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**Reconceptualising Kaprow:
Creating Interactive ‘Happenings’ Using
EEG Technology**

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London, United Kingdom
2018

Declaration

I declare that the work presented in this thesis is my own. Reference to the work of others has been cited and indicated throughout.

William S. Goodin IV

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Abstract

Interactive art can be seen as a dynamic concept that is in a constant state of flux and evolution as technology provides new and different ways to allow artists to engage viewers and transform them into active participants in the creation of the art itself. As technology permits the nature of interaction and collaboration to evolve, the interactive nature of the art posits challenges to the traditional roles of artist and viewer and transforms that relationship to one of collaborators.

The research practice for this thesis centres on the creation of interactive computer systems utilising EEG technology that collects the brainwave data of participants, which is then rearranged or reinterpreted through a system I have created to allow the participant to have an active role in the creation of the art. This interactive system was created through a reconceptualisation of the precepts governing interaction utilized by Allan Kaprow in the 'Happenings'. The research practice also focuses on other theories for facilitating and enhancing the nature of the interaction including art as experience, play, affect, and magical thinking, thereby allowing the interaction between artist/system and participant to be the true nature of the art, or the gestalt of the work.

Keywords: interactive art, affect theory, play theory, authorship/ownership, EEG technology

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INTRODUCTION



The innovation and emergence of new technologies has resulted in a genre of interactive art that relies on the use of technologies to foster engagement with an audience. As I had the opportunity to view and engage with interactive art that relied on the use of such computational components to foster interaction, a reoccurring question began to emerge in my mind regarding the various artists' motivation for creating the art and what the artist was attempting to communicate.

My foundational instruction in art was part of a very concept centric or concept oriented programme.¹ Within this training, the concept or artistic motivation was often seen as more important than the final product. Art practice was approached from concept out, in that the process was driven by concept and not by objects. When undertaking a project or piece of work, we, as students of art and as artists, were expected to understand our motivation for undertaking a particular project, what we were trying to communicate, and we were expected to be able to articulate why we made certain choices. Consequently, my appreciation for and understanding of art was shaped by this training. Thus as I had the opportunity to view and interact with the technologically based artworks of others, I began to search for and speculate as to the artist's meaning, motivation, and attempt at communicating with his or her audience. Through my observations, it further seemed to me as though interactive art presented more challenges for communicating meaning and motivation to the audience in ways that artistic statements made via the mediums of photography or video did not.

Eventually, these initial queries gave way to musings about how I would create interactive art that presented an opportunity for a shared experience between audience and participant. It was important to me that this shared experience — as the driving motivation or concept behind my artwork — be predominate, and that the practice component of this research appear to be more than a showcase for new technology. My initial attempts at creating artwork that was in keeping with my focus on collaboration were done utilising the medium used in much of my prior work as an artist — namely, video. The technological component that would become the means of interaction was an electroencephalogram (EEG) headset. Given my background in photography and electronic art with an emphasis in video and sound, the medium of

¹ This foundational education was part of a Bachelor of Fine Arts programme, at the University of New Mexico, in Albuquerque, New Mexico, United States.

video was an instinctive first choice. What soon became apparent, however, was that the medium of video communicated too much, and, yet, not enough of what I wanted to communicate to my audience through my work. The video itself, with its auditory elements, time progression, shot angles, and camera movements, became the focus of those participating, and the EEG headset I utilised became a novelty that was rendered ancillary as a result. In addition, the nature of the interaction became lost in the video elements. I therefore stepped away from all of the trappings that I was used to dealing with in an effort to place the focus on the interaction itself and the shared experience. In attempting to further this objective, I decided, instead, to use inanimate objects so as to allow the interaction to be the focal point of the work. Thus, it was this need to find concept and motivation in my own interactive art that propelled me toward this practice research, and helped to guide this practice research from inception to conclusion as discussed throughout this thesis.

A Brief Overview of Concept and Objectives

The practice based research undertaken for this thesis sought to create art objects that would in their form, function, and construction work as collaborative and interactive artistic expressions. The primary objective was to create art objects that would be interactive in nature in so far as the art objects would respond to the external stimuli provided by participants and that this participation would become a collaborative artistic expression both of myself as the artist practitioner and of the participant. The creation of these interactive art objects was intended to achieve the fundamental goal of this practice research—namely, to create art that existed in a conceptual place between the physical art object that was created and the experience that was undertaken by a participant. In order to achieve this outcome in my practice research, I used various computational and non-computational devices that are introduced below to create objects that were able to foster an interest in participating or, to state it a slightly different way, to hook a participant or to pique a participant's interest. However, before introducing the computational and non-computational devices used to foster interest and participation, it is first necessary to define some of the relevant concepts or terminology used within this thesis and discuss ethical concerns related to the research practice.

Concepts & Terminology

A primary component of this thesis rests in analysing what constitutes ‘art’ when a collaborative, interactive process is undertaken. In discussing that artistic moment or culmination, this thesis often relies on the term ‘gestalt’. Thus, the term ‘gestalt’ used throughout this thesis refers to an artwork’s totality, impact, and/or reason for being.² More directly, it refers to the ‘whole form’ that is the experience generated by the collected aspects of the artworks created. Here, the individual aspects of the EEG headset, the toy, and the Internet of Things are elements that culminate in the creation of an interactive experience considered the true nature or impact of the work.

In addition, a key element of this practice based research is centred on how to propel an active, or perhaps non-standard or less traditional, consumption of the art. While it can be argued that the consumption of art is never truly a passive process³, a

² Gestalt is a set of theories that examine the idea of looking at things as wholes and not merely the product of a sum of the individual parts of its construction (en.oxforddictionaries.com, Accessed Feb. 2017). The first notions of gestalt were created in 1890 and introduced to the fields of psychology and philosophy by the Austrian philosopher Christian von Ehrenfels. The current theories surrounding gestalt primarily have their origins in the work of David Hume, Johann Wolfgang von Goethe, Immanuel Kant, David Hartley, and Ernst Mach. Max Wertheimer, an Austro-Hungarian psychologist, who in conjunction with Kurt Koffka and Wolfgang Köhler would go on to found the theory of gestalt psychology, made a critical observation. Wertheimer would insist that ‘gestalt’ was primarily linked to perception. More succinctly stated, Wertheimer claimed ‘gestalt’ was linked to how perception was organised or constructed. In the briefest of senses, Wertheimer’s theory was that ‘gestalt’ defined the pieces or elements it was constructed or composed of, and not merely a secondary element that is a derivative from the parts, as von Ehrenfels’s earlier theories had suggested (Verstegen, 2005:12-18). Koffka, Wertheimer, and Köhler asserted that the perception of objects needed to be understood from a global perspective vantage point where all elements of an experience should be seen as a ‘whole form’ in regards to the visual perception (Verstegen, 2005:12-35). Gestalt has been adapted to apply to many different theories in many different academic disciplines like art, sociology, psychology, and design; however, the details and nuances of gestalt theory are outside of the scope of this thesis. Instead, this thesis focuses on the common usage of gestalt within the art community, or, ‘The whole is other than the sum of its parts’ (Heider, 1977: 383).

³ John Berger as early as 1972 in his *Ways of Seeing*, challenged any notion of passivity as acts of looking at pictures and consuming them was entirely framed by gender and cultural context. However, the foundational principle explored in this thesis does not involve active or passive art engagement or consumption as it can be defined or studied in the fields of philosophy or psychology. Rather, for purposes of this research practice the foundational principle explored is one involving a hands-on participatory role. This type of engagement is necessary to facilitate a state between artwork and observer that allows the observer to become what Allan Kaprow refers to as, ‘a real and necessary part of the work’. In order to do that, the audience needs to be ‘willing [to] participat[e] in a work’ on a physical level (Kaprow, 2003: 64). Thus, for ease of reference, and in keeping with Kaprow’s own terminology, this thesis draws a distinction between audience participation on a physical level, referring to such engagement as ‘active’, and audience participation that falls short of that level of engagement as ‘passive’. In doing so, this work takes no stance with respect to the theories of John Berger and others.

distinction can be drawn between the more traditional notion of art consumption that is based primarily on the act of observation, and the interactivity required to engage with the works created for this practice research. Thus, to the extent this thesis utilises the term ‘passive’, it is intended to refer to a more traditional observation-based form of art consumption, and is utilised to draw a distinction from the hands-on engagement required for the interactive process created as part of this practice research. The use of this terminology is also in keeping with Allan Kaprow’s observations of engagement in the ‘Happening’s’ which form a primary foundational component of this thesis. According to Kaprow: ‘The fine arts traditionally demand for their appreciation physically passive observers, working with their minds to get at what their senses register. But the Happenings are an active art, requiring that creation and realization, artwork and appreciator, artwork and life be inseparable’ (Kaprow, 2003: 64).

Ethics and Ethical Concerns

All of the procedures undertaken in collecting data for this thesis were structured and are in compliance with both Goldsmiths’ research ethics and integrity guidelines⁴ and the code for practice research set out by the UK Research Integrity Office⁵.

Throughout all of the practice research conducted for this thesis that involved participants, all individuals that consented to participation did so fully and freely. All participants were deemed to have the capacity to understand the research and the role of their given involvement. Furthermore, participants were informed of who I was as a PhD candidate at Goldsmiths and what the purpose of the research was; however, in some instances this information was not communicated until after the participant had completed his or her interaction with the device in order to ensure the spontaneity of the interaction. At that time, they were also made aware that references to their participation and possible photographic documentation of their participation would be included in the final thesis and in potential peer reviewed papers, articles, websites, online forums, and conferences. I received verbal consent to photograph each participant prior to the photograph being taken. After I received verbal consent and took the photographs, anyone involved in the images was given my details in the form

⁴ Goldsmiths Ethics and Integrity: <http://www.gold.ac.uk/research/ethics/>

⁵ UK Research Integrity Office’s Code for Practice Research: <http://ukrio.org/wp-content/uploads/UKRIO-Code-of-Practice-for-Research.pdf>

of my cell number and email address. I informed each person photographed that if, at any time, they wished not to have their image used, all they needed to do was contact me by either cell or email and their likeness would be removed. With respect to the use of questionnaires, all questionnaires were sent out via email after the participation was over. Participants were informed that filling out the questionnaires was completely voluntary, and that filling out the questionnaires would be considered approval to utilise the responses for anonymous inclusion as research data. The participants were informed that they could withdraw their consent for inclusion at any time and for any reason by contacting me, and any reference to their anonymous responses would be removed.

To ensure safeguards with respect to access to the data used in this thesis, all data gathered from contact with participants was handled in the following way: data collected from the participant involvement in the form of questionnaires (*see infra Appendix A and B*) was anonymous; the read outs from the EEG system were converted to streams of live and constant changing numbers that were never recorded; and participant names, ages, gender, ethnicity, social or economic status, or any other sensitive personal information was not gathered or recorded.

Something New: Technological Components

Returning to the idea that a key element of this practice based research was centred on how to propel an active, or perhaps non-standard or less traditional, consumption of the art, the computational tool that was chosen for the purpose of propelling such consumption was a type of augmented video game controller that relies on the participant's own mind to act as the controller, rather than the physical manipulation that is generally required. This device relies on electroencephalogram or EEG technology and has been coupled with the use of microcontrollers to animate otherwise inanimate objects.

Developments in technology have led to the availability of accessible consumer grade and relatively inexpensive EEG technology that can be used with personal computers and/or smart devices, such as phones and tablets. While not necessarily new technology in and of itself, the recent developments that have led to consumer grade EEG technology have permitted the use of this computational device as the central component of this research based practice. Meanwhile, the lack of pervasiveness of this technology given its more recent consumer grade availability,

helps to compel the art consumption or engagement previously discussed due to both the novelty of the item and the fact that the device allows for the mental manipulation of objects.

Something Old: Mentalism & Nostalgia

Since the 1800s, people have been keenly interested in the scientific provability of psychic powers including abilities such as: precognition⁶, telepathy⁷, and telekinesis⁸. People's fascination and interest in these mental abilities spans all forms of entertainment from graphic novels and books to television and film (Radford, 2013). This fascination can also be seen in people's interest in the mentalism feats performed by magicians and/or prestidigitators. Famous mentalists still exist to this day and include the likes of David Blaine, an American street magician and illusionist, and Derren Brown, a British professional mentalist and illusionist (Mind Magician, 2010). My own personal fascination with these alleged psychic abilities acted as one catalyst, among several, for choosing to experiment with EEG technology.

The availability of EEG consumer grade technology has created the opportunity to mimic these alleged psychic abilities within the digital realm. Through the repurposing of these EEG technologies, artists like myself can create environments in which participants can have their mental states read, manipulate physical objects, or alter the way they interface with digital media elements such as audio clips, video elements, and even text. Through this repurposing, an artist can create an environment in which the impossible is virtually possible.

While a compelling basis for fostering participant engagement, this thesis does not focus on alleged psychic abilities. Rather, this thesis wrestles with the creation of an art practice that is collaborative and yet stimulating enough to foster engagement from an audience or participant. And, while the use of computational devices that mimic the mystery of telekinesis is a prominent component of how this research practice fostered engagement, efforts at fostering engagement relied not only on the technological innovation and advances of today, but also on the nostalgia of times

⁶ Precognition: Precognition is defined as the ability to know 'future events before they happen' (Radford, 2013).

⁷ Telepathy: Telepathy is defined as the ability to describe 'things at a remote location' (Radford, 2013).

⁸ Telekinesis: Telekinesis, also known as psychokinesis, is the 'ability to move objects through mind power' (Radford, 2013).

past. The tapping into the nostalgia of potential audience members was done primarily through the objects chosen to be used as the tools of the interaction along with Affect Theory as discussed in Chapter Five (*see infra*, pages 144-151). And, while those tools are of importance in drawing audience members in and getting them to engage, it is the actual act of engaging, the direct and physical interaction between artist, participant, and object, that is the gestalt of the artworks created for this thesis.

To create an art practice that was both collaborative and stimulating, this thesis explores various themes including a close examination of Allan Kaprow's the 'Happenings', ways of facilitating engagement, the nature of play, and notions of authorship. This discussion and analysis is framed by the following four research questions that precede the layout of this thesis, which is then structured to include an introduction, six chapters, and a conclusion — the content of which are summarized below.

Research Questions

- I. How can the relationship between participatory and interactive art be used to reconceptualise Kaprow's the 'Happenings'?
- II. How can Kaprow's seven precepts be utilised to create interactive digital art where the art exists in the interaction?
- III. How can the application of various theories facilitate a prolonged and more active engagement between the artist and the participant?
- IV. What impact do art systems created to be dependent on the participation of others have on traditional notions of ownership, authorship, and collaboration?

In grappling with these research questions, this thesis begins by taking a multi-disciplinary approach and in doing so discusses various artists, art theories, and psychological theories that informed the concept behind the research practice of this thesis in Chapter One: Art & Theory. This chapter discusses the development of interactive media art, beginning with its antecedents of participatory art and Kinetic art, and the distinction between participatory art and interactive art being based on the presence or absence of technology. The Art & Theory chapter explores various examples of participatory art that emerged during the Avant-garde movement including the work of Allan Kaprow and Sol Lewitt. The chapter goes on to discuss the concept of art as experience, explores the theories of John Dewey, and examines how Allan Kaprow applied Dewey's ideas in his creation of the 'Happenings'. The

chapter then takes a deeper look at Kaprow's 'Happenings' and the seven precepts that Kaprow asserts define a 'Happening'. The chapter then goes on to examine the concept of play as a means of structuring interaction and the notions of ownership and authorship where collaboration exists. Finally, the Art & Theory chapter looks at a sampling of interactive artworks utilising EEG technology.

Chapter Two: Methods and Methodologies discusses the various methods and methodologies that were considered and the conceptual method that was employed in conducting the research and various iterations of experimentation. This chapter discusses how the conceptual form as method centres on a conceptual goal or output as informing the form and function of the artwork and how the conceptual goal employed for this thesis is the collaboration between artist and participant. It further discusses the various methods that were employed to test the interactive process, to collect feedback, and generally how that information would be utilised in shaping future testing and experimentation.

The following chapter, Chapter Three: Practice Based Review, takes an in-depth look at how the various iterations of testing and experimentation evolved. It begins by discussing the various choices that were considered and weighed in selecting the technological component of the EEG headset and the testing that was employed in reaching that determination. It also discusses the testing of the interactive processes and how the process of moving from video to inanimate objects as the object with which participants would engage unfolded based on the feedback of participants and the various difficulties that arose. This chapter culminates in a discussion of the final experiment conducted as part of the research practice.

Chapter Four: 'Happenings' in the 21st Century, A New Paradigm undertakes an examination of Kaprow's the 'Happenings' and how they can be applied to interactive art and the artworks created for the research portion of this thesis, by building on the seven guidelines or precepts set out in Chapter One: Art and Theory. This chapter, thus, deconstructs the 'Happenings' in order to reconceptualise the fundamental tenets of the 'Happenings' in the context of interactive digital art. As a result of this examination, this chapter suggests that the 'Happenings' are not merely an antecedent to interactive digital art, but that interactive digital artworks can be 'Happenings' on a more fundamental level. This chapter ends by asserting that 'Happenings' occur in interactive artworks and exist at the moment of interaction.

Chapter Five: The Interaction discusses various psychological theories — specifically, the psychological theories or concepts of affect and magical thinking — and how those theories were considered in structuring the interactive process so as to facilitate interest and prolong engagement. As part of this discussion, this chapter looks at how presenting participants with novelties and curiosities can pique a participant’s interest, but how introducing elements that are familiar or invoke feelings of nostalgia can act to prolong engagement. This chapter goes on to dissect the interaction further, looking at how elements of the system, the participants, and the artist communicate via the interaction, and how that system of communications, cues, or feedback creates a self-contained loop that is the shared moment of interaction.

Chapter Six: Death of the Author delves in to the implications of collaboration on traditional notions of authorship or ownership with respect to art. This chapter looks at different ways of structuring authorship, and the traditional approach of looking at the role of author as a singular role. The chapter goes on to discuss some ways in which collaborative art and co-authorship have gained greater acceptance within the art community where the collaboration is amongst multiple artists, and how collaboration between artist and participant appears to still be gaining a foothold as an acceptable form of collaboration. Finally, this chapter notes the central role that collaboration plays within this research practice, that the interaction cannot exist without the engagement of the participant and, thus, as a result, the authorship or the ownership of the resulting art — which, here, is the— must also be shared. The chapter concludes by noting that the effective result of this shared authorship is, therefore, the negation or death of singularity interaction of authorship within this context.

Finally, this thesis concludes by discussing the major themes and questions addressed by the academic and practice-based research conducted for this PhD. Thus, the final chapter recapitulates some of the highlights of the process, including how the practice research for this PhD moved from video based artworks to art systems involving analogue toys; the rubrics and methods I employed for maintaining a concept-centred focus to my academic and practice-led research and how they were utilised to help make the moment of interaction the gestalt of my artworks; the implications of focusing the work on the shared experience between the artist and the participant; and ideas regarding the future iterations, exhibitions, and showcasing of

the art systems. Finally, Chapter Seven: Conclusions and Contributions emphasizes the contributions this thesis has made by reconceptualising Kaprow's 'Happenings' to apply to the genre of interactive art and the artworks created using this reconceptualisation.

CHAPTER ONE: ART & THEORY



The subject of interactive digital art is a rich, nuanced, and vast field consisting of countless catalogues of artworks, theories, and histories and interpretations ranging from analogue computing to autonomous machines and artificial intelligence.⁹ Yet, this thesis has a distinctively framed scope that focuses tightly on a few key antecedent movements within art history and art theory as pertinent to interactive digital art.

This chapter contains an array of resources that I have utilised to construct definitions with regard to the fields related to my practice. These fields are interaction, art as experience, theories of play, and the notion of ownership and authorship¹⁰. The research done in these fields create the foundation on which my practice is based and help to facilitate an understanding of how best to produce and navigate an equilibrium between modern technologies as a medium, and the roles of artist, author, and participant. My research practice involves the creation of a system or subset of systems that are interactive and that build on the definitions and theories outlined within this review. The underlying goal of this system is to allow a participant's interaction to be the gestalt of the work while also making the production of that interaction a co-authorship between the artist and participant.

Within this chapter, I contend that interactive art is a dynamic concept that is in a constant state of flux and evolution as technology provides new and different ways to allow artists to engage viewers and transform them into active participants in the process of the creation of the art itself. Interactive art, however, as I found out through the literature review component of this chapter, is not a concept that finds its roots in connection with computer technology. Although computers currently allow for new and different ways that artists may use the concept of interaction to engage

⁹ There is a vast library of articles and scholarly research that has been written on the broader topic of digital art; however, to the extent that such research does not address interaction specifically, it has not been included as part of the literature review conducted for this thesis. Examples of such scholarly research and articles include: *White Heat Cold Logic: Early British Computer Art 1960-1980* (Brown, Gere, Lambert, & Mason, 2009), *A Critical Examination of 'Computer Art'* (Lambert, 2003), and *New Media Art and the Gallery in the Digital Age* (Gere, 2008).

¹⁰ While this thesis touches on other theories, such as affect theory and magical thinking, my research into these areas emerged much later in the research and drafting process for this thesis as a result of changes in the art objects utilised and, as a result, were not covered by the initial research conducted for the literature review component of this thesis.

with and in some instances, collaborate with their audience, interactivity used in art can be traced back to artists and art theorists that long predate the invention of practical computer systems. This can be seen in art movements such as the Music Hall¹¹, Pantomime¹², Participatory Theatre¹³, Interactive Theatre¹⁴, and Performance Art¹⁵. As is so often the case, these early collaborations and theories regarding such art practice have shaped the evolution of artistic interaction and help inform current incarnations of interactive art. Thus, the following taxonomy traces critical thinking, theories, and art practice examples that I have utilised to inform and structure my practice-based work with computer interaction in the context of interacting with digital assets or media.

The Concept of Interaction

What is the nature of interaction and art? Broadly defined, ‘interaction’ is ‘the relation between two or more relatively independent things or systems of change which advance, hinder, limit, or otherwise affect one another’ (Baldwin, 1901: 236). Stated another way, at a fundamental level, ‘interaction’ occurs where two or more unrelated things have any kind of discernible impact on the other. Although the idea

¹¹ Music Hall: Music Hall is a type of British theatrical entertainment popular between 1850 and 1960. It would involve the combining of popular songs, comedy, speciality acts and variety entertainment. The term itself derived from a type of theatre or venue in which such entertainment took place. British Music Hall was similar to American vaudeville, featuring rousing songs and comic acts. However, in the United Kingdom the term ‘vaudeville’ referred to a more working-class type of entertainment that would have been termed ‘burlesque’ in America. (Vam.ac.uk, Accessed Jan. 2016).

¹² Pantomime: Pantomime is a type of musical comedy stage production designed for family entertainment. It was developed in England and it is generally performed during the Christmas and New Year season (Vam.ac.uk, Accessed Jan. 2016).

¹³ Participatory Theatre: Participatory Theatre is a form of theatre in which the audience interacts with the performers or the presenters (Revolvy.com, Accessed Jan. 2016).

¹⁴ Interactive Theatre: Interactive Theatre is a form of theatre in which the presentational or theatrical form of the presentation attempts to break what is known as the ‘fourth wall’ that in traditional theatre separates the performer from the audience both physically and verbally. Within interactive theatre the performances may happen amidst audience members, and often involve the audience in more active roles (Revolvy.com, Accessed Jan. 2016).

¹⁵ Performance Art: Performance Art is a performance presented to an audience that is traditionally an interdisciplinary performance. Performances may be scripted or unscripted, random or carefully orchestrated, spontaneous or otherwise carefully planned, and with or without audience participation. The performance can be live or via media; the performer can be present or absent. It can be any situation that involves four basic elements: time, space, the performer’s body or presence in a medium, and a relationship between the performer and the audience. Performance art can happen anywhere, in any venue or setting, and for any length of time. The actions of an individual or of a group at a particular place and in a particular time constitute the work (Revolvy.com, Accessed Jan. 2016).

of interaction has been explored in relation to many different types of feedback processes, the concept itself was not established until the early 1900s (Baldwin, 1901: 236).

Comprehending the nature of interaction in relation to art first requires an understanding of the distinctions drawn between participation and interaction. Although it was previously noted that the concept of interactive art predates the invention of computers, the term ‘interactive art’ has come to characterise art created, primarily, through the utilisation of modern technology and participant involvement. Predominately, this characterisation is the result of a line that has been drawn between interactive art and participatory art. The fundamental difference that characterises this division is technology, ‘artworks that actively involve the public — without the use of modern technology — are often not denoted as “interactive,” but as “participatory” or “collaborative” works’ (Kawstek, 2013: 7).

Stepping back momentarily from this distinction between participatory art and interactive art based on the utilisation of modern technology, and returning to the broad definition of interaction discussed previously, this broader concept of interaction in art arguably emerged from a focus on the process-oriented styles of art. Art forms that were focused on the process, mechanism, and structure of art looked beyond the physical object of artistic production, instead, taking an introspective approach. This introspective dissection of the art system was largely a product of the philosophical thinking of the movements of Modernism¹⁶ and Postmodernism,¹⁷ and

¹⁶Modernism: Modernism is a philosophical and cultural trend of the late 19th and early 20th centuries in Western Society. Modernism has been cited as a reaction to the horrors of World War I and the ever-increasing growth that was taking place in modern industrial societies and cities. In general, Modernism rejected the certainty of the Enlightenment and would go on to influence the creations and activities in the forms and areas of architecture, literature, religion, philosophy, art, science, and the routine of normal daily life. Modernism had the defining characteristic of being self-conscience and rejected the ideology of realism. Modernists sought to draw attention to the form of production. Notable philosophers, writers, and poets from the movement include: Friedrich Nietzsche (1844–1900), Fyodor Dostoyevsky (1821–1881), Ezra Pound (1885 –1972), and Samuel Beckett (1906 –1989) (Brettell, 1999: 20-60).

¹⁷ Post Modernism: Post Modernism is a general and wide-ranging term. It is described as a movement that has had a major impact on the following fields: literature, art, cultural and literary criticism, philosophy, architecture, fiction, and cultural and literary criticism. It was seen as a reaction to the Enlightenment and Modern movements. At its core, it denies any assumed certainty of scientific objectiveness and philosophical attempts to explain reality and the natural world. In Postmodern thinking, an individual’s interpretations of reality as they are filtered through his or her own experience is paramount over that of abstract principles. Postmodernism uses the prefix ‘post’ to denote its break with any absolute truth. It breaks with all scientific, philosophical, or religious truths, which attempt to explain or create a universal theory for everything or for everybody. Some notable artists, writers, and thinkers from the Postmodern

was incorporated in to art practices by some of the key Avant-garde art practice movements of the 1950s and 1960s (Huhtamo, 2007: 153)¹⁸.

These mid-twentieth century Avant-garde movements — although arguably currently seen as being participatory or collaborative in form and content because they were executed without the aid of modern technology — were experimentations in interaction that should be viewed as the evolutionary building blocks to the technological based digital interaction computer systems utilised in what is currently referred to as ‘interactive art’. Specifically, Avant-garde movements such as the ‘Happenings’, Kinetic Art¹⁹, and Participatory Theatre actively involved participants in the realisation or rendering of the individual work’s gestalt. For instance, Allan Kaprow’s the ‘Happenings’ is critical to the interaction proposition created in the practice-based element of the research contained herein, because of Kaprow’s desire to create a fluid state between the author or the artist and the recipient or the patron. Similar to Kaprow’s the ‘Happenings’, the contribution of the Participatory Theatre movement to the idea of interaction, generally, and to the interaction proposition that helps form the basis of this research and practice, is again the exchangeability of the roles of the author/artist and the audience/participant.

movement include: Eduardo Paolozzi, Andy Warhol, Betty Dotts, Roy Lichtenstein, and George Maciunas (Sim, 2011: 3-10).

¹⁸ In this instance, Avant-garde is referring to what the French political writer Henri de Saint-Simon described as artists facilitating social evolution in connection with or ahead of scientists and other academics and its more modern adage of being connected to radicalism and in some form challenging the current artistic status quo. Henri de Saint-Simon lived from 1760-1825, and was also known by the name Claude Henri de Rouvroy, comte de Saint-Simon. Saint-Simon was a French theorist in the fields of politics and economics. His writings have influenced the cornerstones of various 19th century philosophies, including the philosophy of science and the discipline of sociology. It is thought by many that his work in these fields has had a vast impact in the areas of politics, economics, and sociology of the Modern western world (Bürger, 1984: 15-34).

¹⁹ Kinetic Art: Kinetic Art is an art movement that was concerned with motion. The movement had its birth in the beginning of the twentieth century as artists began incorporating movement into their art and art production. The overarching artistic goal in the Kinetic Art movement was to explore the nature and artistic possibilities inherent in movement. It was also a critical reflection on the importance of the world’s continual shift towards technology and the mechanical that was prevalent in the 20th century. The most notable and the principal artists of this movement were Naum Gabo in the 1920s and Alexander Calder in the 1930s (Tate.org.uk, Accessed Feb. 2017).

Starting in the late 1990s the French art critic Nicolas Bourriaud introduced the concept of 'Relational Art' in his book, *Esthétique Relationnelle* (1998) or *Relational Aesthetics* (1998). Bourriaud's 'relational aesthetics' in his own words are 'a set of artistic practices which take as their theoretical and practical point of departure the whole of human relations and their social context, rather than an independent and private space' (Bourriaud, 1998: 113). Bourriaud's 'relational aesthetics', participatory art, and interactive art are all mediums that require the audience's bodily engagement in the art creation and reception process. In relational art, the artist's role shifts and is no longer situated at the centre of the art process. The artist is no longer the soul generator or creator, the master, genius or even celebrity of artwork. The artist, instead transmogrifies, they are now the catalyst of art creation (Unm.edu, Accessed Jan. 2017).

An example of the exchangeability of the roles of the author or the artist and the audience and/or participant is seen in the work of Rirkrit Tiravanija²⁰ who also works within the realm of art happenings. Tiravanija's *Untitled (Free)* (1992) was a landmark piece where Tiravanija converted a gallery space at the New York 303 Gallery into a kitchen. Within this modified space, Tiravanija cooked Thai curry and rice, which he served for free to anyone that was interested (Moma.org, Accessed Jan. 2017). In this creative yet almost ambiguously simple conceptual artwork, Tiravanija invited his visitors, whomever they might be, to view and interact with contemporary art in a new and different way — a sociable way. *Untitled (Free)* (1992) is a conceptual artwork that blurs the distance or distinction between the artist and the audience and art 'aesthetics' and everyday aesthetics²¹. With Tiravanija's conceptual artwork *Untitled (Free)* (1992), as a participant you are not looking at the art, yet you are at the heart a part of it. As you eat curry, chat with friends, or make new

²⁰ Rirkrit Tiravanija: Rirkrit Tiravanija is a Thai artist that was born in Buenos Aires, Argentina. He is based in New York City, Berlin, and Chiang Mai. Tiravanija was the recipient of the 2004 Hugo Boss Prize (Artsy.net, Accessed Jan. 2017).

²¹ Artists continually try to blur the lines between art and life in today's Western artworld. These attempts to overcome the long-held separation between art and real life manifest in a number of ways — some of which are discussed as part of this thesis, such as rejecting the art institutional setting as a location for their art (see *infra* Chapter One, Theories on Art as Experience, pages 31-36, and Chapter Four, pages 120-142); denying the necessity of authorial authority (see *infra* Chapter One, Ownership and Aesthetics, pages 47-53, and Chapter Six, Role of the Author, pages 166-179); and blurring the creator/spectator dichotomy by collaborating with the general public to create art as a joint venture (see *infra* Chapter Six, pages 167-172).

acquaintances, you are making the art and you also are the art, simultaneously (Moma.org, Accessed Jan. 2017).

However structured, the concept of interaction as it pertains to art and art practice evolved through this progression of some of the named Avant-garde movements. Moreover, this progression eventually sought to integrate movement and machinery as a collaborative or participatory element of the art. Kinetic Art is one of the earliest art movements in the post-Modern age that sought to integrate movement, machinery, and early computer systems into an art gallery setting. As such, Kinetic Art may mark the beginning of the modern definition of 'interactive art' to the extent it embraced the inclusion of technological advances as an essential element of the artist's creation. This concept of interaction continued to be focused by later technological innovations in the fields of computing, networking, and virtual reality (Huhtamo, 2007: 153).

Many of the approaches utilised by artists engaged in interactive art are taken directly from the participatory artworks and practices of the Avant-garde movement as evidenced by the continued involvement of audience participation in the creation of the art. As art historian and researcher Katja Kwastek recognized, '[s]ince the beginning of the twentieth century, artists have increasingly sought to actively involve the recipient in their works and to stretch the boundaries of the traditional concept of the art work' (Kwastek, 2013: xv). As a result, audience involvement has been utilised as an element of the medium to create a finished work in much the same way a painter chooses a shade or hue of paint. While this interaction and collaboration between the artist and the audience is not a recent phenomenon as previously discussed, the involvement of modern technology is what demarcates the transition from participatory art to interactive art.

One such art work that illustrates the bridge between participatory and interactive art is the Australian artist Jeffrey Shaw's 1983 work called *Points of View*. In *Points of View*, Shaw adapted his already existing concept of participational art, which he developed throughout the 1960s, and applied it to computer art installations. In his first incarnation of *Points of View*, Shaw centred the work around a computer joystick. This is the same interface that is commonplace in video games and electronic gaming. Through the use of the joystick, participants of *Points of View* transcend the role of spectator and became a director, making selections of picture and sound elements that dictate the experience. The interactive process the participants in

Points of View undertook was described by Shaw, stating: ‘It is the particular audio-visual journey made by the spectator who operates the joystick which constitutes a “performance” of this work. For other spectators that performance becomes ‘theater’” (Dinkla, 1994). Even though with *Points of View* Shaw has done away with the traditional use of participant performance in participatory art, he keeps the coined terminology. For example, in *Points of View*, movement ceases to be about the movement of the performer in space, similar to Kaprow’s ‘Happenings’ discussed below; rather, the concept of movement is transferred to the movement of Shaw’s images through joystick manipulation. Similarly, in participatory art, the participant performer had to change or alter their relative position in space to change their perspective, but with *Points of View* shifting perspective is computer controlled via joystick manipulation (Dinkla, 1994). Shaw’s *Points of View* demonstrates a clear bridge between interactive computer art and the participatory art movements of the 1960s through Shaw’s adaptation of the form, function, and terminology of participatory art in creating his interactive computer art work, thus, paving the way for modern incarnations of interactivity.

In these more modern incarnations of interactivity, an artwork could, for instance, consist of objects staged around a city centre and the participants being asked to use their cell phones to seek out and locate these objects through the use of geotagging²². In this example, the phone is used to track a geotagged object the artist has created and placed around a specified location. As part of this process, and to guide the interaction between the artist and the participants, the artist has created a rough outline of directions for these participants to follow. This process driven form of artistic expression is not remarkably different from how Kaprow would have involved a participant in the ‘Happenings’, which are described in detail below. ‘A Happening,’ according to Kaprow, ‘is *generated* in action by a handful of ideas or flimsily jotted – down score of “root” directions’ (Kaprow, 2003: 19). Kaprow used these root directions as an element of the medium of participatory art in the very same

²² Geotagging: Geotagging is a process of adding geographical identification metadata to various media such as a geotagged photograph or video, websites, SMS messages, QR Codes, or RSS feeds and is a form of geospatial metadata. This data usually consists of latitude and longitude coordinates, though they can also include altitude, bearing, distance, accuracy data, and place names (Techopedia.com, Accessed Feb. 2015).

way the artist in the fictional example provided above used the cell phone as an element of the medium of interactive art.

Of course, artists other than Kaprow have utilised rules or directions to guide their audience's involvement in a participatory art piece. For example, in 1968 another American artist, Sol Lewitt²³, began creating wall drawings solely through the use of instructions and diagrams that others would execute. The wall drawings were made completely by others following Lewitt's detailed instructions and the art was created directly on the gallery walls. This approach, again, highlights the similarities between those art forms designated as participatory and interactive. Specifically, this is highlighted in how Lewitt uses his limited interaction with his participants through his predefined text instructions, and in how that participation is necessary not only for the creation of a finished work, but is a critical element of Lewitt's artistic process.

However, the distinction to be drawn between the work of Kaprow and Sol Lewitt and the fictional example provided above is that neither Kaprow nor Sol Lewitt sought to make the finished art product the very act of involvement with technology. Thus, while both created innovative participatory pieces with their audiences from which many parallels can be drawn to artists creating interactive pieces, Kaprow and Lewitt did not utilize modern technology — arguably the defining characteristic of interactive art according to Kwastek.

Interactive Media Art

Shifting the focus away from the building blocks of participatory art and towards genres of interactive art utilising modern technology as a means of audience participation, the twenty-first century saw the notion of interaction being focused within the boundaries of interactive media art. References to interactive media art, for the purpose of the literature review component of this thesis, are intended to refer to art that uses digital assets such as audio, video, text based, and image based objects. Within the boundaries of interactive media art the fundamental features of interaction utilising modern technology were also developed: exchanges made in real-time, occurrence, control and feedback, and selection and interpretation systems (Jensen, 1999: 196-198). In interactive media art, as with other participatory art forms, the

²³ Sol Lewitt (1928 – 2007): Sol Lewitt was an American artist linked to various art movements. The most notable movements Lewitt was connected with are Conceptual art and Minimalism (The Art Story, 2015).

action of the recipient is a critical facet of the art's aesthetic. The recipient's response to the work in the form of his or her interaction, whether that be either passive or active, gives a nuanced presence to the work and, ultimately, it is the recipient's action or activity that is at the heart of the aesthetic experience of the work as a whole (Kawstek, 2013: xvii).

The term or classification 'Media Art' is mainly regarded as an artistic field that combines technical and classical forms of artistic expression. It can include the use of analogue and digital technologies but are not limited to these. Media art 'is often considered to be a genre or trend in art, and thus understood in terms of common cultural goals' (Kwastek, 2013: 1). These goals are the need to reflect artistically on the commercial media and on an information-based society (Kwastek, 2013: 2). The major criticism that was levied against media art early on was with classifying media art as a specific genre or category unique from others found in art. The criticism being that all art can be seen as media based, because it all conveys a message through the means of a medium of some kind.

For many authors and scholars, media art became the realisation of some of the quintessential ideals of the Avant-garde movements of the 1950s and 1960s. Hans-Peter Schwarz, a historian and the founder of the Media Museum at the Zentrum für Kunst und Medientechnologie (ZKM) in Karlsruhe, called Media Art 'magnificent breakout scenarios of the intermedia art forms of the 1960s' (Schwarz, 1995: 7). Heinrich Klotz another founding director of the ZKM saw media art as the coming of the Second Modern Age of Man: 'The arrival of the media arts has changed all art' (Klotz, 1995: 35). Also, the 1998 Ars Electronica festival catalogue described the roll of the media artist as a 'prometeic battle of the self-sufficient and the solitary subject against the perverse over-determination of society' (Stocker & Schöpf, 1998: 292). Although currently the utopian ideals held in the early 1990s about media art have been seen as unrealistic and unattainable, unlike the case of the Avant-garde movements of the mid-twentieth century, media art has not been usurped. Quite to the contrary, media art has become fundamentally mainstream in the terms of mass media. This switching from radical approach to visualisation to adaptation by mass media caused a shift in artistic goals at the end of the twentieth century which Martin Rieser claims is one, 'not about the authenticity of the image and its relationship to a set "reality"[,] but who controls the generation of simulations or substitutions and the context of their presentation' (Rieser, 2002: 82).

Interactive media art can be roughly defined as a system or condition designed to interface or interact with a participant by means of a technologically based system or apparatus that allows access to assets that are either created in advance or live at the moment of interaction. These assets can be any number of things from a complex programmed environment as seen in David Rokeby's, *Very Nervous System* (1983-1990)²⁴, where a recipient's actions cause system evolutions. Conversely, simple systems can use static hypertext links as with Internet art pieces like, Olia Lialina's, *Agatha Appears* (1997)²⁵. In both cases, the assets used to create the system are critical to the interactive process because they are the basis for the proposed interactive potential, or as Kwastek calls it, the 'proposition' that is designed by the artist (Kwastek, 2013: 34). According to Kwastek, the differentiation of interactive media art from other participatory art is that participants are greeted with a '10' or an apparatus. The use of this apparatus is not always clear or self-evident (Kwastek, 2013: xvii). It is the discovery and interaction of the assets by the participant that reveal the nature of the apparatus. It is through the user's experience that the gestalt of the work and its aesthetics are revealed.

Thus, having established that interactive art can be fundamentally understood as a set of conditions that govern how media is accessed, arranged, rearranged, and presented to many types of recipients, both active and inactive, and having illustrated through the examples discussed above how interactive media art has been utilised in different types of art practice, I now turn to the substance of what makes these art practices possible and the foundation on which they are based. Thus, this next section is less in keeping with the technological level of black boxes and interfaces but, rather, refers to the intellectual theories and discourses surrounding art as a product of interaction and participation and how the mechanics of play and playing are a part of that interaction. These theories will involve aspects or elements of psychology, sociology, and art history. This trajectory has been undertaken to explore the theories

²⁴ David Rokeby, *Very Nervous System* (1983-1990) is the third generation of interactive sound installations, which was created by David Rokeby. It is made of a series of systems that use image processors, video cameras, sound systems, computers and synthesisers to construct a space that reacts to body movement. The reactions of the system are then translated into sound and or music. It has been showcased as installations in art galleries and public outdoor spaces (Davidrokeby.com, Accessed Jun. 2015).

²⁵ Olia Lialina, *Agatha Appears* (1997) is a hyperlink internet based art work. It is the story of Man.gif who then meets Woman.jpeg. Man.gif then shows Woman.jpeg the Internet. Once shown the Internet, Woman.jpeg is transfixed and is teleported there and is never alone again (Artsy.net, Accessed Jun. 2015).

that underpin the connections in the planning, thinking, and understanding utilised in the creation of the practice component of this thesis.

Theories on Art as Experience

John Dewey on Art as Experience

Assessing art in terms of one's experience with the object or the work as an event is one of the foundational pinnacles behind the research for this practice-based degree. It is important to see how experience as a relationship between artist, audience, and artistic production comes together to be itself art and how the physicality of this relationship works and functions. The American psychologist and philosopher John Dewey undertook some early investigations in the 1930s to create a new theory to study fine art production and reception. This new theory centred on exploring the fine art paradigm as a detailed human experience. According to Dewey, this experience was to be scrutinised as a whole and not just the creation of the final output²⁶. In Dewey's book from 1934, 'Art as Experience' there was a detailed study done to map out the connections between experience, aesthetics, and the notion of fine art.

Dewey began this exploration by ascertaining that the human compulsion to create art in both conventional and unconventional forms²⁷ stood as proof that human kind had distinguished itself from other animal forms and elevated its spiritual standing as well. Dewey theorized, 'When the conception of art as the distinguishing trait of man was made explicit, there was assurance that, short of complete relapse of humanity below even savagery, the possibility of invention of new arts would remain, along with use of old arts, as the guiding ideal of mankind' (Dewey, 1934: 26). The notion of what constituted fine art was something Dewey felt was defined by a given society's experience with the given objects. He surmised that society was itself the dowsing rod that would sieve out fine art objects from other human artefacts:

²⁶ In writing about this new theory, Dewey stated, 'By one of the ironic perversities that often attend the course of affairs, the existence of the works of art upon which formation of an esthetic theory depends has become an obstruction to theory about them. For one reason, these works are products that exist externally and physically. In common conception, the work of art is often identified with the building, book, painting, or statue in its existence apart from human experience' (Dewey, 1934: 1).

²⁷ 'Form, as it is present in the fine arts, is the art of making clear what is involved in the organization of space and time prefigured in every course of a developing life-experience' (Dewey, 1934: 24).

It is customary, and from some points of view necessary, to make a distinction between fine art and useful or technological art. But the point of view from which it is necessary is one that is extrinsic to the work of art itself. The customary distinction is based simply on acceptances of certain existing social conditions (Dewey, 1934: 27).

Dewey's example of 'existing social conditions' shows the shifting of objects or artefacts from their intended realm and being reconceptualised into fine art. He cites the cases of the shifting of tribal African symbols, everyday tools, and sacred items being viewed as fine art once removed to the western world.²⁸ Dewey felt strongly that the distinctions between fine art and commonplace human creations are purely the providence of given societies and even subsets of societies or, in other words, social groups. According to Dewey, not only must art objects be the product of human invention and creativeness, but art must also reflect the added social condition that society has accepted or declared an object to be art. It is this degree of completeness of living in the experience of making and of perceiving that makes the difference between what is fine or aesthetic in art and what is not (Dewey, 1934: 27).

Dewey's study in the simplest of terms shows that art is subjective and its value is determined in a fluctuating state between human inventiveness and creativity and societal norms and values. But, even beyond that, Dewey's study shows that the experience of art is how humans define an effigy of art in the form of an object. For Dewey, how and where one engaged with objects of artistic production was key to the experience of the item and led in to how and if the item was to be classified as art.

Two examples that illustrate this interpretation of Dewey's theory in practice would be the ready-made art²⁹ of Marcel Duchamp³⁰. In the first example, Duchamp took a wheel from a bicycle and mounted it on a stool. Duchamp called this object *Bicycle Wheel* (1913), and had it exhibited. In the second example, *Fountain* (1917) Duchamp went to the J. L. Mott Iron Works show room in New York City and purchased a "Bedfordshire" model porcelain urinal. After taking it back to his studio,

²⁸ Dewey explains his term 'existing social conditions' with this passage; 'I suppose the fetishes of the negro sculptor were taken to be useful in the highest degree to his tribal group, more so even than spears and clothing. But now they are fine art, serving in the twentieth century to inspire renovation in arts that had grown conventional' (Dewey, 1934: 27).

²⁹ Readymade: a readymade is an everyday object selected and defined as art by placing it in the context of an art venue, gallery, or museum (Tate.org.uk, Accessed Feb. 2017).

³⁰ Marcel Duchamp (1887 – 1968): Marcel Duchamp was a French naturalised American painter, writer, and sculptor who was heavily connected to the Dadaism and conceptual art movements. Along with the artists Pablo Picasso and Henri Matisse, Duchamp helped to define and develop 'plastic arts' (Ades, Hopkins, Cox, 1999: 30-42).

he turned it upside down and painted on its rim the name 'R. MUTT' in bold black letters (Tomkins, 1996: 181). Duchamp made these statements as a protest against the elaborate importance placed on art objects (Ades, Hopkins, Cox, 1999: 50-55). Yet, the reception of Duchamp's *Bicycle Wheel* and his *Fountain* as art at the time they were exhibited was questioned, if not rejected out right. However, these works by Duchamp are still illustrative of Dewey's theory because they later came to be received as art, in large part, because they came to be experienced in a place that society has designated to house objects of art — i.e., the gallery.

Other philosophers have made similar observations as Dewey. For example, Walter Benjamin³¹ asserts in his essay, *The Work of Art in the Age of Mechanical Reproduction* (1936), that art objects are devoid of meaning outside of their originally intended physical experience. 'Even the most perfect reproduction of a work of art is lacking in one element: its presence in time and space, its unique existence at the place where it happens to be. This unique existence of the work of art determined the history to which it was subject throughout the time of its existence' (Benjamin 1936: 5). Benjamin argued that as art is reproduced in textbooks and postcards, it has been stripped of its time and space in history (Benjamin, 1936: 5-7).

Allan Kaprow on Art, Experience, and 'Happenings'

The observations and philosophical findings of John Dewey have been studied and used as a focal point in many artists' work. One of the artists mentioned above that is particularly relevant, again, is Allan Kaprow, given how Kaprow has applied Dewey's observations and findings to his own expeditions into the realm of participatory art³². Kaprow, as an artist, was linked to the 'Happenings' and other performances from the 1960s that heavily involved participation and challenging the social constructs regarding art objects and where and how they are exhibited and received. In Kaprow's essays, *The Happenings in the New York Scene* (1961), *The*

³¹ Walter Benjamin (1892- 1940): Walter Benjamin was a German philosopher and cultural critic (Marxists.org, Accessed Feb. 2017).

³² In the introduction to 'Essays on the Blurring of Art and Life' (2003), editor Jeff Kelley talks at length about the critical role that John Dewey's book, 'Art as Experience' (1934) played in the formation of Kaprow's thoughts and attitudes towards the art world. According to Kelley, Kaprow struggled to make Dewey's ideas more clear and relevant to his own art practice. Kelley points to a passage underlined in Kaprow's Graduate School copy of 'Art as Experience.' On page eleven of *Art as Experience*, Kaprow underlined a passage that reads, 'Even a crude experience, if authentically an experience, is more fit to give a clue to the intrinsic nature of esthetic experience than is an object already set apart from any other mode of experience.' Next to this passage he [Kaprow] scribbled the question, 'What is an authentic experience?' (Kaprow, 2003: xvi).

Happenings Are Dead: Long Live the Happenings! (1966), *Pinpointing Happenings* (1967), and *The Shape of the Art Environment* (1968), Kaprow demonstrates a desire to change the way in which art was defined and to further expand what he saw as the roles that art, artists, critics, and audiences could play.

In *The Happenings in the New York Scene* (1961), Kaprow set the scene for one of the performances with the following excerpt:

Everybody is crowded into a downtown loft, milling about, like at an opening³³. It's hot. There are lots of big cartons sitting all over the place. One by one they start to move, sliding and careening drunkenly in every direction, lunging into one another, accompanied by loud breathing sounds over four loudspeakers (Kaprow, 2003: 15).

He further explains that there is very little that happens that conforms to conventional art practice, 'In contrast to the arts of the past, they have no structured beginning, middle, or end. Their form is open-ended and fluid' (Kaprow, 2003: 16). The 'Happenings' individually were also one-off performances, 'They exist for a single performance, or only a few, and are gone forever as new ones take their place' (Kaprow, 2003: 17). Since they lacked little to no structure, the experience of them was critical to their gestalt. Every account of them, either written or photographed, would not only strip them of their connection to time and space but, more importantly, are completely devoid of the experience itself, and thus the experience factor is gone.

Kaprow's experiments would play a major role in how experience would be utilised by artists in the Post Modern, and Post Post Modern eras. Kaprow experimented, implemented, and redefined many of Dewey's theories as they relate to Dewey's explorations of philosophical thought regarding fine art and how it is defined in connection with experience, aesthetics, and social conditions. In his essay *Pinpointing Happenings* (1967), Kaprow makes this connection clear, 'Happening selects and combines situations to be participated in, rather than watched or just thought about' (Kaprow, 2003: 87). Kaprow asserted that a form of natural extension of Dewey's thoughts on experience would be direct participation and involvement. According to Kaprow, 'whether it is art depends on how deeply involved we become with elements of the whole' (Kaprow, 2003: 11).

³³ Here Kaprow is referring to traditional exhibition opening receptions.

Kaprow explores these subjects in the collection of his essays that are listed above and that are compiled and contained in the volume, 'Essays on the Blurring of Art and Life' (2003). The essays go on to further chronicle Kaprow's experiments and writings in connection to the subjects of experience through involvement and participation. He does this through deconstructing and illustrating his own involvement and critical responses to movements, artworks, and popular culture within the contexts of the 1950s and 1960s.

In the 1950s, Kaprow illustrates for the reader a break with formalistic ideas concerning the form of art. In *The Legacy of Jackson Pollock* (1958), he describes Jackson Pollock's contribution to painting. While Kaprow acknowledged that Pollock was responsible for the creation of many magnificent paintings, according to Kaprow, Pollock's drip-paintings had destroyed the traditional understanding of what painting is and how it is done (Kaprow, 2003: 2). In describing the experience of seeing a Pollock drip-painting³⁴, he talks about its break with the formal convention associated with art presentations, 'The Form'. According to Kaprow, 'To follow it, it is necessary to get rid of the usual idea of "Form," i.e., a beginning, middle, and end, or any variant of this principle — such as fragmentation' (Kaprow 2003: 5). Kaprow thinks of Pollock's most notable painting style, the drip-painting, as blurring the lines between artist, spectator, and world too interchangeably (Kaprow, 2003: 5). He equals it to an ebb and flow state, 'Anywhere is everywhere, and we dip in and out when and where we can' (Kaprow, 2003: 5). In another essay from this era, *Notes on the Creation of a Total Art* (1958), Kaprow again reiterates his definition of art as being connected to experience, stating: '[W]hether it is art depends on how deeply involved we become with elements of the whole' (Kaprow, 2003: 11).

The 1960s would see the birth of the 'Happenings', as touched on above, and it is during this period of time that Kaprow makes a clearer connection between his work and Dewey's philosophies: 'I think that today this organic connection between art and its environment is so meaningful and necessary that removing one from the other results in abortion' (Kaprow, 2003: 18).

³⁴ Drip-painting: Jackson Pollock utilised a brushless form of painting technique where he dripped and splashed paint in a form of abstract expressionism (Svarez Art, Accessed Feb. 2017).

As Kaprow would investigate the nature of experience, he would begin to define templates for what he called ‘forms’³⁵. Kaprow would use these ‘forms’ to dissect and study the communicative function of art. The ‘forms’ set out by Kaprow are ‘[t]emplates for modern experience, they are situational, operational, structural, subject to feedback and open to learning’ (Kaprow, 2003: xvii).

In the introduction to ‘Essays on the Blurring of Art and Life’, the art historian Jeff Kelley points out that if there is a central theme that is present in Kaprow’s entire essay collection it is that art is a participatory or interactive experience between the audience, artwork, and the artist³⁶. Through all of Kaprow’s writings, he demonstrates a need to seek out or find the ‘art’. Based on Kaprow’s essays, there seems to be no limit on where the ‘art’ can be found. It is Kelley’s assertion that the true measure for Kaprow is not in aesthetics or the art object produced, but in methods.

Any and all methods or no methods are valid to Kaprow. Chaos, order, art, and non-art are some methods in which Kaprow was experimenting within his experimentations with ‘Happenings’³⁷. What is fundamental to express in regard to Kaprow’s philosophies around art and aesthetics is that anything and everything can and should be methods³⁸. Furthermore, Kaprow argued that with the creation of the ‘Happenings’ the method itself was fine art.

Defining Kaprow’s ‘Happenings’

Kaprow’s ‘Happenings’ are principally about loosely sketched out concepts that inform or direct an experience, where the art is a product of the activeness of the participants acting out that loosely mapped score. According to Kaprow, ‘a Happening is *generated* in action by a headful of ideas or a flimsily jotted-down score of “root” directions’ (Kaprow, 2003: 19). Art, as it connects with the ‘Happenings’, is firmly entrenched in the individualistic experience. Kaprow does not differentiate

³⁵ Kelley defined Kaprow’s ‘forms’ as ‘mental imprints projected upon the world as metaphors of our mentality, not as universal ideals’ (Kaprow, 2003: xvii).

³⁶ ‘If a central theme runs through Kaprow’s essays, it is that art is a participatory experience. In defining art as experience, Dewey attempted to locate the sources of esthetics in everyday life. In defining experiences as participation, Kaprow pushed Dewey’s philosophy — and extended his own measures of meaningfulness’ (Kaprow, 2003: xviii).

³⁷ Kaprow loosely defines ‘Happenings’ as, ‘Happenings are events that, put simply, happen. Though the best of them have a decided impact — that is, we feel, “here is something important” — they appear to go nowhere and do not make any particular point. In contrast to arts of the past, they have no structured beginning, middle, or end’ (Kaprow, 2013: 16).

³⁸ ‘Method becomes a discipline by which experience is shaped and interpreted’ (Kaprow, 2003: xxiii).

whose experience is the focus of this art synthesis, just that the experience negates the passivity of traditional art and is the offspring of activeness and the blurring of art and everyday existence. In Kaprow's own words:

The fine arts traditionally demand for their appreciation physically passive observers, working with their minds to get at what their senses register. But the Happenings are an active art, requiring that creation and realization, artwork and appreciator, artwork and life be inseparable (Kaprow, 2003: 64).

It would seem like a fair extrapolation that the art afforded within a 'Happening' is not confined to the traditional roles of an artist who creates the artwork and the passive audience that consumes or experiences the art. Whom art exists for in a 'Happening' is proportionately relevant to the level of active engagement, but only genuine engagement. By use of the term 'genuine' in this context, I am referring to an engagement that is fostered by one's own life experiences, and therefore results in an engagement that makes, 'artwork and appreciator, artwork and life inseparable' (Kaprow, 2003: 62). It is this process that Kaprow defines as 'analogous to art' (Kaprow, 2003: 62). It is not my contention that there is no rubric for art to be defined within the 'Happenings' beyond the act of experiencing something or anything for that matter; rather, in Kaprow's own words, there are 'rules to the game' (Kaprow, 2003: 62).

The rules of the game codified and illuminated by Kaprow are the rules he felt were necessary to follow in making art within the confines of a 'Happening'. These rules allow for an experience to transcend the ordinary and to become a 'Happening'. There are seven precepts that define the 'rules to the game.' Each of these seven precepts exists in a duality that is as equally declarative as it is fluid. These precepts are contained in Kaprow's 1966 essay, *The Happenings Are Dead: Long Live the Happenings!*, and in addition to functioning as definitions of 'Happenings', they also act as a road map for how to create a 'Happening'.

The First Precept: Fluidity

The first stop along the way or the first game rule is, 'the line between the Happening and daily life should be kept as fluid and perhaps indistinct as possible' (Kaprow, 2003: 62). Kaprow's own deconstruction of this first rule is, at first glance, mystifying to say the least.

The reciprocation between the handmade and the readymade will be at its maximum power this way. Two cars collide on a highway. Violet

liquid pours out of the broken radiator of one of them, and in the back seat of the other there is a huge load of dead chickens. The cops check into the incident, plausible answers are given, tow truck drivers remove the wrecks, costs are paid, the drivers go home to dinner... (Kaprow, 2003: 62).

In this instance, it is the conscious contemplation of the seemingly disjointed statement first about fine art terms of the handmade, readymade and the narrative about car accidents, violet antifreeze, dead chickens, cops, tow truck drivers, fines, and dinner that illustrate the point. We are given fine art and daily life intermixed; where they start and stop have been removed; there is no beginning, middle, or end; and, thus, each individual element of this encapsulated text exists in a state simultaneously and of equal importance and irrelevance. To prove this point, one just needs to rearrange the order of the individual statements to see that the combined and collective meanings do not change. For instance,

Two cars collide on a highway. The cops check into the incident, plausible answers are given, tow truck drivers remove the wrecks, costs are paid, the drivers go home to dinner... Violet liquid pours out of the broken radiator of one of them, and in the back seat of the other there is a huge load of dead chickens. The reciprocation between the handmade and the readymade will be at its maximum power this way.

I have scrambled the order of the elements of the passage yet the elemental reception of the text is intact, thus, illustrating that order or form have no meaning to this text or the 'Happenings'. We understand the meaning and impact of the encapsulated text because we have seen or experienced something similar. The 'Happenings' function on the same level in that they mimic or mirror singular vignettes taken from everyday life and showcase them out of context to juxtapose their function and meaning.

The Second Precept: Non-Art Derived

The second rule for creating a 'Happening' is that the 'themes, materials, actions, and associations that they evoke, are to be gotten from anywhere except from the arts, their derivatives and their milieu' (Kaprow, 2003: 62). In this instance, Kaprow is concerned with the authenticity of the art experience that the 'Happenings' offer. The concept at work here can be linked back to the handmade and readymade contention raised by Marcel Duchamp's artworks *Bicycle Wheel* (1913) and *Fountain*

(1917)³⁹. That contention being that Duchamp pointed out with these works that the distinction between an object of fine art production and a mass-produced object was not connected to the skill of the craftsmanship or the quality of the materials used, but is instead connected to the context of the reception. An oversimplification, yet not untrue explanation, of this is that art is defined by the context of its reception — if an object is exhibited in a gallery setting then that object ought to be considered art.

Kaprow wanted the art that was created within the ‘Happenings’ to exist as a ‘separate art’ (Kaprow, 2003: 62). According to Kaprow, the art exists because of its active engagement with the here and now, and the artist and audiences, and is not to be defined as art production merely because of the context of its reception. According to Kaprow, we are to

[e]liminate the arts, and anything that even remotely suggests them, as well as steer clear of art galleries, theaters, concert halls, and other cultural emporia (such as nightclubs and coffee houses), and a separate art can develop. And this is the goal (Kaprow, 2003: 62).

The Third Precept: Dispersed

The third stop along this migration is Kaprow’s idea that, ‘the Happenings should be dispersed over several widely spaced, sometimes moving and changing, locales’ (Kaprow, 2003: 62). This was an open call, if you will, to not only diversify the audiences and the fine point elements of the ‘Happenings,’ but perhaps, even more importantly, it also acted to expedite their evolutionary growth. The more varied the groups that took part in these events, the more varied and nuanced type of life experiences the ‘Happenings’ as a medium could mirror, and the more enticing experiencing a ‘Happenings’ could become. Another way of thinking about this precept is that, as the ‘Happenings’ moved and changed to fit a given place or social group, it differentiated itself from a ‘Happening’ that occurred down the hall, down the street, or last week. The more diversified the locations and resulting participants, the more potential for nuanced and transformative experiences.

The Fourth Precept: Time

The fourth rule of the ‘Happenings’ is, ‘Time, closely bound up with things and spaces, should be variable and independent of the convention of continuity’ (Kaprow, 2003: 63). The key to this element is that the process should develop

³⁹ For a more in-depth discussion of Marcel Duchamp’s artworks *Bicycle Wheel* (1913) and *Fountain* (1917), see *supra* Chapter One, pages 32-33.

naturally, situating itself in opposition to more traditional time based art forms, like music with the regimented scores, or like cinematic representation with standard plot structures (Kaprow, 2003: 63). All occurrences should have their own time and should be fluid and without restraint (Kaprow, 2003: 63). This rule links back to the element of evolution, which was a component of rule number three — the last rule discussed. If processes are left to their natural time scale then the experiencing of that process is unique and different from a process that on the surface is the same process.

To deconstruct this point, take for instance two different processes. First, let us consider the process of driving to work. The process of driving to work is generally comprised of things such as, collecting the prerequisite work related items which may include paperwork, tools of the trade, and a lunch, among other items; entering the car; and then physically driving yourself to your respective place of employment. Second, consider walking to the corner shop to buy a soda during a relatively busy time of day. Both of these tasks may take the same amount of time to complete, but if both were undertaken by the same person, they would be required to occur at separate times. Yet, if each task is done by a separate individual then the processes have the ability to overlap with one another. If the tasks are undertaken by different individuals, then the driver of the car could pass the person walking to the store and, as a result, the two separate individuals can share in an experience (Kaprow, 2003: 63). This means that the more natural the progression of time, the more authentic and fluid the link between real life and the ‘Happenings’ is allowed to become.

The Fifth Precept: Artless

Rule number five for the creation of a ‘Happening’ is, ‘the composition of all materials, actions, images, and their times and spaces should be undertaken in as artless and, again, practical a way as possible’ (Kaprow, 2003: 63). This rule is not about removing form from the ‘Happenings’, but is linked back to the concept discussed earlier in connection to defining art by context or associations to established forms, theories, and places of reception. If the ‘Happenings’ can be far removed from the typical packaging of art, and yet find its way to art on its own accord, then new and genuine art is produced (Kaprow, 2003: 63-64). Kaprow’s desire to negate any and all connections to contexts of art is, in a way, the inverse of Duchamp’s concept of everyday objects that become venerated fine art objects when included in the vanguard of the galleries. Contrary to Duchamp’s concept, the ‘Happenings’ seem to

only transcend to a form of artistic expression by their rejection, or for that matter self expulsion and exile, from those vary same trappings.

The Sixth Precept: Spontaneity

Kaprow's sixth rule is centred chiefly around spontaneity. According to Kaprow, 'happenings should be unrehearsed and performed by nonprofessionals, once only' (Kaprow, 2003: 63). This rule taps in to the freedom that the 'Happenings' have to connect with the auspices of what Kaprow referred to as the 'realms of action', which cannot be repeated (Kaprow, 2003: 64). The following events are listed by Kaprow to illustrate his meaning:

A crowd is to eat its way through a roomful of food; a house is burned down; love letters are strewn over a field and beaten to pulp by a future rain; twenty rented cars are driven away in different directions until they run out of gas... (Kaprow, 2003: 63-64).

The action of the event is the defining aspect of a 'Happening'. It is the unfolding of the actions as small discernable entities that are the gestalt to their art essence. No special skills or experience are required to perform such tasks and the 'here and now' is the most salient reason for their existence. There is nothing to improve upon and nothing to be gained by athletic prowess or specialised skills, thus, neutralising any advantage to using professionals or rehearsing (Kaprow, 2003: 64). Furthermore, the necessity of the 'here and now' as a requirement makes any staging of a 'Happening' non-repeatable. Even if the conditions of any 'Happening' were attempted to be exactly duplicated to the minutest detail, they would still have their very unique 'here and now' identities, thus, never allowing the original to be reproduced or repeated. Kaprow asserts that the only thing left in the wake of a 'Happening' is a value to one's self (Kaprow, 2003: 64).

The Seventh Precept: No Audience

The last of Kaprow's 'Happenings' game rules is precept number seven, '[i]t follows that there should not be (and usually cannot be) an audience or audiences to watch a Happening' (Kaprow, 2003: 64). More succinctly stated, Kaprow is referring to passive audiences. Potentially, everyone in the vicinity of a 'Happening' is in some way a participant even if they are not cognisant of or consenting to their involvement. A 'Happening' is about actions and interactions; there is no passive reception of a 'Happening' (Kaprow, 2003: 64). A 'Happening' by its design is individual experience. No group or multitudes of people have ever experienced a collective

‘Happening’ (Kaprow, 2003: 62-65). There is no possible way for an audience to be passive or empathetic in their reception of a ‘Happening’ (Kaprow, 2003: 64). If an individual’s reception of the actions that are contained within the generation of a ‘Happening’ are passive rather than active, then the experience was not a ‘Happening’, but stage theatre (Kaprow, 2003: 64).

Allan Kaprow’s ideas about art as experience, along with the philosophies of John Dewey, help to illuminate the foundations present within the current aesthetic systems used to examine, not just interactive and/or participatory art, but all contemporary art. Kaprow, utilising and building on Dewey’s ideas, created ‘the Happenings’ as his attempt to bring art as experience to fruition and Kaprow’s seven precepts created the structure for him to do so. While these theories are pivotal to the understanding and interpretation of interactive mediums, in transitioning from the participatory nature of Kaprow’s ‘the Happenings’ to the realm of interactive art, it was first necessary to look at ways in which to structure that interaction. With this in mind, we now turn to what Kwastek calls the ‘Aesthetics of Play’.

Interaction and Play

How to foster interaction is a fundamental question to both the research-based component and the practice-based component of this PhD. It is necessary to understand on a basic level the motivations and components of play if one wishes to create an object that in its broadest sense is to be interacted with at a physical level. The more foreign and unusual the technology or object is to the public at large the harder it is to foster a state of interaction. Knowing and engaging with principles connected to the psychology of how play works and unfolds will facilitate a well-informed approach to making an art object that fosters a greater likelihood of interaction.

The German philosopher, Friedrich Schiller first studied play as an action outside the context of child development in the 1790s (Kwastek, 2013: 72). In his *Letters on the Aesthetic Education of Man* (1794), Schiller claims that with humans — and in the case of lower animals, as well — there resides a primary ‘play impulse’. The impulse of play, when stimulated by a sufficient amount of energy, manifests itself in the free, non-utilitarian exercise of play, without a reason for the play or any logical forethought prior to engaging in play (Hein, 1968: 67-71). Since Schiller, the concept of play has been researched within the domains of many different scientific

disciplines: cultural studies, media studies, economics, biology, psychology, sociology, philosophy, physiology, and game studies (Kwastek, 2013: 71). In the 1950s, play came to be codified by the following characteristics: freedom, unproductiveness, self-contained, free from real life, inner infinitude, based on rules, and residing in an artificial realm (Kwastek, 2013: 74).

The freedom and unproductiveness that characterise play, according to Hans Scheuerl's book *Das Spiel* (1997), are seen in the fact that the play pursues, 'only its own self-sustaining purpose' (Scheuerl, 1997:105). Similarly, John Huizinga, a Dutch historian who took an aesthetic approach to history, defined play as free activity without the goal of materiality (Kwastek, 2013: 72). These ideas are further reinforced by Rodger Caillois, a French sociologist, in his book, 'Man, Play, and Games' (1961), where he emphasises the condition that play must be free and voluntary but must also lack a material goal. The two-fold condition of play being voluntary and purposeless is not only important to play but also to interactive art. As Kwastek points out, 'This distinction is necessary because play (as well as interactive art) is based not only on contemplative perception but also on action' (Kwastek, 2013: 74).

The self-contained characteristic of play is connected to its spatial and temporal boundaries. Kwastek points to these aspects as being 'responsible for the fact that games can continue to exist beyond when they are played' (Kwastek, 2013: 75). Scheuerl and Caillois both make mention of the predefined temporal and spatial nature of play in their work on the characteristics of play. Both Scheuerl and Caillois saw play as an action partaken within a certain time and place. The location of play within a certain boundary of time and space makes it self-contained because those boundaries are codified within the play itself. While there need not be clearly defined boundaries to play, they may be included. For example, such clearly defined boundaries exist in the case of a board game like checkers or chess, or in the time frame in which a basketball game is played (Kwastek, 2013: 76).

The inner infinitude characteristic of play as described by Scheuerl consists of the endless loop and variation that can be found in play. Scheuerl elaborates to explain that, even if a game has ended, the completion of the game is not the real motivating force behind the play. Instead it is the player's own engagement with the, 'circling, oscillating, ambivalent state of suspense, which arises as a result of the reciprocal relativization of forces and in itself is not oriented toward a conclusion' (Scheuerl, 1997: 205). He also noted that this too is found in games with clearly

defined goals. This is further reinforced by what Caillois called ‘uncertainty’, where the course or the outcome of this type of play is defined in advance (Caillois, 1997: 9).

Many researchers of play do not universally agree upon the use of rules as a characteristic of play. Instead, many researchers see the use of rules as belonging more within the domain of games. For both Scheuerl and Huizinga, rules were part of the underlying structure of the self-contained nature of play. Caillois on the other hand saw rules and artificiality being mutually exclusive entities of play: ‘Thus games are not ruled and make-believe. Rather, they are “ruled” or “make-believe”’ (Caillois, 1997: 9). Rules seem to play a more defined role as they are applied to interactive media art. Here, the use of rules is usually in the confines of the system or systems utilised to create the interaction proposition. They can also be connected to the instructions set out by the artist to outline the nature of using the apparatus or black box.

In regard to the artificial characteristic of play, Sheuerl sees it as the moment that play is differentiated or removed from reality. According to Sheuerl, play needs to exist outside the constructs of reality and the real world but also can be reinforced by it. The artificial is most easily seen in the imaginary worlds and conditions that can be associated with play. These can be simple constructs within the mind of an individual player or the complexity of a computer created environment (Caillois, 1997: 9-12).

Miguel Sicart, a play scholar with a background in philosophy of technology, literature, and game studies, discusses the impact of play in his book *Play Matters* (2014). Specifically, Sicart looks at the impact of play as a creative and social catalyst for learning, engaging, and understanding. Sicart breaks down the ‘romantic theory (or rhetoric)’ of play by looking at what ‘play is’ (Sicart, 2014: 5) in social, political, and ascetic realms. For Sicart, play should be seen more as a cultural necessity beyond the purely psychological and rule based aspects focused on by Scheuerl and Huizinga.

Sicart asserts that, ‘To Play is to be in the world. Playing is a form of understanding what surrounds us and who we are, and a way of engaging with others. Play is a mode of being human’ (Sicart, 2014: 1). He proposes this new adapted theory of play as a response to what he feels is the postmodern, mechanistic, and

institutionalised thinking about play (Sicart, 2014: 5). The importance for Sicart is that play is seen as,

A fundamental part of our moral well-being, of the healthy and mature and complete human life. Through play we experience the world, we construct it and destroy it, and we explore who we are and what we say. Play frees us from moral conventions but makes them still present, so we are aware of their weight, presence, and importance (Sicart, 2014: 5).

Sicart's play theory is comprised of a list of declarative statements of what he sees play as being. Those declarations of what he considers play to be are: 'play is contextual', 'play is carnivalesque', 'play is appropriative', 'play is disruptive', 'play is autotelic', 'play is creative', and 'play is personal' (Sicart, 2014: 6, 11, 14, 16, 17).

Play is contextual. According to Sicart, this refers to our common understanding of play and how it can be seen in a traditional confined space determined by rules and a given community of play, but how, conversely, play can also be infinitely more complex. This complexity arises from cultures, networks of people, negotiations, physical or virtual locations, objects, societies, and rules (Sicart, 2014: 6). The best example of this would be organised sports. In sports, you have a place allocated for play and rules and systems in place to order the play and to dictate the way play is undertaken. As an inverse to this context, you have places like playgrounds that order play in a more suggestive and free way.

Play is carnivalesque⁴⁰ for Sicart because it can find a balance with a creation and destruction process (Sicart, 2014: 11). Play can create worlds, rules, and objects while affording the ability to tear all those artifices down as seamlessly. With true play those constructs can be dismissed easily without real dangers or repercussions. This is evident when a contest or game's outcome is laughed off and the play state is reset for another act (Sicart, 2014: 11). Sicart defines this as, 'equilibrium between creation and destruction in embodied laughter' (Sicart, 2014: 11).

Play is appropriative because it can assimilate any context where it exists and cannot be predefined by any such context (Sicart, 2014: 11). Elements like toys, rules, or spaces become subservient to the act of playing (Sicart, 2014: 11). The example I like to envision to explain this aspect of play is my childhood affinity for large cardboard boxes. Through the use of markers and scissors, boxes were transformed

⁴⁰ Carnavalesque: Carnavalesque suggests a carnival or carnival-like atmosphere. An atmosphere that is fun and playful, but often marked by a mocking or satirical challenge to authority and the traditional social hierarchy of a given society (Merriam-webster.com, Accessed Feb. 2015).

from spaceships to secret bases and back to garbage once the box started to breakdown. In this way, play forces us to recontextualise any object utilised in play to conform to the meanings of said play (Sicart, 2014: 14).

Play is disruptive chiefly because it is appropriative (Sicart, 2014: 14). As play takes over a context, it sets aside the original context or state of being of the object, location, or meaning used while in play (Sicart, 2014: 14). This can be witnessed as skateboarders take over public space and use them as skate parks. What was previously just a bench now becomes a rail for sliding in this context, and a trashcan becomes an object for the skater to vault or jump over. These acts while being undertaken set aside or disrupt the intended use of these areas and only allow the intended purpose to be restored after the play has finished or moved on to another location.

Play is autotelic⁴¹ in the sense that it is an activity that Sicart asserts is focused on its own self-contained goals and purposes (Sicart, 2014: 16). Sicart defines play in this context as having a purpose of its own. This purpose, at its core, is not static but can be fluid, flowing, and changing as play is undertaken. This interpretation of play by Sicart is congruent with the theories of Scheuerl and Caillois, but the boundaries of autotelic play are not fixed or ridged and often there is no clear distinction between the real world and that of the one created and sustained in play (Sicart, 2014: 16).

Sicart points out,

Play is autotelic in its context, but it is also negotiated. Its autotelic nature is always being discussed and negotiated. We play by negotiating the purposes of play, how far we want to extend the influences of the play activity, and how much we play for the purpose of playing or for the purpose of personal expression (Sicart, 2014: 16).

Play is creative in its nature because it allows those engaged in playing varying degrees of self-expression within the confines of the play undertaken. Typically, playing is comprised of two basic dualities, acceptance of the rules governing the instance of play and playing within those confines to suit one's own personality, desires, and the larger community connected to the defined play (Sicart, 2014: 17). Playing in its most simplistic form, Sicart asserts, is inventive, performing between contexts, the world at large, objects, locations, and technologies. This performance can take place in a gambit of places and instances like games or

⁴¹ Autotelic: Autotelic is a state of being in which the characteristic exhibited has a purpose in and not apart from itself (Merriam-webster.com, Accessed Feb. 2015).

playgrounds (Sicart, 2014: 17). To play, one has to create and simultaneously accept that which has been created.

Play is personal because it allows for individual expression. Even when play involves others, either real or imaginary, the affect of play is personal. Players bring to play their own sentimentality, interpretations, morals, experience, skills, and expectations. Sicart defines this as, 'who we are is also who plays, the kind of person we let loose when we play' (Sicart, 2014: 17). The personal aspect of play for Sicart is not just about individual expression, but how play allows one to find that expression. Play becomes a medium unto its own right, indistinguishable from any other accepted medium conscripted in to the arsenal of self, art, or artistic expression (Sicart, 2014: 18).

Ownership and Aesthetics

While play theory is aimed at fostering interaction, the response that results from play or interaction, also called a reciprocal feedback system, can be viewed as a form of collaboration. Thus, the response between an input type and the systems creator is a type of collaboration and an aesthetic component of interactive art systems. In relation to this response, the interactive media artist Myron Krueger stated, 'It is the composition of the relationship between action and response that is important. The beauty of the visual and aural response is secondary. Response is the medium!' (Krueger, 1991: 86).

An interactive system is inert with out some type of input from an outside source. That source can range from things like data input from sensors, Internet search data, artificial intelligent, human haptic⁴² interfaces, or fundamentally anything the creator of the interaction proposition decides to use. With human and system interaction, the response, as seen as collaboration between the interaction propositions or in the abstract the artist and the recipient, and the nature of the ownership and authorship of the response come in to question.

This notion is connected to ideas discussed by Erving Goffman⁴³ in *The Presentation of Self in Everyday Life* (1959). Goffman asserts that every interaction

⁴² Haptic: elating to the sense of touch, in particular relating to the perception and manipulation of objects using the senses of touch and perception (Merriam-webster.com, Accessed Feb. 2015).

⁴³ Erving Goffman (1922 – 1982): Erving Goffman was a Canadian born sociologist who is accredited with pioneering the study of face-to-face interaction. This type of interaction is also known as micro-sociology. Goffman made his study of face-to-face interaction famous by

between people centres on an ebb and flow cycle between performing and/or expressing ideas through behaviour towards others. This behaviour is interpreted through a filtering mechanism comprised of personal history and a person's own use of demonstrated behaviour. The behaviour, once filtered, is then used as a bench mark for gauging how to formulate a response (Goffman, 1959: 47-88). While Goffman's ideas are concerned with relationships between humans, it can also be extrapolated to interactive systems. In the case of interactive systems, we would be focused on the ebb and flow between a viewer and an interactive artwork. As a participant interacts with an interactive system, he or she alters his or her response to coincide with the parameters or inputs that the system uses or understands. In turn, the system responds to inputs from the participant and then the system's response creates a behaviour change in the participant. This cycle continues as long as the participant interacts with the system. When applying this concept to interactive systems, the author of the unfolding interaction becomes unclear because both the participant and the interactive system are demonstrating equal effect on the behaviour of the other.

Authorship

When approaching the notion of authorship, we begin with the nature of the word itself, 'The meaning of the word "author" has shifted significantly through history and has been the subject of intense scrutiny over the last 40 years. The earliest definitions are not associated with writing per se, but rather denote "the person who originates or gives existence to anything"' (Rock, 1996). In the first half of the twentieth century the figure or entity that was the author signified a totalitarian role. This was a role that held magic-like control over creative activity and validity. Moreover, it conveyed a presence that by its very nature seemed an essential ingredient of high art. The author was seen as proof of the relative quality level of genius of an object of artistic production and activities that lacked a clear central authority figure were devalued (Rock, 1996). As the twentieth century progressed, these notions connected to ownership and authorship began to be challenged.

The literary theorist Roland Barthes takes issue with the concept of how we generally define authorship, arguing that authorship is always a collaborative process,

publishing his book *The Presentation of Self in Everyday Life* (1959). Goffman was also a professor at the University of California at Berkeley in the early 1960s, and in 1968 he became a Chair in Sociology and Anthropology at the University of Pennsylvania (Sociology About, Accessed Mar. 2015).

stating, 'The [Author] can only imitate a gesture that is always anterior, never original' (Barthes, 1968: 146). He argues that authors only rearrange words and ideas found elsewhere in the human realm and that they have meaning only when received by a reader or recipient. Furthermore, he found that the labelling of a work with an author ends the information exchange between the work and the recipient, 'To give a text an Author is to impose a limit on that text, to furnish it with a final signified, to close the writing' (Barthes, 1968: 147). For Barthes, the purpose of a work and its meaning lies with the recipient and simultaneously negates the author's validity (Barthes, 1968: 147-148).

A text's unity lies not in its origin but in its destination. Yet this destination cannot any longer be personal: the reader is without history, biography, psychology; he is simply that *someone* who holds together in a single field all the traces by which the written text is constituted. ... The birth of the reader must be at the cost of the death of the Author (Barthes, 1968: 148).

A contemporary of Barthes, Michel Foucault, is in agreement with Barthes when he argues that an author is a type of tyrant that does nothing less than limiting the free thinking of the recipient of given works (Foucault, 2005: 101-120). The aesthetics researcher and philosopher Sherri Irvin argues that ownership of an artwork does not reside with the artists merely because they facilitate the manipulation of a given medium to create an artistic product, but it is adhered to the decision-making process employed (Irvin, 2005: 131-133). Irvin's contention can be illustrated by the before-mentioned work of the artists Sol Lewitt and Allan Kaprow. Lewitt's wall drawings are created without any manipulation of artistic medium by the artist but only through a detailed set of scripted instructions. Kaprow, too, in certain incarnations of the 'Happenings' controlled the decision-making process employed in the art creation. The question that now arises is: how is ownership and authorship shared to empower the participant in the role of co-author of an artwork? (*See infra* Chapter Six, *Death to the Author*, pages 166-179).

This raises yet another question: if the participant can share the role of author of an artwork, how must the artist construct his or her role as a practitioner to allow a state of co-authorship to exist? In his book, *The Third Hand* (2001), Charles Green⁴⁴

⁴⁴ Charles Green: Charles Green is a lecturer and an artist. Green is currently a lecturer at the School of Art History and Theory at the University of New South Wales. Green is also a correspondent for *Artforum* (University of Minnesota Press, 2015).

illustrates three ways he has deduced that artists have negotiated the concept of authorship. According to Green, these three ways are Collaboration, Anonymity, and Partnership (Green, 2001: 59-74). Green has concluded that through these methods the role of ownership and authorship can become a shared hybrid experience. A critical exploration of Green's use of these terms in connection to ownership and authorship with regards to art production must be done in order to facilitate, not just an understanding of his core concepts, but also to be able to apply an interpretation that will help to realise one of the main goals of the practice component of this PhD — that goal being, to create a state of co-authorship between the practitioner and the participant and/or the audience.

Collaboration

'Collaboration' for Green is rudimentarily described as artists working together in the form of a collective (Green, 2001: 98-101). This type of collaborative process often is realised in the form of a company or an incorporation of artists and other craftsmen. As some examples of this collaborative process, Green cites the Harrison Studio, Helen Mayer Harrison and Newton Harrison and Associates⁴⁵ and the Boyle Family⁴⁶. In these examples, the individual artist becomes part of the larger conglomerate where the ownership or authorship of a given artistic work or project is shared by the group as an entity.

⁴⁵ Harrison Studio, Helen Mayer Harrison and Newton Harrison and Associates: The Harrison Studio is a collaborative team that is part of the eco-art movement. Newton and Helen Mayer Harrison run this collaborative team. The Harrisons have been working together for nearly forty years. They often work with other art practitioners, biologists, ecologists, architects, and urban planners. The Harrison Studio works to initiate collaborative dialogues and to uncover ideas, solutions, and systems, which support biodiversity and community development (Theharrisonstudio.net, Accessed Jun. 2016).

⁴⁶ The Boyle Family: The Boyle Family is a group of collaborative artists based in London, England. The Boyle Family's artistic goal is to make art that does not exclude anything that can be seen as a potential subject. For the past twenty years the Boyle Family's subjects have come to include the four natural elements: earth, air, fire and water. They have also included as material in their works: animals, vegetables, minerals, insects, reptiles, fish, crustaceans, and even human beings. Their projects have also included modern media forms such as performances, films, video projections, sound recordings, photography, and electron-microphotography and various forms of site specific installation techniques. The Boyle Family is best known for works pertaining to earth studies. These earth study works have included three-dimensional casts taken from the earth combined with real material from the site such as stones, dust, twigs, etc. They combine all these elements to create works that offer new interpretations of the environment, combining a powerful conceptual framework with a strong and haunting physical and visual presence (Boylefamily.co.uk, Accessed Feb. 2015).

Anonymity

The Anonymity approach to navigating the issue of ownership and/or authorship is described by Green as, ‘an emptying out of identities and structures’ (Green, 2001: 175). If the author of any given work is unknown or obscured, then the work is open to a different level of interpretation. An interesting example of this is the American photographer Patrick Nagatani’s⁴⁷ *Excavations* (2001). In *Excavations* (2001), Nagatani claims to be collaborating with a Japanese archaeologist named Ryoichi. In this collaboration, Nagatani asserts that his role is simply that of a technical adviser and printer of the photographic images shot by Ryoichi during archaeology digs. All the images that Nagatani and Ryoichi print together demonstrate a paradox. This paradox exists because the artefact that Ryoichi unearths at the ancient sites he has proclaimed to excavate and document did not exist in that era, as the artefact was an automobile. In this example, the collaboration of the photographer and the archaeologist lends a level of authenticity to the images and the photographer and archaeologist share the role of authorship. Yet, Nagatani and Ryoichi’s collaboration is actually a lie. If you were to examine the personal artefacts of Ryoichi, you would find mixed among the journal of field notes and surveying equipment, a portrait of Ryoichi. This photograph reveals that Ryoichi is in fact the artist Nagatani (Patricknagatani.com, Accessed Mar. 2015). Through the use of anonymity, Nagatani has extricated his past as a creator of artifice and hidden behind the role of a fictitious archaeological persona allowing his exhibit to be interpreted with a greater level of credibility.

Another example of an artist using the anonymity approach, not as a way of sharing the role of author but to negate the provenance of having their name connected to a work, is *Fountain* (1917), which was discussed in some detail above (see *supra* Chapter One, Theories on Art as Experience, pages 31-33). *Fountain* is the work of the French artist Marcel Duchamp, who was discussed in some detail above. With *Fountain*, Duchamp entered the artwork for inclusion into the first annual

⁴⁷ Patrick Nagatani: Patrick Nagatani is an American born artist of Japanese descent. He holds a Bachelors of Art from California State University and a Masters of Fine Art from the University of California. Nagatani is best known for his work in photography and mixed media arts. Nagatani was a Professor in the Art and Art History department at the University of New Mexico from 1996-2007 and an Associate Chair of Art in the Art History Department at the University of New Mexico from 2001-2003 (Patricknagatani.com, Accessed Mar. 2015).

exhibition of the Society of Independent Artists⁴⁸ at the Grand Central Palace, New York, in April of 1917 under a false name to conceal his involvement in the piece's creation from the society's governing board for which he at the time was the director (Tomkins 1996: 181-185).

Partnership

The third approach towards authorship expounded on by Green in *The Third Hand* (2001) is partnership. The tactic of partnership is one Green describes as the coupling of two artists by forming a group and leaving their former identities behind. Green calls this the, 'Link between collaboration and the dissolution of identity' (Green, 2001: 174). The examples given by Green are the artistic duos Gilbert & George⁴⁹, Christo and Jeanne-Claude⁵⁰, and Marina Abramović and Ulay⁵¹. In each

⁴⁸ Society of Independent Artists: The Society of Independent Artists was an association of mostly American artists and was founded in 1916 and was based in New York City. It was created based on the French Société des Artistes Indépendants. The founding principal of the society was to hold annual exhibitions by avant-garde artists. The exhibitions were designed to be open to anyone who wanted to display their work. The exhibitions were without juries or prizes. (Revolvy.com, Accessed May 2015).

⁴⁹ Gilbert & George: Gilbert & George are an artistic duo comprised of Gilbert Prousch and George Passmore. They are both European artists. Gilbert Prousch was born in San Martin de TorSan Martin de Tor Italy and George Passmore was born in Plymouth, United Kingdom. Gilbert & George began their collaboration in 1967 when they met at St. Martin's School of Art in the United Kingdom. In their earliest works in film and living sculptures, they appeared as figures in their own work. Gilbert & George believe that everything is potential subject matter for their work. They like to address issues involving social taboos and artistic conventions. One of the foundational principles found in their work is the notion that there is a necessary condition of art. The necessary condition of art is that there is artist's sacrifice and personal investment embodied in the work. Gilbert & George have depicted themselves as naked figures in their own work many times with the pretence of recasting the traditional role of the male nude as a figure of strength and vitality in to something vulnerable and fragile. The main inspiration for much of their work has been the East End of London. London's East End is where Gilbert & George have lived and worked for over 40 years. They have worked with street signs, Ginkgo trees, and chewing gum stains on the pavements, as effigies of urban grandeur and decay. They have used their work to create a living portrait of London and a reflection on the human condition that is present within it. Gilbert & George continue to make work that they feel confronts many of the fundamental issues of existence: sex, religion, corruption, violence, hope, fear, racial tension, patriotism, addiction, and death (Whitecube.com, Accessed Mar. 2015).

⁵⁰ Christo and Jeanne-Claude: Christo and Jeanne-Claude was a married artist couple that worked in the field of environmental art. Their collaboration ended in 2009 with the death of Jeanne-Claude. Christo or Hristo Vladimirov Yavachev was born in Bulgaria in 1935 and Jeanne-Claude or Jeann-Claude Denat de Guillebon was born in 1935 in Morocco. Christo and Jeanne-Claude are best known for their large scale wrapping and massive land art installations. These installations were mostly privately funded by Christo and Jeanne-Claude through the sale of lithographs and books connected to their works. Among their more well-known works are *The Umbrellas* (1984 – 1991), *Wrapped Reichstag* (1995), *The Wall* (1999), and *The Gates* (2005) (Christojeanneclaude.net, Accessed Feb. 2017).

⁵¹ Marina Abramović and Ulay: Marina Abramović and Ulay were an artist collaboration group consisting of Marina Abramović, a Serbian artist, and Ulay, a German artist, whose real name is Frank Uwe Laysiepen. The Team Abramović and Ulay is most noted for their series of works

one of these groupings, Green points out that the individual artists step away from his or her singular personas and become part of a new entity in much the same way that the conglomerate systems work for the Boyle Family and the Harrison Studio. The key difference between partnership and the conglomerate systems discussed above being that in these partnerships the couplings work as a singular artist (Green, 2001: 85-178). Essentially, this means that once the individual artists form a partnership they work toward a singular artistic goal equally. Additionally, the work generated by the partnership plays off the individual members of the partnership as an entity, and in many instances the two artists themselves are the medium used. The partnership system differs from the before mentioned conglomerate model because the partnership system is focused around the two individual artists as they work together, whereas in the conglomerate model the individual parts work as one to the realisation of a work — very similar to cogs in a machine — and their singular contributions are hidden within the fold of the larger entity.

Each of these three concepts outlined by Green helps to illustrate ways in which artists can negotiate the roles of ownership and authorship. However, the primary focus of Green's three concepts deals solely with negotiation of ownership and authorship between artists. As a result, although helpful to consider, Green's theories do not directly relate to the negotiation of the relationship between artist and audience, or in the case of interactive art, artist and participant.

Researched Artworks

In addition to researching various theories relevant to interactive art, as part of my initial research for this Ph.D. I also researched various types of contemporary artworks that were based on interaction, as well as researching the technology that was used to create them. In doing so, I gravitated to those contemporary artworks that have utilised EEG technology. Through my research, I found that this technology has been used to create a plethora of different types of art forms. These art forms range from site-specific installations, to live performance and sound creations. As I continued to uncover more artistic work that was founded on utilising EEG

titled *Relation Works* (1976-1988) where they used their physical bodies as a medium to create sexually charged and gender role questioning gallery performances (The Art Story, Accessed Feb. 2017).

technology, the more enticing it became to find a way to utilise this technology myself. In addition, through my research, I also realised how accessible this technology actually is. I have distilled the results of my research and investigations into interactive art that utilises EEG technology to three case studies that I have chosen for inclusion in this document. A contemporary artist created each of the works chosen for inclusion. In addition, each of the three case studies that I have chosen involve EEG technology and are focused on generating work in the before mentioned areas of installations, live performance, and sound creation. In some instances, the works that I have chosen for inclusion here incorporate all three areas. Furthermore, these three case studies focus on the gestalt of the work being the outcome of the interaction of an EEG system and a participant, as this link is the ultimate driving force behind the artistic goals of my work as artist/practitioner.

The three artists and their work that make up the aforementioned case studies are the following: Luciana Haill's⁵², *Analogue Oneironism* (2011), Masaki Batoh's⁵³, *Brain Pulse Music* (2012), and Lisa Park's⁵⁴, *Eunoia* (2013). This grouping was chosen primarily because each artist had honed the gestalt of his or her work around EEG technology⁵⁵. However, perhaps more importantly, each artist also dealt with and facilitated certain aspects of interaction and experience based art practices in his

⁵² Luciana Haill: Haill is a British, United Kingdom based interactive artist that has been working with EEG systems since 1995. She holds a Bachelors of Art in Interactive Art, from GCHE, Newport, Wales and a Foundation Diploma in Fine Art & Design, from Ravensbourne College of Design, Kent (Haill, Accessed Feb. 2017).

⁵³ Masaki Batoh: Batoh is a Japanese musician and artist. He is most widely known as the founding member of the experimental rock group Ghost (Watercutter, 2014).

⁵⁴ Lisa Park : Park is an American born Korean artist. Park holds a Master's degree in the Interactive Telecommunications Program from New York University's Tisch School of Arts and has a Bachelors of Fine Arts in Fine Art Media at Art Center College of Design. Park's works have been featured on The Creators Project, The New York Times' Bits Blog, Time Out New York, New York Post, Wired, Daily News, PBS' Off Book Series, and Intel's *Make it Wearable* video, in addition to many other publications. She has also been a collaborator with the Marina Abramovic Institute, working with its digital platform (Lisa Park, Accessed Sept. 2013).

⁵⁵ The artworks researched as part of this research practice are by no means an exhaustive look at interactive art utilizing EEG technology. Rather, the use of EEG technology in creating interactive works of art is much more prevalent than that. For example, in addition to myself, there are other artists within the Computing Department at Goldsmith's University that have undertaken similar research — in other words, using EEG technology in connection to interactive art. Dr. Mick Grierson and Dr. Eleanor Dare have both created works using EEG technology. Dr. Grierson is the Director of Creative Computing and the Programme Leader of MA/MFA Computational Arts / Computational Studio Arts. Dr. Grierson also works with the Embodied AudioVisual Interaction Group. Dr. Dare previously taught within Goldsmith's MA/MFA Computational Arts / Computational Studio Arts programme, and is currently a professor at The Royal College of Art.

or her work. Essentially, these artists were selected because the aspects of interaction and experience based art that they dealt with and facilitated are the aspects of interactive art that I have found to be of critical importance. Thus, these case studies reflect similar concerns present in my work regarding the aesthetics of interaction. Specifically, these concerns can be broken down into: first, the ability to foster engagement of participants or audiences, and, second, the negotiation of the owner and author relationship between the art practitioner and recipient or audience. Each of these aforementioned works will be described in detail with a focus on, not only how they function and how the artist has used them to engage with participants, but also how they have navigated the ownership and authorship issues that arise in interactive art.

Haill's Analogue Oneironism

Luciana Haill's *Analogue Oneironism* (2011) explores the brain's response to both optical and auditory stimulations. Haill used an EEG device that she had created herself called the IBVA Bluetooth monitor⁵⁶. Haill used the IBVA Bluetooth monitor to trigger an audio playback that consisted of abstracted generic sounds taken from a multi-layered prerecorded file (Haill, Accessed Feb. 2017). *Analogue Oneironism* (2011) was created as a response to and repurposing of the kinetic experiment created by the writer and poet Brion Gysin⁵⁷ in collaboration with mathematician and psychological experimenter Ian Sommerville⁵⁸. The original Gysin and Sommerville work in question was called *DreamMachine*⁵⁹ (1961) (Haill, Accessed Feb. 2017).

⁵⁶ IBVA Bluetooth Monitor: The IBVA Bluetooth Monitor is an EEG monitoring device now called BrainMachine. Luciana Haill created BrainMachine. The device uses a set of unique software made by IBVA and it is native to Apple Mac OSX with custom plugins for interactive real-time authoring control in Max/MSP MIDI, Logic and Quartz Composer (IBVA, Accessed Dec. 2015).

⁵⁷ Brion Gysin (1916-1986): Gysin was a Canadian writer best known for his beat poetry and his discovery of the cut-up technique of writing made famous by his friend, the novelist William S. Burroughs (Briongysin.com, Accessed Feb. 2017).

⁵⁸ Ian Sommerville (1940-1976): Sommerville was a British computer programmer and electronics technician. His claim to fame is through his friendship and association with William S. Burroughs and his circle of Beat Generation writers, artists, and performers (Geiger, 2004: 90).

⁵⁹DreamMachine: DreamMachine was a device created by the Canadian writer Brion Gysin and mathematician and psychological experimenter Ian Sommerville. In its original form, the DreamMachine was constructed from a cylinder with slits cut all the way around it. This cylinder was placed on an old-style record turntable. The cylinder would then be rotated at 78 or 45 revolutions per minute. A light bulb would be suspended in the center of the cylinder. The rotation of the cylinder at the rate of 78 or 45 rpm would cause the light emitting from the cylinder to be a constant frequency of between 8 and 13 pulses per second. This frequency range corresponds to alpha waves of the brain. Alpha waves are electrical oscillations normally present in the human brain while relaxing or near sleep (Gysin, 2010: 35-56).

The *DreamMachine* (1961) was simply a visual device used to induce an Alpha wave⁶⁰ brain state by the rhythmic strobing of flickering light on a recipient's closed eyelids.

In *Analogue Oneironism* (2011), Haill constructed her own DreamMachine based on the Gysin and Sommerville instructions. She then invited participants to experience the reproduced DreamMachine while she captured their brainwave data. This data from the participants was fed into a software programme, which, in turn, caused the multilayered file Haill had created to play over speakers. This audio component of Haill's installation became a second stimulation. When both the visual and auditory stimulation were combined, the two functioned in real time and created a feed back loop that had the effect of then altering the brainwave patterns of the individual participants. Although Haill built upon the original concept of Gysin and Sommerville's DreamMachine, Haill made her incarnation of this installation both interactive and reactive to brainwave data through the use of an audio element. Even though Haill had created the audio she chose to use and did so prior to the event, the audio component was played back in unpredicted and truncated ways that were unique to each participant. Each participant's engagement with Haill's *Analogue Oneironism* (2011) was therefore nuanced and unique to that individual participant. This would lead to the argument that with each new participant *Analogue Oneironism* (2011) was co-created by a hybrid collaboration between Haill and the participant.

In addition, the way Haill exhibited the work helped lead directly to audience participation. Haill exhibited *Analogue Oneironism* (2011) as a performance installation at The Playgroup Festival in 2011 for the 'Forest of Thoughts' Art and Science tent. The exhibit occurred in an ad hoc environment where audience members were asked to volunteer. The use of the device by audience members, which was ultimately a type of performance that piqued the interest of others, caused other audience members to try the device. Had Haill chosen an exhibition format that had been in keeping with or consistent with a more classical format, the format might not

⁶⁰ Alpha waves: Alpha waves are neural oscillations in the frequency range of 7.5–12.5 Hz arising from synchronous and coherent electrical activity of thalamic pacemaker cells in humans. They are also called Berger's wave in memory of the founder of the EEG. Alpha waves are one type of brain wave that can be detected either by electroencephalography (EEG) or magnetoencephalography (MEG) and they predominantly originate from the occipital lobe during wakeful relaxation with closed eyes. Alpha waves are reduced with open eyes, drowsiness, and sleep. Occipital alpha waves during periods of eyes closed are the strongest EEG brain signals (Psychology Today, 2017).

have been so engaging. Rather, the choice of a less engaging format might have resulted in more passive spectators and less active participants.

Batoh's Brain Pulse Music

Masaki Batoh's *Brain Pulse Music* (2012) began as a project where Batoh sought to capture brain wave activity and translate it to sound that he would compile into a musical album. Working in conjunction with company MKC, Batoh developed an EEG head set system called the BPM Machine (Watercutter, 2012). The BPM Machine is made up of a strange-looking science fiction themed headgear that works in conjunction with a motherboard control system (Watercutter, 2012). The area of the brain that the BPM Machine draws its data from is localized to the parietal and frontal lobes. The headset detects the brain waves of the wearer and translates them into radio waves that are then transmitted to the motherboard component. The main function of the motherboard is that it converts the transcoded brain waves into a wave pulse that is output as modulated sound (Watercutter, 2012). The sound that is generated by this device is best described as futuristic and eerie with unique oscillations and reverberations of both tone and frequency. The BPM Machine can be used as a stand-alone audio synthesizer or as an audio effect device in conjunction with traditional instruments like keyboards, electric guitars, or microphones (Watercutter, 2012).

The structure and ethos of *Brain Pulse Music* (2012) changed from being solely a musical project created around Batoh's exploration into brain waves that were turned into experimental musical scores after March 2011. In March 2011, a large earthquake and subsequent tsunami hit the coast of Japan and devastated the country. Batoh, who supplements his experimental music career by running an acupuncture clinic, noticed that when treating survivors of the tsunami disaster many of those survivors were suffering from extreme anxiety, depression, and mental instability. In an effort to bring comfort and relief to his patients, Batoh began combining the use of the BPM Machine with acupuncture in the hopes of reconnecting his patients' bodies and minds into a state of harmony. Batoh described this treatment process to *Wired*, with the following quotation, 'Acupuncture's effects on one's autonomic nervous system is connected to the brain directly' (Watercutter, 2012). Batoh also stated that 'BPM works on the brain waves directly, which means both of them operate with synchrony and diachrony' (Watercutter, 2012). As he began this new treatment method, his previous album's conceptual life was reborn and took a new focus.

Thus, the focus of *Brain Pulse Music* (2012) was shifted away from experimental musical exploration and was, instead, shifted towards the healing process of the survivors of the tsunami. Batoh utilised audio recordings that were taken from the therapy sessions he held with his patients. The interaction utilised in creating the final version of *Brain Pulse Music* (2012) was in the form of one on one sessions between Batoh and his patients. In these sessions, Batoh worked to create an experience of harmony between the patients' minds and bodies using the BPM and traditional acupuncture. To help facilitate this process, Batoh fitted the BPM headset with 'bizarre goggles [that] have indicator lamps synchronized with the motherboard so the performer can see their brain's musical output[,] in addition to hearing it (Watercutter, 2012). This approach to interaction differs from the other works researched because it is not connected directly to an exhibition or an audience's reception of the work. Likewise, the experience aspect is only in retrospect, much like reading a description or documentation of Kaprow's 'Happenings' where the only proof of the artistic rendering is first hand accounts documented through written descriptions, notes, and photographs.

Park's Eunoia

The next work chosen was Lisa Park's *Eunoia* (2013). In *Eunoia* (2013), Park is exploring questions concerning vulnerability, liberation, and self-control (Chow, 2013). This is done with the use of a different EEG device than the devices used by either Haill or Batoh. Instead, the device Park used was a commercial headset embedded with an EEG sensor made by NeroSky⁶¹. This headset monitored the artist's brain activity while she is engaged in meditation. The data collected from Park's brain is then translated into vibrations that are experienced by spectators as ripples in water (Chow, 2013). Park herself describes the work as follows:

'Eunoia' is a performance that uses my brainwaves — collected via EEG sensor — to manipulate the motions of water. It derives from the Greek word 'ey' (well) + 'nous' (mind) meaning 'beautiful thinking'. EEG is a brainwave-detecting sensor. It measures frequencies of my brain activity (Alpha, Beta, Delta, Gamma, Theta) relating to my state of consciousness while wearing it. The data collected from EEG is

⁶¹ NeroSky EEG Headset: The NeroSky headset is a consumer grade device that utilises priority algorithms to interpret brainwave data through the use of an EEG biosensor. NeroSky utilises a single EEG biosensor chip. The traditional use for a NeroSky headset is for videogame applications that are focused on concentration, working memory, and mind acuity. The NeroSky website also provides a list of the following other uses: meditation, relaxation monitoring, and an improved educational process (Neurosky.com, Accessed Dec. 2014).

translated in real-time to modulate vibrations of sound with using software programs. EEG sends the information of my brain activity to Processing, which is linked with Max/MSP to receive data and generate sound from Reaktor (Lisa Park, Accessed Sep. 2013).

The mechanics and physical manifestation of *Eunoia* (2013) is elegant. Park sits amongst five twenty-four inch plates filled with water balanced on top of fifteen-inch speakers arranged in a circle with her at the centre. Her brainwaves are translated to the speakers by software and a NeroSky EEG headset. During her performance, Park works on a simple visual metaphor where each of the five dishes are meant to represent a particular emotion and together are infinite unity. Spectators watch as Park is attempting to achieve enlightenment (Chow, 2013). Park's *Eunoia* was included within this set of case studies chiefly because of the direct way in which Park's connection and interaction through the EEG technology is the gestalt of her work — meaning that the connection and/or interaction between Park and *Eunoia* is the physical manifestation of Park's emotions and the feedback that the physical manifestation allows for. In the simplest of terms, Park and the audience are aware of how Park's mental state is influencing the interaction.

These three artworks, while only a small sampling of contemporary interactive artworks utilising EEG technology, were chosen due to their co-existing dynamism and simplicity. The artworks, along with the theories discussed herein—including those of interaction, art as experience, play, and authorship—were influential in many of the choices made in creating the interactive artworks. Thus, the art and theory discussed in this chapter have been considered and incorporated into the practice based component of this thesis (*see infra*, Chapter Three, Practice Based Review, pages 72-120), in addition to the contributions offered to the field of art and computational technology. However, before turning to a discussion of the practice research, the methods and methodologies employed in both the research and practice-based component of this thesis must first be discussed.

CHAPTER TWO: METHODS AND METHODOLOGIES



This chapter will discuss the three primary methods I have utilised in both the research and practice based components of this thesis and the methodologies that have informed the development and use of these methods. The three primary methods I have utilised for this thesis are based on an art practice conceptual goal, prototype testing, and participant observations. These methods were integral to every stage of this thesis from the formation of theories to the physical production of Brain Machine Interface based interactive artworks. As such, these methods combined to inform all stages of the practice process from the research and concept stage, to outlining the structure, to the construction of fully rendered working products. The methods themselves are interdisciplinary in structure and draw mainly from theories and concepts derived from various aspects of the work of philosophers Donald Schön and Martin Heidegger; fine artists and academics Allan Kaprow, Hazel Smith, and Rodger Dean; and art theorists Estelle Barrett and Barbara Bolt. This chapter provides a detailed analysis of these methods and the methodologies that have informed these methods to demonstrate how information was gathered and utilised for purpose of this practice based thesis.

Conceptual Form as a Method

Adopting the conceptual form as a method is a process that I utilised where the form and function of an artwork centres on a conceptual goal or output. This conceptual goal dictates all elements of the artwork through research, iteration, and refinement of the philosophical conceptual engine. The major concern that drove the adoption of this method was finding or creating a model for structuring the network of theories and referential artistic practices studied. Thus, the purpose of this method was intended to not only be in the form of an ingress into gathering information, but was also intended to function to direct future paths of the inquiry, all while keeping ready the conceptual goals and aims of the artwork. Thus, the function of the conceptual form as a method is to take the artwork's core conceptual artistic foundation and use it as the driving force that dictates all the facets of the research and artistic production.

In deciding to utilise the conceptual form as a method, I first considered and test fitted two similar research models. While these research models were not ultimately adopted for the purpose of the research and practice based components of this thesis, the method I have employed utilising the conceptual form draws from and

is informed by these models. Therefore, in fully explaining how I decided to employ the conceptual form as a method and how it is applied, I begin by discussing and defining each of these models and then move on towards explaining their role in the decision to utilise the conceptual form as a method.

Iterative Cyclic Web

The first model is a research model created by Hazel Smith and Rodger Dean called 'Method the Iterative Cyclic Web' (Smith & Dean, 2012: 19-35). The Iterative Cyclic Web Model is a research model that is used to illustrate the type of connection between a research process and the creative output. The model allows for a combined system by utilising a three-tiered framing of 'Practice-Led Research', 'Research-Led Practice', and 'Academic Research Facilitation'. This model is designed to give a researcher the ability to flow freely between each of these states as the researcher's process evolves through a series of iteration cycles that span the three modes (Smith & Dean, 2012: 19-25).

Smith and Dean use the term, 'Practice-Led Research' to describe two distinct states in which they see practice based works of art being positioned. The first of these states being that the work of art as a physical object is a self-contained form or mode of research. The second state is the mode of making or the creation of said work of art. Smith and Dean view the mode of making or creating of the artwork as a separate and distinct generator of research insights and knowledge apart from the knowledge and insights gained from the finished object, itself (Smith & Dean, 2012: 7). There is, however, a caveat to these notions. Smith and Dean have defined, and in doing so limited, when a work of art can be classified as 'Practice-Led Research'. They have expressed this limitation by stating, 'In our view for an artwork itself to be a form of research, it needs to contain knowledge which is new and that can be transferred to other contexts, with little further explanation, elaboration or codification, even if this transferral involves a degree of transformation' (Smith & Dean, 2012: 7).

The term, 'Research-Led Practice' is used to classify what Smith and Dean describe as the critical complementing element to their concept of 'Practice-Led Research'. Chiefly, Research-Led Practice is the idea that scholarly research can be the inspiration for creative work. While applying this idea of Practice-Led Research to artistic based research endeavours, Smith and Dean acknowledge that this mode occurs more readily or regularly in other fields of research outside of art: 'For us it

originates in the contemporary *modus operandi* of science, engineering, technology, and medical research, in which research work is directed not only towards the elucidation of falsifiable ideas but also towards the production of practical outcomes' (Smith & Dean, 2012: 7).

The term, 'Academic Research Facilitation' is described by Smith and Dean as being akin to a type of lynchpin in regard to the interplay of the 'Practice-Led Research', and 'Research-Led Practice' within the 'The Iterative Cyclic Web' model. Its role has a critical manifestation in their model because it is used as a catalyst for interacting, informing, and causing reactions that fuel both the 'Practice-Led Research' and 'Research-Led Practice' to feed off itself and the other modes (Smith & Dean, 2012: 2-9).

Modes of Knowing

The second model that was test fitted for this thesis is Robin Nelson's 'Modes of Knowing' (Nelson, 2013: 36-47). This model is a research system that focuses on an imbricating theory or scholarly investigation in to practical practice production. This is done through a systematic analysis pursuant to Nelson's modes of 'Knowing'. These modes of knowing are: 'Know-how', 'Know-what', and 'Know-that' (Nelson, 2013: 41-47).

'Know-how' is what Nelson defines as 'procedural knowledge' (Nelson, 2013: 41-44). More specifically, 'Know-how' is tacit knowledge or process learned motor skills. Nelson is referencing the concept of tacit knowledge as defined by Michael Polanyi in *The Tacit Dimension*, as 'the fact that we can know more than we can tell' (Polanyi, 1966: 4). Nelson likens it to knowing how to ride a bike or drive a car after systematic practice of these skills. 'Know-how' is the doing of a complex set of tasks via muscle memory that is independent of the in-depth knowing or understanding of the physical or physics principles evolved in facilitating the process. Nelson illuminates the idea of 'Know-how' through his use of the example of knowing how to ride a bicycle by explaining that the act of riding a bicycle is done largely without thinking or understanding the laws of motion or centrifugal forces that are at work and that allow the bike to remain upright (Nelson, 2013: 41-44).

'Know-what' as Nelson points out, is what can be learned from conscious informed critical reflection on the act or process of making (Nelson, 2013: 44). Nelson clarifies this assertion by citing the following text from the American philosopher Donald Schön, '[a] practitioner's reflection can serve as corrective to

overlearning. Through reflection he can learn and criticize the tacit understanding that have grown up around the repetitive experiences of a specialized practice' (Schön in Nelson, 2013: 44).

The last mode of 'Knowing' in Nelson's model is 'Know-that'. This mode centers on 'the equivalent of traditional "academic knowledge" articulated in words and numbers'. In other words, this is knowledge derived from primary sources. Primary sources are important to this mode because, '[t]acit knowledge may be too close (proximal) for it to be fully recognized' (Nelson, 2013: 46), and might become too formulaic or static and not progress to any new knowledge production (Nelson, 2013: 45-47).

Informing the Conceptual Form as a Method

The reason these two models were initially chosen was because they are structured around 'Praxis' (Bolt, 2011: 86-103; Nelson, 2012:40-41; Smith and Dean 2012: 19-35), or 'our being in the world' (Bolt, 2011: 179), but seen in the sphere of practice as research as a type of intelligent practice informed by doing or handling (Bolt, 2011: 86-103; Nelson, 2012: 40-41; Smith & Dean, 2012: 19-35). The concept of handling is a complex and nuanced systematic set of philosophical inquiries in art production proposed by the German philosopher Martin Heidegger in his 1927 book, *Being and Time*. Barbara Bolt eloquently distills Heidegger's theorem of handling briefly by stating, 'we come to know the world theoretically only after we have come to understand it through handling' (Bolt, 2011: 30).

Heidegger's notion of handling is a facet of his larger concept of 'being-in-the-world' (Bolt, 2011: 88). Bolt unpacked this concept as: '[B]eing-in-the-world is concerned with handling or dealing with things in the world, whether it is with tools, with emotions, ideas or other beings' (Bolt, 2011: 88). Bolt contends that it is art's unique way of negotiating and learning from 'being-in-the-world' that makes the praxical knowledge it creates so important. According to Bolt, 'Heidegger suggests that in our everyday handling of things we tend to act out of habit, and forget to notice what things *are* in themselves' (Bolt, 2007: 88), but art is centred in a 'privileged place' because of its 'capacity to create a clearing, a space where we once again notice what entities are in themselves' (Bolt, 2007: 89).

This idea of 'being in the world' and the idea of habit or routine are clearly reflected in Nelson's 'Modes of Knowing'. Importantly, this process of knowledge being gained through self-observation of the rote or the routine of well trained

practitioner art production is also a meaningful element of the structure fueling Allan Kaprow's evolution of 'Happenings'. Kaprow was aware that mindful and critical observation not only gleans new tacit knowledge, but he asserted that the observation itself could and indeed would alter that which was observed. Kaprow's own take on knowledge being gained through self-observation — the idea that Nelson would later coin as 'Know-what' — is summarized somewhat singularly in Kaprow's 1990 essay *Meaning of Life*. There, Kaprow stated, 'What happens when you pay close attention to anything, especially routine behavior, is that it *changes*. Attention alters what is attended' (Kaprow, 1993: 236). Given Kaprow's predominant influence on this practice based thesis, the application of these principles that guide the close observation or reflection of the rote or routine as part of utilising the conceptual form as a method were informative in gaining knowledge from and guiding my own practice.

However, with that said, at the onset of test fitting these research models as a framework, it became clear that the prevailing model that would inform applying the conceptual method was the 'Iterative Cyclic Web' (Smith & Dean, 2012: 19-35). This was apparent because, as my academic and practice research began to take shape, the use of 'iteration' — where the research leads the practice but the practice then feeds back in to the research thereby leading the research (Smith & Dean, 2012: 19-25) — in both the design and research foundations of the practice became crucial. As a result, the equal and circular principles of the 'Iterative Cyclic Web', with its oscillation between the 'Practice-Led research', 'Research-Led practice', and 'Academic Research Facilitation' (Smith & Dean, 2012: 19-25) models more heavily informed the conceptual-form centred method than Nelson's 'Modes of Knowing'. Therefore, the Iterative Cyclic Web model was adapted to and informed the method of focusing on the conceptual form, because it is based heavily on the three-distinct practice based research approaches discussed above and because navigating in between these approaches was made instinctual due, in part, to the nature of the interactive process and because it allowed the project to continue to be reinvented to better fit around the concepts driving the artwork.

The conceptual form as a method also draws from Kaprow's 'Happenings' in integrating aspects of the interactive process. Specifically, the conceptual form method uses formal elements from the structure of Kaprow's 'Happenings', or lack of structure, in formulating an operational model. In later iterations of the 'Happenings',

Kaprow devised tentative outlines or structures used to loosely direct how a given performance or occurrence of a ‘Happening’ would take shape and thereby formulate its initial structure (Kaprow, 2003: 15-20). The method of conceptual form uses a similar precept in its format. The conceptual idea of a collaborative approach to interactive art production is the precept that outlines practice in this thesis. Thus, the precept — here, collaboration — is the only rigid element in this method.

The system of instituting a conceptual goal as a rigid element is a dynamic way to weave the same structure throughout every research mode and give an overarching infrastructure to all aspects of the research. For purposes of this practice based thesis, this approach has provided a rough outline to map the progression of the ‘Practice-Led research’, ‘Research-Led practice’, and ‘Academic Research Facilitation’. In addition, the system of instituting a conceptual goal as a rigid element simultaneously functions to keep the continued research on task by maintaining the focus of the research — which, again, in this case is interaction and collaboration. In other words, the use of a rigid element serves to act as a litmus test to ensure that the theoretical reasoning and technological selections combine to produce the desired practice outcomes. In summation, the use of a rigid element operates as an atlas to maintain, shape, and assist in the evolution of the trajectory of primary source

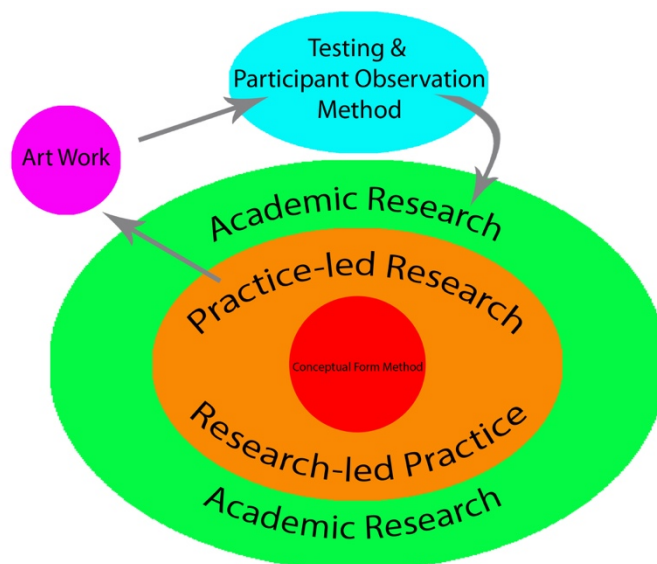


Figure 1: Illustration of Iteration Model

inquiries. Thus, given that the rigid conceptual goal for the purpose of this practice based thesis is the interaction or the collaborative process, employing the conceptual form as a method allowed the focus of the research, design, and the physical product to be guided and informed by the concept of interaction and collaboration throughout the process in its various iterations.

Testing and Participant Observation Methods

The Testing and Participant Observation Methods used in this thesis are derived from combining theoretical aspects of several methods from the spheres of traditional psychology, sociology, and anthropology research methods. At the outset of narrowing down the different theories and creating a hybrid approach to data collection the terms of ‘Observation’ and ‘Participant Observation’ must be defined. Thus, within the context of this thesis the definition of ‘Observation’ by Catherine Marshall and Gretchen Rossman was applied. Marshall and Rossman define “observation” as, ‘[A] systematic description of events, behaviors, and artifacts in the social setting chosen for study’ (Marshall & Rossman, 1989: 79). ‘Participant Observation’ within the context of this thesis is defined as set out by Kathleen DeWalt and Billie DeWalt. DeWalt and DeWalt define participant observation as the ‘Process enabling researchers to learn about the activities of the people under study in the natural setting through observing and participating in those activities. According to DeWalt and DeWalt, participant observation provides the context for development of sampling guidelines and interview guides’ (Dewalt & DeWalt in Kawulich, 2005: 2). These definitions were also combined with the, ‘Live Methods’ aspiration of, ‘imagination through creative collaborations, publicness and exhibiting’ (Back & Puwar, 2012: 3) to create a process of testing the products of this practice in iterations.

Such testing and observation was a crucial aspect of ensuring that the interactive processes worked as desired. As Ernest Edmonds notes in his paper, *The Art of Interaction*,

A painter might not explicitly consider the viewer at all. It is quite possible to paint a picture by only considering the properties of the paint, the colours and the forms constructed with them. In an interactive work, on the other hand, as behaviour is central to its very existence, the artist can hardly ignore audience engagement within the making process. This is where the most significant implications of

interactive art for creative practice lies. As we know from the world of HCI, reliable predictions of human behaviour in relation to interactive systems are not available, except in certain very simple cases. Observation, in some sense, of an interactive system in action is the only way to understand it (Edmonds, 2010a: 260).

This creates the need for artists to test their works at various different stages.

Edmonds recognizes this necessity that arises in the context of interactive art, stating:

A significant feature of the increasing role of research has been the need for artists to try their works out with the public before completion. Because an interactive work is not complete without participants and because the nature of the interactive experience may depend significantly on context, an artist cannot finish the work alone in the studio (Edmonds, 2010a: 260)⁶².

In keeping with these ideas that interactive works must be tested, a number of experiments in interaction were undertaken as part of the practice based component of this thesis, because, as Edmonds acknowledged, 'In all cases engagement with the public can provide critical information for further iterations of the artwork or of the research' (Edmonds, 2010a: 261).

The testing for the practice based component of this thesis was done via a bifurcated lab and field-testing process. The first stage of the testing process was undertaken as a solo practitioner trial. The second stage of the bifurcated process was to move the testing forward from solo practitioner to informal group participation. The aim of this test process was the evaluation of the various iterations or evaluations of the B.M.I system of creative art production against principles incorporated within the conceptual form focused method.

As a practitioner and as a researcher, I was present at all stages of the iteration testing. This being the case, my role was one of 'Selective Observation'. 'Selective Observation' is defined as being where '[a] researcher focuses on different types of activities to help delineate the differences in those activities' (Angrosino and dePerez, 2000: 677). To gather data in this way, I relied on reflective journals that were kept in

⁶² To aid in the difficulties presented by the need for testing and observation of interactive processes before the interactive work is complete, Edmonds notes that one example 'of an approach to dealing with the problem is Beta_Space' (Edmonds, 2010: 4). Beta_Space is the product of the collaborative efforts of The Powerhouse Museum Sydney and the Creativity and Cognition Studios, University of Technology Sydney. Beta_Space provides an environment for experimental exhibition. Beta_Space 'shows interactive artworks in development that are ready for some kind of evaluation and/or refinement in response to participant engagement' (Edmonds, 2010: 4). The artworks are shown at various stages of development, 'from early prototype to end product' (Edmonds, 2010a: 261).

a series of bullet point style hand written notes comprised of personal reflections and keywords and phrases overheard as group members engaged in casual discourse after having a chance to use the B.M.I interactive artwork (Appendix D).

By gathering data in this manner, I employed a method known as the 'Fly-on-the-Wall' (Martin & Haninton, 2012: 90). This method was selected because it can be viewed as a sub-method of the traditional observation method. In addition, and perhaps more importantly, the Fly-on-the-Wall method was selected because it can serve to negate the 'Hawthorne Effect' or observer effect/viewing effect (Coombs & Smith, 2003: 98-99). The 'Hawthorne Effect' occurs where the individuals studied or polled attempt to change or improve their behaviours as a direct result of their awareness that they are being observed (Coombs & Smith, 2003: 98-99). With this effect in mind, the 'Fly-on-the-Wall' approach was employed in conjunction with the more traditional questionnaire method to help protect against the 'Hawthorne Effect' and with the hope of ensuring that I received more candid information or feedback.

While the information received from the 'Fly-on-the-Wall' approach provided the opportunity to acquire candid responses from the participants, the questionnaire method helped to obtain insight into areas perhaps not being consciously considered by participants or, at the very least, not being discussed with other participants. These questionnaires were used in one of the initial iterations of experimentation to assist in determining how to alter and improve upon the interactive processes at work, and then again in the final experimentation to ensure that the interactive process was working as desired and to obtain information relevant to the exhibition space. The iteration for which questionnaires were utilised were *The Lamp Experiment* (2015) and *The Jack in the Box* (2017). The questionnaires covered issues such as the participant's initial reaction to the objects and equipment; the participant's desire, or lack thereof, to engage in the interactive process; and the affect of the ESP-like nature of the experiment (*See infra* Appendices A & B).

Another method for procuring information that would assist in the development of the different iterations of experimentation conducted as part of this thesis, was my creation of a website and forum to allow me to communicate and share information with my larger research community of people conducting technological do it yourself hacking projects. The website acted primarily as a place to showcase video documentation of the various iterations of interactive experimentation I conducted and allow for people to provide feedback, questions, and commentary. The

website also included a forum where people had the ability to post questions regarding the interactive experiments I was undertaking, along with questions about the technology being used, or share information they may possess based on their own use of or experimentation with similar technologies. Given this aspect of community sharing, the forum also provided an avenue for asking questions of my own and engaging with my larger research community.

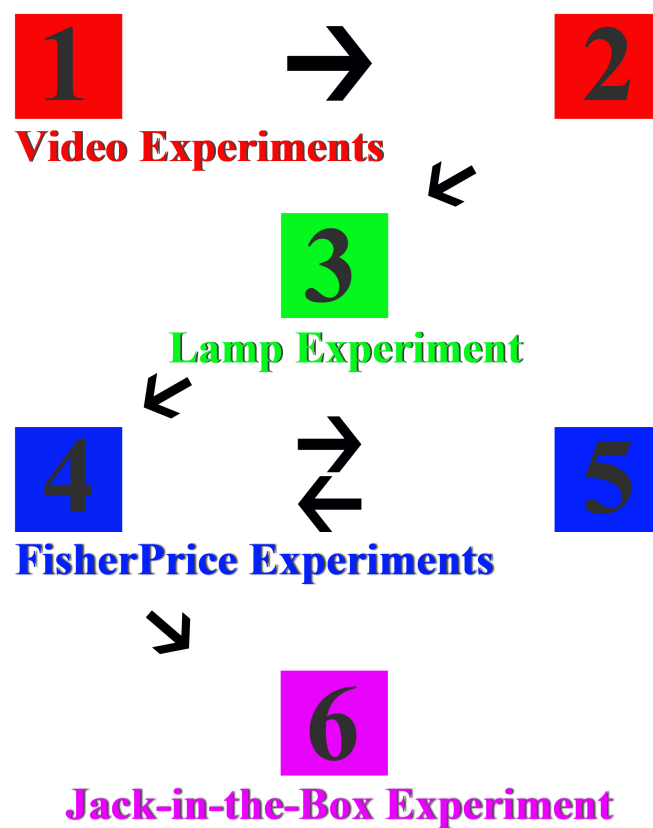


Figure 2: Illustration of Experiment Iterations

By utilising the process of selective observation, polling participants in a limited fashion, and creating a forum for community sharing, I was able to examine the viability of the B.M.I interactive system and to gauge its adherence to the aims derived from applying the conceptual form as a method. The data gathered was then directly implemented by analysing it in conjunction with the B.M.I interactive artwork. The given version of the total system would then be assessed and a rendering of the work would be generated focusing on strength, shortcomings, and technical or conceptual failings. The purpose of this process was to determine what conceptual, aesthetic, and/or technical problems existed such that they could be transformed or removed and what aspects established coherence with the conceptual-form focused method and were therefore retained or modified. New knowledge was then gleaned and evaluated to form a new set of inquires that would then be researched and considered via the conceptual form as a method.

CHAPTER THREE: PRACTICE BASED REVIEW



The practice connected to this PhD is aimed at using interactive computing in relation to art and computational technology to create visual elements using predetermined constructed and/or live components. These elements will be rearranged or reinterpreted based on brainwave data input that is taken from viewers and/or participants. It will systematically attempt to combine aspects of experience-based interactive art to create a finished work that not only engages the viewer, but also causes the viewer to spend time examining the artwork in terms of its aesthetics and functionality. It will also attempt to give the role of the audience, as active participants, a level of co-authorship along side myself, as in this case, artist-researcher-practitioner.

Equipment

The technological requirements for the practice aspect of this research centre on the use of devices to capture and translate EEG data into visually perceived information. Accordingly, this process began with research and investigation into the different headset choices available. Each of the possible headset systems was weighed against various aesthetical concerns and goals. Next, I considered many different programming platforms that might meet the technical requirements of that device and aesthetical choices connected to the goals of the practice. The search for a suitable headset began by looking at the various devices chosen by other artists and videogame researchers working with EEG technologies, namely the NeroSky Mindwave, and the Emotiv EPOC/EEG⁶³.

NeroSky EEG Headset

The first headset system that was considered — the NeroSky EEG headset — came from a list of the headsets utilised by the artists in the preceding case studies. The NeroSky headset was the system at the centre of Lisa Park's *Eunoia* (2013), and was chosen as the first device to test because of Park's stunning performances utilising this device. After researching the NeroSky's technical specifications, the choice to move forward with this device was made for three critical reasons. The first

⁶³Emotiv EPOC/EEG: The Emotiv EPOC is an EEG detecting high resolution, multi-channel portable headset system. It has been designed for practical research applications. Using a portrait software package developed by Emotiv called Testbench and Emotiv Control Panel. This software allows the headset to receive raw EEG data from the Neuroheadset and also allows Testbench to use the following custom APIs and detection libraries: Mental Commands, Performance Metrics & Emotional States, and Facial Expressions (Emotiv.com, Accessed Jun. 2014).

reason being the simplistic nature of its construction and implementation; the second reason being its ability to be used across all programming and operating system platforms; and, the third reason being the wealth of documentation provided by artists, programmers, and developers in connection to its functions and possible uses. These three key elements were primary in ascertaining how the headset could be used to foster interaction and how an experience could be constructed by utilising the headset.

The construction and implementation of the NeroSky headset makes the device extremely user friendly. The form of its construction is likened to that of a typical audio, over-the-ear headphones. This design made the NeroSky headset seem less alien or foreign and had the affect of making it seem approachable to almost all potential recipients. The implementation of the NeroSky device was also very simple. The NeroSky sits on the head in very much the same way headphones do; however, it differs from headphones in that it has a single biosensor chip on an arm that sits on the forehead and one grounding electrode that is clipped to an earlobe. Once the headset is adjusted to fit on a recipient's head, the chip is placed on the forehead, and the grounding clip is connected to the earlobe, the device is ready to pair with a computer, tablet, or other smart device. Also, this device is adjustable so as to allow for the accommodation of prescription spectacles.

The NeroSky headset uses a priority software system to translate the signals received by the biosensor chip and then to relay them to the computer. This software is called the NeroSky Thinkgear Connector⁶⁴ or TGC. The TGC allows the data collected to be routed to a developer's environment that contains a socket library. This versatility made the NeroSky headset very ubiquitous from a computer-programming standpoint, but also makes its integration in many integrated developers environments, or IDE, seamless.

⁶⁴ ThinkGear Connector: The ThinkGear Connector or (TGC) is a software developers package created by NeroSky to connect the NeroSky Mindwave headset to Windows or Mac platform systems. ThinkGear runs as a background process on a computer and relays headset data from the serial port to an open network socket. It demonstrates great versatility by accepting any language or framework that contains a socket library. TGC is an ideal option for developers working in frameworks like Adobe Flash or openFrameworks (Nerosky.com, Accessed Dec. 2014).

The IDE that I selected to work with was Cycling74's Max MPS/Jitter⁶⁵. The Max IDE system was chosen for the programming component of the interactive system because of its ability to render programme modules in real time without the need for compiling. And, perhaps even more importantly, the Max IDE system was chosen because of its graphical user interface format. Another key reason worth mentioning for choosing the Max IDE system is Max's long history of development in the field of interactive multimedia. Because Max has such a long-standing history in the interactive multimedia field, a modular nature, and a library driven format, there exists a vast repository of peer shared open source add-ons to choose from. Even though the NeroSky Mindwave headset and the ThinkGear connector exhibited a number of positive attributes in connection with user friendliness and cross platform operating system support, the NeroSky Mindwave headset also had some drawbacks in the practical application of the headset in conjunction with the experiments created for the practice.

Critical Reflections

As my practice evolved using the NeroSky system, two primary critical concerns developed. The first of these concerns that I noted was a slow data transfer rate. In fairness to the NeroSky developers, the issue regarding the slow data transfer rate had more to do with the nature of how I desired the interaction process to unfold as an aesthetical element, and was not necessarily due to a failure of their system to perform as a whole. The interaction required by my practice needed to have an almost instantaneous feel. This need for an instantaneous feel is to better allow the participant and audience members to clearly identify the moment of interaction between artist and participant, as this moment is the gestalt of my work. The NeroSky Mindwave headset rendered brain wave data into usable signals in two to five second intervals. Unfortunately, the two to five second intervals did not give the interaction either an instantaneous or a fluid feel, and was, therefore, less than ideal for the interactive experience desired to be achieved by the practice goals.

⁶⁵ Max MSP/Jitter: Max MSP is a programming IDE that is itself modular in structure. It is mainly made up from routines existing in the form of shared libraries. Max uses a graphical interface, which mimics traditional GUI, making programming more akin to using photo editing software or media editors. Its focus is centred on developing interactive music and media performance software (Cycling74.com, Accessed Nov. 2014).

The second issue that arose was in connection to the ease in which participants could be cycled in and out of the headset's use. The main drawback found in connecting to changing users was that the headset had to be re-paired with the computer each time the participant was switched out. The process of restarting the connection protocol to allow the new participant to interact with the system took upwards of ten minutes. Again, this being a critical problem distills down to elements of aesthetic concerns related to the desired experience fostered in the interaction. Namely, the delays involved in changing the headset from one participant to the next would detract from the mystical or magical nature that later iterations of the work were trying to convey and would diminish the ability to foster the interaction or participation of members of the audience. When these two issues were discovered, the choice to conduct further experiments with another EEG headset system was a foregone conclusion. The next step was to conduct research into other headsets that could possibly assist in creating the interaction and aesthetic required by the practice goals articulated herein and address the deficiencies discovered with the NeroSky system.

Emotiv EPOC/EEG Headset

This research into other headsets resulted in discovering and testing the Emotiv EPOC/EEG. Thus, the Emotiv EPOC/EEG was the second headset utilised for this artist's practice based experiments. The Emotiv headset is close in design to a standard EEG Electro-Cap⁶⁶. The Emotiv operates using a fourteen channel electrode system, which allows EEG data to be rendered at high speeds and high resolutions. The Emotiv Testbench and Emotiv Control Panel software in conjunction with the EPOC/EEG headset can detect and interpret EEG data in higher resolutions than the Nerosky single Biosensor chip. Additionally, this software in conjunction with the EPOC/EEG headset can also detect emotional and thought pattern mapping⁶⁷. The

⁶⁶ Electro-Caps: Electro-Caps are an EEG electrode application technique used to collect EEG data. They are traditionally made of an elastic spandex-type fabric with imbedded, pure tin electrodes attached to the fabric. The electrodes on the standard caps are positioned to the International 10-20 method of electrode placement (Bio-medical.com, Accessed Feb. 2014).

⁶⁷ Thought Pattern Mapping: Thought Pattern Mapping in this context refers to training the Emotiv Control Panel software to detect, store, and interpret patterns of repetitive thoughts that are then translated to a function. An example of this is the manipulation of a digital three-dimensional cube in virtual space. The cube can be controlled in the following ways: push, pull, levitate, and rotate, and even hard to visualize commands, such as disappear. These control functions can then be translated to video game elements to replace conventional hand manipulated devices such as game pads and joysticks. It can also be used to control real world

implementation of the Emotiv EPOC/EEG system solved the deficiencies that arose using the Nerosky system, yet posed challenges of its own in regard to implementation.

The Emotiv Headset has a data transfer rate that was significantly faster than the Nerosky, which allowed the interaction to be perceived as instantaneous. The Emotiv also allows for much faster user cycling. In addition, its sensor design layout allows it to adapt to various head sizes automatically permitting the device to be fitted to adults and youths alike. The challenges that arose with the implementation of the Emotiv system stemmed from the same design features that solved the problems seen with the Nerosky system. This design feature is the sensors themselves. The sensors used with the Emotiv headset require felt pads that use a turn and locking mechanism to fit them to the headset. This mechanism tends at times to fail when switching between users and causes the sensors to disassemble. Furthermore, the felt components of the sensors require a saline wetting solution to enable conductivity. This wetting process needs to be repeated in intervals averaging every 45 to 60 minutes of usage and the dampness of these components can be off-putting to some users. These challenges aside, the Emotiv system is still superior to the Nerosky system based on the initial research conducted in the practice based research component of this PhD.

NeuroGame Jam

During my early stages of researching and investigating the different headset choices available, I participated in the NeuroGame Jam in order to conduct additional exploration into how the headsets operated, as well as their functionality and limitations. The NeuroGame Jam was an international video game conference, workshop, and design competition designed to help teach and foster the interests of children within the fields of computer programming, video game design techniques, and neuroscience. The NeuroGame Jam was hosted by two entities: the Rio Grande Chapter⁶⁸ of the International Game Developers Association⁶⁹ and the University of

devices that utilise Bluetooth or WIFI remote control interfaces. In the context of this PhD research the Thought Pattern Mapping function was used to operate a quad copter in real-time.

⁶⁸ Rio Grande Chapter: The Rio Grande Chapter of the International Game Developers Association is the local chapter in the region of Albuquerque, New Mexico, U.S.A.

⁶⁹ International Game Developers Association: The International Game Developers Association is one of the largest non-profit membership organisations in the world serving all individuals who

New Mexico's Interdisciplinary Film & Digital Media Department⁷⁰. The event was coordinated and organized by Professor Jonathan Whetzel⁷¹ of both the IGDA and the University of New Mexico's IFDM programme teaching staff and Dr. Chris Forsythe PhD⁷² of the Brain Hackers Association⁷³.

The format of the NeuroGame Jam was centred on having teams of kids from the ages of secondary school up through college and university students. All of the students had the same thing in common, in that, on some level, they were all interested in themes relating to video games, computer programming and neurotechnology. The NeuroGame Jam drew participants from all over the world. Some international teams flew in to be on hand at the University of New Mexico campus while others participated remotely via Skype. The teams were tasked to

design and make computer-based games. The IGDA's mission statement is concerned with, 'Advancing the careers and enhancing the lives of game developers by connecting members with their peers, promoting professional development, and advocating on issues that affect the developer community.' As an international organization, the IGDA is a global network for collaborative projects created by communities comprised of individuals from all fields of game development and the digital arts. The types of professionals that are part of the IGDA are: programmers, producers, writers, and visual and sound artists. The IGDA brings together persons from disciplines connected with games and game development at key industry conferences. The IGDA is made up of over 90 Chapters worldwide. The IGDA advocate on behalf of their members to ensure a quality of life, perpetuation of the craft of game design and development, and preparation of the next generation of developers and game researchers (Igda.com, Accessed Mar. 2014).

⁷⁰ University of New Mexico's Interdisciplinary Film & Digital Media Department: The University of New Mexico's IFDM Department is an interdisciplinary programme that offers detailed instruction in theory and practice in the fields relating to: gaming, engineering, film, video, animation, music, computer science, art, design, photography, writing, communication, journalism, multimedia and business (Ifdm.unm.edu, Accessed Mar. 2014).

⁷¹ Jonathan Whetzel: Jonathan Whetzel is an Artificial Intelligence Researcher working with Sandia National Laboratories, and is also a Game Design and Computer Science Professor at the University of New Mexico in both the Computer Science Department and the Interdisciplinary Film & Digital Media Department. Professor Whetzel has also worked in video game development at PixelBot Laboratories, LLC. Professor Whetzel holds a Master of Science in Computer Science from Texas A & M and a Bachelors of Science in Computer Science also from Texas A & M (Whetzel, 2014).

⁷² Chris Forsythe: Chris Forsythe is a Distinguished Member of Technical Staff at Sandia National Laboratories. Forsythe has also been the president of The Brain Hackers Association since 2013. Forsythe has a PhD in both Cognitive Psychology and Biopsychology from the University of Memphis (Researchgate.net, Accessed Feb. 2014).

⁷³ The Brain Hackers Association: The Brain Hackers Association is a STEM program for youth focused on neurotechnology and applied brain science. It is an after-school club at the Roosevelt Middle School in Tijeras, New Mexico, in the United States. It is a programme created by Dr. Chris Forsythe, PhD. The programme utilises volunteers to help start up new programmes, as well as to provide technical, media, and other support (Brainhackers.net, Accessed Mar. 2014).

create video games or digital devices⁷⁴ that incorporated some elements that were connected to neurophysiology (Neurogamejam.com, Accessed Mar. 2014).

The competition aspect of the NeuroGame Jam set specific elements that were required to be present in the final working game or digital device. These elements were established in the form of three categories that defined the criteria needed for the team's entry to qualify for judging in the NeuroGame Jam competition. Those three categories were: Brain Controlled Games⁷⁵, Recreational Brain Controlled Devices⁷⁶, and Brain Training Games⁷⁷. The NeuroGame Jam judging panel looked for how each team's submission utilised the most innovative approaches to integrating each of the goals of the before mentioned three categories in the development of the final product (Neurogamejam.com, Accessed Mar. 2014).



Figure 3: NeuroGame Jam 2014

My time spent in connection with the NeuroGame Jam was one of a creative and technical consultant. Specifically, my role at the NeuroGame Jam was to help the teams integrate the EEG technological systems of either the NeroSky MindWave or

⁷⁴ Digital Devices: Digital Devices in connection to the NeuroGame Jam referred to Devices for which the primary purpose was entertainment and used one or more neurophysiological sensors. These sensors are used to control one or more functions of the device. For example, the Nekomimi uses a single EEG electrode to sense brain states with the resulting signal controlling a pair of cat ears worn on the head. Similarly, the Puzzlebox Orbit uses EEG signals to drive a remote-controlled helicopter or the Emotiv EPOC using the software MindDrone to control the Parrot AR Drone 2.0 (Neurogamejam.com, Accessed Mar. 2014).

⁷⁵ Brain-Controlled Games: Brain Controlled Games in the context of the NeuroGame Jam were games in which one or more neurophysiological sensors are used to control events within the game (Neurogamejam.com, Accessed Mar. 2014).

⁷⁶ Recreational Brain Controlled Devices: Recreational Brain Controlled Devices in the context of the NeuroGame Jam were Devices for which the primary purpose is entertainment and one or more neurophysiological sensors are used to control one or more functions of the device (Neurogamejam.com, Accessed Mar. 2014).

⁷⁷ Brain Training Games: Brain Training Games in the context of the NeuroGame Jam were Games for which game activities are based on scientific findings concerning the neurocognitive functions of the brain and the purpose of playing the game is to enhance these functions (Emotiv.com, Accessed Jun. 2014).

the Emotiv EPOC into their game or digital device for competition. Based on the research I had completed using both the NeroSky and Emotiv systems, Professor Jonathan Whetzel extended to me this opportunity to work with him and Dr. Chris Forsythe, PhD as part of the NeuroGame Jam. In addition to my role as a creative and technical consultant, I had a unique opportunity to see the EEG systems that I had been engaging with so heavily in my PhD practice used in new and innovative ways. This opportunity also provided me with additional exposure to the fields of game design and development. The opportunity to work as a creative and technical consultant with a combination of people — both those highly experienced in working with this EEG technology and others being newly introduced to this technology — was illuminating with respect to my PhD research in that it allowed me to ascertain and understand some of the possibilities and limitations of the technology itself. It was this exposure to the game design and development that made me research the theories of play and eventually led me to the art historian and researcher Katja Kwastek and her work in connection to aesthetics, interaction, and digital art (*See supra* Chapter One, pages 42-47).

While working with the participants and other researchers at the NeuroGame Jam, I also had the opportunity to conduct a small experiment of my own trying more processes that used the Emotiv EPOC EEG system to control elements outside of the confines of the digital world. This process that I experimented with was to set up the Emotiv EPOC as a means of piloting the flight controls of a Parrot AR Drone 2.0 quad blade copter⁷⁸. In this experiment, I used a special software package called MindDrone⁷⁹ that connects the Emotiv EPOC and its Control Panel software to the Parrot AR Drone 2.0 using a Windows based laptop computer's standard local area wireless computer networking data transfer system or Wi-Fi.

⁷⁸ Parrot AR Drone 2.0 Quad Blade Copter: The Parrot AR Drone 2.0 Quad Blade Copter is a remote controlled four-blade copter that uses Wi-Fi along with a smart device like a phone or tablet as a control input device. The AR drone 2.0 also utilises an onboard smart control system using ground tracking cameras and gyroscopic stabilisation to help the user with flight controls. The AR Drone 2.0 also is equipped with a front facing 720p camera system that allows point of view flying (Parrot.com, Accessed Jan. 2014).

⁷⁹ MindDrone: MindDrone is a software application that lets a Windows based laptop connect and fly the Parrot AR Drone 2.0 using a laptop, Wi-Fi, and the Emotiv EPOC EEG Headset. Mind Drone allows the control flight functions of the AR Drone 2.0 to be mapped to any output of the Emotiv Control Panel software. Using MindDrone allows the AR Drone to be controlled using EEG, Cognitive mapping, facial gestures, eye movements, and head movement (Emotiv.com, Accessed Jun. 2014).

The AR Drone 2.0's flight controls are normally interfaced using Wi-Fi so there was no retooling or recoding required to interface the quad copter with the Windows based laptop. The MindDrone software mimicked the traditional smart device control platform used for flying the quad copter but instead of using touch controls for input it uses input rendered by the Emotiv EPOC. The before mentioned virtual object manipulation protocol that is a standard function of the Emotiv control panel was the protocol use to bridge the EPOC with the AR Drone 2.0 flight controls. The process of using the EPOC to control the quad copter in real time was very problematic. The training of the EPOC headset to understand and implement the flight controls required enormous amounts of setup time and practice. The pace of flight is very fast paced and more often than not the system's override commands had to be implemented to remove control from the EPOC and the participant to avoid crashing the quad copter. This experiment, therefore, highlighted and confirmed some of the concerns that I already had regarding use of the Emotiv EPOC.

Attending and participating in the NeuroGame Jam, while also conducting my own experiments with the available EEG technology, was immensely beneficial in informing future iterations of my practice based research. It allowed me both an opportunity to conduct my own problem solving with respect to the technology, while also allowing me to be part of a larger research community and learn from others also engaged in similar problem-solving endeavours. It allowed me to work neuroscientists and video game developers, and allowed me to see the EEG technology applied in contexts outside of computations studio arts, but still in creative and innovative ways.

Video Experiments (2013-2014)

The first set of interactive experiments that I conducted as part of the practice based research for this thesis were video experiments conducted using the Nerosky MindWave that were later repurposed using the Emotiv EPOC/EEG systems. These early video experiments were designed around two principle investigative needs. The first investigative need being a proof of concept and the second investigative need being to gauge the hardware reception of potential participants. The interactions constructed for the initial tests utilised the two basic detection protocols of attention or concentration⁸⁰ and meditation or mind-emptiness⁸¹, which are both native to the

⁸⁰ Attention or Concentration: The attention or concentration element of both the Nerosky and Emotiv headsets use priority algorithms that are contained within the perspective companion

Nerosky and Emotiv headsets and interpretation of both mental states is a built-in functionality of both software platforms. These interactions were designed in the before mentioned IDE of Max MSP/ Jitter. The Max IDE was used for all of the experiments pertaining to the attention or concentration and meditation or mind-emptiness protocols and involved both the Nerosky and Emotiv EPOC/EEG headsets.

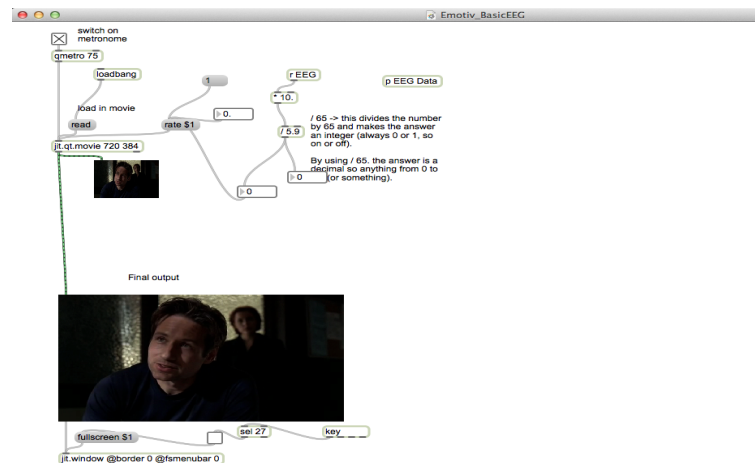


Figure 4: Attention/ Concentration Video Experiment

The first attention or concentration experiment was comprised of a video element that would only play when the given EEG detection system measured a sustained level of attention or concentration of the participant. The video would continue to play while the participant maintained this level of attention or concentration. A slight variation of this experiment was also used in which the level of attention or concentration was not merely an on and off trigger for play of the video element but the controlling factor of the rate of playback. In this instance, the more consistently the participant controlled his or her levels of attention or concentration at a predetermined median level the more fluid the rate of play of the video element was. The lower the level of attention or concentration the participant exhibited the slower the playback was. Conversely, when concentration levels higher than the median

control software that uses the EEG data to ascertain the level of single mindedness or purposeful attention and/or the concentration state of a subject's mind while engaged in a given task (Emotiv.com, Accessed Jun. 2014).

⁸¹Meditation or Mind-emptiness: The meditation or mind-emptiness element of both the Nerosky and Emotiv headsets use priority algorithms that are contained within the perspective companion control software that uses the EEG data to ascertain the level of meditation or empty mindedness state of a subject's mind (Emotiv, Accessed Jun. 2014).

threshold were exhibited the video playback occurred at a rate that could exceed over twice the rate of normal playback speed.

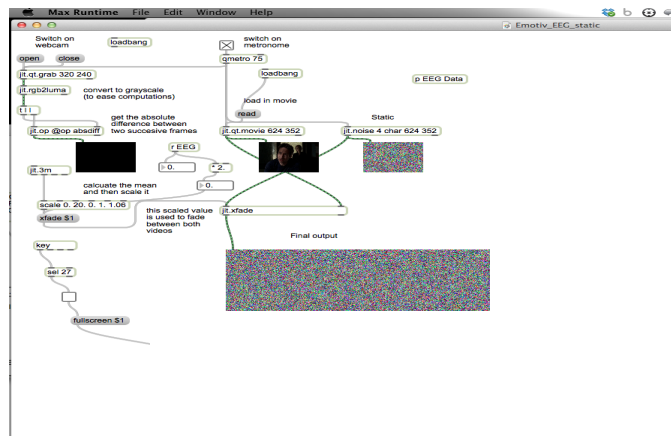


Figure 5: Meditation or Mind-Emptiness

The meditation or mind-emptiness experiment was comprised of an interface that displayed a video element that was fashioned to mimic analogue television static or snow⁸². When the participant reached a mindset that consisted of a meditative state or one where the mind was blank, the television static would fade and reveal a coherent video element. The more the subject's mind was blank the clearer the video image would become. Conversely, the image would fade back to static when this meditative state would wane. In this experiment, the video playback was constant regardless of the mental state of the participant. The participant's input via the headset only controlled the opacity of the television static based on the participant maintaining a meditative or mind-emptiness state. If the participant failed to maintain the meditative or mind-emptiness state by beginning to focus on the video that was being played, the opacity of the static layer would increase and prevent the viewing of the video element.

⁸² Analogue Television Static or Snow: Analogue Television Static or Snow is also known as video noise. This is a state or phenomenon seen in analogue video and television. It is a result of the random dot pixel pattern of static displayed when no transmission signal is obtained by an antenna receiver or any other input receiving device used for television signal receptions. The random pattern superimposed on a Cathode Ray tube image rendering system creates an image visible as a random flicker of 'dots' or 'snow'. This process is the result of random electronic noise and radiated electromagnetic noise accidentally picked up by the antenna or other signal input device. This effect is most commonly seen with analogue TV sets and other Cathode Ray tube image based devices (Hainge, 2013: 54-78).



Figure 6: Participant Interfacing with Video System

Two concerns arose while I was conducting the video experiments discussed above. First, in each of my media-based experimentations, the participant utilised either the NeuroSky or Emotiv EPOC headset and sat in front of the computer to attempt to control the video playback by achieving either a state of focused attention or concentration or a state of meditation or empty mindedness. Having viewed the interaction and received feedback, I became concerned that the computer or laptop was impeding the level of engagement ultimately hoped for. Thus, I began to consider ways in which I could eliminate the need for the participant to interact via a computer. Second, it did not appear that the participants were fully aware of the extent to which they were controlling or interfacing with the video element. In an effort to make the video element more interesting and to make the participant's interaction with the video element more apparent, I considered experimenting with a variation on the video playback methods utilised in the previous experiments with the media-based interactions.

To address these concerns, I devised a media-based experiment that would utilise a projector with the image displayed on a white wall or screen in an effort to eliminate the need for the participant to interact via a computer. In addition, this media-based experiment, rather than having the participant's concentrative or meditative state either allow the participant to see the video clearly or to control the speed of playback, the participant's concentrative or meditative state would allow the participant to be able to control whether the video playback played normally or in

reverse. Thus, the video would play in reverse until the participant reached and maintained a specified level of focused concentration, at which point the video would begin to play in normal fashion. Utilising concepts and elements from the prior media-based experimentation, the participant would be required to maintain a specific level of concentration — within a range of acceptable levels — to maintain the video playback going forward at a normal rate of speed. Concentration levels above the acceptable range would increase the rate of playback speed so that the video could no longer be viewed normally, and concentration levels that fell below the required levels would result in the video playback returning to playing in reverse.

This variation in playback — from that of clarity or speed to that of playing in reverse or forward — was inspired by Mark Wallinger's⁸³ *Angel*⁸⁴. In Wallinger's *Angel*, the piece is a video comprised of single shot looking up at a bank of three escalators located in the Angel Underground Tube Station in London. In the video, Wallinger plays his alter ego, Blind Faith. At the beginning of the video, the audience sees normal travellers on escalators at the Angel Station. However, the centre escalator remains free from travellers. After a brief period of viewing, the audience sees that the movement of the travellers seems disjointed and out of place, soon making it apparent that the video is being played backwards. This becomes further evident as Wallinger backs into the frame in front of the empty centre escalator. At this point, Wallinger begins reciting the first five verses of the Gospel of St. John. As he does so, it is immediately evident that his speech pattern is unusual and after listening longer it becomes clear that Wallinger spoke the words phonetically or pronounced them in reverse, so that when the video was played in reverse the words would sound correct. However, this process gives Wallinger's spoken words a very eerie, bizarre, and other worldly quality. This process seems to be a reference to the

⁸³ Mark Wallinger: Mark Wallinger is an English painter, sculptor and video artist. Wallinger studied at the Chelsea School of Art in London from 1978 to 1981 and at Goldsmiths College from 1983 to 1985. Wallinger's work addresses aspects of British society — its traditions and values — along with its class system and organised religion. In 2009, Wallinger designed 'the largest public artwork ever commissioned in Great Britain'. Wallinger's art has been displayed at the Tate (2007), the Centre Pompidou (2007), and the Whitechapel Gallery (2001) (Tate.co.uk, Accessed Apr. 2015). His work has also been exhibited at the Denver Art Museum (2015) (Denver Art Museum, Accessed Apr. 2015).

⁸⁴ *Angel* is a video exploring the theme of religion. In the video, Wallinger plays his sightless alter ego, Blind Faith, as he repeatedly recites the first five verses of St. John's Gospel from the King James Bible backwards. *Angel* was exhibited at the Denver Art Museum from 15 February 2015 to the 3 January 2016 (Denver Art Museum, Accessed Apr. 2015). I personally viewed this art work on 12 April 2015.

practice beginning in the 1960s and continuing into the 1980s of people playing records backwards in an attempt to decipher what were claimed to be Satanic messages (Vh1.com, Accessed Apr. 2015)⁸⁵. Here, Wallinger recites Christian doctrine physically in reverse giving it the same audio quality of the reversed played records in what is, arguably, an act of irreverence.

By adopting a process in which he created an audio quality that was eerily like a backward played record, Wallinger draws his audience in as audience members attempt to decipher what about the video playback does not seem quite right. It was this quality of drawing audience members in that I hoped to encompass in my experimentation with a video playing in reverse. In having the video playing in reverse, it was my hope that this would draw participants to the artwork and make them more likely to engage by placing the headset on and attempting to control the video playback.

I conducted the initial testing of this experiment on myself. When I undertook this iteration of video experimentation, I assumed that the variation in video playback controls and replacing the the large-scale video projection screen would create a very different experience from the earlier video based experimentation. However, while certain aesthetical components of this experiment — such as the large projection screen and, thus, the space and form of interaction — were different, some of the concerns I had with the early video work persisted. In particular, I found the interaction was too difficult to control and the feedback received by the user was neither clear enough nor quick enough for a participant to gauge how he or she was controlling the system. In other words, I concluded that the interaction element depended too heavily on how quickly an individual understood how his or her conduct affected the system, therefore, leaving the participant confused as to his or her ability to attain and control the appropriate mental state for sustained periods of time. Given that I found the interaction was difficult to control when I knew how the system worked, I felt it would be much too difficult for participants to use. Therefore, I concluded that the system's complexity in relation to the different types of playback

⁸⁵ As part of rock 'n' roll's reputation as the 'devil's music', there were rumours beginning in the late 1960s that famous bands were hiding secret Satanic messages in their music that would be able to be subconsciously heard. It was thought that when records were played backwards these secret messages could be deciphered. Some believed that even classic groups like the Beatles and Led Zeppelin were responsible for including these secret messages (Vh1.com, Accessed Apr. 2015).

controls and the vagueness of personal impact on the system offered the participant a confusing interaction, and the lack of understanding did not provide for a meaningful interaction.

Given the insights I gained from the personal trial I conducted of this video experiment, and in light of the remarks many participants interacting with the previous video systems made that they were not sure if they were really in control of the video, I determined that the Wallinger-inspired experiment failed to achieve the type of interaction I was trying to create. Thus, after further reflection on the aims and goals for the interaction, I determined that my concerns that participants weren't fully aware of the extent of their contribution or control over the interactive system was well founded. I further determined that a participant's ability to understand the cause and effect relationship that existed as part of their participation was paramount to the interaction. I concluded that moving away from the use of video or media based experimentation entirely seemed to be the best way to resolve this deficiency in understanding. Additionally, by moving to a different type of object for participants to interact with, I also hoped to not only be able to break away from a direct computer interface, but to also obfuscate the technological component of the device and increase participant engagement. Thus, these concerns and their attempted resolution gave rise to a new series of experiments dealing with tangible, and somewhat ordinary, objects.

Object Experiments (2015-2017)

For this next collection of experiments where I moved away from media-based experimentations, I continued to work with the Emotiv EPOC headset to interact with participants by allowing them to manipulate tangible real-world objects. These interactive processes were designed by incorporating some of the elements of play theory as outlined by Hans Scheuerl in his book 'Das Spiel' (1997), in addition to also incorporating elements of play theory from Rodger Caillois's book, 'Man, Play, and Games' (1961). I specifically focused on the elements or ideas that play is often self contained and purposeless.

This shift in approach was also inspired by a video game I witnessed at the NeuroGame Jam (*see supra* pages 77-81). The game in question was a fairly typical adaptation of a Lego genre game. In this particular game, the EEG headset was used to control only one simple aspect of the game — the level of light or darkness within

the game environment. It was, by far, one of the simplest uses of the EEG technology of all the games created, yet was still very impressive in its application. It was apparent to me because of that game simplistic function was an approach to experiment with. I found the level of simplicity to be intriguing, as it stood in stark contrast to the complexity my video based experiments had taken on by utilising numerous facets of video playback. Instead, the simplicity of the EEG component of the Lego-genre game seemed to illustrate simplistic functionality combined with the self-contained and purposeless nature of play theory.

The act of the participant interacting and performing a task, which is then to be rewarded with a useless product like a light switching on and off or a spoon moving towards them or away, arguably has no value. Yet, this process of rewarding the participant seems to keep the participant in the interactive process longer than a more complex interaction. The responses that I have personally witnessed as active participants engage in this object based interaction that I created via the EEG headset, facilitated the greatest opportunity in my research to track the way participants moving through and dealing with their actions illustrate the elements of play — again, namely, that the interaction is both self contained and purposeless — and, thus, became the focus for the rest of my practice research.

After conducting these experiments where the participant was interfacing directly with a computer laptop to play a preloaded video element, I sought to try to move away from the direct computer interface and try to have the interaction be with the object or objects rather than a computer. While it is always necessary for the EEG system to be connected to a computer to collect and render the data, it is not necessary for the computer to be the object the participant is shown or where the interaction stimulus is derived from. In the next set of experiments I completed, I chose to hide the computer from the participant's perception all together and have the object being controlled by the mind state to be one in the tangible world. This next round of experiments would also focus on the same mental states used in the video based experiments — in other words, the mental states of attention or concentration and meditation or mind-emptiness.

The Lamp Experiment (2015)

As noted above, the primary difference between the prior experiments and this round of experiments was that the object being controlled in this new round of

experiments would not be contained within the digital confines of the computer or an IDE, but would be a common everyday household object. For the first of these

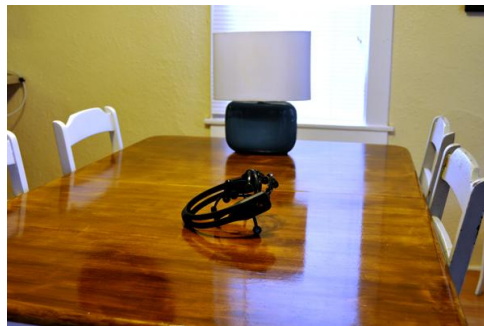


Figure 7: *The Lamp Experiment (2015)*

experiments, the computer components other than the Emotiv headset were hidden from the view of the participant and a system of Internet connected micro-controllers⁸⁶were used to relay the control signals from the EEG data rendered by the computer to a lamp. In this experiment, when a participant reached and maintained a high level of single mindedness — in other words, a mental state of attention or concentration — it would trigger a micro-controller to switch on the power source to the lamp and cause the bulb within the lamp to light up. After this lighting stage was reached, if the participant again reached a maintained high level of single mindedness, or a mental state of attention or concentration, it would trigger the same micro-controller, this time switching off the power source to the lamp, ultimately, turning the lamp off.

⁸⁶ Microcontrollers: Microcontrollers are a small computer. They are made up of a single integrated circuit containing a processor core, a memory core, and programmable input and output peripherals. Programme memory in the form of Ferroelectric RAM, NOR flash or OTP ROM is also often included on chipsets. Often, microcontrollers will also have what is typically a small amount of RAM. Microcontrollers are designed for being embedded into applications. They are stand-alone programmable processing entities that are in contrast to the microprocessors used in personal computers and or other general-purpose applications such as smart phones and tablets. Microcontrollers are used to facilitate autonomist-controlled products or devices. Microcontrollers have been use for such application as automobile, engine control systems, and implantable medical devices. They have even been integrated in to remote controllers, office machines, home appliances, and toys. Microcontrollers are also capable of integrating analogue components needed to control non-digital electronic systems (Texas Instruments, Accessed Mar. 2014). The microcontrollers used for the various iterations of the research practice for this thesis were manufactured by LittleBits. Full schematics of the internal systems utilising the LittleBits microcontroller and additional components manufactured by LittleBits are provided (*See infra* Appendix D).



Figure 8: *The Lamp Experiment* (2015) with Participant

This round of experiments was the first where I sought to minimise the role of myself as artist and author and also limit the participant perceived interaction with an overt computer system. In this experiment, I portrayed myself as merely a technician working to ensure the system performed correctly. I adopted an anonymity approach to negate my personal connection to the issue of ownership and or authorship. Charles Green⁸⁷ described this approach in his book, *The Third Hand* (2001), as ‘an emptying out of identities and structures’ (Green, 2001: 175). This decision was also influenced by the American photographer Patrick Nagatani⁸⁸ and his series of work titled *Excavations* (2001) where Nagatani took on the alternate persona of an archaeologist to give the work a new level of authenticity through the means of co-opting the authority given to that profession to unearth lost true histories. By changing my perceived role from that of artist or practitioner to that of technician, I was able to give the work a new level of authenticity by co-opting the role of technician and moving the experiences from artistic novelty to scientific inquiry. This shift in perception, I felt at the time, would help me gauge the interaction of the participants with the system itself and the response of the audience as they watched the interaction. It was my hope that by creating the perception that I played a more limited role, audience members and those that had already participated would feel more open to discussing their impressions of the work without the self-censorship that generally occurs when a person knows they are speaking to the artist or where the artists is present. This also offered more opportunity for conversations between myself as technician and people in audience, as well as those directly having a hands-on experience with the system. These conversations were less about the meaning or the

⁸⁷ See *supra* Chapter One, Ownership and Aesthetics, pages 49-51 for a discussion of Charles Green and *The Third Hand*.

⁸⁸ See *supra* Chapter One, Ownership and Aesthetics, pages 51-52 for a discussion of Patrick Nagatani and his work titled *Excavations*.

philosophy behind the work and more about its form and functionality. At this stage of the practice, I was more concerned with the feel of the interaction and how clear it was to the participants how they were affecting the system, and how that played out as an experience. In one of these exchanges where I was in the role of technician I questioned one participant while she was engaged in the interaction to see if she felt highly frustrated. She responded, ‘Yes, how could you tell?’ I informed her that one function of the Emotiv headset is that it interprets emotional states and her current read out was showing high levels of frustration.

This same format was used in a second set of experiments involving the turning on and turning off a lamp, but this time I employed the meditation or mind-emptiness mental state. This experiment proceeded in the very same way as the prior experiment by using an internet controlled microcontroller to turn on the power to the lamp, however, this time the trigger for turning on the lamp was a sustained level of meditation or mind-emptiness by the participant rather than attention or concentration. Once again, when the lamp was switched on a second sustained level of meditation or mind-emptiness would switch the power source to the lamp off, thus, switching off the lamp. The obscuring of the elements of technology, in other words, the computer and the micro-controllers being hidden and concealed from view of the participants and spectators, seemed to allow the interactive processes to have a greater impact on the participants and spectators than those observed where there was direct interfacing with the digital elements within a computer environment. As I observed the interactive process, it seemed that controlling the lamp in real time and space, without the transparency of the technology connected to the EEG headset or the lamp, made it so the presentation of the process was more in line with a sleight of hand⁸⁹ magic performance than that of typical black-box interactive installations.

⁸⁹ Sleight of Hand: Sleight of hand refers to a variety of methods or techniques used by magicians and other performing artists to entertain or manipulate objects. Sleight of hand is an element that is very commonly associated with forms of close-up magic, card magic, and card flourishing. It is often confused as a form of magic in its own right, which is incorrect (Sachs, 1980: 1-3).

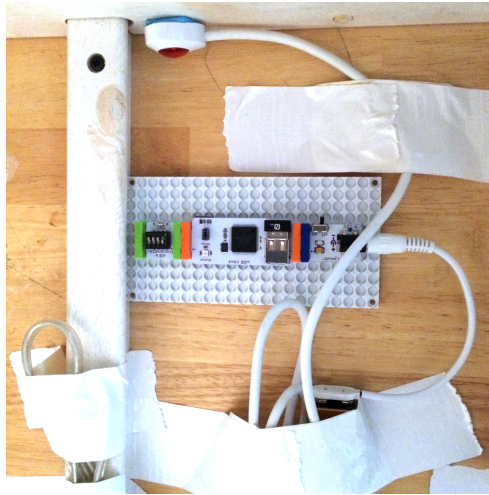


Figure 9: Lamp Control System

It should be noted, however, that one technical difficulty that arose was that the time for reconnecting the headset after changing the participant was relatively significant and became somewhat problematic. This was, in part, due to the simplicity of the interaction itself, in that the participant was able to achieve the desired result — in other words, turning the lamp on or off — in a relatively short period of time. Thus, the headset was changed out frequently as participants lined up to be the next to engage in the interaction. The time for changing over the headset from one participant to the next was almost equal to the time a participant was involved in the interaction, thus, giving the impression that the delay was significant. This cycling out of frequent users also caused the EPOC's sensor elements to dry out faster resulting in the headset having further connectivity issues and delaying the participant cycle times. Once this issue was identified, it required the frequent reapplication of the soaking material to the sensors.

In addition, it should be noted, that the direct current power source for the microcontroller was a standard 9-volt battery. That battery source, however, was insufficient to power the device for more than two hours worth of use. Specifically, the device was no longer able to connect to an Internet source given the lack of power. As a result, the device ceased to function and therefore it had to be connected to a mains power source. While connecting to the mains power source resolved the power supply problem, the concern was that, in doing so, there were more cables and connections seen by the participants and spectators, which could detract from the ESP-like illusion that was intended to draw the interest of spectators and foster engagement.

The Fork & Spoon Experiments (2015)

The next experimentation in this vein that was considered for the art practice portion of this thesis was centred on using a gimmicked prestidigitation or magic prop. This prop was a specially crafted fork that is constructed out of temperature sensitive metal. This prop is designed to remain static at temperatures ranging from 25° Celsius and below and only becomes active at temperatures above 25° Celsius. The fork is crafted to deform while being held and is heated through body contact. The longer the fork is held the more pronounced the deformation that occurs.

This proposed experiment was intended to utilise the EEG interactive component to mimic the effect of holding the fork in the participant's hand without physical contact by the participant. The participant, while wearing the EEG headset, would be required to achieve a requisite level of mindfulness in order to toggle on and off a heat source on which the fork would set. This would allow the fork to begin to deform while the participant remains physically removed from the analogue object. Using the self-bending magician's fork as part of the interactive experience was in keeping with the desire to utilise common everyday analogue objects and to create an interactive process that would be visually stunning. These factors would also help in creating a type of ESP-illusion that would foster participant interest and engagement.

The self-bending fork interactive system was never fully realised and was never tested with participant interaction. This was due, primarily, to a few major problematic aspects that seemed to break down the ESP-type illusion that is the underpinning of this series of interactive system experiments. Specifically, safety concerns developed regarding the need to have an internal heating element that could safely and covertly transfer the heat necessary to increase the temperature from 25° to 40° Celsius to trigger the fork bending properties. In preliminary testing, it was determined that the interactive fork system would have to be constructed out of a material that would easily allow the transfer of heat from a heating element that was in constant contact with the fork in order to simulate the fork being held in a participant's hand. In order to achieve this, a special staging area would have to be constructed and then heated to a temperature in excess of 40° Celsius. This heating condition raised too many safety concerns and, as a result, this experiment was aborted.

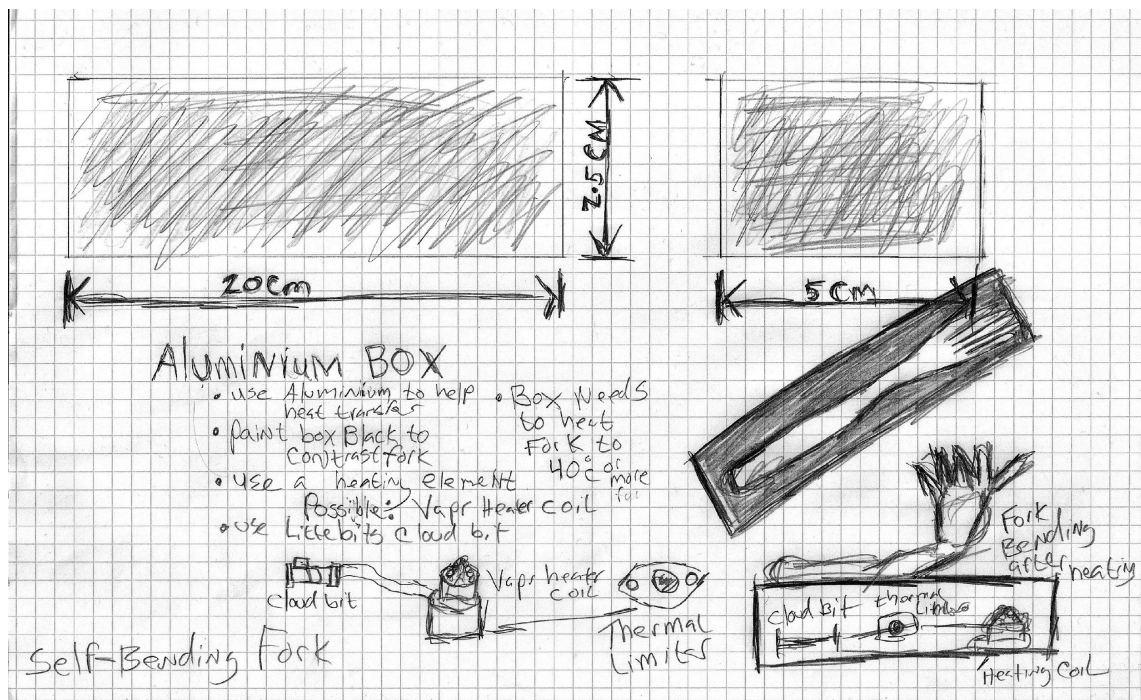


Figure 10: Self-Bending Fork System Sketch

Other similar experiments were considered for the simplicity of the object being manipulated and the ESP-type illusion they would create, but were eventually discarded in favour of experiments utilising items that had a greater affect or nostalgic value and that could enhance participant engagement and the interaction, itself. These experiments were also intended to utilise the Emotiv EPOC system in conjunction with microcontrollers to facilitate an interaction between participant and a tangible, every day object. Similar to the bending fork, these experiments, rather than having the participant turn an object on or off, were intended to have participants attempt to move a tangible object using the Emotive EPOC EEG headset. This specific experimentation was intended to mimic and parody the mentalism tricks of Uri Geller⁹⁰. The Emotiv EPOC in this process was intended to move a spoon along a table surface based on the attention or concentration protocol. This process would have been conducted using microcontrollers to operate direct current electric motors to move a magnet and pulley system covertly installed to the underside of the table surface. The system was intended to be completely contained within itself by utilising

⁹⁰ Uri Geller: Uri Geller is self-proclaimed to be one of the world's most investigated and celebrated mystifiers. His website further claims he is famous around the globe for his mind-bending abilities. Geller became famous in the 1970s, after his appearance on various television talk shows in both the United Kingdom and the United States, for his public illusions and magic performances where he performed spoon bending (Uri Geller, Accessed Jan. 2015).

a battery power source, rather than an electrical power source that would have to be plugged in, and the control transmission from the Emotiv EPOC would have been transferred via a wireless Internet data cloud interface. By utilising a battery power source and covertly installing the microcontroller motor, the illusion that the participant moved the spoon across the table by thinking about it, would have been complete.

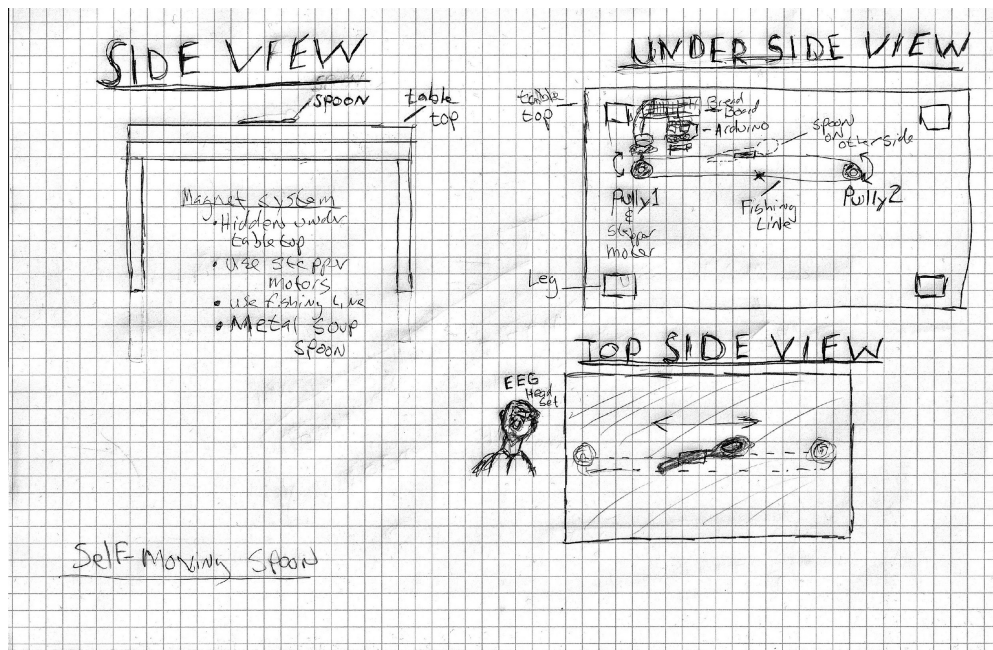


Figure 11: Self-Moving Spoon Sketch

A variation of this experiment that I considered and also discarded for the reasons discussed above, was an interactive process, again using the Emotiv EPOC, that would allow the participant to move a small object in a rotating or spinning fashion. This experimentation would have also utilised a microcontroller and a direct current motor system to achieve the desired result, and all of the components of the device driving the interaction would have been hidden from the participant's view, thereby, completing the illusion. However, as discussed above, these variations of object based experiments were discarded in favour of experiments utilising items that had a greater affect or nostalgic value and that could enhance participant engagement and the interaction, itself. Thus, the experiments that followed were designed to create a similar visual element to the one proposed with the self-bending fork or the moving spoons — that being a physical real-time mechanical manipulation of an analogue object — while utilising objects that possessed a greater inherent ability to invoke nostalgia.

The Music Box Record Player Experiment (2015-2016)

For the first of these experiments that were intended to play on the nostalgic feelings of participants or spectators, the object chosen was the Fisher-Price Music Box Record Player. The Fisher-Price Music Box Record Player is a child's toy first released in the 1950s and uses a winding mechanism like traditional music boxes to play a selection of standard children's tunes by the selection of five double-sided multicolored disks.⁹¹ This object was selected because it fosters interaction on many



Figure 12: Fisher-Price Music Box Record Player

different levels in its own right. It has tactile interaction because of the need of the participant to select a disk and song to play, the placement of the disk on the turntable, the setting of the sudo-record needle, the winding of the playing mechanism, and lastly the physical manipulation of a large toggle switch to engage the rotation of the turntable allowing audio playing to commence.

Additionally, there is another level of interaction created by the use of the record player as the object, which centres on the audio component of the installation.

⁹¹ Fisher-Price Music Box Record Player: Originally, the Fisher-Price Music Box Record Player used a mechanical system to play music from the proprietary included disk system. The version used for this research is an updated version reissued by Fisher-Price in 2010 and even though it retains its winding mechanical elements to initiate turntable rotation and to trigger audio playback it does so with the use of sensors and electronics and plays pre-recorded songs. The songs played are: Disk #1 'Humpty Dumpty' and 'Jack and Jill'; Disk #2 'Twinkle, Twinkle, Little Star' and 'Au clair de la lune'; Disk #3 'London Bridges Falling Down' and 'How Much is the Doggie in the Window'; Disk #4 'Camp Town Races' and 'Children's Marching Song'; and Disk #5 'Hickory Dickory Doc' and 'Edelweiss' (Thisoldtoy.com, Accessed Aug. 2016).

The audio component generated by the Fisher-Price Music Box Record Player was originally designed to function as a child’s learning and entertainment device. The use of this device in the very different context of an art installation was deliberately chosen in an attempt to foster nostalgia — and therefore interest on the part of the participant — based on the child-based music selection. These facets are then combined with the EEG interactional element in order to facilitate aspects of play that are self-contained and purposeless, and with the hope that the tactical and whimsical nature inherent to the toy will incite desire to participate in the interactive proposition.

Similar to other experiments, the EEG interactive component designed for this experiment uses the attention data detected by the Emotiv EPOC. Once the participant using the device reaches and sustains a high level of attention this triggers a servo and microcontroller augmentation element, which engages one of the before-

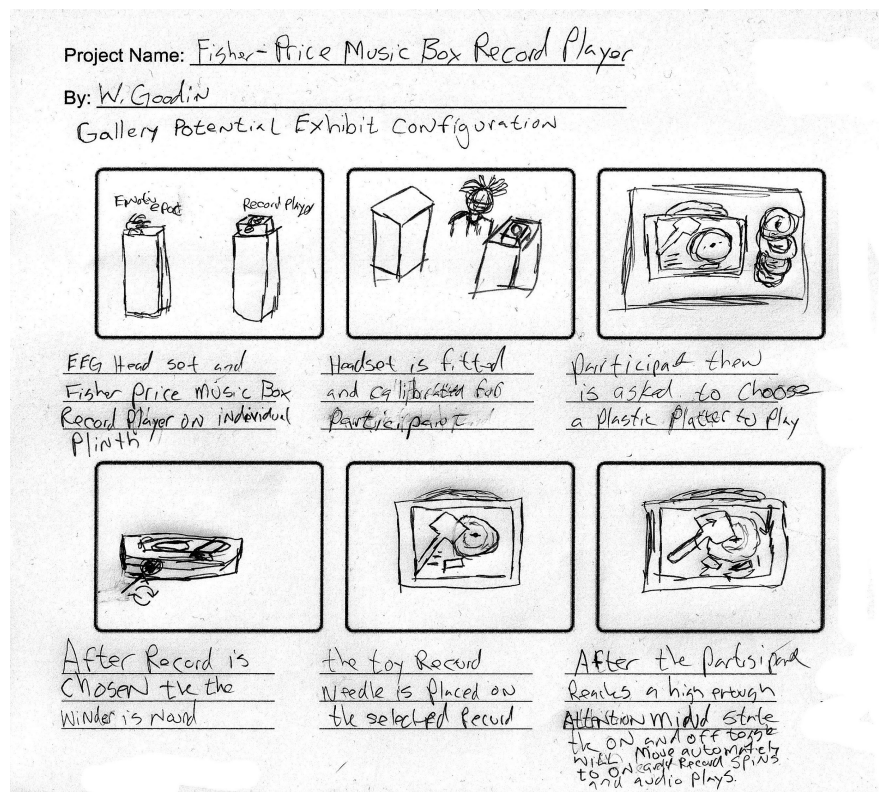


Figure 13: Possible Interaction Storyboard

mentioned inherent interactive elements of the toy by switching the turntable engage toggle. Once engaged by the EEG controlled system, the large yellow toggle switch moves autonomously in to the ‘on’ position. This movement is very similar to the

action of the lamp turning on in the previous experiment, but adds a visual physical dimension of watching an analogue switch move in space from left to right.

The construction of this experiment builds directly on the strengths of *The Lamp Experiment* as well as a desire to compensate for any weaknesses associated with the lamp arrangement and interaction. Some of the strengths shared between the two interactive experiments include that the purposed interaction is simple to understand and mimics systems that participants will have some level of familiarity with. One of the weaknesses of *The Lamp Experiment* that the Fisher-Price Music Box augmented system attempted to address, is the visibility of both the power source for the lamp and the lamp's connection to the electronic components placed on the underside of the table. The visibility of these components during *The Lamp Experiment* detracted from the illusion of the ESP affect. In an effort to address this concern, the system created for the Fisher-Price Music Box is completely self-contained. The toy has been modified to hold all of the extra components within its

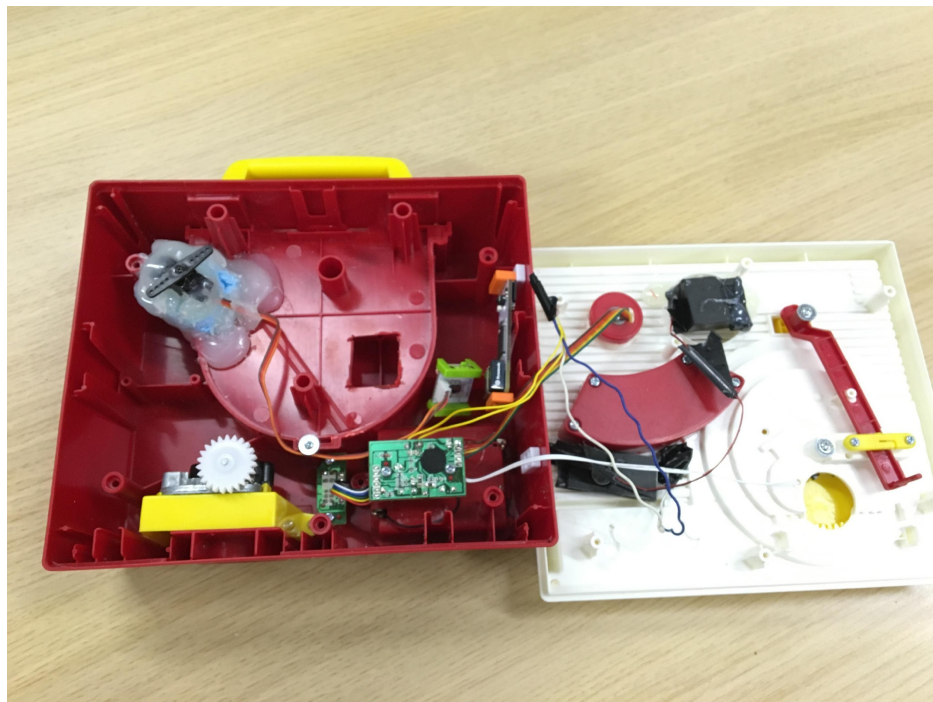


Figure 14: Fisher-Price Music Box Record Player with Augmented System

original structure and is powered by an internal battery pack. This frees the object to be manipulated exactly as the Fisher-Price toy designers intended. The item can be wound up, have the records changed, and be examined on every side with no

indication of how the system functions or has been augmented, thus, allowing the ESP illusion to be maintained during the interactive process.

Two Tune Music Box TV Experiment (2015-2016)

The next experiment was designed to build on the results that were achieved with *The Fisher-Price Music Box Record Player Experiment* and sought to strengthen the use of both play theory elements and an undercurrent of nostalgia connected to a vintage toy. The toy chosen for this experiment was another Fisher-Price product the Two Tune Music Box TV. The Fisher-Price Two Tune Music Box TV is a toy that was first produced in the United States in 1967 and has only minimal differences with its modern counterpart. These alterations consist of the elements of its base construction. The earlier models being made using a wooden construction and the current release utilising plastic. This object uses two forms of interaction: visual and auditory.

The Music Box TV plays two different songs, 'London Bridges' and 'Row, Row, Row Your Boat' and has a side scrolling images that correlates to the given tune played. In order to interact with this toy, one simply uses the two large yellow knobs located to the right of the seven-inch screen. The primary knob is the larger of the two and simply winds the music box element and when released plays the tunes and scrolls the images left to right. The second knob is a facsimile that just produces a clicking sound when turned but has no other function. Unlike the Fisher-Price Music Box Record Player there is no on/off functionality (Thisoldtoy.com, Accessed Aug. 2016).

The interactive system created for this object was very similar to that used in *The Fisher-Price Music Box Record Player Experiment* utilising the EPOC/EEG headset in connection with Internet of Things technology to control the analogue music box housed in the toy. This system would again be triggered by a mental state of attentiveness or concentration.



Figure 15: Fisher-Price Two Tune Music Box TV

The interaction process for the participant was designed to connect with the same aspects of play theory as in the previous experiment — those aspects being that play should be self-contained and purposeless. And, similar to the interaction structured in *The Fisher-Price Music Box Record Player Experiment*, this experiment was also designed with the desire to, once again, engage the participant with both a tactical and an audio element. Yet, unlike the previous experiment, the visual element in *The Two Tune Music Box TV Experiment* would not be the physical movement of an element of the toy itself, but the scrolling images inherent to the toy.

The participants were once again fitted with the EEG headset and then asked to wind the toy by hand using the original large yellow knob used in the toy's construction. After doing so, the participants were then asked to focus or to raise their level of attention. The duality of this toy having both an audio component and a moving image element was part of the reason this toy was selected, because it allowed both the audio component and moving image element to function simultaneously, which provided feedback to the participant regarding their level of attentiveness or concentration, but also served as a distraction as they watched the scrolling images.

The API connected to the EEG headset controlling the interactive components of the toy achieved this duality of feedback and distraction with the aim of sustaining the interaction of the participant and the object, which was something I felt, was lacking in *The Fisher-Price Record Player Experiment*. The system controlling the TV would allow for both the starting and stopping of the music box inside the toy to play audio and move the images in direct relation to the levels of attentiveness or concentration achieved and maintained. This was in contrast to *The Fisher-Price*

Record Player Experiment, which would continue to play once the toggle switch was engaged.

Allowing for the starting and stopping of the TV was achieved through the use of an oscillating servomotor that would disengage a custom-made stop mechanism constructed for the music box that altered the TV's native nature of continuously running once wound. Using this oscillating servomotor would cause a start to the music box and visual element and conversely stop it as attention levels wavered. This bifurcated state was chosen to give a real-time and constant feedback to the participant of their interaction with the object, which was lacking in the one-off movement used by the Record Player system.

While the TV afforded more continuous and active feedback to the participant and offered a level of whimsicalness and game like quality by distracting the participant with moving images, it lacked one of the strongest aspects of *The Fisher-Price Record Player Experiment* which was the participant observing the physical movement of a tangible object — the flipping of the switch on the record player. This distinction between *The Fisher-Price Record Player Experiment* and *The Two Tune Music Box TV Experiment* and the impact of seeing the switch physically move, lessened the ESP nature and accompanying intrigue and mystery that was achieved in *The Fisher-Price Record Player Experiment*. The loss of this element seemed to take the interactive nature of the experiment a step back towards the interactive nature of *The Lamp Experiment* — which seemed to be a step in the wrong direction.

The Final Experiment: *The Jack in the Box* (2016-2017)

My deduction after testing both objects using Fisher-Price toys was that a follow up experiment to the Fisher-Price Two Tune Music Box TV and the Fisher-Price Music Box Record Player needed to have all of the aspects of both objects combined in a single object that fostered play that was both purposeless and self-contained, was built on a nostalgic emotional connection to childhood toys, and included an interaction that was bifurcated to give real-time feedback and attention distraction via the use of audio-visual elements.

The conception for a solution to finding an object to fulfill these before mentioned aesthetic and functional concerns, occurred quite randomly one day while attending an unrelated workshop. This revelation was that I should use a Jack in the

Box⁹² as the object of the EEG interaction. This object seemed to tick all the prerequisite boxes that I felt the previous two experimentations did not.

The Jack in the Box seemed to be a perfect fit. It was a vintage toy that would lend itself to a nostalgic emotional connection. It also was also wildly known to the Western World being cited by the Toy Hall of Fame, which listed its earliest appearance around the 16th century in Europe under names like: Johnny jump-up, an admiral on a stick, and Punch box (minus sidekick Judy) (Toy Hall of Fame, Accessed Aug. 2016). Because of this long history it was a more ubiquitous toy and did not have the same generational and cultural inclusion that seemed to be present with the previous Fisher-Price toys. Specifically, the Fisher-Price Record Player and the Fisher-Price Two Tune Music Box TV appeal primarily to the children of the late 1960s to early 1980s in predominantly the United States, Canada, with some limited cross over to the United Kingdom (Thisoldtoy.com, Accessed Aug. 2016). The Jack in the Box also has the audio component of a music box, an analog moving crank the runs said music box, and a visual element that would serve as a distraction to make the interaction more challenging and engaging in the form of the anticipation of the inevitable startle as the spring loaded Jack reveals itself.

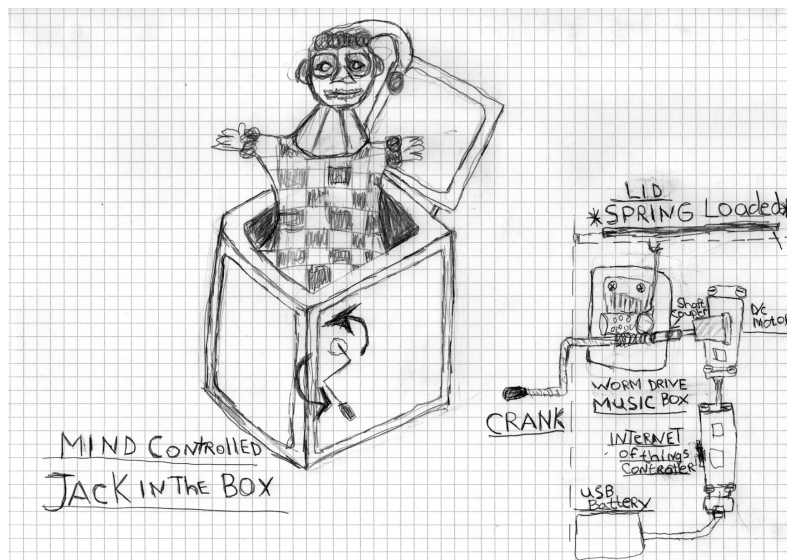


Figure 16: Mind Controlled Jack in the Box Sketch

⁹² Jack in the Box: A Jack in the Box is commonly a tin box with a protruding bend crank that when turned plays a musical tune which crescendos with a spring loaded figure of a clown jumping through a trap door on the top. More often than not, the 'Jack' figure was more horrible or frightening than humorous or whimsical. In modern times, the Jack now appears with an array of child friendly options such as: Winnie the Pooh, the Cat in the Hat, the Three Little Pigs, The Big Bad Wolf, assorted kitties and doggies, and suitably, Curious George, and cute stuffed clowns (Toy Hall of Fame, Accessed Aug. 2016).

Once the choice was made to retro fit a Jack in the Box to be controlled by EEG and a mindful state of sustained attention, the crucial step was the selection of what form the Jack in the Box would take, there were after all almost an endless variety to chose from ranging from Winnie the Pooh to soft cuddly clowns. After perusing the modern options available, I was struck by how sanitised these models seemed when compared to the almost creepy hard plastic clown that resided in my childhood Jack in the Box variant.

The first Jack in the Box I acquired to begin building the interactive object from this experiment was an antique model from 1967 made by the toy manufacture Mattel, Inc.⁹³ This model was selected because of its similarity to the one I was given as a child. It seemed to be the best ingress into fostering a level of nostalgic interaction and to be in keeping with the aesthetic precedent set with the two former objects used in the preceding experiments. I felt this aesthetic connection should be maintained to help these three objects have a strong connection as a series of artistic works.

The retrofitting initially began with first carefully cutting out a square panel from the underside of the toy's base to gain access to the inner workings of the toy. Based on initial research in to the construction and inner workings of similar style toys, it was expected that there would be a simple crank driven music box and cam system used to play the common song of 'Pop Goes the Weasel' and the releasing of the latch allowing the spring-loaded jack to project up. Upon freeing the cut out panel and removing the doll and spring apparatus it became clear that this was not the case.

The analogue system used by Mattel, Inc. in this model was of a unique design and conformed in no way to the conventional systems in use by other toy designers. It consisted of a rubber belt of about 5 cm wide and 7.5 cm long that was stretched between two fixed axles. The first of these axles was extended out of the toy and fashioned in to the crank and the second axle was mounted inside the toy maintaining tension and causing the belt to circulate between these two fixed points when rotation was applied to the crank. The rubber belt also had molded protuberances of varying heights and placements that actuated thin metal tines of different lengths, which when struck would produce the notes of the tune. This belt also controlled the latch that

⁹³ Mattel, Inc.: Mattel is a United States toy manufacturing company that was founded in 1945. It supplies toys to over 150 countries worldwide and has its world headquarters in El Segundo, California, United States (Mattel.com, Accessed Sep. 2016).

released the spring-loaded Jack. It was this belt drive design that would prove difficult to retrofit.

My attempt to automate the rotation of the crank via an electronic motor to facilitate the goal of activating the toy by means of the interactive EEG system was met with several set backs. First, and arguably the most critical, was the precise level of tension required to spin the crank, while simultaneously allowing the belt the right amount of friction to rotate correctly on its two axels. After many attempts to facilitate this goal through the use of various types of motors, motor torque levels, motor speeds, additional gears, axle replacements, and friction agents, I achieved no success in activating the toy consistently from hidden embedded components. The end result was primarily that the crank would spin freely and not engage the belt system.

After this construction set back, a series of modern Jack in the Boxes were obtained and to stay somewhat in keeping with the aesthetics offered by the 1967 Mattel model, the decision was made to replace the clown doll of the modern toy with that of the vintage one. In doing this, two things were accomplished. First, the look of the clown was maintained, and, second, the level of surprise afforded to the participant was heightened because of the mismatch of the revealed clown doll in comparison to the cartoonish rendering of the expected clown on the façade of the toy.

The automation of this new hybrid toy was to be relatively straight forward, chiefly because of the simplicity of the music box mechanism and release system. This toy used a music box that was much smaller, affording more space to mount components, and was easier to connect to a motor for automation of the crank, music, and release apparatus. This toy used a cylinder driven music box that was fitted with a cam to trigger the release of the latch holding the door containing the spring-loaded clown. The whole setup was driven by a threaded axel that extended outside of the toy and was then fashioned into the crank. This crank and axel combination was mounted to a corresponding gear on the cylinder. The cylinder was responsible for the playing of the tune which is accomplished through the metal nubs covering the cylinder's surface, which interact with a metal series of tines that when struck play notes. It also has a cam that engages with the latch releasing the Jack when the cylinder reaches a position of rotation. The whole drive system is kept rotating due to a clutching device

that resets the threaded drive system to prevent it from locking up as the crank and axle combination turns.

The EEG interactive system created for this object uses an axle coupling connecting a small direct current motor directly to the crank and axle combination allowing rotation of the original drive system. The motor is controlled by an API interface that is connected via the Internet directly to the EEG headset through a computer. This is all powered by a self-contained battery pack. When the mindfulness state of attentiveness or concentration is achieved, this causes the motor in the toy to begin to rotate, thus, turning the crank and playing the tune. As the level is maintained, the toy continues to play autonomously. Conversely, if the level wanes, the process stops. As a result, the participant is given real-time feedback regarding the state of interaction with the device. The anticipation of the release of the Jack/clown was hoped to cause a distraction or possibly break the participant's attention giving the interaction more nuance and an increased level of difficulty or challenge. In initial testing of this object, it seemed that this was indeed the case. Furthermore, because of the obfuscation of all of the facets allowing for the automation process, participants seem to remain transfixed on the cranks allusion of unassisted motion and totally surprised by the jack/ clown's abrupt eruption from the box. This effect I felt was linked to the desired outcome or the suspension of disbelief that was also present in the two previous experiments and, in part, accomplished by hiding all signs of alteration and retrofitting of the toys. This object was no exception. To hide all signs of alteration the square cut panel removed from the base of the box was repurposed in to a custom-fitting panel to keep all of the electronics concealed and to keep the spring compressed while the jack/clown is confined under the lid. To further add to the obfuscation of the act of tampering with the original toy, a false bottom was constructed and covered in black felt to allow for handling and inspection of the toy. As with preceding objects, this was included to enhance the illusion of ESP powers afforded to the participants.

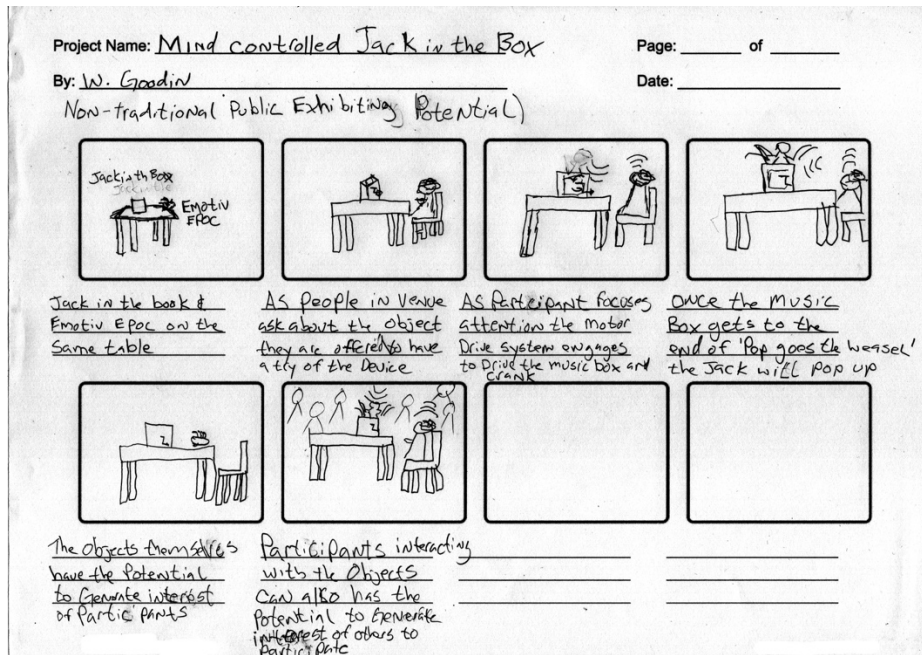


Figure 17: Possible Interaction Storyboard



Figure 18: Fully Integrated Jack in the Box Interactive System

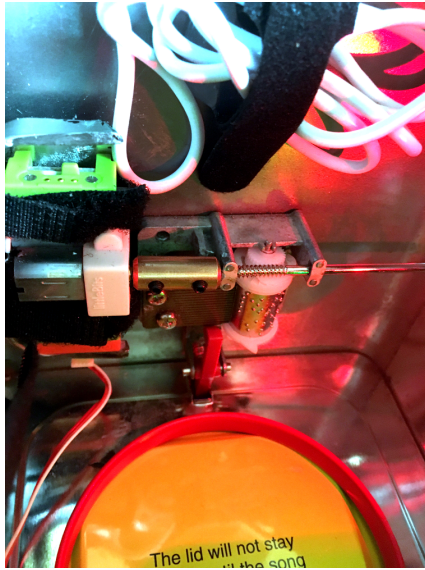


Figure 19: Jack in the Box with Augmented Drive System

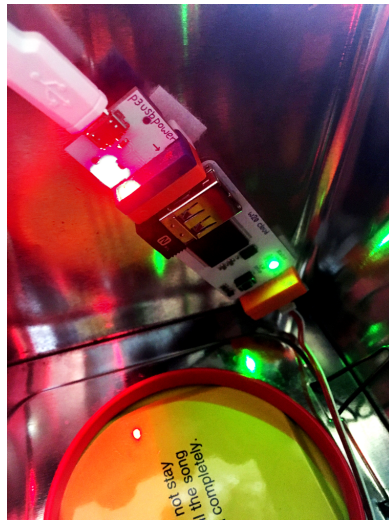


Figure 20: Jack in the Box Internet of Things Controller



Figure 21: Jack in the Box Full Integrated Augmented System

Impact of the Literature Review

As I have conducted my research and practice for this PhD, I have been both mindful and vigilant in attempting to encompass the key concepts I have learned through the literature review into the practice based component of my research. Thus, I have embraced the concepts of interaction contained in my literature review (*see supra*, Chapter One, Art and Theory, pages 22-31), including embracing the idea of trying, through obfuscation, to hide what Kwastek calls the ‘black box’ of computer art (*see supra*, Chapter One, pages 42-47), thereby shifting the focus or the centre of my work away from the technology, itself. Additionally, I have sought to create art where the gestalt is the moment of interaction by taking Dewey’s theories about art as experience (*see supra*, Chapter One, pages 31-33) and incorporating those ideas in making art where the work is the totality of the experience, as opposed to a tangible object. As part of my practice based research and the works I created, I also focused on shaping my works such that the aesthetics of the practice evolved to be the moment of the here and now --- in order to, ultimately, showcase Kaprow-esque ‘Happenings’ (*see supra*, Chapter One, pages 33-36 and *see infra*, Chapter Four, pages 120-133). Given that the works I have created for this PhD are structured around the moment of interaction, this creates a framing that makes the process of art creation dependant on others. Those ‘others’ come in the form of participants, which creates a state of

collaboration between myself as the artist/practitioner and the participant — thus, meeting the criteria for co-authorship (*see supra*, Chapter One, pages 47-53).

In essence, this has created a somewhat circular approach that has driven both the practice based component of my research and my research for the purpose of my literature review. It was the process of going back to the literature review, and utilising it as a type of rubric, that allowed me to assess my successes and failures as my practice research evolved. By approaching the literature review in this manner, it became an irreplaceable tool in both establishing a process for my practice and in the creation of my work. The literature review created and informed my conceptual goals. As a result, the research I conducted for my literature review has helped to alter and evolve the types of systems that I created and tested and the systems' purposed goals. But, also, as I engaged in various experimentations in the practice based component of my PhD, I encountered information or results that would then lead me to research new concepts and theories, which then also informed my practice. This process is illustrated in the diagram that can be seen below.

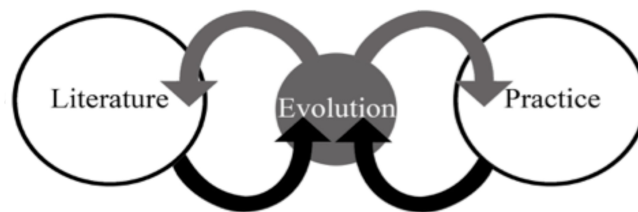


Figure 22: Research Practice Evolutionary Cycle

Impact of Participants

The role of participants in this research was also a critical one, given that the artwork is dependent on the involvement of others. Throughout my practice based research process, I always began by testing the equipment, video, or objects myself, before involving participants. However, once my initial self-testing was complete, I immediately moved to involving others in testing my work, enabling me to observe the interaction and determine what aspects of the experiment worked and what aspects

needed revision. Participants were drawn in a number of different ways throughout the various iterations of the practice. Initial testing of the video-based experiments were done using friends, family members, and ex-colleagues from both my undergraduate experience at the University of New Mexico and my Masters level work at the University of East London and Goldsmiths. This grouping was comprised of both males and females of ages ranging from early twenties up to late sixties⁹⁴. As the practice moved away from video work and progressed towards the animated object oriented work, the participants were first drawn from a large group of attorneys for the *Lamp Experiment* (see *supra*, Chapter Three, pages 88-93), when I was invited to showcase my work as part of the entertainment portion of a dinner. As my practice continued and evolved on to the *The Music Box Record Player* (see *supra*, Chapter Three, pages 96-99), the first group a participants I began with were, once again, drawn from friends, family members, and ex-colleagues from both my undergraduate experience at the University of New Mexico and my Masters level work at the University of East London and Goldsmiths. In addition, I did a more random sampling of test subjects by taking *The Music Box Record Player* to Goldsmiths University to test the ability to foster interaction and engagement. The participants for *The Jack in the Box*, (see *supra*, Chapter Three, pages 101-108) were derived from random strangers found during impromptu ad hoc exhibitions. These participants were both male and female and ranged in aged from eighteen to their fifties. Consistent throughout all the groups that were used, individual participants were selected based only on the criteria that they were willing to have the EEG headset placed on them and desired the opportunity to interact with the system. In all cases and consistent amongst all groups, anyone that was interested in participating was invited to do so.

Since the interactive experience or moment is at the heart of this thesis, it cannot exist without participant interaction. The participants have two functions within the work created for the practice. First, they complete the artworks through their taking part in the moment of interaction and, secondly, they become a type of collaborator or co-author in the final stage of the art creation process. The objects

⁹⁴ There was a single test-subject utilised in the initial testing stages of the video experiments that does not fall within the age range stated above. I had the opportunity to test both the NeruoSky headset and Emotiv EPOC headset on this test subject (age ten) and was able to quickly determine that the NeuroSky headset would not function on the child test subject. This was one of the reasons, among others already discussed, for switching to the Emotive EPOC headset.

were created to facilitate, but also more importantly, to foster active interaction and engagement. Because of the overwhelming importance of active interaction and engagement, testing was undertaken to create work that would help participants be comfortable with the headset and to make sure they understand how they were interacting with the system. This was done, first, by practitioner testing that then moved on to participant testing of the system.

The first testing that was done was of the EEG headset. The first choice was the Nerosky model and in the practitioner phase the test was positive. It was in the very first application to the participant that the headset showed that it was not suited to the task. Once the system was up and running and was tested by the practitioner, the headset was passed off to the participant. This would cause system instability and often lead to a lengthy reinitialisation of all hardware and software elements. This was a tedious task for both the practitioner and the participant and, thus, the participants over time lost interest in the process. Even when the system was working, the feedback was too slow to allow for the participant to see and understand his or her impact on the interactive system, one again causing a loss of interest. These early participant observations and the fact that participant interest in the system would wane were the main catalysts to replacing the headset.

As the development proceeded to *The Lamp Experiment*, which used the updated headset and a simplified interaction feedback of a physical common device, the initial participant response was much more positive to both the system and the interaction itself. This compelled the use of questionnaires (*see infra* Appendix A). These questionnaires were devised to find out which aspects of the interaction the participants were strongly connecting with and also what types of devices they would most likely want to interact with. This information was then used in creating the three successive interactive devices. The participant testing moved the process of object creation more towards participant centric frames and ultimately helped to create more engaging and more satisfying interactive experiences.

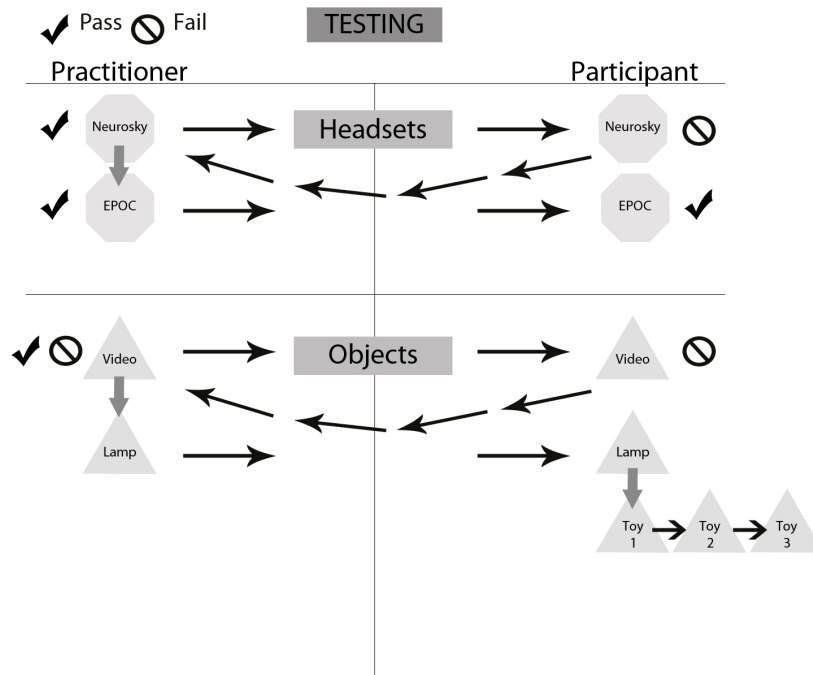


Figure 23: Participant Impact Flow

Online Forum

One of the ways in which I have chosen to disseminate the work contained in this thesis is through the use of an online forum⁹⁵. This was originally done as a means to share technical insights gained while trying to construct the items rendered for the practice, but it became larger in scope over time. This evolution led to the forum taking on the role of showcasing the projects, hardware, and technical resources, in addition to permitting a venue for larger discussions pertaining to my research. The forum also offered me the ability to connect with a diverse research community. The type of individuals the forum was created to permit interaction with ranged from electronics and software hackers; computer scientists, students, and professionals; and other artists.

⁹⁵ The online forum connected to this thesis can be found at www.wgoodin.com.

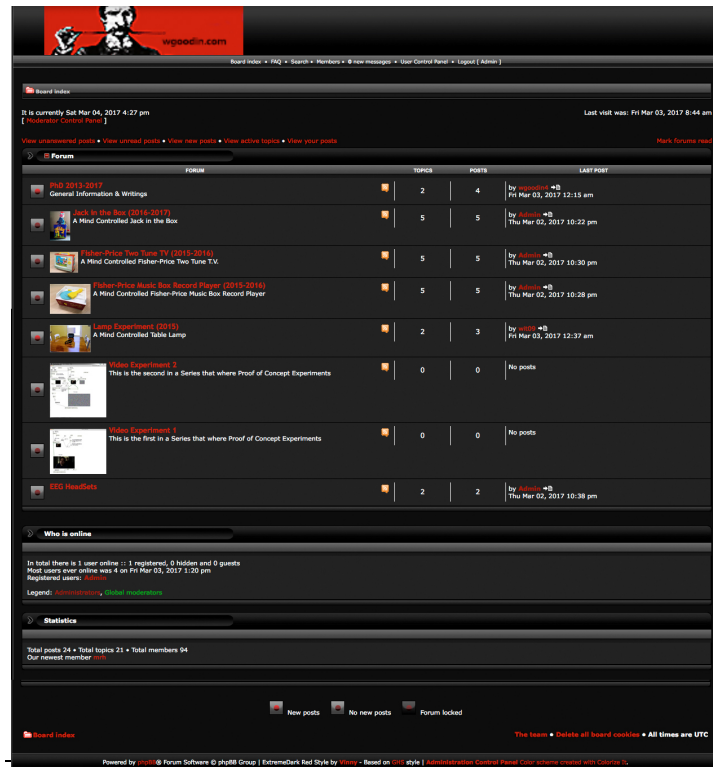


Figure 24: Main Forum Page

The forum is open to anyone for read-only access, but requires user registration in order to comment on the postings or contribute to the discussions. At the time of this writing, the forum has 93 total members. I circulated information regarding the forum by posting the link when I visited other forums while sharing information about hardware/software issues and through word of mouth. I also mentioned the forum to participants at many of the practice experiments and exhibitions when they expressed interest in the inner working of the augmented toys or objects.

The forum is structured to provide general information, along with information regarding testing, concepts, components, and exhibiting for each of the various research iterations. By and large, the same structure is used for each of the research iterations, with the exception of the initial video experimentation. I structured the forum in keeping with the format and style of other forums that I have utilised while problem solving both throughout the practice aspects of this thesis and my personal hobbies of information technology and computing. Some of the forums I have previously utilised that influenced the structure of this forum include:

<http://stackoverflow.com>; <http://www.sudomod.com/forum>; <http://discuss.littlebits.cc>; <https://www.emotiv.com/forums>; and <https://forums.hak5.org>. These sites were used

as models because of their ease of use and indexing of information. The use of these forums has provided me the ability to get feedback on technical issues and to help others with the same. The creation of my forum has provided similar opportunities, allows others to see my work, and permits others to engage with me directly through a larger community discourse.

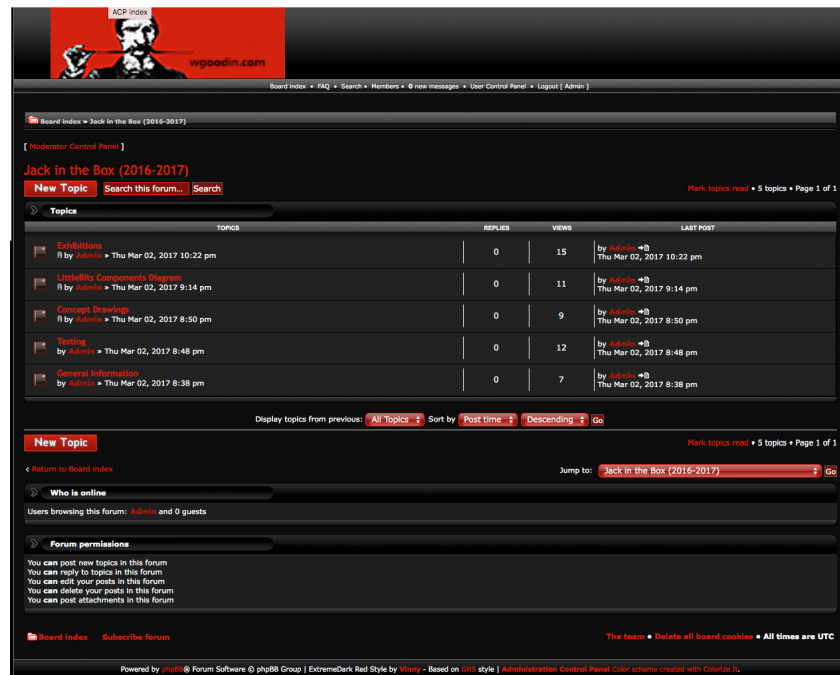


Figure 25: Detail of Topics for Jack in the Box Section

Conferences

I presented my work in two different conferences and at two very different stages in my research. During the early stages of my research, I presented my work at the Graduate School Festival at Goldsmiths College, University of London in 2015. This event was the first time that I had presented this body of work outside of the PhD programme to the public at large. I found that many people were intrigued by the idea of using technology to allow mind control over everyday objects. This event also reinforced the fact that the system was generating interest.

The second conference that I presented at was much closer in time to the completion of my final experimentation, i.e. *The Jack in the Box*. This conference was called ‘Troubling Time: An Exploration of Temporality in the Arts’, and was held at the University of Manchester. There, I presented a paper entitled *Individualising Temporal Spaces Through Mind Control*. I discussed the variation in the temporal nature of the interaction with my art systems and the individualised control that rests

with the participant with respect to that temporal space. The subject matter for this conference was varied, but was focused in the area of Theatre and Performance rather than computational technology. I found that having the opportunity to present, interact, and speak with academics and artists outside of my own field was helpful, in that it provided me with different feedback and provided me the opportunity to interact with academics that work and study in areas whose theories have informed much of my research and practice.

Impromptu Exhibitions

University Library, Goldsmiths College (2017)

As this thesis drew to a close, the final artwork created, *The Jack in the Box* (2016-2017), was taken out to engage with audiences in two impromptu pop-up style public exhibitions. The first of these was conducted at the library at Goldsmiths College. The library exhibition was undertaken in the study/meeting area of the library just inside the library's entrance. This location was chosen to maximise visibility due to the high volume of traffic flow in this area.

A MacBook Pro laptop as the Emotiv EEG connection and control centre, and a WiFi hotspot for secure CloudBit controller connection were necessary to conduct the exhibition. These items were arranged at one end of a long library work table. Initially, I observed that the Jack in the Box would generate questioning glances but no further interest was forthcoming. Public interest in the artwork began quickly after I placed the Emotiv EPOC headset on my head and started to interact with the device. Once my brainwave input animated the device and the crank moved, the music played, and finally the jack sprung forth from the box, students sitting nearby started to inquire what the item was and how it worked.

With this first of the impromptu style exhibitions, it seemed important to return to a questionnaire to gauge the impact of the interactions, the EEG headset, and the Jack in the Box itself within a random audience setting before venturing out to conduct further impromptu exhibitions in other venues. The most critical detail discovered in both my personal observations and in the questionnaire responses was that, generally, to gain the interest of individuals in random locations chosen as ad hoc exhibition spaces, creating an interest in interacting with the device was most effectively achieved when potential participants witnessed someone else engaged in interaction with the device (*see infra* Appendix B).



Figure 26: Impromptu Exhibition, Goldsmiths College Library (2017)



Figure 27: Impromptu Exhibition, Goldsmiths College Library (2017)

Occasional Half Pub, Palmers Green, London (2017)

The second impromptu exhibition that was undertaken was at the Occasional Half Pub in Palmers Green, North London. This location offered a pool of potential participants that would arguably vary largely from that seen at the Goldsmiths College library. Where at Goldsmiths the exposure to staged art events is something that a student is likely to encounter, this pub is a different case. The Occasional Half Pub is situated in a largely residential area of Palmers Green and its clientele is comprised mostly of area locals.

The set up of the artwork was similar to the impromptu exhibition at the library, utilising the Macbook Pro, a WiFi hotspot, and the Emotiv EPOC headset. In this instance, I made one alteration to the exhibition of the artwork. In this instance, I began the event by first personally interacting with the artwork through the EEG headset in order to foster engagement and interest of others within the pub environment. This approach resulted in participant interaction occurring much faster. However, the first major drawback or shortcoming I observed in this impromptu exhibition was the large level of background noise causing difficulty with participants' auditory reception of the sound element of the Jack in the Box. The second major drawback was that some of the potential participants that expressed interest in the artwork and engaged me in detailed questioning about the system and processes at work and the purpose of the device, afterwards declined the offer to interact. When asked what made them reluctant to interact with the artwork, many of them stated things like the following, 'I'll look silly with that thing on my head'.

I learned from these pop-up exhibitions that location and context played a key role to both the effectiveness of the presentations and how diverse the participant pools would be. More critically, it also illustrated that location and context would dictate the willingness of individuals to make the transition from an observer to a hands-on participant taking place in the interaction.



Figure 28: Impromptu Exhibition, Occasional Half Pub (2017)



Figure 29: Impromptu Exhibition, Occasional Half Pub 2017



Figure 30: Impromptu Exhibition, Occasional Half Pub (2017)



Figure 31: Impromptu Exhibition, Occasional Half Pub (2017)

CHAPTER FOUR: ‘HAPPENINGS’ IN THE 21ST CENTURY, A NEW PARADIGM



In creating artworks for this PhD, one of the lodestars utilised in that creation and the benchmark for success or failure was whether the work captured the essence or aesthetical components of a ‘Happening’. In the ‘Happenings’, Allan Kaprow not only changed the reception of art but, more importantly, he redefined how and when the process or the moment of art takes place. In this I mean that he helped to shift the focus away from the traditional object centred rendering of art and made the here and now of experience of art the focal point. He described this object centric focal point by stating, ‘Western art tends to need many more indirections to achieving itself, placing more or less equal emphasis upon “things” and the relations between them’ (Kaprow, 2003: 7). As illustrated in the previous Art & Theory chapter (*see supra* Chapter One, pages 33-42), I traced Kaprow’s work with art as an experience through his study and reworking of the theories of John Dewey. In the Art & Theory chapter, I also discussed in some depth, how Kaprow defined and interpreted the gestalt of the ‘Happenings’ and how that helps to legitimise and strengthen areas of art, like those of participatory theatre and performance based art.

Kaprow loosely explains the ‘Happenings’ in his 1961 essay, *Happenings in the New York Scene* as,

[i]n contrast to the arts of the past, they have no structured beginning, middle or end. Their form is open-ended and fluid; nothing obvious is sought and therefore nothing is won, except the certainty of a number of occurrences to which we are more than normally attentive (Kaprow, 2003: 16).

Kaprow’s deconstruction of the ‘Happenings’ and his outlining of where the art resides in object negated or objectless art production are still relevant in the current interactive digital art realm. It is the focus of this chapter to offer a reinterpretation and reconceptualisation of the ‘Happenings’ by constructing a remapping of those critical facets, and to establish connections to current art production in the interactive digital age and the artworks created within the practice based component of this PhD.

Kaprow’s ‘Happenings’ have been linked to the aesthetics of interactive digital art before, but what this chapter is centred around is the ethos or the actual art event that is and exists in the moment of interaction. The aspect of the ‘Happenings’ that is under inspection here is the connection between the practitioner or artist, the interactive proposition, and the participant or audience. It is the very moment that the

connection takes place that I will argue is the valid and veritable art object and not in the physical and tangible objects that have been constructed.

Recalling Kaprow's Precepts

As discussed previously in the *Art & Theory* chapter, Kaprow crafted seven precepts that he used to define and structure what constituted a 'Happening' (*see supra*, Chapter One, Defining Kaprow's 'Happenings', pages 36-42). These guidelines were used by Kaprow to create his own form of participatory art where the art is the experience. While Kaprow's precepts were discussed in detail earlier in this thesis, they have been listed here as a reminder of Kaprow's guidelines for creating art where the experience is key. These precepts are:

One, 'the line between the Happening and daily life should be kept as fluid and perhaps indistinct as possible' (Kaprow, 2003: 62).

Two, in creating a 'Happening' the 'themes, materials, actions, and associations that they evoke, are to be gotten from anywhere except from the arts, their derivatives and their milieu' (Kaprow, 2003: 62).

Three, 'the Happenings should be dispersed over several widely spaced, sometimes moving and changing, locales' (Kaprow, 2003: 62).

Four, '[t]ime, closely bound up with things and spaces, should be variable and independent of the convention of continuity' (Kaprow, 2003: 63).

Five, a 'Happening' is, 'the composition of all materials, actions, images, and their times and spaces should be undertaken in as artless and, again, practical a way as possible' (Kaprow, 2003: 63).

Six, 'happenings should be unrehearsed and performed by nonprofessionals, once only' (Kaprow, 2003: 63).

Seven, '[i]t follows that there should not be (and usually cannot be) an audience or audiences to watch a Happening' (Kaprow, 2003: 64).

We now turn to how these precepts can be reconceptualised to apply in the context of interactive art.

The Reconceptualisation

The fact that the 'Happenings' are freed of the restrictions connected to the rules and formulas present in the traditional tropes and trappings of Western fine art production, allows for positioning them relevant to countless applications and formulations that are yet to be discovered. But more interestingly, and perhaps even more relevant, is that they are removed from being, 'filtered through a specialized

medium and a privileged showplace' (Kaprow, 2003: 65). For a 'Happening' to transpire it needs to be actively engaged with being in the 'here and now' plus being in and of the real world.

The 'Happenings' have been related to the aesthetic precedent in interactive digital art both within this thesis and by sources cited within. Yet the foundational precepts or guidelines set forth by Kaprow, as stated above, largely have not been elucidated by means of modernising and/or by direct application in conjunction to current art practice. The remainder of this chapter is orientated to work on a bifurcated level. This serves as a means of bringing the 'Happenings' to modern relevance and, thus, offers a reconceptualisation of Kaprow's the 'Happenings'. It also serves as a means of deconstructing and gaining insight into the theoretical understandings and motivations incorporated within the practice based elements of this research. Directly linking Kaprow's 'rules of the game' to the objects and scenarios developed in the research based practice component of this thesis, helps to reveal the experimental ramifications of the resulting experiences.

Applying the First Precept

The essence of Kaprow's first rule is that there must be a rejection of the necessity of contrived form and a fluid blurring of the event taking place with real life. It can be asserted that the rejection of contrived form as required by Kaprow allows for such contrived forms to be negated but not entirely eliminated provided that the contrived purpose is not relevant or necessary to the gestalt of the work. Within the confines of interactive digital art, one major contrived form is the computer. The ingress to a 'Happening' is not the computer or its computational power that has a footing here but the action of use. The components of a computer system that allow for interaction like sensors, mice, gamepads, cameras, or even the Internet offer a fluid blending of the real human world and that of the computer or the digital. It is my contention that the space between input given and input received in any order or transmission satisfies Kaprow's first condition. Thus, the actual form of a computer, a human, or an interfacing element can be negated, but it is their active process of information being given and received that flows naturalistically and is imperceptible or indiscernible of any other active process found within real existence that meets the requirement of Kaprow's first condition. To illustrate this point, let us consider two different types of information transmission frameworks.

First, consider a real world scenario at a surface level. This scenario is how the process of visual identification works within any animal. The corporal visual sensors standardly are the eyes. The eyes work fundamentally by the harnessing of light signals and converting them to electrical signals, which are then sent along to the brain via the optic nerve. The brain then interprets the signals and renders what is seen (Aoa.org, Accessed Oct. 2016).

Now consider the computational interactive framework at work within my practice based research. My systems utilise an EEG headset to read and interpret human brain activity that is then transferred to a computer. Once transferred, the computer interprets the signals in to the relevant state of the participant's brain activity assessing levels of attention and/or mindfulness. Then, the computer, based on programmed functions, translates those levels to trigger a relative state change in an electric motor.

In both cases, when the forms that allow the transmission — in other words, the eyes and the EEG headset — are negated but not eliminated, what is left to examine is the action of the mode of information transmission. In both cases, the movement between transfer states is imperceptible. Presently, there is no distinguishable element between the transfer of information being in the form of the light signals on photoreceptive cells in the eye and the transfer of information from the brain to the EEG electrodes. In both of these vignettes, the spaces in between the action of information transference are indistinguishable from one another.

Applying the Second Precept

With his second rule Kaprow is dictating that, 'Themes, materials, actions, and the associations they evoke are to be from anywhere except from the arts' (Kaprow, 2003: 62) and should be conscripted from any repository that is not within art or connected to it. This rule is mainly concerned with the aspects of reception, placement, and interpretation. Staging an art experience outside of the traditional contexts of art placement and reception is critical to creating what Kaprow considered new and genuine art (Kaprow, 2003: 62-63). It is the active and purposeful distancing from art contexts and venues that allows the presentation to objectively exist and consequently allows for the assessment of the interaction to be real and genuine.

One art form that adheres to this rule strictly and has the 'Happenings' as an antecedent is the Flashmob or Flash Mob. The flash mob has its origin in Manhattan, New York City and was first created by Bill Wasik, a senior editor of Harper's

Magazine (Wasik, 2016). These are events that are scripted, preplanned, and choreographed, with instructions being disseminated via social media. For an event to be considered to be a flash mob, the event must be purposeless and cannot be an event or performance that has been undertaken for any external purpose. Thus, to constitute a flash mob the event cannot be undertaken for purposes such as political protests, advertisements, commercial purposes, and cannot involve paid professionals (Wasik, 2016).

In the realm of computational art, the medium that adheres closely to this rule is Internet Art or Net Art. This is an art form that, according to artist Roy Ascott's⁹⁶ description, shows it has by its nature a negation of established art contexts: 'In my view, we might anticipate the dematerialisation of academies, galleries, and museums, or at least their fusion into pervasive and wide-reaching networks' (Ascott, 2003: 221). It has to be said that Internet Art might exist outside of codified annals of art but it could be seen as a by-product of their technical requirements and, therefore, not by artistic design. The very structure and infrastructure of public and private networks that Internet Art relies on typically exist outside of the, 'academies, galleries, and museums' (Ascott, 2003: 221), thus, their existence outside of those confines is a natural state and not done because of artistic necessity.

When conducting the interactions discussed in Chapter Three, Practice Based Review, I sought to make the experience exist outside of, 'academies, galleries, and museums' as a component of its design and a gift of happenstance. All of the events where participants were able to engage in experiences involving my objects took place outside of artistic contexts. The locations used were always everyday life spaces and the participants used were drawn from non-art and or random vocations⁹⁷. This way, even though there is a well- established connection of interactive computing and art, this knowledge would be limited and fractured in its understanding and reception of those participating.

⁹⁶ Roy Ascott: Ascott is a Professor of Technoetic Arts at the School of Art, Design and Architecture at Plymouth University in the United Kingdom (Plymouth.ac.uk, Accessed Dec. 2016).

⁹⁷ To clarify, the use of the term 'events' refers to actual public displays of the various artworks created for this thesis. The term 'events' is not used to refer to initial testing and experimentation of devices, objects, and systems, which were conducted using some people possessing art degrees or some level of art education.

Applying the Third Precept

The Flash Mob and Internet Art are both examples of types of digital art that fulfill the next rule of ‘the Happenings [being] dispersed over several widely spaced, sometimes moving and changing, locales’ (Kaprow, 2003: 62). Also, in both examples, not only are the experiences able to be undertaken in countless vastly different locations, but they are also able to exist in any variable temporal space consecutively and/or simultaneously. Because both of these mediums utilise networked communication systems, arguably they could use locations as vast as Mount Everest or the international space station.

The experiences created and discussed in Chapter Three, Practice Based Review, were staged in both the United Kingdom and within the United States. Throughout the iterations of experimentation, many different objects like EEG headsets, standard computer interfaces, and retro toys were interchanged and/or discarded through the process of gauging their suitability. Varying the location of the events, as well as the object and the interactive potential embedded therein, offered every experience a nuanced and unique identity. The changing of locations and physical and interactive elements was naively intended to solve technical issues as the prototypes progressed but it was discerned through reflection that these changes were critical to the theoretical understanding of the artistic by-products produced.

Applying the Fourth Precept

Kaprow’s fourth rule of the ‘Happenings’ is about time and relativity. The experiences that are a ‘Happening’ should progress naturally so and in their own time. This rule when applied to computer or digital art of any kind becomes both freeing and convoluted because, within the virtual world, time and relativity are fluid. The natural progression of time for a computer program is relative to the conditions of its underlying mathematical functions. Those functions are most often reliant on a variable that is to be specified as the program is executed. Thus, the natural progression of time in a virtual environment is analogous to that of the nature of time in a dream in that it is relative to a given occurrence and can change at any moment. The virtual world of computation is, for that matter, a perfect medium for the construction of a ‘Happening’ because time will progress based on the nature of the programming elements specified and relative to itself and any given instance, as it is both fluid and malleable.

The toy based objects created for the research based practice component of this thesis all have a duality present in their connection to their natural progression of time and to the overall experience. The toys used in the practice were the Fisher Price Music Box Record Player, Fisher Price Two Tune Music Box TV, and a Jack in the Box, and each one had a musical and mechanical element that had a fixed playback rate and duration. These were either based on the song or winding down of a spring. The EEG headset and computer system had a variable nature to their interactive experience. By design, the interaction would last until the desired brainwave state was reached and maintained long enough to trigger the toy's spring wind down process, or in the instance of the Jack in the Box, the release of the spring loaded Jack. These devices relied on a fluidity of time progression from headset to toy and then back from toy to headset. The experience's natural progression of time therefore was relative on a moment-to-moment basis.

Applying the Fifth Precept

The fifth rule is about the materials and actions and their time and spaces in a practical and artless way (Kaprow, 2003: 63). By including this rule or definition, Kaprow was trying to ensure that the art made in a 'Happening' is not influenced directly by the objects, time and places, people, or what should be referred to as the tools, of a 'Happening'. This leaves only the experience or the active interplay of all of these elements as the focal point of the experience and is, thus, wherein the creation of the art lies. In the world of interactive computing, this is easily understood through video games. While the components of a video game are made up of many art forms — things like graphics, 3D shape rendering, texture mapping, music and sound effects, and game mechanics, even if these elements are perfect and amazing, it does not guarantee an amazing or popular game — that comes down to game play. If the experience is not nuanced and dynamic then there is little to no point. The act or experience of interacting with a video game is the gestalt of the game. In this way, the interpretation lends itself to see the art of a video game as how one entices another to click buttons and live in the 'here and now' of that given video game's universe.

Throughout the research and physical construction of the interactive objects and devices created as part of this thesis, the principal goal was always to foster a desire in the interactive proposition. The underlying principles used to create the physical objects are strongly rooted in art and art theory; however, as this chapter demonstrates they have not been undertaken in an artless manner, but in keeping with

Kaprow's precept of avoiding art trappings, they have been adapted to function as tools. They are a means to an end in a philosophical way. It is not their construction that is the 'Happening', it is the moment there is a connection between the participant, object, and practitioner that it becomes a shared experience. It is the transitional moment between enticement and interaction that becomes the gestalt and that interaction has not been artistically dictated or manipulated.

Applying the Sixth Precept

In rule number six, Kaprow declares a need for the 'Happening' to be non-contrived and spontaneous, 'unrehearsed and performed by nonprofessionals, once only' (Kaprow, 2003: 63). This rule affords that each time any given occurrence of the 'Happenings' is undertaken, it is then judged on its own merits and within its given 'here and now' mentalities. Each 'Happening' event is singular. Even if a 'Happening' event has been restaged or recreated down to the very last detail this new mirrored event is its own new 'Happening'. This concept is captured by the words of the poet Antonin Artaud⁹⁸ in the way he describes his understanding of the singularity of moments in the world, which he expresses by stating, '...[in] the world where a gesture, once made, can never be made the same way twice' (Artaud, 1958: 75).

Each 'Happening' is seen as a unique occurrence because no moment can ever really be in the same place and the same time as another moment. Each is singular within its given time and place. This understanding of a 'Happening' points out that true 'Happenings' are moments that cannot be rehearsed. Their rehearsal creates 'Happenings' in their own right. Those 'Happenings' would differ greatly from any and all acts that have been modelled to recreate them. It is a looping pattern that makes for a new genesis or creation of unique 'Happenings'.

Spontaneity is necessary because the art of a 'Happening' is contained within the very moments of active interaction and engagement and is generated in the slots or spaces in between moments. These slots or spaces are found in any place, time, or moment where participants are actively engaged within the event. I would assert that in my understanding spontaneity can be found by looking at the traces of a 'Happening'. One needs to be spontaneous in picking them out of their context of being hidden in the veil of everyday life. One should be looking in every active

⁹⁸ Antonin Artaud: Artaud was an early twentieth century French poet and playwright. He is most notably associated with the genre of experimental theatre (Poetryfoundation.org, Accessed Dec. 2016).

process to find and understand the moment that a ‘Happening’ exists. It is how one engages in the act of looking — either passively or actively — that is relevant to the spontaneity required for the existence of a ‘Happening’ as, according to Kaprow and discussed above, without active looking there can be no ‘Happening’.

In the context of interactive digital art, systems are not rehearsed, but those systems are tested for errors and those errors, if found, are corrected. This makes every compiling of a programme a unique event. There is spontaneity built in to the ability for countless running of any given programme and the nature of who decides to use said programme at any given time or place. Interactive digital art, in this way, falls in step with this prerequisite of Kaprow’s ‘Happenings’.

In the work done in my practice based research, each interaction was dealt with as a one off event by having each event staged one at a time. Since there have been many different interactive objects made and more than one type of headset available, I could have staged multiple interactive experiences at the same time. However, it was ultimately determined that multiple interactive experiences occurring at the same time would become overly complex in terms of both the technical support required and in the ability of the audience to view and understand the moment of interaction. By having two participants interacting at the same time, it was determined that this would cause audience members to split their focus and risk them not actually observing the interaction itself or the actual gestalt of the work. In addition, I had concerns that having two people participating at the same time would also change the focus for the participants from the nature of the interaction itself in to something that resembled a competition.

It was observed that there was a duality in this experience in that people engaged both as observers and as active participants. First, there is the event of waiting for an opening or turn to use the system. This mirrored in many ways the act of queuing or standing in line to partake in a carnival amusement. With respect to a carnival amusement, you are attracted to the amusement by seeing others experience their turn and while waiting you engage in the act of anticipating or imagining what your individual turn will be like. Very similarly, when a group of participants is gathered to watch the interactive events that were undertaken as part of the research based component of this thesis, they are both attracted by seeing others take their turn, and are left anticipating or imagining how their turn will be. Second, there are the practical mechanics of actually interacting with my objects. As a participant, the

system requires you to focus your mind to a high level of mindfulness or singular attention — this being an ability or an exercise that must be used or practiced often while engaged in countless real life tasks. Granted, when engaging in this mental task as part of the interaction with my objects the task is taken out of those familiar real life contexts, but the act itself is still a mirror of real life.

While the participants may have experience with the mental task of engaging in mindfulness or singular attention, the participant groups targeted for these interaction iterations, in keeping with Kaprow's sixth tenant of the 'Happenings', were not professional artists or actors. The participation of these non-professionals allowed for participants to more actively engage in the 'here and now' and fully become part of the 'Happening'. Artistic professionals, with their understanding of various contrived forms, are more likely to apply traditional tropes of art to the engagement and hinder the natural evolution or development of the interaction. Thus, by using non-professionals in the various iterations of experimentation engaged in for the research based portion of this thesis, it allowed for the creation of a 'Happening' in accordance with Kaprow's rules.

Applying the Seventh Precept

Kaprow's seventh and last rule concerning a 'Happening' is that, 'it follows that there should not be (and usually cannot be) an audience or audiences to watch a Happening'⁹⁹ (Kaprow, 2003: 64). This rule is stating the very same notion that ties everything that makes up the 'Happenings' — activeness or liveliness. Kaprow's requirement that the 'Happenings' consist of 'purposive action' is what Kaprow says gives the 'Happenings' its affinities. Affinities, Kaprow states, are:

⁹⁹ At various points throughout this thesis, I have discussed the audience and its role in my artwork. However, my inclusion of audience members as playing a role in my work, is not inconsistent with Kaprow's rule that 'there should not be (and usually cannot be) an audience or audiences to watch a Happening.' Kaprow's point was that a 'Happening' is about engagement in the experience. As I discuss more in-depth in Chapter Five, Structuring the Interaction (*see infra* pages 151-155), there are different levels of engagement with the art systems I created — not only passive and active, but even different levels of engagement within what I refer to as 'passive' engagement (*see supra* Chapter One, pages 11-14, for further explanation of the terms 'passive' and 'active' as utilised in this thesis to draw a distinction between the more traditional observational mode of engagement and hands-on, physical participation or interaction). However, in order to be part of a 'Happening', those that are observing must be actively engaged in that process. This may mean that they are actively attempting to decipher what is occurring or that they are observing the interaction of others as they await their turn to physically engage with the art system; that level of engagement is what is necessary to become part of the overall experience.

With practices marginal to the fine arts, such as parades, carnivals, games, expeditions, guided tours, orgies, religious ceremonies, and such secular rituals as the elaborate operations of Mafia; civil rights demonstrations; national election campaigns; Thursday nights at the shopping centers of America; the hot-rod, dragster, and motorcycle scene; and not least, the whole fantastic explosion of the advertising and communications industry (Kaprow, 2003: 64).

These items make his list of affinities because they all in their own way work at the substrates of the tangible everyday life and the results of which are ‘partly conscious ceremonies acted out from day to day’ (Kaprow, 2003: 64). The point here is that these are all details present in everyday life. These are details that people interact with on an autonomic level. The ‘Happenings’ are about actively interacting with these processes, and altering their ceremonial or ritualistic aspects by the very act of actively looking at them.

It would be in his essay, *Art Which Can't Be Art* (1986), where Kaprow makes this point more concisely. In this essay, Kaprow talks at length about the most important aspect of what that ‘purposive action’ creates. It creates art. It does so because in the ‘purposive action’ of looking at a ceremonial or ritualistic autonomic real life moment, the moment is altered in the act of looking. When an autonomic ritual like brushing one’s teeth is carefully watched and studied, the process changes as a result of self-observation. Kaprow talks about how after many weeks of close observation of his movements and processes used while brushing his teeth he found the process changing to be more efficient or to be more precise (Kaprow, 2003: 219).

With interactive digital art there is, by the very nature of the name, a requirement that interaction occur. There is a transmission of information in some form or means. It is this transmission of information itself that can be extrapolated to be an interaction and makes everyone a type of participant. This holds true even in the case of individuals that are watching others engaged in the interaction. While perhaps not considered direct and physical participation, ‘[p]erception is an active process’ (Edmonds, 2010b: 1-2). Edmonds discussed the active nature of perception in his paper *The Art of Interaction*, stating:

Even when we stand still and look at the Mona Lisa our perceptual system, the part of the brain behind the eyes, is actively engaging with the painting. However, we do not change the painting in any way. As we look it may seem to change and we sometimes say that we ‘see more in it’, but it is our perception of it that is changing (Edmonds, 2010b: 1).

Edmonds acknowledged that ‘Marcel Duchamp went so far as to claim that the audience completes the artwork. The active engagement with the work by the viewer is the final step in the creative process’ (Edmonds, 2010b: 2). According to Edmonds, ‘From this perspective, audience engagement with an artwork is an essential part of the creative process. The audience is seen to join with artist in making the work’ (Edmonds, 2010b: 2).

Yet active engagement in the realm of interactive digital art goes farther, creating instances in which participants engage directly and physically. While individuals that are watching others directly and physically interacting with the artwork are not engaged in the interactive process in the same way, their viewing of the interaction transmits information that may alter the observer’s engagement with the objects and devices of the interaction once his or her turn arrives. This transmission of information elevates the viewer from a passive audience member to a type of active member of the interactive process, although on a more discreet and subtle level than those actively engaged with the objects and devices of the interaction.

Regarding the experiments conducted for the practice chapter, the experience has two phases of active viewing. The first phase is the enticement or the hook to sell the process of interacting. This is either being connected to the EEG headset or to the object that will be activated by that interaction, and depends on why the participant’s interest was piqued. This first phase is also present in those individuals that are waiting and watching while others participate with the system. The second phase, is where their active looking at the process alters their reception from passive to active. If they see the process being undertaken they either are enticed to themselves interact or they are not and interest is lost and their attention is transfused elsewhere, thus, in both cases never allowing them to be a truly passive audience.

The ‘Happenings’ are about activeness and liveliness in everyday tangible life. They are focused on the moments connected to exploring the ‘here and now’ and seeing them unfold. They exist in the moments between the real world, spatial and temporal, in defiance to art contexts, and exist in any form only once. The ‘Happenings’ are about the process of autonomic ritual and ceremony as they are altered through their examinations. These crucial facets of the ‘Happenings’ as listed above are present in interactive digital art. Thus, interactive digital art can be used to

construct or bring about a reconceptualisation of the ‘Happenings’ in a new and more contemporary context.

Reinterpreting Interactive Digital Art as ‘Happenings’

When using my reinterpretations of the ‘Happenings’ as a type of lens through which to view other artwork, evidence can be found of the ‘Happenings’ existing in interactive digital art. The works that I have created for the practice chapter were created to specifically work within Kaprow’s seven rules using them as guides. Yet, the true litmus test of the theories set out in this chapter is applying them to works that have not been created to connect directly to Kaprow’s ‘Happenings’. In doing so, this demonstrates the broader applicability of Kaprow’s ‘Happenings’ to interactive digital art. While the works I created for the practice chapter were made to conform to Kaprow’s seven precepts, when something is created with certain precepts in mind it will, of course, conform to the precepts applied. However, to test the broader applicability of a reconceptualised view of Kaprow’s ‘Happenings’, we must also look to interactive artworks that do appear to have been created pursuant to the same constructs. If we look at the following three contemporary interactive artworks *La Maison sensible* (2015), *The Rain Room* (2012), and *Beyond the Wall* (2012) we can unpack the presence of ‘Happenings’ connected to their use of interaction and actively engaged participants.

La Maison sensible

La Maison sensible (2015) or the *Sensitive House* (2015) is an interactive installation created as a collaborative effort of the Scenocosme group comprised of Grégory Lasserre and Anaïs met den Ancxt with the group Lola and Yukao Meet that includes the members Lola Ajima and Yukao Nagemi. *La Maison sensible* is an installation that is an interactive experience that transforms the physical space and alters the relationship between a participant and a tacit, tenuous, and subtle environment. *La Maison sensible* in its installation uses cleverly hidden discrete sensors to transform all of the elements of a physical space. These elements are the furniture, walls, and floors of an exhibition space. The space has been dressed to recreate the setting of a standard Western living room. The presentation space is transformed from a model of a living room to an interactive art experience by combining it with computational interactive components. This creates a new hybrid space that is tacitly responsive, sensitive, intricate, and pragmatic. The visual and

auditory aspects are rendered in direct connection to responses of numerous and variegated types of interactions of the participants. Lasserre and met den Ancxt in their briefing literature pertaining to *La Maison sensible* describe the end result of this hybridisation as, ‘each surface is sensitive: walls, floor, and furniture [and they] capture the visitor’s behaviour’ (Ancxt, 2017). The resulting response of the interactive simulation of the computational system is rendered in the forms of diverse and nuanced shades of light and sounds that vary based on the individual processes of interaction. As a means of enticement to enter the space, when looking in to the space when it is empty and silent, the prospective participant is greeted with a visual display which is recounted by Lasserre and met den Ancxt as,

The walls and floors of the environment [are covered with] hundreds of thousands of fragile video-projected particles. They are all quiet and nicely ordered. Only a slight breathing motion is perceptible. They slowly and gently draw mesmerizing figures (Ancxt, 2017).

In *La Maison sensible* the Kaprow requirement of a rejection of contrived form with a fluid blurring of the real life is evident in the recreation of the living room environment devoid of its traditional context. The individual tropes that signify a living room are present, but their form and function have been perverted by their loss of contextual relevance. The new space mirrors similar spaces found in real life, but is situated outside of it; thus, it can be asserted that the contrived form of the living room is negated but not eliminated. The ‘Happening’ present in the form of information transmission resides in the process of the participant’s ability to recognise the tropes that construct the staged living room, the participant’s personal association with such places, and the disquieting nature of the transposition of this new contextual rendering.

The second guideline of the ‘Happenings’ is concerned with the actions, themes, and associations they evoke. These actions, themes, and associations can be drawn from anywhere that are not associated with the arts. It is *La Maison sensible*’s blending of the domestic, emotional, and computational spaces that illustrate this guideline. Through the construction of a hybrid of all of these devices, *La Maison sensible* becomes an augmented reality where the actions, themes, and evoked associations become unique and encapsulated within this separate reality. Even though the rudimental elements individually do exist in the annals of artistic

production, this augmented reality that is part and parcel to *La Maison sensible* exists only in the one off realities created by each and every new interaction.

Through its combining of abstract video and auditory elements, *La Maison sensible* is also connected to the third rule of the ‘Happenings’ which requires that the mode of placement and reception be disconnected from any context of the art. The visual and sound elements of the work create a space that is both attentive and empathetic (Ancxt, 2017). The space created by *La Maison sensible*’s interactive system responds to the behaviour of the participants in ways that mimic a living organism. If the participants are loud and interact aggressively within the space, the system freezes and responds in a way that presents itself as being like fear or apprehension (Ancxt, 2017). This process places the interactive process apart from traditional art reception because it shifts the centre of focus away from visual or aesthetic appreciation. Instead, it shifts it towards one of learning and tailoring of behavioural responses of the participant by means of the feedback given by the system. This can be seen as a cause and effect emotional flow of information between *La Maison sensible* and its actively engaged audience members.

The progression of the experience of *La Maison sensible* has no fixed temporal requirement. Furthermore, the combination of its materials of construction and the flow of its actions unfold naturalistically and are dictated by its self-contained time scale. This temporal landscape is controlled by the give and take between *La Maison sensible*’s interactive system and the participant’s desire to continue the interactive process. This means that the process’s time scale contains an unspoken agreement between the system and the participant and is conducted in its own unique time. This interpretation of *La Maison sensible* connects it to both the fourth and fifth requirements of the ‘Happenings’ in a combined state. To fully understand the processes at work within *La Maison sensible* the interpretation that is undertaken should not divorce the material components from their active use within its augmented reality. When viewed through this lens, *La Maison sensible* has a natural and self-governed, self-imposed, and material driven temporal landscape.

The sixth rule, at its core, is about spontaneity and the action that generates a ‘Happening’ being unrehearsed and a one-time occurring event. In the experience contained within *La Maison sensible* the spontaneity is controlled by the level of activeness or liveliness of the participants. Each reception of the event is a one off experience in time and place. This refers again to the ‘here and now’ of a given event

in time and space. Even if a participant returns to *La Maison sensible* at a later date and retraces their performance exactly, the result will be a unique event. When the act of participation is the genesis of a ‘Happening’, as stated before, there is no way a rehearsal if actively undertaken would not be a ‘Happening’ in its own right.

The seventh rule is that passivity of reception of a ‘Happening’ cannot exist. With *La Maison sensible*, audiences in its proximity exist in two states. Those states are directly interacting with the space and those witnessing the interaction of others. If you are directly and actively interacting then you are participating in the occurrence of a ‘Happening’. If you are passively observing the process unfolding then what you are witnessing is not a ‘Happening’ but a type of experimental theatre (Kaprow, 2003: 63-64). The transition between these two states can and does exist when the passively observed moment entices a desire to actively interact personally. That transition moment is a ‘Happening’ in its own right, which is separate, and distinct from a ‘Happening’ that will exist once a participant is actively engaged in the interactive process.

Through this application of the reconceptualised theories of the ‘Happenings’ as it relates to interactive digital art, *La Maison sensible* illustrates that it is not just a singular ‘Happening’ art event but is also comprised of several different discernible moments of ‘Happenings’ as well. Each one of these discernible moments is caught up with key facets of *La Maison sensible* as an event. As an installation, it mimics or mirrors real life through its appropriation of the tropes and forms of the Western living room and also in its responses to behavioural forms. It creates an augmented reality that has its own temporal space and scale of time. It has spontaneity that is proportional to the feedback or information transmission process of the participant interaction and the system’s quasi-emotional replica responses. And, finally, the experiences are a one time or one off unique event that has no ability to be rehearsed, prestaged, or recreated in time and space. *La Maison sensible*, therefore, demonstrates the existence of a ‘Happening’ in the context of the modernized landscape of interactive digital art and is, in fact, comprised of many moments of ‘Happening’ throughout the experience.

Rain Room

The second artwork to be illustrated as a ‘Happening’ by its deconstruction through the reconceptualised theory is, *Rain Room* (2012). *Rain Room* is a creation of the collaborative art studio called Random International. Random International is a

collective of three contemporary interactive digital artists and graduates from the Royal College of Art in London. They are Hannes Koch, Florian Ortkrass, and Stuart Wood (Digitalmeetsculture.net, Accessed Jan. 2017). *Rain Room* has been exhibited at the Los Angeles County Museum of Art, the Yuz Musuem in Shanghai, the Museum of Modern Art in New York, and the Barbican in London. It is the Barbican exhibition that I will be focusing on (Random-international.com, Accessed Dec. 2016).

The *Rain Room* was installed in the section of the Barbican know as ‘The Curve’. The exhibition comprised of a walking space measuring roughly one hundred square meters. When entering the space, the participant was met with a simulated state of pouring rainfall. The computational aspects of *Rain Room* are comprised of the use of augmented humidity, the physical and visual experience of rainfall, and digitalized sounds. The unusual facet to the experience of *Rain Room* is that as the participant enters into the indoor rain shower they never get wet. The rainfall responds to the movements and actions of the participants. As participants move through the space, the falling water is selectively controlled to rain around their location and never on them. The rain is present in a state that is always encapsulating the participant, yet simultaneously being just outside their reach (Digitalmeetsculture.net, Accessed Jan. 2017).

Using the reconceptualisation of the ‘Happenings’ as a model we can unpack how the *Rain Room* is, when experienced by participants, a form of a ‘Happening’. The rain having been moved out of its established context of being an event of nature and dedicated to the world outdoors is a contrived form, but in its staging it has become a space that is an augmented or virtual reality. In this new reality, this is a verisimilitude that is created between the rain of the outdoors and this rain system of the indoors. The staged form of *Rain Room* affords it a unique reality that is fluid in its connection with its real life counterpart and within the time undertaken in the experience causes a fluid blurring of the staged performance and real life.

Continuing through the reconceptualisation model, the associations, actions, and themes of *Rain Room* are more akin to things like the Uncanny Valley¹⁰⁰ than to

¹⁰⁰ Uncanny Valley: The Uncanny Valley is a concept in aesthetics. It is a hypothesis that replicas of humans that are very much like humans, but not exact recreations of the human form, elicit feelings of eeriness and revulsion among some observers. The ‘Valley’ refers to an exponential dip in an observer's affinity for the replica. This dip is in direct relation to the proportion the

the realms of traditional fine art. The reception of the augmented reality generated in *Rain Room* is met with the essence of excitement and unease that are connected to the artificial and its resemblance to the real. The physical action of the rain's falling placement being a direct extension of the participant's body is a key driving force of the work and within that augmented reality it is an association that is self-referencing, in that there is no real world counterpart. *Rain Room* has refocused the associations, actions, and themes of real time and reappropriated them in to a form that within the temporal space of its experience is self-contained within its artificial environment.

The many installations and placement of reception has been in art gallery spaces in their physical manifestations. All of the hardware, pumping devices, and water are revised and experienced in traditional if not prestigious homes of contemporary art. The physical location of the work is not relevant to its reception in regard to its process as an experience. When the participant enters the fully rendered space they are in a type of virtual space that exists with in its own temporal and spatial realities. The gallery in this way becomes a discarded element like a shipping parcel after the item shipped has been removed. The unique reality that *Rain Room* creates is not reliant on the gallery; it could be generated in a carnival tent, a post office, a tube station, or an empty warehouse. When focusing on the experience of *Rain Room*, the physical location of its components is negated.

As with *La Maison sensible*, *Rain Room*'s temporal requirement is not fixed but fluid and relative to the connection of the participants to their unique experience within its augmented reality. The experience of *Rain Room* flows naturalistically from the basis that it is reliant on only the actions of the system and the bodily expressions or movements of the participants. Time in its natural state is irrelevant and the experience lasts for as long as or as diminutive as wished by the actively engaged participant. This is much like how a game will be played until playing has stopped when playing has naturally concluded or when the players lose interest.

There is no rehearsal or recreating an exact experience of *Rain Room*. Each experience or reception of its reality is a unique one off event. Even when *Rain Room* is experienced by groups of participants sharing the same physical reception of the work, each one is having a unique personally relevant experience or event. This is

human replica appears in its likeness to an actual human. Examples of this can be seen to exist in the realms of life-like dolls, 3D computer animations, and robotics (Kageki, 2012).

provable in the way that each participant in turn will have reached in his or her own time a moment when they feel it is time to move on to other different experiences; basically, when they have had enough of the experience.

In connection to the passive reception of *Rain Room*, it mirrors *La Maison sensible* in the way the audience exists in multiple states: those merely observing, those waiting to interact, and those that are physically engaged in the interaction. The participant moves from being a viewer of a type of performance art to participating in a ‘Happening’ as he or she makes the transition from passive to active reception of the work. Once active engagement takes place, the participant has become part of a ‘Happening’.

Beyond the Wall

The third and final interactive digital artwork interpreted using my reconceptualisation model is *Beyond the Wall* (2011) by artist and designer Carina Ow. *Beyond the Wall* is a work that explores physical space through the use of virtual and augmented realities and is similar to what was seen in the examples of *Rain Room* and *La Maison sensible*. Ow describes *Beyond the Wall* as a work that uses the, ‘superimposition of simulated perspectives in the form of interactive mapped video projections’ (Carinaow, 2016). *Beyond the Wall* is an interactive video work that has been tailored for the exhibition space of a wall in a building foyer — specifically, a foyer of a building that conforms to a particular style of classical architecture. The building must have as a prerequisite the architectural elements of decorative cornices and a central window. The wall of the foyer is then ‘light-painted’ with different sequences of animations that create virtual environments that exist in connection with, but beyond the physical wall. The movements of the participants trigger the animation sequences as they enter in to or take leave of the space. The spatial differences between the participants from one another also factors in to the play back order of the animations. *Beyond the Wall* was achieved with the use of new media tools including video mapping software, video cameras, and video projectors (Carinaow, 2016).

The foyer and architectural building type requirement that Ow has dictated for *Beyond the Wall* has functioned to blend or blur its augmented reality with that of real life. In the case of *Beyond the Wall*, this blurring is taken a step farther than it was in the previous two works because the wall is an element that the work cannot function without. With *Beyond the Wall*, the interactive video work is projected on the wall

and in doing so the augmented reality or world the piece creates and the wall become one.

The wall itself when seen without the projected animation sequences is an object or material that is steadfastly grounded in the themes and associations typical to the tropes of art. Yet those tropes of art fall away as the wall becomes absorbed in the new reality created by *Beyond the Wall*'s hardware and software elements. The original aesthetic function of the wall is gone and replaced and renewed while in progress as Ow's system cycles through its animations.

The location of *Beyond the Wall* is bound to very clearly defined architectural requirements but still offers numerous and varied application options. The locations available for *Beyond the Wall* are, however, more diverse than those offered by *La Maison sensible* and *Rain Room* because they require relatively large spaces and additional infrastructure. Thus, as with all 'Happenings', *Beyond the Wall* can be seen in multiple and varied locations.

As with the prior two works, *Beyond the Wall* creates its own unique temporal landscape. As a participant actively engages with the space and its animations, time outside the augmented or virtual reality has no bearing on the progression of the experience. The process flows naturally and continues, as is also seen with *La Maison sensible* and *Rain Room*, for as long as one wishes to be actively engaged. *Beyond the Wall* also offers no means of rehearsal between prospective participants and the system, and each interaction is a unique and one off individualistic experience. This is a product of the fact that each interaction is special within the 'here and now' of the augmented reality and is created or rendered as a participant experiences the process of interaction. There is no passive docile experience of this work. As with the other works deconstructed using the reconceptualisation model, participants exist in multiple states. These states range from being a passive empathetic viewer of a type of performance art to being that of an active participant in the formation of a 'Happening'.

Kaprow provides guidelines and requirements for what comprises a 'Happening' that have been discussed in detail above to provide a better understanding of the elements and conditions necessary for the creation of an occurrence or event that can qualify as a 'Happening'. By setting out each of these guidelines in detail and unpacking and explaining Kaprow's seven conditions, one is able to see how these guidelines can be applied in other more modern and

contemporary contexts, such as interactive digital art, thereby giving new life and relevance to the 'Happenings'. Reference to the 'Happenings' in the context of interactive digital art is not a new or unique idea. However, that discussion often rests primarily on using the 'Happenings' as a means of justifying the idea that interactive digital events are art given the aesthetic choices that are made. Art as experience is an aesthetic choice. Yet, beyond mere aesthetic concerns, this thesis suggests that the 'Happenings' are not merely an antecedent of interactive digital art, but that interactive digital artworks can be 'Happenings' on a more fundamental level. Thus, this thesis looks beyond the aesthetics, and asserts that there is art occurring in the precise moment of interaction. It is my assertion that, the objects and devices that allow for the interaction are aesthetic choices, but that the 'Happening' occurs — and therefore the art lies — in the intangible moment or transitional moment of the interaction. Thus, the aesthetic choices are secondary to the interaction, and the interaction becomes the gestalt of the work. It is my conclusion that this approach is in keeping with Kaprow's notions of the 'Happenings', and his building on the ideas of Dewey, that art is strongly connected to experience. Through this application and reconceptualisation of the 'Happenings', the resulting focal point of the work becomes less on what the artist chooses for the participants to interact with, and more on the nature of the interaction, and how that interaction becomes possible.

CHAPTER FIVE: THE INTERACTION



The artworks constructed in this practice research have been to create a unique and distinct moment of interaction as the gestalt of the work. They are a modern reconceptualisation of the ‘Happenings’ and, unlike many traditional works of art, the centre of focus is on the active connection between participant, practitioner or artist, and the object; the centre of focus is not on the object itself. With the moment of interaction being the gestalt of the work, facilitating and fostering the interactive process became of paramount importance. This chapter grapples with the various levels of engagement that lead up to the gestalt of the work, focusing on, first, the passive engagement by participants on both an autonomic level and on a more cognizant and reflective basis, and, second, the more active engagement required as participants actually engage in play. It also looks briefly at how pseudo-ESP or magical thinking can be used to help sustain a more prolonged and active engagement. Finally, this chapter looks at the nature of the resulting interaction, the levels of communication occurring during that shared experience, and how that experience becomes the gestalt of the work when viewed through the lens of the theories of John Dewey and Allan Kaprow.

Facilitating Engagement

Given the importance of the interaction, the desired nature of the interaction for the artworks prepared as part of this practice research were designed to be more in keeping with a naturalistically evolving engagement. Thus, as the practitioner, I wished to avoid hard sell tactics and the ‘Step right up’ style more at home with a carnival barker; rather, I looked for ways to facilitate an interaction that at its inception was more autonomic. However, it was also understood that an autonomic response to stimuli would only take the interaction so far, and that continued or prolonged engagement, and more active engagement would require additional enticements. Understanding how best to facilitate such engagement required a consideration of both passive and active engagement and autonomic and more reflective responses to stimuli, and an understanding that these types of engagement and responses would occur individually, but also, at times, simultaneously. In order to construct communication systems that would facilitate the type of interaction desired, I turned to theories of affect and play to guide the development of the artworks and their interactive structures.

The Theory of Affect

In general terms, affect deals with how we interact with objects, people, things in the world, or our environment. Affect is not as concrete as a feeling or emotion. As Gilles Deleuze¹⁰¹ and Félix Guattari¹⁰² noted, feelings and emotions are conscious thoughts, but affect is the unconscious reaction to stimuli. Affects are in essence an analogue of their given stimuli and they function to amplify the stimulus, thus, bringing the stimuli to the forefront of our attention (Tomkins, 1995: 68-74). In the words of Guattari:

AFFECT/AFFECTION. Neither word denotes a personal feeling (sentiment in Deleuze and Guattari). L 'affect (Spinoza's affectus) is an ability to affect and be affected. It is a prepersonal intensity corresponding to the passage from one experiential state of the body to another and implying an augmentation or diminution in that body's capacity to act. L' affection (Spinoza's affectio) is each such state considered as an encounter between the affected body and a second, affecting, body (with body taken in its broadest possible sense to include 'mental' or ideal bodies) (Deleuze & Guattari, 1987: 23).

It was this language, found in Guattari's definition of affect, about it being 'prepersonal', that first piqued my interest in affect theory and led me to consider utilising such ideas in the construction of my artworks and in the facilitation of the interactive experience. As I began my initial research in to autonomic communications, I encountered the following citation from Dr. Eric Shouse, communication professor and researcher from the East Carolina University, defining the concept of 'affect' by stating, '[A]ffect is not a personal feeling. Feelings are personal and biographical, emotions are social, and affects are prepersonal' (Shouse, 2005: ¶2). Exploring this idea that Shouse referred to as 'prepersonal', I realized that it offered a way to build in an element within my systems that could make the initial enticement less heavy handed and, thus, widen the scope of potential participants.

¹⁰¹ Gilles Deleuze (1925–1995): Gilles Deleuze was a French philosopher who is best known for his writings on the subjects of philosophy, literature, film, and fine art. The most influential of his writings were *Capitalism and Schizophrenia: Anti-Oedipus* (1972) and *A Thousand Plateaus* (1980). These two works were co-authored by the psychoanalyst Félix Guattari. Scholars and critics cite his *Difference and Repetition* (1968), a work concerning metaphysics as his finest endeavours. Deleuze's writings are seen to have impact on a large array of disciplines like art, philosophy, literary theory, post-structuralism, and postmodernism (Williams, 2013: 1-12).

¹⁰² Félix Guattari (1930-1992): Félix Guattari was a French born psychiatrist, philosopher, and militant. In the 1960s and 1970s he was the leader of the antipsychiatry movement. The antipsychiatry movement challenged established thinking in the fields of psychoanalysis, philosophy, and sociology (Britannica.com, Accessed May 2016).

Although this theory of affect has its origins in psychology¹⁰³, art has been defined as ‘a bundle of affects or . . . a bloc of sensations, waiting to be reactivated by a spectator or participant’ (O’Sullivan, 2001: 26). According to O’Sullivan, ‘There is no denying, or deferring, affects. They are what make up life, and art’ (2001: 26). Affect theory has been compared to a biological inherent autonomic response to the ‘present experience — the moment, the event — . . . inaccessible to consciousness’. Because affect does not occur on a conscious level and it has been pointed out that once the conscious mind becomes aware of it the moment is long gone, ‘[a]ll we ever have is its trace (we experience “passing” moments)’ (O’Sullivan, 2001: 27). According to Simon O’Sullivan, ‘If the affect “is” precisely present experience, it could be said, . . . that all we ever have is a kind of echo, the representation of affect’ (O’Sullivan, 2001: 26). O’Sullivan describes affect as an event or a happening, stating: ‘In fact the affect is something else entirely: precisely an event or happening. Indeed, this is what defines the affect’ (O’Sullivan, 2001: 127). Based on these statements, I came to realise that this theory could not only provide a way of analysing the system of echoes and communications that Kaprow refers to, but it also incorporates a number of the themes and ideas discussed through out this thesis. Play theory also becomes relevant in creating specific affects. Susan Best¹⁰⁴ refers to the ‘space of communion’ between subject and object as being ‘aligned with play’ in her article *Rethinking Visual Pleasure: Aesthetics and Affect* (Best, 2007: 511). Thus, the theory of affect resonated strongly as a means for creating a system that would entice and encourage interaction by participants

Tomkin’s Nine Affects

To understand how to structure or devise a communication system or artwork that relied on autonomic responses required that I first look at the type of autonomic responses that affect theory encompasses in order to determine how best to utilise them in my work. As stated above, affect or affect theory finds its roots in psychology. The theory was initially advanced by Silvan Tomkins, a personality theorist and psychologist, in the hopes of understanding the ability to affect and be

¹⁰³ Silvan S. Tomkins (1911-1991): Tomkins ‘is known to psychologists as the author of an expansive and eclectic theory of affect, as the originator of script theory, and as a theoretical and empirical worker in the field of personality assessment’ (McIlwain, 2007: 49).

¹⁰⁴ Susan Best: Susan Best is an art historian with expertise in critical theory and modern and contemporary art. She is a professor at Griffith University in Queensland, Australia. She is also the director of Griffith Centre for Creative Arts Research (Griffith.edu.au, Accessed Feb. 2017).

affected between bodies, other bodies, and objects (Deleuze & Guattari, 1987: 48). The Tomkins Institute¹⁰⁵ — a group created to continue Tomkins's work — defines 'affect' as a complex set of systems that are comprised of protocols that we are given at birth. These are protocols that, when triggered, pilot our attention and motivate action within us. Affects are distinctly different from emotions; although, they do become connected in later development to emotions. This connection between affect and emotion occurs when a person ties the perception of an affect with a feeling or memory of a prior or similar feeling, which gives rise to or is what we refer to as 'emotion' (Tomkins, 1995: 68-86).

Tomkins identified nine different innate affects that appear in infants before learned conditioned responses are developed. It was Tomkins's contention that these nine innate affects are very subtle, nuanced, and diversely discrete. Tomkins felt that these discrete innate affect elements were different from emotions, which are more varied, muddled, and complex. Tomkins also theorised that affects are the manifestation of a type of shared root that is connected with biological heritage. This biological heritage is closely linked with what is often improperly ascribed as emotion in animals. Instead, '[o]ne of the central tenets of this theory is that the nine basic affects (technically six basic affects: interest–excitement, enjoyment–joy, surprise–startle, fear–terror, distress–anguish and anger–rage; one affect-auxiliary: shame; and two drive-auxiliaries; disgust and dissmell) — not the drives — are the primary motivators of human behaviour' (McIlwain, 2007: 500)¹⁰⁶.

Seven of the affect elements that Tomkins has laid out are grouped in pairs of two. Each pair of names indicates a range. The first of the pairs is the mild form or manifestation of the affect and the second represents the other end of the spectrum and is considered to be more intense or severe (Nathanson, 1992: 55). These affect states are: distress and anguish (the cry for help), interest and excitement (the pull toward mastery), enjoyment and joy (the social bond), surprise and startle (the reset button), anger and rage (the demand to fix it), fear and terror (the signal to flee or

¹⁰⁵ The Tomkins Institute: The Tomkins Institute is a research entity that 'promotes awareness, understanding, and personal and professional applications of Silvan Tomkins' Human Being Theory of affect and emotional intelligence' (Tomkins.org, Accessed Feb. 2017).

¹⁰⁶ 'The drive system is ... secondary to the affect system. Much of the motivational power of the drive system is borrowed from the affect system, which is ordinarily activated concurrently as an amplifier for the drive signal. The affect system is, however, capable of masking or even inhibiting the drive signal and of being activated independently of the drive system by a broad spectrum of stimuli, learned and unlearned' (McIlwain, 2007: 500).

freeze), shame and humiliation (the self-protection signal). The last two affect elements or states have only a singular naming system and they are disgust (the need to expel) and dissmell (the avoidance signal) (Tomkins, 1995: 68- 86).

Distress and Anguish

The affect state of distress and anguish is a process that Tomkins labels as ‘inherently punishing’— meaning that the process is arduous in that it is both mentally and physically demanding. The origin of distress and anguish based on Tomkins’s theory is the act of crying at the moment of birth.

The crying response is the first response the human being makes upon being born. When the affect reaches full intensity, it is expressed with crying, corners of the lips pulled down, the inner eyebrows arched up, red face, and breathing turns into rhythmic sobbing. Tears come into the picture about six weeks after the baby is born. The purpose of distress is to signal that all is not well. The birth cry is a cry of distress (Tomkins.org, Accessed Feb. 2017).

Crying for Tomkins is seen as the response to an, ‘excessive, inescapable level of stimulation’ (Tomkins.org, Accessed Feb. 2017). This affect is first registered when the baby is initially exposed to external stimulus upon being born. The cry is a response used to alert oneself and others that all is not well in reference to one’s present state. The purpose of a cry of distress is to vocalise a demand for the presence of a parent or caregiver to attempt to rectify whatever is causing the triggering of distress and stop the crying. The distress affect is triggered by an event or stimulus that causes neural firing in the brain at too high of a level. This firing can be associated with any number of a large array of persistent stimuli — in other words, when exposure is too great or too intense a threshold is surpassed and crying begins. For infants, these stimuli most commonly are things like hunger, bright light, or pain (Tomkins, 1995: 68-73).

Interest and Excitement

The interest and excitement affect is categorised by Tomkins as ‘inherently rewarding’ and is recognised by ‘an intensity of gaze, eyebrows down, “track, look, listen” is the face of interest. High intensity excitement usually involves muscle movement and vocalization’ (Tomkins.org, Accessed Feb. 2017). Tomkins asserts that the function of interest is to make the process of learning a rewarding one. Tomkins points out that this particular area of affect is the most commonly overlooked or negated because it does not ‘disrupt thinking’ but rather is a type of

thought catalyst. Moreover, he asserts that its negation stems from the notion that emotions are seen as sitting nearly at a polar opposite spectrum than that of reasonable rational thought. Tomkins felt that the affect of interest had escaped the annals of thinkers and researchers because there is a 'good feeling' associated with thinking and that good feeling is 'interest' (Tomkins.org, Accessed Feb. 2017).

Tomkins highlights the importance of the affect of Interest with the following:

The interrelationships between the affect of interest and the functions of thought and memory are so extensive that the absence of the affective support of interest would jeopardize intellectual development no less than destruction of brain tissue. To think, as to engage in any other human activity, one must care, one must be excited, must be continually rewarded (Tomkins, 1962: 343).

The neural firing associated with the affect of interest is gradual and increases as the interest is maintained. Tomkins points out the example of the marked responses seen in the faces of infants as they encounter things that are new to them.

Enjoyment and Joy

Enjoyment and joy, like interest and excitement, is also labeled by Tomkins as an affect that is inherently rewarding. Enjoyment and joy in infants is typical to the face in the form of smiling. Smiling is the visible recognition of the affect of joy. This innate affect is propagated by a tangible decrease in negative stimulus. Tomkins ascribes this as being due to the possible decrease in loneliness, hunger, or even the removal of pain stimuli. Enjoyment and Joy is an affect that Tomkins points out are often a contagious state. A case in point to this phenomenon is a parent's response to the smile of his or her baby, which is to smile in return. This reciprocal system of rewarding through the affect of interest and joy is translated into a desire for humans to connect with others or to be social. The Tomkins Institute cites this process the following way:

We will seek to help and be helped by other humans who smile at us. Moreover, experiencing joy in association with people, objects, and activities creates a sense that there is a domain of the familiar, trustworthy, and good. And then is generated a commitment and attachments to those joy-inducing people, objects, and activities (Tomkins.org, Accessed Feb. 2017).

The affect of enjoyment and joy Tomkins claims is created in the brain of the infant by a decrease in neural firing similar to that seen in interest and excitement.

Surprise and Startle

The affect of surprise and startle is cited to be inherently neutral. It is marked on the face of an infant, as the ‘eyebrows up, eyes wide, and blink are the facial signposts of the startle response’ (Tomkins.org, Accessed Feb. 2017). The overall goal behind the Surprise and Startle affect is to get the subject’s attention. It is a de facto interrupt button, it causes you to drop whatever you were thinking about or whatever you were doing and be present in the here and now of the given moment. It further forces one to process what is actively happening. Startle — this affect’s more acute or extreme state of form — can be exhibited in a physical jarring of the body which causes the person to be completely separated momentarily from any and all thought patterns or physical activity currently undertaken. This affect state is caused by a brief stimulus that is brought on very suddenly (Tomkins, 1992: 499).

Anger and Rage

The affect of anger and rage is classified by Tomkins as being a state which is inherently punishing. This affect state is marked on the face of the infant through muscle tension, red face, and often swollen cheeks. For Tomkins, anger is the result of a system overload. This affect state is the direct result of a ‘persistent high-density neural firing’ in the brain (Tomkins.org, Accessed Feb. 2017). If the affect state of Distress is a communication of stimuli reaching a threshold that is marked as being ‘too great’ or ‘too much’, then anger is the message that things have escalated further to the point they have reached a hyper critical state.

Fear and Terror

The fear and terror affect state is one that, according to Tomkins, is in the category of being inherently punishing. The facial cues indicating fear on the face of an infant typically consist of the eyes being open widely, with tensioned lower eyelids, and the eyebrows furrowed. Further possible visual cues may include hairs which are raised or standing on edge on the back of the neck, and/or skin being sweaty, cold, and pale. The function of this affect is survival. Fear exists as a protection mechanism from emergency or life and death propositions and it triggers an extreme and intense biological response. It is an affect state that is designed to be an experience that lasts briefly. Tomkins points out that, ‘fear, like other affects, can also be triggered by internal stimuli such as memory or other affect’ (Tomkins.org, Accessed Feb. 2017). The fear state is brought on by a rapid and potent rise in neural firing in the brain (Tomkins.org, Accessed Feb. 2017).

Shame and Humiliation

Similar to the fear affect, the shame and humiliation affect state's purpose, according to Tomkins, is also one of self-protection and preservation. It is classified as a state that is inherently punishing. The state of shame, as defined by Tomkins, is markedly different than the colloquial use of the word. According to Tomkins, 'shame' as an affect is meant to refer to the vacuum left behind from the loss of joy. This stems from the fact that infants have no innate sense of the social and, thus, have no shame derived from the act of sociological stigmatisation. For infants, the affect state of shame is experienced when they are acutely denied the experience of joy and/or excitement. The characteristic facial manifestations for shame are very short and indistinct. This, of course, stands in contrast to the before mentioned affect states, because each of the states previously discussed are concerned with telegraphing information to the self and others. However, where the affect of shame is involved, the goal is in the hiding of information from the self and others. The Tomkins Institute points out:

The purpose of shame is to be sufficiently negative so as to bring attention to whatever might have caused the positive affect to be impeded, so that we can learn how to avoid the loss of the positive in that moment or in the future. Shame affect exists to help us foster our sense of belonging and mastery by asking us to make sense of and overcome what might get in the way. Unlike the previously described affects, shame is an affect auxiliary. It is triggered by the incomplete reduction of interest-excitement or enjoyment-joy, and like other affects, it is an analog of its trigger. Once triggered, shame-humiliation further impedes positive affect. While shame can operate when the individual is alone, it is tremendously important, and often unacknowledged, in relationships throughout life (Tomkins.org, Accessed Feb. 2017).

When experiencing the affect state of shame-humiliation, the infant's eyes look down and away. In addition, the head falls and the over all appearance is one of a shrinking in stature.

Disgust

The affect state of disgust is the inherent need to expel and is defined by Tomkins as inherently punishing. Disgust is supplementary to the drive of hunger and it derives from a desire to remove or expel an article that has been eaten that is found later to be highly unpleasant. Disgust is present in the state of an affect

principally on a figurative and symbolic level. This level is in the parallel with the notion of ‘ingest’ because we absorb concepts, individuals, and visual and auditory stimuli from the outside world that when found to be disagreeable it becomes necessary for them to be purged or expelled. The physical manifestation of this affect is present in the throat. In adults and infants alike the extreme response to disgust is vomiting. For instance, it is commonly understood that at the scene of graphic and horrifying accidents, emergency or first responders and innocent bystanders have been known to vomit. Disgust begins innately linked to hunger and eating but is later mapped and applied to objects, sights, sounds, people, and any other non-food items (Tomkins.org, Accessed Feb. 2017).

Dissmell

The last innate affect state in Tomkins’s Affect Theory is dissmell. Dissmell is labeled as inherently punishing. The word or term ‘dissmell’ is one coined by Tomkins to encapsulate repulsion as a biological response to stimuli (Tomkins, 1995: 399). The affect state of dissmell is an avoidance signal and is another subcategory of the hunger drive. It simply is the drive or impulse to ‘pull away’ from or ‘push away’ an element discovered to be virulent and that should not be ingested. These are items of repulsion and are varied and culturally based, but can include such items as: feces, rancid meat or milk, the rotting flesh of dead animals, and insect infected fruit. Dissmell’s ramification as an affect is chiefly when it is connected to object, people, or any non-food items that are kept at a state of separation from the self. Contempt is the process of dissmell becoming intertwined or melding with anger. Dissmell’s signature expression in the form of the face is the nose crease that results with the raising of the upper lip, a lowering of the innermost region of the eyebrows, and the head pulled backwards (Tomkins, 1995: 82-86).

Structuring the Interaction

Each of these different classifications of affect became relevant in determining how to structure the interaction, and perhaps, even more importantly, the type of art system that would eventually be developed. While a number of the affect classifications were determined not to bring about the result I desired, and were not ultimately used in structuring the interaction, even the affects of dissmell and disgust were briefly considered as possibilities. Ultimately, the affect classifications that I

relied most heavily on were interest—excitement, enjoyment—joy, and surprise—startle for the reasons discussed below.

The art objects that I have created, as I have stated before, focus on engagement as their chief concern. That engagement has two main stages in its process. One stage can be characterised as the passive engagement that is comprised of an audience member observing. And, the second stage can be characterised, as the active engagement wherein an audience member takes part in the interaction. The passive engagement of audience members can be further broken down in to two different components. These two components are two different stages in the reception of the artwork. The first component of the passive interaction appears as people initially come in to visual contact with the work. The second component of the passive interaction is when people passively observe others actively interacting with the system.

Passive Interaction

Passive reception is generally aligned with more traditional types of art like painting and photography; in the realm of interactive digital art, active engagement is at its core purpose. That does not mean, however, that elements of passive engagement are not relevant to fostering the interactive process, even interactive artwork requires, on some level, a passive reception as part of the initial engagement process. Further, it stands to reason, that in order to facilitate engagement, it was first required that the artwork trigger the participant's interest.

Interest – excitement is the first of Tomkins's pairs of affect discussed above. Tomkins 'refers in passing to the importance of interest in becoming acquainted with a painting, a person, an idea and the self' (Best, 2007: 510). As Susan Best, who authored an article applying affect to the aesthetics of art, summarizes:

[I]nterest is the basis for cognition; without interest, the work of thought has no propeller; the inner world of thought needs the propulsion of interest. In sum, without the fertile soil of interest, [Tomkins] suggests, nothing else can develop. It is, then, the primary mechanism for orientation and embedment in the world and holds the possibility of engagement with it.

Thus, the first step in fostering engagement either on an autonomic level or as a more reflective response, requires that stimuli sufficient to evoke the affect of interest be present. As Best noted, this may seem to be a very common-sense proposition: 'Positing interest – excitement as the root cause of aesthetic pleasure may

just seem like a very common-sense proposition: if you are not interested in art (modern or otherwise), it is highly unlikely that it will deliver a moving experience' (Best, 2007: 510).

According to Best, 'interest – excitement is involved with learning and oriented towards novelty' (Best, 2007: 510). Interest, unlike joy, is based on the unfamiliar, according to Best:

If we think of it in Kantian terms we might think of it as a kind of liking, but a liking not so much for the familiarity and comfort of beauty — the domain of joy encompasses the familiar, which entails the reduction of interest. Interest is a liking for the challenge of the unfamiliar. It is thus about a kind of psychic stretching, perhaps even a restlessness about things as they are, things known. (Best, 2007: 510).

It is therefore arguable that based on this characterisation that the affect of interest and excitement is tied up with exposure and positioned towards curiosity and novelty (Best, 2007: 510-511), while the affect of joy is based on that which is more familiar. It was, thus, with this balance of curiosity and familiarity in mind to foster both interest and joy and, therefore, to arguably pique interest and maintain engagement, that I approached structuring the interaction for this practice research.

Within the interactive structure I have created, the EEG headset is intended to provide the stimuli necessary to evoke the affect of interest. The headset, itself, being a new and somewhat unfamiliar device is an embedded curiosity and novelty. The EEG headset, therefore, is intended to pique a participant's interest, with the hope of sustaining that interest and even moving it to the other end of the interest – excitement spectrum. The objects selected — the lamp, the Fisher Price Record Player, the Fisher Price Two Tune Music Box TV, and the Jack in the Box — while familiar objects to many, and thus thought by Tomkins to diminish interest, were chosen in order to stimulate another layer of affect, that of enjoyment and joy, in an effort to sustain the interaction, at least on a passive level. For this reason, I have structured my interactive system to include the headset as that which is unfamiliar or novel and simple everyday objects as that which is familiar. This dance between the two affects, by utilising the unfamiliarity of the EEG headset and the familiarity of the everyday objects, works to fluctuate the affect states back and forth from interest and excitement to joy and enjoyment. This structuring of the art system appears to be in keeping with Susan Best's understanding of the interaction between the affects of interest and joy.

The primacy of interest recognizes the otherness and novelty of the object, while joy works to bring the object into communion with the subject. Interest thus underscores the separation of subject and object and thereby facilitates a kind of joyous communion that avoids the mastery that might be evoked by some conceptions of play (Best, 2011: 512).

However, both the interest and the enjoyment must be maintained in order to propel participants towards active interaction. This brings us to the second level of passive engagement that exists as part of the interactive structure of the artwork. This is the process by which observers watch the interaction of others as they engage with the EEG headset and the object. The byproduct of this is the hope that, like in all contemporary modern art, that it triggers other affects, emotions, and sensations. This heightened state of interest for a given individual ends or, more accurately, transforms once the individual participant undertakes the interactive process for himself or herself.

As the participants leave the passive process of looking and observing and undertake the active interaction, they are confronted more directly with the object they are poised to control by means of the headset. The controllable objects that the participants were met with in the later evolutions of the practice were nostalgic vintage style toys. These toys for many are known and seemingly connected to memories and emotions that are persisting. For others, these toys would be quickly identified as relics of childhood and could be mapped to similar likenesses that are personally relevant. These objects are aligned in such a way that they can be identified with and return the participants to the realm of the familiar. By doing so, the participants make the full conversion from the affect of interest to enjoyment. As Tomkins points out, enjoyment is often a contagious state (Tomkins.org, Accessed Feb. 2017); therefore, those participants still engaged in passive viewing and observation may be drawn in to actively engaging by other's enjoyment¹⁰⁷.

The affect of enjoyment is reinforced by the playfulness of the interaction. The interaction of the participant and the toy is a self contained and self-referencing dynamic. The physical response of the toy is relevant only to the toy and is at work on

¹⁰⁷ In connection to the one of the objects controlled by the headset, specifically the Jack in the Box, there is a moment in which the Jack pops up that the startle affect comes in to play. However, this is not discussed in detail above, because this affect was not as relevant to the fostering of the initial engagement, but only was at issue towards the end of the interaction or at the culmination of the interaction between artist and participant.

another level. It is also in keeping with the original way that the toy was to be used. The difference being that the interaction is done using the mind through the headset and not via manual manipulation with the hands. This shift allows the toy to be simultaneously familiar and unfamiliar and again self-referencing.

The Pseudo ESP Experience

The pseudo ESP experience of the artworks function as a playful element constructed within the parameters of play and play theory, but it also exploits human tendencies towards or against Magical Thinking. The inclusion of the ESP type effect is designed to connect with the participant's preconceived notions connected to their beliefs or disbelief in the existence of ESP abilities. To explore these notions, I consulted introductory texts in the Psychological sub-discipline of Anomalistic Psychology. Professor Christopher French and Anna Stone state in their book, *Anomalistic Psychology: Exploring Paranormal Belief and Experience* that anomalistic psychology

attempts to explain the paranormal and related beliefs and ostensibly paranormal experiences in terms of known (or knowable) psychological and physical factors. It is directed at understanding bizarre experiences that many people have, without assuming that there is anything paranormal involved. While psychology, neurology and other scientific disciplines are rich with explanatory models for human experiences of many kinds, these models are rarely extrapolated to attempt to explain strange and unusual experiences (French & Stone, 2014: 2).

Whichever given attitude a potential participant exhibits — either positive or negative — in regards to ESP, its pseudo presence still elicits a 'why' and 'because' line of questioning by the participant. It is this set of questions or line of questioning, while undertaken as a passive observer, that helps to facilitate the transition to active participation. Additionally, this set of questions may also help to prolong active participation as the individual seeks answers to the questions posed. Looking at the concept of magical thinking and the attitudes and convictions in conjunction with paranormal beliefs, helps to detail the mechanics of how the pseudo ESP experience is assisting participants in making this transition.

Magical thinking is defined by the psychologists Leonard Zusne and Warren Jones in *Anomalistic Psychology: A Study of Magical Thinking* as:

Magical thinking is the belief that a transfer of energy or information between physical systems may take place solely because of their

similarity or contiguity in time and space, or that one's thoughts, words, or actions can achieve specific physical effects in a manner not governed by the principles of ordinary transmission of energy or information. Magical thinking arises in connection with uncertainty concerning cause-effect relationships. A 'why?' question requires a 'because' answer. If the information is not available, incorrect information will be used (Zusne & Jones, 2014: 13).

Zusne and Jones point out that magical thinking is universal and has its origins in prehistoric human groups but is still present in the modern world (Zusne & Jones, 2014: 13). It is because of its longevity in human existence that is thought to have roots in some very fundamental psychological processes that stem from autonomic functions much like Tomkins's Affects.

French and Stone in *Anomalistic Psychology: Exploring paranormal Belief and Experience* (2014), define magical thinking as taking two main forms:

The first is that our actions or thoughts can cause events to occur without any logical connection; for example, the belief that a wish can come true, or that saying a magic word can cause an object to appear or disappear. The second is animism: the belief that inanimate objects are alive and can act and think, or animals can talk and have other human attributes (French & Stone, 2014: 70).

Magical thinking has its predominate root in the human's response to the notion and experience of uncertainty. Uncertainty being a psychological response to the personal or collective realisation that there is a gap in what one knows and understands, causing there to be a drive or desire to fill that gap. Zusne and Jones point out that this cognitive motivation to remove the uncertainty is a universal process (French & Stone, 2014: 70). Magical thinking is the byproduct of the failure or lack of information to solving a given instance of uncertainty. More specifically, it is a failure or lack of information in resolving an uncertainty in connection to relationships of cause and effect. Yet, French and Stone contend that magical thinking stems from the fact that 'we tend to assume that objects in world have agency and intent and that events occur for a reason' (French & Stone, 2014: 70). These adaptations and understandings of the study of magical thinking and their theories regarding behavioural and cognitive function were utilised in implementing aspects of a pseudo ESP experience as part of the interactive experience for my artworks.

The way in which the fake ESP process is playing off of behavioural and cognitive functions is by exploiting preconceptions, attitudes, and beliefs regarding the paranormal. Most definitions of attitudes tend to centre on the notion that there is

a predisposition to respond positively or negatively to a set of subjects or objects. Attitudes are made of two core elements. The first core element is a cognitive component or belief, while the second core element is an affective or emotional component (Zusne & Jones, 2014: 229).

Because beliefs can and do operate without external verification, it may be tempting to conclude that people who strongly believe in the paranormal are illogical and dogmatic, whereas disbelievers are attuned to facts and reason. Beliefs are personal entities and, as such, always to some extent irrational (Zusne & Jones, 2014: 230).

The pseudo ESP event present in the work has universal applications because it works with either those that believe or those that do not. Whichever side of the ESP debate one finds themselves on — whether you are a believer or a non-believer — the process still provides an ingress or path to foster participation interest. For instance, if a potential participant is a non-believer, or, in other words, does not believe in the concept of ESP, then the process of unmasking the system can be a catalyst for personal interaction and may even foster a deeper level of engagement¹⁰⁸. This disbelief or curiosity as a driving force of engagement was seen to some degree in participant responses to questionnaires during the lamp experiment, where one participant noted that watching others engage with the interactive system made her ‘curious to see how something like this could be done’ (Appendix A, Participant 1).

Yet, conversely, for one who believes in the concept of ESP, the process offers those individuals a chance to have a fleeting experience that is akin to an ESP experience or the closest instance one may come to having a ‘real’ ESP ability. The chance of personally experiencing such a quasi-phenomenon is the catalyst for a believer to engage in the interaction. Whereas, as noted above, it is the opportunity to debunk or disprove what appears to be an ESP like phenomenon that is the catalyst for the non-believer to engage in the interaction. It is my hope that the whimsical

¹⁰⁸ In Krissy Wilson and Christopher French’s article *Magic and Memory: Using Conjuring to Explore the Effects of Suggestion, Social Influence, and Paranormal Belief on Eyewitness Testimony for an Ostensibly Paranormal Event*, they state that non-believers have greater recall of the details of ‘pseudo-psychic’ demonstrations, perhaps indicating a greater level of engagement (Wilson & French, 2014: 2). According to the Wilson and French article, prior research had compared the recall of believers and disbelievers in the paranormal for the details of prerecorded ‘pseudopsychic’ demonstrations, such as apparent metalbending by psychokinesis. Believers tended to have poorer recall of the details of the demonstrations, particularly those details that would give some indication of the type of sleight of hand that was used to achieve the effects. Perhaps not surprisingly, the believers rated the demonstrations as being more ‘paranormal’ than disbelievers (Wilson & French, 2014: 2).

nature of the toys chosen and the complete transparency of the EEG headset will help minimise any hostility or backlash from individuals on the extreme fringes of the belief spectrum that might feel the work is a form of mockery or satirical hazing of their beliefs. This was done as with other aspects of the overall design to help cast the widest net of potential participants as possible¹⁰⁹.

Cueing the Interaction

Prior to the realisation of the instance or moment of interaction there is only a collection of objects. These are objects of artistic potential and are strategically so because of their ability to foster the interest or desire of interaction. Utilising affect theory coupled with the ruse of the pseudo paranormal gives artistic weight to the objects, thus creating a condition wherein the separate interactive elements become more than the sum of their parts. It is like a stage set with props, scenery, and actors with the curtain still down and no dialogue recited — each one of these elements has no separate inherent artistic value in the genre of theatre. Yet, when each item is set within a frame or condition that is akin to the conceptual realisation seen in theatre performance they transcend. They become part of the collective item that is the performance and become critical to that given time and place of fine art production.

The moment of this transcending — when the interaction with the objects created within the practice and a realisation of the artistic concept takes place — comes about and is the result of a self-contained and self-referencing and independent loop. The actions that take place inside the loop are relevant only there in space and time and begin anew with each new participant. The apex of the conceptual moment is also the apex of the interaction and exists for the participant and the artist for a singular moment.

These moments are fundamentally a ‘system of echoes, communications, reflections, and dialogues’ (Kaprow, 1993: 151) that all feed back in to themselves within the self-contained, self-referencing, and independent loops. With each new conceptual realisation instance, there is a new and individualistic set of echoes,

¹⁰⁹ When structuring the interactive system, it was my hope that the use of the pseudo-paranormal would appeal to a wide-reaching audience, including both those that believe and those that do not. According to Wilson and French in *Magic and Memory*, ‘Opinion polls repeatedly show that a large proportion of the population believes in the paranormal and a sizeable minority claims to have had direct personal experience of paranormal events’ (Wilson & French, 2014: 2). It was therefore expected that the pseudo-paranormal presentation would appeal to a larger audience.

communications, reflections, and dialogues taking place and no two moments of interactions are ever the same. The echoes and communications within these loops exist between the participant and the object and the artist. They take place in the form of feedback and cues. Feedback communication exists in many modes between the sender and receiver in a ‘communication as a interaction’ model (Kluszczynski, 1996: 6), and can be from the system to the participant and from the participant back to the system, but also simultaneously transmitted to the artist or practitioner, as well.

The creation of this loop is the result of multiple layers of communication created by a series of various types of cues, but this loop also exists as a means of communication itself. These cues are seen throughout the interactive process and help to foster both passive and active participation and are integral to the interaction. These cues can be seen as communication from the author or artist — in other words, cues that the participant takes from the author; communication or cues between the system and the participant; and communication or cues between those individuals actively participating and those observing.

Communication from the Author

The communication or system of echoes that exists as part of the interactive process are, in part, communications from the author or artist. In addressing the idea of communication in interactive art, one approach is to ‘consider interactive art in reference to the basic categories building the modernistic aesthetic paradigm’ (Kluszczynski, 1996: 3).

The most important dogmas of this system include representation, self-expression, and the convictions about the supremacy of the artist/author’s position in the process of artistic communication. S/he dominates both over the very artwork (art as anything presented as such by an artist) as well as over its meaning (content), which consequently also means his/her domination over the receiver and perceptive-interpretative process. This view of interactive art says that interaction we embark on is not an interaction with any artificial creature or artificial intelligent system, but a mediated interpersonal interaction with the author of the artwork (or of the software) (Kluszczynski, 1996: 3).

However, there is another approach that exists for understanding or addressing communication within interactive art systems. This approach ‘presents interactive communication as free from the traditionally defined concepts of representation and expression, from the concept of meaning prior to communication, and the

modernistically interpreted concepts of the author/sender and recipient’ (Kluszczyński, 1996: 3). Pursuant to this approach,

The artist/author ceases to be the creator of the meaning of the artwork, which is created by the recipient in the process of interaction. The artist’s only task consists in the construction of the artifact¹¹⁰ — a context in which the recipient constructs the subject matter of his/her experience and its meaning. The recipient is thus no longer a mere interpreter of a ready-made sense waiting to be understood, or an agent perceiving a finite work. It is on the recipient’s activity that the structure of his/her (aesthetic) experience depends (Kluszczyński, 1996: 3-4).

According to Ryszard Kluszczyński, in *The Context is the Message: Interactive Art as a Medium of Communication*, in keeping with the second approach, ‘[t]he process of communication in the interactive art assumes often a character of a game (although the rules and roles of the game do not have to be ultimately and explicitly defined)’ (Kluszczyński, 1996: 4). This second approach to understanding communication in the context of interactive art is much more in keeping with the central focus of this research practice with its emphasis on the collaborative nature of the art, and in the way it negates traditional tropes of art and the singularity of authorship.

Applying this second approach to communication in interactive art, the creation of the interactive process or structure within which the participant interacts can be viewed as the artist’s communication with the participant. This is similar to the structure within which Sol Lewitt’s wall drawings were created through a detailed set of scripted instructions, or how Kaprow, too, in certain incarnations of the ‘Happenings’ controlled the decision making process employed in the art creation. With respect to the interactive system created for this practice research, there is a subtle level of communication that is outwardly expressed by the toy chosen to generate interest. Within this subtlety there is at work aspects connected to a nostalgic response. These can be seen as a communication as well as an enticement when the participant and the artist have a similar nostalgic link to the objects. If a similar nostalgic connection is not present then the communication and/or enticement has functioned to render the object an item of curiosity or novelty for the participant.

¹¹⁰ Kluszczyński defines ‘artifact’ as the ‘result of a viewer’s creative interaction with the artist’s product’ (1996: 3).

The objects chosen to be the focus of the physical manipulation via the EEG headset were selected to be representative of the toys within the personal genre of childhood experienced by the artist. The toys that were selected from within that genre are ones of singular significance to the artist but also possess benign qualities of form and shape in the hopes of being ubiquitous generic tropes of Western childhood. These were also chosen to communicate a whimsical and, perhaps, carnivalesque tone by the artist to the participant as part of the interaction.

Communication from the System

Given that the interactive system is created by the practitioner or artist, communication or cues that come from the system can be construed as either communication from the artist or communication from the system itself. Regardless of how you characterise the source of the communication, the feedback that the participant receives is in the form of visual feedback. This visual feedback is seen by way of the physical movement and the speed of such movements of the inanimate objects as they respond to the EEG inputs that are received from the participant. In addition, the system to participant communication occurs as the participant learns how to alter the speed, regularity, or consistency of movement through system feedback.

Communication from the Participant

In addition to communication between the artist and participant and the participant and the system, there is also communication occurring between those that are actively participating and those that are observing. This dynamic was discussed above in terms of passive and active interaction. When viewed in terms of communication, those that are actively engaging with the system give off non-verbal, visual cues to those observing the interactive process.

The existence of such non-verbal, visual cues became clear following the utilisation of focus group questionnaires during the conducting of the lamp experiment. Each of the participants that took part in the lamp experiment and completed questionnaires noted that watching others utilise the head set to turn the lamp on and off made them eager to actively engage, as well. According to Participant 1, ‘seeing other people being able to turn the light on or off with their brain waves made me very eager to try it for myself and see if I could do it myself’ (Appendix A). Similar opinions were expressed by most of the other participants, such as, ‘[w]atching others made me eager to have a try’ (Appendix A, Participant 2);

‘[w]atching others participate in the study made me more interested in participating’ (Appendix A, Participant 5); and ‘I was much more interested in participating after seeing others participate’ (Appendix A, Participant 6). Thus, active participants communicated a sense of joy or excitement to passive participants or observers during the course of the interaction, thereby, encouraging others to actively participate.

In addition, some participants noted that during their passive engagement or observation stage, watching others actively participate communicated a sense of competitiveness that also drove or pushed those observing to actively engage. According to Participants 4 and 6, the communication or perception of competitiveness also affected their desire to participate. According to Participant 3, ‘both the people who did not do as well and those who did better made me want to “prove myself” by using the headset — either in the first place or again, after I had already had a turn’ (Appendix A). Similarly, Participant 6 indicated that ‘[w]atching others sparked a friendly competitiveness to see who could keep the lamp on longer’ (Appendix A). Thus, communication and non-verbal, visual cues between active participants and passive observers helps to facilitate interaction by those that have not yet actively engaged, and perhaps even fosters greater or prolonged interaction by those actively engaged due to the spirit of competition that may emerge.

The Shared Moment of Interaction

The bringing together of facets of affect theory and the ruse of the pseudo paranormal are merely an ingress into fostering interest — specifically, the interest within an individual to interact with the digital system created. In addition, the various levels of communication and non-verbal cues involved in the interactive process help to both foster interest and prolonged engagement. The goal of these processes and of the interaction is to create a specific shared moment. This moment takes place between the artist and the participant and its result is a distinctly one off original collaborative work of art. The moment becomes the artwork, but it also gives legitimacy to the use of the elements of the interactive system due to the nature of the experience. In other words, the moment of interaction transforms the system from a technological gadget or digital curiosity to an experience that is in the realm of art.

It was deemed critical to the research practice that comprises this thesis to ‘make a distinction between fine art and useful or technological art’ (Dewey, 1934: 27) by having an authentic instance of experience. Without the legitimacy offered by

an authentic instance of art as experience, the EEG headset and interactive system would be little more than a cute toy or novelty and could be seen to hold no conceptual or aesthetical value as art objects. This is not a new or novel concern in the area of interactive art, but was reflected on by Nam June Paik in 1969 in dealing with the technology of the time:

The real issue implied in 'Art and Technology' is not to make another scientific toy, but how to humanize the technology and the electronic medium ... [to] demonstrate the human use of technology, and also to stimulate viewers NOT for something mean but to stimulate their phantasy to look for the new, imaginative and humanistic ways of using our technology (Lee & Renert, 2010: 28).

The use of the EEG headset and the interactive system is an example of such a 'distinction', as Dewey called it, because the conceptual framework or nature of the work is solely concerned with and dependent on the moment of interaction. This dependency makes the EEG headset and the corresponding interactive system mere tools used in the production of fine art. The headset and the system itself make the shift to elements of distinction at the very the moment the interaction is realised.

These moments of interaction or moments in which the art occurs can be long or short in the measure of real time, but the moment is only realised inside the feedback and communication loop discussed above. The time in the loop has a finite nature and is dictated by the experience alone making the process overall what Dewey referred to as a 'degree of completeness of living in the experience' (Dewey, 1934: 27). The degree of completeness in a given moment is unique from participant to participant and ends when the interaction does. These moments have no meaning beyond their corresponding experience and are confined to where and when the interaction is taking place.

Within these moments, however finite, there is also the opportunity for reflection as the participants succeed in getting their first momentary physical responses from the retro fitted toy. During these finite moments, the artist is also given an opportunity to reflect on a given participant's ability to maintain the mindfulness necessary for the interaction as gauged by the physical response of the inanimate object. The meaningfulness of this reflection, by either the participant or the artist, is proportional to the real time duration of the interaction.

The duration of the moment allowing for reflection was too short in the lamp, the Two Tune Music Box TV, and the Music Box Record Player, thus, not offering

much in the way of meaningful reflection. The lamp system had the upside of being able to be turned on and then back off, but the reflection of the interaction was very quick and made the response too fleeting. The Two Tune Music Box TV. and the Music Box Record Player had a much more dynamic physical response but they too were only actionable once and therefore did not offer meaningful reflection of the level of mental input. The Jack-in-the-Box offered the greatest range of reflection on the mental state of the participant by both the participant and the artist. The Jack-in-the-Box required a much longer interaction to complete the cycle allowing the jack to pop up. The crank and music would also stop and start in correlation to the participant's attempt to sustain the required mental task. This offered the best reflection of the participant's influence on the toy. The participant's ability to continuously move the crank is also a reflection of the level of a participant's immersion within the world of the interaction. The level of immersion that a specific participant reaches is also evidenced by the participant's startle at the sudden emergence of the Jack.

Thus, this moment of shared experience occurs once the participant finds him or herself in a feedback loop in which novelty, curiosities, and the observation of others help to facilitate an interaction that allows for and encourages the communication between artist, participant, and system. The interaction therefore exists in a complete and self-contained system that is complete upon the conclusion of the interaction.

Arriving at this moment of interaction resulted from a consideration of each of the three areas discussed above: affect, pseudo-ESP, and the communication system. These three areas were used to determine what conditions were necessary to help foster and maintain the interaction. It was determined that these conditions included the introduction of something new or different to foster interest and excitement and pique the interest of passers-by; the inclusion of something familiar to spark enjoyment and joy and draw people further in; the use of pseudo-ESP to play on the desire of human beings to understand that which appears at first to defy explanation, thereby, encouraging physical participation; and, the development of an art system that allows for these ideas to be communicated between the artist and the audience and/or participant. Thus, these three elements link together in informing the creation and stylisation of the appearance, quality, and working manner of the system. It is the combination of these considerations and the conditions discussed above that allows

for the engagement and collaboration between myself, as artist, and the participant within the art systems I have created.

CHAPTER SIX: DEATH TO THE AUTHOR



As discussed in the previous chapters, the objective of this thesis was to create artworks that focus on the moment of interaction as the gestalt of the work. This objective has been accomplished by focusing on a reconceptualisation of Kaprow's 'Happenings' in an effort to create work that is active, lively, and exists in the 'here and now'. And, because the focus of the work is on the moment of interaction, fostering that interaction by relying on theories of affect, play, and magical thinking, became crucial. However, when these things converge to create art where the interaction is the gestalt of the work, one must acknowledge the obvious proposition that this creates a necessary dependence on the participation of others in order for the art to exist. Thus, given that the art cannot exist without the efforts of the participant, who then is credited with the final realised product? This chapter delves in to the nature of the relationship between practitioner and participant that emerges from the art systems created for this thesis, and concludes that practitioner and participant exist as co-authors of that moment and, therefore, co-authors of the art.

Role of the Author

In contemporary art, there is a predication to the predominance of singularity with respect to authorship. Even though the act of co-authorship or collaboration is common in contemporary art, there is still a strong historical connection to 'a conventional artistic economy predicated on self-expression' (Green, 2001: 68). This also stems from a fetish like devotion of the international art market's attachment to recognisable big names and reputations (Cronin, 2012: 33).

Historically in the canon of western contemporary art the ownership and/or authorship of a given artwork has been ascribed to the generator of that said work — i.e., namely the artist. This has often been the case even with works that have been produced by large teams of contributing artisans. The artists Andy Warhol, Damien Hirst, and Sol Lewitt are exemplary or consummate examples of this concept. In the case of Andy Warhol, he had a team of artists in a workshop he called the 'Factory' mass-producing his screen prints. In Warhol's case, even his most iconic renderings of 'Soup Cans' were created in this fashion. Damien Hirst, in his own way mirrored Warhol's 'Factory' model and has created many instances of his signature 'Dot Paintings' through the employment of vast teams of painters and craftsmen. Sol Lewitt's approach varied from those of Warhol and Hirst in the fact that he created

site specific handwritten instructions by which drawings would be made. These drawing installations were rendered by strict adherence to his written directives that were predominantly undertaken or carried out by volunteers and students. In the case of each of these artists, even if any recognition of the teams or individuals utilised in the creation of the works were given, the pieces would still, ultimately, be exhibited and sold while being attributed to solely the artist.

In each of these instances listed above, the finished piece of art is the direct result of a form or a type of collaboration. Yet, the teams of artists, craftspeople, and other non-artists are left out of the authorship that is attributed to the various works. Rather, the authorship lies solely with the commissioning artists and the collaboration that took place in the creation of the art is negated. While the nature of artistic collaboration is much more varied and diverse than these few examples denote, the style of collaboration illustrated by Warhol's Factory and Hirst's creation of Dot Paintings exemplifies a type of collaboration present in the arts where authorship is not shared, despite the efforts of others; instead, authorship remains solely with the principal artist.

Although traditionally authorship has focused on a singular artist, since roughly the mid-point of the 20th century there has been a subtle shift in the thinking of art-historians, theorists, and critics in regards to the subject of collaboration. Through artists and artistic movements there has been a deconstructing of the role of individual authorship and an increasing interest in collaborative non-author systems that includes participation of audiences (Beinginorbit.wordpress.com, Accessed Jan. 2017). One of the earliest examples of this can be found in the first performance of John Cage's¹¹¹ work *4:33*(1952) that was undertaken at the Maverick Concert Hall in Woodstock, New York. In his essay, *Situating Freedom: Jackson Mac Low, John Cage and Donald Judd*, in the journal publication *Anarchist Developments in Cultural Studies: Art & Anarchy*, Allan Antliff¹¹² describes how Cages's initial performance was comprised of, 'the sounds of crickets, wind and other chance noises

¹¹¹ John Cage was an American musical theorist and composer. He is most known for his work in the fields of electroacoustic music, indeterminacy in music, and the application of non-standard or non-traditional musical instruments. He has often been cited as one of the most influential American composers of the 20th century. He was also a key fixture of the avant-garde art movement of the post World War II era (Johncage.org, Accessed Feb. 2017).

¹¹² Allan Antliff is the holder of the Canada Research Chair in Art History at the University of Victoria in Victoria British Columbia. He is an art critic and anarchist activist and has written extensively on the subjects of Anarchism and art in North America (University of Victoria, 2017).

mingled with shifting seats and comments amongst the audiences’ and how these elements were ‘the composition’s content, which the audience imbued with meaning’ (Antliff, 2011: 54). Antliff further contends that 4:33 functioned in such a way that it allowed for the idea of singular authorship to be broken down and to be replaced with a type of collaborative state, with the authorship being prescribed to the audience as participants (Antliff, 2011: 54).

This idea of questioning the role of singular or individual authorship in artwork would be carried forward from Cages’s 4:33 to movements like Kaprow’s ‘Happenings’ and George Maciunas’s ‘Fluxus’¹¹³. The ‘Fluxus’ movement was undertaken by artists like Yoko Ono, Nam June Paik, LaMonte Young, and Jackson Mac Low, and is a movement that called for a ‘radical elimination of individual authorship’ (Beinginorbit.wordpress.com, Accessed Jan. 2017). Intellectuals and academics like Roland Barthes, with his essay, *The Death of the Author* (1967), and Michel Foucault’s lecture presented to the Société Française de Philosophie on 22nd of February 1969, titled *What is an Author?*, exemplified this shift away from the 18th century notion of the author being the sole giver or regulator of meaning (Beinginorbit.wordpress.com, Accessed Jan. 2017). These ideas that questioned the singular nature of the role of the author that were taking place in the 1950s and 1960s, often seemed to be in conjunction with audiences acting in the role of participators as part of art performances. In the post millennium era, these ideas are now being applied to collaboration in the arts.

While the idea of collaboration has gained greater acceptance in the last decade, with the collaborative team the Chapman Brothers¹¹⁴ being nominated for the Turner Prize in 2003, and the Tate Modern commissioning *Working Together* — a workshop that explored collaboration in art — as recently as thirty-five years ago collaborative artistic endeavours were viewed much differently (Lehrman, 2011). As discussed by Rachel Lehrman in her essay *Toward a Definition of Collaboration:*

¹¹³ The Fluxus movement was based on the Fluxus Manifesto written in 1963 by George Maciunas (Beinginorbit.wordpress.com, Accessed Jan. 2017).

¹¹⁴ The Chapman Brothers are a visual artist team of the brothers Jake and Dinos Chapman. Iakovos or Jake was born in 1966 in Cheltenham, UK and Konstantinos or Dinos was born in 1962 in London. The subject matter chosen for their work is often called deliberately shocking. In the mid-1990s, their sculptures were included in the YBA showcase exhibitions *Brilliant!* and *Sensation*. In 2003, the brothers were nominated as a group for the annual Turner Prize, but they ended up losing out to Grayson Perry. In 2008, a series of their art used an appropriated original watercolour image painted by Adolf Hitler (Jakeanddinoschapman.com, Accessed Feb. 2017).

Collaborative Authorship in the Arts, ‘only 30 years earlier, many collaborating partnerships and groups such as the Boyle Family and Christo and Jeanne-Claude concealed their collaborative efforts under individual identities in order to appease the art establishment’s demands for named individuals’ (Lehrman, 2011). Lehrman puts forth that artists openly forming collaborations in recent years ‘suggests that the art establishment has at long last relinquished its fixation with solitary artistic geniuses – the lonely and suffering Van Goghs’ (Lehrman, 2011). According to Lehrman, ‘[a]long with this growing interest in “collaboration” and “collaborative authorship” . . . there have been increased discrepancies as to what these terms mean’ (Lehrman, 2011).

One way in which artistic collaboration has been structured encompasses art practice that involves artistic coupling or partnership, a form of collaboration that is presently seen as quite commonplace within the artistic community. The partnership or coupling model, as outlined in the literature review (*see supra* Chapter One, *Art & Theory*, pages 47-61, involves the coupling of two or more artists that step away from their singular and individual roles and take on the form of a collective group or identity. Charles Green explained this idea of artist coupling as a ‘[l]ink between collaboration and the dissolution of identity’ (Green, 2001: 174). The examples of art coupling given in the literature review are the duos of Gilbert & George, Christo and Jeanne-Claude, and Marina Abramović and Ulay. In each one of these groupings the individual artists become a part of the new group entity. While these collaborations involve multiple artists giving up their singular artistic identity to be part of a collaborative coupling where group billing or attribution occurs, these couplings or partnership groups, like Warhol and Hirst, often employ teams of artists and craftsmen that work in the background, that are not part of the artistic collective, and that do not receive any attribution. However, with respect to the artists making up the collective or coupling, the artists within that collaboration are often granted equal share with regards to authorship, which I understand as being attributed to the way in which the role of the artist or the author has been negotiated in those instances. Traditionally, the artists themselves have negotiated the role of author or owner to be singular. This occurs even in cases of artist groups or couples where the singularity is a product of a self-scribing nature. Thus, given that the role of owner or of author can be negotiated by the individual artist, the role of owner or of author therefore seems to be addressed on a case-by-case basis (Green, 2001: 172-174).

An area in which the terrain of collaboration and the role of authorship is currently being explored is in the context of interactive art. In the context of interactive digital art, traditional notions and ideas about authorship are being set aside as artist and researcher Ernest Edmonds observes:

There is another area in which interaction or at least the use of computers, has brought changes to creative practices. The complexity of computer systems and the many sub-areas of specialist knowledge required for their full exploitation have increased the need for collaboration by the artist with others. The artist today is often a member of a collaborative team and the role ‘artist’ is even shifting to be applicable to the whole team or at least beyond one individual (Edmonds, 2010b: 2).

This is consistent with Lehrman’s observation that the pendulum has swung in the other direction with respect to collaborative artistic endeavours: ‘Whereas previous art-critics refused to acknowledge creative partnerships, contemporary art-theorists now often veer towards the other extreme — overlooking the individual and categorising various types of participation and interaction as forms of collaboration’ (Lehrman, 2011). Lehrman notes that Green categorises ‘both assistants and technicians as collaborators’, while Grant Kester¹¹⁵ ‘describes the audience-participant as a collaborator, further noting a “collaborative, rather than a specular, relationship with the viewer”’ (Lehrman, 2011).

It is this idea of audience-participant as collaborator that drives the creative practices that were undertaken in conjunction with this thesis. Edmonds also refers to the role of the audience engagement in the creative process:

Marcel Duchamp went so far as to claim that audience completes the artwork. The active engagement with the work by the viewer is the final step in the creative process. As Duchamp put it, ‘The spectator ... adds his contribution to the creative act’. From this perspective, audience engagement with an artwork is an essential part of the creative process. The audience is seen to join with the artist in making the work (Edmonds, 2010: 2).

For the purpose of the practice based component of this PhD, it should be interjected that participant engagement is more than essential — it is critical.

¹¹⁵ Grant Kester is a Professor of Art History at the University of California, San Diego. He is the author of the Art History books, *Activism and Oppositionality: Essays from Afterimage* (1998), and *The One and the Many: Contemporary Collaborative Art in a Global Context* (2011) (Visarts.ucsd.edu, Accessed Feb. 2017).

Edmonds appears to acknowledge the increased importance of audience engagement in the context of interactive art, stating:

In interactive digital art, the artist is concerned with how the artwork behaves, how the audience interacts with it (and possibly with one another through it) and, ultimately, in participant experience and their degree of engagement. In one sense, these issues have always been part of the artist's world but in the case of interactive art they have become both more explicit and more prominent within the full cannon of concern (Edmonds, 2010: 1).

While central to the interaction, when incorporating audience members or participants into creative processes, 'the roles and responsibilities of the author-artist begin to overlap and resemble the changing roles and responsibilities of the spectator, it becomes more difficult to distinguish the interaction among artists and spectators from the interaction among collaborating artists' (Lehrman, 2011).

Negotiating the Role of Author

It is important to note in the context of negotiating and defining authorship of a given work that the individual artist is generally responsible for negotiating his or her role as the author of a given work. Thus, it is critical to understand and consider the notion that, with relation to art and artistic production, 'art is what the artist says it is. The rules of authorship are not agreed upon' (Cronin, 201: 32). In other words, there are no clear rules addressing authorship that all art adheres to. While this may appear to be a very convenient statement in favour of the individual artist, beyond being a self-serving and solely confined statement making the artist a grandiose narcissistic self-proclaimed genius, it also allows for a variety of interesting things to occur within the creative process. For instance, this notion allows for the appropriation and the adaptation of existing art forms and artworks resulting in the creation and emergence of new and expanding genres of practice. As an illustration, the horror filmmaker George A. Romero's classic zombie picture, *Night of the Living Dead* (1968),¹¹⁶ has no official legal ownership attributed to it. While not a deliberate choice made by Romero, the film and all of the tropes contained within it are subject

¹¹⁶ Notably, '[t]hough "Night of the Living Dead" is most commonly associated with George Romero (who both wrote most of the script and directed it), it was actually a collaboration between him and John Russo, who co-wrote the script' (Bailey, 2011). Due to creative differences following the first movie, Romero and Russo decided to go their separate ways with Russo retaining the rights to the 'Living Dead' and Romero going on to use 'of the Dead' for his future films (Bailey, 2011).

to public domain and as such have fostered the very prolific and lucrative genre of zombie fiction (Bailey, 2011)¹¹⁷.

Another example is the somewhat controversial case of the artist Sherrie Levine. Levine is most notable for her works consisting of rephotographing the photos of the artist Walker Evans and exhibiting them as new works of her own (Cronin, 2012: 32). These examples illustrate that there is status in art with regards to ownership and authorship that is malleable and workable. This flexibility in essence allows for the concept of authorship to be reframed or negotiated with the goal of encompassing a varying field of alternative possibilities.

The works created for this thesis focus on the interaction between practitioner and participant, and the notion of authorship as it pertains to this work has been deliberately constructed to be open ended. The works have interaction and engagement as a critical design element and are intended to be the gestalt of the work as a whole. The engagement is a feedback loop between the artist and the participant, and the systems and devices created function as a bridge for this cyclical flow of information (*see supra* Chapter Five, Cueing the Interaction, pages 158-162). Because the systems of art created for this thesis require both the artist and the participant for the creation of art to occur, it is the opinion of this artist that the necessary involvement of the participants with the artist make the artist and the participants collaborators. However, this collaboration exists only while the engaged interaction is taking place, with new collaborations taking place when an old participant is replaced by a new participant.

The interaction being defined as the gestalt of the work creates questions about the role of the artist in this process. The role of author and/or creator was negotiated for the purpose of this thesis in such a way as to allow the art that is created and contained in these works to be the product of collaboration. The headset, hacked toys, and the connection of artist and participant through active engagement strive to become an object that is a 'piece of art, constructed, in effect, by the artist and his or her audience' (Cronin, 2012: 21). This has been achieved through the fact that the work that has been created cannot function without active interaction and

¹¹⁷ 'Nearly every zombie movie since 1968 owes its roots to Night of the Living Dead, even those that deviate from the formula' (Bailey, 2011). This, however, was the result of the original film being released to public domain accidentally, resulting from a title change that the distributor failed to include for the copyright notice on the final print (Bailey, 2011).

willing participants. When participants actively interact with the objects the art lies in the moment of interaction. This is achieved by, first, strongly rooting the purpose of the work in the aesthetic of experience and, second, by negating the traditional role of artist so a state of collaborative authorship of the work could exist by way of an automatic genesis.

The act of placing the moment of active interaction as the focal point of the artistic production caused every other element contained in the pieces created for this thesis to function as merely elements or tools of a medium. This functioning is likened to how canvases, paints, and brushes work in painting or how cameras and film work in classic photography. With any such art mediums, it is the use and manipulation of those mediums that generate the art objects. In the work that I have created for the practice based component of this thesis, each element that is present in relation to the form and function of the systems was treated as the elements or the tools of a chosen medium.

Thus, the outward structural components of each experimental piece are to be viewed as just tools of the medium. These objects vary in the degree of complexity, and in the way that they have been altered by the addition of microcontrollers, motors, and power supplies, but are no different to how an artist like Robert Rauschenberg selected mixed media elements to create his combine paintings of the 1950s¹¹⁸. The components of the EEG headset and the elaborately and covertly modified nostalgic toys are a means to an end, arguably they have to be fashioned artistically, but they should not be seen as stand alone art objects.

These objects should, however, be seen as similar to how Roland Barthes assessed written works in his essay, *Death of the Author*, as objects created for the purpose of interaction (Barthes, 1968: 147). In doing so, it allows the modified toys to be understood as elements that have been plucked from elsewhere in the human realm of creation and ideas. Just as Barthes also claimed that written works only have meaning when received by a reader or recipient, the modified toys only have artistic meaning or merit when interacted with.

¹¹⁸ Combine Painting is an approach to creating artworks that is a mixed media type. Different types of media or objects are combined in to a painted canvas surface. This style creates a cross or hybrid between sculpture and painting. The types of media commonly used in this approach can include three-dimensional objects, cloth, newspaper, photographs, or any number of ephemera (Robert Rauschenberg Foundation, Accessed Feb. 2017).

As discussed in Chapter One, Art & Theory, for Barthes, the purpose of a written work is its meaning, and that meaning lies with the recipient (*see supra* Chapter One, pages 47-49). Barthes further claimed that because of this fact there is a forgone negation of the author's validity (Barthes, 1968: 147-148). Extrapolating Barthes's claim that meaning lies with the recipient to the objects of fine art production, it can be found that it is congruent with the ideas of Dewey's notions on experience being of ultimate importance to art. Barthes's assertion that this also simultaneously causes the negation of the author's validity, is often at odds in the world of fine art where authorship is sometimes of critical importance.

The systems created for this thesis have no function without the interaction or engagement. They have artistic potential as stand alone items, but just as the paintbrush or canvas needs a painter or creative practitioner, these devices need participation. The fact that audience participation is critical to the gestalt of the creative work creates a shift in the paradigm of the artist, artwork, and audience relationship and the notion of ownership and authorship. Given that the art does not exist until audience participation occurs, the fact that the author or artist exercises complete control over the ideas, construction, and staging of these events, without any direct influence from and prior to the interaction of the participant, does not diminish the participant's role as collaborator.

The nature of the collaboration created for this practice, is both fleeting in time and varied based on a given participant and which iteration of the interactive system is being utilised. Further, these collaborations are not agreed upon in the traditional ways or honestly agreed upon at all consciously with regards to the participant. In the collaborative groups or couplings discussed above, the artists and collaborators engaged in or undertook a deliberative creative process. For instance, Mark Boyle related the following regarding the collaborative group The Boyle Family:

And it's in this context . . . that I would like to assert there is only one reason that we bill ourselves as Boyle Family. It is the fact. We work together from the initial concept, through every stage of making each piece, through to hanging the exhibitions and talking to the public. It's not a cosy cooperative. It's not even a partnership. It's four individuals each of whom has a veto. So that if any one person doesn't want to work on a certain piece, we don't do it. As Sebastian¹¹⁹ says, '*Boyle*

¹¹⁹ Sebastian is the son of Mark Boyle and a member of The Boyle Family collaborative group (Green, 2001: 68).

Family is not a democracy. It's four feuding dictators' (Green, 2001: 68-69).

Even in collaborations seen as being more removed from traditional norms, such as the inclusion of researcher and collaborator as co-artists or co-authors (Lehrman, 2011), the nature of the collaboration is more deliberative than the collaboration undertaken for this thesis. Edmonds describes the impetus for including a researcher or technician as co-author, which appears to reflect a deliberative collaboration between the principal artist and researcher and/or technician:

A technical expert, for example, may often make creative contributions and may, as a result, be named as a co-author of the resulting artwork. The collaboration may not be limited to technical matters. There is a need for research into human behaviour and this research may also be something that requires skilled input from an expert other than the artist and technologist/scientist themselves.

A significant feature is the nature of the collaboration between the artist, researcher and technologist. There are many ways in which it can work, but it seems that the notion of the researcher and technologist being assistants to the artist is less and less common. Partnerships are often formed in which the roles are spread across the team (Edmonds, 2010b: 2).

In each of the examples just discussed, the collaborators consciously work together to create the work of art. This idea of a deliberative process, although still the product of collaboration, is more in keeping with contemporary art traditions where the artist is the originator or creator of art as an object of experience than is the collaboration undertaken for this thesis. In the case of the works created for this thesis, it is my claim that because the nature of the art is such that it only exists when active engagement takes place, there is a collaborative artistic situation that happens automatically or naturalistically every time a participant interacts. In this instance of automatic collaboration, the role of artist is different. The artist has not created art; they have created art potential. Many famous artworks outside of the genre of interactive digital art have exhibited these same characteristics of automatic collaboration and the work of the connected artist can be framed as creating art potential without audience participation.

Allan Kaprow's 'Happenings' and Sol Lewitt's instructed drawing installations are instances that have already been addressed, but they each provide an example of a case where the artist has created items or objects that are devices of art

potential (*see supra*, Chapter One, pages 22-28). Looking at these instances, it is the use of devices with art potential that results in the fruition of art through an automatic collaboration. Another such work that has not been framed as such yet, but that fits these conditions, is a piece called *Seedbed* (1972).

Seedbed (1972) was an installation and performance piece by the American artist Vito Acconci and was created for the Sonnabend Gallery in New York City. This piece was comprised of a false ramped floor installed over the gallery floor. The ramping started at the entrance to the gallery and sloped upwards as a patron walked from the front of the gallery to the back. The height of the ramped section allowed for Acconci to hide himself between the ramp and the gallery floor. While in this secret partition of the new floor, Acconci would wait for patrons to ascend the ramp to view art showcased on the wall and repeatedly masturbate when they did. The sound of people walking above him would be used as part of his sexual fantasies. His voice was amplified in to the space through a microphone and sound system. Acconci would spew out a vulgar style monologue designed to be disconcerting and unsettling as it intermixed with the sounds of Acconci's masturbatory actions (Tate.org.uk, Accessed Feb. 2017). This work like the 'Happening' and Sol Lewitt's instructions has no singular quantifiable art object; instead, the art is created collaboratively. The artist created objects have only artistic potential and it is through the automatic collaboration of the participants that a co-authored experience occurs and that generates art.

The art that is present in the creative practice of this PhD is also a case of automatic collaboration and is co-authored by the participant and the artist. The art is only generated in moments of interaction; it is unique and its rendering is attached to a given participant. The consequence of this framing of the work generated for this thesis is not necessarily the death of the author, but a serious negation of this traditional trope of art as author as a singular identity or even the more contemporary notions of collaboration as a deliberative process. The author in the singular sense is replaced with an unmediated and automatic co-authorship. Thus, by focusing on the interaction as the gestalt of the work, there is a renegotiation of the role of authorship resulting in a death to singularity of authorship. While the artist is still an author of the work, the artist has been relegated to the position of co-author with the various participants. There is nothing new or novel about artists negotiating their role of author. Warhol and Hirst negotiated their role to make the singularity of authorship of

prime importance, and as a result negating any collaborative process or efforts that may have occurred. In the work completed for this thesis, however, primacy is placed on the collaboration rather than ownership, leaving the role of singular artist dead as a result.

CHAPTER SEVEN: CONCLUSIONS AND CONTRIBUTIONS



Since the initial conceptualisation of this thesis, I have been driven to try and find a way to distinguish between technologically based interactive artworks that showcase new technology but otherwise remain fairly static, and technologically based interactive artworks that communicate more of the meaning and motivation of the artist. Through my observations, I concluded that this can be a more difficult task in the context of interactive art, than it is perhaps via the mediums of photography and video. Ultimately, however, I focused on creating art around a central concept or motivation — the moment of the interaction — with the goal that the shared experience, which is the artist’s motivation, was what audiences of my art would take away. And, in that way, it was my aim to create artworks where the shared experience, or the moment of interaction, became the gestalt of the work. This line of inquiry brought me to Kaprow’s ‘Happenings’ and the realisation that the principles that defined that movement were more critical not only to the work created for this thesis, but to the current state of interactive digital art. The ‘Happenings’ are commonly presented as an antecedent to current artistic practices in numerous genres of art. However, with the reconceptualisation and application of the ‘Happenings’ as done in this thesis, current works of interactive digital art are not merely built on the ‘Happenings’; instead, they are ‘Happenings’ themselves. The notion that interactive art can be structured in such a way as to create a ‘Happening’ is critical to the unique and original art works created for this PhD (*see supra*, Chapter 3, pages 72-120). However, it is the reconceptualisation and recontextualisation of the precepts underpinning Kaprow’s the ‘Happenings’ to make them applicable to the use of modern technological advances within the realm of interactive digital art that is the major contribution this thesis makes.

To prove and illustrate these concepts, I focused on four research questions that guided me and tracked the trajectory of this thesis. Those research questions were:

- I. How can the relationship between participatory and interactive art be used to reconceptualise Kaprow’s the ‘Happenings’?

- II. How can Kaprow's seven precepts be utilised to create interactive digital art where the art exists in the interaction?
- III. How can the application of various theories facilitate a prolonged and more active engagement between the artist and the participant?
- IV. What impact do art systems created to be dependent on the participation of others have on traditional notions of ownership, authorship, and collaboration?

As evidenced by the title to this thesis, the key question addressed by the academic and practice based research of this PhD is the first research question listed above, as the aim herein was to determine how Kaprow's 'Happenings' could be reconceptualised and applied to interactive art. These research questions in sum, however, were devised to help me understand the context from which interactive art arises and to place my work within the larger context of that field. Addressing these questions, I built upon the antecedents to interactive art; the thoughts, theories, and philosophies behind art as an experience rather than an object possessing physicality; what tools were available to me to create and shape the experience; and the implications of focusing on that shared experience or moment of interaction as the artwork, itself. The utilisation of Smith and Dean's 'The Iterative Cyclic Web' and Nelson's 'Modes of Knowing' (*see supra* Chapter Two, pages 62-64) to devise a concept-centred focus to both my academic and practice research was indispensable to answering the research questions identified above. This concept-centred focus allowed the academic research and the practice research to inform each other, fostered evolution of the art works, and encouraged me to let go of ideas or concepts that did not contribute to the paradigm this thesis was creating. In this final chapter, I recapitulate some of the highlights of that process, including how this thesis transmogrified from the video based artworks initially envisioned to art systems involving analogue toys; the rubrics and methods I employed for maintaining a concept-centred focus to my academic and practice-led research that were also utilised to help make the moment of interaction the gestalt of my artworks; and the implications of focusing the work on the shared experience between the artist and the participant. In addition, I briefly discuss future iterations, exhibitions, and potential showcasings of the art systems created for the purpose of this thesis.

The Path from Video to Analogue Objects

The drive to better signal artist motivation and the desire to work with BMI/EEG technology were both influenced by seeing a showcasing of BMI hardware at the Musée National d'Art Moderne in Paris in the Spring of 2012. In the exhibition at the Musée National d'Art Moderne in Paris there was a woman sitting in a glass case reading a paperback book while wearing an EEG cap. The cap broadcasted the real-time readouts of her brain as she read the book. I was captivated by the spectacle of this exhibit. It was a strange event that had a touch of voyeurism and the carnivalesque about it. The audience watched her while under glass and was provided insights into her brain functions of which she herself was not aware. I was immediately drawn to the interactive nature of the EEG device. Yet, while drawn to the exhibition, I thought that the use of EEG device in the exhibit at the Musée National d'Art Moderne took the dynamic information streaming from the subject's brain activity and utilised it in a way that was much too static. While I did not know it at the time, my viewing of this piece would eventually become part of the motivation that propelled me towards the use of EEG devices in interactive art and towards a focus on the nature of the interaction and collaboration between artist and participant.

In my initial expeditions into this area, I proposed to explore whether interactive art — and more specifically, interactive media art — could be constructed in such a way as to make the process of interaction simultaneously exist as art, collaboration, and an act of co-authorship. Within this context, I further proposed to review and rely on John Dewey's book, *Art as Experience*, and Allan Kaprow's book, *Essays on the Blurring of Art and Life*, in determining how to approach a collaborative process or system. Thus, given my initial focus on media art, the first medium I utilised in the research practice for this thesis was video. Video for me was a suitable jumping off point because of my extensive background with the medium in my undergraduate degree and subsequent two Masters degrees. One could say that the medium of video was a language that I knew and understood fluently given my previous work in my M.A. and M.F.A. programmes. I paired the use of video with BMI or EEG devices to conduct my initial experimentation.

Once the method of interaction had been chosen and the medium with which participants would interact had also been selected, I began testing the hardware and software that would generate or create the interactive moment. I began with a simple

consumer grade EEG head set, the Neurosky Mindwave, and a simple Max MSP patch to run the interactive playback of video files. This was the point at which I encountered hardware difficulties. The Neurosky device was problematic when cycling through participants and the information upload time was far too slow, leading to the system's reaction times being too high. This made it difficult for the participant to understand how his or her brain was affecting the video. As a result, an upgrade of the EEG headset was called for and the higher end Emotiv EPOC was acquired. The use of the Emotiv EPOC greatly decreased the deficit in the upload times and increased the overall reaction time of the video system.

However, while fluent in the language of video, I continued to encounter difficulties communicating the nature of the interaction to participants. Specifically, in utilising the Emotiv EPOC and video to create the interaction, the application of these components did not render the desired result, in that there seemed to be no substance to the nature of the interactions. The participants seemed to still have difficulty ascertaining how they were affecting the video playback. Consequently, the resulting interaction did not seem to be any different from any other interactive art display I had encountered before in my research; instead, the interaction still seemed to be more about the technology and seemed to have little to do with anything beyond that. At this point, it was decided that there was a need to look at other applications for the headset.

Quite unexpectedly, the answer came from a hobby that I was indulging in at the time — the Internet of things. The Internet of things—wherein everyday objects are allowed to connect and exchange data—was something I started exploring largely because of its novelty. I was in the process of automating a coffee pot to power on through the use of a SMS¹²⁰ text message when it occurred to me: Instead of utilising a text to power on a coffee pot, why not use brainwaves? The testing of this application ultimately took on a different household device — a lamp instead of a coffee pot. This process was a success for both my artistic needs and received positive feedback from the first focus group of participants (Appendix A).

The combining of the Internet of things technology and the EEG headset to switch on a lamp was a fruitful pursuit. It was a step away from being just a showcase

¹²⁰ Short Message Service or SMS messaging service element present in most Telephone, World Wide Web, and mobile telephony systems that uses simple text as the communication platform (Techterms.com, Jan. 2017).

that relied on the ‘wow’ factor of the interactive technology, but it was not far enough. The action the interactive system controlled needed to be far removed from the typical realm that the Internet of things was currently being employed to manipulate and control. The types of projects being done with the Internet of things ran a wide gambit from digital to analogue. These projects would be used to sniff Internet traffic for key words or topics and track world trends, to opening bedroom curtains at dawn, or making automatic pet feeders. The critical thing that was devised from research into the current uses of the Internet of things was that almost all applications seemed to have an external purpose that was directly connected to the function.

Therefore, the application I chose for the Internet of things was purposeless. It was used to give action to analogue toys, but unlike other applications of the Internet of things an external function was nonexistent. It functions as both the proof of effect of a participant’s brainwave impact and the catalyst to entice others that witness the interaction to partake in the process themselves. This was done in the hope of transferring the ‘wow’ factor of the EEG headset and the Internet of things technology to the oddity of the purposeless application of moving a plastic toggle or turning a Jack in the Box crank. Through experimentation it was determined that novelty, familiarity, purposelessness, and the creation of a pseudo-ESP experience all had a role to play in helping to facilitate and sustain the interaction. Additionally, by obfuscating the method or means of transference, it allowed the moment of interaction to be singular and remain the goal of the overall process by allowing the interaction to be the focus and not the technology.

A Concept-Centred Focus

Maintaining a concept-centred focus was a critical aspect of this thesis. In order to maintain the conceptual goal of creating artwork centred on interaction or collaboration, I employed a concept-centered methodology for the purpose of this thesis. The conceptual form as a method is based on the combining of Smith and Dean’s ‘The Iterative Cyclic Web’ and Nelson’s ‘Modes of Knowing’ (*see supra* Chapter Two, pages 62-63). These two approaches were combined and utilised for this practice-based research because they both deal heavily with ‘Praxis’ in connection with the sphere of practice as research as a type of intelligent practice informed by doing or handling (Bolt, 2011: 86-103; Nelson, 2012:40-41; Smith &

Dean, 2012: 19-35). The conceptual form as a method also strongly connected to Kaprow's 'Happenings' and Dewey's, *Art as Experience*, to inform the creating of interactive experiences that are deemed art through their connection with audiences. These combined methods allowed for informed evolution through the process of physical making through 'iteration' — where the research leads the practice but the practice then feeds back into the research thereby leading the research (Smith & Dean, 2012: 19-25).

In addition, other methods employed were critically examined and analyzed against the goal set out by the conceptual form — namely, the collaboration or the nature of the interaction. For instance, 'Live Methods' (Back & Puwar, 2012: 3) were employed in the process of testing the products of this practice in their various iterations. The testing involved using the devices by the practitioner and the participants to observe the suitability of the headsets and the interactive system hardware and the object chosen to hold the interactive potential.

Another method employed was that of participant observation, where, once again, the information obtained was critically evaluated in light of the conceptual goal. The participant observation methods utilised in this thesis were derived from combining theoretical aspects of several interpretations and definitions of observation and participant observation thereby creating a hybrid based approach. The interpretations and/or definitions at the foundation of this hybrid style method are Marshall and Rossman's 'Observation' as, '[A] systematic description of events, behaviors, and artifacts in the social setting chosen for study' (Marshall and Rossman, 1989:79) and DeWalt and DeWalt's interpretation of participant observation as a process that for researchers enables them to learn about people in naturalistic environments or settings through the use of observing and participating in those activities themselves (Dewalt & DeWalt in Kawulich, 2005). The data gathered from the participants through this approach was principally done through a method known as the 'Fly-on-the-Wall' (Martin & Hanington, 2012: 90). This method was selected to negate the 'Hawthorne Effect' or observer/viewing effect (Coombs & Smith, 2003: 98-99). The 'Fly-on-the-Wall' approach was employed in conjunction with the more traditional questionnaire method (Appendices A & B). By utilising these various methods, it allowed the research practice to evolve in a way that furthered the conceptual goal of the practice.

The significance of this research process is that it acted to highlight the use of a natural evolutionary approach to both the academic and practice research branches of this thesis. The research was undertaken with the framework that the conceptual goal was to create an interactive artwork where the interaction was the gestalt of the work. This was the only fixed point or goal and every other element revolved around it. Because of this, the theoretical inquires moved from topic to topic to facilitate that goal. No single theoretical framework was held on to if it failed to serve the conceptual precept. This approach was also true of the practice component of this thesis.

Standardly, as an artist, I would work by finding an object, a photograph, a phrase, an auditory component, or a video element that I would then build an artwork around. However, in this case, the artwork was not centred on an object, but on the concept of interaction and, thus, there could be no attachment to anything other than the concept. Therefore, throughout the research, when some element, for example, the mode of interaction or the medium, were seen to fail the conceptual goal, they were dropped and a new device or medium was adopted. This worked to not only move the process along, but required a level of openness to leave theories, devices, and artistic output behind in the pursuit of a singular concept. This proved to be a very difficult but, yet, rewarding process. It teaches that, even though it is difficult to walk away from a large number of hours of physical and intellectual investments and the comfort of that which is known and familiar, the understood pay off is greater than the strife. Because the process used within both branches of this thesis was allowed to evolve and absorb incorrect inquires and experiments, the process took on its own life and travelled down paths that were not originally anticipated or foreseen. This approach emphasizes the need to critically examine research failures and theoretical misadventures, reinvent the process wheel, and then start again.

These methods and methodologies that have driven and informed this thesis were not newly created by me for use in my research, but are an amalgamation of other methods and methodologies as discussed above and more substantially in Chapter Two, Methods and Methodologies. While I have utilised various methods and methodologies to inform the methods employed in my research and practice, it is not the combining of these models that is truly special or unique to this document, but it is the handling of the process of interweaving the models and their outcomes back through themselves that is the unique feature. Having applied these methods

throughout this thesis, it is my assessment that this process of interweaving offers a more organic evolution for the academic research, the practice research, and the resulting artworks.

By combining multiple methods to focus on a single conceptual goal, the contribution to the field of methods and methodologies generated by my research process is a demonstrated method of letting the research inform the practice and the practice to inform the research equally— giving no dominance to one over the other. The determining characteristic seen in the method I employed is that the artistic concept was the testing apparatus for all data gained through both the practice and the research. While having concept be the driving force in art practice production is not new or exclusive to this thesis by any means, it is the rigid and systematic use of it, while allowing it to function as a type of architect and curator of an artistic practice, that is unusual and divorced from the common place.

A Rubric for Communicating Motivation

In my efforts to better signal artist motivation and to focus on the conceptual goal of structuring a moment of interaction or shared experience that exists as the gestalt of the work, I turned to ideas, theories, and examples of participatory art to provide guidance. In many ways, participatory art practice can be viewed as a precursor to interactive digital art, but without the digital component. Given the similarities that can be drawn between the two, as discussed more fully in Chapter One, Art & Theory, (*see supra* pages 22-28), the manner in which participation is structured in the realm of participatory art can greatly inform how to structure the interaction for this medium or genre of art. Thus, I turned to Allan Kaprow's, 'The Happenings', and his work with art as experience through his study and reworking of the theories of John Dewey. Kaprow's act of redefining how and when the process or the moment of art takes place, placing the focus and emphasis on the experience, provided a lens through which to critically view the moments of interaction created for this thesis and to maintain the focus of the research and practice on the conceptual goal of the collaboration or interaction.

However, as noted above, the rules or precepts Kaprow applied were not constructed in the context of interactive art. Therefore, in order to apply Kaprow's rules for creating a 'Happening', it was first necessary to reconceptualise Kaprow's rules, and determine how they would apply to interactive art, in addition to how they

can already be seen reflected in specific interactive artworks. In Chapter One: Art & Theory, there is a detailed look at Kaprow's formation and inception of the 'Happenings' and his creation of seven precepts or guidelines that help to define a 'Happening' (*see supra*, Chapter One, pages 33-42), and in Chapter Four: "Happenings" in the 21st Century, A New Paradigm', those precepts and ideas were then reconceptualised and applied to interactive digital art. This reconceptualisation is more than a simple interpretation of their role as antecedents to the aesthetics within interactive art; rather, it is an unpacking of each of the precepts that shows through careful and critical applications of Kaprow's theories that interactive art is more than informed by the 'Happenings', but can be viewed as many small instances of 'Happenings' themselves. Thus, part of the contribution to art theory that emerges from this thesis, is the idea that interactive art is more than merely based on or inspired by the 'Happenings', but many interactive artworks are 'Happenings' staged with the help of electronics. This refocusing of the 'Happenings' as a type of lens helps to give the original formation of the 'Happenings' in the 1960s and 1970s greater weight and importance in connection to the evolution of interactive digital art.

In addition, by reconceptualising the 'Happenings' and adapting Kaprow's seven precepts to apply to interactive digital art, I also distilled a rubric for the creation of fine art production that does more than just showcase new technology, but places the focus on the interaction rather than the technology and, thereby, communicates the motive of the artist — that of the shared experience. This rubric assists in giving the work that I have created a clear and concise intent. Intent, which artist Stuard Wood of Random International and co-creator of *Rain Room* (2012), attributes as being the necessary element between art and design (The Guardian, 2012). For the artworks or art systems created for this thesis, it is that intent or motivation that elevates them above modes of showcasing new technology. By allowing me to focus on that intent, this rubric also provided me with a system to ensure that the conceptual goals were followed in structuring the moments of interaction, and allowed me to ensure that the focus of the artwork was on the interaction, and permitting the interaction to be what the participant takes away as the gestalt of the work. Thus, by utilising this rubric, I have made a clear and deliberate move away from the technology blackbox or the scientific toy and have uncovered a new way to bridge human interaction and technology.

The Implications of Collaboration

The focus on the moment of interaction as the essence or gestalt of the artwork comes with certain implications, which are explored in more detail in Chapter Six, Death to the Author. The single most important implication may be the question, when the art is in the moment of interaction, who gets to claim ownership or authorship over the art where that moment only exists through the collaboration of artist and participant. This thesis highlights some of the past forms and trends within the field of collaborative art that concern the process of collaboration as part of the process of art production. More importantly, Chapter Six, Death to the Author, makes use of a newer type of collaboration, automatic collaboration or co-authorship. This is done through a negating of the author or artist and the creation of art where the moment of interaction between participant and object is the gestalt of the work, whereby consequently there can never be a singular author or artist. Thus, the act of interaction in the practice elements of this thesis are constructed in such a manner as to allow automatic collaboration or co-authorship between the participant and practitioner when combined through the experience of the devices.

Future Applications of Research

Future applications of this research are many. Firstly, in a similar vein to the one taken within this thesis, there could be a shift from the use of simple objects to larger and more elaborate ones. This would allow the experience to shift from having a micro experience of one-on-one interaction to a macro experience, wherein multiple people could participate in the interaction simultaneously. One such concept or example of a macro experience, would be to have a network of participants that would all be using EEG headsets and having their feedback combined to control individual actions of a larger object towards a cooperative effect. For instance, there could be four participants, with each participant controlling one aspect of a self-powered vehicle something like an R/C car or quadcopter. Thus, each participant would be responsible for controlling a single axis of movement, i.e. forward, backward, left, and right. This paradigm would create an experience where collaboration and communication would be key to completing a given task — such as, moving around a set course.

This application could also be extrapolated even further to allow for participants in vastly different locations the ability to perform this or any other task

remotely via the Internet. Participants could collaborate in larger scale interactions in this way. The type of system that has been constructed for this thesis could also be adapted to control a mechanical, analogue, or digital operation; it would just be a question of substituting the physical computing elements for ones that are practical and relevant for a given application. This potential future application of my current work is an area that could be further explored in post-doctoral research and for which I am considering applying upon my return to New Mexico.

In addition, the reconceptualisation of Kaprow's the 'Happenings' creates opportunities to understand and experiment with more varied forms of interaction within interactive digital art. Art works that focus on discrete and/or involuntary types of interactions can be studied in greater detail to ascertain additional artistic implications. By shifting the discussion of Kaprow's the 'Happenings' from being an antecedent contribution to the aesthetics of interactive digital art to being a more integral part of the creation of interactive digital art, the 'Happenings' can evolve and inspire other artists and art practices.

The Artworks: Present and Future

In addition to the contributions to the theoretical areas discussed above, out of this thesis also emerges the formation of a series of **three** unique carnivalesque interactive experiences that create art as the moment of interaction. These objects are unique and each time they are interacted with create a one off or one of a kind artwork that exists because of the experience. The experiences are between the participant, the interactive object, and the artist, and are driven through the use of carefully augmented vintage toys and an EEG headset that give them form and facilitate the interactive function. The process of interaction is given prominence through the embedding of the interactive system elements seamlessly with the construction of the original toy to obfuscate the technology. Each device was constructed solely for and because of the process of research and its conceptual goal.

In addition, each of these **three** unique carnivalesque interactive experiences are a 'Happening' in the here and now of real life and become the gestalt of the work. As discussed more fully in Chapter Five, The Interaction (*see supra* 151-166), the EEG headset and the analogue toys used are mere tools for the creation of the art — the shared experience or moment of interaction. Thus, in keeping with Kurt Koffka's theories of gestalt, the artworks produced for the purpose of this thesis are not 'the

sum of the parts' (Heider, 1977: 383) — here, the EEG headset and the analogue toy; rather, it is something independent of and different from the individual pieces. For the artworks created for this thesis, the gestalt is the interaction.

Future Exhibitions of Artworks

In considering how to move forward with the artworks created, I am currently researching the ideal locations for them to be exhibited. In doing so, I have reflected on and considered Kaprow's notions of work needing to, 'eliminate the arts, and anything that even remotely suggests them, as well as steer clear of art galleries, theatres, concert halls, and other cultural emporia' (Kaprow, 2003: 62). While recontextualising and modernising the 'Happenings' is a foundational principle of this thesis, simply relying on Kaprow's principle for the future of the existing artworks would be too simplistic a position to take. In other words, it seemed that more consideration was necessary than simply concluding that the artworks belong outside of traditional art venues merely because a 'Happening' does.

However, in contemplating whether the artworks would be best showcased in traditional art venues, it seemed apparent that certain drawbacks would exist based on the unique attributes of the artworks and how the interaction has been structured. Specifically, I considered whether exhibiting the artworks in a gallery setting or a museum setting would best showcase the works and foster the interaction. Exhibits of a similar nature are sometimes found at museums, such as the Museum of Discovery in Little Rock, Arkansas in the United States that is pictured below. However, one drawback that could exist is that often in gallery and museum settings the nature of the artwork is described to those coming to view the art.

The exhibit at the Little Rock Museum of Discovery utilised EEG headsets that measured levels of concentration to move an object across a magnetic strip that ran the length of the table. Two people would compete to move the object away from themselves and towards the other person by concentrating. As can be seen in the picture below, this objective is clearly explained to participants and the mechanism and how it works is fully understood prior to participating.

As discussed in this thesis (*see supra* Chapter Five, pages 155-158), a large aspect of facilitating the interaction relies on a certain degree of mystery regarding the artworks still existing prior to active engagement by the participants. Based on the theories of affect and magical thinking, as well as my observations and information gathered from participants, not understanding precisely how the pseudo-ESP

experience is occurring is part of what draws people to stop and observe and then, eventually, interact. Thus, this method of facilitating the interaction and getting people to actively engage with the artworks may be lost in a gallery or museum setting.

Consequently, I have returned to the idea, consistent with Kaprow's second precept (*see supra*, Chapter One, pages 38-39, and Chapter Four, pages 124-126), that a non-art derived setting may be more appropriate for showcasing my artworks. In addition, the augmented toys in their current have a carnivalesque quality, that, when exploited, I believe helps to facilitate the interaction. Thus, staging the artworks in areas that elevate the carnivalesque helps to better foster and facilitate interaction with different segments of the public. Venues such as outdoor markets or seasonal fetes may provide a location that elevates the carnivalesque qualities inherent in the nature of the artworks, while still drawing on some of the benefits of the impromptu exhibition at the pub that was conducted (*see supra*, Chapter Three, pages 117-120). Specifically, venues like outdoor markets will provide the carnival feel while still invoking interest due to such exhibits generally not being expected by those in attendance.

While the impromptu pop-ups conducted near the time of concluding this thesis exhibited many beneficial traits, the strategy moving forward is to make a shift to less random impromptu staging. Although venues like pubs or street corners are very conducive to impromptu staging, and venues like outdoor markets, seasonal fetes, lobbies of pantomimes, or airport terminals require planning permission, insurance, health and safety, and informed consent, showcasing the artworks in places such as outdoor markets and seasonal fetes will allow access to larger and more diverse audiences. These venues will allow for the benefits discussed above, while still permitting some of the impromptu nature of the prior pop-ups and retaining the feel of the old-style carnivals in the United States that are here one moment and somewhere else the next.

In summation, this thesis creates a rubric through a reconceptualisation of Kaprow's 'Happenings' for creating artworks where the gestalt of the work is the shared moment of interaction. The most successful interaction created for the purpose of this PhD involved not only the EEG headset and augmented analogue toy, but relied on ideas of novelty, familiarity, magical thinking, and a pseudo-ESP experience to foster engagement. The interaction or shared experience further results in a type of

automatic co-authorship that calls into question the singularity of traditional authorship. And while, ultimately, the EEG headset and augmented analogue toy are crucial to the creation of the artwork system, it is the moment of interaction that is the purpose, the meaning, and, therefore, the gestalt of the work.

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APPENDIX A: PARTICIPANT QUESTIONNAIRES FOR LAMP EXPERIMENT



Written Interview Questions:

Participant 1

1. What were your first impressions of the installation?

It was futuristic, like things you see in movies involving brain scans.

2. How did you feel about the prospect of wearing the EEG Headset?

I was eager to try it once I found out what could be done with it; I was also concerned about “doing it right” so that I could make the light go on or off, because I’m very competitive.

3. How would you classify your experience wearing the headset? Was it positive or negative? Please explain your answer.

I would say my experience was positive; there was no discomfort of any kind and it was a fun new experience.

4. Did the initial setup time required to calibrate the headset limit your enjoyment of the overall experience?

Not at all; the initial setup time was just a part of the whole experience, which was entirely positive.

5. Did the experience of watching others using the headset and the interactive system have any effect on your interest to participate?

Yes, seeing other people being able to turn the light on or off with their brain waves made me very eager to try it for myself and see if I could do it myself. It also made me curious to see how something like this could be done.

6. The objective goal of the interactive process was to give you the ability to control the functioning of a normal household lamp by thought. Did you feel that the lamp was truly responding to your thoughts?

Yes, when I was able to focus the way I was supposed to I could tell the lamp was responding to that.

7. What other objects, if any, do you feel would strengthen your experience if you were allowed to control them with the headset?

I would like to control a small drone, or turn a tv or radio on or off.

8. Did you feel the process at any stage was too technical or too complicated in its setup or presentation?

Not at all; the whole thing was explained thoroughly and in terms I could easily understand.

9. Do you believe in the paranormal? And, did your belief or disbelief in the paranormal influence your interest in participating with this device?

I am an agnostic about the paranormal, so I don’t believe in it or disbelieve in it; unless by “paranormal” we are including the power of one mind to perceive what someone else is feeling or thinking—to that extent I do believe in it. I just am not sure about other aspects of it like ghosts, or telekinesis. My beliefs about the paranormal had no effect on my interest in the device; I didn’t see this as being about anything

paranormal at all, just another example of devices being able to pick up brain waves and turn them into energy (similar to biofeedback devices, or quadriplegics being able to control computers with their brain waves).

Written Interview Questions:

Participant 2

1. What were your first impressions of the installation?

The setup with the lamp on the table appeared spare and almost clinical at first. I was not sure what it was or how it worked.

2. How did you feel about the prospect of wearing the EEG Headset?

I was not bothered by the idea of wearing the headset, but I had some concern about how wet the electrodes would need to be in order to contact my scalp through my hair and wondered if proper contact could be made at all.

3. How would you classify your experience wearing the headset? Was it positive or negative? Please explain your answer.

The initial experience of just wearing the headset was neutral for me. I had a brief moment of minor performance anxiety at the thought of being unable to make the lamp turn on or being the only one of the group unable to do it. Once I was able to use the headset to interact with the lamp, the experience was definitely positive and entertaining.

4. Did the initial setup time required to calibrate the headset limit your enjoyment of the overall experience?

I don't recall an initial calibration process, but I think there was some time further into the session where the headset had to be calibrated or was experiencing some technical difficulties. I remember being somewhat disappointed about the delay and my interest waning some after that.

5. Did the experience of watching others using the headset and the interactive system have any effect on your interest to participate?

Yes, very much. Watching others made me eager to have a try to see if I could make the lamp work.

6. The objective goal of the interactive process was to give you the ability to control the functioning of a normal household lamp by thought. Did you feel that the lamp was truly responding to your thoughts?

I'm not positive, but I think so. I don't recall thinking any specific thought to make the lamp turn on or off. I am somewhat skeptical I was actually controlling it and don't know that I could replicate the interaction, because the lamp turning on didn't correspond with any particular thought or way of concentrating.

7. What other objects, if any, do you feel would strengthen your experience if you were allowed to control them with the headset?

I think I would be more convinced if the object moved in different directions in response to my thoughts. Maybe something like a fan that could reverse directions would be more convincing to me.

8. Did you feel the process at any stage was too technical or too complicated in its setup or presentation?

Using the headset was not complicated, but the time during the session when it was being calibrated or tweaked took some time and made operation of the headset seem much more complicated and vulnerable to inconsistencies.

9. Do you believe in the paranormal? And, did your belief or disbelief in the paranormal influence your interest in participating with this device?

I am skeptical of the paranormal, but I have not ruled it out. I do not think my views about the paranormal influenced my interest in the installation.

Written Interview Questions:

Participant 3

1. What were your first impressions of the installation?

It seemed like a cool idea.

2. How did you feel about the prospect of wearing the EEG Headset?

I didn't really have strong feelings about the prospect.

3. How would you classify your experience wearing the headset? Was it positive or negative? Please explain your answer.

It wasn't really positive or negative. I didn't have much success with turning the switch on and off.

4. Did the initial setup time required to calibrate the headset limit your enjoyment of the overall experience?

No.

5. Did the experience of watching others using the headset and the interactive system have any effect on your interest to participate?

It made me want to try.

6. The objective goal of the interactive process was to give you the ability to control the functioning of a normal household lamp by thought. Did you feel that the lamp was truly responding to your thoughts?

Not in my case, no.

7. What other objects, if any, do you feel would strengthen your experience if you were allowed to control them with the headset?

Video games.

8. Did you feel the process at any stage was too technical or too complicated in its setup or presentation?

No.

9. Do you believe in the paranormal? And, did your belief or disbelief in the paranormal influence your interest in participating with this device?

No, and no.

Written Interview Questions:

Participant 4

1. What were your first impressions of the installation?

I was very impressed that someone was able to use such simple (everyday) type products to create such an impressive result. It was exciting to think about actually participating in the installation.

2. How did you feel about the prospect of wearing the EEG Headset?

I was excited about wearing something that was supposed to make something else happen just by detecting brain waves.

3. How would you classify your experience wearing the headset? Was it positive or negative? Please explain your answer.

My experience was positive - the headset itself was sort of a non-issue, but the activity that the headset let me perform was enjoyable. I felt motivated to succeed and thought the whole process was fun..

4. Did the initial setup time required to calibrate the headset limit your enjoyment of the overall experience?

No - I don't remember this being an issue.

5. Did the experience of watching others using the headset and the interactive system have any effect on your interest to participate?

Yes - both the people who did not do as well and those who did better made me want to "prove myself" by using the headset -- either in the first place or again, after I had already had a turn.

6. The objective goal of the interactive process was to give you the ability to control the functioning of a normal household lamp by thought. Did you feel that the lamp was truly responding to your thoughts?

Yes and no. I felt that the lamp was truly responding to my brain waves, though perhaps if I thought of something other than the lamp, but was still focused on the single thing, it might still work.

7. What other objects, if any, do you feel would strengthen your experience if you were allowed to control them with the headset?

Well, turning things on and off, in general, is impressive. I suppose if there were a way to make things *different* by focusing on them, that would strengthen the experience. E.g., changing channels on a tv or selecting specific objects, even on a screen of a computer, by focusing on the thing.

8. Did you feel the process at any stage was too technical or too complicated in its setup or presentation?

No

9. Do you believe in the paranormal? And, did your belief or disbelief in the paranormal influence your interest in participating with this device?

Hmm. I don't believe in ghosts in the traditional sense, but I am Christian so do believe in the supernatural. I suppose that would be a "sort of"? I do not believe my belief or disbelief influenced my interest in participating at all - I believe the installation was science, not paranormally/supernaturally influenced.

Written Interview Questions:

Participant 5

1. What were your first impressions of the installation?

I am not sure what is meant by “installation.” If it refers to the tools that were used to run the tests, it appeared to me to involve a highly scientific experiment, the sort of setup one might see in a science fiction movie. I could not imagine how the various items would be used or what information would be gathered.

2. How did you feel about the prospect of wearing the EEG Headset?

I must admit that I was a little concerned because it first appeared to be a sort of electrode headset, the type used in movies (again) to control a subject or cause harm. For that reason, I waited until others had participated before I agreed to join in.

3. How would you classify your experience wearing the headset? Was it positive or negative? Please explain your answer.

My experience wearing the headset was positive. The researcher explained everything carefully and made sure I understood what was going to happen. He worked to make me comfortable and to make the experience enjoyable.

4. Did the initial setup time required to calibrate the headset limit your enjoyment of the overall experience?

The time to setup and calibrate the headset did not affect my enjoyment at all. The researcher made certain that I was comfortable and talked through the steps that were being taken.

5. Did the experience of watching others using the headset and the interactive system have any effect on your interest to participate?

Watching others participate in the study made me more interested in participating. It was very interesting to watch what happened with each participant as they went through the procedure. It was a lot of fun to watch the effects of using the headset, and it was interesting to see the reactions of the participant and of the other volunteers to the effects

6. The objective goal of the interactive process was to give you the ability to control the functioning of a normal household lamp by thought. Did you feel that the lamp was truly responding to your thoughts?

Logically, I cannot imagine having such powerful thoughts that I can control a lamp. However, the lamp was clearly receiving some signal from my brain that caused it to turn off or on. It is definitely not something I could explain, but it was fascinating to realize that our brains can transfer energy or some other force in that way.

7. What other objects, if any, do you feel would strengthen your experience if you were allowed to control them with the headset?

I am not sure if it would strengthen my experience, but it would be great to have a headset used for simple tasks around a home such as answering a telephone or controlling a fan or heater. Things that healthy people take for granted, but disabled people cannot accomplish without assistance.

8. Did you feel the process at any stage was too technical or too complicated in its setup or presentation?

The process may have been technical and complicated, but the researcher made it seem simple and manageable.

9. Do you believe in the paranormal? And, did your belief or disbelief in the paranormal influence your interest in participating with this device?

I tend to lean toward believing in the paranormal. Some things happen that just cannot be explained by anything other than some force or energy beyond the norm. For example, many people have experiences involving ESP and tuition that defy explanation. However, any belief in paranormal activity did not influence my interest in participating in the process.

Written Interview Questions:

Participant 6

1. What were your first impressions of the installation?

I thought it was a little strange, and I did not understand how the installation was a form of art. It seemed much more scientific.

2. How did you feel about the prospect of wearing the EEG Headset?

I did not mind wearing the EEG Headset. In fact, it made me think that the result---turning the lamp on based on my thoughts---was more plausible because the Headset was connected to my head.

3. How would you classify your experience wearing the headset? Was it positive or negative? Please explain your answer.

I thought the experience was very interesting and positive. Interestingly enough, however, when I focused on a negative memory, the lamp stayed on longer. Perhaps it was because I was able to stay focused on this memory longer and it evoked much more passion in my brain.

4. Did the initial setup time required to calibrate the headset limit your enjoyment of the overall experience?

No, I found the discussion regarding, and during, the calibration to be very interesting.

5. Did the experience of watching others using the headset and the interactive system have any effect on your interest to participate?

Definitely, I was much more interested in participating after seeing others participate. Watching others sparked a friendly competitiveness to see who could keep the lamp on longer.

6. The objective goal of the interactive process was to give you the ability to control the functioning of a normal household lamp by thought. Did you feel that the lamp was truly responding to your thoughts?

Yes, the more that I focused on a thought, the more the lamp seemed to respond.

7. What other objects, if any, do you feel would strengthen your experience if you were allowed to control them with the headset?

The visual aspect of seeing the lamp turn on, flicker on and off, and stay on for longer periods of time was interesting. However, it would also be interesting to control a sound, perhaps like a doorbell.

8. Did you feel the process at any stage was too technical or too complicated in its setup or presentation?

Initially, I felt like the setup and presentation was technical; however, after seeing it multiple times and learning more about it, I no longer felt that way. Instead, I was interested in what was happening, and I was trying to figure out how it was happening.

9. Do you believe in the paranormal? And, did your belief or disbelief in the paranormal influence your interest in participating with this device? I am skeptical of paranormal activity, and I was hesitant to participate with the device. However, after seeing other people participate, I wanted to try it to see if my thoughts could turn the lamp on, too.

**APPENDIX B: QUESTIONNAIRES
FOR JACK IN THE BOX
EXPERIMENT**



Written Interview Questions:

Participant 1.

1. What drew your attention to the artwork?

Well it was that it was out of sorts in the library. I didn't expect to see something like that when I arrived at the Uni library this morning.

2. Before your participation with the artwork, did you have a chance to witness others interacting with the device? If so, do you feel your observation of the device in action was a catalyst to your wanting to interact with the artwork?

Yeah, when I was passing by the table I saw you staring at the toy and it cranking itself and then it popped up. It was very odd and I was a bit taken back by it so I stopped to ask you what it was.

3. This version of the artwork uses a Jack in the Box toy as the object of interaction, is this an item you recognised or had some past experience with?

Mostly, at first I wasn't sure what it was until it jumped up but then I remembered. I had something like that when I was younger but it was an elephant and not a creepy clown person like thing.

4. If you witnessed others interacting with the artwork or you were familiar with the toy on which this artwork is based, what was your response to the object popping up from the box?

It was startling. I was just trying to keep the knob turning and kind of forgot that the thing inside would jump out at me.

5. Was it clear to you that your mind was having a direct impact on the animation of the toy?

Yeah, it took a bit for me to get the hang of it but from its stopping and starting up again as I tried to be single minded on something I knew it was me working it.

Written Interview Questions:

Participant 2

1. What drew your attention to the artwork?

My mate brought me to it.

2. Before your participation with the artwork, did you have a chance to witness others interacting with the device? If so, do you feel your observation of the device in action was a catalyst to your wanting to interact with the artwork?

No, not really. I wasn't really paying any mind to it. I was messaging on my phone while others were having a go.

3. This version of the artwork uses a Jack in the Box toy as the object of interaction, is this an item you recognised or had some past experience with?

Nope. It looked like something my Nan might have had or something.

4. If you witnessed others interacting with the artwork or you were familiar with the toy on which this artwork is based, what was your response to the object popping up from the box?

It made me jump a little.

5. Was it clear to you that your mind was having a direct impact on the animation of the toy?

I guess so.

Written Interview Questions:

Participant 3

1. What drew your attention to the artwork?

I saw the headset and I knew what it was from something I saw on the web. Youtube I think.

2. Before your participation with the artwork, did you have a chance to witness others interacting with the device? If so, do you feel your observation of the device in action was a catalyst to your wanting to interact with the artwork?

Yes I did and yes it did.

3. This version of the artwork uses a Jack in the Box toy as the object of interaction, is this an item you recognised or had some past experience with?

Yes. I had one.

4. If you witnessed others interacting with the artwork or you were familiar with the toy on which this artwork is based, what was your response to the objet popping up from the box?

I forgot it was even coming.

5. Was it clear to you that your mind was having a direct impact on the animation of the toy?

Yes, very much so.

Written Interview Questions:

Participant 4

1. What drew your attention to the artwork?

I was sitting at a table over, and I hear the tune play and thought, 'what's that, then'.

2. Before your participation with the artwork, did you have a chance to witness others interacting with the device? If so, do you feel your observation of the device in action was a catalyst to your wanting to interact with the artwork?

I saw two others have a run on it before my go.

3. This version of the artwork uses a Jack in the Box toy as the object of interaction, is this an item you recognised or had some past experience with?

Yeah I knew just what it was.

4. If you witnessed others interacting with the artwork or you were familiar with the toy on which this artwork is based, what was your response to the object popping up from the box?

It scared me, I wasn't ready for it. Brilliant!

5. Was it clear to you that your mind was having a direct impact on the animation of the toy?

Yeah definitely, because of the way if I changed my thinking it would stop and I had to try again to get it running again.

Written Interview Questions:

Participant 5

1. What drew your attention to the artwork?

I saw you take it out of a box and my thinking was, that's a bit odd.

2. Before your participation with the artwork, did you have a chance to witness others interacting with the device? If so, do you feel your observation of the device in action was a catalyst to your wanting to interact with the artwork?

I saw you setting it up for a bit then testing it.

3. This version of the artwork uses a Jack in the Box toy as the object of interaction, is this an item you recognised or had some past experience with?

My sis had one.

4. If you witnessed others interacting with the artwork or you were familiar with the toy on which this artwork is based, what was your response to the object popping up from the box?

It slipped my mind I was thinking about how crazy it was that the crank moved by itself and I could see how it was done.

5. Was it clear to you that your mind was having a direct impact on the animation of the toy?

Completely.

APPENDIX C: REFLECTIVE JOURNAL EXCERPTS



Video Experiment 19/03/2014

New Sky Mindwave headset attention video system

- set up time with participant very long,
- participant was excited when first saw headset
- had to restart system 3 times to get it to function
- participant kept asking if the video was responding to them or just playing by itself

Second test with meditation video

- Same very long setup and reboots as with other system
- once working the fading video seems to be a clearer interaction
- head set up load of data needs to be passed

Video Experiments

20/05/2014

* Emotiv EPOC Headset Attention System *

- Much faster set up time
- much faster data transfer times
- participant a little uncomfortable with wet sensor pads.
- still not sure what is actually they are controlling.
- participant said liked the idea but wasn't sure what was going on.

* Emotiv EPOC Headset Meditation within test *

- Much faster participant change out time
- set up and data transfer much faster.
- interaction is simpler and there for clear to understand.
- these systems are not engaging enough the use time is very short need to make process of interacting longer

Object based E experiment 15/06/2015

Emotiv ePoc headset used

Lamp Experiment

- System setup and charging of participants good. (same as video)
- Interaction was very clear and understandable
- People were excited to have a turn
- Many people want to go again
- Key word: Responses from talking.
Simple too short
Positive dissent
funny
strange
- Some people want to compete with each other to see who could turn on the lamp faster and faster
- System battery problems had to switch over to mains power

Object based Experiment 25/08/2015

Emobiv EPOC head set used with 2 tone EV

- Set up time & data transfer (same)
- Same Level of interest in system and object as with music ~~but~~ record player
- Some tactile interaction (with dial)
- Play back very less dramatic no seen moving parts. ~~no~~
- interaction could stop and start playing but interaction was too short still.
- overall less drama than the Record Player
 - key words from Participants
 - odd • short • pointless
 - Esp • childhood • toy
 - fun • interesting
 - seems like a step backwards from Record player

Object based Experiment 20/01/2017

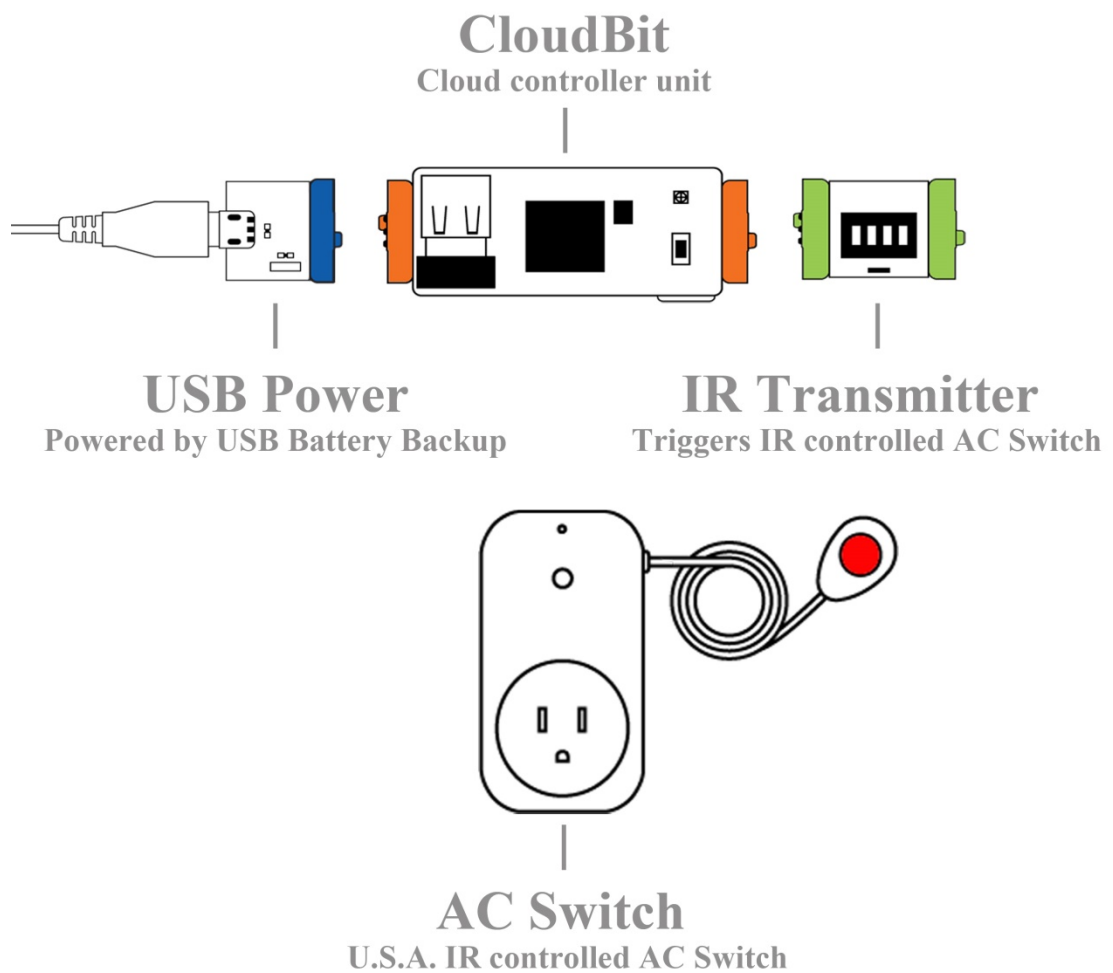
emobio epoch head set used with Jack in the box

- set up and participant change (same as before)
- shocked when Jack pops up
- clear understand of level of control
- no familiarity with object
- focused on crank and forgot about the Jack
- Very Visual
- people once had a turn brought others over to try
- Library response was very enthusiastic while pub was more stand off.
- in both pub and library lots of interest in head set
- Keywords
 - scary . ESP
 - crazy . odd
 - fun ~~BB~~

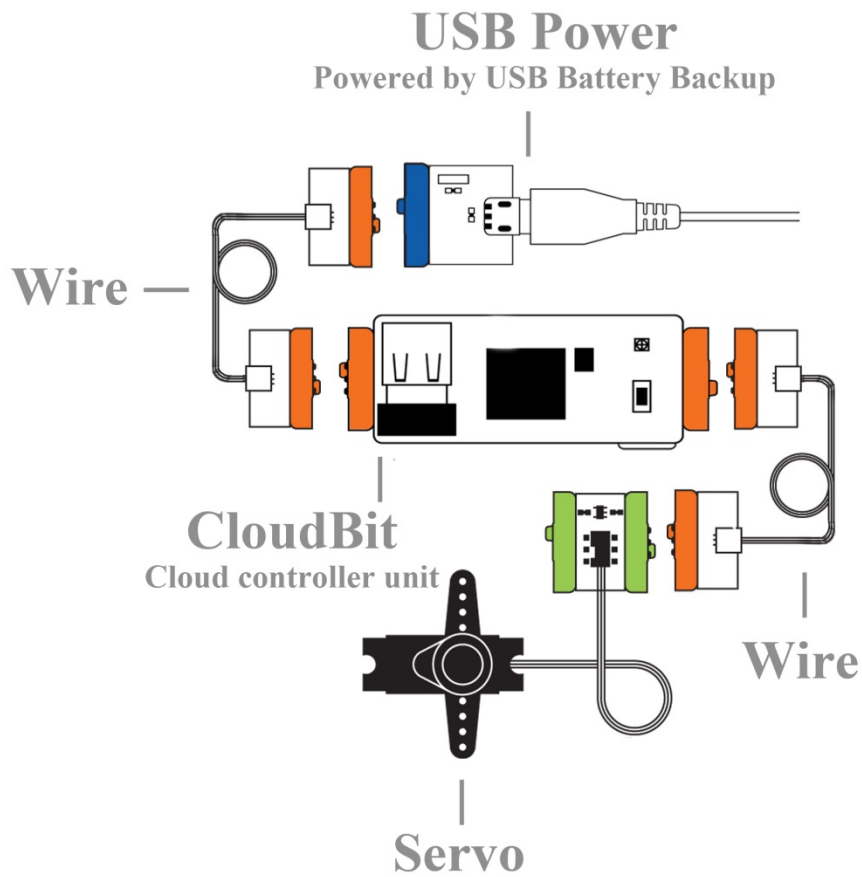
APPENDIX D: AUGMENTED OBJECT COMPONENT SCHEMATICS



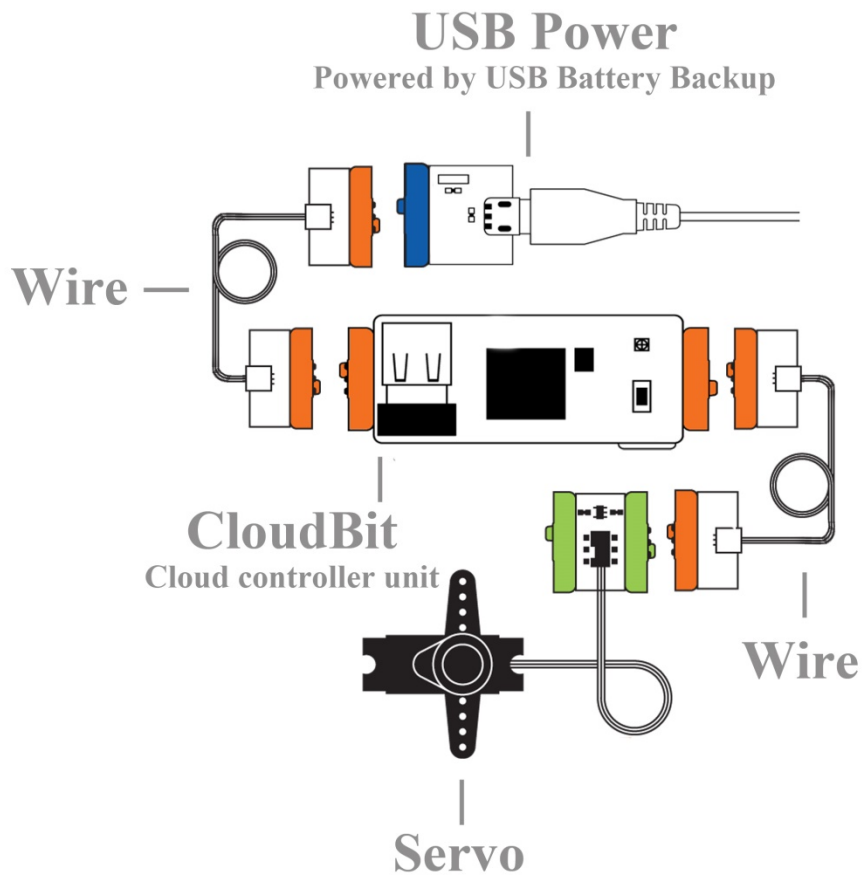
Lamp (2015)



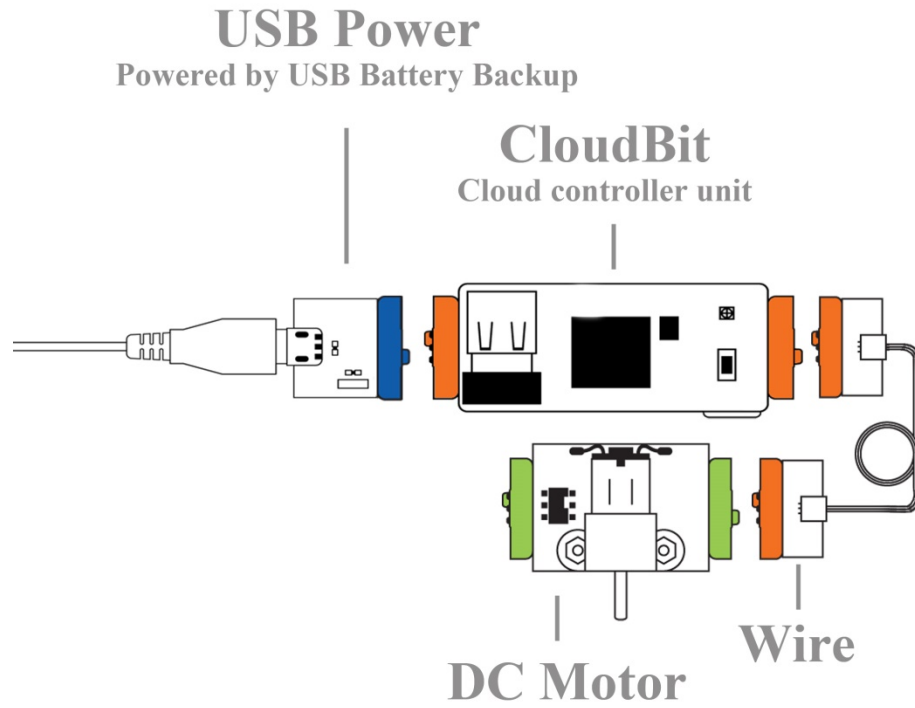
Fisher-Price Music Box Record Player (2015-2016)



Fisher-Price Two Tune T.V. (2015-2016)



Jack in the Box (2016-2017)



APPENDIX E: EXPERIMENTS, EXHIBITIONS, PUBLICATIONS & PRESENTATIONS



Experiments

Video Experiments 2013-2014

London, United Kingdom; Albuquerque, New Mexico, United States.

Lamp Experiment 2015

Albuquerque, New Mexico, United States.

Fisher-Price Music Box Record Player (2015-2016)

London, United Kingdom; Albuquerque, New Mexico, United States.

Fisher-Price Two Tune T.V. (2015-2016)

London, United Kingdom.

Jack in the Box (2016-2017)

London, United Kingdom.

Exhibitions

Jack in the box (2017)

Goldsmiths Library, University of London: Lewisham, London, United Kingdom, March 2017

The Occasional Half: Palmers Green, London, United Kingdom, March 2017

Spitalfields Market: Spitalfields, London, United Kingdom, Permission Pending

Publications

Individualising Temporal Spaces Through Mind Control, submitted for conference titled Troubling Time: An Exploration of Temporality in the Arts, University of Manchester: Pending

Presentations

Graduate School Festival, Goldsmiths College, University of London 2015