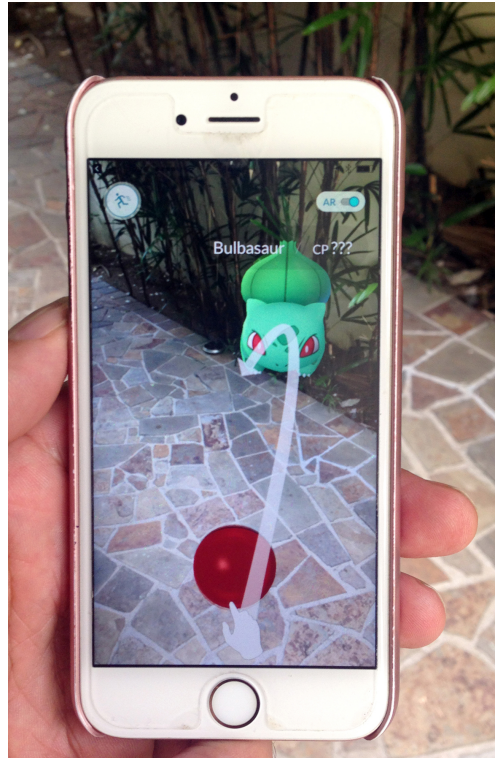
Figure 4.7.1 Niantic Inc's *Pokémon Go*, game play detail

Based on these studies, Benford and Flintham argue that the choices audiences make as they move through a space is not only subject to interactions between themselves and provocations provided by the artefacts. They are also subject to exchange with other visitors. These studies argue that this is the case in environments that require overt physical action, and ones that are considered reflexive, such as those that house screen-based, or two-dimensional artwork. The implication is that visitors to public exhibition spaces are not engaged in private feedback loops with objects and situations, but are entangled in a wider *intra*-activity with the encounters they have, the location and their own histories. In other words, individuals comprising an audience navigate from within, and as an intrinsic part of a system, and it is this entanglement that gives meaning to their experiences. In her theory of *Agential Realism,* Karen Barad (2007) introduces her concept Intra-Action to define how relationships between objects, people and things are deeply inter-twined. Although the idea had been introduced several years earlier by Stephan Moore and Timothy Place (2001) in a similar context, Barad goes into greater detail. Her thesis challenges theories that claim agency is an action by one separate unit (or individual) on another, or an exchange between separate units of identity. Her argument, Agential Realism, proposes that relationships between units (or individuals) are woven together and are not divisible into individual units, they are synthesised parts of a greater homogeneity. Her theory is based on Niels Bohr's principles in physics that led to the discovery of quantum entanglement. Verified by numerous experiments it is based on the behaviour of particles that remain rooted in each other's rotational trajectories, with each mirroring any changes that occur in its twin, even over increasing distances. From this Barad extrapolates that human relations do not comprise a collection of temporary connections between an individual's Self and the Other, but are composed of a complex entanglement that extends beyond a given situation, or encounter.

Despite there being no facilitation within *Soundweb* and *Interplay* it was clear that the physical laws governing the spaces and the capabilities of the media artefacts set limitations on what could be achieved or performed within the installations (see Chapter 8.2). Emergent patterns of behaviour were observed to repeatedly occur (see Chapter 7.4). If it is accepted that interpretation can be achieved through embodied interaction and social participation, this contradicts the subjectivity that has been considered inevitable in audiences since Susan Sontag's (1966) publication *Against Interpretation*. It became apparent very quickly that the trajectories of individuals within the research installations was also affected by behaviour of others within the spaces. While a proportion of this was observed and overheard in accord with the propositions above, a large proportion of these behavioural affects was transmitted non-verbally. They were most clearly observable as what appeared to be infectious involuntary movements that spread between individuals during periods of simultaneous occupancy.

4.8 Contagion and Mimesis

Collective behaviour within crowds is not fully understood (Moussaïd *et al*. 2009), but what is interesting is that infectious patterns of behaviour appear to emerge in contexts wherever groups of individuals congregate. It was noticed in the nineteenth century by Gustave Le Bon (1895) when he introduced Contagion as a theory after researching the dynamics of crowds. His thesis introduced the phenomenon that individuals become absorbed into a collective consciousness within large groups. He argued that within crowd situations a process of temporary transformation takes place where an individual replaces their normal patterns of behaviour and judgement with reactive responses that spread through a crowd of which they are a part. According to him, individuals in groups become highly receptive to influence and this can be infectiously transferred through either conscious and/or subliminal suggestion.

Research in the field of neuroscience appears to corroborate Le Bohn's thesis with the discovery of neurons that have developed specifically to mimic the behaviour of others with the most likely function of gaining survival advantage. A neuron is a cell that exists in all but a few animals that transmits information by becoming electrically charged. Recent research into the mirror neuron's presence in the human brain and spinal cord has become more widely accepted in the biological sciences (Ferrari and Rizzolatti 2014). Mirror neurons become active when an individual replicates an action that is observed in another, and when that individual notices that its own actions are being imitated (Fogassi and Ferrari 2007). They are increasingly considered fundamental to processes of learning and understanding. Leonardo Fogassi and Francesco Ferrari maintain that mirror neurons are likely to have been essential to the development of verbal and non-verbal language. The ability to empathise with another's mood that is expressed through gesture, for example, is achieved through mimetic process. Similar research into collective behaviour indicates that rapid non-verbal communication within groups may also serve basic survival functions in animals. David Eilam's (2012) study into anxiety contagion found changed behavioural patterns in vole communities after controlled attacks by barn owls. After an attack, a dramatic increase in a community avoiding open spaces was observed regardless of whether particular individuals were targets of an assault. This is an effect that Eilam ascribed to emotional contagion within the social group. If the studies on audience trajectory showing how individuals are influenced by the actions of others are viewed in a context of Contagion Theory and the mirror neuron, then what begins to emerge is evidence suggesting that interaction within an environment is not linear, but is subject to multiple simultaneous influences which also challenge the primacy of physical space. It suggests that navigation also functions through psychological and sensory equivalents which refutes arguments claiming irreducible dualities between the mind and the physical (Foster 1996).

In his Polyvagal Theory, Stephen Porges (2009) argues that autonomic functions, such as heartbeat, or breathing can be affected by gestural and facial movements which, when observed in others, generates a cyclical responsive relationship with the brain. Heartbeat affects brain operation which in turn again affects heartbeat, and has evolved to equip humans and other mammals in fight or flight situations. The theory has its origins in Charles Darwin's (1872) proposal linking nerve excitation to brain function, and according to Porges, is a mechanism directly related to evaluating perceptions of

safety within an environment. By reading and responding to the actions and facial expressions of others, Porges argues that levels of risk are continually assessed, to aid the nervous system's potential alternation between defensive mechanisms and social engagement.

The research artworks were situated in an environment that gave permission to visitors to engage in an open-ended manner, which was communicated through the absence of facilitation. Probably because it was also dark, the ensuing de-centring that was generated in visitors appeared to provide a sense of uncertainty that produced a heightened vigilance that amplified their social participation (see Chapter 7.3). Visual cognition was responsible for some acts of mimicry within the spaces but much was also clearly transmitted at an unconscious level. The flows of cohesion that emerged between multiple occupants were observable in the surveillance videos passing from one person to another. This ripple-effect was particularly evident in *Soundweb* when visitors responded to the media artefacts in a manner that appeared specifically to explore fight or flight stimuli (see Chapter 8.2). Within *Interplay* group synchronisation was more evident in the movement of engaged interactors through the space (see Chapter 8.5.).

4.9 Conclusion

This chapter included summaries of key concepts and theories pertinent to the participatory processes that were observed in the research artworks *Soundweb* and *Interplay*. It positioned visitor agency as a fundamental aspect of those procedures, which the chapter explored in relation to the phenomena of behavioural contagion.

In art environments such as *Soundweb* and *Interplay,* where occupants are required to perform physical movements to stimulate effects, authorship and interpretation become complex. This chapter explored how those dialogues are generated through negotiation, and emerge and mutate to influence how other occupants interact within such environments. In developing this line of investigation, the chapter illustrated how the immediate surrounding of a situation can provide a framework for actions and interpretation in those that engage with it.

Also examined was the terminology frequently adopted by institutions to describe how visitors respond to institutionally-placed provocations. The chapter argued that descriptions of certain forms of behaviour are steeped in a disjunctive past that still persists through the language that is often employed to define visitor engagement. It was included because it locates *Soundweb* and *Interplay* as democratic works that do not attempt to educate or activate a claimed passive audience.

Open-ended conditions, such as those offered by the research artworks, do not didactically try to present something that is pre-subscribed. Connecting the constituents of agency, authorship, contagion and location that formed the trajectories within *Soundweb* and *Interplay* helps identify some of the tacit provocations involved in these entangled situations (see Chapter 7). They are critical in understanding how the specific forms of interaction within the research installations manifested in the way that they did, which was through play and gamification. To fully appreciate the significance of these forms of engagement it is important to understand what play does.

Chapter 5

Tools for Participation

5.1 Introduction

This chapter introduces concepts that theorise the behaviour of visitors to *Soundweb* and *Interplay* once their reactions that were discussed in the previous chapter transitioned from unconsciously transmitted embodied affects. While aspects of behaviour continued to infectiously spread amongst visitors and code initial responses, it was observed to develop into more self-determined activity within the spaces. It was a phase where visitors took ownership over their initial biological responses to the uncertainty that accompanied their situation, or 'encounter' (see Chapter 1), and began to interact rather than react with the environment. Ownership is argued in this thesis to be a necessary condition to extend engagement in interactive environments. Evidence of it appeared in the familiarisation process of visitors to the spaces when they employed mechanisms that are often associated with what is commonly described as play. This chapter begins by explaining how participation manifested within the research artworks, and introduces propositions on how embodied play is used to derive meaning from new experiences. Taking examples from Game Theory, the chapter then briefly explores how play is utilised in negotiations between the self and an environment to build a framework of understanding. Such transactions are located at intersections between the psychic and the somatic self which is explored through what is termed the 'Playspace'. It is where contingent encounters are explored in a mentally projected version of the physical environment, to construct workable rules with which an unfamiliar event, place or situation can be navigated. The chapter concludes by positioning the outcome of embodied encounters as creative acts that were transitional and authored by visitors within frameworks supplied by the research installations.

5.2 Participation and Play

Individuals that respond to each other and to situations within an environment involve complex relationships that are enmeshed within a variety of tangible and ephemeral contexts. For example, the contagion discussed in the previous chapter comprises elements of subconscious and biological triggers that combine to overlay uncertain physical situations so that an individual can ascertain a response based on mass reaction (see Chapter 4.8). Intersection between physical and psychological, or imaginative spaces, is also a condition that exists in play. It is an activity proposed by Lev Vygotsky (1978) that consolidates understanding of the world within criteria that are often defined spontaneously. According to him, play is a practice in which an individual can explore meaning by transferring it from one thing to another, a function that he argues forms the basis of understanding. Vygotsky importantly notes that while spontaneous play appears to be self-determined, it is not always the case. The actions of individuals at play are defined by the meaning of things and, according to him, this is evident in the way play manifests itself. Understanding the processes unleashed through play is fundamental to this study because it was the main mode of interaction adopted by visitors within the research artworks.

According to David Whitebread (2012) play occurs across all cultures and with all age groups in human societies. This appears to have consistently been the case for millennia and can be seen in the popularity of ancient board games, such as chess and backgammon, or sporting events such as the Olympic Games. In his report, Whitebread identifies five types of play: physical (rough and tumble); play with objects; symbolic play (language, images, signs); pretence/socio dramatic play (make-believe) and rulebound play (games). He acknowledges that these categorisations are fairly arbitrary and that others have made claims for different classifications. The types of play that Whitebread identifies were all observed within the research artworks *Soundweb* and *Interplay*. Whitebread presents the important argument that play is a fundamental ingredient of innovation, not only in children, but in adults too, which is most likely due to its function as a mechanism for making meaning.

In a context of action, the word play is often coupled with childhood, most likely through its association with influential theories on cognitive development, such as those proposed by Jean Piaget (1952). He argues that play forms a pivotal role in constructing reality during early years development, and as a child grows older, forms a foundation through which new experiences are engaged with and decoded (1954). According to Donald Winnicott (1971), the physical activity involved in play overlays an equivalent psychological environment to create what he calls a transitional space, which ultimately produces what we consider to be cultural experiences (1971:51). Although his thesis focuses on the developmental stages of children he acknowledges that they continue into adulthood and operate in much the same way. According to Vygotsky (1978), play is incentivised by rules, and engaging in it is a means of exploring the constraints that can often physically or imaginatively limit outcomes. Vygotsky claims that as a child gets older play is transferred from objects to concepts, which he suggests is the point at which words become entangled with physicality. During this phase, he claims that play changes from being primarily a roleplay activity to a sport, or games of strategy. This is perhaps more due to play not being recognised as explorative in adults, although in the research artworks this was witnessed but in a more subdued form than with children (see Chapter 8.3). Imaginative play may seem less common in adults but there is a paucity of research in this area that was identified as problematic by Mary Glynn and Jane Webster (1992). Their study makes a correlation between play and productivity in the workplace, particularly with reference to areas that involve innovative thinking.

Play has an established relationship with art through Immanuel Kant's (1790) influential *Critique of Judgement* where he argues that an individual's mental faculties should be allowed freedom to intuitively play with new associations between understanding and imagination without the constraint of a defined notion or context. As a paradigm it was bound in arguments of truth and beauty as vehicles for the emergence of morality (see Chapter 1.2). James Sweeney (1959) positions play as a conduit for interpreting art by stimulating empathy between individuals and objects through curiosity. He argues that it is equally important in both the appreciation of art and its production. According to him, play fosters a willingness in audiences to approach the unfamiliar in art, and by implication, uncertainty. Hans-Georg Gadamer (1960) argues that play achieves this by freeing audiences from the shackles of rational thought when engaging with artworks. Gadamer's arguments originate in Friedrich Schiller's (1794) *Letters on Aesthetic Education* which were written in response to Kant's *Critique of Judgement* and with whom he disagreed. Where Kant believed that morality required the negation of negative urges, Schiller maintained that morality emerged through aesthetic education and an understanding through the vehicle of what society considered to be truth and beauty. The play they are referring to is an intellectual one where reason is not allowed to subjugate intuition, but work with it through free play to enable an unexpected outcome (Wertz 2005).

Embodied forms of play operate in a similar manner, but with the addition of the somatosensory system that incorporates the sense of movement, position and touch. This form of play was adopted as a strategy by Dada and Futurist artists to disrupt established notions of what art was, or could be. It has constituted a theoretical backbone to many enquiries ever since, and continued along a trajectory maintained by the Surrealists, the Lettetrists and Fluxus among many others (see Chapter 3.4). Boundaries are defined by rules and, to a certain extent, the decision to engage with them is tacitly entwined within cultural systems. It is the relationship between them that Anna Dezeuze (2010) argues artists have explored through play. She points out that although the primary participants in these scenarios have been adults, the mechanisms are the same as those with children. According to her, artists have capitalised on what she describes as a "carefree space" to test notions of normativity, or what is accepted as such within the everyday (2017). It is an important point because her suggestion implies that the terms 'play' and 'interaction' are interchangeable.

The statistical analysis of strategy in human interaction known as Game Theory, offers a greater understanding of what might encourage visitor groups to play as a method of participating with artworks. Game Theory is useful because it analyses complex situations by exploring the potential

payoffs that choices may lead to. However, it is important to remember Haim Shapira's (2017) point that it is a retrospective system of analysis because the complexities involved in lived experience are too unpredictable for mathematical modelling. According to Ivan Pastine (2017), the manner in which a motivation relates to a particular scenario will determine the nature of interaction between the individuals involved. For example, a game with 'Infinite Horizon', one that has no perceivable end, is much more likely to encourage cooperation between those involved, than one that is finite (Aumann 1995). An ability to re-engage with the system perpetually withholds value from what may be won or lost, and negotiates a different kind of affordance. The research artworks operated as infinite horizon games because there was no perceivable end. *Soundweb* and *Interplay* could engage multiple and interchangeable 'players' and interactions for indefinite periods of time.

Christopher Kirby and Brolin Graham (2016) claim that the transactions occurring between the living self and any object of interest ultimately lead to a framework of understanding which, according to them, becomes the basis of subsequent enquiries. Gadamer agrees by suggesting that play operates in a way similar to language, in that it extends beyond the immediate experience of an individual. He proposes that play often exists to perpetuate itself in an argument aligned with the Infinite Horizon principle. It is through the negotiation between an individual's sense of identity and those of other people that he claims understanding is achieved. Gadamer proposes that as participants, individuals are interchangeable elements of play's ability to exist beyond them, such as players being replaced in a team sport, or the visitors to the research installations changing to others. The separation between participants and their actions is an important one for Gadamer because it not only offers the ability to replace rules defining what is considered normal, it enables play to lead to transformative experiences. It is achieved through an embodied revealing of new choices through a changed priority of imagination over accepted reality. He suggests that these choices are negotiated between rules, imagination and the physical confines of the situation, of which he argues that play is a representation, but not one that is performed for others as a requirement of its function.

Whitebread (2010) positions play as a manifest process of an individual's metacognitive abilities. Within the research artworks this awareness of the Self in an encounter became ritualised through repeated actions that often developed into games. Evident within much of the literature on play is agreement that it comprises very specific components emerging from an amalgam of physical and psychological elements, even though these may differ in quality or arrangement. For example, motivation might be either extrinsic, intrinsic or a combination of both, but the general premise is to test accepted, understood or unknown boundaries. These can be bodily or mental as in the case of games, or linked to making sense of an unfamiliar, or altered situation. The process is similar to that of Thomas Kuhn's (1962) paradigm shift, where a period indeterminacy, or liminality, presides over redefined sets of criteria before new boundaries emerge and attach to language. Play perhaps differs from Kuhn's description in that rather than facilitating understanding of a context in relation to the Self, it reverses this by repositioning the Self in relation to a context. This is an important difference because play is not bound by rules of physical spaces, it overlays them with imagination and emotion. On entering the research artworks visitors were not offered a clear narrative experience. They were offered uncertainty. Play was utilised as a mechanism to generate rules with which to navigate their encounters.

Decisions by visitors of *Soundweb* and *Interplay* to take ownership over their initial psychological and sensory responses to uncertainty in their encounters was represented by their decisions to interact, and this took the form of play. The function of play in its relationship with the manipulation and construction of usable contexts that can be applied to uncertain situations, is an essential component in supplying a framework for understanding this study. Comprehending the specific forms interaction took helps to clarify the criteria being sought in the first research question that asks: What factors are required to extend engagement with participation in interactive environments? Identifying why interaction might be sustained also helps in answering the third research question that asks: Given how little is understood about the trajectories of

participants during periods of physical interaction with artworks, how could interaction be re-theorised within a context of unpredictable public interactive environments?

5.3 Participation in Physical Space and a Psychic Equivalent

Descriptions of public encounters with artworks frequently use the word 'space' to denote an environment where the audience and the represented idea of an artwork encounter each other in ways that present meaning. These points of contact do not necessarily involve objects, and within the research artworks provocation was provided through projected audio and visual media artefacts in combination with the presence of other people. Although the location of art presentation spaces is often assumed to consist of minimal blank interiors in which artefacts are displayed to a spectator, it is not a necessity and they could manifest in other ways. However, embodied encounters tend to occur within environments, and these have been described as 'carefree' by Dezuze (2010) and as 'transitional' by Winnicott (1971). Even though specific environments might be shared by inhabitants that form groups they are only ever perceived through the senses of an individual, a process that Jacob Uexküll (1936) famously described as 'Umwelt'. In his writing on architecture, Charles Rice (2009) claims that embodied awareness extends as far as the sense of interiority and exteriority. Like play, space comprises overlays of the corporal and the cognitive, which can be emphasised within black cube environments such as those *Soundweb* and *Interplay* were presented within (see Chapter 1.2). Unlike the white cube and its tacit relation to courtrooms, mausoleums and temples claimed by Theodor Adorno (1955), and Brian O'Doherty (1999) the black cube does not have any defining attributes outside those of other black cubes. It does not directly relate to any history of place, and therefore does not have an identity that could be said to locate it at a physical point in space or time. The black cube is a material manifestation of Michel Foucault's (1966) 'heterotopia', a space that is opened up through language's relationship between object and meaning. According to Foucault, heterotopia is a place of multiple metaphors that exist beyond singular identity. Until content and audience are present, the black cube is a situation of becoming with an agency that is merged with black cubes elsewhere. These liminal locations are further defined by Marc Augé (1995) as existing between *place* and *absence*. According to him, *place* is rich with associations that mark it out as a thing in direct relation to an individual. Augé describes absence as a non-place that lacks physical or emotional connections with the Self and is therefore transient, other, and in a state of entropic flux. By this, he reasons that because these non-places lack the addition of an event, they exist in a limboid state of becoming, where agencies of place and Self have yet to establish an embodied relationship. For example, a town frequently passed on a motorway but never seen, whose existence is proclaimed by sign-posts, becomes a place only when it is visited. This is a phenomenon shared with the black cube. By dislocating a visitor's sense of self within *Soundweb* and *Interplay*, their physical environments could begin to merge with a dream-space to generate an imaginary theatrical place in which user-generated narrative could be utilised to test and construct the boundaries of context. The lack of definition these spaces have due to their absence of light can help circumvent the behavioural modelling that Susan Handy (2002) argues architecture is known to have, and present an environment ready to explore the potential for modifying visitor responses that is asked in research question two: To what extent can public behaviour be modified to facilitate sustained engagement, embodied interaction and social participation within interactive environments?

Entanglement between the somatic and the psychological Self, and its relation to location, is not so much a manifestation of duality as an indication of the complexities that emerge between affordance and Umwelt. Rita Carter (2002) maintains that this also extends to the perception of time. According to her, negotiation between material and immaterial manifestations of places and things can be characterised by an individual confronting a situational or object-based condition for the first time. Recollections of comparable past encounters function to pre-empt sequences of events that could occur from an interaction in the present. Grosz (2001) suggests that this is not so that a thing, in and of itself can be understood, but for the potential needs of an individual to be transposed onto it. In combination with memories, associated emotions and judgements come together to construct an environment into which an immaterial or psychic version of a situation can be projected. With this function of facticity (Sartre 1943), potential scenarios that could result

from engaging with an object can then be explored in the relatively safe virtual environment of the mind. This is something all humans do and has been much explored in psychoanalysis. Norbert Freedman (2004) argues that this projected reality is where our understanding of the world and our place within it is processed. Psychic space is made up of a dialogue between how individuals view or feel about themselves, in relation to their dreams, aspirations and nightmares, and how they expect to relate to the people and objects in a given environment. Everything defined by the laws of physics, whether understood or not, must have an equivalent in psychic space before being processed into consciousness, because it is the editing suite of reality.

Dialogues between psychic and physical spaces overlap and interconnect in numerous complex ways and stem from such things as an action and what is simultaneously fantasised, and associated with performing that action (Freedman, 2004). The transactional point between psychic and physical polarities is an environment that has been labelled the 'Playspace'. It has been referred to in a number of disciplines, that includes literature, digital interaction and the work-place where it is used to describe situations in which the physical and psychic are overlaid and experienced simultaneously to navigate an outcome. It is an important aspect of this study because it provides a contextual role in understanding how and why visitors engaged with the research artworks and supplies insight into this study's third research question that asks how the trajectories of participating visitors can be reconceptualised within the contexts of public interactive environments.

Since the 1970s the term 'Playspace' has been used to describe the relationships individuals build with a number of interactive situations, and amongst these, as may be expected, are children's play areas. In Erika Passantino's (1975) analysis of adventure playgrounds, she proposes that Playspaces emerge through an interaction between the physical artefacts, the mode of activity they encourage and the imagination that is stimulated in the child that is exploring them. The Playspace also appears in the field of literature, where Diane Sekres (2009) claims that self-identity is formulated through the physical act of reading, word assimilation and the mental projection readers direct on to the characters and scenarios. In analysing video gaming Colleen Macklin and John Sharp (2016) argue that they manifest in spatial intersections that are constructed by overlaying the rules governing virtual environments with the physical act of navigating them. Another example is found in Pamela Meyers' (2010) suggestion that workplaces can be directly transformed into Playspaces by introducing open framed rule structures that encourage a sense of innovative thinking amongst employees.

Common to all analogies is the notion that the Playspace consists of negotiations between an individual, their past, imagined futures, the confines of their environment, the objects situated there and other occupants inhabiting the same space who bring their own associations with them. If each of these physical or emotional states is represented by a diagrammatic node connected together by a line, then what emerges is a network. Given that all network diagrams are subjective in what they include, as Stephen Borgatti (2011) argues, the sum of such a network can be positioned as representing elements of an individual's Self. The addition of multiple networks, or other people, forms groups and inevitably develops new random relationships between members in the form of new connecting lines. These fluctuate depending on who comes into contact with whom and with what. This potentially forms a complex self-organising, and adaptive system whose chief characteristic is unpredictability. Networks of this nature are volatile and subject to capricious change. Crowd Theory (Le Bon 1895) illustrates that such networks are manifested wherever groups of people gather, such as in a sports stadium or the aisles of a supermarket, and were clearly observable in the interactive environments created to harvest data for this study (see Chapter 4.8). Playspaces provide psychologically and physically blended environments for these negotiations to occur, ones in which the Self can be partially separated from. They enable individuals to take the ownership over their actions that transforms reaction into exploration.

Once ownership had been claimed over the uncertainty produced by encounters within the research artworks, automatic responses were replaced by determined actions. These exploratory processes of play functioned to locate the boundaries of the physical environment by establishing what was possible. The process was dependant on a mental projection of the environment and this

was evident in the types of play that emerged. Rules were established that enabled patterns of play to develop into games. The Playspace was where interaction was rooted in the research artworks and provided an environment for the transformative aspect of the interactive process, which is where contexts were established.

5.4 Participation and Creative Moments

Ownership and permission have already been named in this thesis as factors that were necessary to extended embodied interaction and social participation within the research artworks (see Chapters 5.4 and 4.6). They both contribute to addressing the first research question that seeks to identify them. However, there is another that manifested at a point where structure emerges as a consequence of embodied interaction and social participation as new meaning in the mind of the visitor. It was evidenced within the research environments by the behaviour of visitors transitioning from reaction into the self-determined actions of play. This factor, transition, is identified in the title of this thesis as a 'creative moment' and is explored here from the perspective of the visitor to the research artworks, and their embodied role in authoring a performative event from elements of the installations (see Chapter 4.6). Creativity, as a subject in its own right, is explored in several disciplines and is regarded as a complex area of investigation in which there is much disagreement (Kauffman and Sternberg 2006). Because visitor-authored creativity is entangled with the transformative aspect of encounters within the research artworks, it is important to devote some space to summarise its definitions.

Common assumptions often affiliate creativity with specific types of output that are themselves aligned with particular disciplines (Robinson 2001). Film, music, theatre and visual art are examples of what those are often thought to be. From a broader a more interdisciplinary perspective, many contemporary definitions of creativity are rooted in the American psychologist Joy Guilford's (1967) proposition of divergent thinking as a means to negotiate multiple solutions to a problem. He positions all potential solutions to an unresolved situation as accepted and valid with no hierarchy imposed between intuitive or logical resolutions. Guilford terms this 'divergent thinking' and contrasts it to convergent thinking, which he argues is rulebound and requires less creativity. However, both can be applied at different phases to generate resolutions because divergence explores potential for multiple solutions, and convergence applies the most adequate of them for a satisfactory outcome. Guilford's research involved developing verbal and performance tests that were designed to measure degrees of deviation from what might be considered a 'normal', or expected answer within a specific sociocultural context. Prior to his research, creativity had commonly been considered an innate quality naturally possessed by some individuals and not by others (Barlow 2000). In the final chapter of his book *The Nature of Human Intelligence*, Guilford remarks that his tests revealed a predominant decrease in divergent thinking in subjects that were older. He does not offer a reason for this claim, and declares that in some older populations his longitudinal study results also show increases in divergence.

Building on Guilford's thesis, the definition of creativity was developed from divergence to 'bringing something original and unique into being' by George Land and Beth Jarman (1992:153). Their influential analysis explored how creativity could be expanded and incorporated into every aspect of life. Included in their publication *Break Point and Beyond: Mastering the Future Today* are the results of their longitudinal creativity test conducted on 1600 children as they progressed through stages of schooling. The exact nature of the tests and what they involved is obscure and has never been revealed. However, given Land and Jarman's interest in the work of Guilford, it is possible that they built on his tests to measure divergent thinking. The researchers recorded a dramatic decrease in the results that children attained in the test as they got older, which led Land and Jarman to conclude that creativity was being gradually educated out of them through a socialising process that assigns 'value judgements'. These, they argue, are the result of agreements in notions of normativity such as 'good, bad, right, wrong, proper, improper, ugly and beautiful' (Jarman:153). They make a connection between playfulness and creativity, implying that without it thinking becomes convergent through the rules imposed by prejudgment. It is an important point in relation to the research artworks *Soundweb* and *Interplay* because divergence

was used as a strategy to navigate the uncertainty of visitors' encounters and was evident in the acts of play.

Land and Jarman argue that to introduce value judgement diminishes creative thinking claiming, as Guilford did, that restraint leads to convergence and not divergence. More recently, Mihály Csíkszentmihályi (1996:23) has positioned creativity as something that must be validated by an 'expert' and reliant on social interaction, such as the presentation of an artefact or event to an audience (1999). Ken Robinson (2001:15) repositions that said validation arguing that, in addition to originality, creativity must have 'value', with which Robert Sternberg (2009: 479) agrees by using the term 'worthwhile' as a definition. James Kaufman and Ronald Beghetto (2009) propose an impact-based system of categorisation with their *Four-C Model of Creativity*, headed by what they name Big-C creativity. In this group are innovations that have generally been accepted, or validated as ground-breaking, including ones that have been retrospectively re-positioned as such. In this section are theories and works of art, that they consider to fulfil their criteria. Next is what Kaufman and Beghetto call Pro-c creativity which is aligned to long term commitment to a practice that is considered by them to be creative, such as playing a musical instrument, or a skills-based game. Little-c creativity defines original and purposeful approaches to everyday living that include activities such as arranging photographs or scheduling. In their final category, Mini-c, Kaufman and Beghetto place innovative approaches to interpreting a situation.

Open-ended definitions of creativity such as that described by Land and Jarman (1992) have no criteria of value attached, whereas others, such as Csíkszentmihályi and Robinson's offer more finite versions claiming it must achieve suitable levels of measurement to be valid. In this study, creativity is considered an integral component of a visitor's encounter within the installation environments. It was the process of concept building that occurred through the formulation of rules that were developed through visitor actions in what is commonly termed 'play', underpinning performative events (see Chapter 4.6). If value were assigned to this procedure then it could be argued to reside in the specific visitor actions that were chosen to test potential contexts within the research installations, and their utilisation for sustained engagement. However, the specific behaviours and games that emerged within the installations resulted from a complex negotiation between multiple actions by visitors and alignments of the installation artefacts, and value is difficult to measure in this context. In the democratised environment of an installation, it is more useful to consider creativity as the point of transition between a visitor's emotional reaction to an encounter and their self-determined exploration of it. This not only generates the rules that define the terms of engagement, it enables its embodied counterpart, play, to be transformative by revealing new choices through a changed priority of imagination over accepted reality.

5.5 Conclusion

Encountering the uncertainty of a new environment for the first time, particularly an interactive one, requires a special set of actions and reactions from an individual which, in its most common form is manifested in play. Although this word is often applied to the way children, rather than adults, navigate their environments, it is an assumed difference and not the reality. This chapter has unpicked what play is, how it operates and what its connection is with interaction. The chapter argued that once responsive embodied affects began to be ritualised into play, a condition of ownership was claimed by the visitors over their trajectory within the research environments. Even though visitor agency continued to be subject to unconscious communication with others, visitors were able to engage their own agency in their interactive trajectories within the installations.

The chapter examined paradigms from psychology to explore relationships between the unconscious mind, embodied learning and the physical environment, to understand how interpretation and understanding might generate a framework for engagement. The environments in which interaction occurred were deconstructed, and a claim was made that these environments extended beyond the confines of physical space to merge with a mental projection of them. The resultant blend of material and psychological realms was identified as a Playspace. It was argued to be the location in which the boundaries of meaning were established within the research artworks by enabling visitors'

metacognitive abilities to establish and test workable rules through embodied interaction and social participation.

The three main aspects that were covered in this chapter discussed the 'how' (permission), the 'where' (physical/psychic space) and the 'what' (performative event) of embodied encounters. These aspects were argued to be tightly interwoven and the creative moment was positioned at the point where the automatic responses of visitors within the installations became self-determined ones, and identified as the factor of transition. Alongside permission and ownership, transition was identified as a third factor that extends engagement with participation in interactive environments.

Chapter 6

Methodology

6.1. Introduction

This chapter explains the methodology that was developed for this research. Components from a number of disciplines that have been integrated into an overall approach will each be explained, and include details of their original applications. The information provided is crucial because it emphasises why aspects of each discipline were suitable to this study, and clarifies why particular elements were chosen.

The overall conceptual approach applied methodologies from the fields of visual art, social science, engineering and interactive media. Each of them was conducive to different points of the research that break down into the following categories: artwork design and development; implementation; audience interaction; data collection; and analysis. It is important to note that aspects of them overlap and flow into one another, which will become more apparent as the chapter progresses. While, to a certain extent, a methodology was developed that is unique to this study, it is discernibly related to the American sociologists Barney Glaser & Anselm Strauss' (1967) Grounded Theory. The most important aspect that was adopted from their model is its premise that data collection precedes hypothesis. It was by taking this approach and applying it to an interest in human behaviour within interactive environments, that the findings were revealed during the analysis of the observed data, and the research questions addressed.

The research conducted for this doctoral project is interdisciplinary research investigating the mechanisms of visitor interaction that occurred within two purpose-built art installations. The term 'interdisciplinary' is used to emphasise the study's integration of traditionally separate fields to construct new forms of understanding. This is reflected in a research methodology that was established from combining aspects of four disciplines. First, the development of two interactive art installations enabled an enquiry through praxis, which drove the initial impetus for this research in addition to providing primary data to address its research questions. Second, Grounded Theory from Social Science was adopted as an umbrella strategy for making observation-based decisions on the development and analysis of the artworks because it is evidence-based and avoids pre-emptive assumptions. Third, Contextual Design's iterative development procedures from engineering were adopted into the main methodology because it advocates continued gradual development after a commodity has been made accessible to a public and assumes that a product market is unknown and changeable. in user-experience that emerged in the early stages of this research. While a bespoke methodology was developed for this research, it is one that can be applied generally to similar environments, for its ability to tackle knowledge gaps that exist in the visual art field.

6.2 Enquiry Through Praxis

The author has engaged with practice-based research in the visual arts for over three decades with an output extending from two- and three-dimensional works presented in art gallery spaces, community arts projects and public performance to non-traditional art audiences, such as those not expecting an encounter with an art event . Given that the vast majority of professional art production is developed to involve audiences in a number of ways that range from economic exchange to physical participation, the author has driven a practice that has developed an increasing interest in the relationship between a public and an artwork. To a certain extent this has been explored in a number of projects that were created and presented prior to those developed for this research. Modes of interaction that have been explored in these include encouraging visitors to gallery spaces to complete artworks by assembling objects or making marks on surfaces (*Please Continue*, Kearns, 2018); encouraging visitors to spaces to take part in workshop-style production lines to generate a final outcome(*Colour Me,* Kearns, 2016), provoking responses to

sensor-driven works that transpose movement to sound (*Smile and I will Sing to You*, Kearns 2015); utilising visitor-operated stills and video cameras to record, store and transmit images over the Internet (*Shoplifters of The World*, Kearns, 2013, *Smile*, Kearns, 2015) and the recreation of mundane external environments within museum spaces (*Cheow Keng Road*, Kearns 2013). Identifying aspects of these projects that catalysed responses in visitors, from those that did not, was not self-evident and remained elusive. Data of this nature is absent from the visual arts (Elwes 2015, Sowa 2016), and its addition has been a primary motivation for this research (see Chapter 1.2). Two artworks were created to specifically address a need to understand catalysts for participation within interactive installation spaces. The research questions presented in Chapter 1.2 were then applied to them to explore possible factors being required for public engagement. The position of the author as creator, observer and analyst offers a unique position in understanding the relationships between the technical and pragmatic mechanisms and functions of the research artworks and their potential effects on visitors. It is understood that it is also a situation that may harbour limitations to objectivity and create bias. However, the inclusion of, and adherence to the approaches from sociology (see Chapter 6.3) and engineering (see Chapter 6.4) in the research methodology help safeguard against innate subjectivity.

The research has an overarching affiliation with visual art through the development of interactive creative content that is positioned as artworks. The thesis findings are situated within a genealogy inherited from over a century of shifting relationships between the art object, the idea it encapsulates and the economy it operates within. With this in mind, the artworks made in support of this study, engage dialogues between their modes of production, presentation and consumption to deliver a central idea as an embodied experience. The study does not consider issues of cultural, or market value even though some of the artworks that have been referenced may be representative of commoditised economies.

The primary methodology in practice-led research, according to Australian academic Estelle Barrett (2007) is the practice itself, where the media and tools of expression lead to the interpretation of an outcome. Within the framework of that methodology dialogues that often appear fragmented and isolated between an artist, their work, an audience, time and place, can generate a response that may sometimes leave the physical indices of that interaction redundant. In other words, aesthetic experience is not always encapsulated within an object, and in processes that encourage an audience to contribute, it often lies within the decision to physically engage with a proposition.

The conceptual turn in art (see Chapter 4.2), in which the dynamics and hierarchies present in an exhibition space can become part of a work, has also influenced the principles governing the organisation of the spaces in which art is exhibited. This is widely acknowledged within Curatorial Theory and often involves individuals who are not involved in generating an artwork, but in contextualising its presentation to a public (O'Neill 2012). Although a curated exhibition can comprise a number of artworks by different artists, it is the dialogue between those works, the dynamics of the space that houses them and interaction by audiences that can often fulfil the intentions of the curator. This approach can facilitate unexpected connections between elements that foster exchanges between creator, artwork, audience and venue that can generate new paradigms that are equivalent to the generation of textual knowledge. Meta Bauer (2002) describes processes of realisation through curated artworks as conversations between strata, that in isolation would otherwise be silent. She argues that the consequent dialogue emphasises inherent multiplicities that reflect the complexity of globalised cultural readings. Deleuze and Guattari (1987) claim knowledge is de-territorialised when it is constructed from collaged information. According to them, this is how segregation between traditionally divergent subject areas can be contested.

Within certain aspects of art, particularly those that acknowledge a lineage through Conceptual Art, Fluxus, the Futurists and Dada, new knowledge is often generated through engagement with such multiplicities (Vincs 2007). The emergence of unanticipated models of meaning is ascribed by Barratt (2007) to increasing degrees of complexity within those new relationships. This is how the artworks created for this research were intended to contribute to the methodology. On the one

hand, both of them were independent installations that delivered an experience to an audience. On the other, they were in dialogue with pre-existing theories from a number of traditionally unrelated disciplines, which they 'tested' and where appropriate, adapted. The literature review was an important procedural element of the study that was incorporated into the theory-building process. As well as providing a conceptual and historical context for the artworks, and the research as a whole, it provided a discursive framework for theory to emerge through comparisons between existing paradigms and emerging evidence. The word 'test' is used to describe the exploration of established dialogues in the context of the research artworks. However, no rigid allegiances were made to particular theories. Instead, they were sought from multiple disciplines, to by-pass the need for their re-invention. Neither was there a specific methodology adopted in the construction of the artworks, in as much as a manifesto might have dictated how, or what was and what was not included in their material or form. However, because they were specifically built for this research, observability was a criterion in their design. Each responded to the requirements of a closed call by the venue host, which also affected their contextual framework, but was in no way constraining in terms of the data gathered, or their functionality as artworks.

The physical construction of the installations combined resources that were derived from pre-manufactured artefacts, including mp3 players, infra-red sensors, closed-circuit television cameras and Raspberry Pi computers, with articles that were purpose-built, such as projection lights and edited audio. These materials were used to build two environments designed to initiate physical interaction with a visiting public, the form of which was unknown at the outset. Without participatory exchange between visitors within the environments the artworks were considered non-functional. Time segments measuring periods of visitor engagement were the primary means of quantifying 'successful' development of the research installations. This measurement was not taken from paradigms emanating from existing, or accepted art practice but was set as a starting criterion for this research. Conclusions that were drawn on factors for successful engagement were done so retrospectively and based on observed visitor encounters. This is an approach that is more commonly found in product design and in the social sciences than it is in visual art practice.

6.3 Grounded Theory

Glaser and Strauss (1967) state that in the social sciences, proving or disproving a hypothesis often relies on the presence of certain sets of assumptions. In their view, the relationship between the use of a pre-defined theory and a specific area of research can become easily compromised and result in increasing inaccuracies. Setting out to prove or disprove a particular situation as the result of a specific event might easily be compromised by research that relies too heavily on existing theory. An example might be an accepted assumption of difference emerging from an ethnocentric viewpoint shaping notions which are then used to interpret the results of collected data (see Chapter 2.2). To address the gap that can emerge between data and its analysis, particularly when analysing human behaviour, Glaser and Strauss propose retrospectively grounding a theory in the statistics revealed during the research process. According to them, this produces hypotheses that are rigorous, accurate and irrefutable through the addition of more data.

Although Grounded Theory was originally recommended as a general method to include quantitative statistics, Cathy Urquhart (2013) argues that it is more frequently used as a means for analysing qualitative data. According to her, the method is primarily one of generating theory through the conceptual relationships established between individual segments of coded data. These associations are discovered through comparative analysis of divergence and convergence, both during and after the data gathering process. Allowing data to continually lead the development of theory through simultaneous analysis and collection is also intended to help identify the next most appropriate information that may be required in a study, and provide insight on how to gather it. Known as *Theoretical Sampling*, it enables the constant development of a nascent theory. Urquhart suggests that this can be accelerated through strategies such as data comparison between widely divergent sample groups.

The research presented in this thesis follows Grounded Theory's original general approach, and comprises qualitative and quantitative data. In an art context this is unusual because a prevailing belief holds that because it is linked to subjective experience, creative practice cannot be measured. This is highlighted by Elwes' (2015) and Sowa's (2016) concern on the absence of data within visual arts disciplines. With that in mind, this study explored engagement levels between participators and interactive installations as 'systems'. Visitors to the artworks had to physically engage with elements to experience anything other than a black dimly-lit room. There were no physical objects to hold or move around within either artwork. In the first installation participation involved moving through the environment to trigger sensors. In the second visitors responded to live video feeds of themselves projected onto each end of the space.

There is no single data collection method that is advocated by Glaser and Strauss. Instead, they recommend variety, arguing that different collection strategies might reveal different data. In addition, sample groups are not controlled, which helps randomise them and prevents the collated information from being prescriptive. This approach fits well within publicly accessible environments that present artworks, because there is little to no control over the makeup of visitors, outside of the criteria that attract specific groups to particular venues. It is important to acknowledge Fiona Candlin's (2010) observation from her research on museums that the majority of those that visit archival institutions come from similar privileged financial and educational backgrounds. However, the artworks that provided data for this research were presented in a space in Singapore that did not share this specialism, because it was not an art gallery and attracted visitors from a range of backgrounds.

During the early stages of investigation, Glaser and Strauss propose that research should exclude 'qualified' literature on a study area until after the core analysis has been completed. They reason that in doing this the developing theories are based on evidence rather than preconceptions emanating from a revised hypothesis. This is not to say that they recommend researchers enter the field with no contextual understanding of supporting literature; they suggest that it should not be used as the framework in which initial data is coded and analysed. Urquhart (2013) points out that this is because emergent theory may redefine the validity of initial literary references and highlight others that at the start of the research appeared unimportant. Once identified as relevant, Glaser (1992) proposes that literature can then also be comparatively coded by analysing convergences and divergences with the findings that have emerged in the field studies. While Grounded Theory is designed to aid researchers in the social sciences, this is a useful approach in an interdisciplinary study such as this one. Outside pre-existing knowledge and research experience, the literature that was used in this thesis was not grounded in a particular field, but sourced in response to observed situations. As a consequence, a great deal of work was required in unpicking discipline-specific language and lineage, but the benefits included a contextual framework that was open to unexpected turns in the resulting analysis.

The overarching objective in using Grounded Theory is to arrive at an unforeseen conclusion that is specific to its users and not refutable through the collection of more data. In this respect Gary Thomas & David James (2006) criticise it as a methodology more concerned with discovering new data than analysing it. However, Stefan Timmermans & Iddo Tavory (2012) argue that this is more likely to be the result of incorrectly applied Grounded Theory principles than inherent weaknesses in its methodology. During the process, data is collected, coded and analysed simultaneously by observing convergences and divergences between information sets collected at different times. Urquhart (2013) stresses that there are no recommended coding systems in the methodology, only the aim to reach a point of Theoretical Saturation, where no new codes can be generated, just repeats of existing ones. This was indeed seen to be the case during the course of observation and analysis of the artworks discussed in this study. While there were rare instances of deviation, the majority of activities within the installations eventually followed clearly discernible finite patterns.

The processes advocated in Grounded Theory are well-suited to this study, not least because it was initially developed to observe and analyse human behaviour within social situations. The scenarios that form the core of this study are rooted in a discipline that has historically lacked

analysis of audience interaction. The methodology actively encourages interdisciplinarity by avoiding presumptions, and as a consequence literature from a number of fields has been incorporated to aid the analysis of data. The application of Grounded Theory was not limited to the analytical phases of research. It was also applied to the design and fabrication of the installations that provided the collected intelligence. This was grounded in a remodelled version of the approach that was developed for the engineering industry, and is discussed in the next section.

6.4 Methodologies for Developing Interactive Installations

Through a process of trial-and-error two artworks were developed to actively encourage visitor participation and produce data that was measurable. This was initially managed by determining the time intervals that individuals spent engaging in activity within the environments, which is known as dwell-time. As further interaction patterns began to emerge, more quantitative and qualitative data opportunities became apparent. To replicate the development of a Grounded Theory within the creation process of the artworks, each artwork was developed in phases. Incremental development enabled comparisons to be made between the evolving stages, which were later used as evidence in the analysis. Evidence to what end, was initially left undefined and allowed to emerge during the observation process, in keeping with the principles of Grounded Theory. For the same reason, 'activity' was also left vague because interactive processes are often unpredictable and are in no way guaranteed to correspond with the assumptions of a creator or hosting venue. This not only applies to how a visitor group might respond but also the way meaning might be construed from interactions.

While it is often assumed that the interpretation of an artwork is highly subjective, it can only occur within learnt cultural frameworks. Such frameworks shift constantly, and within interactive art environments there are no fixed terms by which they operate. The implications are that it is unknown to what extent the information, as experiential knowledge or otherwise, generated through interactive processes is subjective or not, which is an area in need of further research.

Trial-and-error approaches to development are known in engineering as incremental or iterative design strategies. They have proved particularly successful within the sector of software engineering because they are responsive to change. There is a variety of closely related methodologies of this kind, including *Contextual Design* and *Interaction Design*, which Daniel Fallman (2008) describes as focusing more on the user experience than the final product. These 'experiences' are a mixture of social, cultural and economic conditions that set the patterns of behaviour within specific user groups. According to the *Interaction Design Foundation* website (2018), elements of user experience are addressed through criteria that fall into five categories: text; graphic symbols; physical objects; time; and behaviour. It then adopts a strategy that enables collected data to be fed back into a process of constant development to refine relationships with their measures. For many visual art practitioners iterative design processes may not be considered appropriate because their focus on human/product relationships may over-shadow the material form of their output. The medium of presentation is often a primary concern in the production of an artwork. However, because this study focuses on points of engagement, open-ended gradual development, such as those developed in Contextual Design strategies, was considered more appropriate. Its affiliation with communication technologies was also felt to present it with similar challenges to those faced in the development of this study's interactive art environments. More specifically, the aspect of interaction that is being investigated in this research chimes with issues addressed in Contextual Design, through their similar interest in the relationships built by unpredictable individuals interfacing with external mechanisms. These are essentially ephemeral situations where physical objects act as conduits for communication.

In 1988 Karen Holtzblatt and Hugh Beyer established Contextual Design as a methodology for gathering user data in the development of information technologies. Their aim was to foster creative freedom by dismantling both the traditional hierarchical management structures within design teams, and the linear product development synonymous with the prevailing *Waterfall* methodology. Waterfall is a linear design strategy that operates along a structure based on client

need, product design, manufacture and upkeep, where each issue is addressed as a distinct and separate phase. Holtzblatt and Beyer criticise it for not adapting well to technological or social shifts that may occur during the period of its development. This is because the method tends to rely on front-loaded data analysis, which risks rendering a product obsolete before its release if shifts in market behaviour emerge between its design and release stages. It is a common approach that has also prevailed within many of the creative industries, and a primary method by which the majority of artworks are currently made and displayed. Industrial applications that adopt a Contextual Design process initiate discourse between management and client structures throughout the design, development and release phases. Holzblatt and Beyer (1988) describe this as a communication process that is intended to identify and resolve misconceived assumptions about market behaviours. This is a development strategy that is then applied to *Agile* (see figure 6.4.1), another software design methodology that also bases development decisions on data gathered from human interactions (Mellor 2001). Holzblatt and Beyer argue that Contextual Design applied to Agile development strategies can avoid the potential product obsolescence caused by misreading market needs and lengthy design processes. The method involves collecting user data from prototypes that have been rapidly released into a market, are operational, but that have not yet been fully developed. By employing a variety of data collection tactics that include observation and interviews in the form of directed discussions, modifications can be made to tailor a product in response to unanticipated changes in the market. Agile development strategies aim to release commodities quickly and develop them through a process of constant refinement based on user needs and responses. This is achieved within a framework called *Scrum*, which enables a development team to work towards a common goal in short time segments called *Sprints*. A Scrum is an attempt to allocate non-hierarchical feedback dialogue within a development configuration that includes design team members, product owners, and users.
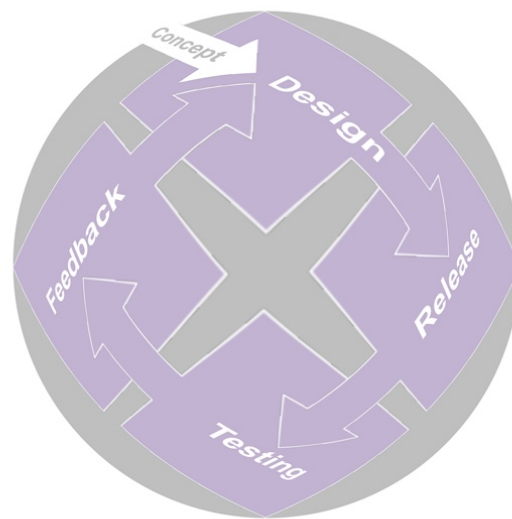
Figure 6.4.1 Diagram illustrating Agile design process

Contextual Design was updated in 2013 in response to the technological developments within the smart device industry. While incremental feedback and improvement is still fundamental to Holtzblatt and Beyer's system, they have introduced new data collection techniques aligned to what they identify as core human motives (2013:180). This takes into account how a product nests within the life of a user permanently connected to a network through their smart devices, such as a phone or a watch, which they name as Cool Concepts. This appears to reflect McLuhan's (1964) notion of *Hot* and *Cool* media, where a Cool medium (he uses the example of an illustrated comic strip), requires more participatory effort on the part of an interactor than a hot medium. According to him, decoding the truncated narrative and image arrangements native to comic strips requires consciously varying which senses are applied by a reader in their interpretation process. McLuhan argues that gaps between abstracted narrative and image sequences also require bridging within

understood implicit conventions native to the mode of communication. According to him, a hot medium, such as film, requires minimal participation and less effort because it engages just one or two senses, but to a far greater extent (1964). It is a questionable argument, because it does not appear to consider narrative editing, but it was influential at the time of its publication and continued to be for some time afterward.

Holtzblatt and Beyer's criteria for data collection includes un-prepared interviews in the form of discussions with users while they are engaged in their own daily life activities. They propose that discourse is punctuated with shared interpretation, and that the interview remains centred on the product being tested. The role of the interviewer is to steer the conversation in the direction of the 'cool' concepts so that relevant information can be gathered. The data collected through the interviews, or focused conversations, is then used to initiate a Grounded Theory, which Holtzblatt and Beyer (2015) argue prompts action within the design process. This appears to risk closed, or leading questioning, and was not adopted as a strategy in this study, where the conversations and interviews were conducted 'in context', either within the hosting venue, close to the installation space or in the interviewees' place of employment.

Artworks generally attempt to communicate a concept without prioritising an audience response, because they are often built on the belief that artworks have multiple interpretations depending on the nature of the audience. Non-engagement with a work is not necessarily seen as detrimental, because any reaction, including its absence, can be construed as validating. However, a primary function of the interactive environments made in support of this thesis was to produce observable responses that provided data which could then be used to address the research questions. The audience was repositioned as a user in an economy of experiential exchange. Evaluation was centred on levels of interaction, and the clearest way to measure it was in engagement, or dwell-time. This is a measurement criterion that is also found within video-game methodologies and is argued to represent the level of psychological player immersion within a game (Sharp 2015). Other systems of measurement became evident as the observations progressed, and they will be discussed further in the analysis of the data (see Chapter 8.6).

6.5 Video Game Methodologies

A video game is more than just an interactive environment that provides a virtual space in which an individual can enact decisions. According to Sharp (2015) video games present affordances that relate to cultural indexes through communities of practice which, according to Nicolas Esposito (2005), positions them as cultural forms. Tim Skelly (2009) claims that games are played primarily to gain a sense of individual agency, which is achieved through clear objectives such as ranking systems. While the objectives of a video game may differ from those of an interactive artwork, Prado & Natkin (2011) claim that both explore relationships between a system's perceived aim, an interactor's sense of agency and the system designer (see figure 4.4.1). As part of that system, methods are then employed to stimulate interest and encourage a 'player' to remain engaged. These, according to Colleen Macklin and John Sharp (2016), are procedures that manipulate synergies between actions, rules, objectives and players within the spaces that house them. In the context of this thesis, those 'spaces' are equally important because they also house an array of complex dynamics. Often in video games, the rules of engagement are implicit within the game itself and more complex interaction and procedures are established after a learning phase that is conducted through game play. With this in mind, the installation artworks kept instruction and explanation to a minimum to relinquish any explicit control they may exert over potential interaction events by visitors. For the same reason neither of the artworks was facilitated by staff, encouraging possible engagement to be as free as possible. The intention was to prevent the introduction of objectives through suggestion and to observe how they may emerge through the process of interaction. The content within the installations was not linear in that they presented a beginning, middle and end to the experience of a participating audience. In this sense there were no clearly definable objectives or rewards that an individual might construe as a reason to engage with them. Any narratives defining engagement needed to be self-initiated by visitors. This was intentional so that the level at which these needed to manifest themselves could be determined through observation.

Video Gaming methodology tends towards clearly definable goals, and according to Sharp (2015), in its simplest form inclines towards singular objectives. This might be in the form of a reward for solving multiple challenges, such as in Nintendo's *Super Mario* (1985), or Core Design's *Tomb Raider (*1996). It could even be developing a skill set with the goal of staying in play as long as possible, such as Nishikado's *Space Invaders* (1978). There are many types of video games with objectives that can be presented in multiple combinations. Regarded through the eye of Game Theory (see Chapter 5.3), these can be conceived of as mechanisms of exchange that describe what gains might be had through an act of participation. The research artworks investigate these as perceived objectives that encourage an individual to participate in an exchange between them and the system. This relates directly to a sense of agency or notions of choice an individual might have, which includes deciding whether or not to engage at all. For example, in a peripheral artwork by the author, agency was explored by positioning pens next to intaglio prints that, in combination with their title, *Please Continue* (2016), implied they could be written on by visitors to the exhibition space (see figure 6.5.1). This was one of a series of five prints where the author explored how expectations that manifest in audiences within gallery spaces might be subverted to encourage acts of 'vandalism', or graffiti.
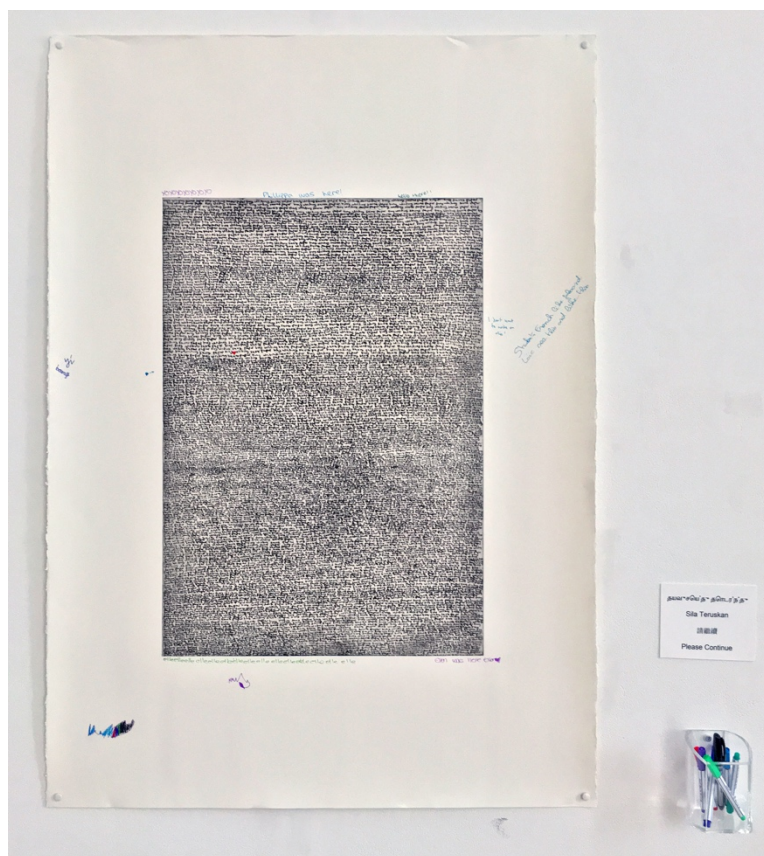
Figure 6.5.1 *Please Continue*, Theorem installation detail, Richard Kearns, 2016

In the first installation that was created to collect data for this research, *Soundweb* (2016), agency and objective were investigated by utilising a complex maze of infrared trip switches that, when activated, projected sound and shadow silhouettes onto the walls of the space. The aim was to establish the initial minimum criteria that can stimulate participatory processes without an apparent use of physical objects. Essential concepts could then be left intact through the modification stages. For example, the shadows on the walls that can be seen in figure 6.5.2 went through three phases without their central 'message' deviating. In each iteration the images remained similar, but their means of presentation changed. These developments are explained in more detail in the analysis chapter, (see Chapter 7.4) where the installation's developments are contextualised through links with subsequent changes in audience behaviour. In the second data

gathering installation, *Interplay*, the shadow silhouettes were exchanged for real-time projections of visitors to the installation space, and all audio was removed. It was an environment that offered greater narrative control to visitors (see Chapter 7.5)

Figure 6.5.2 *Soundweb*, Installation detail, 2016

6.6 Combined Methodologies

At first glance the disciplines (Engineering, Social Science, Video Games, Visual Art) from which the above-mentioned methodologies originate may appear to possess little commonality. However, their unifying feature lies in each of them building a dialogic relationship with a social user base. Developing an interdisciplinary methodology enabled the strengths of each to be reutilised in a bespoke approach that was aimed at addressing the thesis research questions. The study investigated the behaviour of visitors, so an approach that prioritised their engagement with an artwork was a logical starting point. The art installations required a careful creation process that if necessary could be modified or adapted at any time. The incremental development processes advocated in Contextual Design presented a workable solution, and an argument was made to the hosting venue to incorporate the method during the period that the artworks were accessible to a public.

Given that the potential visitor responses to the research artworks were unknown at the outset of their presentation, the research installations were made operational and opened to the public with the intention that they would be adapted in response to observed visitor reactions. The same data used for development purposes was assessed to ascertain levels of visitor engagement. One of the early benefits of this approach was that it enabled technical issues to be identified and resolved quickly. Although the technology utilised in constructing the interactive environments was not complex, it was applied in non-standard ways. Pre-manufactured and custom-built items were linked in ways that produced initial operational problems. In practice, these proved to be a combination of compatibility and manufacturing issues, including user-based wear and tear, some of which was intentional. Because the hosting venue attracted large audience numbers, continual observation proved critical in keeping the installations fully functional.

Agile and Contextual Design strategies are orientated to developing technologised products for mass markets by locating and designing for the needs of users. On the surface this may appear to differ from the motivations of visual arts output, which is often bespoke. The artworks developed for this research investigated how visitors engaged with them, and the principles of Contextual Design were adapted to explore how permitting unhindered exploration within the environments might extend those periods of engagement. Contextual Design as a methodology is closely allied

with Grounded Theory, and indeed uses it to construct hypotheses through the development processes. The major difference lies in the application of the strategies. Grounded Theory was developed for practices in Sociology, but still with human behaviour at the forefront of that process. Retrospective analysis is used by both as a foundation for decision-making during the incremental development stage, and proved fundamental to addressing the research questions with the development of artworks. Interactions by visitors within the installations were observed and measured in periods of time and compared to engagement periods once further changes were made.

Elements that were used in this research to engage visitors in participation were initially sourced from methodologies in the video game industry because there appeared to be a number of shared values and particularly the one of interdisciplinarity. According to Bernard Perron and Mark Wolf (2009), the video gaming industry has been interdisciplinary from its beginnings enabling it to embrace a wide subject area and mine similar subject fields to this research. They often adopt an Agile development practice and embrace unpredictability as a part of the development process (Fernández-Vara 2009). Many also use time periods as a measure of successful engagement. Most important to this research is their investigation into the alignment between cause, affect, agency and goals. Once transferred to the physical spaces of the installations, it was these alignments that were incrementally developed and manipulated through observation. Theoretical paradigms were then sought from existing literature in response to what was observed occurring within the installation to build a grounded theory. It was a useful strategy that prevented the re-invention of existing theories, which would be beyond the scope of this research. There was no rigid replication of existing strategies; they were put together to construct an approach that enabled a bespoke methodology to be developed that aligned the research questions with the technology used in the environments and an unpredictable audience.

6.7 Conclusion

This chapter explained the strategies that were adapted and combined to produce data for this research. Beginning with enquiry through praxis, it then introduced Grounded Theory, followed by Contextual Design and methods from video game development, before culminating in an explanation of how elements of them were combined to produce a new methodology. In addition to its application in this study, it is an approach that can be applied to the development of interactive environments in general.

The methodology took into consideration the particular concerns involved in building physical interactive environments that were accessible to a public and subject to continual development. It is a model that proved well suited to processes that revealed unanticipated avenues for system development, data coding and analysis, and particularly as a means of quantifying the potentially unknowable reactions of visitors. This is where the elements taken from Contextual Design proved useful, precisely because they did not make assumptions about 'users', or 'market' environments. Artworks tend not to be exhibited with the intention that the activity between them and their visitors is monitored, and in doing so the methodology developed here is particularly suitable for addressing the resulting lack of data in this area, as was identified by Elwes (2015) and Sowa (2016).

Environments that produce data, from which conclusions about exchanges between visitors and artefacts can be drawn, require an allowance for each interaction to be potentially unique. Combining retrospective analysis strategies of Contextual Design and Grounded Theory with paradigms emanating in video-game theory, enabled the validity of their similar concerns with rules in relation to periods of engagement to be rapidly assessed when transferred from digital to physical environments.

In keeping with Grounded Theory, the chapter explained how literature sources were identified retrospectively to provide continual research material throughout the duration of the study and offer insight as to how interactions might be understood. As a consequence, even though the data-producing elements of this research were intended to manifest as art, they were not rigidly

enforced as such, and visitors were free to conceptually shift the installations and their experiences within them in any way they wished. In this respect, the interdisciplinary nature of the study reflected a multi-faceted approach that allocated equality to the variety of theoretical propositions that were sourced, including those that originated from within the field of art.

Chapter 7

Enquiry Through Art Installations, Data Collection and Analysis

7.1 Introduction

This chapter explains the development process of the two interactive research installations *Soundweb* and *Interplay*. Both were created as artworks by the author to generate data that was collected by observing visitor encounters within them. Detail on how interactions were recorded and why those methods were considered appropriate are also included here. As discussed in the previous section, the methodology used in this process was an adapted form of Grounded Theory. In accordance with that, no initial hypotheses were being proved or disproved, and no assumptions were made on how potential relationships between either of the environments and their visitors might develop. The conclusions that are drawn from this research are intended to suggest a general approach to developing environments that encourage forms of participation on the part of an audience. This is evident in the study's focus on the operational mechanisms of the artworks, rather than their ability to construct meaning or contribute towards debates on aesthetics. While these are important issues, this thesis aims to help bridge a gap in knowledge on participatory processes within immersive environments, what they offer an individual, or their affordances and how that can be measured, at a point in time when participatory and socially engaged practices are becoming more common. It does this by investigating the psychological and physical overlaps involved in emerging relationships between human inhabitants and the components of the artworks. These are considered elements of an integrated system that incorporates artefacts, objects space and interaction as the artwork. It is important to note that no individual was coerced into participatory acts through third party suggestion, facilitation or ignorance, but entered freely into the environments and knowingly engaged in embodied interaction.

Critical artworks often function to either question or communicate to a public, and understanding the mechanics of interaction when this is an embodied relationship will potentially enable this to happen more effectively. A prevailing lack of evidence-based theory in this sector suggests that this research could serve as a valuable asset to any discipline seeking to engage a wide public in participatory processes of this nature. The systems made for this study use technology in innovative ways, but the theory that has come about as a result of the observations can be applied to a variety of scenarios, including ones that do not incorporate technology. As mentioned, it is important to stress that what is being explored in this study are the operational mechanics of interactive environments, and not the processes by which visitors might construe meaning from their interactions. Questions concerning the subjective manner in which information is transferred through these processes will be examined in a later study as it is beyond the scope of this thesis.

The chapter proceeds with a brief description of the environment in which the research artworks were presented to a public. It will include a further summary of the artworks themselves, how they operated and what they were referencing in their design strategy. A brief description of factors that may have impacted the context for interaction will also be included, such as other activities and situations that were occurring at the venue at the same time. The development stages of the artworks will be recounted with an explanation of how each of these affected subsequent interaction behaviours, particularly those that increased the amount of time visitors spent engaged in interaction. The chapter concludes with a description of the observational processes that were employed during the study, including reasons why they were considered appropriate.

7.2 The Artworks

Soundweb and *Interplay* each came about as the result of closed invitations by Playeum's Children's Centre for Creativity in Singapore that provides open-ended experiences for children up to the age of twelve, and their adults. At the time it was more commonly referred to by the first part of its name, which is 'Playeum', an amalgam of the words 'play' and 'museum'. Playeum

originated as an outreach organisation with the aim of promoting a foundation for creative learning through open-ended play. Its venue, subsequently opened in 2015, is situated at The Gilman Barracks, a large decommissioned army barracks that has been converted into a location primarily for commercial and funded contemporary art gallery spaces. One of these, The Centre for Contemporary Art, currently headed by Uta Meta Bauer, also provides a number of temporary artist studios for invited international and local artists to explore new work. Within this thriving art environment Playeum hosts a programme of themed interactive exhibitions that changes twice a year. It is a non-profit making organisation that charges an entrance fee of $20 (equating to £10 at the time of writing) to help fund a continuing outreach programme aimed at low-income families and children with special needs.

Among the number of discipline specialists Playeum frequently engaged with at the time the installations were exhibited, were architects, artists, designers, engineers and storytellers, all of whom developed interactive open-ended projects. The organisation presented itself as a multi-functioning creative space, and not an exhibition venue. This is an important point because galleries and museums tend to favour linearity where audiences enter, visit each artwork or experience them in sequence, moving on to the next (Smith and Smith 2001). In contrast, Playeum offers multiple activity zones where users engaged with hands-on activities that are arranged to encourage repeated experiences in no specific order, throughout the duration of a visit. These often occur in areas that are not clearly defined, in the way that Anthony Hudek (2009) recounts Jean- François Lyotard and Thierry Chaput's delineated sectors were in their landmark exhibition *Les Immatèriaux* (1985) at the Centre Pompidou, Paris. By allowing overlaps between content, forms of de-territorialisation were explored that challenged linear readings. Deleuze and Guattari (1987) claim that removal from the familiar (territory) also constitutes a colonisation of the new, because the culture of the old is used as a context for engagement. This was somewhat embodied in the soundtracks that were used to mark areas of *Les Immatèriaux*. Playeum's zones merge into one another through the absence of any precise demarcation, with the exception of the area that housed the installations made for this study. Named by the venue as *The Dark Space,* it is a curtained-off room measuring three by five metres with black floors and walls, segregated by a curtain across the entrance to prevent unwanted light bleed from the main area. It is a zone reserved for projects that require minimal illumination such as moving image projection, or works that explored light. Another important difference between this and a venue exhibiting art alone lies in the nature of the implicit rules (see Chapter 4.2). The Children's Centre for Creativity harbours an atmosphere of permission. It may be tempting to assume that the venue's implicit rules were responsible for encouraging play within the installations, but it is not considered to be the case. Evidence gathered in the study indicated that exploration of an unfamiliar environment occurs in playful ways despite transferred rules, especially among the young, and it is often the implementation of didactic structure by appointed figures of authority that prevents it.

7.3 Soundweb

Soundweb was a motion sensitive interactive artwork comprising six animal calls that became audible when an infrared beam was broken. In unison, six projected animal silhouettes were timed to remain visible for five seconds when their sensors detected movement. Each sound and image projection was independently connected to its own sensor. There was no central control unit; this was a role bestowed on the inhabitants of the room. Without their presence the room remained dark, and all that could be heard was the song of a nightingale. The moment the entrance curtain was disturbed and the room entered, the singing stopped. The nightingale was not audible from inside the space.

The artwork came about as a consequence of an invitation to submit a proposal to the venue for a themed exhibition of interactives titled *Hideaways: Creating with Nature*. Aside from the theme implied by the title, the only requirements made in the invitation were that the proposed work should involve visitor participation, be open-ended and able to withstand the large footfall that was expected to visit for the duration of the exhibition.

The conceptual aim of the work was to probe assumptions on notions of naturalness and mediation. It was an exploration of the terms an audience might engage to appropriate and make relevant an environment that had been made unfamiliar. All of the source animals were local to the area, but had been presented in a nocturnal setting. However, nightingales are not indigenous to the region, which is why this audio loop did not play when the room was inhabited. Its function was to indicate that the room accommodated a potential experience and to encourage further visitor exploration by enticing them in. This particular bird had been chosen as a pun on the artwork's creator also not being from the region. These aspects were separate from the installation's underlying function, which was to gather data and identify the causes of physical engagement within interactive environments.

Figure 7.3.1 Projected owl silhouette, installation detail, 2016

The exhibition *Hideaways: Creating with Nature* comprised works by five additional artists, each presenting a participatory experience. Isabelle Desjeux created a digital microscope using a web-camera connected to a projector. Amongst other provocations it enabled onlookers to witness the investigation of other individuals into a variety of living and dead insects in a work titled *Knock, Knock, Who Lives There?* Madhvi Subrahmanian in her *Make-Believe Hideaway* produced an on-going workshop style project that encouraged visitors to produce clay forms, which were then added to tree-like structures throughout the duration of the exhibition. Shogun Creatives constructed an interactive sound tunnel out of bamboo and living climbing plants situated directly outside the building. A variety of natural sound emitting objects were attached to its interior in a work they titled *Sounds of the Earth, Nature's Ensemble*. Visitors were invited to construct their own musical instruments out of a variety of natural and recycled materials and add them to the structure. The People's Atelier installed a piece called *Welcome to my World* which also intended to create an immersive environment to coax visitors into feeling like insects. Participants were encouraged to build shelters inspired by insect architecture that were intended to be continually developed over time by multiple contributors. Bartholomew Tang developed *Creature Cave,* which was a large gyroscopic corrugated cardboard structure that housed an extension of *Soundweb* developed for toddlers, where they could explore a range of textures, LED lighting effects and pressure-pads that when activated emitted a range of animal sounds. The interior of this space was developed in collaboration with Playeum who installed other sensory stimulation in the form of wall textures. Data was not collected from the *Creature Cave* for this research because of its cramped conditions, and the heavy carer facilitation required for the occupying age

group. It was targeted at very early years, the majority of the children being under three years of age.

The conceptual heritage behind the installation *Soundweb* had two key references, the first of which was Plato's narrative *The Cave* (380 BCE). This has been mentioned in Chapter 2 (see Chapter 2.7) and is a tale recounting a transition the protagonist underwent in a journey between two environmental conditions. According to the story, the change revealed that what is perceived by the eye and interpreted by the mind is not truth, or renditions of reality, but a diluted manifestation of it. The pure versions Plato named *Ideals* and claimed that they were ungraspable by the human mind and existed in a non-place beyond space and time. In *Soundweb* this *ideal* had been switched with a replication. The projected animal shadows (see figure 7.3.1) were generated from mass-produced children's toys. Each had been positioned in a telescopic tube with a powerful light emitting diode (LED) at one end (see figure 7.3.2), and a magnifying glass at the other, which enabled the toy's shadow to be focused onto a surface.

Figure 7.3.2 Silhouette projection source for the cicada

The second reference borrowed by *Soundweb* was the Indonesian shadow theatre, *Wayang Kulit*, where backlit silhouettes of puppets are projected onto a screen, often accompanied by a narrative sequence of voice and music. A medium frequently used to narrate traditional stories, it bears some similarity with cinematic experience. While the origins of shadow puppetry are widely debated, with evidence of it found in China and Europe among others, according to Fan Pen Chen (2003) it is the art form emanating from Java that is considered the most complex and sophisticated. This form of cultural heritage continues to be popular in Singapore with performances attracting large community audiences. In *Soundweb,* both the allegory of the cave and the shadow theatre met through their use of abstracted reference to forms from nature that created intangible narrative relationships with reality, the control of which was offered to the installation's visitors.

Soundweb presented an interactive experience that occurred within a three by five-meter black-cube style room. When the infrared sensors where activated, visual and audio cues in the form of shadow animal silhouettes and their respective audio calls, were projected at various points within the room (see figure 7.3.3). Specific animals were chosen that were, or had been indigenous to Singapore and known to be active at night, even if not strictly nocturnal. They comprised a cicada, crocodile, frog, scops owl, tiger and toads. The tiger, for obvious reasons, was eradicated from the island in the first half of the twentieth century (NLB 2004), but sightings are still claimed in

nearby Malaysia and Sumatra among others (Thompson 2010). Each of the animal sounds perpetually played on a small mp3 device that was connected to a powered loudspeaker. The power supply for each of these was attached to a sensor that emitted an infrared beam. Each of these, in addition to a second array controlling the lights, criss-crossed the room to create a gossamer of light, invisible to human perception, that constituted the *web* element of the artwork. When one of these threads was disrupted by something passing through the room, power was supplied to the speakers and the audio could be heard. The afore mentioned nightingale, on the other hand, operated in reverse. This audio loop could only be heard from outside the room and switched off whenever movement was detected inside and had no accompanying shadow image.
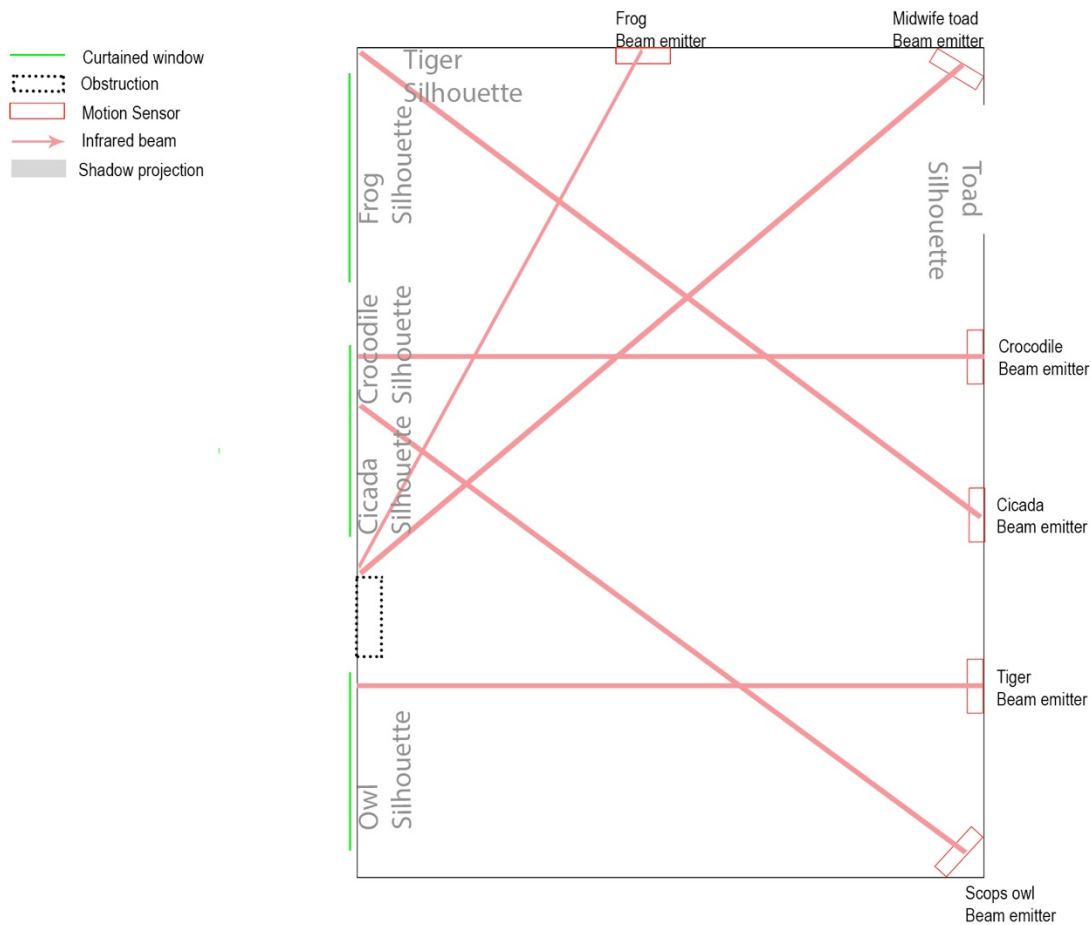
Figure 7.3.3 Plan of *Soundweb* showing sensor and shadow locations

The venue's theme, *Hideaways: Creating with Nature* was interpreted in *Soundweb* by isolating elements of the local natural soundscape, what Bernie Kraus (2012) describes as a biophony, and re-presenting them stripped of any immediate signifiers. The habitat these sounds were intended to colonise, in combination with the silhouettes, was a psychic one generated in the mind of the audience through a process of de-contextualisation and re-naturalisation. Half of the playback loops were re-arranged into rhythms based on instructions found in 'How to Compose' literature, such as those found on edmprod.com's *The Ultimate Guide to Writing Better and More Memorable Melodies*. Texts of this nature tend to include cultural assumptions that are often applied to their topic of discussion. For example, one such claim frequently found in composition guides is that ascending arrangements are uplifting and descending ones melancholic. These

claims can also be found in academic literature on music theory, such as Laurel Trainor and Kathleen Corrigal's (2010) *Music Perception* but they lack the instructional quality found in sources that are aimed at popular mass consumption. To comply with the guidelines found in the literature, the audio loops were cut, collaged or had their pitch modified. One loop, for example, arranged five croaking frogs into a descending tonal order. Another adjusted the frequency of the owl's screech and arranged several variations into a syncopated rhythm. This is a musical procedure that often stresses a note before it is expected in order to break the sense of uniform timing within a melody. Evenly timed animal calls can sound like electronic alarms because they occupy narrow frequency bands. The original intention was to produce the calls so that they could be easily identified as either melodic or percussive and then live 'edited' by visitors manipulating the sequence in which they were activated (see Appendix H *Soundweb* Audio).

7.4 Interplay

Soundweb presented ephemeral versions of animals, through their projected images and calls, for visitors to explore in a psychological environment that was also rooted in the physical dimensions of the installation space. The second installation that was created to generate data for this research, *Interplay*, explored ephemeral versions of its visitors and their movement, but this time in relation to an extended space that had been folded and re-presented on a screen. The installation investigated the 'manifestation' of a psychic self in a screen space that was created by real-time closed-circuit video projections. It occupied the same space that *Soundweb* had three months earlier and was developed in response to a second closed invitation requesting an interactive artwork that considered the venue's new theme *A World Full of Stories*.

Interplay comprised an array of four infra-red cameras that were secured at unequal intervals along the walls of the space at a height of 1.5 meters from the ground. Each camera was connected to a Raspberry Pi computer which enabled them to be programmed to operate with minimum effort. For example, if there was a problem with the software, the system could be switched off and on at the power supply and the computer would automatically reboot the video feed. Small cages protected the camera and computer hardware from damage, which meant that this installation could also be left un-facilitated without risking its elements, or the safety of the potential inhabitants. Each of the four microcomputers fed their video signal to a projector that had also been placed inside a cage for protection. Infrared floodlights provided bright illumination for the cameras, but were invisible to the installation occupants because they were beyond the spectrum of the human eye (See figure 7.4.1). This enabled a bright detailed image to be captured and projected onto the screens. Enough ambient light was provided from the beamed image for the audience to navigate the space without injuring themselves, or giving the impression that the space was closed and their presence was a mistake. The wall at each end of the room was painted white and functioned as a large image screen, and respectively held a composite of two of the four projections. Each of these overlapped by one metre and was sourced from a different camera positioned around the room. The intersecting screen area gave the impression that there was a convergence, or fold, in the video-space that was not physically present in the room. The overlapping projection screens created the illusion that individuals occupying different areas of the installation were next to each other on the screen. One of the video feeds at each end of the room had been flipped 180° to introduce a counter-intuitive reflection of audience movement. Individuals positioned in different zones of the installation could explore another's virtual personal space, but it would require them to develop a degree of skill to combat the image flip. This afforded visitors the ability to interact with each other in a virtual screen space, while remaining at least three metres away from each other in physical space (see figure 7.4.1).

Interplay responded to the venue's theme *A World Full of Stories* by subverting traditional approaches to representing an account, and did not have a plot, a beginning, middle, end or any of the mechanisms that may be assumed to be associated with the structure of a story. It reflected back to visitors whatever scenario they chose to explore, or perform, within a framework of observation. Alongside their own self-observation, it included that of any others within the space. The process of surveillance was an important part of the installation's procedure because it helped to define action as a contribution to self-initiated narrative.
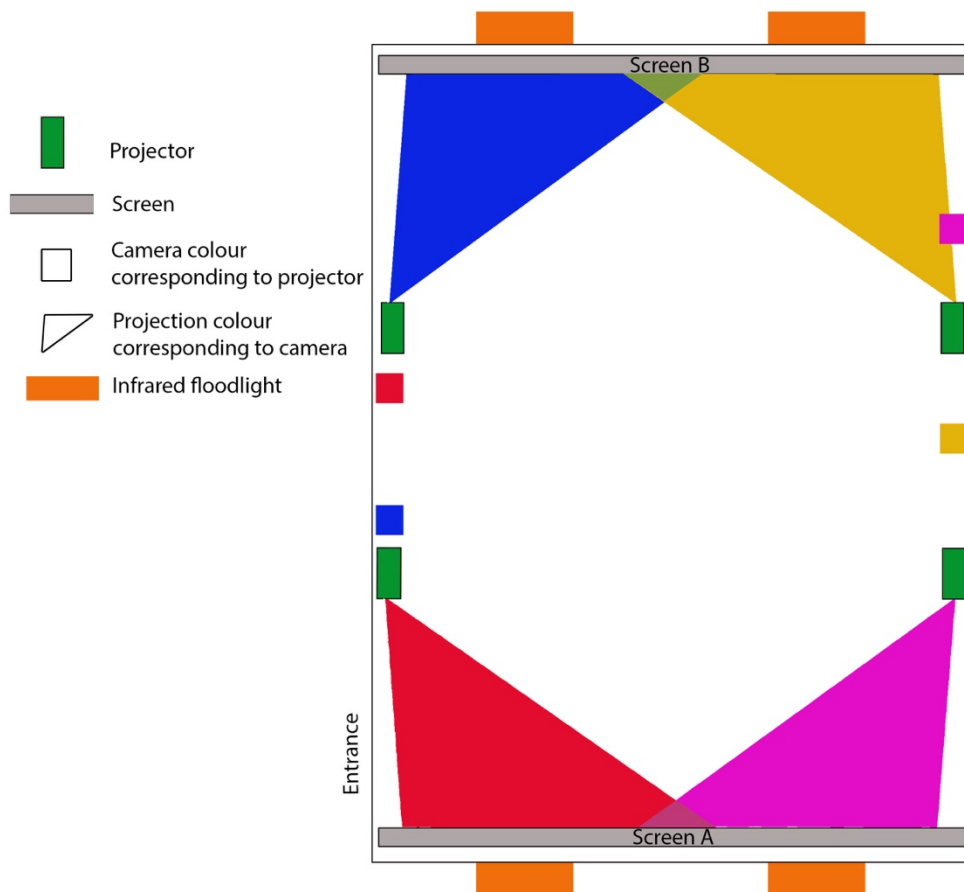
Figure 7.4.1 Plan of *Interplay*

Aside from its function to explore the catalysts of participation, as an artwork *Interplay* was constructed to explore three aspects of a participating audience. The first was to establish if, and for how long personal boundaries are maintained between interactors in a screen-space whose proximal relationships do not correspond with the physical environment. These could be self-maintained spatial boundaries between one individual and another, or psychological ones. The intention was to reveal to an audience the existence of junctures between video-presence, psychic-presence and physical presence by creating a dialogue between viewing and doing. The artwork sought to examine whether a convergence of these components would initiate an intersectional space, or Playspace (see Chapter 5.3) in which proximal limitation could be explored. The third aspect was to observe the interaction of an audience once the apparent power structures of ownership had been displaced from the media that was being used. Instead of offering a 'pre-developed' structured narrative that audiences could respond to, it relied on them taking ownership and responding to the immediacy of the moment by exploiting an assumed pre-existing relationship with the form of the installation's structure, namely screen-based technology. This could be as simple as visitors understanding the reflective nature of a mirror or shadow, or that television, film, theatre, or video-games, among others, follow implicit narrative structures. These media were ubiquitous and accessible amongst audience groups that accessed *Interplay*, and it commented on the manner in which these technologies mediate information through the nature of their own mode of transmission. This is a complex set of issues that is not only affected by the way media is edited and what its primary function is, but by what it does to the sense of Self through identification with a protagonist in a narrative, or the control of a gaming avatar.

Figure 7.4.2 *Interplay,* installation detail showing virtual interaction

Unlike the majority of video games, films or plays, *Interplay* removed the regulating author(ity), which more often than not transmits the ideologies of a script's benefactor, and the interests of the presenting parties. To elaborate on this, information, whether printed or transmitted, is and always has been subject to certain levels of control. Likewise, individuals and populations have always been receptive to control mechanisms. This was shown in Stanley Milgram's well-known 1961 experiment, where participants were encouraged to deliver electric shocks to an unseen other whenever that person answered a question incorrectly (Rod Dickenson re-created the experiment in 2002 as an artwork). Even when the level of electricity delivered in an electric shock appeared to exceed safe levels on visible dials, the majority of participants continued to deliver them when instructed to do so by the figures of authority leading the experiment. Peter Foulkes (1984) argues that the apparatus of control is also embedded within the fabric of everyday structures, such as vernacular language, and tend to reaffirm cultural norms, and in doing so can be positioned as forms of propaganda. While the origins of the word 'propaganda' once described the propagation of animals and plants, Erwin Fellows' (1955) etymology tracks its changing meaning to the promotion of an idea, whether in advertising, politics, religious ideology or news feeds. Foulkes claims that propaganda is most effective when it is hidden within the structures of society and language which, according to him, is exemplified in phrases such as "cashing in on an opportunity". He argues that when ideology is covertly reinforced through everyday terminology, there is great difficulty in maintaining objective critical distance from those manifestos, which is what makes it so effective. It is with this in mind that *Interplay* offered audiences a mechanism based on familiar modes of presentation, but without offering any clues on how it should be interacted with. This had to be drawn from what visitors could apply from their past experiences, what they saw others doing or what they were prepared to explore now the control element had been transferred from the media content to the situation. Although on the surface there was no instruction or narrative direction, it is acknowledged that behaviour could be moderated by similar systems that operate within the propaganda of the everyday. The moment a public knowingly enters an environment in which an artwork is displayed it also enters a contract that potentially mediates its behaviour. This is aided by the implicit structures present within the hierarchies of the institution itself, or indeed, location, which has been discussed in the section on Situational Aesthetics (see Chapter 4.2), and in the exchanges of Game Theory (see Chapter 5.3). This is aside from the control the artist exerts over the audience through the arrangement of function and

the position of objects and titles, and it is the institution itself that provides the introduction to what Groys (2008) argues is extended authorship (see Chapter 4.5).

It is important to outline how the installations were intended to operate as artworks because that is the context in which they were delivered to their visitors. It could be argued that the audience entered *Soundweb* and *Interplay* in the knowledge that they would provide an interactive experience, and through their own imagined expectations, were likely to behave in certain ways, such as interact rather than observe and reflect, for example. However, even though Playeum's Children's Centre for Creativity offered a permissive environment, participation with a provocation was not obligatory. In both instances it was observed to be the result of alignment between the physical and psychological aspects of the artworks. When this was not present interaction was, at best, minimal. The initial gauge of audience participation with both artworks was marked by the duration an individual spent actively engaged within the installation. As the installations progressed through their periods of public access, other criteria were added. In the case of *Interplay,* for example, this went on to include the gestural responses adopted by visitors and the trajectories they followed through the space. These were dwell-times that were observed 'live' and recorded so that they could also be reviewed at a later date and assessed in a number of contexts predisposed to a variety of disciplines.

7.5 Data Collection

Collecting data for the evaluation of public interaction with an artwork is unusual in the visual arts, and to address the research questions of this thesis a method was sought that would have minimal influencing effect on visitors. *Soundweb* was accessible to the public for six months and *Interplay* for five months. Based on the host venue's entrance figures, each of the installations received approximately seven hundred visitors per week. The majority of these were children under the age of twelve. Interviews with visitors were difficult, as working with young people can be challenging, so the data derived from each installation was drawn primarily from observation. Given that the number of visitors to the installations was so high, the observations were considered reliable because the documented interactions reached the theoretical saturation advocated in Grounded Theory (see Chapter 6.3).

Soundweb was the first of the two installations constructed for this research, and the observational data gathered from it during the period it was open to the public provided information for its subsequent developments. Of a total of fifty-seven days observing *Soundweb,* forty were conducted with the researcher physically present within the installation documenting interaction in written form. Due to the speed that was required in documenting information this consisted of box ticking categories such as approximate age and gender based on appearance, with space to add duration and extra notes on particular behaviours (See Appendix D – *Soundweb* Interaction form). All information was considered potentially valuable at the initial stages of observation and as many discriminators as possible were logged. While gender and age are not considered by the author to be determinants of interactional response, the methodology adopted in this research made no presumptions on what would emerge in the artworks, and so estimates of these were included.

During the initial period of documentation, it became clear that the challenges involved in making notations by hand of multiple interactions within the entire space of the installation *Soundweb* was inadequate. At most, only one or two interactions by individuals within the space could be recorded at any one time, when often there were a number of inhabitants within the space. The environment was dimly lit and what notes were taken were not legible until the installation had been exited. The visible presence of an onlooker lurking in the corner of the installation while taking notes was clearly affecting responses audiences had within the installation. This was evident in attempts interactors made at verbal communication with the researcher during observation periods, and gave the impression that the space was facilitated by a staff member. Theories on the non-neutrality of visible observation processes are well known and include the Hawthorne effect (Landsberger 1958) among others, where the noticeable attendance of a witness documenting behaviour is argued to modify the behaviour of those being observed.
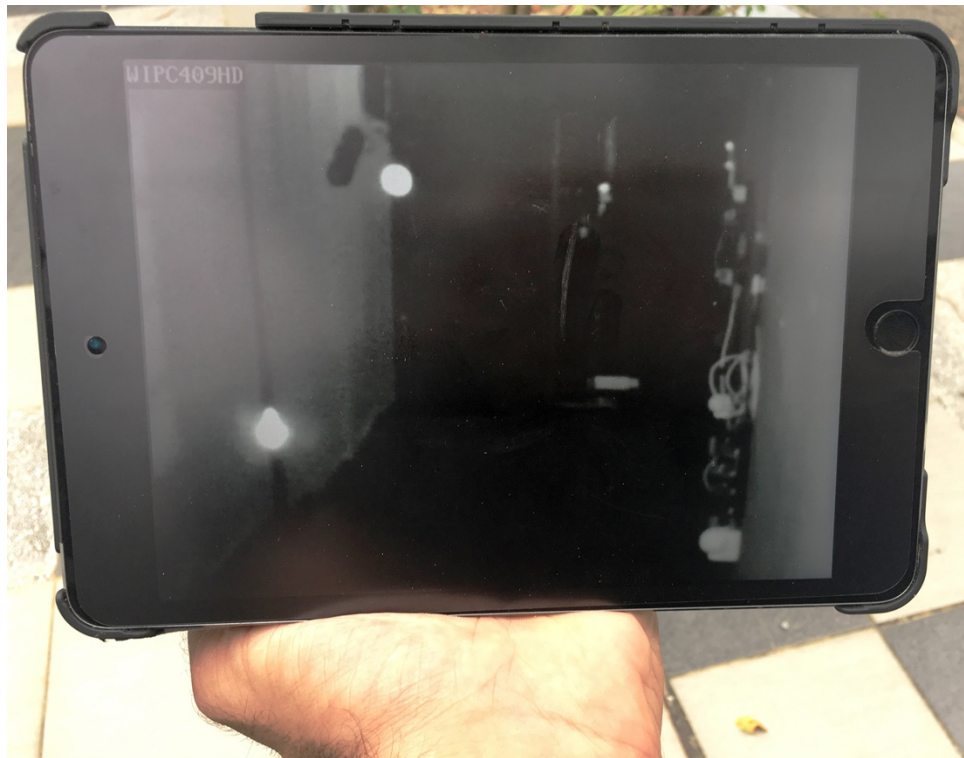
Figure 7.5.1 Remotely monitoring *Soundweb* with a tablet

Any movement by *Soundweb*'s research observer also ran the risk of triggering an audio effect within the space and inadvertently affecting subsequent events. A decision was made that for the remaining seventeen days data would be live streamed and recorded using a video camera discreetly mounted within the space with the researcher on site, but not present within the room. On entry to the venue, visitors and their guardians were informed of the monitoring process and its purpose and were asked to sign a consent form. The observation process was governed by the number of visitors the venue had on randomly chosen days throughout the life of the installation. On each of these days data collection periods lasted up to two hours, split into segments based on periods of activity.

The change in the collection process was transformative for this study because by comparison a far broader range of activity within the installation could be captured. In addition to how installation artefacts were responded to, the video recordings began to reveal how audiences behaved with each other within the environment. The dynamics occurring between individuals as groups had been invisible while collecting information using a pencil and clipboard. Although the number of days on which data was collected by camera equated to less than the written documentations, the number of observed interactions was far higher because the behaviour of all participants could be witnessed, both individually and as groups. While the written documentation was used in the analysis, the video recordings enabled interaction to be viewed several times and within a variety of framing criteria. This was useful because methodologies based on Grounded Theory tend to require large amounts of data to make emergent patterns visible.

The success of *Soundweb*'s process of data gathering by video led to its subsequent adoption with *Interplay*. In this study two cameras with rotatable heads were installed, one at each end of the space. While this led to twice the amount of recorded information, it also enabled the room to be viewed in its entirety, revealing sometimes difficult to view relationships between the individuals in audience groups and artefacts. *Interplay* was exhibited in an identical environment to *Soundweb*, which offered an opportunity to compare the installation with groups of the same visitor profile and under the same conditions. Data was gathered using the two surveillance cameras with one positioned above screen A, the other above screen B (see figure 7.4.1), which enabled dwell-times throughout the entire space to be observed. There were twenty-one observations, each lasting an average of ninety minutes, during which nine hours and eighteen

minutes of data was recorded on one camera, and eight hours and forty-one minutes on the other. The difference was due to occasional technological failure. Each observation camera transmitted data separately over its own wireless network, and sometimes one or the other would stop working.

Visitor engagement within *Soundweb* and *Interplay* was recorded on closed-circuit cameras that enabled behaviour within the space to be re-viewed and re-analysed any number of times. The approach enabled previously hidden variables to be considered, such as child to adult ratios, or the influence of concurrent workshops within the venue in which the installation was exhibited. While these factors were observed to have an effect on modes of interaction, they were not enough to radically shift the overall patterns of behaviour and influence in the way that the artefacts within the installations operated. Due to the nature of the hosting venue, the majority of audiences were children, and over the course of the observation periods there were no perceivable differences in the way either gender behaved within the installations whether in mixed or same sex groups. It was the recordings that also provided evidence for the emergence of Playspaces through observable dialogues between an individual's somatic self, or bodily presence, and its psychic equivalent, the emotional and imagined relationship with it, and the environment. It was a discourse that emerged when visitors engaged within the installations as components of an autonomous system (self, space, artefacts and other interactors). This is important because the emergent relationship between the ludic (spontaneous unrestricted play) and the intersectional states of being appear to constitute a test site for context.

7.6 Processes and Methods of Data Analysis

This section describes how collected data was coded and explains the decisions behind qualifying particular events and situations as significant. The periods chosen to observe activity within research installations *Soundweb* and *Interplay* were randomly picked times that fell either in the mid-morning or mid-afternoon of a data gathering day. This was to avoid sections of the day where visitor occupancy was likely to be at its lowest, such as lunch times. This was a pattern that was already established at the hosting venue, and most likely due to the absence of food or beverage facilities.

Documented visitor activity within *Soundweb* and *Interplay* was coded by identifying repeated patterns of interaction behaviour that occurred within the installations. In accord with Grounded Theory, criteria for choosing particular events over others were not pre-defined, although the initial observations that were documented by hand within *Soundweb* did include a check list of statements that could be ticked, such as school, birthday party or other-group (See Appendix D – *Soundweb* Interaction form). This was to enable the sections to be filled out quickly by gathering types of information that did not necessitate writing. The data collection sheet also had space to elaborate on any specific activity that took place, any deviations and any participant feedback that may be given. Comparisons were then sought among the written accounts of visitor activity by looking for convergences and divergencies in activity and dwell-times. The process of data coding began by grouping similar activities together and noting how many times they re-occurred. It was through this process that the inadequacy of this approach to data gathering became apparent. Even though the notes were written at speed, a very limited number of interactions were recorded and often with insufficient detail. The installation was prone to multiple occupancy with individuals often entering and leaving at similar times.

Once data collection by hand filled form had been abandoned in *Soundweb* it was gathered instead by observing live interaction within the installations via closed circuit television cameras. All of the activity occurring during *Interplay's* observation periods was gathered in this way, with the addition of an extra camera to cover the entire space. Transmitted video and audio signals were received on mobile smart devices situated nearby and were observed live and, when the installations were inhabited, were also recorded. Footage was then analysed in addition to any notes that might have been taken at the time (see Appendix D - Notes taken during CCTV observations). Unlike the written documents the video recordings enabled the events to be re-visited multiple times and enabled manifold interactions to be observed simultaneously.

Each video segment that was recorded during an observation was examined for behaviour and events, to which a descriptive title was allocated, sometimes as a short statement. These were documented on a large sheet of paper to build an initial observational gauge for the types of interaction that might occur in the environments (see Appendix E). The list of initial patterns was used as search criteria for a manual re-examination of all the video footage to establish frequency and duration of activity with a particular interest in any activity that appeared to be mirrored in other observation footage. This was a time-consuming task that provided deep familiarisation and visual sensitisation to events that occurred within each installation during their observation periods. Each time the video segments were re-examined more nuanced patterns became apparent which were documented and titled accordingly and added to the search criteria, before the footage was scrutinised again. The interactions that became part of this coding method emerged through live and repeated observation and documentation of video footage. Coding the interaction data consisted of noting the repeated patterns as headings in a notebook and counting the number of times and duration that each event occurred (see Appendix D - Annotated Patterns: *Soundweb*/*Interplay*).

Data drawn from *Interplay* produced twice as much video footage than *Soundweb* because two CCTV cameras were installed instead of one. The extra camera enabled observation of the entire space, leaving virtually no blind-spots. The camera heads could also be remotely rotated and any activity that was outside the field of view did not remain so for long. In addition to interaction within *Interplay*, the trajectory of visitors through the space was also mapped. It was apparent from the first observations that visitors appeared to congregate in specific areas of the installation before moving to another, and in most cases this probably accountable by the position the cameras along the walls and their field of view that was being projected onto each end of the space. An attempt to track these movements with a software package proved unsuccessful, so the movement of individuals was manually traced using the observation footage to establish approximate trajectory patterns (see figure 8.5.6). The identified trajectories were precise enough to conclusively categorise particular mass behaviours within the space.

Navigating the complex interconnections between artwork development, observation and analysis in this research was greatly facilitated by them being conducted by the same person. This is because, in this instance, data coding and analysis were interlinked processes tied to installation development and to addressing the research questions. This was a dual approach that required experience in practice-based development because changes made to the artworks needed to be applied quickly to fit within the timeslots available in a public venue, and the overall exhibition timeline. It also required discoveries that were made during textual research to be considered and where appropriate included in the development and analysis processes. Apparent correlations with similar findings in other fields such as biology, psychology and sociology, for example, were simultaneously explored through their literature and by observing behavioural patterns in the installation environments. The parameters for these convergences were identified through the written descriptions that were mentioned above, of visitor behaviour, being fed into internet search engines. When the search results appeared to reflect the activity descriptions within the installations, the source and its discipline were investigated in greater depth.

7.7 Conclusion

Developing two interactive art installations and presenting them to a public provided a stable and controlled foundation to this research. It permitted the prior skills and experience of the author to be utilised in a manner that enabled the collection of primary data that specifically addressed the research questions without having to learn new skills of construction, presentation and venue negotiation within a visual art context. Had existing installations been used as case studies, making changes to reveal catalysts for public interaction within them would not have been possible. This chapter explained how the installations *Soundweb* and *Interplay* were developed, and what happened when visitors entered them. It described how information was gathered on activity within the installations, clarified what was being sought within that data and how it was coded. The chapter illustrated how the installations were developed through a combination of continual live and retrospective observation. It was shown how this enabled the operational

functionality of both artworks to be maintained by utilising data on interactional and participatory behaviour of visitors. The use of live and recorded video in the observation process was proven to be a fundamental component in addressing the research questions, and the chapter explained how careful examination of the collected footage gradually transformed into informed observations. As will be seen in the next chapter, this approach facilitated deeper understanding of the events within installations during the analysis stage.

Chapter 8

Findings

8.1 Introduction

Drawing on observations collected from the two art installations, *Soundweb and Interplay*, this chapter will elaborate on the strategies that were observed to maximise audience engagement with the interactive environments *Soundweb* and *Interplay*. It identifies the factors necessary to extend engagement that are sought in the first research question, which are unpicked to extrapolate entangled discourses and relational associations between the inner dialogues, somatic responses and physical environments which were revealed in the behaviour of participating visitors.

The activity of visitors within *Soundweb* and *Interplay* was examined live in real-time via the closed-circuit television cameras, and additionally afterwards by re-examining the recorded data. Evaluation of activity within *Soundweb* and *Interplay* began almost immediately as explanations from existing theory were sought for the behaviour that was witnessed. It was a strategy adopted from Grounded Theory (see Chapter 6.3), that aimed to create a hypothesis that clarified how visitors were interacting within those specific spaces, and that could also be extrapolated to develop further immersive environments. A variety of interconnected procedures are recounted in this chapter that often combine what appeared to be shared emotional reactions and game-play in response to the provocations of the installations. The process of incremental development used with the installations, and their perpetual state of progress, created an important conceptual framework for the installations as laboratory-style artworks. Collated information from periods of observation was used to gradually develop each of the installation's ability to encourage interaction for longer periods of time.

This chapter begins by describing how visitors responded to the media artefacts within *Soundweb* at different iterations of its development. It then looks more closely at the types of interactions that were taking place between individuals. The chapter then proceeds to examine the installation *Interplay*, and after explaining how visitors initially responded to it, investigates their movement through the space by presenting four trajectory patterns adopted by visitors in apparent response to the camera positions and screen overlays. The chapter then looks at two specific genres of interaction that emerged within the installation, one in which visitors appeared to explore the situation they found themselves in, and another in which they appeared to perform to a perceived, or imaginary audience. The chapter then concludes with a discussion that contextualises the findings.

8.2 Soundweb: Evaluating Intersectional Space

Soundweb was accessible to the public for six months between April and October 2016, during which repeated patterns of behaviour were observed to emerge, despite there being no custodial presence within the space that suggested or prescribed activity. The artwork's outcomes were observed to stem from direct interaction by visitors to situations that were mediated by the projected artefacts. This was evident in the changes that occurred in visitor interaction each time the installation was modified. Individual reactions to the installation were often accompanied by communication with others occupying the space at the same time. Discourse was often silent, but visibly transmitted between individuals through gesture in a manner that appeared to be contagious. Infectious communication became apparent when the video recordings were re-examined, and although subtle became more apparent when familiarisation with the video footage increased (See Appendix G). There were several modes of response to the installation, particularly when its development process began to present overt alignments between physical action and the effects of the media artefacts within the space. Over the observation period visitor responses emerged as clearly visible sets of repeated interaction patterns. They appeared to be overlaid by mental manifestations constructed by the inhabitants to navigate the environment, in response to

*Soundweb'*s tangible reactive media artefacts. The most common of the behavioural repetitions by visitors was a spontaneous formation of a game in which sounds and visuals were triggered by interactors, rapidly followed by their running exit from the installation while screaming. They would often then creep back and repeat the process in what appeared to develop into an exploration of group fear and hysteria through play. Initiating the processes of gamification appeared to be a deep emotional uncertainty that visitors experienced and shared as groups inside *Soundweb*.
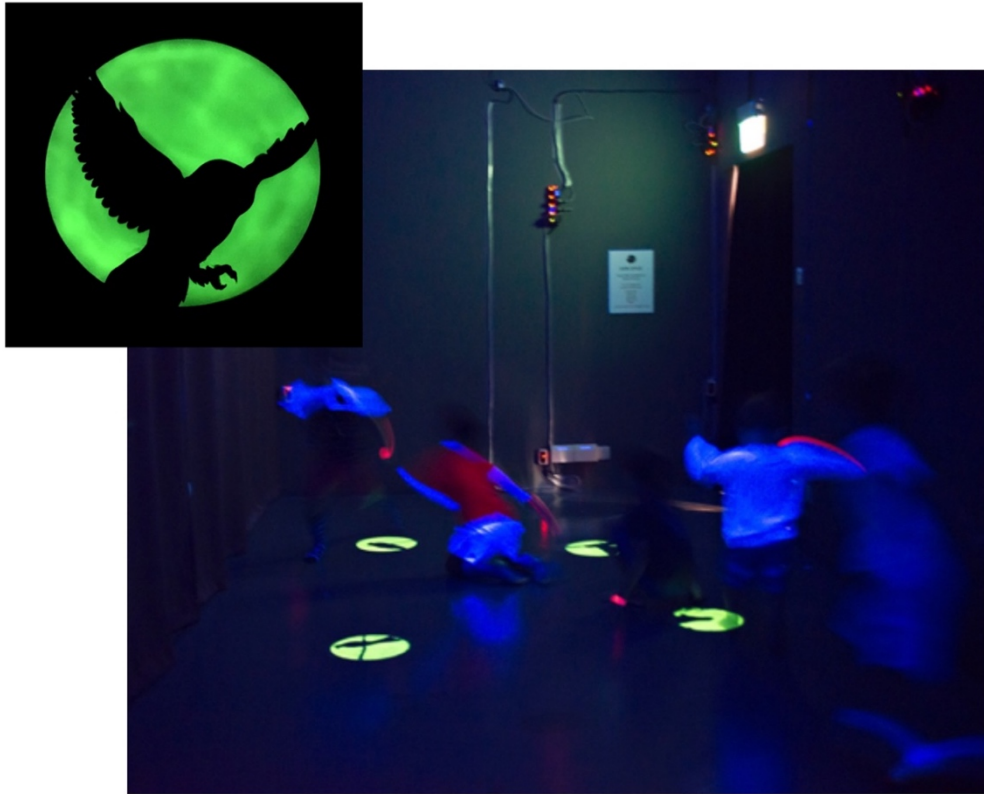
Figure 8.2.1 *Soundweb*, introduction of glow-in -the-dark floor markers with owl detail

The incremental development history of *Soundweb* and the subsequent behavioural effects that were observed is detailed in this section. However, the data analysed from the installation is weighted towards its latter development phases where audience response was observed and recorded by video camera. This is because the amount of information captured by the camera far outweighed the initial written collection method. In addition, the quality of the recorded information was superior because decisions on behavioural relevance did not have to be made on the spot. Activity was observed 'live' at the time it occurred from outside the installation, allowing unexpected contingents to be accounted for. By recording interactions re-examination of events within the installation were enabled using contexts other than the initial one of durational engagement, or dwell-time.

The data that was gathered from *Soundweb* had four overall motivations that were linked to the development of the artwork. There was no rigidly imposed hierarchy attached to these and each contributed to development throughout the life of the artwork, although at the initial stages they commanded the following chronology of attention: to rapidly resolve technical issues with the devices that were used to generate audio and visual responses; to aid incremental development of the piece; to document emergent behavioural patterns within the installation environment; and to optimise audience participation and increase levels of absorption, or 'flow' (Csíkszentmihályi 1990). This latter term is used in several disciplines to describe the level of emotional and physical commitment an individual has with an event, often without noticing such things as the passing of time, or their somatic needs, such as hunger. As the installation matured through its iterations, the

order of importance that were held by the four motivations reversed to better address the research questions by prioritising sustained visitor interaction and its documentation, because the technical aspects had been resolved.

The first iteration of *Soundweb* offered a sensor-driven audio experience within a space that resembled a black box. Ultra-violet strip lights provided a low level of illumination, but not enough to perceive any amount of detail. By moving through the space and disrupting any of an array of infrared break-beam sensors that criss-crossed the room, recordings of nocturnal animals were triggered. There were no clues indicating where these beams might be, and no description was supplied as to how the environment might be explored.

Interaction within the environment was initially fairly short with participation times calculated over the first seven observations at no more than five seconds. Visitors were passing through the space too quickly to become absorbed into its mechanisms, which was evident in their apparent lack of interest in the system, or its components. It appeared that the audio alone was not enough to engage visitors to the space without supplying an explicit context, such as how to operate it, what the sounds were, or how they may be used to build a narrative or sound score. Because this study explored catalysts of interaction emanating solely from the artwork's provocations, rather than instruction, modifications were made with the intention of increasing visitor dwell-times. These were carried out on the one day each week that the venue was closed to the public, often continuing through the night. Technical failure was always addressed as soon as it became apparent, which occasionally required the installation to close for short periods.

In a bid to increase the low levels of visitor dwell-time, glow-in-the-dark silhouettes of corresponding animals were added to the floor of the space (see figure 8.2.1). The ultra-violet strip-lights kept the luminosity of the paint perpetually 'charged' and therefore visually prominent enough to give the impression that they were back-lit. Each image was positioned in such a way that a participant standing on one triggered its corresponding audio loop. Calculated over forty observations, the introduction of images increased audience dwell-time from seconds to an average of two-and-a-half minutes, with a standard deviation of three minutes and twenty seconds. There were only two observed interactions over six minutes at this stage, one at ten minutes and one at twelve minutes. While this may exceed the amount of time an average visitor spends in front of a painting in a museum, which according to Jeffry Smith and Lisa Smith (2001) averages around ten seconds, the environment was intended to lock visitors into engagement for longer periods than that of a painting. The audio loops were also remodelled into rhythmic scores at this point to explore the extent that the rhythmic and percussive qualities given to the animal sounds would be investigated by visitors musically or through dance, but only in one case was this type of interaction witnessed (see Chapter 7.3).

Individuals jumped between one image and the next and initially appeared to notice alignment relationships between floor image and the triggered sound. However, at any given point in time there could be several other people moving around the space, also triggering the audio. The venue was busy and vary rarely would there be solitary interactors within the installation. As a result, correlation between image and audio was soon lost. A causal relationship between the floor images and the audio outcomes was clearly expected from individuals interacting within the space. They were observed stepping and jumping on each picture then looking around for a corresponding effect. When this was not overtly apparent, their interest waned rapidly. Throughout *Soundweb's* life as a publicly accessible artwork visitors were offered the freedom to interact in an open-ended way. There were no imposed restrictions on potential outcomes within the space, other than the physical limitations involved in generating an effect from the system. However, there was little initial motivation for individuals to engage at all because without a perceivable goal set by clear alignments between action and outcome, a sense of underlying purpose could not be established. This appeared to confirm the argument Macklin and Sharp (2016) apply to game design, proposing that successful interaction requires a correlation between individual agency, explicit goals and an underlying purpose. Foster's (2015) argument that an 'unfinished' artwork will not be completed by an audience just because it is presented within a public space, also appears applicable. On the contrary, according to him, audiences are more

likely to mirror the artist's apparent lack of interest and not engage at all with provocations presented as artworks. In respect of *Soundweb*, at this stage, 'unfinished' appeared to take the form of unresolved correlations between actions and consequences. Extrapolated further, it became evident that agency not only consists of the freedom to act and the will to do so, but the freedom not to act. Artworks are often differentiated from video-game design on this point because if a game does not maintain audience interest it will not sell and distribution is likely to cease. Conversely, if a physically presented artwork does not engage an audience, it is often not considered problematic, which originates from a conceptual position that has traditionally resisted measurement. In this way, potentially pejorative categorisations of success and failure can be avoided being pinned to concepts of significance. Despite this, hierarchy is often introduced by way of the art market and its explicit attribution of monetary value as a measure, or implicitly through situational rank projected from the type of exhibition space, such as a difference between a public institution and a disused high street shop. Arguably one audience may not engage, whilst another, at another time, might. In the case of the research artworks, the principle of 'value' was qualified by visitor dwell-time, which was considered to be the simplest initial interaction to capture as data.
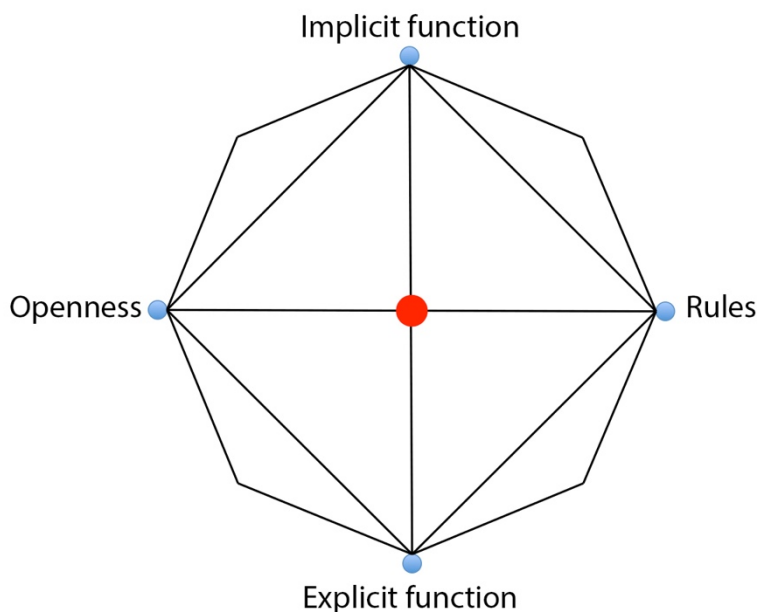
Figure 8.2.2 Network diagram of the elements that stimulated increased interaction

Responding to the apparent expectation from audiences that the images needed to trigger an effect, the silhouettes on the floor were removed and replaced with projected shadows of animals that appeared when a visitor inhabited a particular point in space. These silhouettes were generated by beaming a light through a tube onto a toy animal and focusing the shadow onto one of *Soundweb's* walls. The new images did not occupy floor positions to prevent the audience obscuring them with their own shadows (see figure 7.3.1). Each light that cast a shadow was activated by an independent motion sensor that was timed to remain visible for approximately five seconds, which operated in parallel to those initiating the sound loops. Each of the silhouettes appeared at a different wall height to divide the space visually, and to approximate the positions these creatures might be found in nature. This being said, all were above one meter above ground level to minimise a visitor's shadow obscuring the projected image until they came within a metre of it. Three of the six animals were 'believably' life size to a human scale, while not falling within strict biological dimensions. The cicada, frog and toad were larger, and intended to present a dimension shift in the scale relationship between human and the animal. Practically, the play on

scale enabled them to be seen clearly, but it also accentuated uncertainty by emphasising their predatory quality.

The changes in the methods by which the images were presented, alongside their correlation with the audio loops, immediately altered interaction within the environment. Over the seventeen subsequent video observations, engagement time increased from two-and-a-half minutes to up to thirty minutes, with a mean dwell-time of eight and a half minutes per individual and a seven-minute standard deviation. This included a period of passive familiarisation preceding independent exploration that averaged fifty seconds, and was clearly evident in visiting groups where transitions from passive to active were sudden. Multiple entries to the environment were common, although the video quality did not allow for definite personal identification in more than fifteen observations. Nevertheless, in these cases sixty multiple entries were witnessed correlating to four per individual.

The installation was isolated from the outside by a black lightproof curtain drawn across the entrance. There were three windows with views onto a tropical forest also covered with black lightproof curtains. While introducing visual elements increased the level of interaction, children would also look through the windows behind the curtains into a forest environment where many of these sounds could be heard in nature. The space itself was void of any obvious physical artefacts and accommodated kinetic activity from visitors, such as running, because there was nothing to break, trip over or disrupt.

There was now a clear link that was evident between position, embodied interaction and audio-visual effect. Communication between these three elements encouraged audiences to begin exploring the environment as a system governed by a set of rules, albeit unwritten, that were worked out by visitors from action through movement. Viewed as a simple network the relationship between the factors that stimulated increased interaction can be easily understood (see Figure 8.2.2). In the diagram implicit function represents the modes of embodied interaction. Rules represent the physical constraints assumed by visitors and applied to their interaction. Explicit function represents triggered audio and visual media artefacts. Openness represents the permission for a visitor to engage however they choose, and it is through negotiation between theses constituents that agency emerges. The central intersecting node, coloured red, represents an individual's perceived position within the installation, as part of a system. If situated on one of the nodal branches toward the edges, visitor dwell-time is likely to decrease because the fundamental principles for engagement are not present and are not in dialogue with each other. For example, if there is an explicit function, or goal, within an environment and an individual's outcomes can be open-ended but the rules of engagement are unintelligible through low causal alignment, significant activity is unlikely to occur because there is no dialogue for positive-agency to emerge (see Chapter 4.4). Negative agency exerted through a refusal to engage in scenarios weighted in this way reflects Foster's (2015) position on the unfinished artwork that was mentioned above. Once a functional dialogue between an installation's elements has been established, the audience is in a better position to decode its rules and apply them to what they perceive as being the purpose of the installation, or its implicit function. In *Soundweb*, this was implicit because the installation was open-ended, and it was a system with enough key factors to provide a structure for engagement. Interpretation, or rather appropriation of *Soundweb's* perceived function could be observed evolving in audiences through acts of play. Given that this is often utilised to explore normative boundaries (see Chapter 5.2), visitors adopted it here to establish the potential function of an operational system of which they were a part. The installation tended to unify the actions of individuals into collectives, which then developed into structured games that incorporated skilled use of the timed elements of the installation, in combination with the anticipation promoted by triggering projections, particularly those of the predators. The gamification of the installation (its implicit function) indicated that it was not just the somatically perceived aspects of the room that built a context for game invention, but included psychological associations that combined to generate a Playspace (see Chapter 5.3). For example, the anticipation of a crocodile projection made real through imagination required the material aspects of the installation to be overlaid onto those emanating from a psychic space. When these aspects of interaction are transposed into a network diagram, the emerging relationships between the

installation and an active audience demonstrates the attributes of a complex self-organising system (see figure 8.2.3).
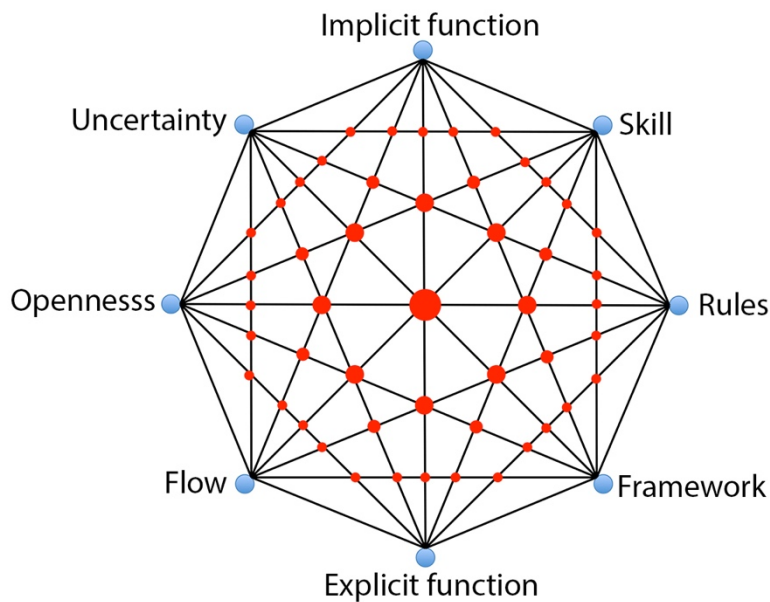
Figure 8.2.3 The emergence of a complex network where the red intersecting nodes represent potential for *Soundweb's* possible engagement goals, with the size of each red node corresponding to the level of action that could be performed

Visual representations of networks are constructed through the subjective choices that a researcher makes in assigning significance to the key nodal points (Borgatti and Halgin, 2011), which is how they function (see Chapter 5.3). The nodes identified in figure 8.2.3 show the relationships between principles that were identified to stimulate interaction in *Soundweb*. The user defined its implicit function in the generation of interactive behaviour, such as game-play, which was modified by the level of skill that was introduced and arbitrated by the rules invented in play. The installation's framework was mediated by perceptible attributes such as the dimensions of the space it occupied, and what the technology was capable of performing. Explicit function represents potential dialogue with the installation's audio-visual effects. Flow, which is manifested in psychic space, is the level of absorption which physically reflects the audience's dwell-time. The perceived freedom within *Soundweb* to make unhindered choices, or to have agency, in conjunction with uncertainty, encourages individuals to engage in building a framework for interaction, which manifested in play. Greg Costikyan (2013) argues that the exploration of uncertainty is fundamental to game-play because it engages interest and stimulates flow. Within the diagram (see figure 8.2.3), the intersection nodes represent potential points of interaction, with several areas offering a complex level of engagement, indicated by the larger red nodal spheres, and others lesser, but still enough to maintain levels of interest. For example, an interactor could engage with explicit function, agency and flow with less emphasis on skill, rules and uncertainty. This might be an exploration of the technology that constituted the operation of the installation (see Appendix G - Exploring). At the same time, another may engage with game generation by exploring uncertainty, skill and rules (see Appendix G - *Soundweb* triggering and running). Missing from the diagram are any personal ethnographic histories of the participants, because they are unknown. However, no interactional divergence was observed in individuals or groups of different cultural backgrounds when they could be identified on the ground by hearing spoken language. The associations introduced by the visitors to the environment inevitably shaped

interpretation, adding further relational complexity particularly when groups of interactors began to communicate with each other. These data are beyond the scope of this thesis but will be explored by the author in future studies.

Figure 8.2.4 Coloured corona surrounding the shadow cast from a toy crocodile placed inside a projection light

Re-aligning *Soundweb's* material elements addressed the first research question that asked what factors are required to extend engagement with participation in interactive environments. It did so by indicating that clear causal relationships increased visitor dwell-times.

The third research question asked how, given the field's limited understanding on the trajectories of participants during periods of physical interaction with artworks, could interaction be re-theorised within a context of unpredictable public interactive media environments. To begin investigating that, further environmental changes were made to explore whether physical behaviour within the space could be modified. To observe how that might manifest, and to gauge the extent to which ensuing interactions might be uniform, the subsequent development phase introduced two sound and movement-activated spotlights that projected a circle of light onto the remaining blank wall of the space. Each was one metre in diameter with its base approximately one metre above the ground, the same proportions to the animal silhouettes. One light was activated by movement within a focused area by projecting the proximity sensor through a narrow tube, which when activated projected a white circle of light. This was timed to turn off after ten seconds if no further movement was detected. An adjacent light produced a red circle that was activated by a sound switch calibrated to operate at a volume of approximately 80 dB(A) at a distance of one metre. The switch was not timed but would respond to noise such as that produced by a clapping hand, which activated or deactivated the spotlight (see Appendix G - Clapping to trigger lights). These additional lights enabled the audience to draw associations between the projected images within the environment, and their own cast shadows. This relational increase between audience action and installation effect (cause and effect = goal) visibly escalated the expressive nature of physical actions within the space, even when re-engaging with projected animal shadows that had already been explored (see Appendix G – Exaggerated movement). The increased activity was manifested in individuals running with 'propeller arms' around the space and adopting more exaggerated movement in their interaction within the space in general. The introduction of new rules through the shadow play that incorporated expressive use of arms and hands to generate silhouettes most likely operated as a cue for amplified limb activity. In addition, a final modification colourised the animal silhouettes by placing photographic effect filters over the projector lights. Although the animal profiles remained black, the corona around them approximated a generalised colour that each creature may be stereotyped as in nature. For

example, amphibians and reptiles are often portrayed as green in children's book illustrations, while mammals are often orange or brown (see figure 8.2.4).

The most interacted with audio visual artefact was the crocodile, situated a little way into the installation and at an easy-to-reach height (approximately one metre) it was the first of three apex predators that could be activated within the space (see figure 8.2.4) and would usually be the key feature of initial interaction. Estuary crocodiles are prevalent throughout Southeast Asia, and there is a small colony of them in the north of Singapore that occasionally spreads to other areas. As can be seen in figure 7.3.3, the infrared beam emitter and the projected shadow (audio and image triggers) were opposite each other, giving the impression that the crocodile appeared when it was approached. There was a clear correlation between a participant's position, its sudden appearance nearby and the sound it made. The crocodile materialised on a black curtain that covered one of the windows and visitors would look behind it to try and figure out where it came from. This was not immediately obvious because the projectors were positioned high up on the opposite wall and directed at a steep angle to minimise visitor shadow interference. The crocodile appeared to operate as a behavioural catalyst within the space by introducing, or increasing a sense of uncertainty. The initial process of un-facilitated entry followed a common pattern of creeping into the space, either individually or in small groups, triggering the crocodile, screaming and running out. Uncertainty was gradually overcome with repeat visits, though not entirely negated and drawn into the modes of activity that would follow.

Developmental Process						
April	▓	▓				
May	▓	▓	▓			
June	▓	▓		▓		
July	▓	▓		▓		
August	▓	▓		▓	▓	▓
September	▓	▓		▓	▓	
October	▓	▓		▓	▓	▓
2016	Darkened room-UV lights	Audio-animal calls	Glow in the dark silhouettes	Projected animal silhouettes	Sensor-activated spotlights	Colourised silhouettes

Figure 8.2.5 Changes made to *Soundweb* during its life cycle on exhibition

The second most physically interacted with media artefact was the tiger (see figure 6.5.2), which was sometimes overheard being identified as a bear. This was a larger projection than the crocodile because there was a greater source to 'screen' distance. Its triggers were at the opposite end of the room to both the shadow's projection point, and the exit. Groups of children as young as two and three were observed in a game of 'destroy the tiger' (see Appendix C). They would activate the projection, run across the room, take a jump and try to hit the shadow before the timer made it disappear. Sometimes these acts of hitting employed lengths of bamboo that were carried in from other zones of the venue. Interactors would run screaming out of the installation in the same manner they adopted in the crocodile game. The other shadows were interacted with less dramatically on an individual level, and activity with them consisted of pointing and identification, particularly when a teacher associated with a school visit or a parent/carer appointed themselves to facilitate a group. However, they were incorporated into story building processes and contributed to the atmosphere. It is important to emphasise that the games that emerged out of ritualised spontaneous play were shaped by the artefacts within the installations. As elements of the installation evolved, the interaction changed (see figure 8.2.5). There were no suggestions by official facilitators or instructions on how to interact with the environment, yet the same game patterns emerged repeatedly throughout the time *Soundweb* was exhibited.

Inside *Soundweb* visitors actively engaged with their feelings of fear and consciously heightened their relationship with it until a point of ritualisation occurred in a more formalised game. As correlations between actions and goals became more prominent through the installation's process

of incremental development, game generation began to repeatedly emerge as a standard procedure in groups that entered the space, particularly in those whose ages appeared to be above six. These audiences tended to further develop their games by including imitative animal sounds and actions. Initial interaction was visibly influenced by the spread of non-verbal gestural and expressive communication, similar to that which Porges (2009) claimed as a mode of transfer in his Polyvagal Theory (see Chapter 4.8). The uncertainty, caused by the installation's dark and unknown environment maintained a close connection between visitor's fight or flight reactions. It is the most likely explanation for what was occurring in the environment *Soundweb*, and it was being explored through the context building behaviour of play. In these situations, the environment was used as a whole unit and incorporated the audio and visual projections, the dimensions of the environment and other people, into play. When populated by up to twenty visitors at a time, multiple groups formed that engaged in separate games but would occasionally interact with each other by swapping players. The majority of game-play seemed to remain orientated towards investigating group emotional responses. These would include explorations of fear expressed through predator and prey role-playing, hiding behind curtains to jump out on new visitors to the space and triggering the shadow spotlights through movement and clapping (often in time to the animal calls) then engaging in shadow play. The frenzy of this interaction visibly increased in the final stage of *Soundweb*'s development when the shadows were colourised and the two shadow play spotlights were introduced.

8.3 Taking Ownership of the Playspace

Soundweb's environment was intentionally kept unfacilitated in order to prevent didactic approaches to interaction through suggestion, and to generate an atmosphere of permission. These are two important points because throughout the observation periods they appeared to enable agency within the space and lead to a sense of ownership of it. Permission, agency and ownership are three factors that are identified here as requirements for interaction. They enabled the content of the installation to be appropriated by visitors and made relevant to them through their explorative processes. Authorial antagonism that emerges between creator intent and visitor procedure is synonymous with interactive systems (see Chapter 4.5). Without a sense of proprietorship by visitors to *Soundweb* there was no motivation to engage with the content and begin to manipulate it through play. During the observations, explicit territorial possessiveness was also witnessed and occurred when individuals entered the space alone, and remained there. This was not a common occurrence, and out of all the observed interactions only 11% of visitors entered alone, averaging a dwell-time of eleven seconds. If an individual found the rest of a group had left, 98% of them immediately ran out. Of these, 89% remained in the space for between five to nine seconds, and only 1.5% remained for longer than ten seconds, with the longest lasting fifty seconds. Children who entered the space alone did not jump or run on the spot, although they did roar and clap to activate the sound switches. Occasionally adults who had separated themselves from the children in their care would enter or remain in the room to explore the environment. Their interactions tended to last for an average of six minutes and would consist of exploring the response effects of technology. This was done through dance-like movement in the space, and close contact with the sensors. Others would engage in shadow play with the spotlights, either by themselves or with a colleague. Given that Playeum's The Children's Centre for Creativity is a venue that caters for ages up to twelve, 3% of the observed interactions were by isolated adults within the space. Although this percentage figure is considered too low to draw any definitive conclusions on solely adult behaviour within interactive environments in this study, it provides enough evidence for the need for further research.

The small percentage of children who remained in the space alone for longer periods attempted to coax others in. Appearing to have taken territorial ownership of the environment, they would act as an installation guide by generating and leading game-play within the space. This would be a combination of attempting to work out the technology, and more frequently, huddling together and experiencing a rising excitement that would culminate in the development of game-play. Actions such as jumping up and down, running on the spot and increasingly loud vocal responses, visibly spread between individuals in what appeared to be a subconscious infectious manner. These reactions were clearly evident on the observation cameras and resembled the expanding

ripples on a pond after a stone has been thrown in. These contagion events would precede a mass rapid exodus from the space, only for the children to return, repeat and gradually develop the process into a formalised game through a ritualisation of the initial response. Over the six-month observation period the games seemed to engage the same exploration of life, death and rebirth of one sort or another. When imitating animals, games of chase and touch, or 'tag', emerged where the tagged visitor commonly lie down on the floor when caught. A similar reoccurring theme was one that involved imitating zombies walking through the space with arms stretched out forwards. Once tagged a player would lay down before re-animating with the classic outstretched arms and slow walking of caricatured 'undead'. Only on one occasion was this behaviour conditioning observed being enhanced by adults who, on entering the space, made classic "wooo" noises that often denote ghost-like sounds to initiate associations between the nocturnal and the supernatural. This method of gamified response occurred only when the majority of the installation's inhabitants had explored the initial running/fear game. Children who became familiar with the installation through multiple entries insisted parents/guardians enter to share their experience, physically pulling them in and guiding them through the space pointing out the audio and visual artefacts. Individual children within groups occasionally lay down on the ground for long periods, often amid the action of other visitors. Their peers usually ignored them until they re-joined the group, or they would re-animate into swimming actions across the floor (see Appendix G - Lying on floor). Others would sit against a wall and refuse to move. During the seventeen video observation days this isolated behaviour was observed eight times.

Out of all the visitors who entered *Soundweb*'s installation space, 80% appeared to be between six and ten years old. This is an approximation based on appearance, and in some cases, what was known by the hosting venue about visiting groups. Younger visitors tended to be less physically and vocally responsive to the environment and in need of facilitator reassurance, usually in the form of hand holding or carrying. The majority of these audiences tended to be more subdued and unsure how to respond within the environment. Some of them cried, and adults attempted to placate them with re-assuring intonations and by demonstrating that it was movement that activated the noises and shadows. When a member of these younger groups showed signs of emotional discomfort, others imitated or asked to leave, demonstrating similar contagious responses that appeared to ripple between the individuals in older age groups. However, this was not always the case. In an interview with one of Playeum's facilitators, Kristen Kaplan (2016), she claimed that audiences between the ages of two and four were also spending up to thirty minutes within the environment, with some also returning at later points in their visit (see Appendix C). Eight children of this age grouping remained inside the installation for the entire duration of their two-hour visit and refused to leave. There were three more verbal accounts of this pattern from staff members, but only one documented. A facilitator described the children that had been witnessed interacting with *Soundweb* as ranging from 'devout and visibly loving what it offered', to those needing more reassurance (see Appendix C). The latter followed a pattern of assessing the environment from the entrance before making the decision to go further. In these cases, their fears were sometimes displaced by torches being offered to them. Usually these numbered less than the group members, and were shared between the individuals and then incorporated into their game generation. By the third visit, initial fear responses in young audiences faded and they would start exploring the space. One four-year old child described the space in the following way: "It was so fun, I saw so many shadow animals, I made a scary story." Incorporated into her narrative were the projected animals, and in a brief interview afterwards she described her story as being about

"A bat [cicada shadow] that scared the frog, but actually the hippo (crocodile shadow) was being so scary, but it was trying to get something to eat; looking for food for its dinner." (see Appendix C).

Soundweb was intended to function as an un-facilitated environment which entrants could navigate without a staff member from the venue, or a parent/guardian being present within the room. However, both carers and venue employees would occasionally accompany a variety of groups into the installation and appoint themselves as facilitators. Groups would comprise individual visitors, pupils on school visits, or attendees of special events such as birthday parties.

The accompanying adults tended to use the space in an educative way, pointing out causes and effects and encouraging children to interact by identifying what they could see with answers that focused on classification, such as: 'owl', 'insect' and 'crocodile'. Adults appeared to focus on the artefacts within the space as separate entities, and many photographed the children in their care within the space, apparently separating them from the environment through objectification. That is to say, that the photographs were documenting a particular child as opposed to a child engaging in a specific environment. A trend in documenting aesthetic experience has been identified by Bishop (2018) in her analysis of performance re-enactment within contemporary museum/gallery spaces. She argues that many artworks are becoming complicit in this and offer the potential for staged selfie/wefie moments in the knowledge of their potential spread to social media sites. While some of the images taken within *Soundweb* undoubtedly were posted to 'sharing' sites, it was a photographically hostile environment with low light levels in the ultra-violet spectrum.

Figure 8.3.1 *Soundweb* detail with adult in background

The self-appointed adult facilitators tended to elaborate on what they perceived to be the rules of the space by attempting to introduce narrative procedures to game-play that often incorporated the triggered projections, but not always. In order to slow the pace of activity, crawling was suggested as an alternative to running in 1.5% of the observations. Although participants acquiesced, they reverted to wild running within four seconds (see figure 8.3.1). In one instance children were admonished for contravening what an adult perceived as an implicit rule, peeking behind the curtains covering the windows. In some cases, the heavy authoritative presence rushed the experience of the children by walking round and checking off the artefacts, then herding the children out. Occasionally, adults placed themselves permanently in the room in order to police it. This had a small moderating effect on behaviour but over a time of around fifteen seconds, in the situations that where observed, if the adult did not interact with the group their behaviour would revert to running and game invention. In contrast to behaviour patterns attempted to be determined through facilitator presence, un-facilitated users appeared to employ the environment to explore their own emotional responses in relation to that of a larger group of peers. Nevertheless, adult responses to the environment were positive, with some offering comments such as "it is such a novelty to be in a space like that" (see Appendix C), perhaps indicating that these audiences were unfamiliar with installation spaces in art galleries.

Soundweb was publicly accessible for a period of six months, and over that time the venue received a footfall of between five to seven hundred visitors per week. This was monitored by the venue through their entry procedure. Even at the lower end of this range, it amounted to a potential

of twelve thousand children visiting the installation, some of them multiple times. It is fair to say that some of the returning visitors may have coded the behaviour of first-time interactors. Nevertheless, the patterns of behaviour described above repeated with increasing frequency and little deviation throughout that time. The changes that were made to the installation significantly increased visitor dwell-time, which in its early days was in the seconds, and in its later stages was counted in half hourly segments.

Dwell-time by individuals who had familiarised themselves with the environment through repeated entry, was observed to increase by up to 275%. From an average of eight-minutes on a first visit, it grew to thirty-minutes on a third, and was not incremental but sudden. It resulted from specific collaborative relationships emerging between individuals in particular groups, the physical installation space and the audio/visual artefacts situated within it. For this to occur a clear correlation between action and effect needed to be present. Explicit authored meaning was not necessary to this relationship because it emerged through the process of interaction, managed through the contagious gestural signals that culminated in the game generation. Given that physical behaviour was so tightly allied to the framework set by the artwork, and was so frequently repeated, it is tempting to assume that the subjectivity of divergent interpretations of the environment was limited. This was not considered measurable in this study, but remains an intriguing proposition for further research. This is particularly so because the interactions appear to counter the claims made by Land and Jarman in their book *Break Point and Beyond* (1992) that children display highly divergent thinking, and much more so than adults (see Chapter 5.4). The periodic changes that were made to the installation clearly showed how correlation between cause and effect dramatically increases visitor dwell-time. In addition, this also necessitated a permissive environment to encourage positive-agency in the form of sustained activity, as opposed to negative-agency as refusal, or uninterest in participating. While both can be considered an 'active' result of decision making on the part of a visitor, the former denotes a decision to engage with a participatory proposition.

The rules that were established during the development of *Soundweb* were considered so conclusive that they were used in the foundational concepts for a second installation that was developed for the same venue the following year. This was an exciting prospect because it offered the opportunity to present a different character of installation to an identical visitor profile.

8.4 Interplay: The other Self

The installation *Interplay* was developed in response to the insights gained from *Soundweb,* particularly the observed links between cause and effect, which in the new installation were made as obvious as possible from the outset. After a development period that explored the use of image effect, such as timed delay between video capture and projection and video signal distortion, a basic system of provocation was adopted that presented a direct live video stream of visitors within the installation from an array of four cameras. The only complex element that was introduced was a horizontal flip to one of the projected images at each end of the space. This was in response to the claim that video-games which introduce the opportunity to develop greater skill dexterity lead to an increase in player engagement (Macklin and Sharp 2016), which was confirmed in the gameplay that developed in *Soundweb*. Once the initial development structure was in place and functional, *Interplay* was open to the public for five months.

The contextual framework of this new installation explored the relationship that visitors, as consumers, had with authorship in a narrative setting. This was provided by referencing the cinematic screens by producing large scale projections at each end of the room in conjunction with the overall theme set by the hosting venue, *A World Full of Stories*. An assumption was made that the increasing ubiquity of screen-based media available to the visitors in their daily lives, from television to smart phones, would feed into this and point to the narrative formats accompanying those. Fiction, for example, is found in video gaming, film and social-media, but elements of documentary narrative also often merge into a story-line. Relationships that emerge between how things look and how meaning is projected onto them has already been discussed in the section on visual culture (see Chapter 2.8). Complex relationships between an

author/originator and an interpreter/user is also embedded within that structure in many intricate ways. However, the process of language acquisition, its refinement and any critical awareness stemming from it, is subject to the same systems that bind an individual to a society (see Chapter 2.2). Even the lack of an explicit narrative can become a political statement when it exposes the control mechanisms that would otherwise be in place to reaffirm an ethical, ideological or socio-political framework. The open-ended nature of *Interplay* was developed to encourage visitors to explore authorial intent, problematised through its absence, if they engaged with it reflexively as well as physically. While it exposed authorial control mechanisms, through their absence, it still presented affordance based on its rules as a system.

Interplay sought to fragment the psychic from the physical by re-presenting the Self as an Other, in order to render relationships between them more evident. Visitors were captured on video as they moved through the installation, and their captured images re-presented back to them as video projections. Interactors responded by manipulating their avatars through motions that explored relationships between a physical space and a screen-space that had been defined by the position of the cameras. Physical exploration of the screen through touch was a considerable reaction over the observation period, and while included as data, its significance is identified as an area of interest for future research.

In contrast to *Soundweb*, which underwent significant developments, adjustments to *Interplay* were few in number. Many of the lessons learnt in *Soundweb* were applied to *Interplay* from the outset. For example, wires were taped down and both cameras and projectors were set behind caged barriers making it difficult to access the technology, and there were no attempts to do so. The installation began with just one infra-red floodlight in the room, which at its inception seemed sufficient. Given that it takes five to ten minutes for eyes to adjust to the dark, and thirty for full adaptation (Passer and Smith 2001), it was subsequently felt that interaction may not be at its optimum because the projected images were dim and the ambient light in the room was low. A second infrared light was introduced that raised the level of light in some areas, but at the same time it increased the illumination difference between cameras, creating hot spots (areas of brightness) in the projections. Another two infrared lights were then added, each one directed to the area in front of a specific camera. This made a significant difference by brightly illuminating occupants of the space regardless of where they were standing in relation to a camera. Visitors were only able to see the raised infrared illumination indirectly as the projections became brighter, raising the ambient level of light within the room. This resulted in dwell-times increasing from an average of one-and-a-half minutes, with a standard deviation of 1.5, to nine minutes with a standard deviation of eight-and-a-half minutes. These were calculated from unbroken interaction periods within the installation and not from return visits to the space, which were classed as new activity periods.

8.5 Interplay*: Trajectory Patterns*

Ara Osterweil (2014) discusses issues that Andy Warhol explored in his film works, such as *Blue Movie* (1969), that dealt with the separation existing between lived experience and spectatorship. According to her, many of his films addressed this issue, particularly *Sleep* (1964) in which Warhol presented over five hours of video footage that presented John Giorno sleeping, or at least appearing to sleep. Austin (1962) and Butler (1988) argue that states of being are constructed through linguistic description (see Chapter 4.6), and vom Lehn (2001) proposes that overheard responses to artworks can shape the trajectories audiences choose in museums (see Chapter 4.7). Both of these examples describe performative changes that appeared to have an equivalence in the visitor responses within *Interplay*. The perception of personal boundaries in the projected screen space inevitably manifested in the psychic space of the interactor, where normal rules of proximity were forced to break down, transform, and re-emerge into the physical present. It was a situation that offered a performative affordance, for at least the duration of visitor dwell-time.
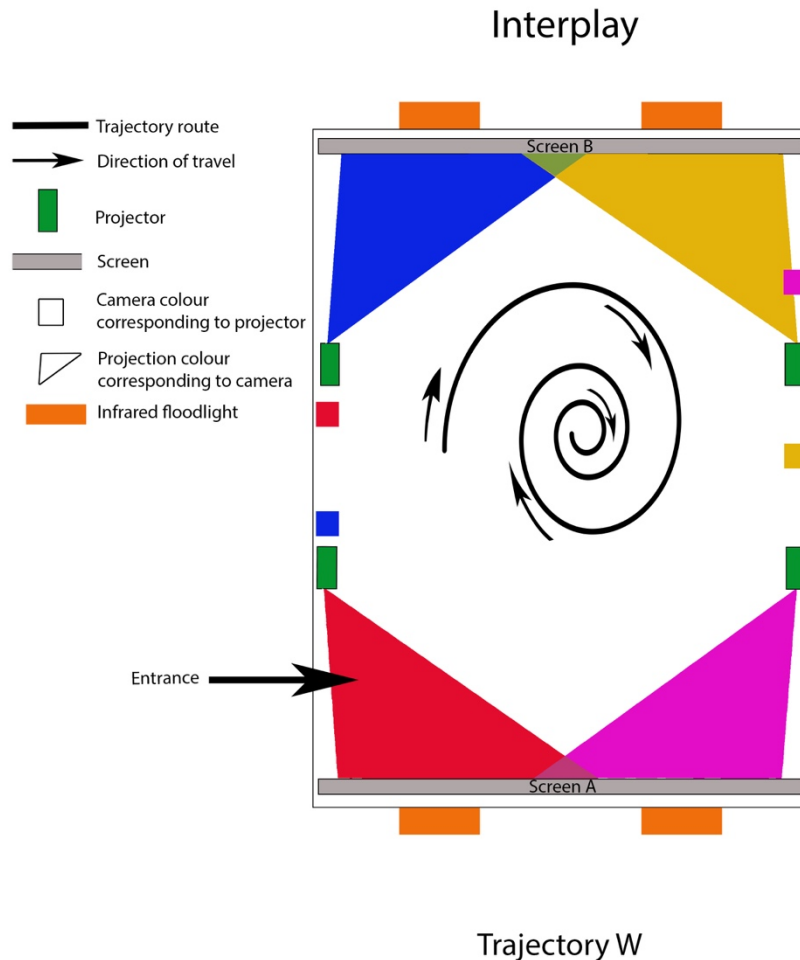
Figure 8.5.1 Visitor Trajectory W within *Interplay*

Interplay offered visitors a simultaneous process of watching and doing through their proximity to any one of the installation's camera lenses that unified the separation experienced by audiences of film that is claimed by Osterweil (2014). Nearness or farness to the cameras controlled the scale of their projected image, which was in relation to any other inhabitants who were physically within the room, and on the screens. The projectors were positioned in such a way that physical distance could be overwritten by a virtual intersection. It was achieved by partially overlapping the image area captured by each of two cameras, an effect that was replicated at each end of the space. To an extent, the presence of another person converging with an interactor's own image on the projection screens replicated the visual artefacts that defined behaviour in *Soundweb* (see Chapter 8.2). The consequences that could potentially result from decisions made in *Interplay* were always relational, because psychological separations between virtual and physical others were defined by their actual presence in the room, proximity to others and the context of observation. The camera positions, and their relationship with corresponding screens were observed to govern visitor trajectory through *Interplay* in the form of routes that were taken by them through the space. Visitors did not navigate each of the trajectories with precision, but followed general paths that could be clearly identified as belonging to one of the specific routes. Trajectories were relationally shaped by modes of activity converging with environmental conditions, similar to the emergence of desire lines in urban spaces. These are informal routes made by multiple members of the public, often in urban spaces, which bypass designated

footpaths and are most visible when tracks are worn across grassed areas. During observation periods, four discernible patterns occurred that have been allocated the identifiers W, X, Y and Z (see Appendix G).

Trajectory W describes the movement groups took when a spontaneous game emerged that involved individuals running between cameras and screens in a circular motion around the centre of the room (see figure 8.5.1). This equated to 16% of all interaction. The number of participants involved would lead to the appearance of a spiral whose outer edge was defined by the position of the cameras. The perpetual spiralling motions in this trajectory pattern, along with the audible excitement, suggest that this was an exploration of the screen's manifestations as phenomenon, rather than the installation's extension into cinematic space (see Appendix G - Trajectory W). During the observations, patterns were also defined by the apparent ages of the participants and Trajectory W was dominated by 70% of audiences appearing to be under six years of age.
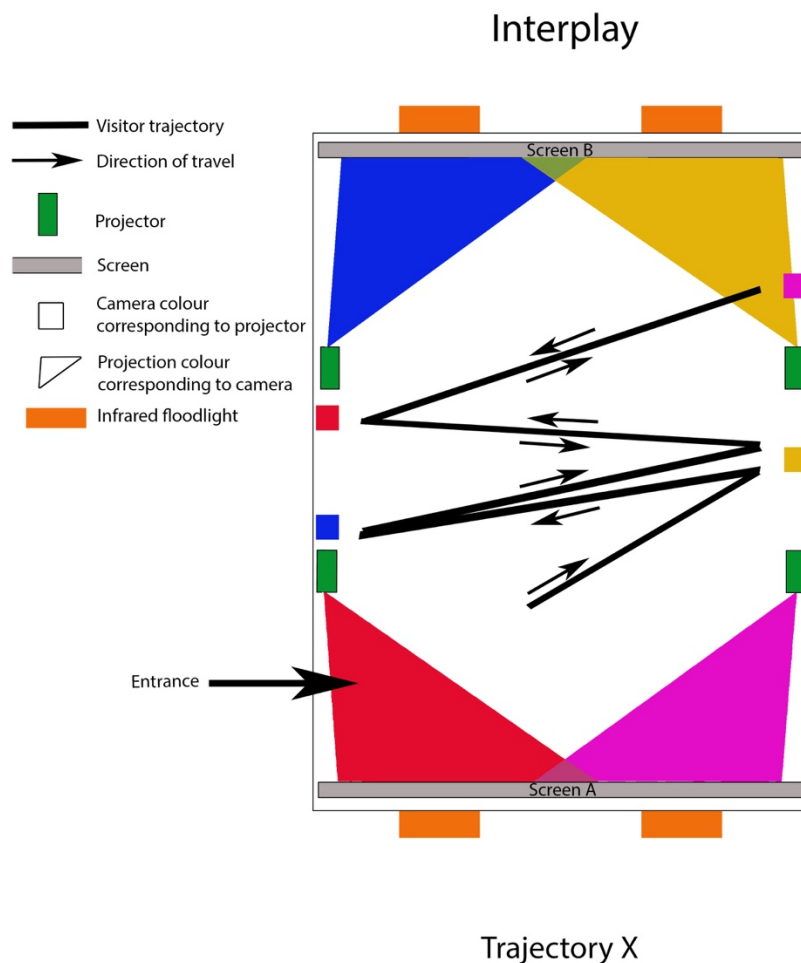
Figure 8.5.2 Visitor Trajectory X within *Interplay*

Trajectory X maps side-to-side movements of audiences as they explored relationships between actions in physical space with their simultaneous manifestation on a screen (see figure 8.5.2). These were a combination of dance-like arm and body movements. The synergy between the two unifies what in performance scenarios is usually a separated experience of doing (performer) and watching (audience) (see Appendix G - Trajectory X).
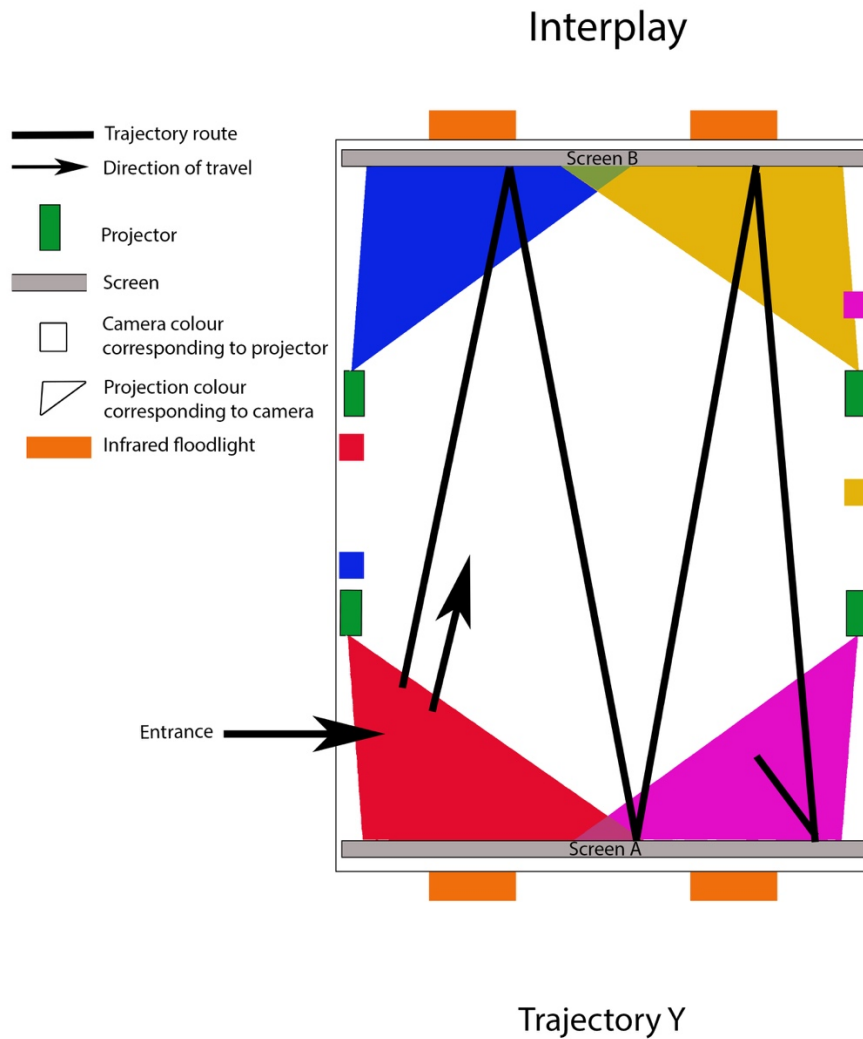
Interplay

Figure 8.5.3 Visitor Trajectory Y within *Interplay*

Trajectory Y involved 17% of participants entering the space and running back and forth past the cameras to touch the projection screens, possibly in an attempt to catch their own avatar (see figure 8.5.3). The action was repeated at each end of the installation. It was a similar activity to that observed in *Soundweb* where visitors attempted to hit the shadows (see Chapter 8.2). In this pattern there appeared an attempt to interact physically with the spectres existing in screen space, although this was clearly a form of game (see Appendix G - Trajectory Y). Nevertheless, it indicated an overlap between the physicality of the room and a psychic affiliation with the projections. Moreover, it suggested the presence of an innate desire to interact more physically with the projected image in general, and presents potential for interactive filmic experiences in both an art and a cinematic context.

Interplay
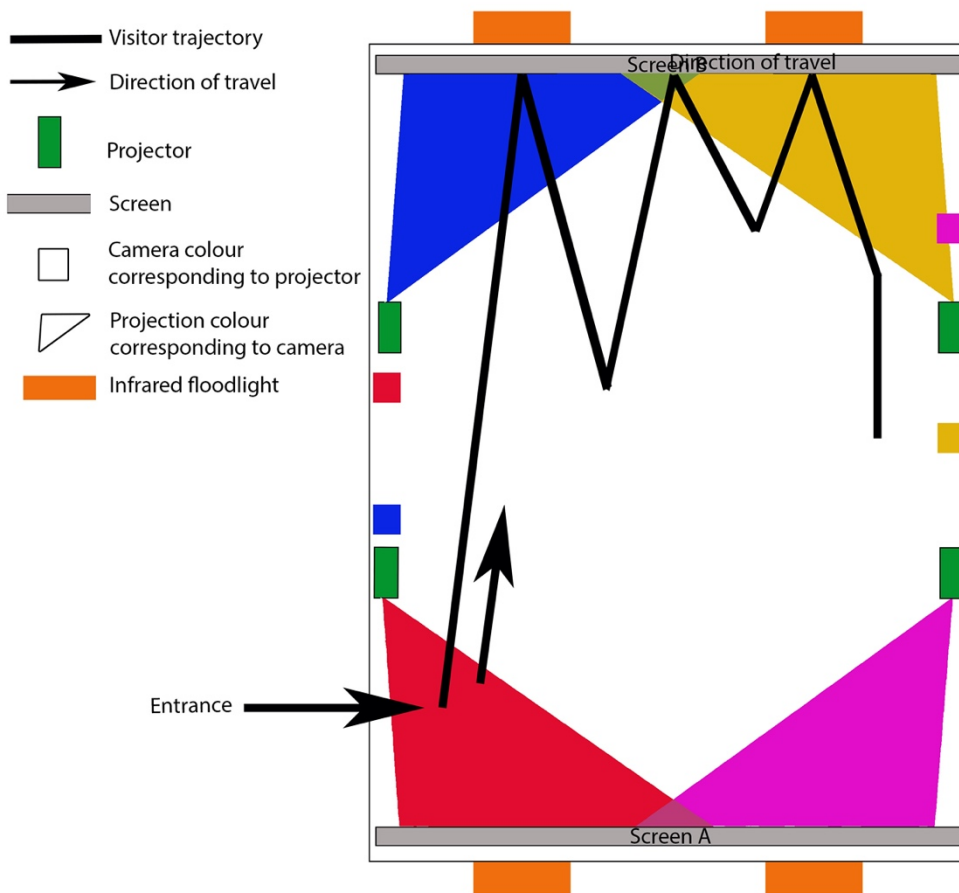
Figure 8.5.4 Visitor Trajectory Z within *Interplay*

Trajectory Z appeared to corroborate this argument and consisted of 41% of individuals remaining near the screen and interacting with the projected images (see figure8.5.4). It was a similar route to Y, but with interaction remaining at screen B (see Appendix G - Trajectory Z). It was also the common interaction pattern that was observed at over 40% of all interaction routes (see figure 8.5.5). In 24% of instances Trajectory Z was accompanied by collaborators following Trajectory X, leaving 14% to explore the projections outside of visible partnerships. During the observation periods there appeared a clear overlay of physical and psychic spaces that afforded arenas for interaction, in all but the spiralling action of Trajectory W. Patterns were also defined by the apparent ages of the participants with 70% of them appearing to be under six dominating Trajectory W, and 17% engaging Trajectory Y. In contrast, Trajectory X was enacted by 80% appearing over the age of eight, including 95% of all adults.
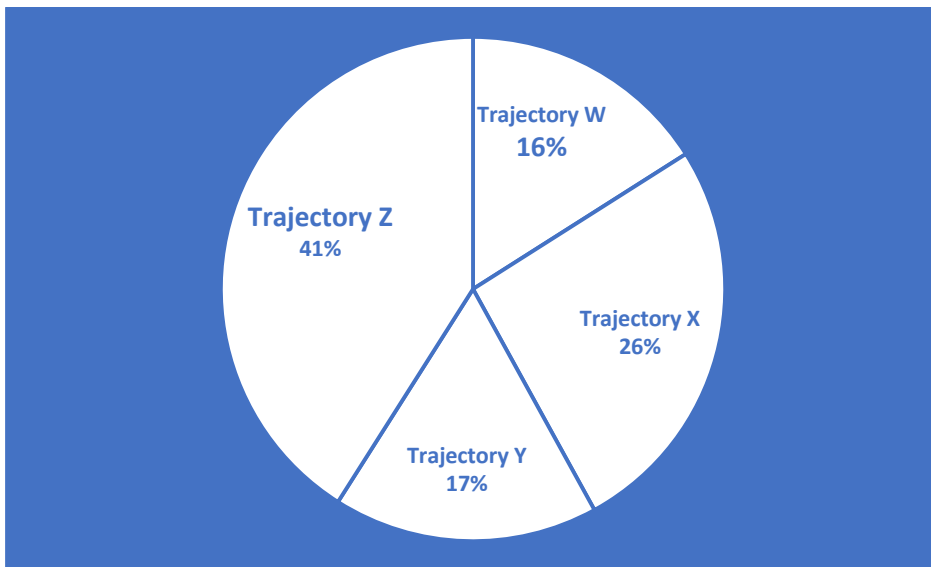
Figure 8.5.5 Spread of audience trajectories in *Interplay*
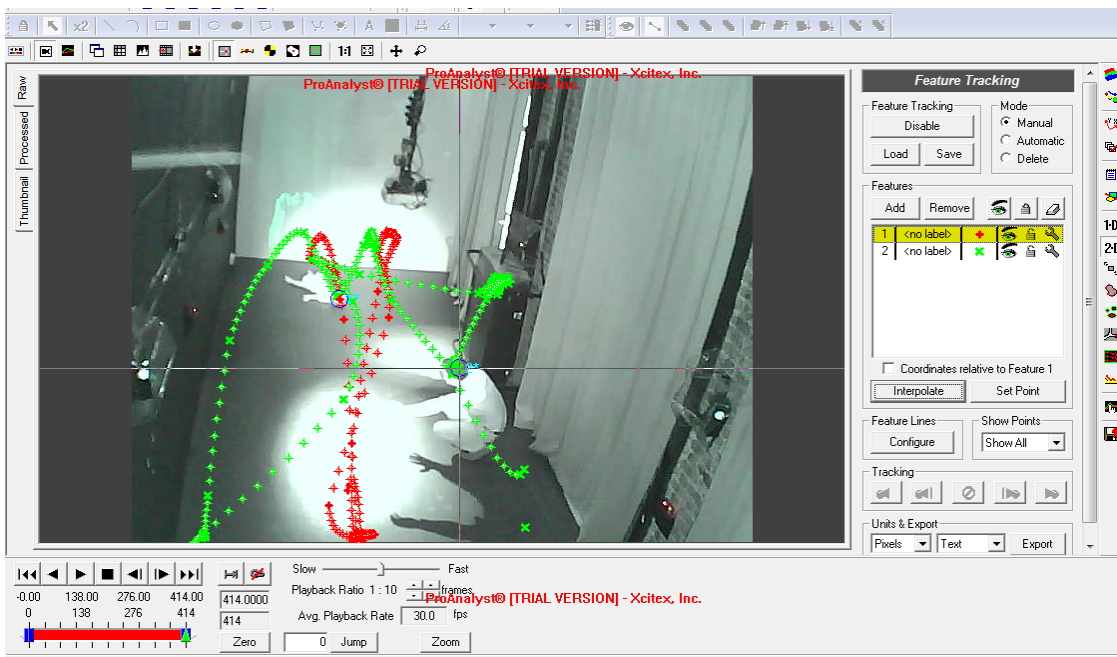
Figure 8.5.6 Sample of ProAnalyst showing trajectories similar to Y (red) and X (green)

The trajectory patterns that visitors were observed adopting within *Interplay* were rarely singular navigational routes through the installation. Their development appeared to stem from co-dependency between a visitor's personal engagement with the installation provocation and how individuals responded to each other within the environment. The resultant trajectory contagion caused different patterns to flow into one another. For example, while one person might follow Trajectory X, another could enact Trajectory Z. If a group emerged, Trajectory Y could morph into Trajectory W through a contagious spread of particular actions between individuals. Initial exploration of visitor movement within *Interplay* activity was tracked using the motion tracking software package *ProAnalyst* (2017), but it proved to have limited success, which was most likely due to the low contrast in the video footage and the number of moving agents. However, it was through the attempted application of a motion tracking package, and the manual functions within the software that the trajectory patterns of visitors became evident (see figure 8.5.6). In practice,

each segment of video footage was watched and the flow of visitors traced to a piece of paper. Within the previous installation, *Soundweb*, it was observed that the position of artefacts and the manner in which they related to each other in conjunction with the dimensions of the space created a framework for the types of activity that emerged. Within *Interplay* the position of the cameras and their field of view presented limitations to how the installation could be utilised effectively. Within the space function was defined by the appearance of a projected image on the screens, in combination with social participation occurring between individuals, both digitally and physically. The combined constituents defined the number of navigable paths, and the spread of behavioural contagion defined which of the patterns became dominant at any one time.

8.6 Performing and Exploring

Audiences were observed adopting a variety of gestures while engaging with *Interplay* and common amongst them was spontaneous dance. Often this would evolve out of explorative arm and leg movements that visitors adopted to investigate their projected self as an Other. As a physical vocabulary was built, patterns began to repeat themselves in formalised movement. It was similar to the ritualisation of movement that occurred in *Soundweb* as play transformed to game. Gestural interactions that were observed appeared to divide into categories of performance-related or explorative. These were not absolute divisions because the modes of interaction were also affected by contagion between individuals engaged in differing trajectory patterns.

Figure 8.6.1 *Interplay* installation detail, screen interaction

Performance-related interaction consisted of users adopting the system to explore theatrical gestures for on-screen observation by and of themselves, and of others who constituted occupying groups. While sometimes similar to actions that are later classified as exploratory, they were performed at periods when *Interplay* was heavily populated and appeared to be motivated by the desire to be observed by others within the space. Out of these interactions the majority consisted of bringing elements from different areas of the venue into the installation: 17% involved a variety of textiles appropriated into make-shift costumes, while another 3% carried in objects that they used as props (see Appendix G - Dressing up). There were two behavioural instigators amongst groups that led to more complex interaction, the first being a series of gestural arm waving that was noted in 19% of the observations. Another 9% of visitors began by jumping up and down. In both cases behavioural contagion between group members was witnessed and these actions led to either dance, or running the length of the installation, between screens in the pattern of Trajectory Y (see figure 8.5.3). Out of the total number of interactions 17% consisted of dance and in all cases, participants appeared between the ages of six to ten (see Appendix G - Dancing). One school group that visited the installation burst into a spontaneous song that rapidly spread between all of the individuals occupying the space (see Appendix G - Singing).

Such instances appeared to indicate a separation between physical space, in which actions were performed, and projected space, in which activity was represented. There was, however another mode of engagement that could still be argued to be performance-related, and that was with the screen itself. The first of these consisted of touching the screen, and in particular the projected images. Comprising 15% of interaction, the activity was not two-way between separate individuals, but an attempt to explore either the cinematic space, the individuals projected into it or both, through touch (see figure 8.5.2.1). This would indicate the presence of a sophisticated intersection between the physical and the psychic, or a Playspace, which brought together the psychological elements with the physical to construct the arena that these groups were operating in. Just over 1% of an observed seven-hundred-and-seventy-four interactions developed this into shadow play. They employed their own cast shadows from the projection lamps in an interactive gesture that did not use the images on the screens as a significant portion of their activity, although this comprised a small part of their total interaction with the space.

Figure 8.6.2 Entrance to the installation *Interplay*

While the majority of visitor activity within *Interplay* appeared to be performance orientated 22.5% of interaction appeared exploratory. Using gestural movements within the space visitors investigated camera location to explore relationships between their own position, the camera's and the scale of the projected image (see Appendix G - Exploring). Exploratory activity also included looking behind the curtains that covered the windows within the space (see Appendix G - Curtains). The entrance to *Interplay* was through a curtain and visitors investigating the potential for further provocations behind those in the space was not unexpected given the artefact alignments seen in the previous installation *Soundweb* (see figure 8.5.2.2). During the observation periods adults were responsible for 20% of the interactions, and all of their activities involved gestural arm movements, side-to-side stepping and walking backwards and forward between cameras, all of which was exploratory. It is important to note that there is no absolute distinction between 'performance' and 'exploring' because the intersection between them was so large. The terms are used to identify what appeared to prompt visitors into activity. The majority of this interaction occurred with screen B (see figure 7.4.1), a preference reflected in 75% of all the observations. Screen B confronted viewers as they entered the installation and screen A was behind them on entry.

During the data collection periods the installation was populated by more than five interactors 70% of the time, which constrained its capacity to certain modes of behaviour. Quieter periods affected more intimate exploration of the split screens in and of themselves and consisted of interaction between individuals in different areas exploring each other's space through virtual proximity (see Appendix G - Virtual Proximity). Occurring in 10% of the observations this

activity also represented a cross-over between performance-based action and exploratory action, where the explicit and implicit functionality of *Interplay* as a system was being investigated (see figure 8.5.2.3).

Interplay had no accompanying audio. However, the environment was noisy with a contagious spread of interactors shouting, laughing and occasionally singing (see Appendix G - Singing). It was quiet for 10% of the time and only when occupied by less than three visitors, during periods when the installation was under observation. It can be deduced from this that in addition to audiences responding to the artefacts of the installation, it also expedited high levels of interaction between individuals when their numbers were high. In this respect they became constituent artefacts of the installation. When only a few visitors were in the space, the artwork facilitated more intimate exploration of movement, space, alterity and by implication, Self. In responding to *Interplay* visitors explored an interactional narrative as an event within a situation that enabled them to bridge the gaps that normally exist between doing and watching. These are relationships that also often exist between consuming and authoring. They were destabilised through the decisions that were required by visitors to interact and, as a result, produce content.

8.7 Discussion

This section discusses the research findings in relation to the questions that were presented in the first chapter of this thesis. It identifies factors that are necessary to sustain engagement with participation in interactive environments and the extent that public behaviour can be modified to prolong dwell times. Also introduced is the measurement framework that was used during the studies, to aid in reconceptualising interaction within a context of unpredictable public media environments.

Participatory processes within institutions implicitly challenge stakeholder hierarchies that for a long time have dictated how content is presented, how its knowledge is shared, and who has ownership over those processes. All individuals who engage with content are part of this structure, including developers, the public and the employees of institutions. 'Normal' behaviour within these spaces is traditionally expected to remain deferential to the authority of the artwork and organisation, which is often reinforced by the presence of guards and security systems. They are elements heavily intertwined with notions of a collection's cultural and economic value. Interactive artworks push at the boundaries of these structures by re-defining the frameworks of entire spaces in a process that challenges authority.

Art often functions to test and question assumptions about the nature of things, their relationships with each other and with those that engage with it. Creative practitioners sometimes manage this by separating objects from 'normally' applied modes of meaning. This is the opposite to what usually happens in language, where words or phrases describe, reaffirm or point to significance. The open-ended artworks, *Interplay* and *Soundweb* were both detached from any explicit meaning and visitors were required to generate context through their embodied interaction and social participation within the environments. Embodied engagement by visitors functioned as the means to reattach meaning to events facilitated by the media artefacts within the installation spaces. *Interplay* and *Soundweb* were both open-ended artworks, and an individual entering the spaces was not required to follow an order of steps to encounter an event. However, an effect was an inevitable consequence of them entering either of the installations due to the position of sensors and cameras. Causal alignment between actions and effects in the installation media constituents was identified as a fundamental ingredient in sustaining interaction. However, equally important was the permissive environment that explicitly prevailed throughout the hosting venue. Part of the consent-giving process, or atmosphere of permission, involved a coalition of non-didactic intentions between the artist and the hosting venue over those who visited the environments, which was agreed at the inception stage. Permission is identified here as one of the essential factors for sustained interaction that was sought in the first research question of this thesis. There was no expectation for the transference of specific information through visitor interactions, only a shared objective between artist and host venue for the installations to stimulate and encourage open-ended, and sustained hands-on participation.

It was within an environment of permission that visitor agency was observed to emerge, and was defined by an individual's ability to affect freely the course of events in a given situation. However, a potential outcome of their choices also included the possibility of them choosing not to engage. The terms 'positive-agency' (to act) and 'negative-agency' (to decline) were introduced to differentiate between the two decisions. The perception of free-agency was identified as critical to engaging visitors because it permits them to appropriate an installation and construct narratives that are relevant to them as individuals.

Building such environments required a sensitivity to the process of emerging relationships between the need of visitors to express their agency and the development process of the installations, even if the functionality of the artworks deviated from original intentions. A part of those needs was identified as a requirement held by visitors for correlation between what they did and what they saw as an outcome. This is what is meant by free-agency. Relinquishing ownership over the potential modes of interpretation, meaning and actions within the spaces gave permission to visitors to take it for themselves. Ownership is identified here as a second essential condition for interaction, and is the point at which engagement becomes sustained. Users were free to model their own function for each installation, despite carers and venue employees occasionally self-appointing themselves as facilitators. However, the interactive environments also exerted considerable agency through their own affordances, which regulated the narrative dialogues that ultimately defined how individuals engaged. Once clear correlation between actions and effects had been achieved through the incremental development process, visitors to the installations were able to appropriate them as systems and begin to make meaning out of their embodied relationship with them. Participating visitors appeared to consider the installation environments as a whole, in which all elements were connected, including their own agential engagement. Actions by individuals aligned with the installation artefacts to generate dialogues that resulted in finite sets of outcomes. These entangled relationships were explored through play in a process that was measured in its complexity and in the dwell times of individuals within the space.

The function of play in its relationship with the manipulation and construction of usable contexts that can be applied to uncertain situations, is an essential component in understanding this study. It was the primary mode of engagement witnessed in *Soundweb* and *Interplay*. Play is the vehicle that tests the boundaries of encultured learning, including its own constraints, by synchronising imagined and physical environments. In an open-ended interactive situation such as *Soundweb* or *Interplay,* it was the visitor that contributed creativity to events through their dialogue with an aligned system of provocation. Play sits at the root of the creative process because it represents a testing and manipulation of boundaries that can build an operational context out of uncertain situations. Consequently, it is deeply entrenched within the mechanics of creativity, because the production of an innovative artefact amounts to the ability to manipulate the context in which it is situated. In other words, creativity is not manifested in objects or ideas that are new, but the perspective from which they are imagined (see Chapter 6.5). This is what Thomas Kuhn (1962) referred to as a paradigm shift when describing a contextual transformation brought about by realigning basic assumptions. Through playful engagement with the open-ended artworks visitors to *Soundweb* and *Interplay* also participated in creative acts of initialisation, because the context for engagement constructed by them became embedded within the installation framework. To date, creativity has tended to be measured through processes of psychometric testing and fails to recognise the significance of embodied encounters. It was the embodied aspect of visitor encounters that initiated rather than objectified. The subsequent transformation in visitors engaging with the artworks *Soundweb* and *Interplay* was channelled through modes of physical activity rather than reflexive responses. It became a performative agent for understanding because information was revealed through context building rather than taken in faith. Both agency and transformation are identified here as important affects in the playful process of de-construction and re-construction of context and meaning through embodied interaction.

The extent to which public behaviour can be modified in such environments, the subject of the second research question, was clarified when each installation modification was observed to generate fresh reactions from audience groups. New behaviours were initially unpredictable, but once established became foreseeable and began to repeat in other visitors. Some behavioural

modifiers introduced potentially new ways to re-engage with the installation artefacts within a single visit. A noticeable uniform change in the physical interaction of visitors was observed when the two sensor driven spotlights were introduced in the latter stages of *Soundweb*. An effect could only be produced from the lights when movement in a narrow field of space was detected, such as waving arms, or the noise of clapping hands. After engaging with the additions to the environment, the visitor's subsequent interaction noticeably changed to include more animated arm movements when revisiting existing provocations. Adjustments to *Interplay* encouraged equally prominent shifts to interaction when the level of infrared illumination picked up by the cameras was increased, and more evenly distributed across the recording areas. In each instance visitor movements within the artworks corresponded directly to the modifications. At the outset they were unpredictable, but once established were later shown to be adjustable. Authorship of those actions came about through dialogue between the affordances offered by the artworks and the agency of the visitors. It indicated that neither were separate interactional systems (people and environment) but constituents of the same one.

The overwhelming majority of visitors adopted *Soundweb* as a conduit to explore shared fear, sometimes within predefined groups, such as school parties, but also within unrelated clusters that formed inside the environment. This was governed through open-ended play that led to the emergence of game-like structures that were defined by the interactors and contained within limitations determined by the sights and sounds that each installation presented. The actions of children who entered the space alone were different from that of groups but still commonly followed a pattern, such as roaring and clapping to activate the sound sensitive light switch. The actions of individuals within specific groups that differed significantly, such as lying down on the ground for long periods, also repeated as a pattern in observations at other times, as were swimming actions across the floor of the installation. The degree of acceptance in deviation from main group dynamics is intriguing and would benefit from further research. *Soundweb* was never designed to stimulate the kinds of emotions that it did, and the exploration of polyvagal fight or flight was unforeseen. What emerged was a visceral exploration of group emotion that generally does not surface in modern technologised societies, particularly in the age group that *Soundweb* was drawing in. It potentially opens an area of future investigation that explores how these needs can be managed within a modern society, research that would need to be conducted within stringent ethical constraints.

Visitors engaging their agency positively within *Interplay* embarked on a ludic exploration of narrative that appeared to position, or derail aspects of their identity in a context of alterity. Framed in a system of self-observation, scrutiny by others and by the CCTV cameras the installation re-positioned the Self as Other. This slippage between spectator and spectacle potentially endowed activity with an embodied performativity that was wrapped in existing narrative relationships with technologies that appear similar, such as music videos, film, television and video games. In this context *Interplay's* closest cousin is expanded film, in that the space and the elements within the installation were expanded into the emotional experience of the interactor (see Chapter 3.8). Extension into psychic space is a function of installation art in general (Elwes, 2015), and similar incursions were achieved with *Soundweb* and theorised in a context of Playspaces.

Using the framework of the Playspace as a tool was crucial in understanding and developing the nature of engagement by audiences with the artworks. It was introduced as an emergent synthesis between what we understand to be physical reality, and our psychic navigation of it. Woven into its fabric are cultural assumptions, motor skills, and the memories of past experiences that are both real and imagined. These are in a perpetual state of uncertainty and produce an unpredictable environment that is modelled by contagious relational fluctuations that are explored through play. In both installations clear evidence of behavioural contagion was displayed that modified the parameters for interaction within them, and which were unique to each installation. These were a combination of both conscious and unconscious mirroring, such as involuntary jumping, or dancing that began to spread between individuals in emergent groups and generate foundational structures for play patterns.

As interaction time increased the embodied exploration of the artworks that manifested as erratic play became ritualised into game and dance invention. It was a process that appeared to involve Playspaces that were temporarily shared between the inhabitants of the installations. It was through these more complex interactions, in combination with dwell-time, that levels of visitor interaction were measured. Engagement within *Soundweb* and *Interplay* continued to be evaluated through duration and complexity throughout the periods of their development and presentation. Both installations were designed to maximise interaction, and exhibiting them in the same space, at the same venue enabled comparison between the visitor groups that responded to them. Despite locational similarities, the activity that emerged was unique to each installation and set within a finite number of patterns, indicating that the modes of interaction were determined by the artefacts that constituted the environments as systems.

It was evident that the presence of a goal within the scenarios presented by the installations was a crucial factor in engaging visitors and encouraging positive-agency. It was shown that goals could be implicit rather than explicit, meaning that a defined outcome was not necessary, and expectations of one could remain open-ended. There was enough alignment between causal relationships of actions and effects to generate equivalent objectives that were perceived as goals. Pre-conditioning did not exist in the art installations, and instead of expectation visitors encountered uncertainty, brought about by the unfamiliarity of the environments and the lack of explicit rules of engagement. The open-ended nature of the installations permitted exploration of their content to develop without restraint.

Very little deviation was witnessed in responses to *Soundweb* and *Interplay* by divergent visitor groups, beyond a slight difference in familiarisation time. This was observed in Singaporean state educated school groups and could have been due to the initial presence of their teachers and transferred rules of conduct from the schools. The educational structures between the Singaporean curriculum and international ones are very different. The International Baccalaureate, for example, favoured by many of the schools that attract pupils from overseas, particularly Western democracies, promotes critical enquiry through interconnected modules. By comparison the Singaporean approach is based more on received information within defined subject areas and is considered to have a more disciplinarian approach. Singapore is situated within Southeast Asia and has a dominant Chinese origin population, but also significant numbers with Malay and Indian origins. Consequently, responses might be expected to be culturally mediated between those of differing backgrounds. However, during the observation of *Soundweb* and *Interplay,* almost no difference in response or variation to the interactional patterns was witnessed between any divergent culture engaging with the artworks. It is an important finding because it confirms that the affordances presented by the installations mediated the behavioural responses to them.

Ethnographic diversity in visitor response to the installation environments was not the purpose of this enquiry, and observation of it was a direct result of situating the installations in a region not native to the researcher. It is understood that the data was analysed through a lens of innate cultural bias, and an effort was made to maintain objectivity throughout. An intended future study will focus on understanding the implications raised by these findings. Nevertheless, they do corroborate the claim made here that it is the framework of a situation that conditions the behaviour of a response. While it was initially not possible to predict the precise form that reactions took, over periods of time there was very little deviation between divergent groups.

Reconceptualising interaction within a context of unpredictable public interactive media environments, the subject of the third research question, can be achieved by understanding points of contact between visitors, artefacts and information within a context of democratised intersectional spaces. A permissive environment is fundamental to this because it encourages ownership, out of which emerges positive-agency. Interactive environments are temporarily unpredictable, but do not remain so. It is necessary to ground theory in observed events to understand how these patterns emerge and mutate, because each new environment will produce a unique set of results. Observation functioned as a mechanism of the research artworks by strengthening the extended authorial control of the artist through environmental affordances. While full agency was offered to visitors through the absence of instruction or facilitation, visitors

were observed to operate within the confines of the framework offered by the artworks as systems. This was the case even though initial reactions were unforeseeable, and demonstrated that within these installation environments, at least, extended authorship is a prevalent limit to divergent forms of agency (see Chapter 4.5).

Psychic exploration of the research artworks was evident in the generation of engagement contexts through play. It was an interaction within the installations that was ritualised through repetition of patterns into structured situations that resembled rule-bound games. Gamification was initiated by the inhabitants of the environments and came about as a result of their interactions with the system without suggestions from any others present. The development of gameplay within the installations suggest that such behaviour can be viewed as evidence that visitors were taking ownership of their participatory processes. It was propriety over the situation rather than the environment, and one in which interaction shifted from the exploration of components that produced the audio and visual artefacts to ones that included psychological experiences that were explored through gamification.

Collecting live data from the installations revealed much about the factors that instigated engagement within them. Incremental development was fundamental to understanding relationships between the installations and their visitors, because it was equivalent to the artworks 'learning' how to respond. It was through this process that alignments between cause and effect were refined, and the behavioural contagion in visitor groups first witnessed. It is somewhat naïve to expect interaction to occur purely on the strength of a proposition. This was evidenced in the early iteration of *Soundweb,* and discussed in Chapter 8.3. The process of incremental development using visitor dwell-time as a scale to determine successful alignments of the installation components provided an initial framework for measurement. Increases in interactional complexity coincided with lengthened dwell-times, which presents both as ideal candidates to evaluate engagement levels. By using this, the observation process clearly indicated that behaviour was mediated through the framework of the installations. The way in which the components of the artworks were positioned and their effects aligned, caused response patterns that repeated themselves in different observation segments undertaken on separate occasions, sometimes months apart. There were variations, but the evidence indicated that activity emerged through a relatively narrow dialogue between the affordances offered by the content, elements of expectation in the users and communication between them. Analysis of the installations introduces evidence that establishing a framework that is incrementally aligned is fundamental to interaction in this type of environment.

It is important to understand that overlaps between the physical, situational and psychic responses to situations produce an entangled place in which the ludic functions to test the confines of the intersections. Visitor engagement within the spaces underwent transformative changes that were defined through embodied exploration of the artworks. Play appears to be fundamental to the manipulation and management of context within an interactive environment. When successful artefact alignment is achieved interaction culminates in ritualised outcomes that can be measured through their complexity and duration. In other words, the creative moment is encountered by responding to initial uncertainty as a mechanism to manage it.

8.8 Conclusion

Among the questions raised in understanding how individuals respond to interactive environments through embodied encounters is one concerning free will. In presenting the research findings, this chapter drew the conclusion that the arrangement of media artefacts within *Soundweb* and *Interplay* placed constraints on physical actions adopted by individuals within the spaces. However, the chapter also explained that it was not this alone that determined behaviour within them. It was shown that intricate relationships evolved between material and imagined experiences of individuals that were contagiously passed between the inhabitants of the spaces. In combination with the media artefacts these built systems of response that were finite, even though unpredictable at first. The degree that engagement is self-determined was not a focus of this research but the chapter revealed how it became connected to the findings by way of the

social participation, contagious behavioural modelling and the navigational trajectories adopted by visitors when they engaged within the installation spaces. The chapter illustrated how extended authorship did exist in making alignments that encouraged responses but the nature of resulting actions emerged from the visitors in relation to the affordances offered by the installations. There were multiple factors that shaped the interactions, which were shown to indicate that the spaces were not ones of control but of democracy. These were dynamics addressing the second research question and it was shown that sustained engagement, embodied interaction and social participation can be modified to a great extent through processes of continual refinement.

It was explained in this chapter that the alignment findings established through the initial ongoing analysis of *Soundweb* were applied to the second research artwork *Interplay*. Although appearing to provide a user experience very different from the first installation, the chapter clarified how visitors travelled through the installation and developed gestural responses that equated to the repeated patterns of gameplay that occurred in *Soundweb*. These attributes were shown to be subject to similar modes of contagion in both installations and intertwined with meeting points between the tangible and intangible relational aspects that emerged between visitors and the installations. These were described as *intra*-connections, and were viewed in the context of the Playspace. The chapter theorised interaction as psychosomatically interlocked and positioned the audience and the artwork as a homogenised unit rather than a system of objective relationships engaged with through degrees of emotional separation. This went some way to answering the third research question, which was further addressed with the addition of necessary factors that were identified as being required to instil democratic environments that were explored through play.

It was explained that a culture of permission is required to initiate engagement within interactive environments because it enables visitors to respond in an unrestricted manner. This was identified as a primary condition, addressing the first research question, enabling personal agency within such environments that engaged with aligned artefacts, and was shown to extend interaction by substantial amounts. By measuring duration and the complexity of engagement samples, the chapter introduced a framework for evaluating interactive environments. The chapter then contextualised the findings of this research with a discussion section.

Chapter 9

Conclusions

9.1 Introduction

This thesis has examined how the embodied engagement of visitors to interactive environments can be sustained, and assessed, and why an individual in such a situation might choose to participate. A synopsis of the thesis is reiterated here that includes the underlying questions structuring the research, the methodology and methods used to address those questions, and the contributions to knowledge that were made as a result of answering them.

By identifying the tacit mechanisms that emerge between individuals in interactive environments this thesis offers insight into how, as installation environments, they might be developed in ways that activate the desires and fears of their visitors to generate uncertainty that can be creatively explored through play. As part of that process the thesis also presented a method of measuring visitor engagement in such scenarios by evaluating interactional complexity and duration.

The chapter begins with a summary of the main points raised in the thesis, followed by a section summarising how the research questions were addressed. After reiterating contributions to knowledge, the chapter presents the potential implications of the findings and acknowledges the possible limitations of the enquiry. The chapter then concludes with a section outlining intended future investigation.

9.2 Research Summary

The aim of this thesis is to examine the tacit machinations that underlie interaction and social participation between people and environments that require physical responses by those who encounter them. The research is motivated by issues that were identified emerging from the author's own practice as a visual artist creating such environments. Developing and constructing two immersive interactive art installations that were used to gather data proved to be an invaluable approach in addressing the research questions. Catalysts for participation were identified by re-aligning, adapting and changing elements within the artworks. Uncertainties produced by the unfamiliar environments were navigated by visitors relating correlations between their actions to the subsequent effects occurring within the spaces. *Soundweb* and *Interplay* formed an integral element of this study, providing primary evidence for the thesis, a summary of which is presented here.

Chapter 1 of the thesis presents a context for the enquiry and introduces the argument that embodied interaction is equivalent to acts of mental reflection when responding to artworks. The framework is then used to provide an environment for the thesis' three research questions that analyse how visitor interaction with artworks can be sustained, how it can be modified and how it can be re-theorised.

To assess how learnt culture might filter information and experience, Chapter 2 began with a summary of influential cultural models that have shaped the way situations are understood in general. Although by no means extensive, it was an important inclusion because it drew attention to the fact that the mechanisms of society are ideologically constructed. It examined how agreed social structures build the basis for interpretation, and how this is often mediated through a mix of gatekeeping and plurality. The chapter indicated that societal control is not exerted through specific agents, such as dogmatic policy or media transmission, but through a complex network of factors that includes an amalgam of prevailing thought that is in dialogue with biological limitation. Complexity Theory was introduced as the most adequate explanation of why culturally fostered change and control result in unpredictable outcomes

Chapter 3 presents a history of participatory art that illustrated a shift away from objects as representational symbols that are bound to notions of emergent morality that results from an acceptance of 'truth and beauty'. The chapter argues that replacing these are artworks that are

explored through embodied relationships to comment on aspects of human existence that is democratic. These concepts are developed in Chapter 4, which examines theories of participatory art and includes some of the issues that have been raised as a consequence, such as the important issue of authorship. It discusses how authorial complication emerges in environments where increased amounts of visitor agency are present, particularly in relation to its assignation representing the allocation of power through ownership. The chapter also examines the language that has developed in describing aspects of audience engagement, and argues that traditional separation of visitor response into 'active' or 'passive' is insufficient. The chapter argues that use of these terms is orientated more towards institutional mechanisms, such as finance, than it is to the adoption, or not, of physical activity on the part of an art-consuming public. It was an important point to establish because it removed the onus for non-participation from visitors who are often described as passive, and positions those presenting structured situations for audience engagement as being ultimately responsible for miss-aligned systems. The new terms 'positive-agency' and 'negative-agency' are introduced by Chapter 4 of this thesis to better the reflect the decision by an individual to engage, or not, within a situation.

Chapter 5 explores how the process of participation might be re-theorised through oscillations between psychological and physical responses to events that involve uncertain parameters. The term 'Playspace' is introduced as a representation of the intersectional overlaps between physical and psychological aspects of an encountered situation within an interactive environment. Play is explored as being integral to this process, serving as the primary means by which the rules of engagement and navigation are re-imagined and defined.

A methodology is introduced in Chapter 6 that is developed for the research from art practice, engineering, sociology and video-gaming. The chapter illustrated how all the methodological influences in the research are closely related to Grounded Theory, with the main benefit resting in its aversion to pre-emptive assumptions. It encourages an openness to possibility through observation-led approaches, and is pre-disposed to incrementally built outcomes and an interdisciplinary perspective. It is built upon in Chapter 7 where the primary method of data generation through art installations is discussed alongside its collection.

Chapter 8 evaluates the findings and discusses them in relation to the research questions. It identifies the factors that can sustain engagement in interactive environments, reconceptualises visitor trajectories within them, and explains the extent that behaviour can be modified to sustain said engagement.

Relationships that emerged between this research and research conducted by others are present and most evident in studies that have explored synchronisation between groups of individuals interacting within communal scenarios. Studies into audience experience by Walmsley and Franks (2011) correlate with some of the claims presented here on user-generated input, particularly in their acknowledgement of the changing roles that are emerging in the relationship between the delivery and receipt of creative experiences. Benford (2011), and Flintham's (2011) exploration into imitative reactions of visitors to their own creative content are also connected, as is vom Lehn's (2001) earlier investigation into visitor flows within museum spaces. Corroborations in behavioural contagion were also found in neuroscience with Fogassi and Ferrari's (2007) proposition for the mirror neuron, Eilam's (2012) study into anxiety contagion in animals and Porges' (2009) Polyvagal Theory.

9.3 Contributions to Knowledge

Historically, studies on audience trajectories have served the requirements of institutions rather than those of their visitors. Attempts to reverse this and include communities in dialogues that integrate their own needs have faced stop and start cycles often tied to fluctuating funding that has left little usable documented history. Understanding how information is received through embodied experience is critical in developing engaging interactive environments. This thesis contributes to that dialogue by presenting investigated synergies between interactive content and visitor experience. It analyses the mechanisms that users adopt in creating contexts for exploration through their decision to respond to provocations. It clarifies the extent that those interactions are

shaped by the environment and reconceptualises public interaction within a context of unpredictable patterns of engagement. The arguments presented here are underpinned by quantitative data, which is identified at the beginning of this thesis to be absent from discussions on audience engagement in arts disciplines.

In addressing the research questions, this thesis illustrates the extent that a framework comprised of an installation's media artefacts determines the reaction visitors have with an interactive encounter. It shows that the outcome of visitor interaction is bound in a relationship between a potentially engaged individual and the environmental attributes that constitute a situation. The physical components and environmental dimensions impose constraints on possible activity and construct a framework that is in dialogue with an array of non-verbal signals emanating from multiple users who are simultaneously inhabiting a space. This is identified in the thesis as responsible for making the initial reactions of visitors to provocations unpredictable. Such levels of complexity are shown to be manageable by a willingness to incrementally adjust the affordances provided by interactive environments through making changes to their structures.

This thesis also contributes by showing that the perception of free-agency is critical to engaging visitors within interactive scenarios, because it presents the potential for choice. To reflect the potential outcome of choice, the new terms positive- and negative-agency were introduced in the thesis. To engage agency positively, a clear alignment of cause and effect must be present to provide a potential goal, but so must certain contextual factors. A prevailing atmosphere of permission is fundamental to the emergence of positive visitor agency because it leads to ownership over their encounter. Ownership is the point at which interaction becomes sustained and leads to a contextual transformation that generates meaning out of a visitor's encounter.

Transformation is shown to be a change a visitor undergoes through a process of physical interaction to reveal functionality. It also shifts the locus of creativity, or elements of it, to the user through the same process. Creativity resides in the visitor's performative process of 'interpreting' a situation through an embodied encounter that is generative, and as such authored by them. A democratised relationship between the visitor and the content creator emerges, in which authorship is collectively shared.

Processes of interaction facilitated by the identified factors that extend and sustain visitor engagement with interactive media environments can be measured through the duration and complexity of emergent behaviour patterns. This is a procedure that is synchronised with the process of incremental development that an interactive environment undergoes and operates comparatively between its phases.

9.4 Implications of the Research Findings

The theories developed here seek to reflect the changing dynamics in hierarchies that are often overlaid onto relationships between the production, distribution and consumption of content, particularly in an art environment. As has been repeatedly inferred throughout the thesis, interactional confrontations are not necessarily bound in relationships with the polemics of objecthood and its affiliation with explicit validated function. They comprise modes of user-based experience that have been brought about through an embodied interaction with situations that may sometimes include intangible artefacts, but that offer permission, alignment and agency to a visitor. They could equally consist of the array of non-verbal communication including unconscious signalling, facial expression and gesture that were observed in the research installations.

Such an interdisciplinary approach can enable the research to impact a number of subject fields concerned with delivering interactive creative content through embodied processes. They include disciplines situated outside, in addition to those from within the visual arts. The term 'creative content' is intentionally broad because it is not considered here to be confined to objects, the act of making or, indeed, to the arts alone. There is an increasing interest in the use of participatory approaches in educational practices, film, the heritage sector and psychology among others. The

thesis does not claim to be a user manual for developers of these systems because each one is likely to be unique. It does, however supply a theoretical framework on how these situations can be advanced by considering alignments between fundamental system elements to keep the interests of the participants at the forefront of an encounter.

While it is not suggested here that interactive procedures could replace existing modes of information transfer, or even the objectified knowledge contained within a static artwork, they could significantly complement them. By contributing to understanding of interactive processes that includes movement through space, audio and visual effects, the findings that are presented here may also benefit organisations that seek to engage communities in creative content that offers agency through devolved approaches to authorship. Permitting democratic narratives to emerge could facilitate the needs of a wider range of constituents by enabling them to become involved in the development and the delivery of content because 'permission' encourages agency.

The research installations determined behaviour within them while at the same time entering dialogue with their visitors. Although reactions were unpredictable at first, modification of them was also shown to be possible through adjustments to the installation frameworks. By summarising the factors in which interaction thrives, a number of scenarios could easily adapt the findings that have been shared here and offer engaging experiences for visitors. The important first step is accepting that a constituent can control the outcome of a situation through an atmosphere of permission. Sustained meaningful dialogues can then be allowed to emerge through action. These may not be tightly controlled narratives, but they will be ones with significant relevance for the individual who has engaged with them through embodied concept-building such as acts of play, or gamification. The psychic elements that form intersections between the imagination and the physical (the Playspace), also incorporate emotional needs into constructed context as part of the permissive environment. In these states, individuals appear prepared to suspend their usual prejudices and assumptions and replace them with open-ended investigation. This is not as chaotic as it may seem, because, as Vygotsky (1977) points out, open-endedness is itself limited by a framework of accumulated personal experience (Sartre's facticity) and accepted meaning that is attached to events, objects and situations.

From the outset, the study's main emphasis has involved social engagement in one form or another. The conferences and publications through which aspects of its findings have been disseminated have all focused on contact points between a public and interactive content. Explanation of the mechanisms by which practice meets theory in an interactive community context is a fruitful impact of this study. The process of addressing the questions laid out here has opened new opportunities for further research, which are discussed below (see 9.1.5). One of the most valuable impacts that this study offers is in the solid foundations it has laid for future enquiry into creative content that encourages physical interaction with provocations by individuals and groups.

9.5 Limitations of the Research

Soundweb and *Interplay* were both immersive installation artworks, and a visitor entering either of them was temporarily fragmented from a wider environment by the curtain that separated the room from the rest of the venue. The *Dark Space* that the artworks occupied was a black-box environment, and consequently contained no reference points other than those supplied through the artworks' components and effects, and visitors entering were immersed within their environments. It is conceivable that the mechanisms determining engagement revealed through the observation process of this study may only be applicable within similar situations. Existing studies by Benford (2011) and vom Len (2001) into audience trajectories indicate that similar frameworks can extend beyond enclosed situations. Although their research has shown that actions of individuals within less enclosed spaces models the behaviour of others nearby, it remains an area worthy of further investigation.

Existing studies exploring audience trajectories have tended to do so from the perspective of the institution that hosts artefacts, which have been clearly defined as either museums or art galleries

(Benford, 2011, Flintham 2011, Vohm Lehn 2001). This study was conducted within a venue that concentrated on the importance of play as a pedagogy. As has already been stated, the venue was situated in an area surrounded by galleries, within what had been designated an art zone. It frequently engaged artists, alongside specialists from other disciplines, to develop its creative content through a process of open and closed calls. Even so, the difference is not considered to impact the study because the focus of the research was on the mechanisms of engagement and did not explore how such artworks might be interpreted, or considered in the context of location.

The majority of those visiting the research installations were children, for whom play can be argued as a natural response. Until recently, ludic action has been widely regarded as a functionless activity, rather than a primary construction method for building context (see Chapter 6.3). It enables an embodied discovery of boundaries that define, or redefine situations. In the same capacity, play was also witnessed being used in adults visiting the installations as a tool to explore what could be performed within the confines of the artworks as systems. It could also be viewed as an exploration of the installations' affordances which, when also considered as agency, were offered to a dialogue with the visitor's agency. Because gamification was also witnessed in adults within the artworks, it seems reasonable to suggest here that play is a natural response for any age, insofar as the embodied exploratory nature of an individual in a new scenario may align with what play is expected to look like.

In an art context, children may not be thought of as a serious enough audience for research into visitor responses. However, the age of the visitors is not considered to compromise the quality of the data, the findings, or the resultant theories. On the contrary, the exaggerated reactions and general lack of inhibition was considered beneficial. The findings provided conclusive evidence that the affordances provided by the installation frameworks were in dialogue with visitor agency, through the well-defined patterns of behaviour that emerged. The installations were not constructed for any specific age group and were made accessible to all.

It could also be argued that a certain expectation to play pre-existed in the visitors due to the nature of the venue. However, in the early stages of the installations when elements were un-aligned, interaction was negligible, and the room was left empty. In addition, the observed reactions occurring in the installations were unique to each of them and were not replicated in other areas of the hosting venue. It was not considered to be the venue that encouraged game invention within the installations, but the atmosphere of uncertainty that was presented through the nature of the works. The forms of play witnessed in *Soundweb* and *Interplay* were unlike any taking place in other parts of the venue. In other words, the responses were specific to the installations' frameworks and not repeated elsewhere.

The research, which was undertaken to explore visitor engagement within interactive art environments, drew from a wide variety of subject disciplines. For some, it may be an approach that appears to lack the depth that other more specialised research adopts. However, this study is rooted in art theory and practice and the enquiry has emerged from the author's experience as an artist Great effort was made to corroborate its findings with similar paradigms from other fields, and its strength lies in the connections that were made. With consideration to many of the connected topics being already complex, the thesis has been made as inclusive and accessible as possible.

9.6 Future Research

Technology offers significant potential for reaching audiences in ways that are innovative, and there is an increasing interest in utilising new mediums as a means of engaging them. However, interaction extends beyond digital components to include physical objects and spaces. Installation art has a history reaching back to at least the 1930s (Bishop, 2015), and many artists presenting immersive physical environments, even then, were aware of their psychological impact. Installation as a heritage tool has been explored for some time, with many examples that recreate environments to illustrate moments in history. The difference between an installation environment of that nature and one that is also interactive is in the presentation of choices to a

visitor. What has changed recently is the wide availability of digital and networked devices that are affordable enough to be explored and presented in innovative ways. The importance of aligning the constituents to criteria that will draw the interest of a visitor and prompt them to engage in positive forms of interaction (the decision to engage) and shared authoring was shown in this study. However, a number of events that emerged in these installations have prompted a need for further investigation. For example, attempted interaction between visitors and the projection screens within *Interplay,* indicated a curious desire in some for a more physically enveloped experience with the images (see Chapter 8.5). Friedberg's (2006) offers an intriguing introduction to the subject in her book *The Virtual Window*, but as she acknowledges in the postlogue, her research was conducted at a time of rapid technological development and emerging relationships with it were in a state of flux. Investigating surfacing synergies between individuals and the projected moving images that were observed within *Interplay* was beyond the scope of this research, but will be the subject of a future study that explores the phenomena in relation to embodied interaction.

Rules established to construct meaning out of situations whose causal elements were in alignment but with open-ended objectives, can also be considered as user-developed narrative. In this state, visitors' experiences entered into dialogue with the affordances of the installations, and the non-verbal communication with others in the spaces. The apparent willingness of visitors to respond to modifications appeared entangled with the way they interpreted the situation, and while not the substance of this study, it will be the focus of further research.

Inside the artworks children and adults were observed adopting forms of play as vehicles to make sense out of what were uncertain situations. Adults were also witnessed engaging in dance-like actions while exploring both of the installations, particularly when they entered alone. However, their numbers were too few to make any claims. The collated evidence suggests that the relationship between embodied interaction, or play, and exploration also exists in adults, but the degree of equivalence in its function is uncertain, and will be the subject of further research.

The forms of play that emerged during the observation periods tended to follow repeated patterns of game making. However, there were significant deviations from children that chose to isolate themselves from this by sitting or lying on the floor by themselves, amidst the group activity. It was a behaviour that also repeated, but on a lesser scale. Some children would remain separated for long periods seeming to absorb the atmosphere, and refuse to leave. Others would suddenly re-animate into swimming actions, moving across the floor of the space to re-join the main activity. It was intriguing activity, as was the acceptance of it by others in the spaces. These reactions were not accounted for in this study. Equally interesting were the behavioural differences of visitors when they entered the installations alone, such as roaring. These deviations to general behaviour will be the subject of future research. The relationship between play, creativity, and knowledge generation was very apparent in this study. Given that there is so little understanding of this in general, it is clearly an area in much need of further research.

The gathered data indicated that the same response patterns were present in visitors from different cultural and educational backgrounds. However, the installations were only situated in one country, which introduces a possibility that responses could be bound to that location. At the time research was taking place, an opportunity to present the installations in another Southeast Asian country was presented, but it would have unreasonably extended the research period too far. It is an area that will be investigated further in the future, and ideally combined with the other possibilities for research that have been identified here. This would require collaborations between institutions situated in different countries that were willing to engage in a partnership. It is a study that would require researchers working in several countries with differing cultural histories over a number of years. During such a study, a variety of scenarios would be explored among different age groups.

The research data was gathered from installation environments that were immersive artworks. It is conceivable that the findings presented here could be extrapolated and applied to an array of collaborative situations that include the transfer of information through embodied encounters, and

social inclusion. Further research needs to establish how immersive and non-immersive environments differ, particularly ones that may contain multiple provocations, not all of which need to be participatory. However, the framework requires further testing and evaluation in differing scenarios with different groups and evaluators. It is an important area of potential research that could, even during the testing periods, benefit a number of multi-disciplinary environments, such as community action projects, heritage venues, and spaces shared by artists in group exhibitions.

A future research project will ideally include all the above areas as important components of a main study with an objective to investigate how specific information can be transmitted through interactive processes and situations. Questions that need to be addressed orientate around issues of interpretive divergency and embodied experience. There also exists a potential for possible collaboration with research into human computer interaction (HCI) with which there are many parallels. These reside particularly in the embodied interaction that is theorised by Paul Dourish (2001) in that discipline, where similar observational techniques have been utilised to observe encounters that occur in different contexts.

Through the process investigating the incentives and mechanisms presented by interactive immersive art installations, the research has made apparent that there is rich and necessary scope for further study. Opportunities have emerged to develop approaches to information delivery that are inclusive and democratic without losing the significance of the content. It is not yet clear whether embodied interaction reveals similar information to textual transference, but the depth of engagement witnessed in this study suggest that it is at least as valuable. As society is changed by the technologies through which it chooses to mediate experience, it is crucial to keep abreast of effective methods that can potentially navigate new emerging expectations.

Appendix A

Interview by Richard Kearns with Anna Salaman 11th October 2015

R. When did programmes begin to emerge?

A. If you mean programmes, I will tell you what my definition is for programmes in museums and art galleries. For me programmes is any activities that are put on to enhance or augment or deepen the content of the museum or gallery and that could be the theme of the museum or gallery in itself so simply something there to reflect the museum or gallery, but it could also be a piece of art or an object or museum exhibition that is on. This is basically my definition an activity that enhances the theme or content. So, when did that start? It started at the same time as museums started because if you take the guided tour or the lecture as a programme, which it is, right from the beginning with the cabinet of curiosities and the rich Tudor men allowing people into their homes to see what they had collected on their forays abroad, no doubt they would be giving a verbal commentary about the objects on display. Then you fast forward to the British Museum opening in the 18th Century I am pretty sure they opened with a lecture series but I might be wrong, and then over time, as I understand it, it really got going in the twentieth Century where in the more contemporary spaces you started to have performances that enhanced the content, but you also had audiences being dealt with more thoroughly through activities so schools programmes started in the 1960s in the UK onwards that's a generalisation but broadly speaking and with that came workshops theatre and museum education music etc, so you started having a lot of different art forms beginning to enhance the content of museums and galleries when different audiences were being specifically catered for. And today of course you have lots of different audiences it is probably easiest to look at programmes through that you have families, schools, adults. In some cases, very specific audiences like communities and within communities you have you can have immigrant or gay and lesbian and bisexual communities. There is some very niche programming out there now.

R. In the light of that how do you feel programming affects the relationship between the audience and artist considering the curator will also have input into that programming? Are you working the curatorial framework, or are you working within your own agenda as a programmes department?

A. It's not necessarily the case that the curator always has an influence on programmes. This is quite a specific example but in the Victoria and Albert Museum it is the case because they have a rule that the curators are responsible for the particular galleries so if you run a programme in those galleries you have to ask permission from those curators who can say yes or no or have a say in it but by and large most medium to large size museums have their own education and programmes departments and they are trusted with their expertise and experience to be putting on programmes without having to work alongside the curator. They may wish to and they wish to get the input of the curator but it's not really the case any more in my experience that they have to. You could say that the fact that the work has originally been curated has an effect on the programming, but I wouldn't necessarily agree with that and if anything, my experience is that programming tries hard to add a kind of dynamism to the work that they feel is possibly lacking through the curating. So, the programmer is a slightly different beast and can be quite political in that respect

R. Given your time at the ArtScience museum which doesn't have a permanent collection, but you also have experience elsewhere that do have permanent collections, with the rising power of the programmes department within those institutions, how do those departments, in your experience, effect what kind of art is exhibited within those institutions? For example, is it exhibited with a view that it may have lots of run off workshops?

A. It depends how forward thinking the institution is. It was always a source of frustration for me that programmes weren't given enough status so frequently there wasn't enough space to have programmes running directly in front of the artwork, which is surely the point because it is there to enhance and deepen the content of the artwork, so the closer you are so the closer you are when you

are doing that programme or activity the higher impact it will have and the more meaning and the more educational etc. I did get very frustrated in the UK and I worked for many different institutions but programmes was constantly playing second fiddle to the way an artwork was displayed which was decided by the curators. Then I came to the ArtScience museum and for the first time I was working for an institution where programming was given an equal footing and that was amazing and it meant that I was present right from the beginning from the concept stage onwards in the development of any exhibition. I had a say on the height and placement of certain objects because I was the one banging the drum for audiences and activities relating to those works and everyone was extremely respectful of that, not only respectful the considered it necessary, so that was very reassuring but there is still a long way to go unless things have moved on dramatically in the last three years in the UK since I haven't been there. The other thing is there are programmes in their own right they do exist outside of the art that may be on display in a museum or gallery, so having said there was a difference in the UK compared to here in Singapore at the ArtScience museum the example I can give is in the UK and is again the Victoria and Albert museum who has been running the late nights for over a decade and a lot of the work that appears in the late nights on the Thursday nights I think is work in its own right. It is there it is part of the museum but it doesn't necessarily reference work within the museum it is just that the late night has become such a brand in itself it is such a popular evening it can stand alone. By the same token at the ArtScience museum in Singapore I programmed a lot that really just rode off the subject of the museum rather than any specific artwork. I had a programme called Sunday showcase, which showcased tertiary work that may be seen as mixing art and science. I also ran a programme called ArtScience Late, which was a performing art programme, where performing artists would come in and enhance that evening, it was a late night. There was a bar and we would keep the exhibitions open later, but the actual work there was simply there for its own sake. I would say programmes can affect the art that is exhibited depending on the culture of the museum or institution, but also, they can exist in their own right as well.

R. Do you see programmes developing more power within an institution in terms of its relationship with bringing audiences in and raising the footfall? Do you see them taking a more prominent position in the future, or do you think that things will remain as they are now?

A. I think there is going to be a dramatic and rapid growth of programmes in all institutions that need to survive as this century continues. Museums and art galleries are not in great shape at the moment around the world if they are affected by government cuts as is the case in the UK except for the hugely popular established ones so they really need to do what they can to attract people. That's one reason why I think programmes will be on the increase because it is what people want. It is not just children that want kinaesthetic hands on participative activities, it is humans and people have been really slow on the uptake of that. People talk about learning styles but miss the point that most people are visual and kinaesthetic and read write and the other styles follow those preferences. If people took that seriously the museum would be a very different space. There are constraints, its expensive whether they are transient events or some kind of interactivity available throughout a particular exhibition. You generally need more staffing, everything needs to be that much more robust if its participative, but there is absolutely no doubt at all that people enjoy them, they talk about them, they document them, they socialise about them. It attracts audiences. It attracts all ages, and it enhances the content so there is no doubt in my mind that people are slowly waking up to this fact. And the other fact is that programmes are very conducive to the use of technology in the way that is becoming second nature to people now; the selfie and the sharing and the Facebooking all being done within a ten second span. Programmes are very incentivising for that because if they are interactive and participative they can frequently be about the visitor themselves and we all know that's very popular for visitors and that they will share it. And we know that A. there is a popular thing going on and B. a marketing thing going on with this advent and rapid rise of technology in the twenty-first century and it is becoming cheaper to implement as well so all of these factors mean, and it is already happening slightly already, that there is going to be a huge surge in programmes.

R. Thank you very much, and your current job exists essentially just as programmes without anything else.

A. Yes that's true, its layers. We have a four-month installation or experience and on top of that we programme artist interventions and art jams and workshops and tinkering events and so we are layering programme onto programme and its ever changing, that's what people want, that's what people like.

R. Thank you very much for your time. Just to clarify you understand that a transcript of this interview will be attached to this thesis but will not be made public.

Anna Salaman is currently the Chief Executive of Playeum: The Children's Centre for Creativity, which is located in Singapore. Previously she was the Programmes Director of the ArtScience Museum, Singapore.

Appendix B

Interview by Richard Kearns with Magdalena Magiera. 3ʳᵈ October 2016

M. We are part of NTU we are their research centre that does exhibitions that engages with research topics. The residencies are also very much related to research themes. We try to pair that and never try to decide what our next year's themes, also how do we want to continue because. This year there was quite a lot about the geo-politics of the region, that will continue, this year was about the land where as next year will be much more around the oceanic and the waters. There is that continuation and one always tries to go back to artists that we have worked with. There is the initial idea, and keeping it in the student section of the university. There is of course the point at which a larger audience will engage in your location as well then there is also what ages, and what themes and where you want to go. There is of course the division between the academic part and the education part. It does not need to be a whole weekend but can be a workshop-based thing and a lot smaller. My background was in Exhibitions and public programming, or activation in general.

R. I am interested in what you would say the relationship is between programmes and curatorial practice, because as far as I understand it, programmes is to draw and develop audiences. Is that correct?

M. Yes and no. Programmes in general in my case and in our case, when there is an exhibition, I sit down with the curators to discuss what can be done with the audiences. On the One hand you can do a development with the artist him, or herself. That's more related to, almost a think-tank workshop basis. Then there is the education, which is more what you said further back and audience based. For example, this may involve an artist, we don't give tours, but walk and engage with a certain area in the city, and based on, let's say sound, you experience your everyday life differently. If you do a hawker¹ centre, or a coffee shop, you don't do it at nine, or ten, you would do it at six am when everything is setting up. We can then ask what kinds of smells are there and what sounds, and how does the sound vary depending on areas. There is an artist who did research on sound level in restaurants, which included hawker centres, let's see how many people want to engage. For me there is a very experimental side to it. I don't know the society here, how much they want to engage, how much want to see, that normally they wouldn't see as art in the first place. I have the impression that all the artworks that are politically engaged, but also activate and you have to do something, people are a bit irritated by how is it called art, because in their mind, it's a sculpture, or a painting inside a building, how is it related to our everyday life? I think this is something in general everywhere and of course the easiest is a talk. When you mention the interactive, there is this artist I worked with in New York. There are actually two. There is one Julia Weist², *and another Tyler Colbran*. Julia works a lot with space and it is very related to on-line digital space, so how something in the real world can trigger something in the virtual world. There was a project that through manipulating the Internet she created that she got much more hits on a work that was every time Haim Steinbach was coming up her name was becoming part of it as if they were one, working on one project. What does it mean if you the ability and how does an artist who also has been involved then play with it. Her latest work, there are two works, one is on the internet and the other one on a word. She found the word *Parbunkells,* which is apparently a very old word but at one point got totally illuminated. I think it is still in the dictionary, but it was not present in the Internet. When she was first looking for the word she went on line and there were zero hits. She then placed the word on a huge billboard outside, I think somewhere in Queens somewhere on the street. Not that present, but present. I think within a week it got several hundred or several thousand hits. And suddenly a word that was not existing whatsoever got super present online. They started merchandising the word. There are mugs with parbunkells, there are post cards, suddenly there was a web page, it was still kind of great but this was actually my project this is my artwork, but what happens if it is being taken over by the

---

¹ A low-cost seated public eating hall with a variety of food outlets specialising in different food types.
² http://work.deaccession.org/#

public, or by the audience? It is also as I see it a certain amount of outreach in education as well. And of course, there are artists that work with that but then there is the more proper education in creating a certain consciousness on either the theme, the topics of the works, or just trying to educate in general. Not even educate but trying to create a certain consciousness or awareness of what contemporary art means in general through some more or less and I guess it depends. In the US they are much more into the whole, you have a lot more talks and lectures and there are directed at professional people, and here the social structure doesn't allow it, in a funny way, there is a family life. Also, art, for a majority, is seen as a job, o you start at nine and finish at six. Whereas in the US it seen as much more of a life style, it takes much more of your life, in that sense. I think it is different in Indonesia, where so far I have the experience where it is way more integrated into an everyday life and art groups, or communities, there is a bigger influence in getting together and gathering, and then artists create educational work or engage with the audience much more. From really small ones to older ones, and I think here, if the education system does not put it in the syllabus of the school it is not seen as something educational or part of an everyday thing. I guess that is just the way the system developed.

R. Yes, I have experienced that as well.

M. I agree there is a lack of communication within countries and cultures, but I was speaking to an artist and she said that actually the biggest git to the art world in Southeast Asia was Air Asia and the cheap flight companies because that was the first time that artists could travel and visit each other and engage a bit more. But I think that is happening much more outside of Singapore. One thing here, more and more, you will find extremely educated professionals. It doesn't matter if it goes into the curatorial or into the artists or into anything like that. You have a high-profile education here because the funding support is much bigger than it is in Indonesia, in Thailand, in Cambodia, or anywhere else in a lot of Southeast Asian countries. I am not sure about Korea but I feel they also have a better planning system in place for people. Dozens of people went to Harvard, to Princeton, tons of them went to Bard, others went to Whitney, there's more Columbia alumnus. There is a very big Columbia alumni in Singapore. But it almost feels that they come back, and they have all this knowledge, but because the system does not work that way, I think there is still this thing between people who would like to do it, and they have the knowledge, but also a certain audience which hasn't experienced it, and it was not in the past years of their life, and I think that is the certain bridge that needs to be somehow created. There is the need because there are a lot of communiqués that they would like to and that they are interested, but they don't know how, and also as you said communication is something that IU have never had such a difficulty in finding out what is happening and with spreading the word with what's happening. It just feels that everything is last minute and I need to figure out why. Because there are so many institutions who do create all this education and knowledge, but they have no audience because half of them are not even aware.

R. It is very hard to get even if you are looking for it

M. Yes that's the point, even if I want to find out, it is like every time the information is on le…, like newsletter kind of post this should always be in an ADM, but isn't for some reason, why isn't this happening and why didn't I get the info? And I am a regular on every possible email send out, and then it is because this only goes here, and then it is like I'm getting so much spam form medical and concerts for lunchtimes, but I am not getting what I am interested in, so I think this is still something that, I don't know where and why. I am drifting away from the question?

R. No I, you've covered some of the points including mainly, you sort of touched on it, how you see programming as affecting the relationship between audiences and artists, and I think you have covered some of that in terms of…

M. I think it really depends because I have the impression that in the West there is a bigger… actually no that's not true. It is not the West. I think everywhere except Singapore there is a bigger interest, or need, or awareness, or, in collaborating with the audience. Where Singapore I sometimes have the impression, they are either afraid of the audience, or, I think it is sad that….

er OK. I think the idea of an artists is exhibiting in a space, and anything combining is almost seen as social work.

R. mmm, mmm, I guess in some ways there's a (indistinct) (perceived) difference with activist art even in the West

M. Exactly, its seen everywhere, there's always this line, who def… how far do you go, and what is like viewed as the bill board, I mean it only works because the rest of the world, or the people in New York City, living, start being interested, and it only works because of this.

And of course, when she does it in the beginning, I mean, how, like, how many people would actually Google it to find out what it is? You never know, and people may be one hundred thousand, and here if there is this moment where you ask artists to interact with audiences, especially the younger generation kids; immediately it feels like oh my god what do I have to do now are they stupid people? Instead of kind of like, OK, I'm doing this and I will do it but how do I find the language where I do exactly the same that I communicated to an audience that has a different vocabulary. So instead of seeing it as young adults, one sees it as like, erm, and it is not only here, it is like general. It is often that there is this moment that artists just don't know how to, what to do, how to come up with, an idea in their ways of working.

R. It is very difficult to take your idea and translate to an audience where they can then somehow work out the rules of the piece and interact.

M. And also how much is it something you are interested in as the artist who wants to produce a certain knowledge, or content, or wants an exchange, or some in-put that's of course kind of like, can a nine-year-old give you the in-put you are actually looking for? And is that then something you would be interested (in)? There is this Australian artist, I met with her, De Susa, Kate De Susa, and she did an amazing project. She also works with communities, and she's a very young artist in her thirties and er she's a migrant, but born in Australia, and likes to work with communities, and she engages through food and cooking, and she sets up, she asks participants to bring a certain dish, and this event is associated with a word, and she comes up with… let's say she speaks about geo-politics in Southeast Asia, there would be a, I don't know, a certain kind of sustainability, or a land reclamation, or water getting higher, or I don't know kind of like certain words which are key words associated with. And then each dish has a certain word that is associated, and through eating you discuss certain problematics, and then also you connect also the words and the dishes. So, what has sustainability to do with reclamation, or loosing water, islands disappearing because of the rise of the water. And so how, which words are connected. And through food and through convivial communion, and so the table cloth which is also your seating area becomes also the lapping , and so you engage, and she also did it with kids. That was in Scotland I think. It was with the farmers kids and I think it was somewhere where there were more sheep area, and it was more connected to food made, like everyone was talking about food and it was all made with er (pause) the porridge thing.

R. Oats

M. Oats that's right and half of the dishes everyone came up with was with oats and then there was the chance to (indistinct) where does this come from and what are the key words and how are they related. And it turned out that there is no tradition for oats in that sense, but everyone eats or cooks with oats. And then on top no one even eats as much oats as other dishes which are made. So can through… of course we unpack this and be interested in where do certain err… where does heritage come from? And how is it superseded? And how can you map and play with it? And how important is it for society? And also, as like a (pause) and so I think she provided to different levels and she still had the input from her which she thought was interesting as well. So I think that is also something that certain, which is fair enough there is others which if I do it with kids I don't think I will get anything out of it, where others say actually that could be very interesting because certain questions a kid would ask, an adult would never ask because they think they know it, or they never repeat about this actually, so therefore it really depends. It is interesting

because every time you give a tour for schools, a question; there's always one person who asks this kind of like "whose your ideal audience?" and it is kind of like wow it always seems it needs to be associated with a certain status or a class, where as it is the other way round, because anyone can be the ideal audience, as long as you are interested and want to engage, and do you want to know, or find out. That's actually the ideal audience, and it's the same for the public programme as well. So I think (pause) and I guess it is difficult also tool wise. Like for example in the US a project, whatever, that has to do with the Internet is something that is picked up much faster than it would be in Southeast Asia. Singapore, again, I find is a funny bubble, which is very difficult to place or at least for me. It's much easier for me to place certain ways of working, and also reaching out to people, also a certain discourse is much easier outside Singapore. I guess it has something to do with how the past years were, and the insecurity about what can be discussed and what not, and always trying to find a way of working with a taboo subject. And one tries to find a way to pump up the forbidden subject. It then does it in a way that doesn't really talk about it. And then it just becomes very blurry instead of just saying OK we want to talk about, I don't know, religion is a big thing, so how can we talk about it while still having a project with it and about it. And not seeing it as an attack against a religious group. And I think that is always of already being before one does something of already being scarred.

R. Self-censorship

M. Yes. And if one speaks to Singaporeans that seems to be one thing hey mention quite a lot. There is a big discussion, especially in the literature world there is a big self-censorship. And theatre wold has less but I think this was always the world that had a bigger community and I think was a bit stronger. The arts seem to be very strong but at one point it backed up and to be honest I don't know that many details so it is difficult to tell. But at the same time there feels like there is more happening as well. And there are certain artists that are now working, or publishing with more knowledge with discussion, trying to get the community together. And that's also the biggest complaint. And everyone I ask their biggest complaint is that there is a lack of exchange. A lack of talking about, or switching from the book you've just read to the film you've just watched, to series to the football game, to the food you just had to a kind of certain ridiculous scene. It seems that multi-tasking is something that everyone would like to do, but somehow it is never done. And I guess the difference is that wherever I've lived so far, there is a bigger community that doesn't live with their parents anymore. Berlin or New York.

R. It is very prevalent here.

M. And here the living conditions, you live either with your parents or you live with your partner and in between is lacking. Like a student that will live in a residency, kind of thing. Well it happens as well, that's not true what I am saying, it happens, we have NUS and NTU that has a campus also for students. But then those are places where the amount of work you have, which you need to deliver is so big that you end up isolating yourself because you have to catch up with work. Which in the States is the same and in Europe, kind of. So, I guess that becomes… like in university it is different.

R. Yes in university there is a presence

M. Yes you go somewhere to study, and you have that moment of creating your interest you do things, parties, and here also. I haven't really been out here. I don't party as much, ok I'm getting older that may be another reason. But it always feels that…

R. It is quite conservative by comparison, so in the light of that do you see your position in programs increasing in power, if that's the right word, within the institution, in terms of managing those discrepancies between, especially here?

M. I think in general it has a different start than ten years ago I think in general the public programme in past years was much more developed as its own department because until today, if one does a biannual or a bigger the thing the person who is going to do this has the same

curriculum as the exhibition, is also asked to do some public talks and lectures. Or if there is a department responsible for this, those are people who are brought in at the last minute. Because everyone thinks let's have the exhibition first, then the education. They can look at what the exhibition does then develop the programme, but in a lot of times it is better if the education starts at the beginning because we can also have different conversations. And I think that in general changes quite a lot. So, Singapore is kind of in a privileged position because things are developed in parallel you have the exhibition and the public programme are seen as one thing, or pitched and seen as one thing. I think that is also a difference to let's say Europe where I think the programmes are not the strongest. Educational programmes are strongest in the US .

R. So that's where it is emerging from?

M. Yes that's also where the biggest money is being put into it for the education, whereas Europe don't have the money, but I think it is something that will also change, because so far you have the tradition that the State pays for art, but that also means that they have less money, so the teams in the museums, or institutions, or kunst halls…

Interruption at this point from the museum director – Ute Meta Bauer

Resumes:

It is interesting that it gets quite a lot of attention. It is funny that there is an interview with a YBT who – like a young professional trainee that might get the job and there is everywhere creative writing but there is nowhere critical writing. And it is like I have it all there in plan, just don't have the money to do it (laughs). So, I think there is the need and people really want to, I guess there is a moment why does want it (? Sentence unclear)

R. Do you think that is because there is no traditional reference point for people to position it anywhere?

M. which at the same time is kind of like they had a certain tradition in art, and of course it got stopped in a development point, but then every time one asks about what is happening in the region, art is always part of it, and they had. no, they didn't have a different idea. It was middle classified the way European, or Western art was classified, and from what I have heard there is quite a lot of written material it is just in a language that the west just doesn't speak, and there is no one so far who goes there finds the material and translates it into proper English. Which is the linguae franca, at this point, for knowledge. So I do think that there would be more people in , because there is a chain if you have more knowledge you are well educated in Southeast Asia, and they have the English language and there are a lot of texts just in one language that only a few speak, or that's not true because there are a lot of people that speak it but maybe their interest is not there. And then one would find out more about art directions, or certain groups, or interests. I think that's a bigger problem than the actual lack of art in those countries.

R. And I suppose that will need to be done within a critical framework.

M. Someone that has a certain education and is able to put it somehow, I mean it needs a big team at the end of the day, and also, they need to be aware of how it works in a country. So, a lot of South East Asian art, you can't put it in the Venice homes and things like that, or periods, it is much more related to certain manifestos of cultural events, like wears or revolutions or something more stirring up the region. A lot that happens between countries, and of course you have the ocean in between so you can't. I mean Indonesia must be one of the most complicated spaces/places to do art history there because each island… and then the amount of languages they have there. So, the amount of knowledge in languages which even people in the same country don't read and understand is really huge, so how could one expect they would learn what was happening on a neighbour island. So, it really feels like most of Southeast Asian art is written by white people coming over and making a study, but then again not having access to all those materials might just have a totally different outcome.

R. Yes, I think that has been a bit of a historical problem with analysis of this region

M. Yes so therefore I say that's another point in education and certain outreach, so how. so, there are so many areas that one can do education, which is also somehow practical. So, I think there is quite a lot of work to do, but not only here, I think in general, especially now – the way the world goes.

R. That brings me on to the final question. The texts that I have been reading that have been put out in the last couple of years are very much dealing with post-colonial thinking, and seem to be very critical of post-modernist world views. Is that a criterion through which you work as a curator or a programmes person, or is that innate within the fabric of discourse?

M. I guess when I came here I was really not aware of the region and the history of the region, so when I arrived a tried to listen much more in general. And what are we talking about if we talk about Southeast Asia, and which direction can we go. I think all the stories are so sad because a lot of the information is missing because it is not in a language I read, speak recall. And I think there is in general a certain lack of voices from the region. So, the whole post-colonial language feels much more spoken by the Britain and the colonialists than there was that were occupied and I think that could also change a certain … so more and more I have the impression that it is interesting to engage with much more of the local, and also their story behind it. And then of course I was brought up in the west so, I don't know how I would be able to think differently because I come with a certain way of behaving. So of course, I try to – a lot of the programming I do is that mix I think. I think when I arrived I had much more of the way I used to do it, which is kind of like there is a theme and I have an artist that does something around it, or I have a thinker, an academic or a scientist and you can vary the format and there is always a certain knowledge like association or ides of giving knowledge to someone else, but here I am trying to be a bit more, hmm, I have always been a bit experimental, but here I think I am trying to go with more, because the traditional way doesn't work. The kind of, I'll tell you how this street goes, doesn't work. And I think here it's much more… and it's in the West as well, but sometimes the whole intuition why I was doing it in a certain way is something which… I think I am trying to find ways of – how can it be communal and convivial, because most of the feedback I get says that is what is missing. Or that's what they like at the CCA and it creates a certain platform which is neutral and gives people the space to exchange in honour of a very neutral territory. And speak to people, I guess like me who have no idea what the region is about, but want to know or would like to find out. And when I talk about Singapore and I compare it a lot with Poland, it's a bit like the feeling I had, because living in Poland I heard so many languages because no one speaks Polish and nobody cares anything about Poland so everyone in Poland is much better or higher than anyone under(??) but a certain at my age generation, a lot of them speak more languages and have better education and have seen more of the world than a German equivalent. And of course, that's just personal experience. Because of course they were in the East, they were behind the iron curtain. There's the hunger of finding out and knowing more but of course there's that thing that you thought the rest didn't or wouldn't know, and here I have the same impression that everyone needs to know more. You need to be aware of the West, because they are not aware of you, in that sense. And if they are aware of you they just come over and think they know better, because in Poland it is the same situation. Because you lived behind the curtain you may not know how the world spins, but they know how to support themselves in their region and their area and I think a lot of them, especially the ones that are willing to go out, a lot of times they have a wider perspective then someone who maybe never left the US, but is very well educated in any kind of public programming or curatorial studies but might not necessarily have the (??) look on it. I am generalising a little bit here. I think that's what I mean when I compare Poland with the East.

R. I think we had better stop, people are starting to arrive. Thank you very much for you time.

M. not at all it's a pleasure.

Magdalena Magiera is currently Director of Public Programmes at Nanyang Technology University Centre for Contemporary Art.

Appendix C

Interview by Richard Kearns with Kristen Kaplan – 5th October 2016

R. So the kids were N1?

K. The kids were N2, they were mostly four years old but apparently they had a couple of siblings that were two. So, it was two to four, mostly four. It was very interesting because usually they aren't as engaged as the group this morning was, but they came in and at first we scaffolded, and we were doing the jungle track and identifying the sights and the sounds. The group today was specifically looking at lights.

R. That was part of their module?

K. Yes. I was telling the parents about the lights and how it works and we were looking at the sensors. When they are younger they are usually a bit scared so I brought in the flashlights. They loved the flashlights and it was really nice because they were sharing accordingly. We had four flashlights in there, so we also did some shadow games. They were probably in there for thirty minutes and then a couple left, but a lot were coming in and out, and a lot were in there the whole time. I would say I probably had eight kids steadily in there for the hour and a half to two hours they were there. It was funny because some were getting scared, but they loved getting scarred.

R. I have noticed that with this installation. They use that. The fear is within a safe context and they have this tendency to heighten it amongst groups, but I have not noticed it yet amongst that age group. They tend to be too scared and a lot of them need to be carried.

K. So no one was carried and I guess the way I try to mitigate that is by showing them behind the curtain. That it is not real, that it is a projection, and it is just light, and I think that helps them not be scared. Then obviously after we go through the initial movement then they started doing… then I also start doing animals, so what kind of noises do the animals make? What do they look like? I always try to get them to crawl on the floor, but they weren't really having that today. They started doing scary noises, and animals like that, and they loved that, and they started really going around the space. We had two-year-olds who came in also, and they always follow the same pattern. They stand by the door and look in and assess the situation, like what's going on. I try and give them a flashlight to make them feel more in control. This one two-year-old girl ended coming in and out for a long time she was by the door and focussed on this area. She really enjoyed it and we had another two-year-old also come in and he was having a good old time. Then towards the later period it was kind of crazy because at that point they were just enjoying the space. They started playing with the curtains but as long as they were ok and not pulling on it I kind of allowed that. They were hiding behind the curtains and playing games. At one point they were doing light sabres you now, Star Wars.

R. With the torches?

K. With the torches. Then at one point they were trying to destroy the tiger (projection) so they had created an army and they would go, and they would do this (hitting motion) and it would disappear and they would say, "you won, you won". And they would walk over there (towards the projection sensor) and then "oh its back" and that was going on for a long time. It was like light knocking, but at the same time I was aware that it was too loud for the other space, so I was trying to get it to just hand prints on the wall.

They were in the space until the very end, and they were very good at sharing also, because they really liked the flashlights.

R. I have noticed that before, but I have also noticed that the teachers sometimes go in and take them off the kids, at which point the kids don't return. The flashlights seem to be a tool that the kids use to diminish that fear factor.

K. Oh yes, I totally think so. I was thinking that you can't have twenty flashlights, but there are those small ones if you needed more. They definitely liked the flashlights, and they were very good at sharing too, because it is always awkward for me if you have eight kids in there and how to navigate the sharing issue. Some kids really want one and others want them also, so that could escalate in a negative way, but fortunately we didn't have that today.

They were playing in the space in a number of ways, and others just came in and ran around the space and did some screaming. I kept telling the parents "it is OK they are allowed to be loud in here". A lot of scaring each other.

R. Did they utilise the sound activated lights at all? The red spot light, or were too many kids in there for that?

K. What do you mean?

R. There is a red spotlight which you can turn it on and off with noise. If you stand and clap you can activate the sound switch. It's not random, although it may appear random with that many children in there.

K. No they didn't and I wasn't aware of it. If I was I would have directed them.

R. I was interested in whether they had worked it out or not.

K. No, no they didn't. In fact, we weren't really sure where it was coming from and in fact I try to guide to a shadow area, and that's a good shadow area, but the light comes on and off so quickly.

R. That's the sound. As soon as it detects a loud sound it turns on or off. The one next to it, the white circle is triggered by movement, which I have focused with a cardboard tube, so you have to be at the back. If you wave around that should turn it on, and it should turn on even for children that size. I might go in and test it. That one stays on whilst it detects movement before it switches off.

K. I don't know if that one was working because it would turn off quickly and I would have people move around to trigger it again.

R. That probably indicates that it needs to be focused lower to pick up the size of a four-year-old.

K. I think the noise element at that age… with older kids it is easier to explain the concept.

With one of the girls X she is in here, she is three years old, maybe even two, we were talking about sensors and she was enjoying putting her hand in front. She didn't understand the concept, but she did understand the red (sensor) light. I was trying to get the whole technological aspect to her, but how much can you (understand) at that age.

R. It is complicated, but with the motions, I have seen children interact with it.

K. But these ones all identified, and this is the second group, so we've been in here a while, but they all identified the animals in the space. We were trying to focus on the sounds, and they were more receptive to that element. I think for younger kids it is just so exciting, and as a couple of the parents said to me, "it's such a novelty to be in a space like that." A dark space with all these various elements.

R. I have noticed that the children do often think that these lights are coming from behind the curtains, which seems to be a repeated pattern.

K. I also think it is interesting that the kids that love that space, they love that space, they are like devout, you know? They are there the whole time, they may come out and in, but they are drawn to that space, whereas, there are kids that come in and spend a couple of minutes and they're out.

R. Yes there is a kind of group dynamic that happens with that interaction.

K. Yes, but is also individual. There was this one girl who loved it and she was coming in the whole time, so you see these kids, and it's not that they are together it's just individual in that they respond well to the space and they come in and out.

R. Do you mind if I type this transcript and add it to the research.

K. No not at all.

R. Thank you very much.

K. [To nearby children] did you guys like the dark space?

Child Y. It was so fun.

Carer X. Was it scary? No?

Child Y. I saw so many shadow animals.

K. Which was your favourite animal that you saw in there?

Child Y. My favourite animal was, I think, the lion.

K. And she was very smart. You were the one that got the frogs right away didn't you?

Child Y. And also, I think I know the other shadow, the strange one, the bat.

K. Oh the bat.

K. And what was your favourite spot of the (dark) place? Did you like the space?

Child Z. Yes

Child Y. And I made a scary spooky story.

K. Oh yes, I forgot. She did a crazy spooky story. And she took the flashlight and put it on her face.

R. Wow that made it even more scary.

K. What did you talk about? She talked about the bat who scared the frog.

Child Y. The bat that scared the frog, but actually the hippo was being so scary, it was trying to get something to eat, looking for food for its dinner.

R. Oh my goodness me.

K. And what she did, all the animals from the space inspired her story.

Child Y. It was just a bit scary

R. Was it fun scary, or not fun scary?

Child Y. It's fun scary.

R. That's great thank you very much.

Kristen Kaplan is a facilitator at Playeum's The Children's Centre for Creativity in Singapore.

Appendix D

Soundweb Observation Documents

First data sheet

Date	Time:	Research checklist		Dark Space – Sound Web	
Function		Age	local	expat	Mixed
School					
Party (Birthday)					
Group other					
Individual					
Parent present					
Carer present					
Activity guided					
Activity unguided					
Duration					
Return visit					
Describe interaction (including any facilitation if any)					
Further observations (Deviations)					
Participant Feedback					

Sample of observation sheet

Number of observations made?
        7 - observations at 2 hours each made before floor circles added

Number of sheets not fully completed?

Number of observations in which sound units were broken?

Duration of visit

Jumping on floor shadows

Date 2nd June Time: 10-10:30   Research checklist **Dark Space – Sound Web**

Function	Visitor	party	Mixed	Other-	expat	local	School
Age		School					5-6
Single engagement	✓						
Group engagement	✓						
Parent present							
Carer present	✓						
Activity guided							
Activity unguided							
Duration							
Describe interaction	20.5						
Return visit							
Duration							
Deviations							

Further observations

3-6

children stand on Luminous circle and
only 2 units working

new group
same as before
children
1 child tries to interact with unit
other children jump from Luminous
circle to Jcircle

Samsung sound
cards failing after
2 months

145

Date 2nd June   Time: 10 - 10:30   Research checklist **Dark Space – Sound Web**

Function	Visitor	party	Mixed	Other-	expat	local	School
Age		School					5-6
Single engagement	✓						
Group engagement	✓						
Parent present							
Carer present	✓						
Activity guided							
Activity unguided							
Duration							
Describe interaction	20.5						
Return visit							
Duration							
Deviations							

Further observations

3 - 6

children stand on luminous circle and
only 2 units working

new group
same as before
children
1 child tries to interact with unit
other children jump from luminous
circle to d circle

Samsung Sound
cards failing after
2 months

146

Appendix E

Coding Notations for *Soundweb* and *Interplay*

List of initial interactions in *Soundweb*
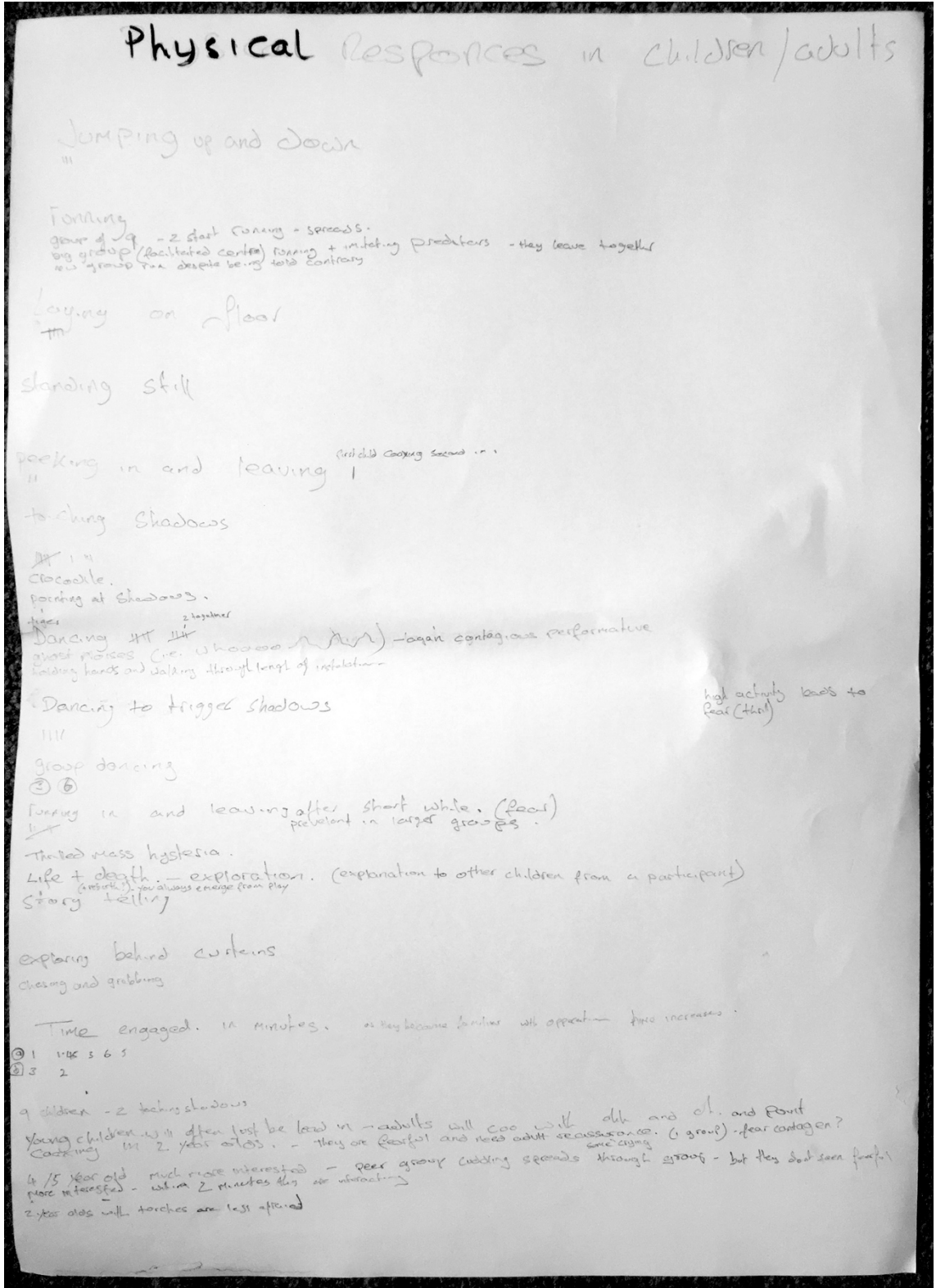
Physical Responces [Detail:]

Native animal noises (single)

Imative animal noise (group) - predator roar
frog
.. third list

HIT 1

Jumping up and down and rapid loud stamping - (running on the spot) increase pass and excitement. and also slow exagerated big steps. (like a frog)
running wildly/flapping arms.
running on all fours.

Ghost Sounds.
Smaller groups don't appear to share excitement (increase?)
Shouting and touching a peer to share excitement (increase?)

- Do children jump when they are alone? — no, no, no, no
- Talking about the environment being scary

Sharing reactions at shadows (group of 5)
Are children shy to scare others through imative animal roars.
And jumping after presence (light to exit)
.... not entering because space unoccupied
What is the performative element between audience/participants / in interactive relationships?
Sharing ownership (single and denying entry to others)
Child alone in room - learning to activate sound switch.
Lying on ground
monkey chimp like noises.
fear/dog like game.
1 group describe the space as 'jungle' they engage with visuals when directed. 1 cries. they are told not to be afraid
Young children 2,3,4 stand hold adult hands hesitant - facilitated
look out of window
Start interacting with sounds (tiger) hunting - facilitated
2-3 enter slowly and many exit. 4 engage and are re-assured. 3 hold on to each other in a chain
More enter holding hands, run out on trigger activation (audio)
crawl in with sticks (4th kambium) lured by reassurance, after 1-4 minutes they enter briefly then exit. then
.... in door adult entering encourages children in
boys and others 4 sticks stand in a ....
boys (8 months) returns ... explore. — continual return
Pretdomopes of laying on the floor is common —
entering with sticks (weaponising) hitting shadows. triggering shadows and attempting to hit them.
.... looking behind curtains (views of real jungle environment)
Parents making ghost noises at children.
Creating spectacle
Other children poking in through curtain to activate sound switch. - sharing ownership?
Dancing to act rhythm
..... fighting with sticks - .... ganders
...... poking in .... sound switch light
Jumping up and down hitting shadows ....
young child on third visit looses fear ... explains .... groups tend to stay together - entering + exiting
shadows hand play at one (mummmed audio) pointing to shadows (parental guidances)
(8 month - 2 year) not wanting to leave (after long visit)
Sound triggers fear response in visitors that are by themselves
Sound scared - activation contagious within ... grasp
trying to hug their shadow
Visual elements give comfort to the back of ..
Children leading parents in to show the space clapping / running
zombie crying loud noise
torch/flashlight becomes a shadow tool zombie scares running touching dying.
torch lights - activating by touring a.
movements + fears breaking from main group to shadow play - then return or a physically pulled back.
When a child is alone in the room they .... call out - .... 'Hello'
Sticks - zombies - 'you're a scary monster.'
Exploring ....
Imitative = imitating sound cues and light cues and each other
group 4-5 jumping briefly stops as scared but subsides
3 year old with (co-lluers) on pedestals. pointing out artefacts.
Some children find it too scary to enter (younger) and doing facilitators (parent/teacher) out.
contagious inspection of the ground

one child sitting in foam for a long period (with facilitat- teacher) does not want to leave or interact with group. sitting in a
Position that activates the sound loops (in discussion) - another child joins (laughter) then third - facilitator
Encourag-g interaction. second child accompanies her out (process to ... ..
sticks and torches.
3rd only mime imative (animal) behaviour - becomes contagious (crocodile arm snapping)
4th re-entry - I love animals. (animal subject critical in the installation) - through association? books,
toys, films.
Relation between installation + outside view from window - sudden reversm to wild imitative play
fear also is contagious too ... on occasion.
uv reflects on shoes kids look - alternate perspectives.
singing a rhythm and clapping to activate lights
Looking out of the shadow, behind curtains becomes part of the installation experience.
imitative / contagious role play (animals) in floor
touching shadows - visceral
interacting with sensors / touching screens.
tend to exit as groups - contageon
silent 360 observation between plays.

go through data again for quantitive information.
How many participants?

Environment to stimulate response

Single child in room
- coming second in.
(1git)
(1soy) 11

Figuring out technology. 1

group play - huddling.

group play games
1 group on third visit playing using triggered sound

The play space (in terms of activity)
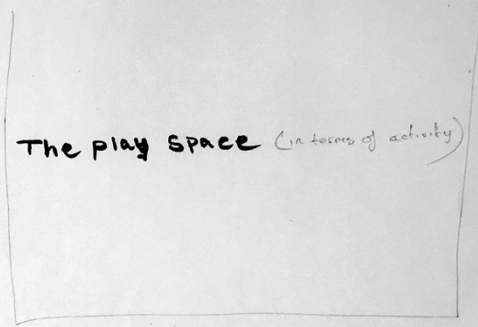
Younger children less fearful (outwardly)
more needy of facilitator contact hand holding
"

imitating tiger shadow walking through space roaring.

running in and increasing excitment - performative and running out.
common with large groups

The environment is being used as a whole to generate mood (thrill) the items are not being searched into units.

Multiple experience bleeding into each other — formation of groups
Movement tuned to rhythms (dance walking)
The majority of interaction is at the entry/exit end and much of it observance close to entry/exit.
Used to facilitate play (private) perhaps because play they would be restricted in doing (bows + arrows)
Hiding behind curtains - becoming part of the installation -
Waiting to see if the triggers are automatic or movement activated

• Used as a space to explore emotions
Moving from new perspective entrants in small groups → agency.
hiding from parents
activity seems to merge into 1 group (birthday party group themself)
clapping in time to the animal rhythms
even when running wildly and playing with curtains audience continues to interact with visuals.
adult (female) roar. is this an assumed response?
After long exposure the environment sets a play-space tone- however the nature of play does not change

• people enter expecting an experience
(based)
• facilitators enter expecting to deliver an experience. — i.e. name the animals...
 — they have invested in the journey

The majority of child audiences tend to return multiple times.
playroom facilitator delivering a product
- second visit - imitating animal actions / pointing - gradual increase in frenzied activity.
imitating

149

Interaction Notations – *Soundweb*

Left page (top)

children entering by themselves
to explore - numerical

children
1. 2 18 sec *
2. 1 7 sec
2-1. 1 re-entered 12 sec
3. 2 x 15 seconds
4. 1 Looks in for 6 seconds
5. 1 7 sec - afterthan enters 6 sec
6. 1 7 sec
7. 1 5 sec (in adult)
8. 1 8 sec (adult)
9. X 1 49 sec - jumping nervous about shadows
10. 1 6 sec - remain unfamiliar nearly left but another infact
12. 1 7 sec
13. 1 4 sec
14. 1 4 sec - before more enter
15. 1 10 sec
16. 1 10 sec

17. 1 child repeatedly (15) enters alone for 3 sec durations
18. 1 - 7 sec
19. 1 - 5 sec
20. 144 sec
21. 1 - 5 sec *
22. 1 - 33 sec - X
23. 1 - 22 sec X
24. 1 - 5 sec
25. 1 - 14 sec torch
26. 10 sec - after X
27. 4 sec
28. 6 sec
29. 14 sec - 2nd visit X
30. 3 seconds
31. 6 seconds
32. 9 seconds 10 s
33. 4 seconds

24. 6 seconds to hit shadow with stick
35. 3 seconds
36. 7 - with torch

396
AV 11 seconds

only 3 stayed longer than 10s

Left page (bottom)

how long between entry +
wild running - numerical data.

(coment 31)
on re-entry instant

1. 30 sec
2. 24 sec
3. 30 use instant on re-entry 3 for 30 seconds
4. 2 min
5. 2.20 min all run when tiger is triggered
6. 40 seconds - starts with dancing group x5 - evolves into toy game
7. 30 seconds group of 5 - some re-entry
8. 80 seconds
9. 60 seconds
10. 30 seconds · starts with 2
11. 40 seconds
12. 70 seconds (group 4)
13. 50 sec (group 9)
14. 20 sec

Right page (top)

familiarisation with revisits
- numerical data.

see re-visit data.
after five revisits participants still interacting with shadows + sounds (pointing)

Right page (middle)

How many adults - numerical
Coment 32.

1. 1·50 sec dancing + waving through space to trigger sensors.
   1-30 sec (re-entry) activing interacts.
2. 1-walked around with facilitator.
   2 enter pointing + explaining to their children 2min 60 sec duration
3.
4. 1 in group 3
5. 3 in group with 3 children
6. 1 adult preceding group
7. 1 adult enters (parent) points to shadow - momentary deep
8. 2 adult with child - system exploration.
9. 1 adult lone 25 sec
10. 1 adult child guide.
11. 3 adults 1 carrying young child and shadow play and system explore
12. 7 adults with children
13. 1 adult 1 child + facilitator

(box) 11 2 (x kids) 23 sec
12 2 (1 toddler) 30 sec
13 1 adult + child 4·37
14 1 adult inspects tech
15 1 adult inspects tech
16 1 adult inspects tents

Second image, left page (top)

Coment 33 - numbers

how many who were uncomfortable

1. group 9 toddlers 2 leave after 24 sec
2. 2 kids with 2 adults - 1 child needs to be carried
3. 1 child carried by adult
4. 1 child but calmed when another 7 entered
5. 1 child pulled to leave parent carried in wanted to leave

32% 25
32.5% (7) 34 hours of video
34 hours of video observation
58 minutes of recoded engagement
8 hours of active engagement recoded
Ave 4 re-entries

Second image, left page (bottom)

Multiple entries (identified)

1. 5
2. bow arrow group IIII II
3. sticks IIII
4. 1 adult
5. IIII
6. IIII II
7. IIII
9. IIII IIII IIII
10. IIII

12. I
13. III
14. IIII
15. III

60 / 1

5
7
4
5
7
40
2/5

3
3
3

Second image, right page (top)

props.
using extras within the room

1. group of 5 increased to 7
   - others copied using paper to flowers the lights increased to 9
2. x6 bows on arrows mock combat.
   swords (bamboo)
3. group enter with sticks 33 sec
4. group x 3 (3-6yr) soft cloth and torches props removed by carers
5. 1 group + using looking / hiding behind curtains (7x)

Second image, right page (bottom)

individuals / groups sitting on floor.

1. group of 4 24 sec
2. group of 9 - 3-4 sec
3. individual before others enter
4. 1 individual - 3-4 sec
5. 1
6. 1 then 2
7. 1 in group 3 - last to leave
8. 1 alone in room
9. 1 group 3
10. 1 with 1 child
11. 2 with kids
12. 1 with 2 kids - separate interactions
13. 3 in group
14. 1 with 1 - calm shadow play

groups influencing/determining behaviour

1 group x3 using paper
      (9)
2 group x4 hiding from potential entrants
      (15)
3 Bow arrow group hide behind curtains 5th visit
   - repeat 6th visit + 7th
4 Second entry with sword sticks & belly crawl in
   10 sec (by entrance)
   huddling/crouching down by door.
5 Adult ① enters and dances through space points at shadow
   to 3 kids in space
6 1 group 3 -1 jumps and stamps to trigger sound switch
   second copies then shadow play then clap
   after 2 min jumping and clapping through space
7 group of 5 adults guiding 3 children + another 3 (toddlers)
   1 child looks behind curtain - another follows then another then
   an adult.
8 group of 9 toddlers - 2 leave after 20 sec. after 40 sec
   2 more another 2 run out after them
   remainder walk through space - holding hands.
   after 2 min 20 sec all run out - tiger/roar
9 Group of 9 students 1 running back and forth - this
   spread to all within 19 seconds
10 group of 3 enter 1 heads to croc shadow and hits other & follow
   and do the same.
11 group dancing + jumping - performatively - until run out. 1 m 40
    - along together as group 6 min. 1 points shadow play others copy
12 Leave and re-enter running out of sight one back for 2½ min
   group 4 1 start clapping + sword play - increase to 2
13 1 child touching croc shadow 2 others copy
14 group 9 - 2 children running around then the 3 within 2 sec 6
15 one child physically trying to prevent the other from leaving by holding
   his arm - 2 more enter as start running in 20 sec.
16 starts with 2 in a group of 8 clapping - to switch lights on. others
   stamping feet.
17 jumping Contagious jumping within 12 1 child jumps on entry
    - spread to all - splits into 2 clear groups 1 group leaves
   2nd group does not see this remains + dances/jumps around
   for further 20 seconds before leaving
18 4 enter - start 2 start jumping within 14 sec. 50 sec
   1 continues to run 2 more start joining 1 min all
   run out immediate re-entry - repeated clapping
   to operate light by many children.

---

group increase to 14 - facilitator arm forward zombie style
3 min 16 sec duration
- running to wall and back jumping and clapping
  spreads to whole group
- Game of Monster Tag @ 5 min
19 Facilitator sits on ground 2 participants follow 1 new
   arrival enters and also sits 4th entrant remains
   standing others stand - within 51 sec
20 group enters
21 exaggerated stamping spreading through group
22 1 child starts jumping spreads to 5th become the
   mode until a new group enter (+4)
23 running clapping bunching into groups and
   breaking away - game (1: 50 min)
    - continued after facilitator left + entered + left.
24 Dancing jumping - spread. (2m 50s)
25 1 starts jumping group 6 - spreads to 3
26 1 arm waving + wild leg movements combines
   group 7 1 entered crawling - spreads to 6
27 jumping/clapping spread.
28 Sitting on floor 1 lone entrant then copied by 3rd.
29 - Big Contagious exodus 16s
30 exodus game (trigger - run) group 4? |||| |||| ||||
31 running stepping up and down spreads from 2 to
   3. then style change jumping - jumping spreads
32 over 2 min period
   floor sitting spreading from facilitator (unaffected)
   stationed in the room
33 Same group as above - crawling spreads from 2
   to four - perhaps influenced by facilitator
34 exaggerated running group 3
35 exodus game = ||||
36 exodus game |||| 1
37 Frog hopping from 1 to two in group of 4
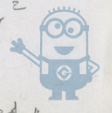
How long between entry and wild running
14 0 sec - 3rd re-entry
15 * In 15 s - group of 3 calm children appeared to
    have a moderating effect on wild behaviour
16 - 33 seconds.
16 25 sec
17 35 sec
18 30 sec
19 55 sec - 26 oct
20 50 sec - oct 20
21 2. min - 22 sept 1
22 1.30 min   19 oct
23 18. seconds.
24 1.14 min.

Average 55 seconds.

distinction between
contagion and copying

Groups influencing/determining behaviour
38 entering with sticks shadow - beating (contagion)
    - group 3 then multiple shadows tiger (crocodile)
39 sitting group 3 spread 1 to other
40 above group remained calm and discussed
   instalothers 2 min 54 s.
41 27 (4) hiding behind curtains to fri/ten (copying)
42 curtain hiding copied by second group
43 adult pretends to be predator type spreads to
   other adult
44 presence → parent Calming
45 Lying rolling on floor - fish like.
46 Second group parent/child remains calm
47 sword fighting with sticks 2 m
48 adult interacting with child - shadow play
49 almost instant contagion - movement.
50 jumping contagion group 10 stops + starts
51 exodus game |||| ||
52 2 group split - jump clap.
   interaction stops to point funding resources
    - contagious
53 group (10) running up down
54 Lying down
55 sitting in group after multiple long sessions
56 1 child remains - called - spread to the other 2 children
   also called
57 jumping (group of)
58 exodus game |||| |||
59 exodus game |||| ||| - zombie embellishment (26 oct) same day
60 running up and down then rolling on floor
70 zombies after 4/5 visits
71 jumping/skip running - contagion
72 crawling - copying
73 exodus game - ||||
74 zombie tag
75 jumping/skipping - contagion

151

Objects influencing

① In a group of 4 3 torches 1 stick seemed to have a calming effect.

② -repeated on re-entry (torches) on 5th entry contagious running but subdued quickly with torch play within 10s.

③ Curtains pulling running behind

④ Torch calming - stops working as calmer when group is large

⑤ Torch - calming - toddlers over 1 min.   small group 2 reassuring

⑥ by selves   torches

a torch can increase long interaction from 6 sec to 1 min

Interaction periods: in time. How do the timings change with development

① group 1   9 min. session ← 22 Oct   same group 2 different interactions apart
② 2 adult 1 child   11 Min   (mostly adult)
③ 2 adult - repeat entry   3 m 40 sec
④ 4 child -   2 m 20
⑤ 5 child group   12 minutes
⑥ 5 child group   5.16 s
⑦ 3 adult 1 child   3 minutes.
⑧ 30 Minutes up to 10 at a time 22 Oct
⑨ 1 adult 1 child 3 min 40 sec
⑩ group + adults + children   8 Min
⑪ Large group >10 12 min 14 Sep
⑫ Large group > 7   8 min
⑬ group adults + children 7 & 7 - 1 min 26.
⑭ 1 adult 1 child   1 min 40 s   19th August
⑮ 3 adults 3 children (carrying)   1 min 47 - 19th Aug

re-do with dates to include incremental devs.

⑯ 27 min
⑰ 9 min - zombie bag   Oct 16

Engagement Duration

quantity	description	time	Date
>15	group . school	3.30 min	August
15 (3 adult)	school group	5.30 o	"
2 + 1 adult	2 children	2.30 m	"
8 + 4 adult	school group	3 M.	October
10 + 5 adult	"	~2 min	October
1 adult 2		1.30 min	"
>10	School	13 Min	1 Sept
1	adult	4.37 Min	"
1	adult/child	30 sec	
2	re-entry from above	30 sec	
2	checking sensors trips	1 Minute	
2			6 Oct
<10			9 Minutes
<10	school	2.44	19 Oct
5	centre facilitator	2.19	
4		2.05	
3			
1	interacts (short)	30 sec	1 minute
11	school	6 min	
<8	school	2 min	
	adults interact with others and herself	9 min	
	adults interacting with each other	13	
<8	school		
<10	school	5.20	
<10	"	1.32	
<10	"	6.08 m	
<10	School	27 min	
	47		
	295 → 7 Min		average on interactions

final modification at the end of Sept either 12th or 19th

27 min - one single adult

Groups influencing / determining behaviour.

⑯ Large group >15 not reaching - 3 adult expanses
⑰ <3 min duration -
⑱ toddlers x 3 - 1 leaves 2nd wants to - all leave (sept.)
Jumping / rapid foot stamping but calms 3 adults group >15
⑳ Jumping (spreading) (50 sec)
㉑ Jumping
㉒ Parent introduces Monster / Zombie Walk
㉓ huddled + subdued (larger group 8) 4 adults - cuddling
㉔ Running skipping . arm waving
㉕ Shadow play clap on / off (copying)
㉖ sitting on floor
㉗ actions among individuals gradually become more expressive (6 oct)
㉘ More adults seems to generate more child launching into groups
㉙ Jumping - echoed by teacher and own fed
㉚ Jumping - near instant contagion - 2 children.
㉛ 1 leaves (nervs) 2 follow
㉜ huddling - 1 needs carrying
㉝ skipping and running - spread to all including adult. jumping
㉞ 1 child started running - instant contagion to all
㉟ Zombie game emerging - Zombie bag
㊱ Moving up and down in unison (like a school of fish)
㊲ Jumping then raising army 1 - another instant contagion Jumping amongst tollers.
㊳ Zombie tag

1 child remains in space with adult and does not want to leave - only documented case of 3 Verbal occurences happening at other times. - 13 minutes (part of school group

Interaction Notations – *Interplay*

3rd group from same School
— arranging students

_____

side to side movements (exaggerated)

— Cares (teacher explanation of
        how to see yourself)

un accompanied

1/12   — Jumping dancing

Waving at the self
— Photographing / videoing (teachers)

trotting up and down - between cameras

1/13 running up and down
      waving - contagious copying
      runs   jumping
      — no facilitating
      up and down betwee cameras and screens

1/14 identifying + playing with
      camera lens (2 kids)
        — portraits hands
      1 kid pokes head in and does
      not enter - room empty

1/15 dressing up and running
      between cameras + screens
      adults arms outstretched walks
      through space

1/16 entering in dress up character
      running around an dancing
      infront of cameras

1/17   "
        — No single occupation

1/18   —
1/19   — in dress up character
       pointing at themselves (group)
       on screen
1/20   dancing jumping escalates
       into running around the room
       holding hands running in
       circles
       all exit together
1/21   same as above
1/22   running up and down screaming
1/23   running and dropping to floor
       on camera pick-up - 4 kids
1/24   "
1/25   "
1/26   facilitator enters draws attention
       back to the cause and effect
       of the cameras

1/27   interacting with camera
       lens - 2 kids
1/28   lying on floor - snow angel
       style
1/29   facilitator leaves
           running
1/30   1 child 11 sec
1/31   1 child 25 sec
         another child 20 sec
1/32   —
1/33   1 child 27 sec
1/34   dancing in front of camera
       — running in circles
1/35   playing with curtains dancing
       infront of cams

153

FOSS CAM

1/1 exploring projections through movement

1/2 running up to screen to touch image
adults interacting with each other
on screen. - touching hands
on image overlap.
interacting with projection and
presence by standing against screen
(adult)

1/4 ✗

(1/5) waving and physical/digital
interaction.
dancing/jumping with arms in
air - touching the projection
- laughing/screaming
adult twisting and saving to [...]
camera position and saving to [...]

(1/6) - ✗

(1/7) running to screen dancing
with arms in air
overlap/scale interaction adult/child

touching faces through overlap
explorat. - of personal digital
space - 2 ADULTS.

(1/8) running between screens images fast.

(1/9) "

(1/10) exploring digital physical space
- movement + position
screen physical interaction. touch →
lens - giant hand
dancing/running between cameras
+ screens

(1/12) "

(1/13) —

(1/14) physically exploring projection
through touch

1/15 running round room

(1/16) "

1/17 "

1/18 image interaction continues
on facilitator presence
scale/physicality interaction

1/19 1 child - 10 sec

1/20 same child 24 more sec

1/21 hiding behind curtains

1/22 " "

1/23 dancing for camera
running and more interaction
play.

Synopsis. further screen has more interaction
explorations of physical space
touch and the projected image
eventually the room was appropriated
for play with occasional returns
to projected explorations

Aztec ②

2/1 curtain play running round room
1x sitting on floor in middle

2/2 walking round room x 2

2/3 exploring scale through camera
play - dancing with [...]
1x running between cameras
screen - presence + place.

2/4 1 child 36 sec.
then 60 sec

(2/5) —

(2/6) —

2/7 —

FOSS cam
2/1 exploring projected self kids running
to and from screen

154

2/2 – exploring projected image on screen

2/3 brief exploration 8 sec

2/4 exploring scale and image over-lap with projected and physical space
running between images (cameras)

2/5 –

2/6 x

2/7 single child exploring cameras + self
dancing 40 sec

for end screen, interacted with more

③ April 20:   Aztec

3/1 facilitate – not organising
Walking between screens exit 39 sec

3/2 dressing up (mermaid fireman) on screen
jumping / kids arms outstretched
holding hands – dancing to cameras
running between cams screens
(words of 'wow')

3/3 dancing (facilitated)
– kids instinct vocals – children
– dancing / arm gestures
– facilitator joining in

3/4 as above   interaction – movement.

3/5 – more dressing up then as above +

3/8 as above

3/9 facilitator swinging kids side to side
others dancing

3/10 repeated visits
as above

3/11 running between screens (laughing)
contagious floor rolling getting up to
check their mates

3/12 floor play established over
5 repeat visits.
repeated entries over 1 hour = 25 visits
1 group of 7 – 10 individuals

Foss cam

3/1 activities includes interacting with cameras + projected images through touch

3/2 as above

3/3 scale play / dancing / exaggerated movement / clapping

3/4 running side to side (scale variation)

3/5 all as above – Lots of screen
↓ interaction
screen furthest from entry is interacted
. with more (90%)

4 – Foss cam (no Aztec) all images of ne...

4/6 April 25 – Aztec.

5/1 running between screens, interacting
more with each other
– group dynamic.

5/2 floor play – dressing up / clapping

5/3 "

5/4 jumping skipping to camera

6/4 "

5/5 adult interaction spinning arms
out interacting with camera

5/6 dancing – dressing up

5/7 "

5/8 adult interaction arranging kids for
photos

5/1 foss cam
as above
Curtains distract this group
18 multiple entries over 1 hou...

Aztec   April 27.

6/1   Jumping performing. (1 adult 1 child)
       " Spreads to child

6/2   group interaction - standing
       Looking slow movement acting

6/3   "

6/4   "

6/5

6/6   "

_____

              Fosscam   April 27

       Screen interaction Jumping
       _____

Fosscam   April 26 (no Aztec)

1/7   Performative Jumping

2/7   Screen to camera interact

April 29 Aztec

8/1   Slow exploration

8/2   Walking backwards and forward
       waving

8/3

8/4   Performative Dancing

8/5   adults - exploring arm waving
       Performative slow movement

8/6   Adult crouching and standing

8/7   Screen interaction. (▯)

8/9   Adults exploring through movement

8/10   Adult ,,

8/11

8/12   Adult + child observing not performative

8/13 (
8/14   Adult returns - more performative

9/15   2 Adults 1 child camera interaction
        waving + exploring multiple cams

8/16   April 29 Fosscam

8/3   Camera ex subdued performative
              interact

       performative actions and

       Screen to cam interact

       floor play is contagious

       _____

       April 30 - Aztec

9/1   Subdued Performative exploration
       this evolves into exploring the
       room + other cams + screens

9/2 mild Performative exploration

       _____

       Aztec March 1

10/1
       _____

       Aztec March 10

11/1   Standing looking waving

11/2

11/3   Walking in checking out walking
        out 1 adult 1 child

11/4   jumping moving around . walking
        out.

11/5   Adult waling side to side
        through room

11/6   walking around room observing effect
        - group.

11/7   "

11/8   " performativity becomes more
        adventurous - group of 4 (2 adult)

11/9

11/10 re-enter - performative increase
       running around camera scale
       interact

11/11 adult interaction walking around
       room.

11/12 running between cams + back

11/15 adult engagement - performative
       in front of young kids

11/16 dancing in front of cam
       looking at screen. (1 child)

Fosscam March 10.

11/1   Looking screen-screen
11/2   Moving between cameras
11/3   Interaction with screen
11/4   "
11/5   - Pointing (adults) backward forward
        side to side
11/6   "
11/7   dancing movements — screen interact
11/8   Scale play with cameras.
11/9   Screen interaction (with projected images
11/10   running between cameras / project
           "
11/11   adult walking to screen touching
11/12   adults + older child — moving
        between cameras — scale
        jumping
11/13   interacting with projected screen.
        - Shadow play / scale
11/14/15   "
        _____
        Lots of re-entries and repeated
        Non-performative exploration.

Aztec.   March 14
12/2 Dressing up running around
12/3   dressing up
           ↓
        bad video quality
           ↓
12/10   Dressing up / performative
        play
           ↓
12/11   dressing up performative play
        large group. forming a circle
        and dancing / jumping around
        clockwise
12/12
           ↓
              "
12/16   dancing in conga fashion (3)
        between screens
    ↓   + floor rolling
    ↓   - kung fu.
        - Aplo
12/17   new group 2 Adults 1 child
        exploring image fl.ps + multiple
        projecting

Multiple entries 22 over 1 hour
performative dressing up to screen
and each other.
        _____
        Fosscam March 14
3/16
            as above
        _____
        Aztec March 15
3/17

4/17   interaction with cam + screen

7/17   dancing (performative + screen
        Looking for camera location
        running on spot - exaggerated clown
        Like
        pointing @ projection.

each re-entry is accompanied
with increased performativity.
running round between screens. dancing
    ↓
12/17 ℞ exploring image flips.
13/17   Locating cameras and exploring scale.
14/17   "   dancing dressing up graps
        performative dancing

        continual re-entry x 45
        exploring cameras + performative
        dancing. (same 3 kids)
        with repeat entry performativity is
        exaggerated - as they develop
        rules to interact.
        _____

        Fosscam march 17
        explorations in scale and interact
        with projected images
6/17 extreme close-ups + dancing
        Mouths over cam lens
        interaction with screen
        - What does this suggest ?   more
        older audiences interact with key images

157

Aztec March 17

1/18

5/18 running between projections
+ screens
exploring image flips
Scale. (hands over lens)

6/18 6th re-entry exploring scale
performing to cameras (dancing)
slow running between screens

✱ remember to say the cameras
+ projectors were inside cages
for safty

---

13 - 16 younger kids dress up.

Foss cam march 17.

1/18 singing and running
dancing
interacting with image on screen.
Using + shirt design (stars)
to project pattern on screen.

Aztec march 22
1/19 Arm waving dancing performative
"can you guess where the cameras is"

1/19 side to side movement / projection
correlation exploration.

3/19 side to side leg running (performative)

Jumping up and down / dancing performativ.
often incorporates shouting

A   B
= younger

C   Screen x

= older
Adults
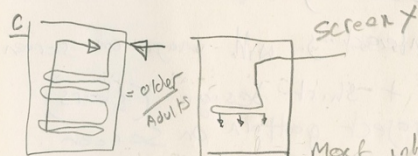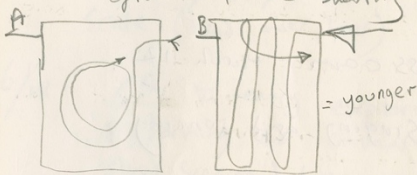
Most interaction
is with this screen

D   Physical
interaction
with Screen   Screen y

Fosscam march 22
1/19 Dancing / Scale Blag
2/19 hands on camera lense
3/19 backwards forwards dancing
contagious

escalates to wild dancing as more
enter
6/19 screen interaction (touching)
8/19 One child exploring dance movements
-self performative

Jumping on camera and another
group jumping to touch projected
image.

accompanying screaming when
group exceeds 5

running up and down incorporates touching
projection Jall
(Cat B)
image

158

Aztec March 24
1/20 (CAT B)

2/20 dancing clown ↗

3/20 dancing - shadow boxing performative
dress up.

4/20 costume wearing spreads from 1 to 4

5/20 performative costume to screen and
to each other

9/20 costume increases to spread

15/20 floor rolling costume play

exploring camera position.

_____

Fosscam March 24

1/20 Screen / Camera / Shadow play
(cat B)

2/20 dancing Jumping Contagious
Camera play - finger on lens
hand on lens

4/20 adult dancing interaction.

5/20 costume projection screen interaction

Category B running & incorporated
Camera + Screen interaction

Aztec March 29
1/ 1 adult 1 child CAT A

2/22

3/22 1 adult carrying child Cat A

5/22 2 adults 2 children cat A
then performative dance

6/22 3 adults 3 children Cat A
then performative arm waving

Fosscam March 29
1/20 Cat B. Screen / cam interaction
2/20 performative postion
3/20 dancing + Scale exploration.
Split screen interaction
5/20 screen /projection interaction

_____

Aztec March 30
1/21 Cat C dancing
exagerated performative
movement both screens waving

2/21 2 kids

9/21 Jumping Cat C

11/21 Cat B

16/21 Cat B floor play

Fosscam March 30
1/21 Cat C + Screen interaction
Clown dance

2/21 touching projections mix of
Cat B + A
Contagious Clown dance

11/21 Jumping Propella arms

_____

Mix of clown dance, waving
and Jumping actions are
contagious combined with
both real and exagerated laughter

_____

March 31 Aztec.
2/22 1 adult 1 child (young) Looking
child Laughs - Camera interaction
3/22 return visit

Fosscam march 29

1/20 Cat B. Screen/cam interaction
2/20 performative position
3/20 dancing + scale exploration
       split screen interaction
5/20 screen/projection interaction

_____

Aztec March 30

1/21 Cat C dancing
       exagerated performative
       movement both screens waving

2/21 2 kids

9/21 Jumping Cat C

11/21 Cat B

16/21 Cat B floor play

Fosscam March 30

1/21 Cat C + screen interaction
       Clown dance

2/21 touching projections mix of
       Cat B + A
       Contagious clown dance

11/21 Jumping Propella arms

_____

       Mix of clown dance, waving
       and Jumping actions are
       contagious combined with
       both real and exagorated laughter

_____

March 31 Aztec.

3/22   1 adult 1 child (young) looking
         child laughs — camera interaction
3/22 return visit

4/22 Cat B   1 adult 1 child

       1 adult cat B image investiga
       Screen B

       Cat B surprised at seeing
       self image — screen B
       group entry
       Kids — toddlers B young
       Adults camera closer - P.

_____

       Fosscam March 31

1/22   Cat B Screen A + B
       screen interaction

4/22 Screen A Adult grand + observe

5/22 interaction with cam to explore
       Projection effect screen A

       interaction explorative rather than
       performative

_____

       interaction types

① performative
       a) — to self
       b) — to others in the sam
② explorative   [enactment
                    dancing
                    jumping]
③ scale
④ camera interaction
⑤ screen interaction (Physical)

       [adult with child
        adult watching encourage
        adult alone
        child alone]

       Aztec February 21

1/23   Cat B (adults) holding
       phone to camera

4/22 Cat B   1 adult 1 child

1 adult cat B   image investig
Screen B

Cat B   surprised at seeing
self image - screen B
group entry
Kids - toddlers B young
Adults camera closer - ρ

_____

Fosscam   March 31

1/22 Cat B   screen A + B
screen interaction

6/22 Screen A adult stand + observe

5/22 interaction with cam to explore
Projection affect screen A

interaction explorative rather than
performative

interaction types

① performative
   a) - to self
   b) - to others in the so
② explorative   enactment
                   dancing
③ scale   jumping
④ camera interaction
⑤ screen interaction (Physical)

| adult with child |
| adult watching encourage |
| adult alone |
| child alone |

Aztec February 21

1/23   Cat B (adults) holding
       phone to camera

29/24
Adult Cat C

2/24 performative dress up
      enactment.

   Adults cat C children Cat B
   _____

Performative enactments dressing
up and using props
   _____

Fosscam Feb 16   A+B
interaction with screen +
projections   screening
touching + dancing infront of
images

3/24 Waving arms around turns
  →   into dance spreads +
      is wild + exagerate)

Aztec February 23
etc
1/25 Cat B   scree B

dressing up -

     Camera in bad position

Fosscam Feb 23

① interaction motion fell
into three general patterns

Screen B ~~was~~ received more
interaction than screen
A.

Adults were more inclined to interact
and always followed the pattern
of Cat C

Adults did interact with screen
when with children mostly
in shadow play

older children aprox > 7 followed
Cat C

Younger children approx < 7
tended toward Cat B

Contagion was evident in
forms of interaction - how this
was carried out on different
days in different observations

Younger children very vocal,
older children quite vocal.

---

dress up	dress up Run	Cam interaction performative group	scale self	Cam interaction Exploratve		proc>
1 arm wave grove	1					III
IIII	Arm dance	IIII	II IIII	IIII IIII		
IIII	1			IIII III 22.5%		3%
III	Run	II%		Jumping shadow		
16	IIII III			1 contagion		
20%	IIII			IIII 1	1.25%	
	1			8.75%		
				adult IIII		
	16.25%			IIII 1		
				20%		

Dancing	clown dance	slit screen interaction	Screen touch		A	B
arm waving - dance		IIII	In		IIII IIII	IIII IIII
1 slow run			1 fast		IIII	IIII I
IIII	quiet IIII	III	II group		III (16)	(16)
IIII	III		IIII		75% increase	
III		10%	III	15%	Afn dancing	
					1 serious	
17%			Singing		1	
			1 whole group contagion		IIII I	
					18.75%	
			remove adult percentage 23.75%			
			Subtract from this 22.25%			
	IIII I %		8.75 jumping		125	
			then 13% if serious less %			

Time	Age	Supervised	T	A	S	
4	5	✓	1	5/2		
4	5		.20	14/5	x	
			2.3	5	x	
			3	5	x	
2	5	✓	32.5			
			16.20		x	
5	5	✓	5.3			
5	3		16.30		x	
3	5		11.50		x	
6	5	✓	12		x	
9	5	✓	9			
			1.30	>25		
			3.3	>25		
			1.20	725		
25.0		x	1.9	725	✓	
			2.30		✓	
8.20		x	2			
			3			
6			6		✓	

Engagement
Longer when
un-facilitated

Interplay interaction time.
- April 4 IR lights

Av 8.9
to 8.5

8.79.

158%

March - 2 IR Light								
T	A	S	T	A	S	T	A	S
1	5	✓	30	25	x			
.2	77o	x	52	5				
50	5	x	2.11	5				
3	5	x	4.1	5				
22	>2o	x	25	1				
2.25		x	30					
3.20			1					
3.30	<5	x	1					
6	<5		86					

Av 1.4
Standard Dev -1.69

3.4
Min.

Spread of engagement type with *Interplay*

Video observation

CCTV introduced on 16ᵗʰ August
Each video observation lasted two hours over 17 days, during which 320 recordings documented 774 interactions.

Number of recorded interactions by CCTV on observation days.

Day	Number of observed interactors	Day	Number of observed Interactors
1	15	10	87
2	22	11	44
3	18	12	21
4	25	13	39
5	66	14	24
6	26	15	19
7	75	16	77
8	59	17	66
9	91		*774 individuals observed*

Number of recorded interaction periods during observation

Day	Number of video recordings documenting interaction over two-hour period	Day	Number of video recordings documenting interaction over two-hour period
1	10		
2	12	10	17
3	11	11	15
4	5	12	4
5	49	13	13
6	21	14	13
7	18	15	6
8	43	16	26
9	29	17	29
			320 separate recordings

Observed time spent by single children entering Soundweb alone.	Time measured in seconds	
18s lays on ground	4s – before more enter	10s
7s	10s with torch	4s
12s above re-enters	10s	6s
6s looks in doesn't enter	3s repeatedly enters five times	14s second visit
7s see below	7s	3s
60s overlapping child above	5s	6s
7s	4s	9s

7s	4s	4s
5s	33s	6s hits shadow with stick
17s enters with a torch	22s	3s
49s Jumping - nervous of shadows	5s	
4s	14s enters with a torch	

Observed time spent by single adults entering Soundweb alone.
8s
20s
23s
25s
30s
45s
50s
120s

Time lapse between first entry and wild running within Soundweb. On subsequent entries running was instantaneous.
Time measured in seconds
30s
24s
120s
140s all run after the tiger is triggered
40s starts with a dancing group of five and evolves into a tag game
30s group of 5
80s
60s
30s starts with two children running
40s
70s group of four
50s group of nine
20s
Instant (possible 3rd re-entry)
75 seconds – group of 3 calm children appeared to a have a moderating effect on wild behaviour
33s
25s
35s
30s
55s
50s
120s
90s
18s
74s
Average 55 seconds

Adults observed engaging with Soundweb
One adult dancing and waving to trigger sensors for a duration of 50 seconds
One adult activates sensors for a duration of 30 seconds
One adult explores space for 2 minutes
One adult walks around the space with facilitator for 23 seconds
One adult enters with two children 57 seconds
One adult with toddler enters and claps for 3 minutes and 10 seconds
One adult enters with a child and shadow plays for 36 seconds
One adult explores the space for 45 seconds
One adult enters with two children points to artefacts for 1 minute and 27 seconds
One lone adult enters for a duration of 25 seconds
One adult enters with a child guiding them around the space 1 minute
One adult tries to coax an unknown party into the space for 20 seconds
One adult one toddler for 14 seconds
One adult enters with a child and facilitator 39 seconds
One adult and two children enter and remain for 4 minutes and 37seconds
One adult enters and inspects the technology
One adult enters and inspects the sensors triggers
Two adults enter with a child and explore the system 1 minute and 57 seconds
Two adults enter one uses phone torch for 32 seconds
Two adults explore the space carrying a baby for 30 seconds
Two adults and one toddler remain for 4 minutes and 17 seconds
Two adults enter and remain for 23 seconds
Two adults enter one uses a torch – 30 second interaction
Three adults enter with one of them carrying a young child. Two adults leave after 1 minute and 6 seconds the remaining adult and child engage with shadow and leave after play 1 minute and 56 seconds (total duration)
Three adults enter and explore for 1 minute and 40sec, preceding a group of children that appear familiar to them
Three adults enter with two children and point at effects for a duration of 2 minutes and 43 seconds
Three adults explore the space two leave and re-enter two times one stays for 9 minutes
Three adults enter with two children for 2 minutes and 43 seconds
Four adults and two babies (carried) for 2 minutes and 35 seconds
Seven adults enter with children
Group of eight adults enter accompanying 6 children pointing and exploring- duration 4 minutes 30 seconds

Number of entrants appearing visibly uncomfortable within Soundweb
Two toddlers in a group of nine leave after 29 seconds
One of two children with adults requires carrying for comfort
One child carried by an adult
One child appears nervous but calms when another seven children enter
One child pulls at adult to leave but the adult wants to remain and look

Positively identified multiple entries by groups of interactors to Soundweb on different observations														
5	7	4	1	5	1	7	4	10	2	5	1	3	3	3

Individuals and groups sitting on the floor of Soundweb

Group of 4 sit for 24 seconds
Group of 5 sit for 4 seconds
1 individual sits until other visitors enter
1 individual sits for 4 seconds
1 individual sits
1 individual sits then a second sits
1 individual in a group of 3 sits and is the last to leave
1 individual sits alone in the space
1 individual sits in a group of 3
2 individuals with children
1 individual with 2 children – separate interactions
3 in a group
1 individual with one child – engage in shadow play

Groups of interactors that influence or determine the behaviour of others within Soundweb

Contagion/copying
1 group of 3 using paper
1 group with bows and arrows hide behind curtains – 6ᵗʰ visit – repeat on 6ᵗʰ and 7ᵗʰ visit
1 group enter with 'sword' sticks – belly crawl to avoid triggering sensors / huddling crouching at entrance
Adult enters and dances through space pointing at projected silhouettes to 3 children
1 member of a group of 3 jumps and stamps to trigger sound switches, 2ⁿᵈ copies, then shadow play then clap. After 2 minutes jumping a clapping through space contagion
Group of 6 adults guiding three children and three toddlers. 1 child looks behind curtain, then another follows, then the other then an adult - contagion
Out of a group of 9 toddlers 2 leave after 20 seconds. 2 more leave after 40 seconds and the remainder walk through the space holding hands. After 2 minutes and 20 seconds the tiger roar is activated and all run out - contagion
1 in a group of 9 children begin running back and forth within the space. The activity spreads to all within 19 seconds - contagion
Out of a group of 3 that enter, 1 heads to the crocodile silhouette and hits it, the other children do the same - contagion
A group dances and jumps until they run out. They return to the space and remain as a group for 6 minutes during which 1 starts shadow play and the others copy. The group runs out of camera view and returns repeatedly for 2 minutes and 30 seconds - contagion
1 in a group of 4 starts clapping and shadow playing the activity spreads to the rest of the group and includes another 3 that join in - contagion
1 child touches the crocodile silhouette and is copied by another 2
In a group of 9 children 2 start running around the space, then 3, then 6 within 2 seconds - contagion
One child physically trying to prevent another leaving by holding their arm for 1 minute. More children enter and start running through the space over 20 seconds
2 out of a group of 8 start clapping to activate the sound switch. The others copy and also begin to stamp their feet - contagion
Contagious jumping in a group of 12. 1 child starts jumping on entry which then spreads to all. Splits into 2 clear groups. 1 group leave but the other does not notice and remains jumping around the space for a further 20 seconds before leaving
Group of 9 enter 2 start jumping within 14 seconds. 2 more start jumping at 60 seconds all run out and immediately re-enter. Repeated clapping to operate the sound-switch-light by many children. The group increases to 14 – an accompanying adult stretches arms out 'zombie' style – for a duration of 3 minute 16 seconds. A game of monster tag emerges at 5 minutes - contagion

Facilitator sits on ground and 2 participants follow. 1 new arrival enters and also sits. 4th entrant remains standing. The others stand within 50 seconds - contagion
Group enters and exaggerated foot stamping begins to spread among group - contagion
1 child starts jumping which spreads among a group of 4 until 4 more enter the space - contagion
Running clapping bunching into groups and breaking away game for 1 minute and 30 seconds continues unbroken while an adult (facilitator) enters and leaves - contagion
Dancing and jumping spread between group for 2 minutes and 50 seconds - contagion
1 starts jumping in a group of 6 which spreads to a further 3 - contagion
1 child combines jumping with wild arm and leg movements
Group of seven enter followed by 1 crawling which spreads to another 6 -contagion
Jumping and clapping spreading between a group - contagion
I visitor sitting on the floor of the space. A 2nd lone entrant copies then a 3st running exodus after 16 seconds - contagion
Group runs out screaming in an exodus game that repeats17 times - contagion
Running and skipping up and down the space spreads from 2 to 3. 1 changes to jumping which spreads to the others over a 2-minute period - contagion
Floor sitting spreads (undirected) from a seated self-appointed facilitator in the space. 2 of the group start crawling which then spreads to another 2 - contagion
Exaggerated running in a group of 3 - contagion
Exodus game – 5 re-entries - contagion
Exodus game – 6 re-entries - contagion
'Frog'-hopping from 1-2 in a group of 4 - contagion
Group enters with sticks and begin contagiously hitting crocodile the activity spreads to include the cicada and tiger
2 children clapping at artefacts adult enters with toddler and starts clapping – children leave adult and toddler remain exit and re-enter 4 times.
Sitting among a group of three spread one to another. They remain calm and appear to discuss the installation for 2minutes 54 seconds. Clapping adult and toddler return and clapping spreads to the seated group
Group hiding behind curtains and jumping out on new entrees.
Curtain hiding copied by a second group
Adult appears to pretend to be a predator, which spreads to another adult
Presence of an adult has a calming effect
Lying / rolling on floor – fish-like
Second group adult with child – remains calm
Group sword fighting with sticks -2 minutes
Adult interacting with child in shadow play
Almost instant contagion movement
Jumping contagion in a group of 10 stops and starts
Exodus game – 7 re-entries
The above group splits with half jumping and clapping. Interaction stops and pointing begins – running resumes
Group of 10 running up and down the space
Lying down
Sitting in a group after multiple long sessions
1 child is nervous and is carried – spreads to another two who are also carried
Jumping – group of 18
Exodus game with 7 re-entries
Exodus game with 8 re-entries – zombie embellishment (Oct 26)
Running up and down then rolling on floor
Zombie game – after 5 re-entries
Jumping skipping running - contagion
Crawling - copying
Exodus game with 4 re-entries

Zombie tag
Jumping skipping contagion
2 children clapping at artefacts adult enters with toddler and starts clapping
Out of a group of 5 shadow play is started by 1, others copy

Visitors refusing to leave
1 child remains seated in space with an adult and appears unwilling to leave. Only documented case that includes 3 verbal accounts – duration 13 minutes

Children acting as guides to other children
Older child acting as guide after multiple re-visits to younger within group/ sub group
Torch use – increasing numbers return with torches – more copying than contagion

Objects influencing behaviour
In a group of 4 – 3 torches and 1 stick seemed to have a calming effect
Repeated on re-entry – contagious running but subdued quickly with torch play
Running behind and pulling curtains
Torch-calming stops working when group becomes large
Torch-calming in a group of toddlers. 2 remain by themselves in the space for over 1 minute
Group of 3 bring in white paper to fluoresce in uv lights – more children enter and leave to fetch paper and return
Group of 5 using paper to fluoresce in the ultra-violet lights. Increased to 7
Group of 6 using bamboo bows and arrows and 1 stick pistol in mock combat -
Group enter with sticks that are used in 'swordfight' and remain for 33 seconds
Group of 3 enter with torches and lengths of cloth – removed by carers
Group of seven looking and hiding behind curtains
Group of three toddlers bring in cushions – adult requests their removal

Appendix F

Live Observation Notes

Soundweb - notes taken during observation 19th -10-2016

Soundweb 19-10 continued.
Game emerging in absence of the facilitator - teacher
Kids have torches.
Teacher returned
Kudos explore crocodile shadow
Facilitator took torched kids leave
Re-enter on mass some with torches.
60 kids total
15-20 in space
Usually group of 8
Teacher heading out
They return
Doing their own shadow play with torches on back wall
They try to figure out triggers by jumping and waving
Teacher interacts with kids - hearts out.
Torch defiantly acting as magic feather (Dumbo movie)
After a while the facilitator who has been present most begins to interact with narrative (she has been neutral mostly)
Torches are currency and fought over
Crawling through trying not to trigger
Around one quarter of total group is removed for snacks in turn. This means that at points 50 percent of total group interacting. These children have been told to choose where they want to play and what they want to do by their teacher - l overheard this
Playing a zombie game
Again, high percentage of total is interacting.
After emersion period. Passive facilitator presence does not seem to affect the nature of interaction
Network drop and camera crash from time to time
Teacher has sat down and taken a permanent position
Heavy interaction one light defiantly down
Teacher briefing children not to scream and jump around in dark space. One child has already fallen-quote and corroborated by kids not witnessed by me.
All kids in centre 11am interaction increased massively
11:12 emergence of multiple games. Heavy interaction fluctuations group 8-20 kids multiple re-entry. Some groups still interacting through shadow play.
Several simultaneous game groups some groups trying to interact with others. Definite zombie thing going on with some.
Post sounds from the dark-space Soundweb screams etc.
Outside the space kids engaged in construction and exploration with microscopes
11:22 herded out possible end of session at Playeum.

Interplay notes taken during multiple observations

Interplay

In a light space the interactor is more aware of another's presence. In a dark space the interactor is made aware of physical presence but more aware of screen presence.

Some two of the projections are horizontally flipped which emphases the sense of disembodiment.
Personal boundaries are crossed as avatars from different people interact in each other's screen space.
Presence and place.

14th march. 1-hour observation. Interaction is good but there are long gaps between active periods.

22nd march. 1-hour observation.
Heavily used with few very short gaps between active periods. Is the decision to enter the room subject to contagion?

29 march
Local School 30kids 25 adults. Virtually no one enters.
Meaningful engagement?
Performative engagement?
Performative child care?

March 30- 1 hour.
Continued facilitating by teacher in the form of observation at the entrance. Space not occupied much. - I turned all lights off (UV) perhaps this prevents the audience from being drawn into the space.

March 31 - 1.5 hour
2-year olds some activity - most interesting was from parents.

29th April 1 hour. Saturday - general public so the space had to be discovered.

This led to I interesting observations.
 little activity at first but increased toward end of observation. Even the act of entering the room appears to be contagious. When X witnesses Y's interest or entry X then becomes more interest which then stimulates X then Q or R. This transference operates between adults to adults. Children to children. Children to adults and adults to children. On entry familiar behaviour patterns then emerge.

Appendix G

Video examples: See included digital media

Appendix H

Soundweb audio samples: See included digital media

Glossary

Affordance: a set of agreed rules that provide a perceivable function for an object, event, or situation, in relation to an individual

Agile Methodology: A development strategy that aims to release functional commodities into a prospective market quickly and then develop them through a process of constant refinement based on user needs and responses.

Agency: is exemplified by Gell (1998) as the potential ability of an individual, group or sometimes an object/artefact to affect change on a natural cause of events. In human society this is often exemplified in the ability to make a free choice. See also negative-agency and positive agency.

Alterity: A sense of 'otherness' that is experienced in relation to the self

Author Function: A term introduced by Michelle Foucault to describe the effect everything an author has done before writing a text and everything they have done after that conditions the text's interpretation. However, the author function, according to Foucault, is not the same for all texts.

Becoming: A philosophical argument that positions the Self as a process of perpetual development.

Cabinet of Curiosities: Thought to have originated in the sixteenth Century these were a collection of diverse artefacts displayed in private homes and argued to be the precursor to museums

Contextual Design: A design methodology that focuses on the user experience and is allied to Agile development strategies.

Cartesian Dualism: An argument emanating from Descartes that the mind and body are irreducibly separate entities.

Détournement: a means by which an original, usually an artwork, is subverted into new meaning through re-contextualisation, and therefore a new work

Dwell time – The amount of time an individual interacts with a system. In the majority of cases in this thesis, these systems are interactive artworks.

Embodiment: Physical encounters utilising the somatosensory system that includes the sense of movement, position and touch.

Event: In 1988 Alain Badiou theorised the *event* as a singularised point existing within an historical situation. He went on to explain that separating the event from a situation required a reflexive period followed by a decision.

Existential nihilism: The belief that all existence and actions within the universe are ultimately meaningless.

Facticity: Sartre's proposition that an individual is a sum of all their past experiences and it is through this that cognition operates

Fiat money: Paper money that is legitimised through legislation. Fiat comes from the Latin word *let it become*.

Game Theory: The study of strategic interaction.

Gamification: To transform an embodied encounter into a game.

Grounded Theory: A retrospective analysis methodology developed by Glaser and Strauss (1967) to ground theory in events that have been observed.

Heterotopia: A space described by Foucault's (1966) that is opened up through language's relationship between object and meaning. It is a place of multiple metaphors that refers to spaces beyond itself.

Hyperreality: Baudrillard describes hyperreality as a condition where by a representation of what is real, such as the reflection in a mirror (: 166), has become convincing to the extent that the fiction supersedes the genuine.

Interaction Design: A development methodology that aims to fulfil five user requirements: text; graphic symbols; physical objects; time; behaviour. It then applies collected data into a process of constant development following the principles of Agile.

Mimesis: To mimic or copy.

Mirror Stage: Jacques Lacan's (1949) theory on the genesis of alienation that connects the moment a person first recognises their own reflected image to their first sense of estrangement

Negation: Hegel's term for detaching preconceptions from what is being observed.

Nihilate: Sartre's term for detaching passed experience from present experience.

The One: Hegel's paradigm that to understand the truth of a perceived object requires an individual's preconceptions about that object to be initially detached.

The Other: Sartre's reminder that accommodating the freedom of other people's minds requires a certain amount of self-imposed limitations

Meta-data is a text file included as a suffix containing information that helps contextualise elements of the information. For example, the meta-data in the file of a digital photograph can contain information on the aperture, shutter speed, brand of camera and even the photographer's name.

Negative-Agency As it is used in this thesis, Negative-agency is the choice taken by an individual not to engage in an action, particularly in response to a participatory proposition.

Neoliberalism A global economic policy aimed at liberalising the markets of developing countries in order to open up key sectors of usually Government controlled commodities for purchase by the first world private sector. Sometimes referred to as the free trade agreement, it was rapidly developed and implemented under the administrations of Thatcher, in the UK, and Regan in the USA.

Performative or a Performative Utterance is a term introduced by John Austin to describe a sentence, or phrase that while descriptive has the agency of an action or of performing action (Austin 1962) that changes the relationship the Self has with reality. One of Austin's examples is the "I do" commonly found in English wedding ritual vows. However, this is provided that certain framing criteria are met outside of the utterance. For example, neither party is already married, or

and convener has the legal authority to facilitate the ceremony. These criteria can also be gestural, or comprise of facial expressions (Austin).

Performative-agency is a performative action that is delivered through a vehicle other than language (Butler, 2010)

Performativity see Performative – The ability of language to construct reality (or binding consequences, Butler, 2010) through describing it.

Positive-Agency As it is used in this thesis, positive-agency is the choice taken by an individual to engage in an action, particularly in response to a participatory proposition.

Post-Colonial: A field of study that explores the legacy of colonialism, particularly in terms of the treatment of people.

Post-Humanism is a paradigm that proposes a new framework built on arguments emanating from Humanism, which came out of the Enlightenment and is a largely secular system putting the human at its centre, and the Anti-Humanist argument accusing it of being a Eurocentric worldview with *man*kind at its centre (Braidotti 2013).

Procedural Authorship: Janet Murray's term for a framework designed by an artist that may have a number of outcomes through participant interaction.

Psychogeography: Goalless Wander through an urban space. Psychogeography has its origins in the Lettrist International (through the journal Potlach), Ivan Chtcheglov's 1953 essay 'Formulaire pour un Urbanisme Nouveau" and also the older concept of the flâneur (Baudelaire)

Psychical Distance Edward Bullough's (1912) theory of aesthetics proposing that the perception of ephemeral artistic qualities requires emotional separation from the subject.

Psychological Transference: A mental or emotional projection of the self into an imagined space.

Psychosomatic: A relationship between the body and mind which is often used to describe a physical illness produced by mental conditions, but can be applied interrelation between the body and the mind.

Phenomenology: A philosophical field exploring experience and consciousness from the first persons usually through somatosensory systems.

Random International an artist's collaboration consisting of Hannes Koch, Florian Ortkrass and Stuart Wood.

Reflexivity A term defined by Hayles in 1999 to draw attention to the ethnocentric element (cultural bias) that exists in interpretation. The situation where an observer's individuation is drawn into the system that is being observed

Rhizome In botany a rhizome is a horizontal interconnecting stem that vegetates laterally underground. Deleuze and Guattari's (1980) theory of the Rhizome describes unrestricted and arbitrary flows of potential within an encompassing framework.

Renren: Chinese social media site that operates as an equivalent to Facebook which aims to keep users up to date with current social content.

Self: An individual's sense of identity that results from their own objective reflection that is contrasted to others.

Simulacrum: A representation that is indistinguishable from what it is representing, and often replacing the original in the perception of the viewer. For example, a Skeuomorph.

Situational Aesthetics investigates authorship in relation to its manifest context .In particular, it deconstructs the power relationships, usually institutional, that validate then fetishize cultural objects

Skeuomorph: A design feature that imitates. For example, plastic printed and textured with wood grain sometimes used in the interior of cars.

Somatic: Referring to the physical body, as opposed to the mind.

Symbol: Either a representational character, or abstract mark, used to represent an object, sound, word, quantity, process or set of ideas, for example an alphabet or numeric system.

Theoretical Saturation: a process in the methodology Grounded Theory where no new data patterns emerge.

Theoretical Sampling: A procedure in Grounded Theory methodology where data collection continually leads the development of theory through simultaneous analysis and is intended to identify the most appropriate information that may be required in a study, and provide insight on how to gather it.

Waterfall: A linear design strategy that operates along a structure based on client need, product design, manufacture and upkeep.

Bibliography

Adorno, T. (1970). *Aesthetic Theory. London:* (Translated by Hullet-Kentor, R. 2013). London: Bloomsbury Academic

Adorno, T. (1955) *Valéry Proust Museum*. In: Prisms (Translated from German by Webber, S and Webber, S. 1981). Massachusetts: MIT Press.

Adorno, T. (1952). *In Search of Wagner*. (Translated by Livingston, R. 1981) London: NLB.

Alexenberg, M. (2013) *The Future of Art in a Postdigital Age*, Bristol: Intellect.

Anderson, B. (1982) *Imagined Communities: Reflections on the Origin and Spread of Nationalism*. London: Verso

Andrews, I. (2013) *Post-digital Aesthetics and the Return to Modernism*. (online) Available at: http://ian-andrews.org/texts/postdig.html (Accessed 15th April 2015).

Aristotle. (335 BCE) *Poetics*. (Translated by Butcher, S. 1895). London: Macmillan and Co.

Artpool. (2013) *The Experimental Art Archive of East-Central Europe*. (online) Available at http://www.artpool.hu/flexpaper/pdf/Artpool_2013_536p_100dpi_hyperlinks.pdf (Accessed 9th October 2015).

Ascher,S., Pincus,E. (1212) *The Film Makers Hand Book: A Comprehensive Guide for the Digital Age*. (4th edition). London: Penguin Books.

Atkins, R. (2008) *Politics, Participation and Meaning in the Age of Mass Media*. In: Freiling, R. (Ed). (2008) The Art of Participation 1950 to Now. New York: Thames and Hudson.

Augé, M. (1995) Non-Places: Introduction to an Anthropology of Supermodernity. (Translated from French By Howe, J). London: Verso.

Aumin, R., Maschler, B. (1995) *Repeated Games with Incomplete Information*. London: MIT Press.

Austin, J. (1962) *How to do things with Words*. Oxford: Oxford University Press

Avril, E. (2012) The Phenomenological Character of Color Perception. In: *philosophical Studies: An International Journal for philosophy in the Analytical Tradition*. Vol 157: 1 (January 2012): 27-45

Baker, M. (1999) *Argumentation and Constructive Interaction*. In: Rijlaarsdam, G., Espéret (Series Eds.) and Coirer, P., Andriessen, J. (Vol Eds.) Studies in Writing: Vol. 5. Foundations of Argumentative Text Processing: 179-202. Amsterdam: University of Amsterdam Press.

Bachelard, G. (1958) *The poetics of space*. Boston: Beacon Press.

Bachelard, G. (1969) *The poetics of Reverie*. Boston: Beacon Press.

Badovinac, Z (2010) Interrupted Histories. In: Merewether, C, Potts, J (Eds) (2010) *After the Event: New Perspectives on Art History*. Manchester: Manchester University Press.

Badiou, A (1988) *Being and Event*. (Translated from French by Oliver Feltham 2005). London: Continuum.

Badiou, A. (2015) *Happiness*. (Translated from French by Barlett, A., Clemens, J. 2015). London: Bloomsbury Publishing PLC

Baldassare, M., Feller, S. (1975) *Variations in Personal Space: Theory Methods and Evidence*. In: Ethos, Vol 3: 4 (Winter, 1975): 481-503. Hoboken, New Jersey: Wiley on behalf of the American Anthropological Society.

Barad, K. (2007) *Meeting the Universe Halfway: Quantum Physics and the Entanglement of Matter and Meaning*. Durham and London: Duke University Press.

Barthes, R. (1967) The Death of the Author. In: *Aspen: The Minimalist Edition*: Vol 5+6, (fall-Winter) 1967). New York: Roaring Fork Press.

Barrett, E. and Bolt B. (2010) *Practice as Research: Approaches to Creative Arts Enquiry*. London: IB Taurus & Co.

Barrett, E (2007) Introduction. In: Barrett, E & Bolt, B (Ed) (2007) *Practice as Research: Approaches to Creative Arts Enquiry*. London: I.B. Tauris

Barlow, C. (200) *Guilford's Structure of the Intellect*. (Online) Available at: http://www.cocreativity.com/handouts/guilford.pdf. (Accessed: 31ᵃ March 2019).

Baudrillard, J. (2002) *Selected Writings*. Stanford: Stanford University Press.

Baudrillard, J. (2001) *Fragments*. (Translated from French by Turner, C. 2004) London: Routledge.

Baudrillard, J (1981) Simulacra and Simulation. In: Poster, M (Ed) (1988) *Jean Baudrillard Selected Writings*. Redwood City: Stanford University Press.

Baudrillard, J. (1970) *The Consumer Society: Myths and Legends*. (Translated from French by Ritzer, G. (1998). London: Sage Publications.

Bauer, U. (2002) The Space of Documenta 11: Documenta 11 as a Zone of Activity. In Ander, H & Rottner N (ED) (2002) *Documenta 11 Platform 5: Exhibition Catalogue*. Ostfildern: Hatje Cantz.

Baudrillard, J (1981) *Simulacra and Simulation*. In Poster, M (Ed) (1988) *Jean Baudrillard Selected Writings*. Redwood City: Stanford University Press.

Bauer, U. (2002) *The Space of Documenta 11: Documenta 11 as a Zone of Activity*. In Ander, H & Rottner N (ED) (2002) Documenta 11 Platform 5: Exhibition Catalogue. Ostfildern: Hatje Cantz.

Bauman, Z. (1992) Intimations of postmodernity. London: Routledge.

BBC (2011) *Great Thinkers in Their Own Words*. Episode 3 (2011) (TV Programme) BBC, 15th August 2011.

BBC (2001) *Safari by Satellite*. (Online) available at: http://news.bbc.co.uk/2/hi/in_depth/sci_tech/2000/dot_life/1595670.stm (accessed 30th May 2016).

Beck, K., Beedle, M., Bennekum, A., Cockburn, A., Cunningham, W., Fowler, M., Grenning, J., Highsmith, J., Hunt, A., Jeffries, R., Kern, J., Marik, B., Martin, R., Benford, S. Crabtree, A. Flintham, M. Greenhalgh, C. Koleva, B. Adams, M. Tandavanitj, N. Farr, J, R. Giannachi, G, Lindt I. (2011) Creating the Spectacle: designing Interactional Trajectories through Spectator Interfaces. *In: ACM Transactions on Computer-Human Interaction*, Vol 18: 3, Article 3 (July 2011). New York: Association for Computing Machinery.

Bell, J (1997) Puppets and Performing Objects in the Twentieth Century. In: *Performing Arts Journal*. Vol 19: 2 (May 1997): 29-46.

Benford, S. Crabtree, A. Flintham, M. Greenhalgh, C. Koleva, B. Adams, M. Tandavanitj, N. Farr, J, R. Giannachi, G, Lindt I. (2011) Creating the Spectacle: designing Interactional Trajectories through Spectator Interfaces. In: *ACM Transactions on Computer-Human Interaction*. Vol 18: 3, Article 3 (July 2011). New York: Association for Computing Machinery.

Benjamin, H., Buchloch, D. (Eds) (1979) *Dan Graham. Video, Architecture, Television: Writings on Video and Video Works 1970-1978*. Halifax: The Press of Nova Scotia College of Art and Design.

Benjamin, W. (1936) 2009. *One Way Street and Other Writings*. Translated by J. A. Underwood. London: Penguin Books.

Benjamin, W (1936) The Work of Art in The Age of Mechanical Reproduction. In: *One Way Street and Other Writings*. (Translated by J, Underwood. 2009). London: Penguin Books.

Best, S., Kellner, D. (1991) *Post Modern Theory: Critical Interrogations*. London: McMillan.

Bertalanffy, L (1968) *General System Theory*. New York: George Braziller.

Beyst, S. (2011) *About the Relation between Art and Play*. (Online) available at: http://d-sites.net/english/mimesisplay.html (accessed 4th October 2018).

Bhabah, H (1991) *The Location of Culture*. London: Routledge

Bishop, C. (2018) Black Box, White Cube, Gray Zone: Dance Exhibitions and Audience Attention. In: *The Drama Review*. Vol 62: 2 (Summer 2018): 22-42.

Bishop, C. (2012) *Artificial Hells: Participatory Art and the Politics of Spectatorship*. Brooklyn: Verso.

Bishop. C, (2006) The Social Turn: Collaboration and its Discontents. In: *Artforum*. (online) Available at:
https://www.academia.edu/3052635/The_Social_Turn_Collaboration_and_Its_Discontents (Accessed July 6th 2015).

Bishop, C. (2005) *Installation Art*. London: Tate Publishing

Bishop, C. (2004) *Antagonism and Relational Aesthetics*. Cambridge: October, MIT Press Journals.

Blast Theory. (2015) *Karen*. (online) Available at: http://www.blasttheory.co.uk/projects/karen/. (Accessed 28th September 2016).

Blast Theory (2015) *Day of the Figurines* (online) Available at:
http://www.blasttheory.co.uk/projects/day-of-the-figurines/ (Accessed 28th September 2015).

Blix (1984) *Kunstfunk* (online) Available at: http://alien.mur.at/rax/KUNSTFUNK/describe.html (accessed 9th October 2015).

Boas, F. (1908) *Anthropology*. New York: The Columbia University Press.

Bolt, B (2004) *Art Beyond Representation*. London: I.B. Tauris and Co.

Booker, C. (2004) *The Seven Basic Plots*. London: Bloomsbury.

Borgatti, S. Halgin, S (2011) *On Network Theory. In Organization Science*. Vol. 22:5 New Perspectives in Organization Science (September-October 2011): 1168-1181. http://pubsonline.informs.org :INFORMS

Borges, J (1999) *Collected Fictions*. (Translated from Spanish by Hurley, A) London: Penguin Books.

Bourdon, D. (1969) Les Levine Bursts with Elusive Ideas-and Ego. In: *Life*. Vol 67(8): 67.

Bourriaud, N. (1998) *Relational Aesthetics*. (Translated from French by Pleasance, S and Woods, F). Dijon: Les Pres du réel.

Botstein, L. (1999) The Audience. In: *The Musical Quarterly*. Vol 83: 4 (Winter 1999) Oxford: Oxford University Press

Bowlby, J., 1969. *Attachment and Loss: Vol I*. New York: Basic Books.

Breton, B. (1924) Manifesto of Surrealism. In: Danchev, A (Ed) (2011) *100 Artists' Manifestos from the Futurists to the Stuckists*. London: Penguin Books.

Breton, B. (1929) Second manifesto of Surrealism. In: Danchev, A (Ed) (2011) *100 Artists' Manifestos from the Futurists to the Stuckists*. London: Penguin Books.

Braidotti, R (2013) *The Posthuman*. Cambridge: Polity Press

Brill, D. (2010) *Shock and the Senseless in Dada and Fluxus*. Hanover: Dartmouth College Pres.

Brown, B. (2001) Thing Theory. In: *Critical Inquiry*, Vol. 28, No. 1, Things. (Autumn, 2001). Chicago: The University of Chicago Press.

Brown, D (2004) *Human Universals, Human Nature, Human Culture*. (online) Available at: http://www.humiliationstudies.org/documents/BrownUniversalsDaedalus.pdf (Accessed: 27th January 2016).

Bullough, E., 1912. Psychical Distance as a Factor in Art and Aesthetic Principle. In: *British Journal of Psychology*, 5(2): 87-118.

Burgin, V. (1969) Situational Aesthetics. In: *Studio International*. Vol. 178: 915 (October, 1969).

Burke, S (2008) *The Death and Return of the Author*. (3rd ed). Edinburgh: Edinburgh University Press.

Burn, I. (1991) *The 1960s: Crisis and Aftermath. In Dialogue: Writings in Art History*. Sydney: Allen and Unwin

Burt, C. (1969) Intelligence and Heredity: Some Common Misconceptions. In: *The Irish Journal of Education*. Available at: http://www.erc.ie/documents/vo103chp6.pdf (accessed 13th September 2018)

Busoni, F (1907) *Sketch of a New Esthetic of Music*. (Translated from German by Baker, T. 1911) New York: Schirmer

Bullough, E. (1912) Psychical Distance as a Factor in Art and Aesthetic Principle. In: *British Journal of Psychology*. Vol 5:2 (June 1912): 87-118. London: Wiley-Blackwell

Butler, J. (1988) Performative Acts of Gender Constitution: An Essay in Phenomenology and Feminist Theory. In *Theatre Journal* Vol. 40: 4 (Dec 1988: 519-531. The John Hopkins University Press.

Butler, J. (2010) Performative Agency. In: *Journal of Cultural Economy*, Vol 3:2, 147-161, DOI: 10.1080/17530350.2010.494117 (Accessed February 15ᵗʰ 2018).

Butler, J. (1988) Performative Acts of Gender Constitution: An Essay in Phenomenology and Feminist Theory. In: *Theatre Journal*. Vol. 40: 4 (Dec 1988: 519-531. The John Hopkins University Press.

Cage, J (1958) Composition Used in Music of Changes and Imaginary Landscape N0. 4. In Cage, J (1961) *Silence* (50th Edition 2013). Middletown: Wesleyan University Press

Cage, J (1961) On Robert Rauschenberg, Artist and his Work. In: Cage, J (1961) *Silence* (50th Edition 2013). Middletown: Wesleyan University Press

Candlin, F (2012) *Art Museums and Touch*. Manchester: Manchester University Press.

Carey, J. (1992*) The Intellectuals and the Masses: Pride and Prejudice Among the Literary Intelligentsia 1880-1939*. London: Faber & Faber

Carroll, L (1893) *Sylvie and Bruno Concluded*. London: Macmillan & Co

Carrol, L. (1871) *Through the Looking-Glass, and What Alice Found There*. London Macmillan.

Carter, R. (2002) *Consciousness*. London: Weidenfeld and Nicolson.

Castells, M (1996) *The Rise of the Network Society*. Malden: Blackwell.

Castells, M (2009) *Communication Power*. Oxford: Oxford University Press.

Castoriadis, C. (1975) *The Imaginary Institution of Society*. (Translated from French by Blamey, K (1975)). Massachusetts: MIT Press.

Catton, W (1960) The Functions and Dysfunctions of Ethnocentrism: A Theory. In: *Social Problems*. 8, (3). (Winter, 1960-1961) Pp: 201-211

Chen, F (2003) Shadow Theatres of the World. In: *Asian Folklore Studies*. Vol 62:1 (2003): 25-62. Nagoya: Nanazan University.

Chomsky, N. (1998) *Profit Over People, Neoliberalism and the Global Order*. New York: Seven Stories Press.

Chomsky, N. (1998) The United States and the Challenge of Relativity. In Evans T (Ed) *Human Rights Fifty Years on: A Reappraisal*. Manchester: Manchester University Press.

Chomsky, N. (2011) *Chomsky Q & A. In response to a question by Jean Bricmont*. (Online) Available at: https://www.youtube.com/watch?v=d1zpMyceru4 (Accessed 16th February 2016).

Choy, L (2010) Crisis and Convening: Or, what is it we want from Art Conferences? In Merewether, C, Potts, J (Eds) (2010) *After the Event: New Perspectives on Art History*. Manchester: Manchester University Press.

Christies (2011) Post-War Contemporary Evening Sale. (Online) Available at: http://www.christies.com/LotFinder/lot_details.aspx?intObjectID=5496716. (Accessed September 30ᵗʰ 2026)

Clarke, R., Briggs, J., Light, A., Wright, P. (2016) *Situated Encounters with Socially Engaged Art in Community-Based Design*. (Conference Paper) DIS 2016, June 4-8, Brisbane, Australia.

Core Design (1996) *Tomb Raider*. (Disk Video Game). London: Eidos Interactive.

Costikyan, G. (2013) *Uncertainty in Games*. Massachusetts: MIT Press.

Coverley, M. (2006) *Psychogeography*. Harpenden: Pocket Essentials.

Cranfield, B. (2014) All Play and no Work? A 'Ludistory' of the Curatorial as Transitional Object at the Early ICA. In: *Tate Papers*. No. 22 (Autumn 2014). (Online). Available at: http://media.tate.org.uk/research/publications/tate-papers/22. (Accessed 11th April 2019).

Csíkszentmihályi, M. (1999) Implications of a Systems Perspective for the Study of Creativity. In: Sternberg, R. (Ed) (1999) *Handbook of Creativity*. Cambridge: Cambridge University Press.

Csíkszentmihályi, M. (1996) *Creativity: Flow and the Psychology of Discovery and Invention*. New York: Harper Collins,

Csíkszentmihályi, M. (1990) *Flow: The Psychology of Optimal Experience*. New York: Harper and Row.

Csíkszentmihályi, M. (1975) Play and Intrinsic Rewards. In: *Journal of Humanistic Psychology*. Vol 15: 3 (summer 1975). New York: Sage Publishing.

Cubitt, S.(2005) Forward. In: Hatfield, J. (Ed) (2006) *Experimental Film and Video: An Anthology*. Bloomington: Indiana University Press.

Darwin, C. (1872) *The Expression of the Emotions in Man and Animals*. New York: D. Appleton.

Davis, B. (2013) A critique of social practice art. In: *International Socialist Review*: 90. (Online) Available at: http://isreview.org/issue/90/critique-social-practice-art (Accessed July 3rd 2015).

Davies, G. (1994) *A History of Money from Ancient Times to the Present Day*. Cardiff: University of Wales Press.

Dawkins, R. (1978) *The Selfish Gene*. Oxford: Oxford University Press.

Debourd, G. (1956) A User Guide to Détournement. In: *Les Lévres Nues*. Issue 8 (May 1956).

Debourd, G. (1956) Théorie de la Dérive. In: *Les Lévres Nues*. Issue 9 (Novembre 1956).

Debord, G. (1958) Thesis on Cultural Revolution. (Translated from French by Shepley, J). In: McDonough, T. (Ed). *Guy Debord and the Situationist International*. Cambridge, Massachusetts: MIT Press.

Debord, G. (1967) *The Society of the Spectacle*. (3rd Edition 1994) (Translated from French by Nicholson-Smith, D). New York: Zone Books.

Deleuze, F & Guattari, G (1972) *Anti-Oedipus, Capitalism and Schizophrenia*. (Translated from French by: Hurley, R, Seem, M, Lane, H). Minneapolis: Minnesota Press.

Deleuze, F & Guattari, G (1987) *A Thousand Plateaus, Capitalism and Schizophrenia*. (Translated from French: by Massumi, B) London: Bloomsbury Revelations.

Derrida, J (1972) Signature and Event Context. In: Derrida, J (1977) *Limited Inc*. (Translated from French by Webber, S 1977). Evanston: North-western University Press.

Dezeuze, A. (Ed). (2010) *The 'do-it-yourself' artwork*. Manchester: Manchester University Press.

Dickerman, L (2003) Dada Gambits. In: *October* 105, Dada (Summer 2003): 3-12.

Disembodied Art Gallery (2015) *Babble* (Online) Available at: http://disembodiedart.tumblr.com/post/88373986168/babble-a-telephone-art-installation (Accessed 29th September 2015)

DiNucci, D. (1999) *Fragmented Future*. (Online). Available at: <http://darcyd.com/fragmented_future.pdf> (Accessed May 16th 2015)

Docker, J (2004) Raphael Lemkin's History of Genocide and Colonialism. *Paper for United States Holocaust Memorial Museum, Centre for Advanced Holocaust Studies, Washington DC*. Available at: https://www.ushmm.org/m/pdfs/20040316-docker-lemkin.pdf (accessed 16th November 2018).

O'Doherty, B. (1999) *Inside the White Cube, the Ideology of the Gallery Space*. San Francisco, CA: University of California Press.

Doubtfire, J. Ranchetti, G. (2015) *Curator as Artist as Curator*. (Online) Available at: https://curatingthecontemporary.org/2015/04/30/curator-as-artist-as-curator/. (Accessed 3rd November 2016).

Dourish, P. (2001) *Where the Action Is: The Foundations of Embodied Interaction*. Massachusetts: MIT Press

Durkheim, E. (1912) *The Elementary Forms of the Religious Life*. (Translated from French by Kields, K. (1995). New York: Free Press.

Eco, U. (1989) *The Open Work*. (Translated from Italian by A Cancogni). Cambridge, Massachusetts: Harvard University Press

Edmprod.com. *The Ultimate Guide to Writing Better and More Memorable Melodies*. *(online)* https://www.edmprod.com/ultimate-melody-guide/. *(accessed 12th January 2018)*

Eilam, D, Zadicario, P, Genossar, T, Mort, J (2012) The Anxious Vole: The Impact of Group and Gender on Collective Behaviour Under Life Threat. In: *Behavioural Ecology and Socio-biology*. 66: 6 (June 2012) New York; Springer.

Eisenstein, E (1968) Some Conjectures about the Impact of Printing on Western Society and Thought: A Preliminary Report. In: *The Journal of Modern History*. Vol 40: 1 (March 1968): 1-56. Chicago: The University of Chicago Press.

Elwes, C. (2015) *Installation Art and The Moving Image*. London: Wallflower Press.

Elwes, C. (2005) *Video Art a Guided Tour*. London: I.B. Taures.

Eskildsen, U. (2008) Introduction to Street and Studio: An Urban History of Photography. In Eskildsen, U. (Ed) (2008) *Street and Studio*. London: Tate

Esposito, N. (2005) A Short Definition of What a Videogame Is. In: *Proceedings of DiGRA 2005 Conference: Changing Views – Worlds in Play*. Available at: https://www.utc.fr/~nesposit/publications/esposito2005definition.pdf (accessed 10th January 2019)

Fabre, M (1914) *Amore Pedestre*. (online) Available at: https://www.youtube.com/watch?v=fx11nKrAv24 (Accessed 18th December 20150Farman, J. (2012) Mobile Interface Theory. London: Routledge.

Fallman, D (2008) The Interaction Design Research Triangle of Design Practice, Design Studies, and Design Exploration. In: *Design Issues*. Vol 24: 3 (Summer 2008: 4-18). Massachusetts: MIT Press

Farquhar, S (2010) *Ricoeur, Identity and Early Childhood*. Plymouth: Rowman and Littlefield Publishers, INC.

Farquharson, A. (2016) Director's Forward. In: Wilson, A (Ed) (2016) *Conceptual Art in Britain 1964-1979*. London: Tate Publishing.

Favall, A. (2011) *Before and After Superflat: A Short History of Japanese Contemporary Art 1990-2011*. Hong Kong: Blue Kingfisher Limited.

Fellows, E. (1955) History of a Word. In: *American Speech*. Vol34:3 (October 1959). Durham, North Carolina: Duke University Press

Ferrari, PF, Fogassi, L. (2007) The Evolution of Embodied Language. In: *Current Directions in Psychological Science*. Vol 16:3 (June 2007) Thousand Oaks, California: Sage Publications Inc. on behalf of the Association of Psychological Science.

Ferrari, PF, Rizzolatti, G (2014) Mirror Neuron Research: The Past and the Future. In: *Philosophical Transactions of The Royal Society*. B. 369: 20130169 (28th April 2014) Available at: http://dx.doi.org/10.1098/rstb.2013.0169 (accessed 22nd December 2016).

Flintham, M. Reeves, S. Brundell, P. Glover, T. Benford S. Rowland, D. Boriana, K. Greenhalgh, C. Adams, M. Tandavanitj, N. Farr, J, R. (2011) Flypad: Designing Trajectories in a Large-Scale Permanent Augmented Reality Installation. In: *Proceedings of the 12th European Conference on Computer Supported Cooperative Work*, 24th – 28th September, Aarhus, Denmark.

Flusser, V. (1985) *The Universe of Technical Images*. (Translated from German by Roth, N. 2014). Minneapolis: University of Minnesota Press.

Flusser, V. (1991) *Gestures*. (Translated from German by Roth, N. 2014) Minneapolis: University of Minnesota Press.

Flusser, V. (1999) *The Shape of Things: A Philosophy of Design*. London: Reaktion Books

Fluxus Portal for the Internet (2006) *Allen Bukoff & George Maciunas on Fluxus*. (online) http://www.fluxus.org/BukoffMaciunasFluxus5Dec08.mp3 (Accessed: 13th July 2015).

Foster, H (2015) *Bad News Days: Art, Criticism, Emergency*. London: Verso.

Foster, H. (1996) *The return of the Real*. Cambridge, Massachusetts: MIT Press.

Foster, J (1996) *The Immaterial Self: Defence of the Cartesian Dualist Conception of the Mind*. London: Routledge.

Foucault, M (1975) *Discipline and Punish: The Birth of the Prison*. (Translated from French by Sheridan, A 1979). New York: Vintage Books.

Foucault, M (1969) *What is an Author*, (online) Available at: http://www.movementresearch.org/classesworkshops/melt/Foucault_WhatIsAnAuthor.pdf (Accessed 11th August 2015).

Foulkes, A. (1984) *Literature and Propaganda*. London: Methuen and Co.

Foucault, M (1966) *The Order of Things*. (English edition 1970) London: Tavistock Publications

Freedman, N. (2004) On Spatialization: Personal and Theoretical Thoughts. In Aurebach, S. Levey, K. Schaffer C (Eds) (2004) *Relatedness, Self-Definition and Mental Representation*. London: Routledge.

Friedman, K (1990) Working from Scores. In: Touchon, C. (Ed) (2008), *New & Improved! Fluxus: Fluxation #2: Classic and Contemporary Scores, Instructions and Artefacts by Fluxus Artists*. Santé Fe: Ontological Museum Publications.

Friedberg, A (2006) *The Virtual Window: From Alberti to Microsoft*. Cambridge, Massachusetts: MIT Press.

Freud, S. (1899) *The Interpretation of Dreams*. Vienna: Franz Deuticke.

Gadamer, H (1960) *Truth and Method*. 2nd revised edition. (Weinsheimer, J., Marshall, D .1989). New York: Crossroad.

Galliano, L (2006) Toshi Ichiyanagi, Japanese Composer and "Fluxus". In: *Perspectives of New Music*. Vol 44: 2 (Summer 2006): 250-261.

Gel, A (1998) *Art and Agency: An Anthropological Theory*. Oxford: Clarendon Press.

George Maciunas Foundation Inc (2015) *Manifesto I*. (Online) Available at: http://georgemaciunas.com/about/cv/manifesto-i/ (Accessed 13th July 2015).

Georgia Tech Research Institute (2015) *Falcon View*. (online) Available at: https://www.falconview.org/trac/FalconView/wiki/3rdPrtyDev (accessed 11th October 2015).

Giannachi, G. (2012) Archaeologies of Presence. London: Routledge.

Gibbons, J (2009) *Contemporary Art and Memory: Images of Recollection and Remembrance*. London: Tauris

Gibson, J (1979) The Theory of Affordance. In: *The Ecological Approach to Perception*. Boston: Houghton Mifflin.

Gibson, W (1984) *Neuromancer*. New York: Ace

Gidal, P. (1976) Theory and Definition of Structural Film. In: Gidal. P (Ed) *Structural Anthology*. London: British Film Institute.

Gillard, D (2011) *Education in England: A Brief History*. (Online). Available at: http://www.educationengland.org.uk/history/chapter03.html (Accessed 22nd March 2016).

Gilroy, P. (1987) *There Ain't No Black in the Union Jack: The Cultural Politics of Race and Nation*. London: Unwin Hyman Ltd

Gintz, C & Aminoff, J. (1993) Michael Asher and the Transformation of "Situational Aesthetics". In: *October*. Vol 66 (Autumn, 1993): 113-31. Massachusetts: MIT Press

Gillespie, D., Leffler, A. (1983) Theories of Nonverbal Behaviour: *A Critical Review of Proxemics Research*. In: Sociological Theory, Vol 1 (1983): 120-154. Hoboken, New Jersey: Wiley

Glaser, B., and A. Strauss. (1967) *The Discovery of Grounded Theory: Strategies for Qualitative Research*. London: Transaction Press.

Glasser, B. (1992) *Basics of Grounded Theory Analysis*. California: Sociology Press.

Glynn, M., Webster, J (1992) The Adult Playfulness Scale: An Initial Assessment. In: *Psychological Reports:* Vol 71:1 August 1992.

Goetzmann, W. Renneboog, L. Spaenjers C. (2011) Art and Money. In: *The American Economic Review*. Vol. 101:3 papers and proceedings of the One Hundred Twenty Third Annual Meeting of the American Economic Association (May 2011): 222-226. Nashville, Tennessee: The American Economic Association

Goggin, G. & Clark, J. (2007) Mobile Phones and Community Development: A Contact Zone between Media and Citizenship. In: *Development in Practice*. Vol. 19: 4/5. (June 2009) pp: 585-597.

Goldberg, S (2016) How We Spot Altered Pictures. In: *National Geographic*, July 2016. (Online). Available at: https://www.nationalgeographic.com/magazine/2016/07/editors-note-images-and-ethics/ (accessed 11ᵗʰ July 2018).

Gonzalez-Torres, F. (1991) *"Untitled" (Portrait of Ross in LA*. Art Institute Chicago Collections. (2015). (online) Available at: http://www.artic.edu/aic/collections/artwork/152961 (Accessed: 23 June 2015).

gpspower.net (2014) *This is the Evolution of in-car Navigation Technology*. (Online) available at http://www.gpspower.net/gps-news/330038-evolution-car-navigation-technology-pictures.html. (Accessed 30ᵗʰ May 2016).

Graham, B. (2012) What kind of participative system? Critical vocabularies from new media art. In: Dezeuze, A. (Ed). (2012) *The do it Yourself Artwork*. Manchester: Manchester University Press.

Graham, D. (2000) *Two-way Mirror Power: Selected Writings by Dan Graham on His Art*. Cambridge, MA: MIT Press.

Graver, M. (2015) *RE:Print/Re:Present*. Available at http://www.markgraver.com/reprintrepresent/ (Accessed May 2nd 2015).

Greenberg, C. (1939) The Avant-Guard and Kitsch. In: *Partisan Review* Vol 6:5 (Autumn 1939) New York: PR.

Grey, C. and Malins, J. (2004) *Visualising Research: A Guide to the Research Process in Art and Design*. Farnham: Ashgate Publishing.

Griffiths, M (2009) Action Research for/as/mindful of Social Justice. In: Someckh, B & Noffke, S (Eds) (2009) *The Sage Handbook of Educational Action Research*. London: SAGE Publications Ltd.

Grosz, E. (2001) *The Thing*. In: Architecture from Outside: Essays on Virtual and Real Space 2001. Cambridge, MA: MIT Press

Groys, B. (2012) On the Use of Theory by Art and Use of Art by Theory. In: *We Are The Time: Art Lives in the Age of Global Transition, Conference*. Amsterdam: Rietveld Académie, 12 -16 March, 2012. (on-line) available at: https://www.youtube.com/watch?v=BuMeizpFdVc (Accessed 18th February 2016).

Groys, B. (2010) Two Cures: Making Art Visible. In: Mereweather, C. and Potts, J. (Ed). (2010) *After the Event, New Perspectives on Art History*. Manchester: Manchester University Press.

Groys. B. (2008) A Genealogy of Participatory Art. In: Freiling, R. (Ed). (2008) *The Art of Participation 1950 to Now*. New York: Thames and Hudson.

Grosz, E. (2001) *The Thing*. In: Architecture from Outside: Essays on Virtual and Real Space 2001. Cambridge, MA. MIT Press

gpspower.net (2014) This is the Evolution of in-car Navigation Technology. (Online) available at http://www.gpspower.net/gps-news/330038-evolution-car-navigation-technology-pictures.html (accessed 30th May 2016).

GSM Association (2015) *Global Mobile Economy Report 2015* (online) Available at: http://www.gsmamobileeconomy.com/GSMA_Global_Mobile_Economy_Report_2015.pdf (Accessed 22nd September 2015).

Günzel, B. (2014) Deluze and Phenomenology. In: *Metodo. International Studies in Phenomenology and Philosophy*. Vol 2: 2 (2014). Available at: www.metodo-rivista.eu/index.php/metodo/article/download/87/61 accessed (5th September 2018)

Guillaumier, C (2016) Reflection as Creative Practice: Perspectives, Challenges and Practice. In: *Arts and Humanities in Higher Education* Vol 15: 3-4 (2016). London: Sage Publishing.

Guilford, J. (1967) *The Nature of Human Intelligence.* New York: McGraw-Hill Book Company

Handy, S., Boarnet, M., Ewing, R., Killingsworth, R. (2002) How the Built Environment Affects Physical Activity: Views from Urban Planning. In: *American Journal of Preventative Medicine*. Vol 23:2. Amsterdam: Elsevier Science Inc.

Handley, K., Sturdy, A., Fincham, R., Clark, T. (2006) Within Communities of Practice: Making Sense of Learning Through Participation, Identity and Practice. *Journal of Management Studies*. Vol 43: 3. Oxford: Blackwell Publishing.

Hanson, M. (2006) *Bodies in Code*. London: Routledge.

Hanson, M. (2015) *Feed Forward: On the Future of Twenty-First Century Media*. Chicago: University of Chicago Press.

Hanson, M. (2006) *New Philosophy for New Media*. Cambridge: MIT Press.

Hantelmann, D. (2010) *How to Do Things with Art: The Meaning of Art's Performativity*. Zurich: JRP-Ringier.

Hall, E. (1966) *The Hidden Dimension*. New York: Doubleday.

Hatfield, J. (Ed) (2006) *Experimental Film and Video: An Anthology*. Bloomington: Indiana University Press.

Hayles, K. (1999) *How we Became Posthuman: Virtual Bodies in Cybernetics, Literature, And Informatics*. Chicago: University of Chicago Press.

Hayles, K. (2012) *How we Think: Digital media and Contemporary Technogenesis*. Chicago: University of Chicago Press.

Hegel, G. (1894) *Hegel's Philosophy of the Mind*. Oxford: Clarendon Press.

Hegel, G (1807) *Phenomenology of Spirit*. (Translated from German by A. Miller 1977). Oxford: Oxford University Press

Heidegger, M (1977) *The Question Concerning Technology*. London: Garland Publishing, INC.

Heidegger, M. (1962) *Being and Time, The Basic Problems of Phenomenology*. New York: Harper Row Publishers.

Heidegger, M (1950) The Thing. In: Candlin, F., Guins, R. (Eds) (2009) *The Object Reader*. Abingdon: Routledge.

Henrickson, L., McKelvey, B (2002) Foundations of "new" social science: In: *Institutional Legitimacy from Philosophy, Complexity Science, Postmodernism, and Agent-Based Modelling, Proceedings of the National Academy of Sciences of the United States of America*. 99 (10) supplement 3: 7288-7295.

Hensel, M., Hight, C., Menges, A. (Eds) (2009) *Space Reader: Heterogeneous Space in Architecture*. Chichester: Wiley.

Higgins, D. (1998) *Fluxus Theory and Reception*. In: Friedman, K. The Fluxus Reader. Chichester: Academy Editions.

Hobbes, T. (1651) *Leviathan or The Matter, Forme and Power of a Common-Wealth and Civil*. London: Andrew Crooke

Hoggart, R. (1957) *The Uses of Literacy: Aspects of Working-Class Life*. London: Penguin Books.

Holtzblatt, K., and H. Beyer. (2015) Contextual Design. In: *The Encyclopaedia of Human-Computer Interaction, Interaction Design Foundation*. Aarhus: Interaction Design Foundation. Available at: https://www.interaction-design.org/literature/book/the-encyclopedia-of-human-computer-interaction-2nd-ed/contextual-design. (Accessed 10th April, 2017)

Holtzblatt, K., Beyer, H. (2015) *Contextual Design*. (online) Available at: https://www.interaction-design.org/literature/book/the-encyclopedia-of-human-computer-interaction-2nd-ed/contextual-design (accessed 4th April 2016)

Holtzblatt, K., Beyer, H. (2014) *Contextual Design: Evolved*. California: Morgan and Claypool

Holschbach, S (2008) *The Pose: Its Troubles and Pleasures*. In Eskildsen, U. (Ed) (2008) Street and Studio. London: Tate

Hornstein, D (2005) Theory, Adaptation, and Administrative Law. In: *Duke Law Journal*. Vol 54: 4. Thirty-Fourth Annual Administrative Law Issue: Incrementalism and the Administrative State (February 2005) 913-960.

Hudek, A. (2009) *From Over to Sub Exposure: The Anamnesis of Les Immatériaux*. In: Tate Papers No. 12, (Autumn 2009). Available at: http://www.tate.org.uk/research/publications/tate-papers/12/from-over-to-sub-exposure-the-anamnesis-of-les-immateriaux. (Accessed 21st March 2017).

Husserl, E. (1913) *Ideas: General Introduction to Phenomenology*. (Translated from German by Gibson, W. (1962)). New York: Collier, Macmillan.

iFit (2016) *iFit outside app*. (online) available at https://www.ifit.com/outdoor (accessed 30th May 2016).

Interaction Design Foundation (2018) *Interaction Design*. (Online) available at: https://www.interaction-design.org/literature/topics/interaction-design (accessed 10th December 2018).

Instructables (2016) *Raspberry Pi (security) Slow Scan Television Camera*. (Online) Available at: http://www.instructables.com/id/Raspberry-Pi-security-Slow-Scan-Television-Camera/ (Accessed 26th May 2016).

Jarry, A (1896) *Ubu Roi*. (Translated from French by Keith, B & Legman, G (2003)) New York: Dover Publications.

Jensen, M. (2009) John Cage, Chance Operations and the Chaos Game: Cage and the "I Ching". In: *The Musical Times*. Vol 150: 1907 (Summer, 2009). Hove: Musical Times Publications Ltd.

Jones, A, Silver, E (Eds). (2016) *Otherwise: Imagining Queer Feminist Art Histories*. Manchester: Manchester University Press.

Kabakov, I., Tupitsyn, M., Tupitsyn, V. (1999) About Installation. In: *Art Journal*. Vol 58: 4 (Winter, 1999). Pp 62-67

Kak, E. (1992) Aspects of the Aesthetics of Telecommunications. In Gimes, J & Lorig, G (Eds) (1992) *Siggraph Visual Proceedings*. New York: ACM.

Kant, I., 1790. *Critique of Judgement*. Translated from German by Pluhar, W., 1987. Indianapolis/Cambridge: Hackett Publishing Company.

Kaprow, A. (1958) The Legacy of Jackson Pollock, In: Kelly Jeff (Ed) (1993) *Essays on the Blurring of Art and Life*. Berkeley and Los Angeles: University of California Press.

Kaufman, J., Beghetto, R. (2009). Beyond Big and Little: The Four C Model of Creativity. In: *American Psychological Journal*. Vol.13: 1 (2009): Pp 1-12.

Kaufman, J., Sternberg, R (Eds) (2006) *The International Handbook of Creativity*. Cambridge: Cambridge University Press.

Kearns, R. (2018) Encountering the Creative Moment in the Age of the Selfie. In: Boyer, J. (Ed) (2019) *Theorem 2018*: *Doctoral Research in the Visual Arts and Design: Theory as Practice and Practice as Theory*. Cambridge: Ruskin Arts.

Kearns, R (2017) The Audience in the Playspace: Developing Interactive Art Installations. In: Boyer, J. (Ed) (2018) *Theorem 2017*: *Doctoral Research in the Visual Arts and Design: Theory as Practice and Practice as Theory*. Cambridge: Ruskin Arts.

Kearns, R. 2016. Bedding the Pixel: From Press to Expanded Theory. In: Chance, V., Ganley, D. (Eds) (2018) *re:print*. London: Marmalade

Kearns, R (2016) Are You Watched: Theory, Practice and the Influence of the Audience. In: *Theorem 2016: Theory as Practice and Practice as Theory*. Cambridge: Cambridge School of Art.

Kenyon, N (2014) Barbican Foreword. In: Admis, D. Bodman, C. McConnon N. (Eds) (2014) *Digital Revolution*. London: Barbican International enterprises.

Kentish Town City Farm (2018) *How Kentish Town City Farm Began*. (Online) available at: http://40years.ktcityfarm.org.uk/the-beginning/ (accessed 26th September 2018).

Kester, G. (2004) *Conversation Pieces*. Los Angeles: University of California Press.

Khuri, F. (2014) *Imams and Emirs: State Religion and Sects in Islam*. London: Saqi

Kirby, C., Graham, B (2016) Gadamer, Dewey, and the Importance of Play in Philosophical Inquiry. Symposium: *Philosophy of Play*. *Reason Papers* Vol 38: 1. (Online) available at: https://reasonpapers.com/wp-content/uploads/2016/09/rp_381_1.pdf (accessed 30th April 2018)

Kirby, M. (1995) Happenings. In: Sandford. M, (Ed) (1995) *Happenings and other Acts*. London: Routledge.

Kittler, F. (2014) *The Truth of the Technological World: Essays on the Genealogy of Presence*. Redwood City: Stanford University.

Klosowski, T. (2015) *Google Maps Now Shows Your Location History in a Timeline*. (Online) available at http://lifehacker.com/google-maps-now-shows-your-location-history-in-a-timeli-1719543525 (Accessed 28th May 2016).

Krause, B (2012) *The Great Animal Orchestra*. London: Profile Books

Krausz, M. (2010) Mapping Relativism. In Krausz, M. (Ed) (2010) *Relativism A Contemporary Anthology*. New York: Columbia University Press.

Kristiansen, D (1968) What is Dada. In: *Educational Theatre Journal*: Vol. 20: 3 (October 1968): 457-462.

Krohn, S (2013) *The Age of Collage: Contemporary Collage in Modern Art*. Berlin: Gestalten.

Krysa, J. (2016) The Politics of Contemporary Curating: A Network Perspective. In: Martin, R (Ed) (2015) *Art and Politics*. Oxon: Routledge.

Kuhn, T. (1962) *The Structure of Scientific Revolutions*. Chicago: University of Chicago Press.

Kwastek, K. 2013. *Aesthetics of Interaction in Digital Art*. Cambridge, MA: MIT Press.

Landsberger, H. (1958) *Hawthorne Revisited*. New York: Ithaca.

Lacan, J (1966) *Écrits*. (Translated from French by Fink, B (2006) London, New York: W. W. Norton and Company.

Lacan, J. (1949) The Mirror Stage as Formative in the I Function as Revealed in Psychoanalysis. In: 1966. *Écrits*. Translated from French by Fink, B. 2002. New York: W.W. Norton & Co, Inc.

Laclau, E. & Mouffe, C. (2002) *Hegemony and Socialist Strategy*, 2ⁿᵈ Edition, London: Verso.

Laing, R.D. (1960) *The Divided Self*. London: Tavistock Publications. Laclau, E. & Mouffe, C. (1985) *Hegemony and Socialist Strategy*. London: Verso.

Land, G., Jarman, B. (1992) *Break Point and Beyond: Mastering the Future Today*. New York: Harper Business,

Lansberger, H. (1958) *Hawthorne Revisited*. New York: Ithaca.

Latour, B. (1990) On Actor-Network Theory. A Few Clarifications Plus More Than a Few Complications. In: *Soziale Welt* Vol 47: 369-381 (1996).

Lave, j., Wenger, E (1991). *Situated Learning: Legitimate Peripheral Participation*. Cambridge: Cambridge University Press.

Leavis, F. (1933) *Mass Civilization and Minority Culture*. London: Minority Press

Leavis, Q. (1932) *Fiction and the Reading Public*. London: Chatto and Windus

Le Bon, G (1895) The Crowd: *A Study of the Popular Mind*. New York: The Macmillan Co.

Le Grice, M. (1972) *Threshold*. (online) Available at: https://www.youtube.com/watch?v=Dz3RStIfv9M (Accessed 18ᵗʰ March 2019).

Le Grice, M. (1970) *Berlin Horse*. (online) Available at: Le Grice, M. (1972) *Threshold*. (online) Available at: https://www.youtube.com/watch?v=LDj8Tc6259o (Accessed 18ᵗʰ March 2019).

Levinas, E. (1995). *Alterity and Transcendence*. (Translated from French by Smith, B. 1999). London: The Athlone Press.

Levi-Strauss, C (1978) *Myth and Meaning*. London: Routledge

Levi-Strauss, C (1955) *Tristes Tropiques*. (Translated from French by Cape J 1973). Cambridge: Massachusetts.

Lévy-Bruhl, L. (1910) *How Natives Think*. (Translated into English by Clare, Lilian (1926)). New York: Washington Square Press, Inc.

Lewis, M (2012) *Michael Asher*. *Afterall* (online) Available at: http://www.afterall.org/online/michael-asher.2#.V8Z_42X5iDA (accessed 31st August 2016)

Lind, M. (2007) The Collaborative Turn, in: Billing, J. & Lind, M. & Lars, N. (Ed). (2007) *Taking the Matter into Common Hands*. London: Black Dog Publishing.

Locke, J. (1824) *The Works of John Locke*. London: Rivington

Loke, L. Robertson, T. Mansfield, T. (2005) Moving Bodies, Social Selves: Movement Orientated Personas and Scenarios. In: *Proceedings of OZCHI 2005*. Canberra, Australia. November 23rd – 25th 2005.

London, B., Biesenbach, K. (2003) *Video Acts: Single Channel Works from Collections of Pamela and Klaus Kramlich and New Art Trust*. New York: P.S. 1 Contemporary Art Center.

Ludovico, A. (2012) *Post Digital Print*, Eindhoven: Onomatopee.

Lux. (2018) *Light Music: Lis Rhodes*. (Online). Available at: https://lux.org.uk/work/light-music. (Accessed 4th April 2018).

Luxonline. (2018) *This is a Television Receiver*. (Online). Available at: http://www.luxonline.org.uk/artists/david_hall/this_is_a_television_receiver.html. Accessed 4th April 2018).

Ma, S. (2007) Political Science at the Edge of Chaos? The Paradigmatic Implications of Historical Institutionalism. In: *International Political Science Review*. Vol. 28 (1) January 2007: 57-78.

Macklin, C., Sharp, J. (2016) *Games, Design and Play: A Detailed Approach to Iterative Games Design*. Boston: Addison Wesley.

Macklin, R. (1999) *Against Relativism, Cultural Diversity and the search for Ethical Universals in Medicine*. New York: Oxford University Press.

MacLeod, S. (Ed) (2005) *Reshaping Museum Space: Architecture, Design, Exhibitions*. London: Routledge.

Magiera, M. (2016) *Unpublished Interview with Richard Kearns*. At: The Centre for Contemporary Art, Singapore (October 3rd 2016).

Maholy-Nagy, L. (1947) *The New Vision of an Abstract Artist*. New York: Wittenborn.

Mahony, E. (1999) When Art Becomes Life: Socially Engaged German Art. In: *Circa 88* (Summer 1999). Belfast: Circa Art Magazine

Malzacher, F., Warsza, J. (Eds) (2017) Empty Stages, Crowded Flats: Performativity as Curatorial Strategy. Berlin: Alexander Verlag.

Manovich, L. (2001) *The Language of New Media*. Cambridge: MIT Press.

Manovich, L. (2013) *Software Takes Command*. London: Bloomsbury Academic.

Marcus, G (2002) The Long Walk of the Situationist International. In: McDonough, T. (Ed). *Guy Debord and the Situationist International*. Cambridge, Massachusetts: MIT Press.

Markovic, S. (2012) Components of Aesthetic Experience, Aesthetic Fascination, Aesthetic Appraisal, and Aesthetic Emotion. In: *I-Perception*. Vol 3:1 (Jan 2012) 1-17. Doi: 10.1068/i0450aap.

Marrinetti, F (1909) The Futurist Manifesto. In: Danchev, A (Ed) (2011) *100 Artists' Manifestos from the Futurists to the Stuckists*. London: Penguin Books.

Marrinetti, F. & Masnata P. (1933) *La Radia* (online) Available at: http://kunstradio.at/THEORIE/theorymain.html (accessed 18th December 2015).

Marrinetti, F. (1915) *The Futurist Synthetic Theatre* (online) Available at: http://www.391.org/manifestos/1915-futurist-synthetic-theatre-marinetti-settimelli-corra.html#.VnNlOTb5iDA (accessed 18th December 2015).

Marshall, C. (2005) When Worlds Collide: The Contemporary Museum as Art Gallery. In: Macleod, S. (ed) *Reshaping Museum Space: Architecture, Design, Exhibitions*. London: Routledge.

Martin, R., Mellor, S., Schwaber, K., Sutherland, J., Thomas, D. (2001) *Manifesto for Agile Software Development*. Available at: http://agilemanifesto.org (accessed 29th August 2017).

Martin, R. (2015) Conceptual Cartographies. In: Martin, R (Ed) (2015) *Art and Politics*. Oxon: Routledge.

Marx, K (1886) *Kapital: Critique of Political Economy* (Ed Engels, F) (Translated from German by Moore, S & Aveling E, 1909). Chicago: Charles Kerr and Company.

Massumi, B. (Ed) (2002) *A Shock to Thought: Expression after Deleuze and Guattari*. New York: Routledge.

Mathiesen, T. (1997) The Viewer Society: Michael Foucault's 'Panopticon' Revisited. In *Theoretical Criminology: An International Journal*. Vol 1 (2): 215-234. London: Sage.

Mathiesen, T. (2013) *Towards a Surveillant Society: The Rise of Surveillance Systems in Europe*. Hook, Hampshire: Waterside Press.

Matutinovic, I. (2010) Economic Complexity and the Role of Markets. In *Journal of Economic Issues*. Vol 44:1 (March 2010) 31-51.

McDaniel, T (2012) Encountering Corpses: Notes on Zombies and the Living Dead in Buddhist Southeast Asia. In: Kyoto Review of Southeast Asia. 12 (September 2012). (Online) Available at:https://kyotoreview.org/issue-12/encountering-corpses-notes-on-zombies-and-the-living-dead-in-buddhist-southeast-asia/ (Accessed 13th January 2017).

McDonough, T. (Ed). (2002) *Guy Debord and the Situationist International*. Cambridge, Massachusetts: MIT Press.

McDonough, T. (2002) Introduction: Ideology and the Situationist Utopia. In: McDonough, T. (Ed). *Guy Debord and the Situationist International*. Cambridge, Massachusetts: MIT Press.

McLuhan, M. (1964) *Understanding Media: The Extensions of Man*. Berkley: Gingko Press

McLuhan, M, Fiore, Q. (1967) *The Medium is the Massage*. New York: Bantam Books.

McNiff, J (2013) *Action Research: Principles and Practice*. (3rd Ed) Abingdon: Routledge.

McNiff, S.(1998). *Trust the Process: An Artists Guide to Letting Go*. Boston: Shambhala Publications Inc.

Mension, J-M. (2002) *The Tribe*. London: Verso.

Mellor, S., Schwaber, K., Sutherland, J., Thomas, D. (2001) *Manifesto for Agile Software* Development. Available at: http://agilemanifesto.org (accessed 29th November 2016).

Meier, M., Schnall, S., Schwartz, N., Bargh, J. (2011) Embodiment in Social Psychology. In: *Topics in Cognitive Sciences*. Vol 4:4 (May 2012).Pp 1-12. Available at: https://dornsife.usc.edu/assets/sites/780/docs/12_topics_meier_et_al_embodiment.pdf DOI: 10.1111/j.1756-8765.2012.01212.x (accessed 12th March 2019)

Melton, A. (1935) *The Problems of Installations in Museums of Art: Studies in Museum Education*. Washington: American Association of Museums.

Mercury Theatre on the Air (1938) *War of The Worlds* (Radio Broadcast) (Online) Available at: https://www.youtube.com/watch?v=Xs0K4ApWl4g (Accessed 10th September 201

Meskimmon, M, Rowe, D, (Eds) (2015) *Women, the Arts and Globalisation: Eccentric Experience*. Manchester: Manchester University Press.

Meta Bauer, U. (2002) The Space of Documenta 11: Documenta 11 as a Zone of Activity. In Ander, H & Rottner N (ED) (2002) *Documenta 11 Platform 5: Exhibition Catalogue*. Ostfildern: Hatje Cantz

Meyers, P. (2010) *Workplace to Playspace: innovating, learning, and changing through dynamic engagement*. Hoboken: John Wiley & Sons.

Mirzoeff, N (Ed) (1998) *Visual Culture Reader*. London: Routledge.

Mirzoeff, N. (2015) *How to See the World*. London: Pelican Books.

Molesworth, H. (2003) Dada to Neo-Dada and back Again. In: *October*: 105, Dada (Summer 2003): 117-181.

Moore, S., Place, T. A. (2001). *The KromoZone Inter- media Performance System*. Available at: http://www.dmu.ac.uk/documents/technology-documents/research/mtirc/nowalls/mww-moores.pdf (accessed 9th March 2018).

Moreno, J. (1940) Mental Catharsis and the Psychodrama. In: *Sociometry*. Vol 3: 3 (July 1940). Washington, DC: American Sociological Association.

Moreno, J. (1946) Psychodrama and Group Psychotherapy. In: *Sociometry*. Vol 9: 2/3 (May – August 1946). Washington, DC: American Sociological Association.

Morris, Hargreaves, McIntyre. (2016) *Culture Segments*. Online (available at) https://mhminsight.com/files/culture-segments-booklet-2016-rN66-148-2195.pdf (Accessed 22nd November 2017)

Moussaid, M. Helbing, D. Garnier, S. Johansson, A. Combe, M. Theraulaz, G. (2009). Experimental Study of the Behavioural Mechanisms Underlying Self-Organization in Human Crowds. In: *Proceedings: Biological Sciences*. Vol. 276: 1668 (Aug. 7, 2009) 2755-2762. London: Royal Society

Munro, M (2009) Dada, MAVO and the Japanese Avant-Garde: A prehistory to the introduction of Surrealism to Japan. In: *Re:bus*. Issue 4 (Autumn Winter 2009). Available at https://www.essex.ac.uk/arthistory/research/pdfs/rebus_issue_4/Munro.pdf (Accessed May 31st 2016).

Murray, J. (1998) *Hamlet on the Holodeck: The Future of Narrative in Cyberspace*. Massachusetts: MIT Press.

National Readership Survey (2016). (online) available at: http://www.nrs.co.uk/nrs-print/lifestyle-and-classification-data/social-grade/ (Accessed 18th March 2019).

National Library Board, Singapore (2004) *Tigers in Singapore*. (Online) Available at: http://eresources.nlb.gov.sg/infopedia/articles/SIP_1081_2007-01-17.html (accessed 16th March 2017).

Newmann, J. V. (1966) *Theory of Self –Reproducing Automata* (Ed Burkes. A.) Urbana: University of Illinois Press.

New York Magazine, (1969) *Two to Try*. Vol 2 (14): 49.

Nicolucci, S. (2010) Cultivating Audiences: Taming, Teaching, Transforming. In: *Music Educators Journal*. Vol 97: 1 (September 2010). California: Sage Publications.

Nietzsche, F. (1872) *The Birth of Tragedy*. Leipzig: E. W. Fritzsch

Nietzsche, F. (1883) *Thus Spoke Zarathustra*. London: Williams and Norgate.

Nintendo (1985) *Super Mario Bros*. (Nintendo Entertainment System Game). Kyoto: Nintendo Co.

Nishikado, T. (1978) *Space Invaders*. (Arcade Game). Tokyo: Taito

Obrist, H. (2014) *Ways of Curating*. London: Allen Lane

O'Doherty, B. (1999) *Inside the White Cube, The Ideology of the Gallery Space*. San Francisco: University of California Press.

Ofcom. (2016) *Guide to the use of Radio Transmitters and the Law*. (Online) Available at: http://stakeholders.ofcom.org.uk/enforcement/spectrum-enforcement/law (Accessed 26th May 2016).

Olaoluwa, S. (2007) *The Author Never Dies: Roland Barthes and the Post-Colonial Project*. (Online). Available at http://intertheory.org/olaoluwa.htm (Accessed 26th May 2015)

O'Neill, P. (2012) *The Culture of Curating and the Curating of Culture(s)*. Cambridge, MA: MIT Press.

Ong, K (2015) Evangelism and the Gay Movement in Singapore. In Martin, R (Ed) (2015) *The Routledge Companion to Art and Politics*. Oxon: Routledge.

Orwell, G. (1948) *Nineteen Eighty-Four*. London: Secker and Warburg.

Osborne, M. (2013) *Southeast Asia, an Introductory History* (11th Edition). London: Allen & Unwin.

Osterweil, A. (2014) Andy Warhol, porn realist. In *Flesh Cinema: The Corporeal turn in American avant-garde film*. Manchester: Manchester University Press.

O'Sullivan, D (2004) *Complexity Science and Human Geography*. Transactions of the Institute of British Geographers. New Series, 29 (3) September 2004: 282-295.

O'Sullivan, S., Stobie, T. (Eds). 2015. *Developing Cambridge Learner Attributes*. (Online) available at: http://www.cambridgeinternational.org/images/417069-developing-the-cambridge-learner-attributes-.pdf (accessed 1st June 2018).

Özgen, E (2004) Learning and Color Perception. In: *Current Directions in Psychological Science*. Vol 13: 3 (June 2004): 95-98.

Passantino, E. (1975) Adventure Playgrounds for Learning and Socialisation. In: *The Phi Delta Kappan*. *Special Issue on the Unrecognized Environmental Curriculum*. Vol 56: 5. (Jan 1975). Bloomington: Phi Delta Kappa International

Passer, W. Smith, E. (2001) *The Science of Mind and Behaviour*. New York: McGraw-Hill

Pastine, I., Pastine, T., Humberstone, T. (2017) *Introducing Game Theory*. London: Icon Books.

Pavlov, I. (1927) *Conditioned Reflexes: An Investigation of the Physiological Activity of the Cerebral Cortex*. (Translated and edited by G.V. Anrep). (Online) Available at: http://psychclassics.yorku.ca/Pavlov/. (Accessed 25th February 2019).

Perusek, D (2007) Grounding Cultural Relativism. In: *Anthropological Quarterly*. 80, (3) Summer, 2007: 821-836 (online) Available at: http://www.jstor.org/stable/30052726 (Accessed 19th February 2016).

Perron, B, Wolf, M. (Eds) (2009) *The Video Game reader 2*. New York: Routledge.

Peters, J. (2015) *The Marvellous Clouds: Toward a Philosophy of Elemental Media*. Chicago: The University of Chicago Press.

Phau, I & Kea, G (2007) Attitudes of University Students toward Business Ethics: A Cross-National Investigation of Australia. In: *Singapore and Hong Kong*. *Journal of Business Ethics*. 72 (1), April 2007: 61-75.

Piaget, J. (1952) *The Origin of Intelligence in the Child*. Translated by M. Cook. New York: International Universities Press.

Piaget, J. (1954) *The Construction of Reality in the Child*. London: Routledge

Pickels, A. (2016) *Let Me Participate and I'll Tell You Who I Am*. In. Burzynska, R. (Ed) Joined Forces: Audience Participation in Theatre. Berlin: Alexander Verlag Berlin

Plato. (380 BCE) *The Allegory of the Cave*. In: The Republic. (Translated from Greek by Jowett, B 1888). Oxford: The Caledonian Press.

Plato, (360 BCE) The Seventh Letter. (Online) Available at: http://www.globalgrey.co.uk/seventh-letter/ (Accessed 20 August 2015).

Plato, (380 BCE) The Republic (Kindle-DX Version) Available at: http://www.amazon.co.uk/Republic-Plato-ebook/dp/B0082SV87G/ref=sr_1_2?s=digital-text&ie=UTF8&qid=1458006432&sr=1-2&keywords=plato+republic (Accessed 15th March 2016).

Playeum's Children's Centre for Creativity (2018). *Our Pedagogy*. Available at: www.playeum.com/pedagogy-cgqd. (Accessed 21st February 2018).

Porges, S. (2009) The Polyvagal Theory: New Insights into Adaptive Reactions of the Autonomic Nervous System. In: *Cleveland Clinic Journal of Medicine*. Vol 76: 2 (April 2009). Doi:10.3949/ccjm.76s2.17. (accessed 15th January 2019).

Pope, R. (2005) *Creativity: Theory, History, Practice*. London: Routledge.

Prado, C & Natkin, S (2014*) Design process for interactive sound installations: the designer, the interactor and the system*. Conference paper: ICMC/SMC, at Athens. September 2014.

Preziosi, D (2001) The Museum of What You Shall Have Been. In: *Brain of the Earth's Body*. Minneapolis: University of Minnesota Press.

Pryor, H (2015) *GPS Drawing*. (online) Available at: http://www.hughpryor.co.uk/gps-drawing/ (accessed 2nd October 2015).

Psarra, S. (2005) Spatial Culture, Way-Finding and the Educational Message: The Impact of Layout on the Spatial, Social and Educational Experiences of Visitors to Museums and Galleries. In: MacLeod, S (Ed) *Reshaping Museum Space: Architecture, Design, Exhibitions*. London: Routledge.

Rancière, J. (2011) *The Emancipated Spectator* (Translated from French by Elliott, G). London: Verso.

Rancière, J. (2010) *Dissensus: On politics and Aesthetics*. London: Bloomsbury

Rasch, W (1991) Theories of Complexity, Complexities of Theory: Habermas, Luhmann, and the Study of Social Systems. In: *German Studies Review*. Vol. 14: 1 (Feb 1991).Pp 65-83 (Online) Available at: http://www.jstor.org/stable/1430154 (accessed 7th March 2016).

Revel, N. (2015) *Palawan Highland Landscape: Forms, Signs and Signals*. ADM Lecture Series, Nanyang Technological University, Singapore, 28th January, 2015

Revich, A (2008) Red Circle Event. In: Touchon (Ed) (2008), *C New & Improved! Fluxus: Fluxation #2: Classic and Contemporary Scores, Instructions and Artefacts by Fluxus Artists*. Santé Fe: Ontological Museum Publications.

Rhizome (2018) *Rhizome*. (online) Available at: http://rhizome.org/about/ (Accessed 16th March 2019).

Rice, C. (2009) The Inside of Space: Some Issues Concerning Heterogeneity, the Interior and the Weather. In : Hensel, M., Hight, C., Menges, A., (Eds). (2009) *Space Reader: Heterogenous Space in Architecture*. Chichester: Wiley.

Rice, L. (2009) Playful Learning. In: *Journal for Education in the Built Environment*. Vol. 4: 2, December 2009. Available at: https://doi.org/10.11120/jebe.2009.04020094 (Accessed May 5th 2018)

Ricoeur, P (1988) Narrative Identity. (Translated from French by Muldoon). In: *S. Philosophy Today*. Vol: 35: 1 (Spring 1991).Pp 73-81 (online) Available at: http://docslide.us/documents/ricoeur-narrative-identitypdf.html (Accessed 25th February 2016)

Rieser, Martin (Ed), (2011) *The Mobile Audience: Media Art and Mobile Technologies*. Boston: Rodopi.

Rinaldi, R. (2012) Art and the active audience: Participatory art changes audience role from viewer to doer. In: *Denver Post*. December 31, 2012 available at: http://www.denverpost.com/2012/12/31/art-and-the-active-audience-participatory-art-changes-audience-role-from-viewer-to-doer/. (Accessed 5th August 2016)

Roberts, J. (2007) *The Intangibilities of Form*. Brooklyn: Verso.

Robinson, F. (1981) Print Culture and the Birth of Text. In: *The Sewanee Review*, Vol 89: 3 (Summer, 1981). Baltimore: The John Hopkins University Press.

Robinson, J. (2005) *George Brecht: Events: A Heterospective*. Cologne: Der Buchhandlung Walther König.

Robinson, K. (2001) *Out of Our Minds: Learning to be Creative*. Chichester: Capstone.

Rogers, H. (2013) *Sounding the Gallery: Video and The Rise of Art Music*. Oxford University Press: New York.

Rosen, R (1986) The Physics of Complexity. In: *Power, Autonomy Utopia: New Approaches Toward Complex Systems* (Ed. Trappl, R) New York: Plenum Press.

Rousseau, J (1762) *The Social Contract*. Amsterdam: Marc Michel Rey.

Ross, A. (2007) *The Rest is Noise*. London: Fourth Estate.

Russolo, M (1913) *The Art of Noises*. (Online) Available at: http://www.ubu.com/historical/gb/russolo_noise.pdf (Accessed 10th September 2015).

Said, E. (1978) *Orientalism*. New York: Random House.

Salter, C (2015) *Alien Agency: Experimental Encounters with Art in the Making*. Massachusetts: MIT Press.

San, J. (2003) Antonio Gramsci on Surrealism and the Avantgarde. In: *The Journal of Aesthetic Education*: Vol. 37: 2 (Summer 2003) Pp 31-45.

Sandell, R. (2005) Constructing and Communicating Equality. The Social Agency of the Museum Space. In: Macleod, S. (ed) *Reshaping Museum Space: Architecture, Design, Exhibitions*. London: Routledge.

Sanders, A. (1929) *Antlitz der Zeit: Sechzig Aufnamen Deutscher Menschen des 20. Jahrhunderts*. Munich: Wolf.

San, J. (2003) Antonio Gramsci on Surrealism and the Avantgarde. In: *The Journal of Aesthetic Education*. Vol. 37 (2) (Summer 2003): 31-45.

Sartre, J. (1943) *Being and Nothingness*. (Translated from French by H. Barnes. 1993). New York: Washington Square Press

Sartre, J (1943) *Being and Nothingness*. (Translated from French by H. Barnes. 1993). New York: Washington Square Press

Saunders, F. (1995) Modern Art was a CIA Weapon. In: *The Independent*. 22nd October. (Online) Available at: http://www.independant.co.uk/news/world/modern-art-as-via-weapon-1578808.html (Accessed 22nd December 2015).

Saussure, F (1911) *Course in General Linguistics* (Bally, C & Sechehaye, A. Ed) (Translated from French by Baskin, W). New York: McGraw-Hill Book Company.

Schiller, D (1999) *Digital Capitalism*, London: MIT Press

Schwartz, B. (2015) *Broadcast Hysteria: Orson Welles's War of the Worlds and the Art of Fake News*. New York: Hill and Wang

Scoville, W. Milner, B. (1957) Loss of Recent Memory After Bilateral Hippocampal Lesions. In: *Journal of Neurology, Neurosurgery and Psychiatry*. Vol 20:1 (Feb 1957). London: BMJ Publishing Group.

Scruton, R. (2010) *Beauty*. Oxford: Oxford University Press.

Selgin, G (2003) Adaptive Learning and the Transition to Fiat Money. In: *The Economic Journal*. In: Vol 113: 484, (January 2003) pp 147–165.

Sekeres, D. (2009) The Market Child and Branded Fiction: A synergism of Children's Literature, Consumer Culture, and New Literacies. In: *Reading Research Quarterly*. Vol 44: 4: 300–414. (October/November/December 2009). Hoboken: Wiley on behalf of the International Literacy Association.

Shanyang, Y. (2015) Systems Thinking in Foresight and Futures. (conference) *Living Leonardos, An International Conference*. *Singapore*, 8-9 May, 2015.

Shapira, H. (2017) *Gladiators, Pirates and Games of Trust: How Game Theory, Strategy and Probability Rule Our Lives*. London: Watkins.

Sharp, J. (2015) *Works of Game: Aesthetics and Game Art*. London: The MIT Press.

Schiller, F (1794) *Letters upon the Aesthetical Education of Man*. Available at: http://public-library.uk/ebooks/55/76.pdf. (Accessed 30th March 2019).

Sherk, B. (2012) *Q & A Bonnie Ora Sherk and the Performance of Being*, (online) Available at: https://bampfa.org/news/q-bonnie-ora-sherk-and-performance-being, (Accessed June 28th 2015).

Sholette, G. (2012) *e-flux, After OWS: Social Practice Art, Abstraction, and the Limits of the Social*. (Online) Available at http://www.e-flux.com/journal/after-ows-social-practice-art-abstraction-and-the-limits-of-the-social/ (Accessed June 29th 2015).

Sholette, G. (2011) *Dark Matter Art and Politics in the Age of Enterprise Culture*, London: Pluto Books

Skelly, T. (2009) Forward. In: Perron, B, Wolf, M. (Eds) (2009) *The Video Game reader 2*. New York: Routledge.

Smith, A. (1776) *An Inquiry into the Nature and Causes of the Wealth of Nations*, (online) Available at: http://www.ifaarchive.com/pdf/smith_-_an_inquiry_into_the_nature_and_causes_of_the_wealth_of_nations[1].pdf (Accessed 17th November 2015).

Smith, F. Smith K. (2001) Spending Time on Arts. *In: Empirical Studies of the Arts*. Vol 19:2 (2001) 229-236. California: Sage Publishing

Smith, N (2015) Designing the Data City: (Conference) *Signals of Tomorrow*. Singapore. 10th - 18th October 2015.

Sontag, S. (1966) *Against interpretation and Other Essays*. New York. Farrar, Straus and Giroux.

Sowa, J. (2016) Its Political Economy, Stupid!: Towards Progressive Modes of Participation. In Burzynska, A (Ed) *Joined Forces: Audience Participation in Theatre*. Berlin: Alexander Verlag Berlin

Spielmann, Y. (2004) *Video and Computer: The Aesthetics of Steina and Woody Vasulka*. (Online) Available at: http://www.fondation-langlois.org/html/e/page.php?NumPage=461 (Accessed June 5th 2016).

Spielmann, Y (2006) Video: From Technology to Medium. *In: Art Journal*. Vol. 65:3 (Fall 2006). New York: College Art Association.

Spivak, G (1985) *Can the Subaltern Speak? Reflections on the History of an Idea*. New York: Columbia University Press.

Stavrinaki, M. (2016) *Dada Presentism: An Essay on Art & History*. California: Stanford University Press.

Steinberg, L (1968) *The Flatbed Picture Plane*. (Online) Available at: http://web.mit.edu/allanmc/www/othercriteria.pdf (accessed 31st August 2016).

Sternberg, R. (Ed) (1999) *Handbook of Creativity*. Cambridge: Cambridge University Press.

Stott, T. (2015) *Play and Participation in Contemporary Art Practices*. New York: Routledge.

Sternberg, R., Sternberg, K. (2009) *Cognitive Psychology*. Belmont: Wadsworth.

Strinati, D. (1995) *An Introduction to Theories of Popular Culture*. London: Routledge.

Sweeney, J (1959) The Generative Role of Play. In: *The Review of Politics*. Vol 21: 2 (April 1959): 389-401. Cambridge: Cambridge University Press for the University of Notre Dame du lac on behalf of Review of Politics.

Sweeny, M. (1984) Pantomime: Preservation of a Tradition. In *Theatre Ireland,* No 8 (Winter 1984: 62-64. Belfast: Paul Hadfield and Linda Henderson

Sweeney, R (2004) Lines of Sight in the Network Society: Simulation, Art Education, and a Digital Visual Culture. In: *Studies in Art Education*. Vol. *Technology Issue*. 46: 1 (Autumn 2004): 74-87.

Tanaka, A., Bongers, B. (2001) *Global String: A Musical Instrument for Hybrid Space*. Available at: http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.21.7421&rep=rep1&type=pdf (accessed 9th March 2018)

Takahash, Y (2015) *Radiations 19thJune* (Online) Available at: http://gpsdrawing.info/#artist (Accessed 18th December 2015).

Tate. (2019) *Dada*. (online) Available at: https://www.tate.org.uk/art/art-terms/d/dada (Accessed 18th March 2019).

Tallant, S (2015) Insights: The Liverpool Biennial, (Lecture) *Centre for Contemporary Art*. Singapore, 24th June 2015).

Tainter, J (2016), The Treasure of Human Experiences. (Conference) *Innovation, Complexity and Cultural Heritage*. 3rd Singapore Heritage Science Conference, Singapore: Nanyang Technological University. 25-26 January 2016.

Tassone, B. (2017) The Relevance of Husserl's Phenomenological exploration of Interiority to Contemporary Epistemology. In: *Palgrave Communications* (e-journal), DOI:10.1057/palcomms.2017.66

Teh, D (2016) Obstacles to Exhibition History: Institutions, Curatorship, and the Undead Nation-State. In: O'Neill, P, Wilson, M, Steeds, L (Eds) (2016) *The Curatorial Conundrum: What to Study? What to Research? What to Practice*. Massachusetts: MIT Press

Telecommunication Development Bureau (2015) I*CT Facts and Figures* (online) Available at: https://www.itu.int/en/ITU-D/Statistics/Documents/facts/ICTFactsFigures2015.pdf (Accessed 22nd September 2015).

Thierry, G. Anthanasopoulis, P. Wiggett, A. Dering, B. Kuipers, J. Ungerleider, L (2009) Unconscious Effects of Language-Specific Terminology on Pre-attentive Color Perception. *In Proceedings of the National Academy of Sciences of the United States of America*. Vol 106: 11 (Mar 17 2009): 4567-4570.

Thomas, G & James, D (2006) Reinventing Grounded Theory: Some Questions about Theory Ground and Discovery. In: *British Educational Research Journal* Vol 32, No 6 (Dec 2006: 767-795).

Thompson, C. (2010) *Tigers on the brink. Facing up to the challenge in the Greater Mekong: Cambodia, Laos, Myanmar, Thailand and Vietnam*. (Online) Available at: http://www.wwf.se/source.php/1279712/Tigers%20on%20the%20brink_WWF-rapport%202010.pdf (accessed 16th March 2017).

Thomson, H. (1902) Concerning Audiences. In: *The Musical Times and Singing Class Circular*. Vol 43: 714 (August 1902). London: Musical Times Publications Ltd.

Timmermans, S & Tavory, I (2013) Theory Construction in Qualitative Research: From Grounded Theory to Abductive Analysis. In: *Sociological Theory*. Vol 30, No 3 (September 2012: 167-186.

TNO Staff. (2016) Crossword Puzzle Mistaken for Art. In: *Culture, The New Observer (*Online*)*. Available at: http://newobserveronline.com/crossword-puzzle-mistaken-art/ (accessed 15th August 2016)

Troemel, B. (2011) *Peer Pressure*. Raeigh: Lulu.com

Toon, R. (2005) *Black box science in black box science centres*. In: MacLeod, S. (Ed) (2005) Reshaping Museum Space: Architecture, Design, Exhibitions. London: Routledge

Tocqueville, A (1835) *Democracy in America: Volume 1*. (Translated from French by Reeve, H.). Available at: https://www.gutenberg.org/files/815/815-h/815-h.htm (accessed 1st September 2016)

Touchon, C (2008) New & Improved! Fluxus. In: Touchon (Ed) (2008), *C New & Improved! Fluxus: Fluxation #2: Classic and Contemporary Scores, Instructions and Artefacts by Fluxus Artists*. *Santé Fe*: Ontological Museum Publications.

Trainor, L., Corrigal, K. (2010) Music Perception of Emotion in Music. In: Jones, M., Fay, R., Popper, A. (Eds) (2010) *Music Perception*. New York: Springer.

Tucker, W (1997) Re-reconsidering Burt: Beyond a Reasonable Doubt. In: *Journal of the History of the Behavioural Sciences*. Vol 33: 2 (December 1998). DOI: https://doi.org/10.1002/(SICI)1520-6696(199721)33:2<145:AID-JHBS6>3.0.CO;2-S

Turing, A. (1950) Computing Machinery and Intelligence. In: *Mind: A Quarterly Review of Psychology and Philosophy*. Vol 59: 236 (October 1950). Oxford: Oxford University Press.

Turner, C, Webb, J (2016) *Art and Human Rights: Contemporary Asian Contexts*. Manchester: Manchester University Press.

Turner, F. Pöppel, E (1983) *The Neural Lyre: Poetic Meter, The Brain, and Time*. (Online) Available at: http://www.cosmoetica.com/B22-FT2.htm (accessed 16th March 2017).

Tylor, E (1871) *Primitive culture: researches into the development of mythology, philosophy, religion, language, art, and custom*. London: John Murray, Albemarle Street, W.

Tzara, T (1918) Dada Manifesto. In: Danchev, A (Ed) (2011) 1*00 Artists' Manifestos from the Futurists to the Stuckists*. London: Penguin Books.

Tzara, T (1922) *Lecture on Dada*. (Online) Available at: http://www.mattesonart.com/tristan-tzara-dada-manifesto.aspx (Accessed 25th May 2016).

Uexküll, J. (1936) An Introduction to Umwelt. In: Hensel, M., Hight, C., Menges, A., (Eds). (2009) *Space Reader: Heterogenous Space in Architecture*. Chichester: Wiley.

UK Geographics (2014) *Social Garde A, B, C1, C2, D, E*. (online) Available at: http://www.ukgeographics.co.uk/blog/social-grade-a-b-c1-c2-d-e (Accessed 14th July 2015).

Urquhart, C (2013) *Grounded Theory for Qualitative Research: A Practical Guide*. Bodmin: MPG Books Group

Vaneigem, R. (1967) *The Revolution of Everyday Life* (Translated from French by Nicholson-Smith, D (1983). London: Aldgate Press.

Van Heeswijk (2014) *Homebaked: Liverpool Biennial, 2up 2Down*. (Online) Available at: http://www.biennial.com/2014/exhibition/locations/homebaked (Accessed June 25th 2015).

Veblen, T. (1899) *The Theory of the Leisure Class*. Massachusetts: Norwood Press.

Velthius, Olav. (2003) Symbolic Meanings of Prices: Constructing the Value of Contemporary Art in Amsterdam and New York Galleries. In *Theory and Society*. Vol. 32:2 (April 2003): 181-215. New York: Springer

Vins, K. (2007) Rhizome/Myzone: A Case Study in Studio-Based Dance Research. In: Barrett, E & Bolt, B (Ed) (2007) *Practice as Research: Approaches to Creative Arts Enquiry*. London: I.B. Tauris

Vom Lehn, D, Heath C, Knoblauch, H (2001) Configuring Exhibits: The Interactional Production of Experience in Museums and Galleries. In: Knoblauch, H., Kottthoff, H. (Eds) *Verbal Art Across Cultures: The Aesthetics and Proto-Aesthetics of Communication*. Tübingen: Gunter Narr Verlag

Vygotsky, L. (1933). The Role of Play in Development of the Child. (Translated from Russian by Coel, M. 1978) *In Mind in Society*. (Trans. M. Cole). Pp 92-104. Cambridge, MA: Harvard University Press

Veblen, T. (1899) *The Theory of the Leisure Class: An Economic Study in the Evolution of Institutions*. New York: Macmillan.

Wade. S (2014) *Museum of Contemporary Art Chicago Back to the 70's Art by Telephone WTTW*. (Online) Available at: http://www2.mcachicago.org/2014/back-to-the-70s-art-by-telephone-on-wttw/ (Accessed 25th September 2015).

Wagner. R, (1849) The Art-Work of the Future. In: *Richard Wagner's Prose Works*. (Translated from German by Ashton Ellis, W. 1892) London: Kegan Paul, Trench, Trübner & Co, Ltd.

Walmsley, B., Franks, A. (2011) The Audience Experience: Changing Roles and Relationships. In: Walmsley, B. (Ed). (2011) Key Issues in the Arts and Entertainment Industry. Oxford: Goodfellow

Warhol, A. (1964) *Sleep*. (Online film). Available at: https://www.youtube.com/watch?v=KaiEM2lUoZg. (Accessed 6th April 2018).

Watts, A. (1960) *The Nature of Consciousness*. (Online transcript) Available at: https://www.erowid.org/culture/characters/watts_alan/watts_alan_article1.shtml. (Accessed 5th April 2018).

Watson, M., Hall, E. (1969) On Proxemic Research. In: *Current Anthropology*. Vol 10: 2/3 (April – June 1969). Pp 222-224. Chicago: The University of Chicago Press on behalf of Wenner-Gren Foundation

Wagner. R. (1849) 1892. *Richard Wagner's Prose Works*. Translated by W. Ashton Elli. London: Kegan Paul, Trench, Trübner & Co, Ltd.

Weaver. W (1948) *Science and Complexity* (online) Available at: http://people.physics.anu.edu.au/~tas110/Teaching/Lectures/L1/Material/WEAVER1947.pdf (accessed 1st March 2016).

Wenger E. (2010) Communities of Practice and Social Learning Systems: The Career of a Concept. In: Blackmore C. (Eds) Social Learning Systems and Communities of Practice. Springer, London

Weisenfeld, G. (1996) Mavo's Conscious Constructivism: Art, Individualism, and Daily Life in Interwar Japan. In *Art Journal*. Vol 55: 3, Japan 1868-1945: Art, Architecture, and National Identity (Autumn, 1996): 64-73.

Wertz, W. (2005) A Readers Guide to Letters on the Aesthetical. In: *Fidelio Journal of Poetry, Science and Statecraft*. Vol 14: 1-2 (Spring-Summer 2005). Washington: Schiller Institute.

Westgeest, H. (2016) *Video Art Theory: A Comparative Approach*. Chichester: Wiley Blackwell.

Windsor, M (2011) *Art of Interaction: A Theoretical Examination of Carsten Höller's Test Site*. In: Tate Papers No 15. Spring 2011. Available at: http://www.tate.org.uk/research/publications/tate-papers/15/art-of-interaction-a-theoretical-examination-of-carsten-holler-test-site (accessed 6th February 2018).

White, A (2011). *Lucio Fontana Between Utopia and Kitsch*. Cambridge, Massachusetts: MIT Press.

White, G. (2013) *Audience Participation in Theatre: Aesthetics of Invitation*. New York: Springer

Whitebread, D. Basilio, M., Kuvalja, M., Verma, M. (2012) *The Importance of Play*. (Online) available at: http://www.importanceofplay.eu/IMG/pdf/dr_david_whitebread_-_the_importance_of_play.pdf (accessed 25th April 2018).

Williams, R (1958) *Culture and Society*. London: Hogarth Press.

Wilkin, R. and Goggin, G. (Ed). (2014) Locative Media: Routledge Studies. In: *New Media and cyberculture*. London: Routledge.

Wilson, S (2002) *Information Arts: Intersections of Art, Science and Technology*. London: The MIT press.

Winnicott, D. (9171) *Playing and Reality*. London: Tavistock Publications.

Winnicott, D. (1958) *Collected Papers: Through Paediatrics to Psycho-Analysis*. New York: Basic Books.

Wittgenstein, L (1953) *Philosophical Investigations*. (Translated from German by Anscombe, B. 1958). Oxford: Basil Blackwell LTD.

Woolf, V. (1919) Modern Fiction. In Woolf, V (1921) *Monday or Tuesday*. London: Hogarth Press.

Worth, S. (2001) Disinterestedness. In: Gaut, B. Lopes, D (Eds) (2001) *The Routledge Companion to Aesthetics*. London: Routledge

Xcitex Video Capture and Motion Analysis Solutions (2017) *ProAnayst*. Available at: http://www.xcitex.com/proanalyst-motion-analysis-software.php (Accessed 26th February 2018)

Xuan, L. (2015) Curator Joseph Ng, whose 1994 performance led to proscription of performance art, joins Pearl Lam Galleries. In: *The Straits Times*. 23rd December 2015. Available at https://www.straitstimes.com/lifestyle/arts/curator-josef-ng-whose-1994-performance-led-to-proscription-of-performance-art-joins (accessed 6th March 2019).

Youngblood, G. (1970) *Expanded Cinema*. New York: P. Dutton and Co.

Yoshimoto, M. (2013) *Fluxus Nexus: Fluxus in New York and Japan*. (Online). Available at: http://post.at.moma.org/content_items/199-fluxus-nexus-fluxus-in-new-york-and-japan (Accessed May 10th 2015)

Zimna, K. (2010) *Play in the Theory and Practice of Art*. (PhD Thesis). Loughborough University. (Online) available at: https://dspace.lboro.ac.uk/dspace-jspui/handle/2134/6277 (accessed 25th April 2018).

Zuboff, S. (2019) *The Age of Surveillance Capitalism*. London: Profile Books.