PLAY AND THE EXPERIENCE OF INTERACTIVE ART

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CERTIFICATE OF AUTHORSHIP/ORIGINALITY

I certify that the work in this thesis has not previously been submitted for a degree nor has it been submitted as part of requirements for a degree except as fully acknowledged within the text.

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Section 3: Documentation of the *Just a Bit of Spin* prototype.   56 secs.

Section 4: Documentation of the *Just a Bit of Spin* artwork.   2 mins.

                                                                          13 secs.

Notes: The DVD contains documentation of the four artworks that were made as part of the research process of this PhD. The documentation is in DVD Video format.

To view this documentation, watch the DVD video on a TV with a DVD player. You could also view it with player software on your computer (e.g. Windows Media Player or Apple DVD Player).

The data section of the DVD contains some extra thesis documentation. To view this data put the disc in your computer and open the DVD to explore the folder titled BrigidCostello DVD-ROM Contents. This folder contains example data from the project's two case studies. It also contains a PDF copy of the thesis.

ABSTRACT

Encouraging audience engagement is a challenge that confronts all interactive artists. If an audience member does not interact or does so in a cursory manner, then it is unlikely that the artistic aims of an interactive artwork will be met. The research project under discussion here approached this challenge by focusing on play as a way to encourage both audience engagement and exploration. Using practice-based research methods the project aimed to develop design strategies for stimulating a play experience within an interactive art context.

The research process began with the creation of two interactive artworks and the development of a framework of thirteen characteristics of a play experience. These characteristics are: creation, exploration, discovery, difficulty, competition, danger, captivation, sensation, sympathy, simulation, fantasy, camaraderie and subversion. This play framework was then used during the creation processes of a third and fourth interactive artwork. Two subsequent evaluative case studies assessed the playful characters of these four artworks within an exhibition context. They also explored the usefulness of the play framework as a tool for both evaluation and design.

The findings from these case studies suggested that the play framework was indeed a useful tool for design. They also suggested three additional design strategies for evoking play experiences within an interactive art context. First, to work with patterns and ambiguity to create a rhythm between rule-based play and improvisational play; second, to use the relationship between action and representation to connect with the emotional and sensual memories of an audience; and finally, to use robustness and responsiveness to give an artwork a vital and playful character and make it an equal participant in the play experience.

The findings from the case studies also led to a greater understanding of techniques for installing playful interactive art. Exhibition signage was found to be important for creating an environment conducive to play and for shaping and directing a play experience. The studies also revealed audience play preferences for either puzzle solving or sense-making. An awareness of these preferences, it is suggested, could help exhibition designers to create an environment that will maintain the boundary of play.

Finally, the findings from the case studies led to a greater understanding of techniques for evaluating playful interactive art. The play framework was found to be useful during evaluation for collecting detailed data about play experiences

and for developing a common language between artist and audience. The use of social pairs as participants was found to help reduce anxiety and encourage play. The sobering effect of evaluation anxiety was also reduced by using peers as participants and by giving participants some training in the practice of doing evaluations. Finally, in order to maintain the play spirit it was suggested that the experience of doing an evaluation needs to be designed to be playful itself.

These findings will be valuable for any artists and curators of interactive artworks that aim to evoke a play experience. They will also be of use to those within the general interaction design community, particularly designers focused on the creation, evaluation and exhibition of playful interactive systems.

CHAPTER 1:
INTRODUCTION

This thesis discusses a practice-based research project that was conducted on a part-time basis between 2003 and 2008 at the Creativity and Cognition Studios, a research centre within the Information Technology faculty of the University of Technology, Sydney. This research was centred within the discipline of interactive art and resulted in the creation of four interactive artworks: *Elysian Fields*, *Sprung!* and two iterations of a work titled *Just a Bit of Spin*.[1] The research in this project focused on play as a way of thinking about, designing for and understanding the relationship between these interactive art systems and the audience experience they evoke. Undertaking this research involved the creation and exhibition of artworks, evaluative case studies of audience experience and the development of a play framework that would aid both the design and evaluation of playful interactive artworks. These three approaches led to the development of insights into three intersecting areas: interactive art practice, exhibition design and audience experience. Firstly and primarily, the project developed insights into strategies for evoking play experiences within an interactive art context. Secondly, it led to a greater understanding of the design of exhibition spaces for playful interactive art. Finally, the project led to an increased understanding of the audience experience within this context and also led to a greater understanding of the methods one might use to evaluate this playful audience's experience.

These findings have potential significance within the field of interactive art and also within the broader field of interaction design. The design of interactive play is becoming more and more important across a wide range of industries. As Prensky points out, digital technology has created a generation of people who "are used to receiving information really fast", who "like to parallel process and multi-task", who "thrive on instant gratification and frequent rewards" and who "prefer games to 'serious' work" (2001). In order to cater for this "digital native" he argues that game-like playful structures are already and will increasingly be incorporated into many technological structures, from the design of software help tools to the physical interfaces of mobile phones or MP3 players. If Prensky's predictions are correct, a greater understanding of strategies for designing for

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[1] Documentation of these artworks can be viewed on the attached DVD.

play will become more and more valuable for all types of interface design. The particular understandings that this research project has generated could, therefore, also be useful in a much broader context, such as for any interfaces situated in public exhibition contexts (e.g. museum exhibit design) or for those that specifically aim to stimulate play (e.g. game design). Hence, these outcomes have potential significance not only for interactive art practice but also more generally for the practices of exhibition design and interaction design.

1.1 Aims of the Research

The project began with what could be described as a key problem for artists working with audience participation; how to get the audience to approach, interact with and engage with an interactive artwork. Interactive artists are often dismayed by the cursory attention that they feel some audience members pay to their work:

> In less than ten minutes they were "done" with the work and had little to say about it. In response to direct inquiries they said they found the navigation unnecessarily confusing, but overall rather simple. They said that they "got it" but that it didn't "do much".(Throop 2003b: 85)

This lack of attention is partly a result of the exhibition context, which usually involves multiple sites of attraction and is designed to lead audiences in a perambulatory way past and through these sites. In this context, it is rare for audience members to devote much concentrated time to each attraction and interactive works often demand such concentrated attention.

Within the ten minutes that Throop describes above an audience member has a lot of work to do. The interactive system that they are being asked to engage with will usually be something that they have never encountered before. The audience member will need to work out what type of participation is possible before they can begin to engage with the system and if the system is complex there might be several possibilities to explore. The type of experience that Throop describes above suggests an audience member who is focused on working out the participation possibilities of the artwork but who never actually engages with it. The artwork, therefore, has little meaning for them. Throop saw this problem as being located in the personality and interests of the audience members, for those audience members whom she describes as "visual" and "imaginative" did participate fully in the work and did have a meaningful experience (2003b: 85). Accordingly, her solution to this problem was to relinquish any sense that she

was creating her artworks for everyone and instead to design specifically for this visual, imaginative audience.

I have chosen to approach this problem from a different angle. Rather than focusing on the qualities of the audience, I will instead focus on the relationship between the audience and the art system and I have chosen to frame this relationship in terms of play. Within this perspective the audience member becomes a player and the artwork becomes a plaything or playmate. Play has been chosen as an approach primarily because it is an experience that involves exploration and engagement. Playful activities are also seen as requiring a level of concentration that does not involve self-consciousness and this lack of self-consciousness is linked to the formation of original and imaginative ideas (Csikszentmihalyi 1992: 65; Lieberman 1977: 122). Through play I am hoping to be able to quickly engage an audience member with the artwork and to lead him or her to explore the work fully. I am hoping that this level of exploration and engagement combined with the imaginative possibilities of play might increase the opportunities for meaningful audience engagement with my artworks. The primary drive of this research project is, therefore, to develop strategies for designing interactive artworks that might engender a play experience.

Image removed
for copyright reasons.

Image can be viewed at:

http://www.stanford.edu/~demarini
/exhibitions.htm

(image above Rain Dance/ Musica
Acuatica title on page)

Figure 1 *RainDance/ Musica Acuatica* by Paul De Marinis (1998).

Figure 2 *Nervous* by Bjoern Schuelke (1999-2003).

Play is frequently described as something that we can all recognise and yet something that is very difficult to define. Indeed, chapter three of this thesis is entirely devoted to exploring definitions of play. It is worth, however, explaining briefly here what type of play experience I hoped to be able to evoke when I began this project. The type of engagement that I was aiming for was not just about concentrated attention, it was also about affecting the audience. The particular type of emotion that I was aiming for was one associated with play and one that I found depicted in two photographs of audience experiences of playful interactive art (figures 1 & 2 above). These images express an emotion that could be described as delight, but this word would be a less powerful and more constrained communicator of this type of experience than the faces in these images themselves. For me, these two images are a non-verbal definition of the kind of playful experience that I hoped my artworks would create when I began this project.

1.2 Contexts of the Research

As a practicing interactive artist with a background in filmmaking and degrees in media and communications, film production and visual arts, I have approached this research project from a humanities perspective and with a particular focus on interactive art practice. The project has centred on the creation of three interactive artworks and particularly on the iterative creation process of the third artwork titled *Just a Bit of Spin*. This work was exhibited and evaluated within the Powerhouse Museum in Sydney and this meant that the exhibition environment of the museum also played an important part within the research context. Accordingly, this project will draw on some ideas from the discipline of museum exhibition design and use these, in particular, to help understand the type of audience museums can attract and the way that museum design can then

structure and frame this audience experience. The project will also draw on ideas from the discipline of interaction design. This is primarily because this discipline has a long history of developing approaches to audience evaluation, but also because of the focus within interaction design on developing innovative approaches to the relationship between an interactive interface and audience experience. These three contexts, interactive art practice, the museum exhibition and its audience, and approaches to interaction design, will be the focus of the next three sections.

1.2.1 Interactive Art and Play

For art historians interactive art is regarded as continuing a tradition of audience participation that began in the 1950s and 1960s with kinetic art, happenings and fluxus art (Popper 2007: 29; Weibel 2007: 21). Audience participation is a key element of most definitions of interactive art, described by Huhtamo as:

> ... something that needs to be actuated by a "user". If the user "does nothing", it remains unrealized potential ... (2007: 71)

This focus on participation means that the interactive artist is regarded as a context creator and the artwork is usually seen as not actually existing until an audience member participates in it. The audience member becomes then, for some, a co-creator of the interactive artwork "within the context delineated by the artist" (Kluszczynski 2007: 216).

Interactive artworks can vary greatly in terms of the amount and type of participation that they involve and there has been some recent debate about what constitutes the most minimal amount of participation necessary to define a work as interactive (Huhtamo 2004). It is sometimes also implied that those artworks that allow their audience a greater level of control and that are able to be more conversationally responsive should be more valued as examples of interactive art. Art historian Frank Popper, for example, describes works that use artificial intelligence to create complex responsiveness as going beyond what he disparagingly describes as "mere participation" (Popper 2007: 221). Similarly, art theorist Ryszard Kluszczynski argues that an approach that involves truly "sharing the responsibility with the viewer" is preferable because it "respects the internal logic of interactivity" (2007: 220-221). These judgements within the art world can give a political dimension to the range of approaches one could take to audience participation.

As an approach to audience participation, play does not necessarily sit easily within these hierarchies of the world of art. Play is more often associated with the world of children than the world of adults and is much more commonly associated with entertainment than art. As artist Andy Polaine notes, artworks that cause playful behaviours are not always welcomed within the serious space of the art gallery, for taking a playful approach seems to accentuate those characteristics that make art curators often uncomfortable with interactive art in general (2005: 1). Nevertheless, play is an approach being taken by some interactive artists who, like me, are concerned with capturing the attention of the audience (Bosma 2006) and with encouraging engagement with the artwork's meanings (Polaine 2006a: 18). Others value play because of its association with pleasure, and they use it to focus on sensation (Rackham 2005: 13). Like myself, these artists choose play because of the influence that it can have over the relationship between audience and artwork and the experience the work then evokes.

Choosing play as an approach also has an influence over the nature of the work itself. Within the range of interactive artworks that could be characterised as playful are those that could also be described as being 'about' play, such as Mary Flanagan's 2006 work *Giant Joystick* or Feng Mengbo's 2002 work with the computer game *Quake* in *Q4U*. Both these works make comments on the cultural form of computer games. Other works create playful experiences but their focus is on different themes, such as Paul De Marinis's 1998 work *RainDance*, which uses water to transmit sounds that can only be heard through an umbrella, or Richard Brown's 2004 work *Mimetic Starfish,* whose giant starfish reacts to and learns from human behaviour. I see the works that have been created for this project as fitting within this second category, in that they are works that aim to create a playful experience while focusing on a theme other than play.

This aim to create a playful experience is, for me, also connected to my desire to create works that audience members will engage with and find meaningful. In keeping with the definition of the interactive art audience as co-creators, I want this meaning to emerge from the interaction experience itself not from any text that might accompany the artwork. I see play as a strategy that might help me achieve this. The strategies for designing for a play experience that are an outcome of this project reflect this dual focus on both play and meaningful engagement.

1.2.2 The Museum Exhibition and its Audience

The Powerhouse Museum in Sydney and the Creativity and Cognition Studios (CCS) together curate an exhibition space for interactive art called Beta_space. This partnership provides the museum with engaging, fast-turnover exhibits. It also provides CCS researchers with a space where they can test and evaluate artworks with a real audience. The CCS research project under discussion here conducted its second case study on the artwork *Just a Bit of Spin* while it was exhibited in Beta_space at this museum.

The museum exhibition context was, for me, a new practice environment: I had previously only exhibited my work in cinemas or small art galleries. In contrast to these spaces the Powerhouse Museum is a much larger institution. It is also a museum of science and design and, as such, attracts a different audience to a cinema or small art gallery. Placing my work within this context exposed it to a more diverse audience and one with an interest in science, technology and design. This was an audience who expected to encounter interactive exhibits and who were prepared to play with them. The Powerhouse Museum was, therefore, an exhibition context that suited many of the experiential aims of this project. I was conscious, however, that as an institution the museum has traditions and cultures of behaviour that could affect the type of play experience that my artworks were trying to evoke.

Historical accounts of the birth of the museum emphasise its role within society as not only a place of education and spectacle but also of surveillance and government control. Bennett describes the early museum as "machinery for producing 'progressive subjects'" that was designed to produce "an improving relationship to the self" (1995: 47). He notes that the art museum in particular was designed so that the audience could "contemplate the work displayed in order to be receptive to its beauty and uplifting influence" (Bennett 1995: 55). The expectation was that the audience would be thus improved by the experience. This contemplative attitude required one to step back and adopt a worshipful approach to the art object and this is linked to the art museum tradition of controlling the audience so that it could not and did not touch art objects (Huhtamo 2007: 75).

This early idea that the act of aesthetic contemplation could reveal the beauty and influence of art to everyone was later challenged in a comprehensive 1960's study of European Art Museums. This study exposed the hidden barrier that poor education could provide to the public's ability to understand and appreciate art (Bourdieu & Darbel 1997). Art was revealed to be a complex cultural system that

required specialist knowledge before it could be decoded and consequently have a meaningful and transforming effect upon its audience.

New approaches to museum design have sought to overcome this barrier by developing more of a dialogue with the museum audience (Bennett 2005: 51) and by trying to speak to "non-art specialists" as well as specialists (Wright 1997: 120). With these new approaches to museums, designers have also sought to develop a less controlling and didactic approach to exhibition design. The focus is often now on audience experience and on the ways that the audience members make meaning as they travel through an exhibition (Kavanagh 2000). In designing for experience, fun, play and interactive objects have become part of many museum exhibits, with some designers now aiming to create a space of discovery and novelty that can optimise "childish awe" (Jordanova 1997: 22).

In spite of these changes, many aspects of the early character of museums remain. The weight of these traditions influence not just the type of audience that attends a museum but also influence the type of experience that an audience member will expect to encounter and their behaviour once they are within the museum walls. Museums are still seen as places of education and spectacle and to this end museums still aim to influence their audience in some way. For example, museum theorist Vergo posits that museums should aim to create a "broadening of our intellectual horizons, a deepening and enriching of our experience" (1997: 58), and with similar intellectual intentions the director of Sydney's Museum of Contemporary Art aims to develop "critically engaged audiences" (MacGregor 2005). As a result, the museum audience not only expects to be educated and entertained but most museum spaces are designed to encourage reflective and contemplative behaviour. Additionally, modern museums are still places of surveillance, involving security cameras and guards, and they still try to control their audience with a range of sanctioned and non-sanctioned behaviours. Many museums, for example, actively discourage the touching of objects, loud talking and boisterous behaviour. This level of surveillance and control can act to constrain the behaviour of the audience making them feel 'on their best behaviour' or anxious about breaking rules.

These influences over the behaviour and experience of the museum audience could potentially both help and hinder the artistic aims of this project. Placing a playful work within the walls of a museum gives the project access to a reflective and contemplative audience and this could help achieve the aim of evoking engaged and meaningful experiences. The same work positioned in the street or in a fun parlour would probably be read very differently. The serious tone of a museum environment and the constraints that it places on the interacting body

could, however, work to hinder any attempts to create a playful experience. Although the Powerhouse Museum is an environment that is more conducive to play than a traditional art gallery, it is still a controlled and a controlling environment. Overcoming the possible adverse effect that this could have on the playful experience that my artworks evoke lead to the development of findings relating to the design of exhibition spaces for playful interactive art.

1.2.3 Interaction Design and Play

Research into the design and evaluation of interactive interfaces within the human computer interaction (HCI) discipline has traditionally focused on the usability of an interface, on its effectiveness and efficiency and on the tasks and goals it demands of its user. A new approach, coming predominantly from HCI researchers with a focus on the practice of design, is instead centred on user experience and on the aesthetics and affect of this experience. These issues are also a key focus of the research project under discussion here and the HCI user experience approach has, accordingly, been a useful resource for relevant design strategies and evaluation techniques.

Like this project, recent HCI user experience research has been interested in developing a playful relationship between a system and its user. For example, in 2000 a group of designers from the Netherlands published a set of 10 rules to guide the design of not only beautiful but also fun interactions. Their strategies included focusing on the enjoyable quality of the experience and on designing "rich" physical interactions (Overbeeke et al. 2003: 13). British designer Bill Gaver also advocated taking into account the playful side of human nature (2002). His design strategies included designing for social engagement and encouraging curiosity, exploration and reflection (Gaver et al. 2004: 888). In 2004 a group of designers from Denmark called for a focus on the aesthetics of interaction and this led them to also define the relationship between user and system in terms of play. Within their model the user took on the role of improviser and the aim of the interaction designer became to create a sense of intrigue and to "trigger" the imagination (Graves Petersen et al. 2004: 274). Finally, McCarthy et al. suggested that designers consider designing for enchantment and do so through "a combination of the wonder of sensory experience, emotional response and direct playful engagement" (2006: 372). These different strategies all have a shared focus on sensory experience, pleasure and engagement and these are three themes that will also play a large role in this research project.

Another common goal that this project shares with recent user experience research is an interest in encouraging users of a system to reflect critically on the

meaning of their experience. For example, Dunne and Raby called for designers to subvert conventional ideas about user relationships with electronic devices and to create "Critical Designs" that can "stimulate debate and discussion" (2001: 65). With a desire to achieve a similar effect, researchers in Sweden advocated creating "Slow Technology". That is, technology that does not aim to be intuitive and seamless but that rather takes time to learn, understand and experience. Doing so could, they suggested, expose technology "in a way that encourages people to reflect and think about it" (Hallnas & Redstrom 2001: 204). Stimulating thought was also a goal of designer Bill Gaver and his colleagues when they advocated designing for ambiguity (Gaver, Beaver & Benford 2003: 240). For them, ambiguity is a strategy that can lead people to be engaged with the possible meanings of a system in a "deeper and more personal" way (Gaver, Beaver & Benford 2003: 233). This type of interpretive flexibility is also advocated as a strategy for stimulating thought in the "Reflective Design" approach of Sengers et al. (2005). In this approach, reflection is tied to providing rich opportunities for users to give and receive feedback, and the designer also plays a role in this. These approaches through subversion, slowness and/or ambiguity aim to create interesting and meaningful experiences not only for the user but also for the designer as they move through the design process.

Common to all of these approaches is the attitude that an experience is not something that can ever be precisely controlled by a design. The strategies that are proposed are seen as open-ended rather than as formulas or recipes for creating a specific effect. Experience is regarded as something one can design *for* not something one designs *in* (Wright & McCarthy 2005: 12). This attitude recognises the variable nature of the user and respects the important effect that this variability can have on the dynamics and resulting character of an interactive experience. It is also representative of the desire of user experience researchers to turn their focus away from "the complexity and interest of the technology itself" and to focus instead on "using technology to spur rich and engaging experiences and reflections" (Sengers et al. 2008: 357). Their focus is, as with interactive art, on what can be created from the relationship between user and system.

There has been some criticism within HCI of the user experience approaches that focus on fun, pleasure and play. Cockton, for example, argues that such approaches focus far too much on the moment of interaction. In so doing they ignore the things that "outlive the moment of experience" and these, he feels, are the things that people really "value" and "find worthwhile" (2006: 102). Van Vliet and Mulder, on the other hand, take issue with the way that fun, pleasure and aesthetics have come to dominate user experience research. This narrow view,

they warn, ignores the power that negative emotions can have and reduces the range of research approaches that are adopted by HCI researchers (2006: 61).

These criticisms also contain some warnings for my research. It is important to acknowledge that play is but one approach that can be taken here and to be aware that taking this approach can close off as well as open up avenues for exploration. However, it is equally important to be aware of the differences between the contexts of design and art. The objects being created by designers are created in multiples; they enter the lives of their users as products and can develop user communities. These objects are used for months and years rather than for ten minutes in a gallery. Cockton's arguments above are much more relevant for the design context than they are for the more transitory art context. This difference in context also needed to be considered before adopting any of the interaction design strategies discussed above. Discovering which, if any, were appropriate for the specific context of this study necessarily became part of the research process itself. These processes lead to the project's development of findings relating to methods one might use to evaluate the audience experience of playful interactive art.

1.2.4 Summary: The Context Under Discussion

Some common threads have emerged from our discussion of the three contexts of interactive art, museum exhibition and interaction design. Each context has had a focus on audience experience and a recent and strengthening interest in the playful aspects of that experience. This focus on play has often been accompanied by a sense of discomfort with some aspects of the frivolous nature of play. Also common to all three has been an uneasiness with any notion that one could or would want to control an audience. However, all contexts have expressed a belief in the positive benefit of an audience being transformed by their experiences, and this desire to create meaning and affect for an audience has at times challenged any unease about control. An important perspective for dealing with this challenge lay in rejecting the notion that one could ever create a formula for developing a playful experience. One can develop and apply strategies for evoking certain types of experiences but one should do so with an awareness of the wildcard that the variable nature of the audience brings to the encounter. When one takes this perspective the variable nature of the audience becomes a valuable addition to the design context, potentially adding complexity, vitality and richness to an interactive experience.

The questions that this project is investigating are not ones that will result in some kind of definitive answer. However, the research process will be able to add

to and deepen some of the research findings that have been discussed above. Specifically, it will develop insights into strategies for evoking play experiences within an interactive art context. It will lead to a greater understanding of the design of exhibition spaces for playful interactive art. It will lead to an increased understanding of the audience within this context and also lead to a greater understanding of the methods one might use to evaluate this playful audience's experience. It will also lead to the development of insights into some related questions on a personal practice level. Are there strategies for designing for play that will work for me practically? How useful will audience evaluation be within my practice? And what can I learn about my audience from this evaluation process? The answers to all these questions will emerge from the creation, exhibition and evaluation of four interactive artworks and these artworks will also be outcomes of the research.

1.3 Outline of Thesis Chapters

The thesis begins with a general description of the project's methodology and a chronological summary of the research process. This process involved the iterative creation, exhibition and evaluation of interactive artworks. This chapter outlines both the project's methods relating to the creation of artworks and those relating to the evaluation of artworks. As these methods of evaluation were developed and tested over the whole research process, this chapter begins a discussion about evaluation methods that will continue throughout the whole thesis.

The next two chapters will discuss a range of issues that emerged from a literature survey of theories of play. The first of these, chapter three, will focus on defining play and then look in more detail at maintaining the boundary of play and at the effect that the attitude of the player can have on a play experience. This will be followed by a discussion of three theories that look at the relationship between art and play and that suggest some strategies for designing playful interactive artworks.

One of these strategies, that of designing for pleasure, then becomes the focus of chapter four. This chapter will discuss a new framework of thirteen characteristics of a play experience that emerges out of a synthesis of ideas from six existing theoretical frameworks. These six theoretical influences will each be discussed before the new play framework's categories are defined in detail. The chapter will finish with an outline of two pilot studies that were used to test the play framework's applicability within an interactive art context. In conclusion, it

is suggested that the play framework might be a useful tool when designing for play, during both the creation and the evaluation of interactive artworks.

Chapters five, six and seven will then deal with different aspects of the first case study conducted for this project. This first case study evaluated three of the artworks that were created as part of this project, *Elysian Fields*, *Sprung!* and the *Just a Bit of Spin* prototype. Chapter five begins the discussion by outlining the processes involved in creating each of these artworks. This chapter will focus on what these creation processes revealed about practical strategies for designing for play and will discuss the use of the play framework in developing the *Just a Bit of Spin* prototype. Chapter six will outline and reflect on the methods chosen to evaluate these three artworks. One of these evaluation methods involved the play framework and this chapter will reflect on its effectiveness in this context. Finally, in chapter seven the results of this evaluation of the three artworks will be outlined and discussed.

The results of this first case study suggested a number of strategies for designing for play and these were then tested further in the project's second case study, which is detailed in chapters eight, nine and ten. Chapter eight will look in detail at the redesign of the *Just a Bit of Spin* interactive artwork. Chapter nine will then discuss and reflect on the methods used to evaluate this new iteration of *Just a Bit of Spin* while it was exhibited at the Powerhouse Museum in Sydney. Lastly, chapter ten will outline and discuss the results of this evaluation. These results suggested possible design directions for a future iteration of *Just a Bit of Spin* and also led to the development of the project's final conclusions.

These conclusions and the future directions that they suggest will be discussed in the final chapter of the thesis. This chapter will begin with an assessment of the value of the play framework as a tool for the design and evaluation of playful interactive art. Three further specific strategies for designing for a play experience will then be discussed before the chapter explores the project's findings relating to the exhibition and evaluation of playful interactive art. The chapter will conclude with a summary of the project's findings and will also consider the applicability of the project's findings within the broader world of interaction design.

CHAPTER 2: METHODOLOGY

The key methods adopted in this research project are those associated with interactive art practice. However, because of its focus on audience experience, the project also makes use of qualitative methods for recording and analysing human experience, methods that are more usually associated with social science research and with the discipline of interaction design. This combination of art practice methods and social science methods is becoming more common within art research (Gray & Malins 2004: 30) and is particularly common in projects that, like this one, focus on the relationship between an artwork and its audience.

This first research approach, art practice, is characterised as involving "dynamic, reflexive and revelatory" processes (Sullivan 2005: 192). The artist as creator and as reflexive critic of their own creations is seen to be inextricably entangled within these processes. The dynamic nature of art practice research often means that the research project must have an equally dynamic relationship with the methods it employs (Gray & Malins 2004: 72). The second approach, qualitative social science research, is characterised as being "cyclical, emergent and discovery oriented" (Sullivan 2005: 192). While the qualitative researcher is traditionally less entangled in this type of research, there are still crucial reflexive processes at work; so much so that the qualitative researcher is described as being "part of the data" (Richards 2005: 42). The emergent nature of qualitative research usually also involves the development and refinement of research methods throughout the whole cycle of a project (Morse & Richards 2002: 70). It is because of the reflexive, dynamic and emergent nature of these two research approaches that this chapter should be seen as only a starting point for the description of the project's research methods. Further reflections, refinements and developments will be detailed in later chapters.

In this chapter we will begin by outlining the project's methodological approach. The chapter will then give a summary of the four phases involved in the research process and finally it will describe each of the methods that were used during the project.

2.1 Methodological Approach

This research adopts the methodological approach known as inquiry by design (Gray & Malins 2004: 75). This approach involves a spiral process of cycles of artefact creation. There are several similar models for describing the stages of

these design cycles (e.g. Ziesel 1981 or Press and Cooper 2003). I have chosen to use the model described by Lawson (2006), which provides the most detailed outline of the processes involved.

In Lawson's model the design process involves cycles of five stages: "formulating", "moving", "representing", "evaluating" and "reflecting" (2006: 291). *Formulating* refers to the processes involved in defining and framing the question or problem that will be answered by the creation of the artefact. The evolutionary processes of generating and developing ideas and solutions to this problem are described by the stage of *moving*. In the stage of *representing*, these ideas and solutions are turned into actual representations and these are then evaluated in the *evaluating* stage. Finally, in the *reflecting* stage the practitioner assesses their ideas and creations, compares these to their own or other's prior solutions and reflects on possible next directions. These stages are cyclic and continue until the final artefact is completed.

It should be noted, that in the real 'messy' world of practice the stages would not necessarily occur in the neat sequence described above. There would be many overlaps and intersections between the stages, particularly with respect to the processes involved in the reflecting stage.

Inquiry by design has been chosen as a methodological approach here because the nature of this research project requires reflective cycles of artefact creation. To arrive at design strategies for creating playful experiences, artefacts need to be created and their effectiveness at stimulating play then needs to be analysed. This process should be cyclical so that insights gained from one cycle of artefact creation can inform and drive the ensuing cycles. The additive and reflective nature of this spiral of artefact creation will then result in the cumulative building of robust insights into the problem of how to design artefacts that stimulate play.

2.2 Chronological Summary of the Research Process

The research process undertaken during this project can be divided into four sequential phases. Each phase is briefly summarised below and in Table 1. The four phases will then be described in detail in the chapters that follow. These chapters will sometimes be ordered to suit the logical flow of the thesis rather than the chronological order presented here. The table, therefore, includes bracketed references to indicate the chapter in which each aspect of the research process will appear.

Table 1: Summary of the research process, methods and outcomes

	Action	Method/s	Outcome
Phase 1	Create artefact: *Elysian Fields* (Ch 5)	Practice, reflective documentation	Formulation of research question. Evaluation methods chosen.
	Create artefact: *Sprung!* (Ch 5)	Practice, reflective documentation	
	Pilot study 1: Sidney Fels' work *Iamascope* (Ch 2)	Observation, video-cued recall, think-aloud, unstructured interview, coding	
Phase 2	Framework of characteristics of a play experience (Ch 4)	Theoretical synthesis	Generate ideas and strategies for artefact creation. Refinement of evaluation methods.
	Analysis of existing artworks (Ch 4)	Interpretative analysis	
	Pilot study 2: Andy Polaine's work *Time Smear* (Ch 4)	Video-cued recall, structured interview, coding	
	Pilot study 3: Participatory evaluation of *Experimenta Vanishing Point* exhibition (Ch 4)	Survey based on play framework	
Phase 3	Create artefact: *Just a Bit of Spin* prototype (Ch 5)	Practice, reflective documentation	Develop ideas and strategies and generate insights. Refinement of evaluation methods.
	Case study 1: Evaluation of *Elysian Fields*, *Sprung!* and *Just a Bit of Spin* prototype (Chs 6 & 7)	Video-cued recall, structured interview, survey, coding	
Phase 4	Create artefact: *Just a Bit of Spin* (Ch 8)	Practice, reflective documentation	Insights tested. Final conclusions reached (Ch11).
	Case study 2: Evaluation of *Just a Bit of Spin* (Chs 9 & 10)	Observation, structured interview, survey, coding	

The first phase involved two cycles of artefact creation and a pilot study of evaluation methods. This phase resulted in the creation of two artworks, *Elysian Fields* and *Sprung!*. This phase also led to the formulation of the project's overarching research question and to the selection of appropriate methods for evaluating and analysing the experience of any artefacts generated by the project.

The second phase involved the development of a framework of play. This framework was then tested by using it to perform an interpretive analysis of existing playful artworks, by conducting an evaluative pilot study of another artist's work and by conducting a participatory evaluation of the exhibition experience of three other playful interactive artworks. This phase resulted in the generation of several ideas and strategies for artefact creation. It also led to refinements being made to the chosen artefact evaluation methods.

In phase three another artefact, the *Just a Bit of Spin* prototype, was created and this was then evaluated along with the two artefacts created in phase one. This phase resulted in the development of previous ideas and strategies for artefact creation and generated some new insights into the stimulation of play.

Further refinements were also made to the evaluation methods. In phase four a final artefact, the second version of *Just a Bit of Spin*, was created and evaluated using these methods. This final phase tested the insights that were developed in phase three and resulted in the project's final conclusions.

The methods used during these phases can be divided into two strands. The first strand contains those methods relating to the *creation* of artefacts, namely practice, reflective documentation and the interpretive analysis of existing artworks. The second contains methods relating to the *evaluation* of the experience of artefacts, that is, video-cued recall, structured interviews, observation, survey and coding. The next sections describe each of these methods and their purpose within the study.

2.3. The Methods of Artefact Creation

2.3.1 Practice

The creation of artefacts through the strategies associated with interactive art practice is an integral part of this research project. Practice is a very broad descriptor for this method, which uses a variety of creation strategies that are tailored both to the context of the study and to the specific context of each artefact. While the precise details of these strategies will be outlined in the chapters that follow, there are three general areas that are worth discussing here: the influence of an artist's personal practice, the use of collaboration and the material nature of practice.

Personal Practice

It is an accepted, some might even say a required, part of artistic practice that each artist will have a personal artistic vision or approach and that this will be a driving force behind their artefact creation. In art practice research an artist's personal vision will shape the nature of his or her research question and shape the practice methods that he or she then uses to investigate it. The practice methods of this project have, accordingly, been influenced by my own personal approach to interactive art practice.

One significant influence on my artistic approach is my preference for creating interactive works that allow multiple individuals to interact simultaneously. This is because I like to work with the social possibilities of multi-user interaction and with the vitality that these interactions can inject into an experience. The creation of a sense of vitality, especially within a computer-based artefact, is another of my driving influences. My Master's research project worked specifically with this concept of vitality and its influence can be seen here

in the way my works all try to create a sense of a separate "creature" or "thing" rather than reflecting the user. A final influencing factor is my technical expertise in the areas of film/video production and interactive programming. These skills have shaped the technical resources that are used in each creation process and have influenced many decisions about form and content.

Collaborative Practice

Several of the cycles of artefact creation in this project involved some form of collaboration. This is a common feature not only of my own artistic practice but also of interactive art practice in general. The technical complexity of interactive artworks requires many different kinds of expertise and it is unusual to find one person with all of these skills. For this project these collaborations were in the skill areas of graphic design, animation and sound. Some of these collaborations were creative partnerships, with both parties sharing some of the creative control over the artefact creation. In others I acted as the 'director' of the creation process. In all cases, though, I was the initiator of the creative process and author of the initial 'problem' that sparked the artefact design. These collaborations, thus, did not deflect the artefacts away from any of the research goals. These creation processes are described in more detail in the chapters that follow.

Material Practice

Art is, as painter Robert Morris describes:

> ... a complex of interactions involving factors of bodily possibility, the nature of materials and physical laws, the temporal dimensions of process and perception as well as resultant [artefacts]. (Morris 1995: 75)

In this definition the 'work' of art is seen as involving both the artefact and the processes of practice, processes that are embodied, material, physical, procedural and perceptual. Both Bolt (2004; 2006) and Carter (2004) stress the value and importance of these processes in art practice research, describing them as a form of "material thinking". This type of thinking involves, as Bolt describes it, an active dialogic relationship between the artist and the materials of their practice.

> The concept of material thinking offers us a way of considering the relations that take place within the very process or tissue of making. In this conception the materials are not just passive objects to be used instrumentally by the artist, but rather the materials and processes of production have their own intelligence that come into play in interaction with the artist's creative intelligence. (2006: 5)

A crucial part of art practice is, therefore, the nature of the materials that it uses and the conversation that ensues between these materials and the artist.

These conversations of "material thinking" are those which involve cycles of resistance and accommodation (Holmes 2006: 7). Resistance occurs when the conversation fails to proceed as intended. As a result the artist will make some kind of accommodation by changing either their goals, their materials or their actions. This can be described as a process of "tuning" and is, Holmes argues, what enables art practice research to be characterised as "experimental" and "experiential" (2006: 7 & 14). In art practice research the twists and turns of these tuning processes need to be recorded so that reflection and analysis can occur and practical knowledge can emerge.

"Material thinking" was, then, one of the ways through which this project developed new understandings through the processes of practice. The next section describes the reflective methods that were used to record these processes and that, therefore, allowed practical insights to be developed.

2.3.2 Reflective Documentation

The concept of the reflective practitioner, described by Schön (1983), lies at the foundation of art practice research. In Schön's model there are two kinds of reflective processes operating in practice-based inquiry. The first, *reflection-in-action*, describes the type of reflecting that occurs during the actual process of practice. This type of reflecting is seen as dynamic, material and conversational. It involves practical know-how about doing things. The second, *reflection-on-action*, describes reflection that occurs after the action and that is, therefore, more theoretical and analytical. Schön's model has been extended by Cowan (1998) to include a third process, *reflection-for-action*. This is reflection that occurs before an action and that leads to strategies being developed that will drive future action. While reflecting *for*, *in* and *on* action is a normal part of art practice, it is the recording and communicating of these reflections that is a key characteristic of art practice research and that allows practice to become "theory generating" (Bolt 2006: 12).

This project used several methods for recording these processes of reflection. A written journal was kept in which any thoughts, ideas, reflections and strategies were recorded during creation cycles. Written communication that occurred during collaborations was saved and notes were taken after face-to-face meetings. Drafts of artworks were saved and stored to enable the "moves" within a creation cycle to be captured. At key moments during the project the researcher

also conducted "self-interviews" (Scrivener & Chapman 2004). These involved the researcher responding to a set of informal questions about the progress and process of her practice and were recorded on video.

The self-reflexive nature of art practice research is seen as having the potential to both add credibility to the research and to reduce it (Gray & Malins 2004: 23). On the one hand the project is in danger of becoming self-centredly narrow and personal in focus. On the other hand the artist's "insider" experience and expertise creates much of the valuable knowledge within the project (Gray & Malins 2004: 23). The reflective documentation methods described in this section enabled the project to capture in rich detail this valuable insider knowledge. These methods, however, needed to be tempered, as Gray and Malin suggest (2004: 23), with peer-review processes in order to prevent the research becoming overly subjective. Accordingly, the research in this project was presented at conferences, publicly exhibited, published in journals and internally reviewed by the research team at the Creativity and Cognition Studios. The collaborations that occurred within the project were also a mitigating factor as was the project's interpretive analysis of existing artworks. The method of this interpretive analysis is described in the next section.

2.3.3 Interpretive Analysis of Existing Artworks

The collection of precedent or existing solutions is a recognised part of the reflecting stage of design inquiry (Lawson 2006: 300). This collection process could be seen as analogous with the literature review in humanities research, particularly when it is used to assess the range of similar art practice within the project's research domain. Precedents, however, are also used within design inquiry to accelerate practical thinking. They fulfil this function when practitioners use them to make "links between problems and solutions" (Lawson 2006: 301). In this sense, the collecting and analysis of precedents becomes one of the practice methods of design inquiry.

This project conducted an interpretive analysis of existing interactive artworks seeking to make connections between existing solutions and the problem of stimulating play. The analysis specifically looked at artworks that were judged to involve a playful component in the experience they generated. It was conducted using a framework of the experiential characteristics of play that had been generated through a review and synthesis of previous theoretical literature. The analysis revealed which categories of the framework were present in existing interactive artworks and compared the characteristics of works that successfully stimulated play. It resulted in a series of practical ideas and strategies

for artefact creation. This analysis is outlined in chapter 4 and the strategies that were developed are outlined in chapter 5. These strategies were then refined and developed through the iterative and evaluative design processes of the later stages of the project. This process produced the project's final recommended strategies for designing for a play experience.

2.4. Methods of Artefact Evaluation

The evaluations that were conducted for this project aimed to collect detailed data about the audience experience of each of the four interactive artworks. The collection of data that is able to reflect this fine grain of a lived experience is no easy task. Choosing and developing the appropriate methods to do so involves finding a fit between these methods and the particular context of the experience under study. Given the individuality of each context it is rare to find a perfect fit and reflections on the success of the methods selected inevitably ensue. All research studies of this type also, therefore, become to some degree reflective investigations about method. This section will discuss some of the pilot investigations into the appropriate methods for evaluating audience experience in this project. It will also very broadly outline the methods that were selected at this initial stage. The details of the application, adjustment and refinements of these methods, however, will not be discussed until chapters 6 and 9, which detail the specific methods of the two case studies.

2.4.1 The Evaluation Environment

The majority of the pilot and case studies in this project were conducted in a public exhibition environment. This type of environment with its complex social and spatial characteristics can play a significant role in the experience an audience has when interacting with an artwork. This complexity can be difficult to reproduce in a controlled laboratory space and without it an evaluation might produce a false view of the possible experiences that could occur. The public exhibition environment is, therefore, a context that is required if an evaluation aims to produce results that can reliably reflect the whole range of potential experiences an audience can have with an artwork.

In recognition of this the University of Technology Sydney (UTS) entered into a partnership with the Powerhouse Museum to create a public exhibition space where evaluative interactive art research could be conducted. This exhibition environment is called Beta_space and provides a public context for artists and researchers to conduct research into artworks that may be at various stages of completion, from early draft to fully functioning work. Beta_space is curated by

the Creativity and Cognition Studios (CCS), a UTS research group that I am part of. Within CCS I am also a member of a team of researchers who collaborate to conduct evaluations of the artworks exhibited at Beta_space. This team have also collaborated to develop a generic coding scheme for use in the Beta_space research context. In this project, Beta_space was used most significantly for the evaluations conducted during the second case study. Accordingly, the layout and spatial characteristics of Beta_space will be detailed when the methods of this second study are discussed later in the thesis.

Although the public exhibition context is an important part of an artwork experience there are situations where a more controlled laboratory environment can be beneficial for evaluating artefacts. This environment suited the evaluations of the first case study because it enabled three technologically complex artworks to be installed within a very short space of time. The controlled nature of the laboratory environment also meant that these works could be installed without meeting the additional requirements of robustness for public display. The benefit of this in terms of evaluation outcomes was that an artefact could be evaluated at a much earlier stage of its development than would have been possible in a public exhibition context.

2.4.2 Pilot Studies

Art practice researchers, and particularly those creating interactive art, are increasingly using more formal methods to record and analyse experience (Armstrong 2005; Hook, Sengers & Andersson 2003). As is the case with this project, these are often qualitative methods borrowed from social science research. Although the recording and analysis of human experience has a long history within social science research, the choice of which methods to use is by no means unproblematic. Human experience is a complex process that involves:

> ... the fluidity and indeterminacy of experience in its sequential unfolding in the present moment and the 'fixing', 'ordering', 'framing', and regularization' of 'structures of experience' with the retrospective imposition of meaning (Throop 2003a: 223).

It is, thus, characterised as involving both pre-reflective and reflective cognitive processes. Throop argues that researchers need to be aware that their methods may "privilege" only one of these aspects of experience, most frequently the easier to capture reflective aspects. Accordingly, a combination of methods should be used to enable an experience's full complexity to be captured (Throop 2003a: 235). It is in order to record the complex nature of experience, therefore,

that this project used multiple methods, both those that were aimed at capturing the reflective aspects of experience and those that were aimed at pinning down elusive pre-reflective experience. These methods were identified through the project's pilot studies.

Three pilot studies were conducted during this project, each piloting different methods for evaluating artefacts in an exhibition context. The first pilot was conducted with fellow CCS researcher Lizzie Muller on Sidney Fels' artwork *Iamascope* when it was exhibited at Beta_space (Costello et al. 2005). This pilot compared three different methods for capturing user experience: think-aloud, video-cued recall and unstructured interview. The study revealed that think-aloud reports in a public exhibition context caused participants to be extremely self-conscious about their performance and the quality of their comments. Post-experience interviews were found to be able to elicit participant's interpretations of the artwork but did not reveal much about their actual lived experience. The video-cued recall method was the most effective because it enabled participants to interact freely with the artwork, unobstructed by any recording equipment. Also, because of its emphasis on non-interpretive reports, video-cued recall reduced the anxiety that can arise out of being asked to evaluate an art experience (Hook, Sengers & Andersson 2003). Above all, the video-cued recall method was found to be the most effective of all the methodologies tested at revealing affective and motivational data about each participant's experience. As a result of this pilot study this research project initially chose to use video-cued recall as its key method for capturing data about each participant's experience of the artefacts.

The video-cued recall method is commonly used for collecting verbal data in studies investigating human cognitive processes. The method involves making a video record of a participant's experience and then playing back this video so as to help the participant to recall and report on their experience. The pilot study results matched those of other recent studies using video-cued recall methods (Amitani & Hori 2002; Bentley, Johnston & Von Baggo 2003; Omodei, Wearing & McLennan 2002; Suwa, Purcell & Gero 1998). These studies found that not only does this method enable participants to recall more detail about their experience but also, more importantly, to recall pre-verbal perceptual, motivational and affective states that rarely emerge from interview data. Omodei et al. also argue that the cued recall experience is less threatening for participants than other verbal reporting methods, which can make them feel self-conscious. The video-cued recall method records the participant's pre-reflective experience and, through retrospective reporting, assists the researcher's interpretation of this

experience. It is, thus, a method that reveals both the pre-reflective and reflective aspects of experience.

In video-cued recall the usual method for recording the experience under study has the camera mounted on the participant's body so that it captures their first-person point of view. However, for this project it was necessary to capture both the movements the participants were making with their body and the dynamics of the artefact that they were interacting with. The camera was, therefore, positioned so that it recorded a third-person perspective, capturing their full body and the artwork installation. This video footage of participants' interaction was then replayed to them on a computer screen and they were asked to report retrospectively on what they had been thinking and feeling whilst they were interacting. A video camera recorded both the image as it played on the computer and their verbal report. Participants were asked to try to recall only what they were thinking at the time and to refrain from making evaluations. Although there was a researcher present in the room they sat out of sight of the participant during the reporting phase. This meant that the participants directed their attention during their reports to the computer screen and spoke to the screen not to the researcher. This approach was designed to elicit more detailed retrospective reports by removing the possibility of the reports being interrupted by dialogue between the researcher and the participant.

In this project the video-cued recall method was then augmented by two other methods. The first involved conducting post-report structured interviews. These interviews were used to record general contextual information about the participants, for example, their age, their occupation and their level of familiarity/expertise with art and interactive entertainment. The interview was also used to elicit evaluative comments about the artefact under study and to ask other focused questions that were specific to the experience of that artefact.

The second method was used in studies that were conducted in a public exhibition context and involved conducting covert observations of the general public interacting with an artefact. The researcher took structured notes during the approximately two-hour observation period and then noted down any reflective ideas that this observation generated. The observation data helped the researcher to formulate the focused interview questions that were specific to each study. It also allowed the researcher to develop a picture of typical audience experiences. This picture could then be compared with participant experiences during the evaluation sessions and revealed how behaviours were being influenced by the test situation. One influence common to all the evaluations was that in the test situation participants on average spent much longer interacting

with an artwork than the observed general public. The test situation created a level of focus and dedication that matched only a small percentage of the observed general public experiences.

The second pilot study applied these chosen methods during the evaluation of a playful artwork, *Time Smear*, created by artist Andy Polaine (2006b). This evaluation also took place in Beta_space and tested some new interview questions designed to elicit information about the playful aspects of participants' experiences. This pilot also tested the use of the now developed play framework as a coding scheme during analysis. This method of applying the framework was not particularly successful; however, some of the new interview questions about play were more so. The third and final pilot then tested the use of the play framework as a survey during the actual evaluation process. Applying the framework in this way proved to be useful and so a play survey was added to the evaluation methods that were then used during the next phases of the project. The method of delivering this survey was then developed further over the course of the project. These developments and these two pilot studies will be discussed in later chapters.

The pilot studies were not just beneficial because they helped select appropriate evaluation methods. They were also an opportunity to develop skills in applying these social science methods that I had previously had little experience of. To this end, as well as the three studies mentioned above, I also conducted two more evaluations of interactive artworks installed at Beta_space using the video-cued recall method followed by a structured interview. These evaluations were not related to this research project but did provide an opportunity to gain valuable experience in applying some of the evaluation methods that would later be used for this project. During this period I also gained experience of these and other methods from a participant perspective by taking part in four other studies of interactive artworks. Having an understanding of this participant perspective was important because it helped inform the experiential design and delivery of the later evaluation sessions that were conducted during this project.

In summary, the key methods chosen for evaluating artefacts in the two case studies of this project were video-cued recall, structured interviews, covert observation and a survey based on the new play framework. In keeping with the inquiry by design approach, these methods will be used to build theories through cycles of systematic inquiry within the two case studies. It should be stressed that although this project might examine theories throughout this cycle the methods used are never experimental. This project is situated within a complex cultural

environment and the methods used involve the detailed analysis of personal experiential accounts and the interpretation of social and behavioural meanings. Such an intricate web of interrelated variables makes this a context unsuited to a controlled experimental approach. This is, then, a project that will develop and suggest theories rather than produce verified results.

2.4.3 Ethics Approval

These artefact evaluations were conducted with ethics approval from the UTS Human Research Ethics Committee (HREC 2004-011P and HREC2006-304P). Participants were fully informed about the research procedures and signed consent forms before participating in the research. The data has been de-identified in the following chapters in order to maintain participant anonymity.

2.4.4 Coding and Analysis

The methods used in this project generated a lot of verbal data and coding, a very common method for synthesising and analysing large quantities of verbal data was used to help analyse this. The coding process involves segmenting out any sections of interest and then applying a set of common codes to each. These codes might be *descriptors* relating to the context of the segment, or they might define aspects of the *topic* under discussion, or, most importantly, they might reflect a developing *analytical* theme (Richards 2005: 88). This process allows the researcher to gather data into groupings that can then be compared and analysed for patterns. The process of coding data qualitatively usually involves the generation of codes throughout the whole process of the study (Richards 2005: 86). As codes are generated, analytical themes emerge and findings are then developed.

In this project an initial coding scheme developed out of the analysis of the first pilot study data (Costello et al. 2005). This was then developed further by myself and a group of CCS researchers, with an aim to create a generic scheme that could be used for the coding of any art experience data generated from the multiple studies conducted at Beta_space (Bilda, Costello & Amitani 2006). It was intended that researchers would augment the scheme with codes specific to their individual research questions and specific to the context of the artefact under study. For this project, accordingly, the generic scheme was adapted to suit the particular research objectives and contexts of its two case studies. This adaptation process resulted in a series of common descriptor and topic codes that were then applied to the data within both case studies (Table 2).

Table 2: Common descriptive and topic codes applied across both case studies

Experiential Components	Aural
	Equipment
	Interaction
	Other Participants
	Own Body
	Scope of Work
	Signage
	Spatial
	Temporal
	Test Situation
	Visual

| Observations | Misunderstanding |
| | Notable Behaviour |

Responses	Negative
	Neutral
	Positive

Thoughts and Emotions	Characterisation of Work
	Expectation
	Feeling
	Interpretation
	Purpose
	Suggestion
	Uncertainty
	Understanding

The two case studies within this project then each developed extra descriptor and topic codes that related to their own particular context, for example, codes relating to specific interview questions and codes relating to participant variables. In each study analytic codes were then generated from this coded data, with these analytical themes particularly emerging during a final comparative mapping stage of the process. These analytic codes will be outlined in the method chapters for each of the studies.
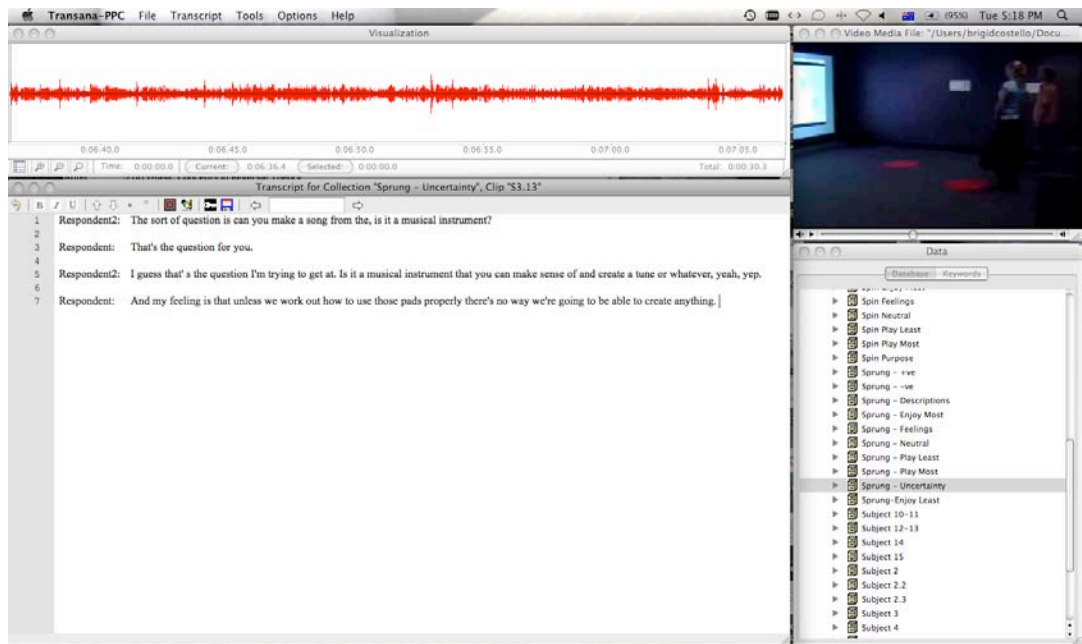
Figure 3: Example of Transana database from first case study

Picture shows anti-clockwise from bottom left: the transcript of a segment, its audio waveform, its video image, and the analytic theme collection that it is grouped into.

This coding process can be supported by the use of one of several software tools specially designed for this purpose. This project chose to use the open source software *Transana*,[1] developed by researchers at the University of Wisconsin-Madison (figure 3). *Transana* was particularly appropriate for this project because it accommodated all the types of data involved – video, audio and textual. *Transana* was used for the initial process of segmenting and coding the data. Once this process was complete and significant themes had started to be developed the codes were analysed further using the mapping software *Tinderbox* (figures 4 & 5).[2] This software facilitated the grouping and relating of categories so that key patterns could then be revealed.

[1] http://www.transana.org

[2] http://www.eastgate.com/Tinderbox/
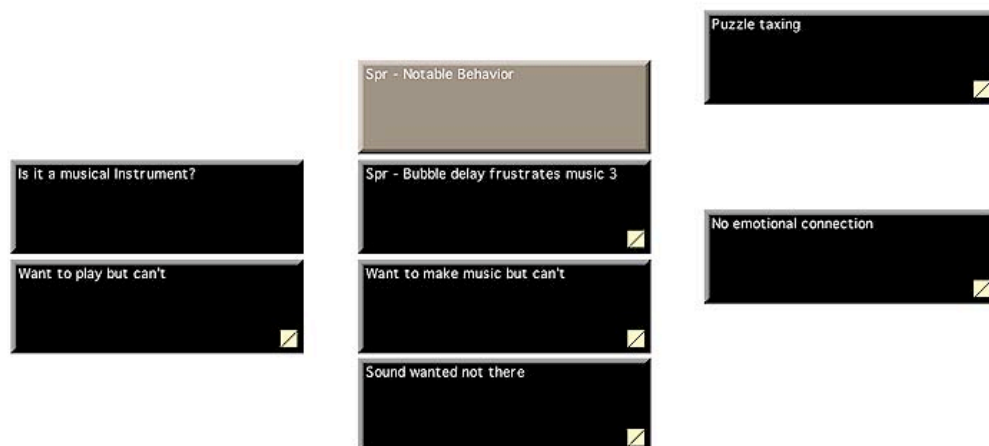
Figure 4: Excerpt from Tinderbox map of codes relating to *Sprung!*. Each rectangle or note contains collections of segmented data (see figure 5 below)
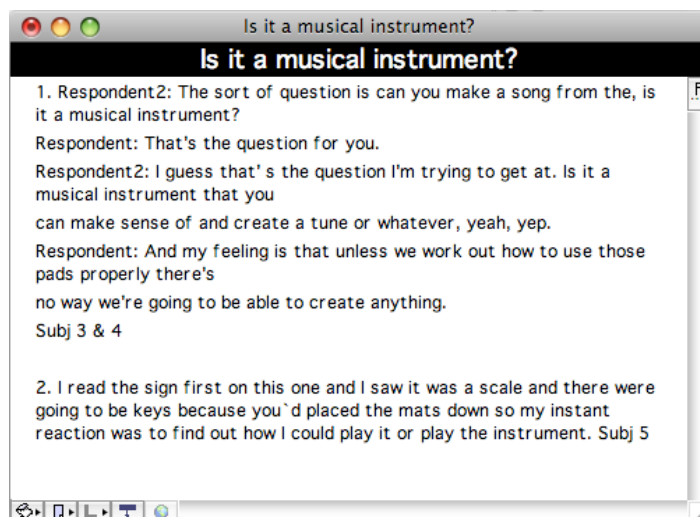
Figure 5: Example of contents of a Tinderbox note from map pictured in figure 4

The two case studies that were conducted during this project also generated numerical data. This came principally from the survey based on the play framework but also emerged from some interview questions. This numerical data was not analysed in a statistically quantitative way but rather was used as part of a qualitative analysis process. It was used to develop comparative findings and was particularly valuable because of what it could reveal about the collective quality of the audience experience. The themes that emerged from these comparative numerical analyses were then tested against the themes that developed out of the verbal data from the interviews and retrospective reports. When two themes corresponded they worked to strengthen the weight of a

finding. When two themes diverged they led to closer analysis and to possible rejection or revision of a theme.

This numerical data generated by the two case studies was analysed using Microsoft Excel spreadsheets. As the project had sample sizes of between 15–22 participants, it was decided not to express the numerical data in percentages. With such small sample sizes, percentages could have distorted the differences between results. Accordingly, any tables or charts that present the numerical data will do so using the raw results. There was also some numerical data that emerged from the patterns that were revealed during the coding process. In the results chapters these numbers will appear as fractions in brackets after a particular pattern is discussed, for example, (5/22). When this occurs, the top number will represent the number of participants who displayed a certain pattern. The bottom number will represent the total number of participants in the study under discussion.

2.5 Summary

This research project adopted the methodological approach of inquiry by design. Its research process, therefore, involved a spiral of cycles of artefact creation. Each of these cycles involved the stages of formulating, moving, representing, evaluating and reflecting. To carry out these stages the project employed multiple methods, some that related to artefact creation and some that related to artefact evaluation. For creating artefacts the project used the methods of practice, reflective documentation and interpretive analysis of existing artworks. For evaluating artefacts the project used the methods of video-cued recall, structured interview, observation, written survey and coding. The whole research process progressed in four distinct phases and these will now be detailed in the following chapters. Before doing so, however, the next chapter will begin the discussion with a look at the many and varied definitions of play.

CHAPTER 3: WHAT IS PLAY?

> We all play occasionally, and we all know what playing feels like. But when it comes to making theoretical statements about what play is, we fall into silliness. (Sutton-Smith 1997: 1)

Brian Sutton-Smith's comprehensive survey of play theory, *The Ambiguity of Play*, contends that its history has been dominated by seven main rhetorics of play, defining play either as progress, fate, power, identity, the imaginary, the self or as frivolous (1997: 10–11). These seven perspectives on play, he argues, were driven by the cultural concerns of their time and resulted in hierarchies that then defined which forms of play were "worthy" of study and which forms were not (1997: 210). Such different perspectives not only influenced the definitions of theorists but also affected the way that players would then perceive and describe their own play (1997: 199). Play, he concludes, "like all cultural forms, cannot be neutrally interpreted" and this means that the perception and the experience of play will necessarily have an ambiguous relationship (1997: 216). What play is said to be and what play is experienced as can both be influenced by the cultural context that play takes place in.

The specific context that this study operated in was that of play within the audience experiences of four particular interactive artworks. The study took place in Sydney, Australia and occurred between 2003 and 2008. The audience and the artist in this context were operating within a culture dominated by Western traditions and one that was heavily influenced by the impact of computer-based interactive technologies. This is a context that Sutton-Smith identifies as being particularly affected by his fifth rhetoric, the rhetoric of the self, which has an emphasis on play as fun and focuses on "experiential concerns" (1997: 199). Not surprisingly, therefore, this study's approach to definitions of play is very much one that is interested in play as an experience and one that will, in the next chapter, also deal with the pleasurable aspects of play.

This study's focus on experience aims to uncover strategies that might be useful when one is trying to design for play within an interactive art context. This aim provides a perspective that will begin by shaping a general discussion of definitions of play and of the modes within a play experience. That discussion will then be followed by a more detailed look at three aspects of play. Firstly, we will discuss the factors that can help to form and maintain the boundary between the play experience and real life. Secondly, we will discuss the effect that player

attitude and personality can have on a play experience. Lastly, we will look at the relationship between play and the interactive art experience.

3.1 Definitions of Play

One of the difficulties in summarising approaches to definitions of play is that such definitions are often intertwined with definitions of games and game playing. While many early play theorists were not particularly concerned with distinguishing between play and game, for many contemporary theorists this has been more of a central concern. Play is regarded by some as encompassing games and by others as a separate but related state that is a pre-condition for games. The mercurial nature of such definitions mean that, depending on the perspective taken, both play and game can potentially be involved in the experience of an interactive artwork. Many of the current discussions around games are, in fact, particularly relevant because they are often also focused on interactive computer-based experiences. For our purposes here, then, we will be discussing definitions relating to both play and game.

The two most often cited definitions of play are those by Johan Huizinga and Roger Caillois. One or both of these two definitions is used as a starting point by many of the theorists who follow. Huizinga, writing in 1938, defined play thus:

> Summing up the formal characteristics of play we might call it a free activity standing quite consciously outside "ordinary" life as being "not serious," but at the same time absorbing the player intensely and utterly. It is an activity connected with no material interest, and no profit can be gained by it. It proceeds within its own proper boundaries of time and space according to fixed rules and in an orderly manner. It promotes the formation of social groupings which tend to surround themselves with secrecy and to stress their difference from the common world by disguise or other means. (1955: 13)

Huizinga's definition focuses on the separation between play and real life, a relationship that will preoccupy many other later play theorists. He also focuses on the social aspects of play and on the absorbing nature of the play experience, aspects that will again be taken up by later theorists, particularly those concerned with human behaviour and psychology. Lastly, he talks about rules and order. It is these last two elements that will be used by later theorists to make a distinction that does not appear here, a distinction between play and game.

Caillois, writing twenty years later in 1958, criticised Huizinga's definition as being "too broad and too narrow" (1962: 4). While his definition is based on that of Huizinga, he does not explicitly include two aspects of Huizinga's

characteristics: the aspect of social grouping and the aspect of player absorption. For Caillois, play has six key characteristics. Play is:

1. Free: in which playing is not obligatory; if it were, it would at once lose its attractive and joyous quality as diversion;

2. Separate: circumscribed within limits of space and time, defined and fixed in advance;

3. Uncertain: the course of which cannot be determined, nor the result attained beforehand, and some latitude for innovations being left to the player's initiative;

4. Unproductive: creating neither goods, nor wealth, nor new elements of any kind; and, except for the exchange of property among the players, ending in a situation identical to that prevailing at the beginning of the game;

5. Governed by rules: under conventions that suspend ordinary laws, and for the moment establish new legislation, which alone counts;

6. Make-believe: accompanied by a special awareness of a second reality or of a free unreality, as against real life. (Caillois 1962: 9)

In Caillois' definition, Huizinga's focus on secrecy and disguise is translated into the category of Make-believe. Caillois does not feel that secrecy or what he terms the "mysterious" operates in play. He argues that play has a tendency to "remove the very nature of the mysterious" (Caillois 1962: 4). Caillois also broadens Huizinga's characteristics in defining the unproductive nature of play. Where Huizinga excludes games involving gambling, Caillois includes them, arguing that, for the gambler, gambling is unproductive and most importantly pleasurable and therefore playful. He also adds a crucial new characteristic to his definition, that of the Uncertain, which is used to describe both the freedom of player action and the need for the outcome of play to be unknown.

In his definition Caillois uses the terms play and game without making a particular distinction between the two. He describes play as an activity or occupation and uses the term when talking about the actions of players or describing essential qualities. The term game is used only as a noun. In Caillois' terms then, a game is the thing that one plays.

Caillois goes on to develop a classification system for games which he describes as operating around an axis of two conditions: that of *paidia*, the "primary power of improvisation and joy", and that of *ludus*, "the taste for gratuitous difficulty" (1962: 27). The term *paidia* was chosen by Caillois because its root is the word for child. In his broader definition of it he uses the words "gamboling", "happy exuberance" and "tumult" to further describe its character (1962: 27–28). *Ludus* is described as being "a refinement of *paida*" and as being something that "disciplines and enriches" *paidia* (1962: 29). Caillois links *ludus* to

the "acquisition of a special skill", to "mastery" and to "the primitive desire to find diversion and amusement in arbitrary, perpetually recurrent obstacles" (1962: 29,32–33). Although not used for this purpose by Caillois, these concepts of *paidia* and *ludus* seem to have influenced some later theorists in their development of a distinction between play and game.

The influence of *paidia* and *ludus* can be seen, for example, in Caspi's distinction between "play occurrences" and "game activities". For Caspi, a play occurrence is, like *paidia*, improvisational, spontaneous and imaginative, while a game activity is, like *ludus*, rule-driven, purposeful and conscious (1992: 301).[1] The spontaneous, improvisational nature of *paidia* can also be seen in Avedon and Sutton-Smith's distinction between play as "unique, individual and ephemeral" and games as "sufficiently systematic for replication by others in other places" (Lieberman 1977: 113). This characterisation of games as structured and systemic and play as improvisational is also seen in Walther's distinction between play as "open to the repetitive fabrication of rules" and games as "open for tactics" (2003: 8). A focus on defined rules and structure as characteristic of games is also found in the definitions of those theorists who focus primarily on games (Salen & Zimmerman 2004; Juul 2005; Järvinen, Heliö & Mäyrä 2002).

Digital games theorist Jesper Juul, for example, arrives at a definition of a game after comparing and synthesising seven key theories of play by the theorists Johan Huizinga, Roger Caillois, Bernard Suits, Elliot Avedon and Brian Sutton-Smith, Chris Crawford, David Kelly and Katie Salen and Eric Zimmerman. As he points out, it is difficult to make real comparisons between all seven definitions because they are framed in different ways with some focusing on defining a system, others on defining the activity of playing and others differing in terms of the scope of activities they are trying to define. Juul, himself, is explicit about the way he has framed his own definition, wanting to create a definition of a game that works on three levels, in terms of the game as system, in terms of the relationship between player and game and in terms of the relationship between the game and the world (2005: 28). His final definition has six categories:

> A game is a rule-based formal system
> with a variable and quantifiable outcome,
> where different outcomes are assigned different values,
> the player exerts effort in order to influence the outcome,
> the player feels attached to the outcome,

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[1] While Caillois does not specifically mention rules in his definition of *ludus,* rules are one of the ways that the "gratuitous difficulty" or "recurrent obstacles" he does mention can be created.

and the consequences of the activity are optional and negotiable.
(Juul 2005: 36)

While all of the seven definitions that he compares mention rules, it is only the definitions relating specifically to games that stress, as Juul does here, the need for the rules to be formal. Like the play/game distinctions outlined above, this focus on formal rules excludes spontaneous improvisational activities that could be categorised as *paidia*. Juul also explicitly rejects what Caillois calls "make-believe" by equating it with the concept "fiction" and then by arguing that as not all games involve fiction it cannot be included in the definition. Caillois' categories of Separate and Unproductive are collapsed into Juul's new category of Negotiable Consequences. Like other digital games theorists (e.g. Nieuwdorp 2005), Juul is uncomfortable with a definition that focuses on games as being separate from real life. New forms of digital games such as mixed reality or pervasive games are regarded as having blurred the boundary between real life and the game. For Juul, the word "negotiable" more accurately expresses the fuzziness of this boundary (2005: 36). In Juul's emphasis on players exerting effort and feeling attached, we can also see the reintroduction of some of the elements of player experience that were in Huizinga's definition but that were later rejected by Caillois.

While Juul's definition of a game includes some elements not seen in Caillois' definition, it is intentionally a much narrower definition that excludes some types of play that Caillois included. Juul uses the following diagram to illustrate how his definition could be used to classify activities as a game or not (figure 6). In his categorisation, freeform play and ring-a-ring-a-roses, which were included in Caillois' definition, are classified as not games, one because its rules are not fixed and the other because its outcome is not variable. Similarly to Huizinga, Juul also places gambling on the borderline of his definition along with games of pure chance. Chance is excluded because he feels it requires no player effort and gambling because he does not regard the consequences as negotiable (Juul 2005: 44).

NOT GAMES

BORDERLINE CASES

Free-form play
- Variable rules

Hypertext fiction
- Fixed outcome
- No attachment

Traffic, Noble war
- Non-negotiable
  consequences

**Ring-a-ring
o' roses**
- Fixed outcome
- No attachment

Skill-based gambling
- Pre-negotiated
  consequences

**Pen and paper
role-playing**
- Flexible rules

GAMES

Fixed rules

**Chance-based
gambling**
- Pre-negotiated
  consequences
- No player effort

**Open-ended
simulations**
- No valorization
  of outcome

Negotiable
consequences

Variable
outcome

Player
attachment to
outcome

Valorization of
outcome

Player
effort

Storytelling
- Fixed outcome
- No player effort
- No attachment

Games of pure chance
- No player effort

**Conway's game of life;
watching a fireplace**
- No valorization of outcome
- No player effort
- No attachment

Figure 6: Juul's diagram defining 'games' and 'not games'

Juul's system diagram (2005: 44) suggests that, for him, play is a broad set of activities that includes games as a specific sub-set. He is not making a distinction between play and game (as others have done above) but rather he is defining the particular type of play known as a game and so the distinction is between game and not game.

In their book, *Rules of Play*, Salen and Zimmerman also position games as a sub-set of play. The model they develop has play divided into three categories, "game play" (formalised play or what Juul would define as a game), "ludic activities" (non goal-oriented games such as kite-flying or Frisbee) and "being playful" (winking, wordplay, being cheeky, etc.) (2004: 304). Salen and Zimmerman then develop a general definition of play that they see as crossing all three categories:

Play is free movement within a more rigid structure. (2004: 304).

In this pared-back definition we can see the broad brush strokes of many of the aspects of play mentioned by others. The concept of "free movement" relates to

Caillois' and other's categories of freedom, uncertainty and make-believe while the idea of a "rigid structure" that play operates within can be seen as referencing rules and the separate nature of play. Zimmerman's later explanation of the relationship between play and its structure describes the same kind of fuzzy relationship between being in the world and yet separate from it that is expressed by Juul and many other play theorists.

> Play exists in opposition to the structures it inhabits, at odds with the utilitarian functioning of the system. Yet play is at the same time an expression of a system and intrinsically a part of it. (Zimmerman 2004: 159)

The broadness of the Salen and Zimmerman definition seems to make it particularly suited to the interactive art context, given its equally broad range of experiential outcomes. This final simple, yet elegant definition of play is the one, therefore, that will be used to guide the research in this project.

In taking on board Salen and Zimmerman's definition we will not be ignoring the complex forces that we know lie behind the austerity of those nine words. Our current exploration of the definitions of play has highlighted three areas that all the theorists regard as being important to a play experience. There has been a focus on the player and on their fascination with, absorption in, and attachment to the play experience. There has also been a preoccupation with the operations that occur at the boundaries of play. Lastly, there has been a focus on the practice of play and on the variety of ordered and improvised structures that can occur during play. The next sections will discuss these three important areas in more detail.

3.2 The Practice of Play

A common feature of many discussions of play is the identification of two types of practices, one involving interpretation of the structure that play occurs within and the other involving making some change to this structure. Salen and Zimmerman, for example, draw attention to the two practices of *meaningful play* and *transformative play*. Their concept of meaningful play draws on Huizinga's definition of play, particularly on his statement that "[all] play means something" (1955: 19). They describe meaningful play as being a result of the process of player action and related system outcomes. Meaningful play is what occurs when:

> ... the relationship between the actions and the outcomes in a game are both discernable and integrated into the larger context of the game ... (Salen & Zimmerman 2004: 34)

For Salen and Zimmerman meaningful play is essential for a game to be successful. Transformative play, on the other hand, while not regarded as essential for success within a game, is regarded as operating to make a game more exciting because it transforms or changes the "rigid structure" that the game takes place within (Salen & Zimmerman 2004: 305). The concept of transformative play, then, describes activities such as digital game modification or any other play that blurs the boundary between a game system designer and a player.

Another theorist who identifies two similar practices within play is Walther. He begins by arguing that although games are *not* play, they *do "require"* play in order to operate (2003: 1). His model of this relationship (Walther 2003: 7) is, then, one between what he calls "play mode" and "game mode" and this relationship involves a progression from non-play to play and then to game (figure 7).
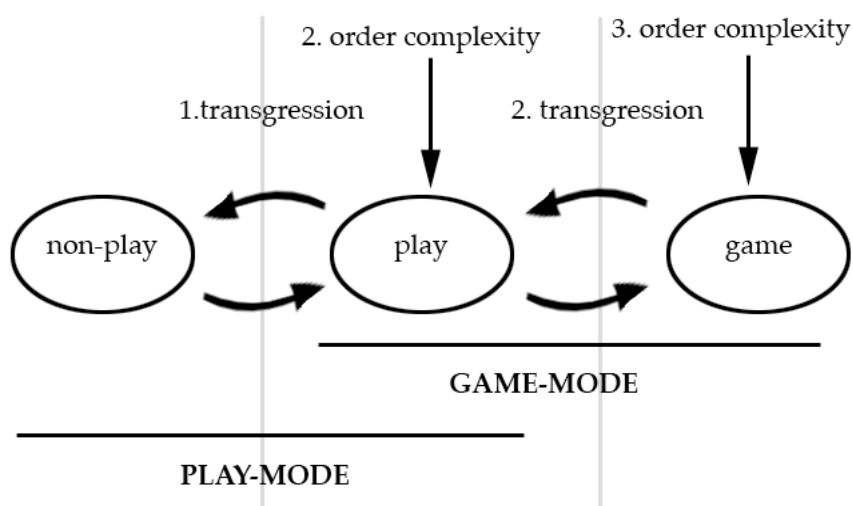
Figure 7: Walther's model of the relationship between game mode and play mode

The two fluctuating progressions between non-play/play and play/game are described as transgressions, which he sees as being a source of fascination within both modes:

> ... in the play-mode the deep fascination lies in the oscillation between play and non-play, whereas game-mode presses forward one's tactical capabilities to sustain the balance between a structured and an un-structured space. (Walther 2003: 1)

Walther regards maintaining this balance between playing and gaming as essential for the flow of gameplay. In order to be in game mode one has to have first developed the "sensation of presence" that is essential for play mode, that is,

one has to already be "playing". When the balance between playing and gaming is broken the player shifts from asking "how do I get to the next level?" to asking "why do I play?" and this, Walther feels, destroys the flow of gameplay (2003: 12).

In Walther's distinction between play and games, play is described as "open-ended" and as involving "make-believe and world-building" (2003: 1). Like Juul, he is positioning make-believe as outside the realm of the game. This is not a light-hearted position to take, for the relevance and importance of narrative in games has been a hotly contested topic amongst digital game theorists. However, Walther's reasoning here is strong. He argues that the suspension of disbelief in a character role and/or fictional world is something that takes place in play mode *before* one starts gaming. In his model, such fictional operations belong to the realm of presence, to the sensation that one is playing. Walther associates the make-believe character of play with a "search for semantics", arguing that in play we are not just involved in building a world, we "are also driven by its potential meaning and the stories we can invent in that respect" (2003: 9). While play is associated with a "search for semantics", games are associated with a "search for structure", for games involve the "interpretation and optimizing of rules and tactics" (Walther 2003: 1). One does not debate rules in a game, for in so doing one has already stepped outside the game (structure) and into the realm of play (semantics). One does, however, debate tactics (Walther 2003: 5).

Walther's two drives seem to connect with the two types of play described earlier by Salen and Zimmerman. Their concept of transformative play sounding very much like the type of process that Walther says happens outside the game mode and that he connects with the "search for semantics". Meaningful play, on the other hand, with its relationship between player actions and the game system, seems to be more connected with Walther's "search for structure". It is slightly confusing that while both theories talk about processes involving structure and meaning each chooses to focus on opposite terms to distinguish between the two. These differences in terminology, however, reflect the different perspectives of the two theories. Salen and Zimmerman's two processes are described from a system perspective while Walther's are described from a player perspective. When Walther's players are searching for semantics they are involved in building and transforming the game world and when these players are searching for structure they are involved in interpreting and looking for meanings within this game world.

Other studies of play behaviour have also focused on two practices at work within play, although these studies do not talk of searching but rather of

exploring (Hutt 1985; Lieberman 1977). In discussing exploration these studies are not trying to distinguish between play and game, as Walther was, but rather between play and not play. For example, Hutt describes the two types of exploration[2] that children undertake when playing with a novel object as "investigative exploration" and "diversive exploration" (1985: 233). Investigative exploration occurs, she says, when children have the goal of "getting to know the properties" of the object. Once they have done this they then shift into diversive exploration and this involves a change of emphasis "from the question of 'what does this *object* do?' to 'what can *I* do with this object?'" (Hutt 1985: 246). For Hutt and others, play only occurs when children are engaged in diversive exploration but, they stress, this will not occur until there is some level of familiarity with an object, and this is attained through investigative exploration. These two processes are often intertwined, with children moving from investigating to playing and then back to investigating when they uncover a new feature or if they become bored.

Designing for a play experience, therefore, requires not just considering the issue of maintaining player interest in the diversity of "what they can do" it also potentially involves managing their unfolding investigation of "what this object does". To stimulate this investigation, Lieberman says, we need to work with "novelty, ambiguity, incongruity, surprise, and complexity". On the other hand, to stimulate the diversive exploration of play we need to work with "familiarity, clarity, simplicity, and congruity"(1977: 109). These two lists might appear at first to be incompatible but it is important to remember that the first *becomes* the second through the process of player exploration.

A common feature of discussions of play is, then, an identification of two modes of practice that a play experience can oscillate between. In the previous section Callois identified the practices of *paidia* and *ludus* and with these made a distinction between ruled, skill-based play and freeform, improvisational play. Here we have seen theorists contrast meaningfulness with transformation, contrast a search for structure with a search for semantics and contrast investigating with exploring diversity. A common feature of all of these concepts is that one side involves working with or interpreting a structure that exists outside oneself and the other involves being creative with or within this structure. What we are seeing here, then, echoes the definition of play as "free movement within a more rigid structure" but relates it to the practices of the player, which oscillate between "what can this object do?" (rigid structure) and "what can I do with this object?" (free movement).

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[2] Hutt is drawing here on concepts that were originally developed by Berlyne.

3.3 Playing at the Boundary

The place that play occupies is regarded as being separate from the real world. As Huizinga puts it:

> Inside the circle of the game the laws and customs of ordinary life no longer count. We are different and do things differently. (1955: 31)

While Caillois refers to this place as a "protected universe" (1962: 7), others call it a "protective frame" (Apter 1991: 14) or "magic circle" (Nieuwdorp 2005; Salen & Zimmerman 2004). The boundary between this magic circle of play and the world of ordinary life is characterised by Walther's first transgression as a boundary of flows and movement. His idea is echoed by other theorists who describe the boundary as "fluid" (Huizinga 1955: 27 & 40) or "permeable" (Nieuwdorp 2005: 6) or who talk of a "flicker[ing] back and forth ... between serious and playful states of mind" (Apter & Kerr 1991: 163–4). For Winnicott this fluidity results in what he calls the "precariousness of play" (1971: 50). Play, he says, is not completely "subjective" nor is it completely "objective", it is "neither a matter of inner psychic reality nor a matter of external reality" (Winnicott 1971: 50, 96). It is the fragility of this paradox that makes it necessary for play to involve mechanisms designed to protect the boundary between play and real life, methods to avoid what Huizinga calls "a collapse of the play spirit, a sobering, a disenchantment" (1955: 40).

Sutton-Smith describes two types of social boundary mechanisms at work within play. The first occur to signal the initial crossing over into the protective frame of play and include, for example, behaviours such as smiling, giggling or making "an exaggerated gesture" (1985: 104). The second are used to maintain the boundary once play has commenced. These maintenance methods include desisting, complying, apologising, assisting, appealing to an outsider, promising, humour and pretending to be hurt after hurting someone else (Sutton-Smith 1985: 104). This very social list implies that the boundary of play is much more precarious when playing with others as opposed to by oneself. However, Sutton-Smith also indicates that playing with others can act to keep players within the circle of play, when, for example, a player's desire not to be laughed at or be seen to lose, works to maintain their attentive presence in play (1985: 257).

For Goffman, playing with others also works to "reinforce" the boundary of play, particularly when players experience what he calls "joint engrossment". This creates a feeling of solidarity that then helps to reinforce the "reality" of the

world framed by the boundary (1961: 72). The world of play has rules that define its reality by specifying what is excluded from it, what materials are available to play with within it and what transformations will occur to accommodate things that enter into its frame. If players become more interested in the things that have been excluded or are "strongly repelled" by the things that are the focus of attention then, Goffman warns, players can experience a tension that will weaken the boundary of play, "leaving participants bewildered about what next to do, or what next to try to be" (1961: 40). If players are engrossed, however, then they are less likely to experience this tension and thus such engrossment, he argues, helps to maintain both the "stability" of the boundaries of play and the "definitions" that shape its world (Goffman 1961: 35).

Whether playing individually or in a group, the level of engrossment that one has with the play experience is, therefore, important for maintaining the protective frame of play. This engrossment often increases with player skill levels and means that the more skilled the player is the less likely they are to behave in ways that might break down this protective frame (Goffman 1961: 51). Goffman's suggested strategies for maintaining the boundaries of play are to either choose players who most fit into the reality of the play world or to design a world that most suits the intended audience (1961: 41). Both strategies require one to have an awareness of the particular abilities and qualities of the player.

Game developer Brian Moriarty has a similar focus on the relationship between the design of the world of play and the player. In his view, the designer must create a system that teaches players "how to be players", that will "entrain" them (1998–2002: paras. 203, 204). For Moriarty the magic circle of the game is maintained by developing harmonious patterns and rhythms of player interaction with the game system. Game design involves creating "an architecture of rhythm" by devising:

> ... resonant gaming spaces with interactive characteristics that reinforce harmonic activity and dampen dissonant influences. (Moriarty 1998–2002: para.173)

The rhythms that he is referring to are those created by the interactive conversation of "action and response" within a game system, and these rhythms, he suggests, will attract the player by appealing to his or her ability to recognise patterns. As with Goffman's second point above, the design strategy here involves tailoring the world of play to suit the audience. Moriarty's idea, however, takes it one step further by suggesting that careful design of this world might also mean that the processes of play could also work to create an audience that is more suited to this world by "entraining" them.

For the interactive art context that we are concerned with here, the boundary of play will be one that involves the spatial, social, physical and affective characteristics of the exhibited artwork. The discussion above suggests that this exhibition environment will need to be designed to be sensitive to the social contexts of single and multiple users and will need to be designed to encourage engrossment and do so by creating a satisfying rhythm of action and response. The discussion also suggests that using evaluation to gain more insight into the attitude and characteristics of the audience will be a useful part of the design process. Gaining a greater awareness of the audience is not just about trying to create a design that might suit them, it is also about trying to gain insights that might enable one to more successfully "entrain" them so that they then might become more suited to the experience of the artwork.

3.4 Player Attitude

In most definitions of play there is a player involved and the behaviour of this player, as we have seen above, is regarded as crucial for maintaining a play experience. The relationship between play and player is seen as systemic, each being intimately involved in the creation of a play experience. Caspi calls this interrelationship a "playing interface" and describes it as being "a function of the person's attitudes, sentiments, abilities and actions combined with the constraints and possibilities inherent in the game" (1992: 300). In Caspi's description of this relationship, game play is seen as a system involving both the qualities of the game and the qualities of the player such as, for example, their attitude to the play experience.

Other theorists also focus on the attitude of the player. This attitude is defined by Kücklich as a player's "play-ability" or, in other words, their ability or willingness to engage in playful activities (2004: 30). A player's "play-ability", he argues, is a factor that will influence the player's level of and possible avenues for engagement. Csikszentmihalyi also regards player attitude as an important aspect of play. He differentiates between the player's actions and the player's perception and interpretation of these actions. He stresses that it is these perceptions or interpretations that create the enjoyment of play (1975: x). These ideas suggest that the attitude of a player influences the amount of pleasure that they will experience because it influences not only the way that a player is able to play but also the way that they interpret their play experiences.

The player attitude that is required for play to occur is seen as being the result of certain player characteristics. These characteristics have been widely studied by play psychologists and are encompassed by the umbrella term *playfulness*.

Playfulness is regarded as an "attitude" that all people have but that they all have different degrees of (Guitard, Ferland & Dutil 2005: 9). While there have been many studies into the components of playfulness in children, there are very few that deal with adults. Adult playfulness, however, is of particular concern within this thesis because the artworks that were created for it were aimed at an audience that was primarily adult.

In a recent rare study of adult playfulness, Guitard et al. synthesise the results from a comprehensive range of earlier studies of children to arrive at the following five components of children's playfulness: "pleasure, spontaneity, curiosity, imagination, and sense of humor" (2005: 12). After conducting a series of studies on adults, they arrived at a very similar list of five components but replaced imagination with creativity, arguing that in adults childhood imagination has matured to become creativity. Their study then questions what it is that makes one adult playful and one not and their results suggest that, while not all five components of playfulness need to be present for an adult to be playful, pleasure and creativity are key attributes (Guitard, Ferland & Dutil 2005: 20).

Guitard et al. suggest that there are other elements that are characteristic of adult playfulness. Spontaneity, both physical and cognitive, becomes less common as we age and adults are described as being less comfortable with displays of joy and humour (2005: 13). Other play theorists point to an increasing preference for rule-based play as we age (Berlyne 1968: 826) (Piaget 1951: 142). This preference is linked to the development of social maturity, with Piaget declaring that rule-based games "are the ludic activity of the socialised being". As children develop a preference for rule-based games they are also described as being less and less likely to engage in pure make-believe play (Piaget 1951: 145). Piaget observed that as children become more socialised their make-believe becomes more imitative of the world around them and he argued that this leads to more constructive types of play. Thus, as Guitard et al. point out above, child imagination turns into adult creativity.

Another attitude that influences the way a player plays and their level of pleasure, is the player's perception of their capabilities. Berlyne describes a 1930 study by Hoppe into what was termed the player's "level of aspiration". The study discovered that each player's estimation of their ability influenced not only what they were willing to do whilst they were playing but also influenced their perception of their success or failure at a particular task (Berlyne 1968: 824). This and other studies revealed that players avoided doing things that were perceived to be too easy or too difficult for them. In one study, results showed that players

preferred a 50:50 chance of success (Berlyne 1968: 825). This acting within one's capabilities is, for Csikszentmihalyi, essential in order for a player to experience the pleasurable, intense state of "complete involvement" that he terms "flow" (1975: 39). Player's estimations of their abilities, however, were found to be extremely varied across different personality types and in relation to their own and other's previous experiences (Berlyne 1968: 825). This variability suggests that although a player's level of aspiration is a factor that will influence the amount of pleasure a player gets out of a game, it is not something that can be easily designed for.

We have seen, then, that the extent to which an adult player will engage with and enjoy a play experience depends on their level of playfulness and their level of aspiration. Whether an adult player is spontaneous, has a sense of humour and is curious is less important than whether they are able to be creative and experience pleasure. Adult players generally prefer rule-based forms of play and also prefer make-believe that is imitative and constructive. They need to feel reasonably certain that a play activity is within their capabilities before they are willing to attempt it, but will also avoid activities that they regard as too easy. While player attitude is not something that can be designed, it is something that possibly could be designed for. However, given the variable nature of both a player's level of playfulness and their level of aspiration, such a design goal would not be easy to achieve and would need to accommodate a very broad range of player attitudes. Developing an understanding of what those attitudes might be is again something that might emerge from evaluation.

3.5 Art and Play

Many theorists, both those concerned with play and those concerned with aesthetics, have observed that there are similarities between art and play. While some, like Gadamer, argue that art is play, others, like Herbert Read, take the opposite position and argue rather that play could be art (Sutton-Smith 1997: 134). Sutton-Smith takes the middle ground and argues that although art and play have similar qualities he believes that equating them leads to a focus on such a reduced range of characteristics that it "obscure[s] whatever the true relationship between play and art actually is" (1997:134). One point that all three of these positions agree on is that art and play have many similar qualities. This section will now take a look at these similarities to see whether they might suggest any further strategies that could be useful when one is designing a play experience for an interactive art context.

For Huizinga, some types of art are play and some are not. He divides art into three categories: dancing, music and the plastic arts. He only regards the first two – music and dancing – as play, because they both involve "action" and that "action is repeated in the performance" (1955: 165). The performative aspects of music and dancing involve play, he feels, because they are a "creative process" and also because they involve their audience in what Huizinga calls "an atmosphere of common rejoicing" (1955: 167). The plastic arts, on the other hand, although they are exhibited, are not regarded as having this type of performativity, rather they are described by Huizinga as being "dumb and immobile". The only action required of the audience is that of looking, and this, he argues, does not involve any "public action" in which the work "comes to life" and therefore does not involve play (Huizinga 1955: 166). For Huizinga, then, art is only play if it has a performative quality and only if in this performance the audience is then involved in acting to bring the artwork into being.

In his exploration of the connections between art and play, Gadamer also focuses on the performative aspects of the presentation of art. He, however, does not make a distinction between different types of art, for him all art is play (Gadamer 1975: 120). This is because he regards knowing and understanding as active and integral parts of the play of art. For him, therefore, the interpretive processes involved in looking at an artwork such as a painting are active and do involve play. Like Huizinga, he also focuses on the way that the activities involved in the presentation of art bring it into being. The key elements for Gadamer are that art's:

> ... actual being cannot be detached from its presentation and that in this presentation the unity and identity of a structure emerge. (1975:120)

This he argues is similar to play which has a being that only emerges during actual play.

Gadamer associates play with movement, as did Moriarty and Salen and Zimmerman. However, he argues that this movement is not tied to the player. It is not just something that the player "does". In order for play to exist, there needs to be a response, a "to and fro movement", and for him this means that not only does the player play the game but that the game also plays the player (1975: 104–106). The being of play lies in the "occurrence" of this movement and, therefore, play, he argues, cannot be detached from its presentation.

A similar to and fro movement is described as operating in art and it is this that gives the artwork its structure. For Gadamer:

> ... the work of art has its true being in the fact that it becomes an experience that changes the person who experiences it. (1975: 103)

This experience not only involves action on the part of the audience; as with the play process described above, Gadamer sees the art experience as involving a movement where the artwork also acts on the audience. This movement is described as associated with the processes of knowledge and understanding. The pleasure of experiencing an artwork involves not just recognizing something one already knows but also "the joy of knowing *more* than is already familiar". It is this, he argues, that puts the being of art outside the consciousness of the audience and into the space of presentation, into the same in-between place in which play operates. For Gadamer, then, art is only art if it has this play between artwork and audience: the necessary condition for the play of art being that it transforms the audience who experiences it.

A more recent approach to the art/play relationship is that of Eskelinen and Tronstad, who focus specifically on the links between games and interactive art (2004). They categorise art and games into three different types of systems. The first are concrete and produce "the same sequences of signs every time". This type of system, they feel, describes the more traditional linear art forms such as painting, film or literature, where the only "work" required of the audience is to interpret. The second type are regarded as requiring more work from their audience and "have the potential of manifesting themselves differently every time they are used" (Eskelinen & Tronstad 2004: 198). These systems, however, still have the primary goal of interpretation and this category is where Eskelinen and Tronstad place interactive art. The third type of system in their categorisation are games, which, they argue, are similar to the second in terms of the type of work that they require from their audience/player. Crucially, however, this third type of system is described as not being driven by interpretive goals or interests but rather by the need to configure:

> ... in art we may have to configure in order to be able to interpret, whereas in games we have to interpret in order to be able to configure ... (Eskelinen & Tronstad 2004: 197)

The three types of systems, therefore, are differentiated by their relationship to the processes of interpretation and configuration. For Eskelinen and Tronstad, while all have the goal of interpretation, only art that also involves configuration can be regarded as similar to a game and involve play.

One of the potential problems for artworks that do involve configuration is dealing with the level of "insecurity" that the instability of their form can evoke. Such works do not present their audience with a "manageable totality" and this means that the audience needs to use "very different strategies of comprehension" if it is to understand them (Eskelinen & Tronstad 2004: 199). This type of work can not only be difficult for the audience but can also produce unreliable outcomes, both leading potentially to feelings of insecurity. Such feelings can interfere with the pleasure that an audience would usually expect to gain from interpreting an artwork. Eskelinen and Tronstad point out that games "pacify" this type of insecurity with their rule-based structures. Games, they say:

> ... promise fun and pleasure in exchange for following and applying the rules. That's exactly what art sometimes promises to do, too, but what it rarely delivers. (2004: 200)

They are suggesting, therefore, that delivering fun and pleasure in exchange for audience adherence to the rules of play could help an interactive artwork reduce the problem of audience insecurity.

Three design strategies for playful interactive artworks have emerged from this discussion of art and play. Firstly, that such an artwork should be designed to be performative and to actively involve the audience in this performance in a way that contributes to the creation of its essence as a 'work'. At a base level this strategy will not be difficult to execute, for it describes the essential condition that distinguishes an interactive artwork from a non-interactive one. As with all design, however, there is a range of possible responses to this concept of audience *contribution* and it is the design of the *quality* of this contribution that will be the difficult task. This is a task that will also, I suspect, have a major impact on the ability of the artwork to achieve the level of audience engrossment that is required to maintain a play experience.

The second strategy to emerge was that the to and fro play of action and reaction within the artwork experience should be designed in such a way that it has a perceptible effect on the audience. Although it could be argued that the second part of this strategy, transforming the audience, is what distinguishes art from non art, this does not make it any easier to design for. We have already discussed, from a play perspective, the influence that player attitudes and qualities can have on the success of a play experience and the same is true of an art audience. The key thing to focus on with this strategy might be rather that it is the *movement* of play that should cause this effect. This might then involve designing the processes of configuration and interpretation in such a way that

together they produce the kind of meaningful play that can have an affect on its audience.

Lastly, the discussion suggested that designing for fun and pleasure could help alleviate the type of audience insecurity that can be evoked by the variable nature of an interactive artwork. This last strategy is one that requires further investigation in order to really understand the practical implications it suggests. The next chapter will, therefore, focus on investigating the possible pleasures involved in a play experience and will attempt to draw some practical conclusions about strategies one might use to design for fun and pleasure within an interactive art experience.

CHAPTER 4:

THE PLEASURES OF PLAY

> ... when an act is performed solely because of the pleasure it affords, there is play.
> (Groos 1901: 5)

Like Groos, many other theorists have focused on pleasure in their analyses of play experience. This chapter will outline the findings from a survey of six key theorists who have each studied the various pleasures that can be experienced during the occurrence of play. A synthesis of these theories led to the development of a play framework of thirteen types of experiential qualities that could possibly arouse pleasurable feelings when one is playing. The aim was to develop a tool that could then be used to aid the experiential design of playful interactive artworks.

4.1 Developing the Play Framework

The play framework[1] was developed as a synthesis of the ideas of six theorists all of whom approached play and pleasure from different perspectives. Firstly, the framework was inspired by the theories of philosophers Karl Groos and Roger Callois, whose ideas arose out of their desire to accurately define a play experience (Caillois 1962; Groos 1901). Secondly, the play framework was influenced by the ideas of the psychologist Mihaly Csikszentmihalyi, who focused on play as a type of pleasurable experience, and the psychologist Michael Apter, who focused on the stimulation of play (Apter 1991; Csikszentmihalyi 1975). Lastly, the play framework drew on the ideas of game designers Pierre Garneau and Marc LeBlanc, who were interested in delineating types of pleasure in games (Garneau 2001; Hunicke, LeBlanc & Zubek 2004). Although the differing perspectives of each theorist meant that their ideas could not be directly equated, there was enough similarity of focus to enable several common themes to emerge when they were each compared. These common themes were then developed into a play framework, with this development focusing on the experience of play within an interactive art context. This was a context that influenced which ideas

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[1] The framework was initially called a "pleasure framework" and appears as such in some of the publications arising from this thesis. It was later decided that "play framework" was a more accurate descriptor.

had more emphasis in the final framework. Those ideas that seemed to relate to the narrower more defined world of games, for example, were often combined into one broad theme because it was felt that this suited the wider range of play experiences that could occur within an art experience.

The different perspectives of the seven theorists are reflected in the names they each gave to the categories they developed. Groos called his categories pleasures, while Callois called his attitudes. Csikszentmihalyi called his needs, while Apter's categories were strategies of arousal. Garneau described his as forms of fun, while LeBlanc's categories were aesthetics. These alternatives were all considered when deciding what to term the thirteen categories within the play framework. It was finally decided to use the term *pleasure*, even though the categories within the framework were regarded as each being capable of arousing as much displeasure as pleasure. However, an audience member who experiences displeasure is liable to become distracted and to stop exploring an artwork and this lack of engagement is not the aim of this research. Calling the categories pleasures, therefore, symbolised the purpose of these categories within this particular design context. That is, within such a design these categories aim to evoke pleasure. The categories within the play framework detail the types of experiential qualities that an audience member might gain pleasure from when experiencing play within an interactive art context. They are intended to be used in design and evaluation to help define, describe and/or identify the characteristics of a play experience.

The thirteen categories within the play framework were also called pleasures because of pleasure's association with both play and absorption (Blythe & Hassenzahl 2003: 95). In everyday language an audience would probably not make much of a distinction between pleasure, enjoyment and fun. However, for theorists Blythe and Hassenzahl it is important to distinguish between these three terms. In their view, enjoyment is a generic term that encompasses the two different types of experience that are described by fun and pleasure. For them, a fun experience is associated with distraction and has the qualities of triviality, repetition, spectacle and transgression. Pleasure, on the other hand, is associated with absorption and has the qualities of relevance, progression, aesthetics and commitment (Blythe & Hassenzahl 2003: 95). They see pleasure as being associated with an activity and with experiences that are "personally meaningful", whereas fun is the "absence of seriousness" (Blythe & Hassenzahl 2003: 97). In these terms, both fun and pleasure could be experienced during play, but whether one or the other is experienced could depend on either the personal qualities of the player *or* on the character of the experience. As the character of the

interactive art experience that this project aims to create aligns most closely with many of the qualities that Blythe and Hassenzahl associate with pleasure, this will be the main term used in the discussion that follows. The term pleasure, therefore, is representative of this research project's focus on stimulating play and its aim to encourage deep engagement with an artwork.

4.2 Theoretical Influences

The six theories that influenced the development of the play framework are summarized below in table 3. This table also shows how each idea relates to the final synthesis of thirteen categories (right-hand column). As with any summary, this table does not do justice to the complexity of the ideas being expressed by these theorists and should by no means be regarded as trying to do so. In many cases the final framework was influenced by just one aspect of a certain theorist's ideas rather than being directly drawn from their total concept. The table should be read, therefore, as a map of the relationship between the final framework and the different theories that have influenced it.

Table 3. Summary of the play framework's contributing theories

Groos	Callois	Csikszent'	Apter	Garneau	LeBlanc	Framework
Pleasure of being a cause		Creative		Power Creation	Expression	**Creation**
	Competition		Exploration			**Exploration**
				Discovery	Discovery	**Discovery**
		Problem solving		Intellectual problem solving		**Diffi culty**
			Challenge	Application of skill	Challenge	
		Competition		Competition Advancement & completion		**Competition**
	Chance	Risk & chance	Facing Danger	Thrill of danger		**Danger**
				Immersion	Submission	**Captivation**
Aesthetic sympathy	Vertigo		Arousing stimulation	Physical activity	Sensation	**Sensation**
			Fiction & narrative	Beauty	Narrative	**Sympathy**
Pleasure of make believe	Simulation			Immersion		**Simulation**
		Friendship & relaxation			Fantasy	**Fantasy**
				Love Social interaction	Fellowship	**Camaraderie**
			Negativism Cognitive Synergy	Comedy		**Subversion**

The table above arranges the various influential theories chronologically with the earliest to the left and the most recent to the right. This reveals a tendency for

each categorisation to become increasingly more specific. As they do so, each theorist is quick to point out the impossibility of ever arriving at a definitive list of the pleasurable qualities of a play experience. Likewise, the play framework presented here should not be regarded as a definitive list, nor should its categories be seen as discrete elements. It will become clear as we explore each of the categories that interrelationships often occur amongst them and their boundaries are sometimes quite fluid. The categories in this play framework are only *possible* pleasures that might be involved in a play experience within an interactive art context. They are not regarded as being essential, rather, they provide a framework for describing and thinking about the different pleasurable qualities that might be involved in such an experience.

The following sub-sections will outline each of the six different theories that influenced the development of the final play framework. We will deal with each of these theories separately because each involves concepts that were instrumental to the development of a different grouping of experiential qualities within the final play framework. The final sub-section will then deal with four factors that are regarded as being modifying variables for each of the categories.

4.2.1 Karl Groos

The development of the play framework drew on three concepts developed by Karl Groos at the end of the nineteenth century. The first of these was the "pleasure of being a cause" and this, Groos argued, is the primary overarching pleasure of all play. He regarded his next category, the "pleasure of make-believe", as a sub-category within this (1898: 296). His third concept, the idea of "aesthetic sympathy", he then saw as being related to psychological and physical processes within this sub-category of make-believe (1901: 322). His three concepts are therefore related hierarchically, with the pleasure of being a cause at the top of the structure.

The pleasure of being a cause was first proposed by Groos in his 1898 book *The Play of Animals*. He describes this pleasure as the "delight in the control we have over our bodies and over external objects", as the delight of extending "the sphere of our ability" and also as the "joy in being able to accomplish something" (Groos 1898: 290). He relates this joy to an instinctive "striving for supremacy" and says that the animal begins by "mastering" its body and then turns its attention to mastering objects and finally develops more social forms of play. These social forms of play are, he argues, still related to supremacy. He associates, for example, play based on building, nursing or curiosity with "impulses of ownership and subjugation", while imitative play and courtship are associated

with rivalry (Groos 1898: 290). Groos sees being a cause as united with the sense of freedom in play, for "if I were able only to set an act on foot, but not go on with it, my freedom would vanish as soon as my causality ceased" (Groos 1898: 322). Pleasure in being a cause is regarded by Groos as the "psychological foundation for all play" (1898: 290).

Groos regards the pleasure of make-believe as a secondary pleasure that is linked to this primary pleasure of being a cause. For Groos, as with many later theorists, one of the most fascinating aspects of make-believe is the player's state of "conscious self-illusion" (1898: 302). In order for make-believe to operate as play, a player must act as if the make-believe is true whilst still maintaining an awareness that it is not true. For example, in play, actions that may have more serious consequences in the real world (e.g. a punch) are usually protected by the frame of make-believe, by the awareness that one is "only playing". As Groos comments, a lack of conscious self-illusion, that is, a total belief in make-believe, would shift the activity out of play and into the realm of the pathological (1898: 316). Being in a state of conscious self-illusion is, therefore, essential for maintaining the play experience.

This conscious self-illusion is, Groos argues, tied to a sense of being the cause of the make-believe and this feeling is pleasurable. As he puts it:

> ... the real I feels itself to be the originator of the make-believe images and emotions which it calls forth voluntarily, and this feeling of being a cause glides over unconsciously to the world of illusion and gives to it a quality not possessed by reality. (Groos 1898: 315-316).

In stating this Groos is arguing against the position of contemporaries who saw consciousness during make-believe as actively oscillating between the real and the apparent. For Groos, our sense of being the cause of the illusion means it is always characterised as "not real" and we do not have to consciously keep making the distinction.

The pleasure that then arises out of this feeling of being the originator of make-believe is, Groos feels, tied to a feeling of freedom that comes from having control. He argues that while reality makes us feel "helpless" and "oppressed", in make-believe "we feel free and independent" (1898: 315-316). This emphasis on a freedom from oppressive reality is echoed by other theorists. For example, Buytendijk, writing in 1933, lists as one of his two "motivational forces" of play a "liberation drive" or an urge to be free from the pressure of the real world (Berlyne 1968: 831). Another theorist, Goldman, describes the power that make-believe play gives children to "recontextualise their experiences ... free of the

temporal-spatial and motivational constraints" of real life (1998: 2). Child psychologist Winnicott ascribes to the creative freedom of play an attitude to eternal reality that "makes the individual feel that life is worth living" (1971: 65). For these theorists, the enjoyment of playful make-believe stems from the feeling of freedom one obtains from being able to create one's own reality in illusion.

Groos' third concept, that of aesthetic sympathy, describes aspects of these psychological pleasures of play more specifically and, most importantly, connects them to the physical pleasures of the playing body. He describes the powerful affect induced by play as being both physical and psychological. The power of this relationship is later attributed by Winnicott to the "magic of intimacy" (1971: 47). Winnicott positions the object of play as paradoxically neither part of the self nor part of "the not-me, that which the individual has decided to recognise ... as truly external" (1971: 41). Similarly, Groos positions the object of play as neither completely external nor completely internal to the player. This relationship, for him, is characterised by a process he calls "aesthetic sympathy" whereby "we put ourselves into the object observed and thus attain a sort of inward sympathy with it" (1901: 322).

Groos defines aesthetic sympathy as involving the following processes:

> The mind conceives of the experience of the other individual as if it were its own.
> We live through the psychic states which a lifeless object would experience if it possessed a mental life like our own.
> We inwardly participate in the movements of an external object.
> We also conceive of the motions which a body at rest might make if the powers which we attribute to it were actual.
> We transfer the temper, which is the result of our own inward sympathy, to the object and speak of the solemnity of the sublime, the gaiety of beauty, etc. (1901: 323)

Groos argues strongly against characterising this process of aesthetic sympathy as purely a matter of psychological association. He describes the process rather as "one of simultaneous fusion, in which the consequences of earlier experience unite with sense-perception to effect a direct harmony" (1901: 325). It is a process, then, where the past and present of lived experience fuse together.

Aesthetic sympathy is seen by Groos as involving not only past and present experience but also as psychological well as physical operations. These physical operations are often imperceptible and include things such as eye movements, tactile sensations and a tensing of the muscles and joints (1901: 328). As an example, Groos describes the feeling when watching marching troops that one is

"keep[ing] time with them in the sensations of…[one's] lower limbs" (1901: 329). Contemporary game theorists have also observed this type of sympathetic physical movement and describe digital game players as a "twitching, blinking, buzzing bundle of nerves" (Moriarty 1998–2002: para. 157). These movements of digital game players are termed "Non-Registered Inputs" (NRIs) by Newman, who, like Groos, argues that they play an important role in intensifying the player's experience (2002: 410). Groos makes an important distinction between actual movements and sympathetic movements, pointing out that sympathetic movements are symbolic of other movements and are not copies. He likens them to the small movements made by the body whilst dreaming and argues that the satisfaction one gets from sympathetic movements lies not in the physicality of the movement but rather in the way that the movement symbolically "satisfies the imitative impulse" (Groos 1901: 332-33). For him they are, therefore, linked to the pleasure of make-believe.

Groos' category of aesthetic sympathy and the distinction that he makes between actual physical movements and sympathetic movements strongly influenced the decision to include the two categories of sensation and sympathy in the play framework. Although the pleasure of being a cause and the pleasure of make-believe did not influence specific individual categories they did act as very important framing concepts that then aided the process of synthesising common themes.

4.2.2 Roger Caillois

The second theorist whose ideas influenced the framework is Roger Caillois. He identifies four broad attitudes within the character of play experiences: competition, chance, simulation and vertigo. While these four attitudes sometimes occur alone in play, they can also be combined and most frequently occur in pairs. When they do combine Caillois feels that one attitude will always be the dominant force within the play experience (1962: 76). He regards the pairings of competition with vertigo and chance with simulation as "unnatural" and "forbidden". The pairings of competition with chance and of simulation with vertigo, however, are described as being the most "compatible" (Caillois 1962: 72).

For Caillois the compatibility between competition and chance is a result of both their similarity of purpose and their disparity of method. Competition is linked to the idea of mastery and is seen as being "a rivalry which hinges on a single quality" that is then "exercised, within defined limits and without outside assistance" (Caillois 1962: 14). The player who can most skilfully exercise or

control the specified quality is regarded as the winner of a competition. Although there is also a winner involved in Caillois' attitude of chance, here winning relies on fate rather than skill and the pleasures involved are, therefore, related to a lack of control. In chance, the player takes the risk of submitting to the "capriciousness" of fate and "awaits in hope and trembling the cast of the dice" (Caillois 1962: 17). The pleasures of competition, on the other hand, are related to having and exercising control. Combining the two attitudes, therefore, can result in a pleasurable oscillation between having control and lacking control over the outcome of a game (Caillois 1962: 75).

Competition and chance are united in both requiring rules. Simulation and vertigo, on the other hand, are compatible because they both do not require rules. They rely rather on the power of improvisation (Caillois 1962: 75). Caillois describes simulation as involving "incessant invention", which in play does not involve deception but rather disguise and making believe. Such inventions need to fascinate in such a way that they do not lead to any errors that might "break the spell" of belief in their illusion (Caillois 1962: 19-23). This belief involves the awareness that Groos described above as self-illusion, and this is where vertigo crucially differs from simulation. Where simulation requires awareness, the point of games involving the attitude of vertigo is to "erase such awareness" (Caillois 1962: 75). Caillois associates vertigo with games that aim to "destroy the stability of perception and inflict a kind of voluptuous panic" (1962: 23). He regards the combination of simulation and vertigo as leading to the type of intoxication, frenzy and transport that is usually associated with the "terror and fascination of the sacred" (Caillois 1962: 76). In this pairing the twin pleasures are, therefore, those of conscious illusion and non-conscious rapture.

These two compatible pairings of competition with chance and simulation with vertigo both work, then, to increase and intensify the pleasures they evoke. In contrast, the two pairings that Caillois describes as forbidden work against each other to negate their possible pleasures and thus destroy any sense of play. The forbidden pairing of rule-less vertigo with regulated competition is regarded as destroying most of the qualities that define competition, such as respecting rules, exercising skill and operating within set limits. Similarly, in the forbidden pairing of simulation and chance, the conscious illusion of simulation is not possible if one is to truly submit to fate, for "any ruse makes the turn of the wheel purposeless" (Caillois 1962: 72-73).

Although these ideas about the compatibilities between Caillois' categories do not explicitly appear within the play framework, they will be considered later when the framework is applied. The framework does make use of the concepts of

competition, chance, simulation and vertigo. However, these concepts have sometimes been adjusted in response to ideas by later theorists and in keeping with the interactive art context. In all cases, Caillois' categories are much broader than those with the same name that appear in the play framework.

4.2.3 Mihaly Csikszentmihalyi

The third theorist, Csikszentmihalyi, based his categorisation on that of Caillois and saw his categories as expressing the human needs behind rewarding activities (1975: 25). He made a conscious decision to focus on the situated activities of everyday life because he felt that other theorists had often separated play from its real life contexts. After conducting field studies of attitudes to everyday play activities, Csikszentmihalyi realised that Caillois' four categories did not accurately represent all the areas that his study uncovered. In particular, Caillois' categories did not take into account the emphasis that many people placed on "discovery, problem solving, and relaxing interpersonal experiences" (Csikszentmihalyi 1975: 33). These changes in emphasis reflect the modern Western lifestyle of his study's participants and in so doing expose the cultural specificity of play and the pleasures it evokes. They also reflect his study's focus on adult rather than children's play and also the study's very broad definition of a play activity.

The model that Csikszentmihalyi developed based on these results had the five "clusters" or "dimensions" of friendship and relaxation, risk and chance, problem solving, competition, and the creative (1975: 29). He saw Caillois' four categories as being contained within these five and at times overlapping between them. Friendship and relaxation, for example, included qualities that he felt related to Caillois' category of simulation, for example, "reading, listening to music and watching movies", as well as those that didn't, for example, "being with a good friend". Risk and chance, on the other hand, linked the qualities associated with chance to those associated with vertigo, for example, "playing a slot machine" and "taking drugs". The category of problem solving involved the type of "purposeful-goal directed action" that Caillois would have associated with both competition and chance, for example, "solving a mathematical problem" and "playing poker". Csikszentmihalyi's own category of competition was much narrower, dealing only with the type of competitive activities found in modern sport. The last category, the creative dimension, was associated with "designing and discovering something new" and, therefore, had qualities that Caillois would probably have associated with simulation (Csikszentmihalyi 1975: 27–29).

Csikszentmihalyi's results revealed that, for modern Western players at least, friendship was an important part of play and this was often experienced during make-believe activities. Like Csikszentmihalyi, other modern theorists have connected the pleasures associated with friendship with the make-believe aspects of play and, in particular, with the sharing of beliefs that it entails. Play is regarded as one of the ways that we learn "a conceptual structuring of the universe" (Bateson 1985: 266). In deciding what is in the play space, what is outside the play space and what it all means, Bateson argues that players are developing consensual structures of meanings. Another theorist, Goldman, uses the term "shared understandings" to describe the operation of these attitudes within social make-believe play (1998: 43). He identifies two levels of such understanding at work. Firstly, players come to a play activity with "their typifications of cultural identities and roles, social events, ways of speaking and ways of acting". Secondly, they come to a play activity with "what they have internalised about pretend playing itself" (Goldman 1998: 2). These two levels operating within make-believe produce the pleasure of fellowship that can arise out of sharing cultural understandings with others.

Although Csikszentmihalyi's participants identified friendship as being an important part of their play experiences, it was not the only quality that they highlighted. The five pleasures that occurred most frequently in participant's experiences were likened to "designing or discovering something new", "exploring a strange place", "solving a mathematical problem", "playing a competitive sport" and "listening to good music" (Csikszentmihalyi 1975: 33). The elements in this list and the participants' common understanding of them are very much related to the culture that they come from; however, Csikszentmihalyi argues that the first four can be reduced to the less culturally specific qualities of novelty and challenge. He then distinguishes between two types of challenges, those that involve the "challenge of the unknown" and those that involve the "challenge of competition" (Csikszentmihalyi 1975: 30). For Csikszentmihalyi, novelty and challenge are key characteristics of play activities, which he describes as "ways for people to test the limits of their being, to transcend their former conception of self by extending skills and undergoing new experiences" (1975: 26).

The influence of Csikszentmihalyi's ideas, with their emphasis on friendship and problem solving, can be seen in the play framework's categories of camaraderie, discovery and difficulty. Discovery was also influenced by his concept of the creative dimension, as were the play framework's categories of creation and exploration. His emphasis on the importance of novelty and

challenge had less of an obvious influence; however, elements of these two qualities will return when we go on to discuss factors that might act as modifying variables for the play framework.

4.2.4 Michael Apter

For the fourth theorist of influence, Michael Apter, the defining feature of play is that it does not have any "implications beyond the present moment" and, therefore, that it happens *alongside* one's real life (Apter 1991: 14). Pleasure plays a less important role in his definition of play than it does in those of many other theorists. However, although he does not focus on pleasure, Apter does focus on what he calls the "arousal seeking" quality of play. He develops a list of strategies that cause play and that particularly cause "high arousal" or intense and stimulating experiences (Apter 1991: 17). Apter's focus, therefore, is not on enjoyment but rather on excitement.

Apter sees play as operating on a continuum between the two poles of excitement and boredom. The aim during play is to increase the level of excitement and it is here that pleasure enters his model. In play, high arousal experiences are exciting and are emotionally pleasing. Apter contrasts this relationship to that of real life where high arousal experiences cause anxiety and are emotionally unpleasant. The key factor that differentiates between an experience being pleasant or unpleasant is the "protective frame" of play (Apter 1991: 19). This frame allows one to enjoy situations that real life consequences would make unpleasant.

Apter identifies seven strategies for causing a play state that involves high arousal, strategies that he regards as being "some of the more obvious ones":

1. Exposure to arousing stimulation
2. Fiction and narrative
3. Challenge
4. Exploration
5. Negativism
6. Cognitive Synergy
7. Facing danger
   (Apter 1991:. 19–20)

Five of these categories can be related to concepts from the three theorists that we have already discussed. For example, the first category here has echoes of Caillois' category of vertigo, being linked to situations of "overwhelming stimulation", for example, loud music or nakedness, and to what he describes as

"perceptual puzzlement". Apter's second category of fiction and narrative focuses on emotional and empathetic reception and, thus, can be linked to Groos' concept of aesthetic sympathy. The category of challenge focuses on the arousing potential of difficulty and frustration, which is also a characteristic of Caillois' attitude of competition. Apter's category of exploration focuses, as Csikszentmihalyi did, on the arousing potential of "facing the unknown" (Apter 1991: 19). There are also similarities between Apter's last category of facing danger and the type of risks that Csikszentmihalyi focused on in his category of risk and chance. In this category Apter makes a comparable connection between experiencing danger in play and it occurring within a frame of safety. As he puts it, "a tiger without a cage produces anxiety in people; a cage without a tiger produces boredom; only a tiger in a cage produces excitement", because it has "danger within safety" (Apter 1991: 22).

A particular strength of Apter's categorisation is his inclusion of two categories that we have yet to see anyone else focus on. These are the categories of negativism and cognitive synergy. Apter describes negativism as "deliberate and provocative rule-breaking" and stresses that this needs to occur within the protective frame of play to be pleasurable. The arousing nature of negativism does not just involve doing wrong but can also involve both the excitement of trying to not be "found out" and the excitement of being "found out". It has, therefore, very social and subversive characteristics. Subversion also plays a part in Apter's category of cognitive synergy, which is based on a concept from the field of psychology known as Reversal Theory. Apter says that cognitive synergy occurs when one experiences simultaneous "incompatible properties in relation to a given identity" such as, for example, an adult dressed as a child (Apter 1991: 19-22). This category is associated with jokes, with toys and with representational artworks because all can involve the type of contradictory experiences that have something that "both is and is not what it purports to be" (Johnson 1983: 464). Cognitive synergies are usually enjoyed when they occur within play and disliked when they occur within life, where they can be experienced as "dissonances" or "ambiguities" (Apter 2003: 4).

These two categories of negativism and cognitive synergy had a direct influence on the play framework and, in particular, on the category of subversion, which combines these two concepts. Apter's emphasis on the importance of exploration also influenced the creation of a separate exploration category in the framework, as distinct from the category of discovery. This distinction between exploration and discovery was one that was considered deeply. There are obvious connections between the two categories and these make separating them difficult.

It was finally decided that because it is possible to get pleasure from exploration without necessarily discovering anything it was worth making a distinction between the two. It could also be argued that this type of pure discovery-less exploration is much more likely to occur in interactive art than in a game and this makes the distinction particularly relevant for the context we are concerned with here.

4.2.5 Pierre-Alexandre Garneau

The last two theorists that had a major influence on the development of the framework are both practising game designers rather than academic theorists. Where the previous theorists were driven more by a desire to *interpret* and *understand* a play experience these two theorists were driven more by the practical concerns of designing digital games, that is, trying to *create* a play experience. This digital game perspective meant also that their categorisations were developed with interactive computer-based experiences in mind.

Garneau's categorisation is the most detailed of all the theories and involves fourteen categories that he calls "forms of fun" (2001: 1). He regards these categories as but one "tool" that a game designer could use and stresses that a designer should not aim to include every category, for that "would only create a confusing mix of different forms" (Garneau 2001: 14). The fourteen categories are:

1. **Beauty**: That which pleases the senses.
2. **Immersion**: Going into an environment different from one's usual environment by physical means or by use of one's imagination.
3. **Intellectual problem solving**: Finding solutions to problematic situations that require thought.
4. **Competition:** An activity where the goal is to show one's superiority.
5. **Social Interaction:** Doing things with other human beings.
6. **Comedy:** Things that make one want to laugh.
7. **Thrill of Danger:** Exhilaration coming from a dangerous activity.
8. **Physical Activity:** Activities requiring intense physical movements.
9. **Love:** Strong affection toward somebody.
10. **Creation**: To make exist that which didn't.
11. **Power:** Capacity of having a strong effect, of acting with strength.
12. **Discovery:** Finding something that wasn't known before.
13. **Advancement and Completion:** Going forward in, and eventually finishing, an activity.
14. **Application of a Skill:** Using one's physical abilities in a difficult setting.
(Garneau 2001: 2-14)

Some of Garneau's categories are very obviously game specific, such as "advancement and completion" and "power", and these, therefore, did not have much of an influence on the final framework. Others were similar to categories proposed by other theorists and added to a developing understanding of their concepts, for example, creation, physical activity, thrill of danger, and discovery. The two most influential of Garneau's categories were those of immersion and comedy. In proposing comedy, Garneau is the only other theorist to reference the type of subversive elements that Apter identified. This category, therefore, strengthened the decision to include the category of subversion in the play framework. Garneau's category of immersion was interesting because it provided a different experiential perspective to the fiction and narrative category proposed by Apter. It also had an influence on the play framework's category of captivation. This category was one that developed out of a concept proposed by Marc LeBlanc, the last theorist that we will be discussing.

4.2.6 Marc LeBlanc

LeBlanc's categorisation has eight elements. His intention in developing these was to provide a more useful "directed vocabulary" for game designers and to move away from the generic term "fun". His categories are termed "aesthetics" and are seen as describing "the desirable emotional responses" of a player (Hunicke, LeBlanc & Zubek 2004: 2). These are part of a more complex framework that LeBlanc has developed to discuss game experiences. This framework combines three elements, the *mechanics* of a game's components, the *dynamics* of its behaviour and the *aesthetics* of player emotion.

LeBlanc's eight aesthetics are:

1. **Sensation:** Game as sense-pleasure.
2. **Fantasy:** Game as make-believe.
3. **Narrative:** Game as unfolding story.
4. **Challenge:** Game as obstacle course.
5. **Fellowship:** Game as social framework.
6. **Discovery:** Game as uncharted territory.
7. **Expression:** Game as soap-box.
8. **Submission:** Game as mindless pastime.
   (LeBlanc 2007)

As with Garneau, there are several categories here that echo those proposed by other theorists and that influenced the play framework by adding to a developing

understanding of their definitions. For example, the distinction that LeBlanc makes between fantasy and narrative aided the definition of the categories of sympathy, fantasy and simulation within the play framework. So far, we have seen three different conceptions of the type of pleasure that can emerge from what Apter calls fiction and narrative, Garneau calls immersion, and LeBlanc calls fantasy and narrative. Apter's pleasure related to the empathy people can feel for fictional characters. Garneau's pleasure related to the feeling that one is "living a different life", that one is "acting" in a different environment not just "controlling" it (Garneau 2001: 3). LeBlanc, on the other hand, makes a distinction between the power of imaginative make-believe and the power of dramatic tension. There is a distinction emerging from these three perspectives, between the affective aspects of the *reception* of these type of make-believe activities and the affective aspects of *doing* them.

In the play framework , the categories of sympathy, fantasy and simulation deal with the pleasures related to the *reception* of make-believe activities. Sympathy relates to the emotional empathetic aspects of reception and fantasy and simulation relate to the more intellectual cognitive aspects. The play framework makes a distinction between make-believe activities that are primarily creations of the imagination, that is, fantasy, and those that are designed to mimic or simulate real-life, that is, simulation. It was anticipated that this distinction would be particularly useful within an interactive art context.

The play framework's pleasures of creation and captivation deal with the pleasures related to the *doing* of make-believe activities. Where creation relates to the activities being done by the person interacting, captivation relates to the activities being done by the artwork. Captivation is related to Caillois' category of chance and especially to the association of chance with "negation of the will" and "surrender to destiny" (Caillois 1962: 18). These concepts of surrender and lack of will are also suggested by LeBlanc's category of submission with its connection to "mindlessness". Similar concepts are also found in an interactive relationship proposed by artist Sidney Fels, who describes the effect of a person becoming embodied within an interactive object as involving the pleasure of submission. In this relationship the person feels like the object is controlling them and they get pleasure from being thus controlled. Fels calls this relationship belonging (Fels 2000). In the play framework's category of captivation this more active sense of being controlled by something is combined with LeBlanc's more passive sense of mesmerising mindlessness. Captivation is, then, the pleasure that the participant feels when they are captivated by the make-believe activities of the artwork.

There are four external factors that are considered to act as modifying variables for each of the thirteen categories in the play framework. Behavioural psychologist Berlyne, like Apter, focused on the arousal of play. He developed four categories that he describes as discrepancies, which, as the name suggests, arouse play by piquing interest. These four categories are novelty or change, surprise content, complexity and, lastly, uncertainty or conflict (Berlyne 1968: 838). These variables, it is suggested, will have an effect on the strength of the pleasurable feeling that can be evoked by each category in the play framework. For example, a work may be trying to arouse pleasure in creation but this pleasure will not be felt very strongly if the things that the participant can create are not perceived to be either novel, or surprising, or complex or unexpected.

4.3 The Thirteen Play Framework Categories Defined

This section will now define each of the thirteen pleasure categories within the play framework. These definitions are aimed specifically at describing the experience of interactive art within a modern Western cultural context. This specificity is intentional and aims to make the framework easier to apply in practice when creating interactive art from within this context, as is the case in the research project described in this thesis. These definitions are also intentionally based on a very broad definition of play in order to reflect the wide range of such experiences that can occur in interactive art.

Creation is the pleasure participants get from having the power to create something while interacting with a work. It is also the pleasure participants get from being able to express themselves creatively. For example, he or she might feel pleasure at being able to shape and manipulate a visual element of a work. This pleasure could come from the aesthetic qualities of the visual creation that he or she makes. It could equally come from the simple pleasure of feeling in control of the creation of something.

Exploration is the pleasure participants get from exploring a situation. Because interactive artworks present participants with unfamiliar situations, all will involve some degree of exploration. However, such exploration might not be pleasurable for some works while for others it may be a key pleasure. For example, a work might have many elements that participants can interact with and they might enjoy exploring each one. Exploration is often linked with the next pleasure, discovery, but not always. Sometimes it is fun to just explore.

Discovery is the pleasure participants get from making a discovery or working something out. For example, participants may be unsure about the relationship between their actions and a sound that a work emits and may then feel pleasure when they realise that a specific action can control that sound. The pleasure of discovery can also relate to the aesthetic elements in the work. For example, a particular action may provoke a different sound each time it is performed and participants may get pleasure from discovering a particularly pleasing sound.

Difficulty is the pleasure participants get from having to develop a skill or to exercise skill in order to do something. An activity can often be more fun if it is not too easy. For example, hitting a ball against a brick wall can become more pleasurable by reducing the target, creating the more difficult task of hitting a specific row of three bricks. In an artwork, pleasurable difficulty might be experienced, for example, in a work that required participants to coordinate a hand gesture with a fast moving object on a screen. Difficulty might also occur at an intellectual level in works that require a certain amount of skill to understand them or an aspect of their content. For example, a work that can be grasped quickly might be less pleasurable than one that is perceived to be more complex.

Competition is the pleasure participants get from trying to achieve a defined goal. This could be a goal that is defined by them or it might be one that is defined by the work. Achieving the goal could involve working with or against another human participant, a perceived entity within the work, or the system of the work itself. For example, a work might require a participant to compete with a fellow participant so that they can move a visual element to a particular spot and they may get pleasure from trying to achieve this. In a work where participant movement triggers different sounds a participant might also experience the pleasure of competition if he or she chooses to set the goal of trying to trigger as many simultaneous sounds as possible. The pleasure of competition is often experienced in tandem with the previous pleasure, difficulty.

Danger is the pleasure participants get from feeling scared, in danger, or as if they are taking a risk. This feeling might be as mild as a sense of unease. For example, participants might feel a pleasurable sense of unease about what a work might do in response to their actions. It could also be quite a strong feeling. For example, participants might become very attached to a character represented

within a work and feel a pleasurable thrill of danger when they sense that there is a threat to that character.

Captivation is the pleasure participants get from feeling mesmerized or spellbound by something or of feeling like another entity has control over them. For example, the sound or vision of a work might captivate participants for a while, making them unconscious of their other surroundings. Captivation could also involve participants enjoying a feeling that a work is controlling or driving their actions.

Sensation is the pleasure participants get from the feeling of any physical action the work evokes, such as touch, body movements, hearing, vocalising, etc. For example, interacting with the work may require participants to wave their arms about in a way that is pleasurable or it may cause them to touch an object that has an enjoyable texture.

Sympathy is the pleasure of sharing emotional or physical feelings with something. For example, participants might sympathetically feel the movement of a represented dancing creature or they might sympathetically relate to the emotion represented by a crying face.

Simulation is the pleasure of perceiving a copy or representation of something from real life. For example, participants might get pleasure from the way an interaction with a work simulates the rocking to sleep of a baby.

Fantasy is the pleasure of perceiving a fantastical creation of the imagination. For example, participants might get pleasure from the representation of a creature that is made from a blend of human and animal body parts.

Camaraderie is the pleasure of developing a sense of friendship, fellowship or intimacy with someone. This could be with another human participant or with a perceived entity within the work. A work could specifically require or encourage people to interact with each other or it might merely establish an environment that permits social interaction. For example, in a work where movement triggers visual patterns participants may experience the pleasure of camaraderie when they create a visual composition together with another participant. They might also experience the pleasure of camaraderie in a work that allows them to converse or interact with a virtual character.

Subversion is the pleasure of breaking rules or of seeing others break them. It is also the pleasure of subverting or twisting the meaning of something or of seeing someone else do so. For example, a work might require participants to behave in ways that would be frowned upon in real life and they might get pleasure from being so mischievous. The content of a work might pleasurably subvert a meaning, thing, or relationship from real life. Participants might also feel subversive pleasure simply from behaving in ways that they perceive as being "against the rules" of the world set up by a work.

4.4 Trialling the Play Framework

The individual names used to refer to each of these categories in the play framework were chosen carefully. In part, the names were chosen to suit the play framework's potential use as an evaluation tool, with the name of each category aiming to reflect its concept in such a way that it would be easily understood by evaluation participants. The success of this aim was not trialled until later in the research project when the play framework was used within participant evaluations. The category names were also chosen to suit the interactive art context and this suitability was something that was trialled at this stage. This trial involved applying the play framework to a selection of thirty existing interactive artworks. These works were mostly analysed on the basis of a description rather than an experience but all were works that were widely known and considered to be successful pieces of interactive art. The selection included some works that were quite obviously playful, such as Mary Flanagan's [*giantJoystick*] (2006), Paul De Marinis' *RainDance/ Musica Acuatica* (1998) and Mark Cypher's *Biophillia* (2006). It also included works that were interactive but not so obviously playful, such as David Rokeby's *n-Cha(n)t* (2001), Thecla Schiphorst's *Felt Histories* (1998-2000) and Christa Sommerer and Laurent Mignonneau's *Mobile Feelings* (2002-2003). The analysis occurred after the artworks *Elysian Fields* and *Sprung!* had been created but before the first iteration of *Just a bit of Spin*.

This analysis process raised some methodological issues relating to the application of the play framework. These concerned whether to use a scale to indicate the strength of each of the experiential pleasures identified in an artwork experience. For the first group of artworks that were analysed, a simple cross indicated whether a pleasure might be likely to be present during the experience of an artwork. This revealed that some categories, particularly exploration and discovery, seemed to be present in almost all of the artwork experiences. It was decided, therefore, that what was important in terms of an artwork's character

was whether or not a category could be described as a *key* pleasure for that work. To determine which pleasures were key, a scale from 0-3 was used to indicate whether a certain category was present and, if it was, the strength of the pleasure it might evoke. The rest of the artworks were analysed on this basis, with just the key pleasures being identified and with the scale being applied. Table 4 gives a brief description of this second group of artworks and table 5 details the scale that each artwork was assigned for each pleasure category.

Table 4. Brief description of the second group of existing artworks

Title	Artist	Year	Brief description of interaction
Giant Joystick	Mary Flanagan	2006	Participants play an arcade style video game by collaboratively manipulating a giant joystick.
Rain Dance	Paul De Marinis	1998	Participants walk with umbrellas under streams of water. The water contains audio signals that can only be heard under the umbrella.
Biophillia	Mark Cypher	2006	Organic forms grow out of and interact with the participant's shadow.
Nervous	Bjoern Schuelke	1999-2003	Bright orange fluffy objects on a wall create sounds and vibrate as participants move their hands around them.
n-cha(n)t	David Rokeby	2001	Multiple screens display an ear that is either blocked, unblocked or cupped for listening. A complex network of computers listens to and reacts to participant speech within the space with their own self-composed sentences. If no-one is audible the computers gradually fall into sync with a single chant.
Mobile Feelings I	Christa Sommerer, Laurent Mignonneau	2002-2003	A pair of organic gourds allow participants to exchange the vibration of their heartbeats and the movement of air created by their breath.
Felt Histories	Thecla Schiphorst	1998-2000	A doorway contains a touch sensitive surface with rear projected video. The touch of participants triggers video and audio of a woman in various situations involving a doorway.
Mother, Child	Heidi Tikka	2000	A video image of a baby is projected on a piece of fabric on a participant's lap. The baby becomes restless if others in the space are noisy and must be rocked to calm it.
Mimetic Starfish	Richard Brown	2000	The projected image of a giant starfish reacts to the movement of participants. It comes closer to them if they move slowly but contracts if they move quickly.
Resonance of Four	Toshio Iwai	1994	Participants use four mice to control the position and amount of dots on four grids. A visual "playback head" passes over the grids and plays a sound for each dot.

Table 5. Scaled pleasures for the second group of existing artworks

Title	Creation	Exploration	Discovery	Difficulty	Competition	Danger	Captivation	Sensation	Sympathy	Simulation	Fantasy	Cameraderie	Subversion
Giant Joystick	1	1	1	3	3	1	1	2	0	3	0	3	2
Rain Dance	1	2	2	0	0	0	1	3	0	1	1	0	2
Biophillia	1	3	1	0	1	0	0	1	2	0	2	2	1
Nervous	3	2	2	0	2	0	0	3	0	0	0	1	0
n-cha(n)t	1	3	2	2	0	1	3	1	2	2	0	2	1
Mobile Feelings I	2	1	1	0	0	1	0	3	1	1	1	3	2
Felt Histories	1	2	2	0	0	0	3	3	2	0	2	1	0
Mother, Child	1	0	1	0	2	1	1	3	3	2	0	2	0
Mimetic Starfish	1	2	1	0	0	0	2	1	3	2	0	3	0
Resonance of Four	3	1	1	2	3	0	2	0	0	1	0	3	0

This analysis process did reveal potentially useful detail about the playful character of these artworks. The key pleasures of each work were those that received a scale of three. However, without any participant experience driving the analysis, the applied scales in table 5 can only ever be tentative. For example, although it was clear that a participant would be likely to feel the pleasure of creation in *Felt Histories*, it was not clear without experiencing the artwork how key this pleasure might be within their experience. It was also difficult to assign a scale to the pleasure of competition. A work like *Giant Joystick* with its game-like structure plainly involved goals as did works like *Nervous* and *Resonance of Four* with their emphasis on musical creation. Other works were more difficult to scale. In *Rain Dance* participants could potentially create self-defined goals when playing with the relationship between streams of water and their umbrella but it was again difficult to judge how key this pleasure might be. A valuable reminder,

therefore, that emerged from this analysis of artworks was that the framework cannot be divorced from actual experience. The play framework characterises the relationship between a participant and an artwork and is, above all, experiential.

The analysis process also offered an opportunity to reflect on what play might mean within the context of interactive art and on the applicability of the play framework within this context. The differing characters revealed in the artworks emphasised the importance of adopting a very broad definition of play. All three categories of Salen and Zimmerman's definition ("game play", "ludic activities" and "being playful") were identified (2004: 304). Although it was found to be relatively easy to apply the framework to this wide range of interactive works, some refinements needed to be made to the names used to describe each category so as to make them more applicable to this art context. For example, the category of *rule breaking* was changed to *subversion*. It was felt that subversion with its connotations of rebellion and the twisting of things more accurately described this pleasure for interactive art. Another important change at this point involved the category of *submission*. This category was re-named *captivation* because it was felt that its connotations of being mesmerised and of falling under a spell more clearly encapsulated what this category meant within an art experience.

Two pilot tests were then conducted to further examine the play framework's applicability within an interactive art context and to trial methods for applying it. The first test involved using the play framework during the evaluation of an interactive artwork *Time Smear* created by artist Andy Polaine (2006b). This evaluation took place when *Time Smear* was exhibited in Beta_space at the Powerhouse Museum in Sydney in July 2006. The evaluation used video-cued recall to capture verbal data of participants' experience and this process was followed by a structured interview.[2] The study took place over two days and recruited eight participants from the general public who attended the museum on the day of the study. The play framework was used during the analysis process as part of the coding scheme and resulted in the development of a model of the key pleasures involved in this artwork.

The process of developing the model required interpretation of the verbal data from the video-cued recall sessions. If a comment was made that appeared to align with one of the pleasures then it was coded as such. For example, the comment *"So at that point I figured that it was just the left of the frame that was moving across"* was coded as discovery. It was quickly decided that this was not a very reliable method of applying the play framework because it was very difficult to interpret pleasure from the type of comments that participants gave during their

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[2] These methods are described in more detail in chapter two.

recall sessions. Although the model produced from these comments was useful analytically, this method of only applying the play framework as a code during evaluation analysis was rejected.

The second pilot test involved applying the play framework to the researcher's experience of three interactive artworks. These three works were all part of the travelling *Experimenta Vanishing Point* exhibition and were experienced when the exhibition was installed at the Newcastle Regional Art Gallery in September 2006. The researcher experienced all three artworks and then completed a simple survey sheet for each work. The survey listed each of the thirteen categories within the play framework and the researcher scaled these using the same 0–3 scale developed in the earlier analysis of existing artworks. Based on this experience, it was decided that this survey method could be useful during evaluation sessions as a more direct method of obtaining data about the type of pleasures that participants experienced. The researcher did, however, find it difficult to make the fine distinctions demanded by the four-level scale and it was also not so clear how useful these fine distinctions were. Accordingly, it was resolved to continue with a focus on key pleasures but to use a reduced scale when using this play framework survey method in the first case study.

In both of these pilot tests the new play framework seemed to be a useful tool for thinking about the playful aspects of the artworks under analysis. The next stages of the research would involve applying it during the design and evaluation of the four interactive artworks that would be created for this project. The findings from these processes would suggest whether and in what ways the play framework could be useful as a strategy to aid the creation of playful interactive art. These findings would also raise issues regarding the definitions and terminology used within the framework and lead us to later revisit some of the development questions explored in this chapter.

It should be noted that the play framework that has emerged here is regarded as being potentially applicable to all types of play contexts. This framework has synthesised ideas and models of play that in some cases were focused on all types of play and in others were more narrowly focused on games. Filtering this synthesis through the context of interactive art has allowed us to create a framework that has the depth of the models developed by game developers and also the breadth of the models developed by play theorists. Although the terminology and descriptions within the play framework have been tailored for an interactive art context, the pleasure categories in the framework are not regarded as being specific to the art world. Play is a universal human behaviour and one can experience captivation, subversion, camaraderie or any other of the

categories whether one is playing with a toy or with an artwork. The framework does not enable one to make a distinction between the categories of toy and art (if indeed such a distinction can ever definitively be made). Instead its value lies in the way the play categories can characterise the experience of play. In this project the framework will be used to characterise play experiences within an interactive art context.

Another point that needs to be stressed is that the thirteen categories within the play framework are only *possible* categories of pleasure that a participant might feel during a playful interactive art experience. They may not occur at all and it is even possible that a certain category might cause displeasure rather than pleasure. It is also expected that the categories would very rarely all occur strongly within a single artwork experience. One trend revealed by the analysis of existing successful artworks was that these artworks had just two or three of the categories as key pleasures, with each work involving a different combination. So it is certainly not being suggested that an artwork that stimulates pleasure in all of the categories will be successful nor is it being suggested that the play framework has any bearing whatsoever on whether something is 'good' or 'bad' art. What is being suggested is that the play framework might be a useful design tool to enable artists and other designers to think in a more detailed and focused way about the type of playful experiences that they want their work to elicit.

CHAPTER 5:

CREATING *ELYSIAN FIELDS*, *SPRUNG!* AND THE *JUST A BIT OF SPIN* PROTOTYPE

This chapter describes the creation of three of the four artworks that were produced during the research process of this thesis. Their creation was an important part of this process, one that would both provoke questions and develop answers. The first artwork, *Elysian Fields*, played an instrumental role in the formation of one of the primary research themes of this thesis. The second artwork *Sprung!* helped to focus this theme and provided the seeds for the development of some tentative conclusions. The third artwork, the prototype version of *Just a Bit of Spin*, tested these conclusions and the results directed the path of the final stage of the research. These three artworks were created over a four-year period, starting from the very beginning of the research process.

The first two works, *Elysian Fields* and *Sprung!*, were created before the play framework was developed. The play framework was applied retrospectively to these artworks just prior to the evaluation process. It was first used by the artist to characterise the type of playful experience that she thought she had evoked. The framework was also then used during the evaluation process of these works. The creation processes of these artworks will be described and a brief explanation of each work will be given in this chapter. The relationship between these two works and the play framework will be discussed later when the evaluation results are detailed in chapter 7.

The third artwork, *Just a Bit of Spin*, was created after the framework had been developed and trialled. The framework played a key role in the development of the initial concept for *Just a Bit of Spin*. It was also used to drive design decisions throughout the whole creation process. This artwork creation process, therefore, was a trial of the application of the play framework as a design tool.

5.1 *Elysian Fields*

The first artwork to be created was *Elysian Fields* in 2003. This work was developed in collaboration with fellow artist Ian Gwilt and used music created by sound artist Dave Burraston. Both of these artists were fellow researchers within the Creativity and Cognition Studios (CCS). The work was developed as a response to the new interactive studio that had just been built for CCS. This

studio had a pressure sensitive floor positioned in front of a large rear projection screen. Ian and I decided to use the floor interface and screen to create an artwork that would give the audience the impression that they were walking through a giant field of grass. I then designed the animations and programmed the interactions while Ian focused on the artwork's background and, most importantly, came up with the title of the artwork. This title, *Elysian Fields,* connected the work to a heavenly place in Greek mythology.

The *Elysian Fields* artwork was consciously designed with a view to achieving three different levels of viewer experience: fascinated observation, non-goal-oriented exploration and goal-oriented interaction. The finished artwork presented its audience with an animated windswept field of abstract grass that covered the entire wall-sized screen (figure 8). Moving towards the screen an audience member would become aware that their physical action of walking in the 'real' installation space was being translated into the virtual 'on-screen' environment, through the animated squashing of tufts of grass and the triggering of sound effects. As he or she moved around, the grasses that had previously been squashed would slowly grow back, triggering a musical tone that blended with the serene music playing in the background. The screen, which was initially full of black blades of grass all moving in unison, would become increasingly chaotic as the tufts grew back in a progressively lighter shade of grey and began moving to a different rhythm. Stepping on particular tufts would trigger an abstract bird animation that would rise slowly up from within the grass and then fly off the top of the screen (see attached DVD). We anticipated that an audience member would begin their experience fascinated by the hypnotic animations, then start exploring the space and finally, when they discovered their first bird, become more goal oriented.
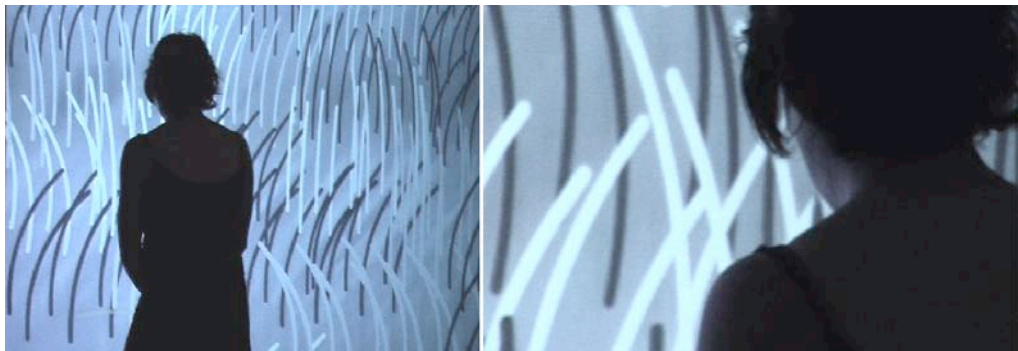
Figure 8: Two views of the *Elysian Fields* interactive artwork

Elysian Fields was never exhibited at an art museum but it was shown along with other works at a CCS research launch event at the University in 2003. During this

event, four groups of fifteen people were shown *Elysian Fields* and another artwork, *Beach*, created by Andrew Martin, a work that also used the same pressure sensitive floor interface. I noticed during these showings that there was a real difference in the way that people moved their bodies when interacting with these two artworks even though they both used the same interface. *Elysian Fields* made the audience stomp their feet as if they were actually using force to crush something. *Beach* in contrast, used the floor interaction to navigate through a series of photographs of a seaside landscape and this made its audience stroll about lightly. *Elysian Fields'* representation of grass squashing, with its accompanying crunch sound, seemed to have a powerful physical effect.

I was so intrigued by the power that this representation had over the audience's physical behaviour that I decided to use the same screen and floor interface for the next artwork that I created. I was interested to see whether a different representational relationship would be similarly powerful. This interest also led to a theoretical focus on the relationship between a physical interaction and its corresponding visual and aural representation. The investigation of this relationship would go on to become a key theme of the whole research project.

5.2 *Sprung!*

The *Sprung!* interactive artwork was created in 2004 while I was a visiting researcher at the Nishimoto Laboratory in the Japan Advanced Institute of Science and Technology (JAIST). The artwork was produced in remote collaboration with Melbourne-based animator and sound designer Alastair Macinnes[1] and was supervised by JAIST professor, Kazushi Nishimoto. *Sprung!* was designed using a similar but portable pressure sensitive floor and screen interface to the one used for *Elysian Fields*. In using this, we aimed to create an interface that was partly a toy and partly a musical instrument. Where the relationship in *Elysian Fields* had been to connect foot pressure with crunching grass, now we were connecting foot pressure with the depression and release of a spring. This new representational relationship would, I predicted, make people leap or jump as they interacted.

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[1] Two publications about this remote collaboration were co-authored with CCS researcher Alastair Weakley. They are listed in appendix 1.
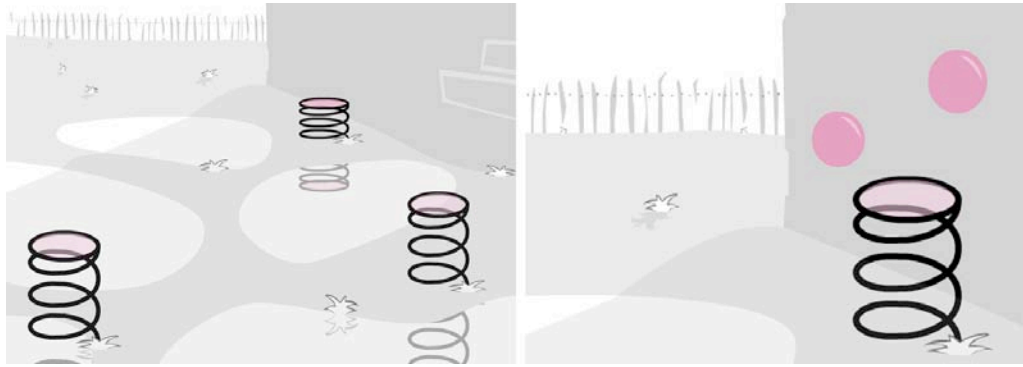
Figure 9: Two views of the *Sprung!* interface

The *Sprung!* artwork involved a large screen depicting a cartoon-style urban wasteland with three large coil springs standing amongst puddles of water (figure 9). The interface used the physical weight of participants standing on three pressure sensitive floor pads to animate these three coil springs. The position of each floor pad was marked on the carpet with a spiral design. Bouncing on these pads caused the springs to depress and release and created animated soap bubbles. There were four different types of bubbles that could be produced on each spring depending on how long the spring was depressed. The bubbles that were created bounced up from the springs before floating down to land in one of the five pools of water. As the bubbles landed they created a ripple on the pool's surface and then popped, producing a musical tone (see attached DVD). The musical tones within the work were based on a Japanese pentatonic scale. Some bubbles produced a single note and some produced a double. With four bubbles for each of the three springs there were twelve different notes or note combinations that could be played.

Sprung! was selected for exhibition in the art gallery section of the GRAPHITE conference held in Singapore in July 2004. As with *Elysian Fields*, this exhibition context allowed me to observe people interacting with *Sprung!* and to come to some initial conclusions about the behaviours that experiencing the work produced. People did leap about and jump as predicted, although only the most playful and unselfconscious did so. A common goal amongst playful people was to try to see if they could depress all three springs at once and they would kneel down and use their hands to do this (figure 10). It was really obvious with this work that, as discussed in chapter 3, some people are more playful than others. Those with a certain childlike *joie de vivre* became intensely involved but those who were more serious did not. I also observed that the work required a certain level of musical knowledge for people to connect with the musicality of the interactions. This musical knowledge had been much more common amongst the group of Japanese students at JAIST that I had tested it on whilst in production.
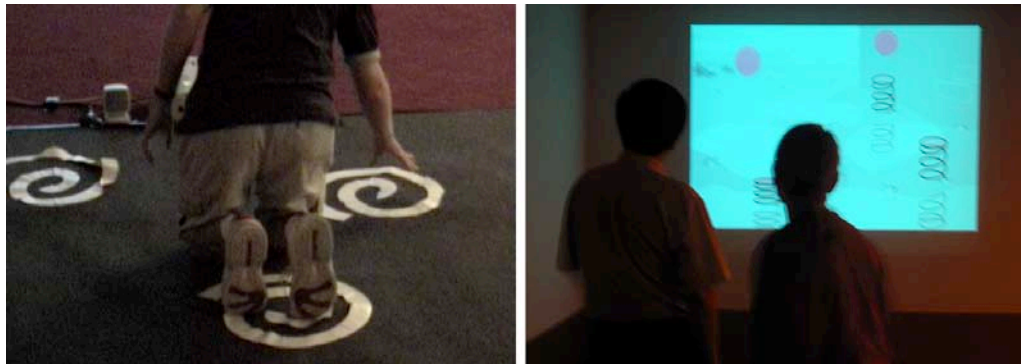
Figure 10: People interacting with *Sprung!* at GRAPHITE 2004

The process of creating and exhibiting *Sprung!* confirmed that there was definitely something powerfully affective about the relationship between physical action and representation within an interactive work. However, I was not yet quite sure where exactly this power lay or how it could be used within a different type of interactive artwork. The process also led me to begin considering in more depth the effect that the personal qualities of the audience members might have on the experience of a playful interactive artwork.

5.3 The *Just a Bit of Spin* Prototype

The creation of *Just a bit of Spin* began in 2006. The first stage of this design process aimed to produce a working prototype that could be formally evaluated. The second design stage then planned to use the results of this evaluation to create a further iteration of *Just a Bit of Spin* and to subsequently conduct a second and final evaluation. These latter design and evaluation stages of *Just a Bit of Spin* are dealt with in the following chapters. This chapter focuses on the first stage of the design process, the creation of the prototype.

The conceptual development of the *Just a Bit of Spin* prototype began after the play framework discussed in chapter 4 had already been developed. I wanted to use this play framework during the design process of the prototype to see whether it would help me to design an interactive work that would stimulate playful behaviours. I began the process of developing this artwork, therefore, by firstly considering the types of experiential pleasures that I wanted the artwork to potentially create. I had noticed in my earlier analysis of existing artworks that many of my favourite artworks used the pleasure of subversion and so I decided to create a work that had subversion as a key pleasure. I also decided that I was interested in working with the pleasures of captivation, sensation, exploration and camaraderie.

The conceptual development of the prototype occurred when I was already well into the research process of this thesis and so I was also able to draw on a wealth of reflective material from my journal. I collated all of this material and organised it into two categories: one contained a list of initial concepts for artworks and the other a list of design strategies. These strategies were reflections that I had either noted when reading about or experiencing other interactive art exhibits or had noted during the creation process of my own previous two artworks. The strategies were:

1   To create interactions that could make people move in physically pleasurable ways.
2   To design interactions that could connect in a real way with the meaning of an artwork.
3   To use abstractness to make a space for the audience's imagination to fill.
4   To use a sequence of interaction goals as a way to build meaning and avoid one-dimensionality.
5   To use human intervention to add vitality.
6   To play with scale.

These strategies, concepts and pleasures were then used to brainstorm ideas and this resulted in the initial concept for *Just a Bit of Spin*.

This initial concept was described in my journal as:

Spinning windmills with faces on them that animate as the windmills spin. Windmills are quite large and are inside cases. People squeeze tactile rubber bulbs to blow them around ... See whole thing as involving a sequence of three windmills. Content is about political or celebrity empty-speak. Add a subversive element by adding another bulb and allowing it to blow the windmill backwards ... then see a different animation and hear different, more naughty, sounds.

In coming up with this idea I was particularly focusing on the first two design strategies. I thought that the squeezing interaction would be physically pleasurable and I thought that by making the spinning interaction create verbal "spin" it would then have a meaningful connection to the artwork. I was also trying to design with many of the experiential pleasures mentioned earlier, most obviously subversion. Additionally, I thought that the tactility of the interface would create the pleasure of sensation and that the animations would be pleasurably captivating. Finally, having the three interfaces would, I thought, provide social multi-user possibilities that would make room for camaraderie.

Figure 11: Transparent animation (left), windmill (centre) and rubber blower bulb (right)

The next stage of the design process involved developing a working interactive mock-up of this idea. I quickly discovered that my windmill concept was not going to work as an animation device even if I used transparent film and tried to project the image onto something else (figure 11). I also realised that the planned bulb-squeeze interaction was not physically pleasurable. What was physically pleasurable was being able to directly touch and control the spin of the object. I began researching early animation devices to see if any of these devices would give me this physically pleasurable spinning interaction and more successfully animate an image. The phenakistoscope (figure 12) was eventually selected as the device on which I would base the *Just a Bit of Spin* prototype.

Figure 12: Phenakistoscope device (left) and *Just a Bit of Spin* prototype (right)

Like a phenakistoscope, the prototype used a spinning vertical disk and a mirror that reflected the images on the rear of the disk back to the viewer. As with the original device, the prototype needed the disk's slits to move past the eye of the viewer in order to create the animation. The prototype device also used a rotary encoder to capture the speed and direction of the spinning disk and fed this information into a computer so that it could then play and control sound files.

These sound files ended up being phrases taken from the speeches of the Australian Prime Minister of the day, John Howard. I chose phrases that either contained the word forwards or the word backwards and then edited these to remove any references to specific current events. Finally, I created a sequence of fifteen phrases for each word so that they could work together as if they were part of a single coherent speech (see appendix 2). These phrases were then recorded using a single male voice.

The last aspect to be designed was the images for the animation. I decided to use a 1950's aesthetic for these images because the Prime Minister John Howard was often described as having ideas that were stuck in this particular era. For the front of the disk, I took a 1950's Persil soap packet design and altered it so that it said "*Policy washes whiter*" (figure 13). I also added directional arrows to the front of the disk to give people a clue that they could spin it in both directions and added an eye graphic near the slits to hint that they should look through them. The main images for the animation on the rear of the disk had two mini John Howards, one running forwards and one backwards (figure 13). The other images on the rear of the disk were more decorative. I had tried to get more meanings into these and to create an animation that would mean one thing when it played forwards and another when it played backwards but none of my ideas had worked. I decided to leave this idea and the concept of having three devices overall for the next iteration of *Just a Bit of Spin*.

Figure 13: Two views of the completed *Just a Bit of Spin* prototype

The completed prototype was, therefore, a single interface that was a reworking of an early animation device. The prototype was constructed quite cheaply out of materials that I had to hand, such as cardboard, broomsticks and wire. Spinning the disk not only created an animation but also produced sounds, and the speed of the disk controlled the speed of these sound files. If the disk was spun first in one direction and then in the other, a bit like a DJ scratching a record, the phrases

within the work would be mixed up (see attached DVD). I was hoping that this interaction was one that would provoke playful behaviours. I also hoped that by playing with this the audience might notice the way that the word "forwards" was always used in a positive way and "backwards" in a negative way and that the overall message being sent by politicians was that progress was inevitable and always a good thing.

I had used the play framework as a design tool throughout the process of developing and creating this prototype. Once I had decided on the key pleasures that I wanted the experience of the artwork to potentially create, I then used these pleasures to make design decisions. As I considered the choices involved in each decision I would ask myself which of these choices would work best to create the key pleasures I was aiming for. This did speed up the decision-making process and was, therefore, quite useful. However, it remained to be seen whether using the play framework in this way would then translate into an audience experience that matched these experiential aims. To discover this I would need to conduct a formal evaluation of the audience's experience of the *Just a Bit of Spin* prototype.

CHAPTER 6:

METHODS OF CASE STUDY ONE

The first case study involved a formal evaluation of the three artworks, *Elysian Fields*, *Sprung!* and the *Just a Bit of Spin* prototype. It was conducted over three days in December 2006. This case study aimed to discover whether the play framework categories that I thought the play experience of the works would evoke were actually experienced by participants. For *Elysian Fields* and *Sprung!* my play framework characterisations of their experience were developed after the artworks had been created. For *Just a Bit of Spin* my characterisation was developed right from the beginning of the creation process. Through this study I hoped to develop a clearer picture of the playful character of each artwork and to discover which, if any, of the aspects of my designs stimulated playful behaviours. I was also interested in whether the new play framework would be a useful tool as part of a user evaluation methodology and whether this would illuminate future design strategies for each work. Above all, I hoped the study would develop some findings about strategies for designing for play.

6.1 The Installation Space

For this case study the three artworks were displayed together in one of the Creativity and Cognition Studios at the University of Technology Sydney. The study did not use the public exhibition environment Beta_space for two reasons. Firstly, the *Just a Bit of Spin* prototype was not robust enough to withstand a public exhibition context. Secondly, it would have been difficult to evaluate all three works together at Beta_space, as the size and technical setup of the space was geared more for the exhibition of a single artwork. The CCS studio had the technical facilities and the space to allow all three works to be shown at once.

The studio installation for the evaluations was designed to mimic a gallery space, with each work having a small black and white descriptive sign that detailed its title, credited its artists and gave a brief one to two sentence description of the work. These descriptions all mentioned the word interactive but were careful not to give any instructions about how to interact. This lack of instructions aimed to draw attention to any confusing or difficult aspect of each artwork's interface and to make it clear what, if anything, might need explaining for each work.

The sign displayed for *Elysian Fields* contained the following information: *The Elysian Fields interactive draws on the story of a mythical space from Greek Mythology. Wondrous, sublime and peaceful, the Elysian Fields are a place where virtuous people would go in the afterlife.*

The sign displayed for *Sprung!* contained the following text: *Part toy, part musical instrument, the music produced by this interactive work is based on a Japanese pentatonic scale known as the Hirajoshi. This work was created during a residency at the JAIST Nishimoto lab in Japan.*

The sign for the *Just a Bit of Spin* prototype displayed the following text: *This reworking of the pre-cinematic phenakistoscope provides an opportunity to interact with the political rhetoric of progress.*

Next to each artwork sign was either a number one, two or three. These numbers indicated the order in which participants should view the artworks and this order was rotated for each evaluation session. As *Elysian Fields* and *Sprung!* both used the same screen and pressure sensitive floor interface they needed to be manually changed over by the researcher at the appropriate time in the evaluation session. The *Sprung!* setup also used three circular red mats to indicate which pads were linked to the three springs within the artwork.

Although the installation tried to mimic an art gallery setting, it was in some ways quite different. The studio space had no windows and this made it both very quiet and very private. There was no possibility that participants could meet, overhear or interact with members of the general public as they could in an art gallery. The studio also had many of the trappings of a technical laboratory setting, including computers, audio-visual equipment, a couch and chairs. Some of this equipment was temporarily hidden from view by black fabric, but the studio was still more of a workspace than an exhibition space. The studio, therefore, was a space that was much more intimate and much less aesthetically controlled than an art gallery.

6.2 Selecting and Refining Methods

This case study employed similar methods to those successfully used in the first two pilot studies and described in chapter two, namely, video-cued recall followed by a structured interview. The study did, however, make two adjustments to the way that these methods were carried out and used two additional methods.

The first adjustment to the methods involved the selection of participants. For this study I selected some participants because of their expertise in the field of interactive art. This adjustment was inspired by the findings of fellow CCS

researcher Lizzie Muller, whose work had suggested that expert audiences could be particularly valuable at the prototype stage of an artwork's development. This was because experts were found to be more capable of dealing conceptually with the unfinished nature of the work (Muller, Robertson & Edmonds 2006). The *Just a Bit of Spin* artwork was a very early prototype and I hoped that using expert participants would give me some useful directions for the next iteration of this artwork.

The second adjustment involved deliberately having some of the participants experience the artworks in pairs. The first pilot study had only involved participants experiencing the artwork individually. This was done because it gave a detailed view of individual patterns of interaction uncomplicated by the social aspects of multiple participants. Nevertheless, observations of the general public interacting with interactive art showed that paired interactions were quite common in art experiences. Accordingly, the second pilot study had tentatively included some paired experiences. Those who interacted in pairs seemed to help each other to figure out the work both intentionally by sharing their realisations and unintentionally by providing an interacting body for their partner to observe. Paired interactions also seemed to perform another important role during the experience of playful artworks, making participants feel less self-conscious and more able to be socially playful. This was especially important for *Elysian Fields* and *Sprung!*, which were deliberately designed for multiple users. Having paired interactions opened up more possibilities for participants to experience the pleasure of camaraderie and, by helping people to figure things out, could also facilitate the pleasures of discovery and exploration. In this study, therefore, the social nature of paired interactions was seen as a positive addition, in particular because it was a factor that could help to foster pleasurably playful experiences.

Lastly, there were two additional evaluation methods both based on the play framework. The first involved getting myself, as the artist of the three works, to reflect on and record the key pleasures that I thought would be experienced in each artwork. The second involved using the play framework to survey each participant about the pleasures that they had actually experienced. The aim was to then compare the results from these two methods, a process that would highlight any similarities or discrepancies between the two views and hopefully result in some fresh insights about the playful character of each work.

6.3 Participant Selection

The study recruited fifteen participants in total. Seven of these were regarded as non-expert. This group included two IT workers, a lawyer, two students and two

researchers. These non-expert users were included to provide a 'raw' general public perspective. The other eight participants were selected because they were expert in some aspect of art production, with all being professional creators of audio-visual, live and/or interactive works. These expert users were selected with a view to obtaining valuable professional advice and comments about the works. They were all people who I knew professionally and that I regarded as my peers, people whose professional opinion I respected. They were expert in a range of different areas of art production: two were expert in graphic design and animation, two were film editors, two were interaction designers, one was a sound designer and one was an expert in performance making.

In recruiting the fifteen participants the study tried to achieve a balanced spread of ages and gender. The participants were evenly spread between the ages of 20 and 50. However, due to some late changes in the participant line-up, the ratio of males to females was not quite so balanced. The study ended up with only five male participants and the majority of participants were, therefore, female.

Nine of the participants experienced the works on their own and six experienced the works in a pair. As already noted above, these paired experiences were partly designed to create opportunities for participants to experience the pleasure of camaraderie. They also allowed the study to record a valuable natural spoken record of each pair's direct experience since those in pairs often spoke aloud about their goals and thoughts. The individual experiences, in contrast, were designed to provide post-experience reflections that were uncomplicated by the social politics that often occurs with pairs.

The number of participants was chosen to allow the three works to be rotated twice through the six possible viewing orders. This was designed to remove any influence that the viewing order might have had on the results and meant that in total there were twelve evaluation sessions with fifteen participants.

6.4 Data Collection

Before they began their evaluation experience, participants were instructed to try to behave as if they were seeing the works in a gallery. They were told they could spend as little or as long with each work as they liked and were given their viewing order. Participants then experienced each of the three works in order and were videoed as they did so, the video camera operator following them around the space as they moved between the artworks. After they completed their experience, the video was played back to them and participants were asked to make a verbal report about what they were thinking and feeling as they

experienced the works. The researcher generally remained silent during these reports but would prompt participants if they fell quiet for a long time by saying "What were you thinking here?". Participants were then asked two interview questions. They were first asked which of the works they enjoyed interacting with the most and then which of the works they thought made them play the most. This report and interview were recorded on video.

Participants were next given a survey sheet that listed each of the thirteen categories from the play framework. The sheet was divided into three columns, one for each artwork (appendix 6). Participants were asked to tick any of the key pleasures that they had experienced while interacting with a work. They were told to give one tick for a pleasure they experienced mildly and two ticks for one they experienced strongly. They were also asked to put a cross next to anything that caused them displeasure in a work. The researcher stressed that the survey was not about describing the artwork but about describing their personal experience. If they did not experience any of the categories then participants were told that they should not tick anything. The play framework category descriptions that appear in chapter four were then read out one-by-one. Participants filled in the relevant part of the survey after each definition.

To finish, participants were asked three more interview questions (appendix 5) and these were also recorded on camera. First, they were asked if there was anything about their responses to the survey that they would like to explain. This question allowed participants to explain any idiosyncrasies in their survey answers and also revealed any uncertainty they may have had about the meaning of the categories. They were then asked if they undertook any activities in their life that they would describe as play and, if so, what they were. Lastly, they were asked if they had any questions about the work or any final comments to make. The whole process took between 45-60 minutes per session.

For the majority of the evaluation sessions there was only one researcher, myself, present in the room. In four of the evaluation sessions, fellow CCS researcher Lizzie Muller was also present and helped to operate the video camera during the participant experiences.

6.5 Analysis

The first stage of the analysis involved collating the results from the participant surveys. These survey results were used to develop a tentative model of the key pleasures involved in each artwork and these models were then tested against the verbal data from the interviews and retrospective reports. Next, these models derived from participant experience were compared to models developed earlier

by the artist. The data from the participant surveys was also analysed from six different perspectives. The first analysis perspective involved collating the data from all fifteen participants and then comparing the results across the three artworks. The next four perspectives inspected the data based on four different pairs of participant variables: expert and non-expert, male and female, under 35 and over 35, pairs and individuals. Each of these pairings involved a unique division of the fifteen participants, as can be seen in table 6. The final survey analysis perspective involved comparing the results across all four participant groupings.

Table 6: Distribution of Case Study One participants across the participant variables

Participant	Exp	Non-Ex	Male	Female	< 35	> 35	Pair	Solo
Interaction Designer 1	■		■		■			■
Performance Maker	■			■		■		■
Lawyer		■		■		■	■	
IT Worker 1		■	■			■	■	
Sound Designer	■		■		■			■
Graphic Designer	■			■		■		■
Film Editor 1	■			■		■		■
Researcher 1		■	■		■			■
Student 1		■		■	■			■
Animator	■		■		■		■	
Interaction Designer 2	■			■	■		■	
Film Editor 2	■			■		■	■	
Researcher 2		■		■		■	■	
Student 2		■		■	■			■
IT Worker 2		■		■		■		■

The next stage of analysis looked in more detail at the video and transcribed data from the interviews and retrospective reports. This data was coded using the audio-visual analysis software *Transana* and the coding scheme outlined in chapter 2 above to produce a set of coded results for each artwork. These results identified responses, thoughts and feelings, descriptions of behaviour, design suggestions and perceptions. The coding process also classified the answers to each of the interview questions and marked any notable behaviour and any misunderstandings.

This coded data was then mapped using the mapping software *Tinderbox* and classified into a series of responses and a set of design suggestions for each of the three artworks. Three meta-level collections were also created that mapped out the play framework survey explanations, general play findings and play definitions. Finally, reflection upon these results and the related survey data from the first stage of analysis resulted in the identification of future design

strategies for each artwork and led to final conclusions about the usefulness of the play framework when designing for play.

6.6 Reflection on Methods

The play framework survey worked well as an evaluation method. Participants generally understood the categories quite quickly and carefully considered their answers. However, because they understood the categories so quickly, some participants became impatient with the length of the pleasure definitions that were read out. After noticing this, the process was sped up by asking participants to signal if they felt they understood a category and were ready to move on to the next section of the survey.

The most successful aspect of the whole play framework survey was the effect that it had on the interview answers that people gave after completing it. Participants answered in great detail about why they had experienced certain pleasures and many of the study's conclusions were strengthened by these answers. The play framework categories in the survey not only made people think in a more detailed way about their experience; the category names also gave them a language that they could then use to express thoughts and feelings. Considering the play framework categories in this depth also led some participants to adjust their survey answers during the interview:

> *I ticked creation but only on a very mild level. I thought exploration was ... actually I'll put two ticks for that, strong.*

The post-survey interview, therefore, was important both in terms of ensuring that the survey results accurately reflected participant experience and in terms of providing verbal data that could help to explain these results.

The use of expert participants did, as expected, produce some very useful data, particularly in terms of design suggestions for future iterations. However, because these experts all knew the artist/researcher the honesty of their responses could have been compromised. This potential compromising of responses might also have worked in reverse, with the professional relationship between the experts and the artist/researcher possibly leading her (me) to take more heed of their responses. There are no easy answers to these two issues. An independent researcher could have been used for the evaluation sessions but, given that this was an unfunded study, it would have been difficult to find someone with the time, skills and commitment. This also may not have solved the problem, for canny participants might have correctly deduced that their comments would later

be reported back to the artist. Alternatively, the study could have tried to find experts who had no connection to the artist. Again this would have been difficult and it might also have changed the important fact that the expert participants were people whose opinion the artist valued. Given these circumstances, the study decided to trust that all parties would give professional responses and to remain mindful of the possibility of compromise throughout the whole process of the case study.

Another aspect of the method that performed as expected was the use of paired experiences. The social communication within a pair did help to foster play and provided experience videos that included many verbalised thoughts and feelings. However, the social nature of the pairings, as anticipated, had an adverse effect on the retrospective reporting process. Having two people report together made the report more of a conversation than a stream of consciousness recall, as usually happened with individuals. The conversational nature of the paired reports made these reports less experiential and more evaluative. Partners also often interrupted each other, preventing thoughts from being completely expressed. A positive aspect of the paired reports was that partners would sometimes question each other about behaviours or feelings they had witnessed during their experiences. This occasionally resulted in important insights into the character of their experiences with an artwork.

One unanticipated, very useful aspect of the study was evaluating the three artworks together. The works were all very different in character and each appealed to a different type of personality. This situation and the interview questions meant that people made comparisons between the three and this revealed details that would not have been revealed if participants had only had the one experience. The comparisons revealed details about individual preferences and these then led to the development of theories about the effect that personality might have on designing for play. Making comparisons between the three artworks also often caused people to define the character of their experiences more precisely. If two of the artworks evoked the same pleasure category, participants would often carefully differentiate between the way the pleasure manifested itself in each artwork experience.

A more tentative reflection about method that I had at this point was a feeling that video-cued recall was not really giving me the kind of data that I needed to investigate play. The retrospective reports produced lots of detail about the process of interacting with a work but because they were so undirected they often only offered tantalising hints about the playful aspects of experience and always required a lot of interpretation. This feeling had started during the pilot study of

Time Smears and it was what had led me in this study to ask people the very direct question, "Which of the three works made you play the most and why?". This direct question, combined with the play framework survey and its associated interview, gave me much more specific play-related data. Armed with this data I could then more confidently interpret what the retrospective reports were able to tell me about playful experience.

This case study had, then, done much to help develop useful evaluation methods for this research project. It also produced a wealth of data, which when analysed would produce many interesting results. It is these results that the next chapter will now discuss.

CHAPTER 7:

RESULTS OF CASE STUDY ONE

This chapter divides the discussion of the results of this first case study into two sections. The first section will look at the data from the play framework survey while the second will deal with the interview data relating to the comparative questions about enjoyment and play. The findings within these two sections will, where relevant, also be supported by the experiential results from the retrospective reports. The last section of this chapter will then reflect on the general implications that these findings might have for the design of interactive artworks that stimulate play behaviour.

7.1 The Play Framework Survey

The play framework survey and its subsequent interview produced both numerical and verbal data, with each playing a different role in the analysis process. The numerical data was extracted from the ticks that participants assigned to the pleasure categories for each artwork. In collating this data, one point was given for a single tick, indicating mild pleasure, and two points for a double tick, indicating strong pleasure. With fifteen participants completing the survey, the maximum points that a category could, therefore, possibly receive was 30 if every participant gave a double tick. These numerical results for the pleasures experienced within each of the three artworks are shown below in table 7.

Table 7: The play framework survey results for all three artworks in Case Study One

Pleasures	Elysian	Sprung!	Spin
Camaraderie	8	11	6
Captivation	16	10	10
Competition	7	7	8
Creation	16	14	15
Danger	5	0	1
Difficulty	7	10	6
Discovery	14	15	14
Exploration	19	16	15
Fantasy	12	6	5
Sensation	17	12	15
Simulation	15	5	7
Subversion	6	2	17
Sympathy	12	6	4

This numerical data was used to make comparisons between the experiential qualities of the artworks and to reach tentative conclusions about which pleasures the audience regarded as key for each individual work. These tentative conclusions were then tested against the verbal data from both the interview and the retrospective reports before any final conclusions were drawn. The numerical data, therefore, was used in the early stages of the qualitative analysis process as a way to quickly reveal possible trends and patterns within the collective audience experiences of the three artworks. The verbal data from the post-survey interview was used along with the retrospective reports to then confirm these trends and patterns.

The next three sections will discuss what the resulting play framework survey trends and patterns revealed about the experiential character of each of the three artworks. Each section will firstly outline the key pleasures that the artist expected to be present in the artwork experience, and then go on to discuss the key pleasures that were actually experienced by the fifteen evaluation participants. In some cases, the expected and the actual pleasures corresponded but in many they did not. Interestingly, these divergences revealed both aspects of the works that needed redesigning and aspects that were unexpectedly effective and that, therefore, needed to be maintained. The result was a much clearer and more precise picture of the playful pleasures that the three artworks could evoke in their audience.

7.1.1 *Elysian Fields*

The *Elysian Fields* artwork was produced quickly and was a work that I regarded more as an experiment than as a fully finished piece. I was pleased with some aspects of the work, particularly the hypnotic qualities of the animation and music, but I felt that the work was a bit one-dimensional and needed more levels. Co-creator Ian Gwilt and I had discussed taking it further and our ideas usually involved adding another level of goal-oriented interaction. When I reflected on this work in terms of the play framework, I decided that its key pleasures would be exploration and captivation but I did not feel that this design of the work would produce either of these particularly strongly. I felt that most of the other pleasures (all except danger, subversion and difficulty) would be experienced to a very minor extent. If we did add more goal-oriented interaction to the work I felt that this would then increase opportunities for the pleasures of discovery and

competition and would also strengthen the participant's pleasure in exploration and captivation.
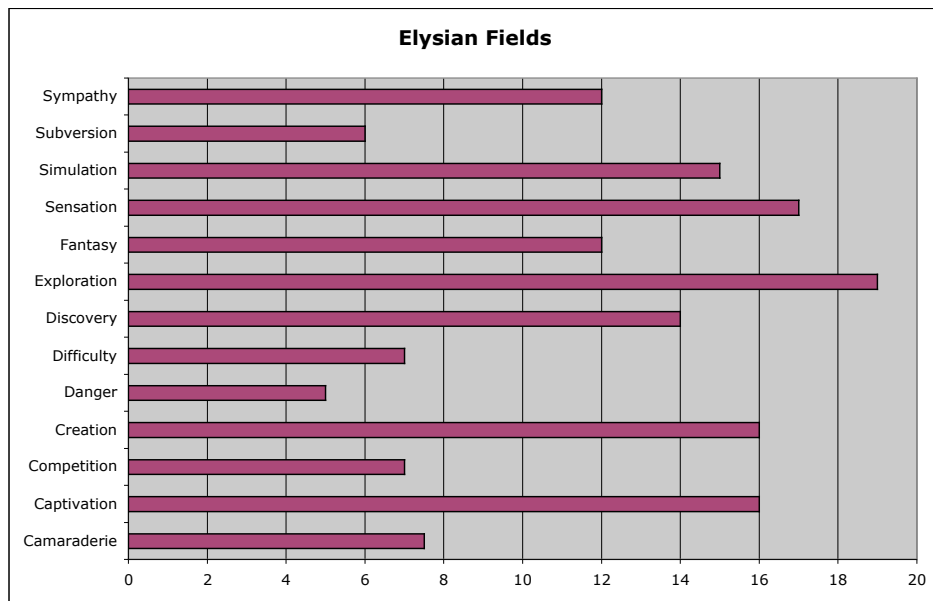
Figure 14: Chart of the play framework survey results for *Elysian Fields*

The play framework survey revealed that the five pleasures that participants experienced most frequently during *Elysian Fields* were, in order: exploration, sensation, captivation, creation (equal third) and simulation. As anticipated, exploration and captivation were key pleasures but the results they achieved were much stronger than I expected. The two main surprises here for me, though, were the high positions given to sensation and creation. The strength of the sensation result was particularly surprising because it was the strongest out of all of the works, even though *Sprung!* used a similar floor-pad interface and the *Just a Bit of Spin* prototype involved a very tactile wheel interface.

So what caused the experience of *Elysian Fields* to produce so much pleasure in sensation? In the interviews and reports, participants frequently commented (8/15) on the sensation produced by the footstep interaction in this work and, in particular, on the sound effect that accompanied their step:

> *That was me, I think, wanting to hear the noise because I quite liked the noise that my feet made in it.*

Many of them correctly recognised that this was the sound of a footstep in snow and for some this gave the piece added resonance, as it reminded them of their childhood:

> *When I heard the sound as I was walking I could remember in my body what that felt like. To put your foot down on snow and feel it compacting in a way that I think only snow can.*

Others commented that the combination of sound and action made them physically feel as if they were stepping on something with more crunch than carpet:

> *I can feel, when I step on the floor, I can feel this kind of crunching sound - it's really like walking on the grass somehow. So it feels really good.*

The factor that seemed to be important here was that this sound was one that evoked a physical sensation. This sensation was evoked partly because of the semantic relationship between three elements: the crunching sound, the physical footstep interaction that caused it and the corresponding visual representation of grass being crushed. However, these strong physical sensations seemed to also be evoked by the very nature of the sound. Footsteps on snow related to a real human physical interaction and could, therefore, resonate with the previous experience of audience members. As Groos put it when defining his term aesthetic sympathy, "the consequences of earlier experience unite with sense perception to effect a direct harmony" (1901: 325).

This strong sense of having a real physical effect may be what also gave participants such strong pleasure from creation. However, there was another factor that appeared in participants' comments about their experiences. They felt a pleasurable tension between having direct immediate control and feeling like the work had a life of its own. As Caillois pointed out, the combination of control and lack of control can produce intense pleasure within a play experience (Caillois 1962:75). As this particular participant expressed it, she could have an effect on the work, but as soon as she moved her effect was erased:

> *And then just stopping every now and again and letting the little stumps just sit there and then I move and these sprouts would come. It was just beautiful, this just ongoing movement and cycle of life ...*

For this participant, the tension between control and lack of control seemed to be particularly affective because it also resonated meaningfully both on a literal level with the growth cycle of the grass and on a metaphorical level with the artwork's title and its reference to the cycle of life in general.

For others, while having control was what made them feel immersed in the work, what they really enjoyed was experiencing the vitality of the work. Several (4/15) talked about wanting to *"just be"* with this living thing:

> *I kind of felt like I was in a field and that because I could make an impact on the field that's why I was in it, but that I didn't want to squash it or change it, I just wanted to be in this thing that is moving and … yeah I could imagine being there - no I **was** there.*

These responses seem to indicate that the pleasure of creation in this work is strongly tied to the pleasure of captivation, to participants' fascination with the movement of the grass. What we are also seeing here again, however, is the affective power of having elements that relate directly to sensual human experience. All of the participants had experienced a field sometime in their lives and their emotional connection to the one within this artwork was, I suspect, aided not just by the visual and aural representation of their physical interactions and not just by the mesmerising vitality of the waving grass but also by their various personal memories.

For another participant the sense of vitality in the work brought with it a sense of intimacy that then gave her the pleasure of camaraderie. Like the person quoted above, creating an effect was the factor that first made her feel immersed. She then felt like the work contained some kind of living "entity" but noted that the intimate power of this was coming from her own resonances with the concepts suggested by the artwork title:

> *Making a difference to what was happening was like being surrounded by it…and because of the connotations that come with the title there's an inherent intimacy… but it's a very nebulous entity on the one hand out there and it's more about a personal intimacy, it's more about what's happening between me and me so that's why I ticked [camaraderie], that's what I meant.*

The representational abstractness of the artwork makes it, in her words, *"nebulous"* and it is this that leaves room for her own thoughts and feelings to resonate, creating a feeling of intimacy.

The play framework survey revealed, then, that *Elysian Fields* was a powerfully affecting work, much more so than I had given it credit for. The

'footstep on snow' sound effect played a major role in creating this power because of the way it evoked physical sensations, both actual bodily ones and remembered ones. Other representational aspects of the artwork also resonated meaningfully with human experience and helped to produce the pleasures of creation and camaraderie. These pleasures seemed to be strengthened by the captivating power of the animations. It was possible to control the work but not totally and this produced a pleasurable sense, as one participant put it, that the work had *"its own life"*. This vitality, combined with the personal meanings that the work provoked, created a strong sense of intimacy for some participants.

7.1.2 *Sprung!*

Compared with *Elysian Fields,* I regarded *Sprung!* as a much more finished artwork. In spite of this, I was still not completely happy with its design. I was quite pleased with the atmosphere created by the work but I was concerned that the work did not allow people enough creative control for it to really work as a musical instrument. When the work was exhibited in Singapore I had observed that the visual signs indicating the time changes between bubbles were too subtle, with many people failing to notice them. I also thought that the experience of creating a bubble was not fun enough. Both factors contributed to the lack of creative control in the work. When I reflected on the character of this work in terms of the play framework I decided that its key pleasures would be creation and fantasy but, given my concerns above, I did not think that creation would be experienced strongly enough to be a key pleasure. I thought that there were seven other minor pleasures that might be experienced in this work but felt that danger, captivation, sympathy and subversion would not be present.
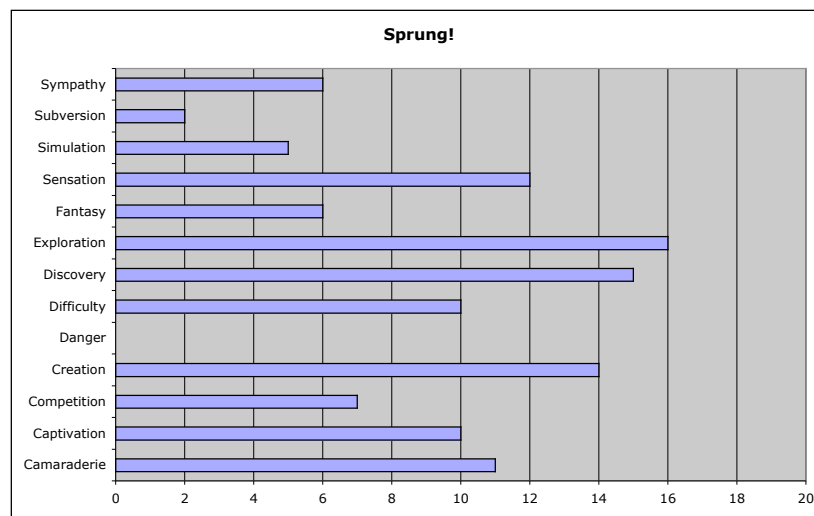
Figure 15: Chart of the play framework survey results for *Sprung!*

In the pleasure model developed from the survey, *Sprung!* was characterised as most frequently evoking the following five key pleasures: exploration, discovery, creation, sensation and camaraderie. Fantasy, which I had expected to be a key pleasure, was not experienced very often at all. Although creation did appear as a key pleasure, the result was not particularly strong compared to the other two works. Camaraderie, on the other hand, was quite strong and this was intriguing. *Sprung!* did not have the sense of vitality of *Elysian Fields*, nor was it a work that particularly aroused human memories and emotions. So what made people experience the pleasure of camaraderie with this artwork?

Most of the people (6/8) who experienced camaraderie with *Sprung*! experienced the work in a pair. In their comments some of these participants said that they had particularly enjoyed experiencing this artwork with their partner:

> *... it felt like with two people participating you could have a lot more outcomes ... you could imagine starting to play sounds together and having the bubbles trigger sounds together.*

The paired participants often worked together to create sounds and to puzzle out the interface. *Sprung!* also made some people feel childlike and free to move in physically pleasing ways and their partner enjoyed watching them do this:

> *... there's a certain pleasure in seeing you jumping up and down on the dots ... it felt like it wasn't what they meant, like they meant you touch them gently ... whereas you were jumping up and down on it and that felt a bit naughty.*

The experience of this work, therefore, had a performative character that was perhaps particularly pleasurable for those in pairs because they had an audience for their performance.

This focus on the performance of those interacting might be one of the factors that stopped people experiencing the pleasure of fantasy. One participant commented that she was *"in the world"* of *Elysian Fields* and this made her experience fantasy. *Sprung!*, on the other hand, did not have this effect:

> *I suppose I more felt in the world of* Elysian Fields *so that's why it felt like a fantasy whereas [*Sprung!*] ... felt more like maybe a simulation of something in my life ... the springs were more like real springs than taking me into another world.*

Perhaps people did not feel like they were *within* the representational world that this work created because of the focus that the experience put on the performing body outside this world. Fantasy is tied to the concept of make-believe and if *Sprung!* did not make the audience believe that they were in its world then this could have prevented them from experiencing this pleasure.

The pleasure of creation was also not experienced as frequently as I had hoped and this feeling was strongly backed up by the verbal data. The creative aspects of this artwork seemed to frustrate participants and this was often associated with audience expectations that the work would be a musical instrument. This expectation was set up by the text of the signage but aspects of the interface frustrated any attempts to make music with it. Four participants commented that the delay between creating the bubble and it then popping to create a sound made it difficult to compose a musical sequence:

> *I was frustrated by the amount of time the bubble took to come down ... it meant that...I couldn't make a bubble quick enough to string some sounds together.*

Another participant wanted to have more choice of which notes were produced:

> *I was getting a bit frustrated because I didn't think the sound I wanted was in there. I wanted - it was a particular note I wanted, I was trying to create music and it wasn't there.*

The participants who made these types of comments were those who had some musical expertise. However, even for those who did not there was a common feeling of frustration about controlling this work, with nine participants commenting in various ways that although they knew they were affecting *Sprung!* they *"couldn't work out how to control it"*.

Some of these aspects that frustrated people were deliberately designed to provide delayed gratification. For example, I purposefully did not want to reward quick responses and so made fast taps of the floor-pads produce only a burst bubble. This design approach represented my refusal to lay the work open to casual unengaged interaction. I expected my audience to work at connecting with the artwork and some aspects of the work were, therefore, deliberately intended to make people think. However, what these results made me realise was that this attitude had permeated the whole design of this work and meant that I had created something that was definitely not able to be controlled like an instrument.

The play framework survey revealed, then, that *Sprung!* had a very different experiential character to the one that I intended. It performed well as a multi-user

artwork and evoked the pleasure of camaraderie. However, several aspects of the design worked against the two pleasures that I thought would be key. A redesign of this artwork could involve either working with this actual experiential character or totally redesigning the work to try to achieve my expected experiential pleasures. Whichever approach is taken it will need to be done with a greater awareness of the effect that my personal attitude to interaction design can have on the final artwork.

7.1.3 The *Just a Bit of Spin* prototype

The *Just a Bit of Spin* prototype was the only one of these three artworks to have been designed using the play framework. Although the form of the work changed a lot during its initial development process, most of the framework categories that were chosen as key pleasures during the conceptual stage were, I felt, still present in this prototype. Those key pleasures were subversion, exploration and discovery. Camaraderie was originally intended to be a key pleasure but as the prototype had only a single wheel interface I did not think there would be many opportunities for people to experience this pleasure. The *Just a Bit of Spin* prototype would, I thought, also have as secondary pleasures creation, sensation and difficulty. The other pleasures would all be present in a minor way except for danger and sympathy, which I felt would not be a feature in this work.
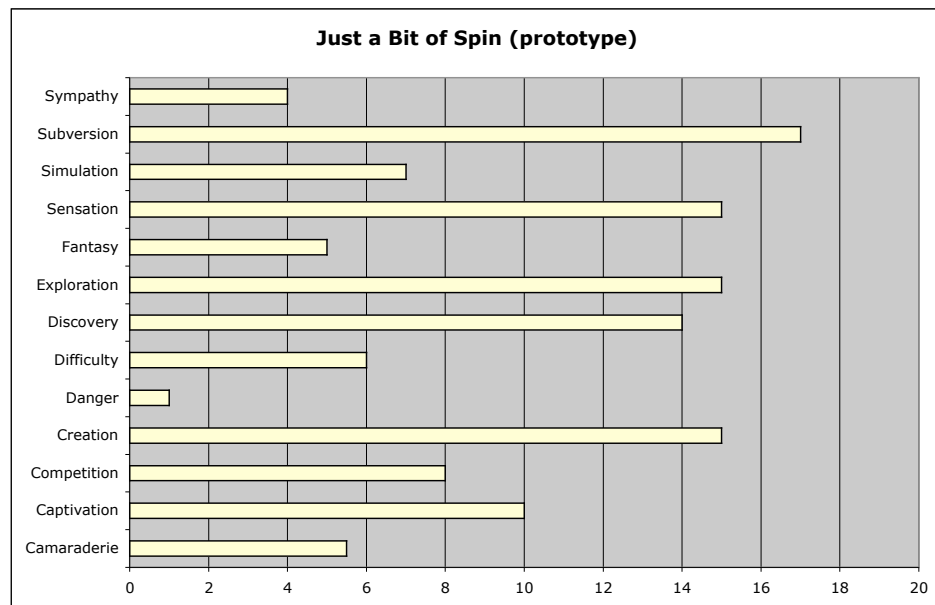
Figure 16: Chart of the play framework survey results for the *Just a Bit of Spin* prototype

The user evaluations revealed that the five key pleasures of the *Just a Bit of Spin* prototype were almost all as expected. These pleasures were subversion, followed by creation, exploration and sensation (all three equal second) and, finally, discovery. Out of the three works, the *Just a bit of Spin* prototype received, as expected, by far the highest ranking for subversion. The position of discovery in the user model, however, was perhaps a bit low, given that it was intended to be one of the three top pleasures. It is interesting to note that not only did the results for this artwork match those that I had tried to design, they also produced a much sharper distinction between primary and secondary pleasures than occurred with the other two works. This suggests that the play framework not only helped to focus the design process but also to focus the type of experience that the artwork was able to produce.

Although these results were quite pleasing there was evidence in the verbal data that some aspects of the artwork were not working to create the experience I intended. Five participants felt that the image aspects of the work were not really doing much experientially. For one, this was because the images lacked conceptual depth:

> *...it was sort of cute having John Howard on there but perhaps ... didn't ideas-wise take me anywhere...*

Another indicated that she was looking for more of a connection between the images and the sounds:

> *What I was seeing and what I was listening to didn't really feel related for me.*

For these participants this meant that they paid very little attention to the images and that the animation interaction, therefore, did not evoke the pleasure of creation.

The aspect that I had most expected to evoke the pleasure of creation was the sound, and some comments indicated that improvements could also be made here. Only four of the fifteen participants had played with the mixing interaction and, although these four all enjoyed it, two commented that they wanted to be able to 'scratch' like you could with a record. I was concerned that more people did not play with this aspect and considered this an issue that the next iteration of this work would need to address.

The most common negative comments about this work, however, concerned the pleasures of exploration and discovery. Although participants enjoyed the

Just a Bit of Spin prototype they felt that there was not as much to explore or discover as there was in the other two artworks:

> *I think the spinning wheel was fascinating and fun and then that would have been it, it would have been interesting and then I would have fully explored it and that would have been the end of it.*

This perception is backed up by the maximum time that people spent exploring each of the three artworks: for *Just a Bit of Spin* this was 5 minutes, compared to 7 for *Sprung!* and 12 for *Elysian Fields*. For one participant this perception that there was not so much to explore in the *Just a Bit of Spin* prototype was connected with a feeling that he was not able to have as much of an effect on it:

> *I couldn't change it as much as I would possibly be able to change the other ones.*

This suggests that increasing opportunities for creation in this work might also then strengthen the pleasures of exploration and discovery.

The results from the play framework survey for the *Just a Bit of Spin* prototype indicated that the framework had been a useful design tool. The experiential characteristics that the survey revealed did align closely with the characteristics that I had tried to create. However, although these aspects were aligned, the interview data did expose some aspects of the work that needed to be improved if *Just a Bit of Spin* was to provide strong opportunities for people to experience the pleasures of creation, exploration and discovery. These results would now be used to develop design strategies for the next iteration of *Just a Bit of Spin* and will be discussed further in the next chapter.

The play framework survey results overall also indicated that the survey was a very useful evaluation method for collecting data about participants' experience of an interactive artwork. One of the most useful aspects of this method was the post-survey interview. Completing the survey made participants think carefully about their experience and this level of thought was reflected, as we have seen above, in the detailed comments that people then made about the framework categories. Compared to the verbal data from the retrospective reports these comments gave more precise insights into the reasons why participants had experienced certain pleasures. As we will now see in the next section, the responses people gave to the interview questions about play and enjoyment would also provide some interesting insights into the audience experience of these three artworks.

7.2 Enjoyment and Play
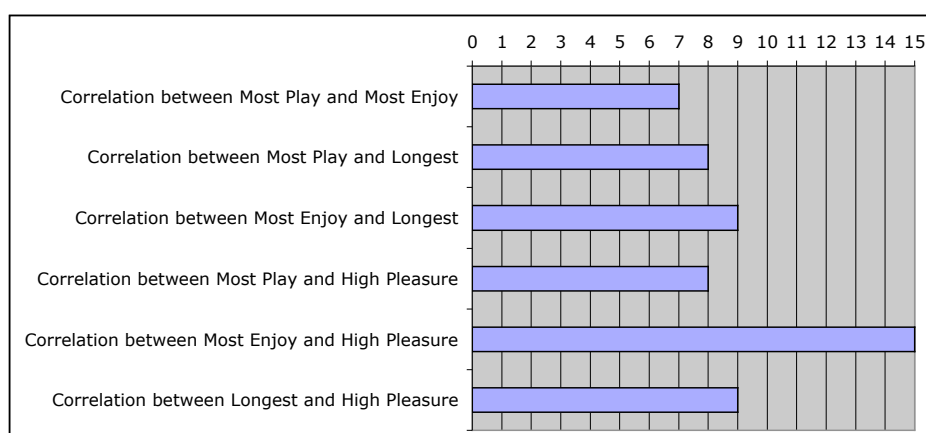
Figure 17: Number of matches between participant results for most playful work, most enjoyable work, work with the longest experience and work with the highest tally of pleasures experienced

The evaluation interview asked participants to nominate which work they enjoyed most and which they thought most made them play. These questions were primarily designed to reveal whether there was any correlation between enjoyment and play. The analysis of these results also investigated whether there was any correlation between either of these factors and the length of a participant's experience. A final comparison then looked at the relationship between each of these results and the amount of pleasure participants had indicated in their play framework survey. Figure 17 above shows the number of participants for whom each of these compared factors aligned.

The clearest result here was that the highest amount of pleasure indicated in the participant surveys matched exactly the work that they most enjoyed. Although not indicated in the table above, there was also a direct correlation between the least amount of pleasure experienced and the work that participants least enjoyed. It is, of course, not very surprising to find that pleasure equates to enjoyment. A more interesting conclusion, however, is that these results indicate that the play framework survey method could be used in evaluations to replace interview questions about levels of enjoyment. These results also confirm that the categories in the survey do indeed relate to the pleasurable aspects of a participant's experience.

The amount of pleasure experienced by participants did not always match their preference for what most made them play. It did for slightly more than half of the participants, but for the remaining seven it did not. There were similarly inconclusive results for the comparisons between enjoyment and play and

between the longest experience and play. These results suggest that the length of time spent with an artwork cannot be used to reliably indicate a playful experience, nor can expressions of enjoyment or the data from the play framework survey. The results, however, are strong enough to indicate that all three factors do indeed play a role in many playful experiences.

The verbal data from this question revealed that people made quite sharp distinctions between what made them play and what did not. While the *Just a Bit of Spin* prototype was the work most enjoyed, it was *Sprung!* that was regarded as the work that most made people play (figure 18). One of the qualities of *Sprung!* that people equated with play was its appearance. The images made people think of cartoons and reminded them (5/15) of other games with foot interactions such as *Twister* and *Dance, Dance Revolution*. Others (5/15) said that the work was playful because it had a childlike quality both in its appearance and in the way it made them feel *"like a kid"* when they were interacting. Similarly, some participants talked about the way that *Sprung!* made them move energetically around the space. Participants also liked the way that they were able to have a direct visible effect on the work (4/15). As one participant summarised:

> It looked like a game. It was like you know pink and colourful and the big red pads were very conducive to play and it responded well when I played with it.

These results indicate that the cartoon-style, game-like nature and childish physicality of *Sprung!* helped contribute to participants' perception of its playfulness. They also make a very clear connection between the responsiveness of the work and play.
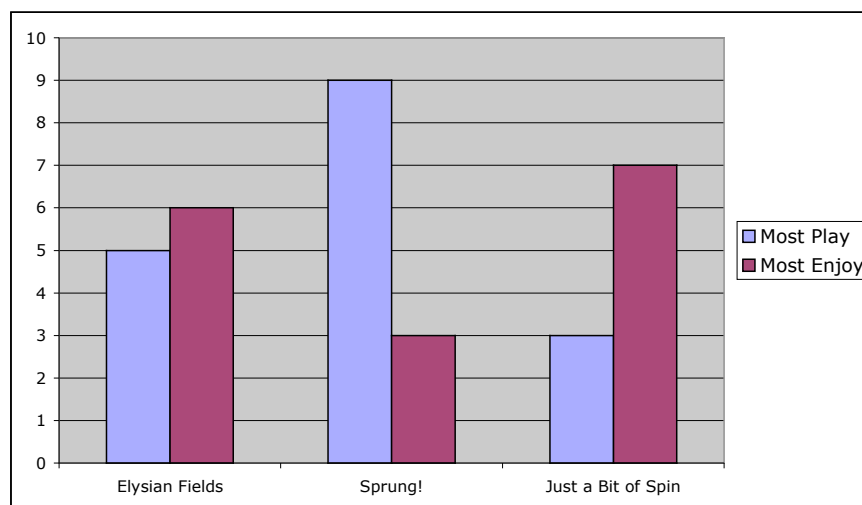
Figure 18: Participant numbers for most enjoyed work and work that most made people play
(Note: The sum of each result is more than 15 because some participants rated two works as equal)

Participants' appreciation of the responsiveness of *Sprung!* appears to contradict the earlier finding that people were frustrated by what they could do creatively with it. However, it is important to remember that the pleasure of being a cause relates to more than one of the pleasure categories. *Sprung!* more frequently evoked the pleasure of difficulty and also had a strong result for discovery. Additionally, *Sprung!* did not have a life of its own, as did *Elysian Fields*, and this could have strengthened participants' perceptions that they were controlling and having an effect on the work. This strong connection between responsiveness and play might also be a reflection of participants' feeling that playing is about doing. As one participant commented:

> *I think that the first one* [Elysian Fields] *I wanted to be in. I don't know that I wanted to do all I could do with it. I think the second one* [Sprung! *was the most playful*]. *... I don't know whether it was because it was a much more obvious effect that I was having that then the playing was more engaging ...*

This comment makes a direct connection between play and "wanting to do" things with a work. In this it echoes Hutt's connection between the question "what can I do with this object?" and the state of play (1985:233). It also then, interestingly, connects feeling like you are actually doing things with both playing and engagement.

These perceptions that a playful work was one that offered plenty of things to do and one where participants had an obvious effect were also common in the answers for the other two artworks. For example, two participants thought the *Just a Bit of Spin* prototype was the most playful because "*there were more alternatives to play with*". Similarly, one participant described *Elysian Fields* as being the most playful because it had "*more to do*". Another participant noted that *Elysian Fields* had "*that direct cause and effect of when I moved something happened*". Participants' preferences for the work which least made them play seemed to relate directly to these two factors. If participants had an experience, as some did with *Elysian Fields,* in which they did not feel as if they were having an effect then they did not feel that they had experienced play. Moreover, if participants felt that they were able to quickly exhaust the number of things that they could do with a work then they also felt that they had not experienced play.

Having too little to play with was a common criticism levelled at the *Just a Bit of Spin* prototype. This artwork was the work that many participants felt least made them play. There was a feeling (5/15) that *Just a Bit of Spin* was a "*blunter instrument*" that "*made its point fairly quickly*" and once a participant had worked

that out he or she *"really didn't think there was much else there"*. As one participant comment indicated, this made the experience of this work more about exploring than playing:

> *The wheel was more about investigating and making sure that I'd covered its possibilities.*

Once participants had covered these possibilities there did not seem to be enough to do in *Just a Bit of Spin* to then make them shift to playing. The other two artworks in contrast were works that you *"could keep on playing with... and keep on figuring out or having an interest in"*. This seemed to be because the *Elysian Fields* and *Sprung!* artworks were much more technologically and conceptually mysterious for participants than *Just a Bit of Spin*. Many participants finished their experience of these two works without feeling completely sure that they had understood them. *Just a Bit of Spin,* on the other hand, was regarded as easy to understand. This result connects with Lieberman's qualities that we discussed earlier. The ambiguity and complexity in these works seemed to stimulate investigation (1977:109).

Being easy to understand was a common reason given for why people most enjoyed the *Just a Bit of Spin* prototype. As one participant expressed it: *"I could relate to this a lot more because I felt I could get it".* Another commented that she enjoyed the fact that it was *"a spinning wheel that I knew how to operate"*. Interestingly, very similar responses were also given by those participants who did not enjoy the *Just a Bit of Spin* prototype. One participant, for example, said that she liked it the least because she *"got it too much"* and another complained that there was *"nothing to figure out"*. This polarisation of people seemed to be the product of individual preferences and interaction styles. Some people were quickly frustrated by any sense that they could not understand how to work or interpret an artwork and seemed put off by the more obviously computer-based works. These people often favoured *Just a Bit of Spin*. Other people enjoyed figuring things out and were excited by the technological aspects of a work. These people tended to favour one of the other two artworks.

Another contrast in individual interaction styles was revealed in the experiences of *Elysian Fields* and *Sprung!,* a contrast that was particularly obvious in the paired interactions. In all three of the paired evaluation sessions there was one participant who focused on trying to figure the artwork out and another who focused more on experiencing what was happening in a sensory way. For one of the pairs these two different approaches clashed when they were experiencing *Elysian Fields*:

> Mary: *I found that [you moving] really irritating because it's sublime and I wanted to stand and experience it. And you kept moving because you wanted to work it out.*
>
> Bernadette: *... well I thought I was doing what I was supposed to be doing.*

Another pair noted a similar difference in styles during their report on their experience of *Sprung!*:

> Peter: *It seems to me that I'm looking at it from a practical point of view .. ."how can we solve this thing" and you're looking at it more ...*
>
> Susan: *... experientially.*
>
> Peter: *Exactly, yeah.*
>
> Susan: *I'm not sure if we had to solve anything actually.*

Both of these couples then go on to discuss art and their differing concepts of what one is *"supposed to be doing"* with an artwork. In each case, working something out is associated with computer interactivity and experiencing is associated with art. This response seems to match the personal experiences of the participants, for in all three couples the person who wants to figure things out is the person who has the most expertise with computer technology.

The three different artworks, therefore, were each attractive to different types of people, their personality, experience and knowledge leading them to prefer one style of interacting over another. As we have seen above, this study showed that there were some common groupings of preferences amongst the fifteen participants. One group liked puzzling over and figuring things out while another group liked to understand things and to focus more on the sensory aspects of an experience. These preferences also influenced the types of play that people enjoyed engaging in. This suggested that considering whether or not to accommodate these two broad preference groups might be a valuable process to undertake when designing the next iteration of *Just a Bit of Spin*.

There was another factor that was more difficult to accommodate which seemed to also be influencing participant preferences. Participants' mood had an influence over which types of play they would enjoy. Two participants made comments indicating that if they had been in a different more *"calm mood"* then they might have enjoyed the quieter nature of *Elysian Fields* more. They felt that the artworks each involved *"very different kinds of enjoyment"* and that the way you connected with these could change depending on your mood on the day:

I found I wasn't able to relax and just look at it. Although it was very beautiful and very calming, I wasn't feeling very calm. I was feeling like it was a game that I had to suss out.

This result is a clear reminder that this study is not and could never be a study with controlled variables. This does not mean, therefore, that the study cannot draw valuable conclusions. It does, however, mean that the conclusions do need to be carefully considered in light of the changeable qualities of each participant.

This comparison between the three artworks has revealed that the different character of each artwork attracted different types of people. *Elysian Fields* with all its interpretive resonances tended to attract people who were quite contemplative. *Sprung!* with its much more puzzle-like interactions attracted people who liked figuring things out. People who disliked having to work things out preferred the *Just a Bit of Spin* prototype, because they could understand it quickly and did not have to worry that they were not grasping something. People's preferences about the artwork they enjoyed and the artwork that made them play really depended on the things that each individual got pleasure from and these individual responses could be a matter of personal preference or a matter of mood.

There were several common factors associated with participants feeling that an artwork made them play. They associated play with game-like things and with childlike things. These two factors were tied to the affective connection participants had with both the appearance of an artwork and the type of physical actions that their bodies performed when interacting with it. Play was also associated with participants feeling that there were many things that they could do with an artwork. This feeling was not just about an artwork offering a range of things to do but also about participants needing to feel like their actions were having a clear and direct effect on the work, in other words, that they were doing *something*. Connected with this was a perception that the most playful works were those that you did not feel you had exhausted, they were the works that you wanted to go back to and play with some more.

7.3 Reflection on Results

This was the first formal audience evaluation that I had ever conducted on my own work as opposed to other artist's works and I was very interested to see how valuable it would be. Although I knew that such evaluations did reveal a lot about the audience experience of interactive art, I confess to feeling a little sceptical about how useful the results would be in terms of practical design strategies. I also wondered whether the process would tell me anything that I did

not already know from just observing people interacting. I had already done this with both *Elysian Fields* and *Sprung!* and these observations had shaped my perception of the pleasures involved in the works. They had also revealed some key interface problems. As we have seen, however, my observations about the pleasures involved in these artworks were not entirely accurate. The formal evaluation did give me a more detailed picture of the experiential character of these works and also revealed much about the affective and motivational aspects of participants' experience. The formal evaluation was, therefore, very valuable because of the way it helped me to understand more clearly the experiential relationship between the audience and each of the three artworks.

I can see that this understanding could be very useful in terms of future design directions, for it will help me to remain focused on the important aspects of each experience. Trying to evoke an experience, like much design practice, is a question of balance, and changing the weight of one feature could have an effect on all of the others. Knowing which features might need to remain more heavily weighted is, therefore, very valuable and may help prevent a redesign from unintentionally damaging the experiential elements that an artist intended to maintain. The evaluation gave me a much clearer picture of not only which elements were really working to achieve my artistic intentions but also helped me to understand why these elements were producing their effect.

One of the most interesting results in this regard was the evidence of the affective power of *Elysian Fields*. I had originally intended to add more goal-driven interactions to this work but the results from the study made me wonder whether doing this would then destroy the affective power that seemed to come from the work's openness. *Elysian Fields* had an interpretive openness that left room for participants to create their own meanings and this then made its emotional effect more personal. The title of the artwork and its accompanying explanation suggested enough to get people thinking interpretively but this information did not lock down the meaning of the work, and the abstractness of the animations then helped people to create their own meanings. The abstract bird animation, for example, was interpreted variously as a smile, a soul and a moon, while the abstract grass animation was interpreted as whiskers on a man's face, the hairs in a lung and seaweed under water. These interpretations were all very personal and indicated a level of thoughtful engagement and reflection that I would want to maintain in any redesign of this work. Perhaps the suggested interpretation in the title and explanation provided the safe frame that then allowed people to play with the abstractness in the work. In Apter's terms the

title is the cage and the abstractness is the tiger. Together they produce the excitement of "danger in safety" (Apter 1991:22).

Increasing the potential for goal-oriented interactions in *Elysian Fields*, however, might work against this reflective and engaged audience experience because it might take the focus away from sensation and emotion. As one participant commented, once she started thinking of *Elysian Fields* as something to be *"controlled"* the aesthetics of the experience *"went out the window"*. Similarly, another participant initially began his experience focused on *"working out"* things but later *"decided to be still"*, and it was then that he *"started to get into it"*. The balance in *Elysian Fields* between goal-oriented interaction and non-goal-oriented interaction seemed to be already working well. There was less pressure in *Elysian Fields* to "get it", when compared to *Sprung!*, but there was also less chance that people would feel that they had "got it all" like they did in *Just a Bit of Spin* and this resulted in a pleasingly engaging and affective audience experience. While adding more goals might increase the chances that the work would be more pleasurable for goal-driven participants, it also might risk destroying the affective power of the artwork.

The ways that the pleasures in *Elysian Fields* diverged from my expectations can in part be attributed to the differing perspectives of creator and audience. A creator of a work has a very different understanding of the levels of difficulty and affect in a work. Something, for example, that may have been very easy to create, may seem very impressive to an audience participant. Conversely, something that may have been quite difficult to achieve, may be barely noticed. I consciously try to design my works by focusing on audience perception of technological effects rather than using technological complexity for the sake of it. Or to put it another way, I try to use the power of simple technological 'smoke and mirrors' to create illusions, believing that what the audience perceives is more important in terms of creating experiences than the actual technology within the work. The discrepancy between my opinion of *Elysian Fields* and the audience's, however, suggests that I had, without realising it, lost faith in this belief. It also suggests that if I want to remain true to this belief then audience evaluations might need to become a more common part of my practice.

Another interesting insight into my practice that emerged from this study was an appreciation of the effect that my personal approach to interaction design could have on an audience experience. The design of both *Elysian Fields* and *Sprung!* contained aspects that were intended to slow people down and to not give them instant gratification. In both works, but particularly in *Sprung!*, this approach effected the usability of the work. These results do not lead me to want

to change this approach, for I still believe that it results in a more interesting artwork. However, they do make me think that I need to be more consciously aware of the effect that such an approach can have on the experience of a work. I could also, as one of the expert participants suggested, consider pushing this anti-instant gratification approach a bit further. This would mean, for example, accepting that *Sprung!* could never be played like an instrument and then redesigning it with a shift in focus away from this type of control and onto other experiential pleasures.

The study also produced some interesting findings that would influence the redesign of the *Just a Bit of Spin* prototype. This prototype was regarded as the work that people thought least made them play and this was tied to a perception that there was not enough to do to with this work. If we consider again the definition of play as "free movement within a more rigid structure" (Salen & Zimmerman 2004: 304), we can make a connection between not having enough to do and not having enough freedom of movement. The openness within *Elysian Fields* and the puzzling interface of *Sprung!* had a sense of movement that gave people something to play with. The *Just a Bit of Spin* prototype, on the other hand, was regarded as easy to understand both as an interface and as a piece of communication and this gave it a finiteness that worked against play. Increasing the potential of this work to stimulate play would, therefore, involve working to increase the freedom of movement within its structure.

The findings about participants' perceptions of play also indicated that an artwork that has both game-like and childlike characteristics would be more likely to be regarded as playful. Although I decided I would probably consider these findings when redesigning *Just a Bit of Spin*, I questioned whether these two characteristics are necessary for play to exist. Participants' characterisations seemed to relate sometimes more to the way that they defined play than to their actual behaviour, with some nominating *Sprung!* even though they had played more with another artwork. As we saw in chapter 3, the spectrum of play ranges from free improvisational activities to more rule-based structured activities. Taking the findings above too literally could, I fear, produce artworks that then only related to one end of this spectrum. As it was, all three artworks produced different types of play behaviours in the audience. The most interesting, in terms of my artistic goals, were those that led to reflective engagement and this, as we have seen above, was not particularly connected with being childlike or game-like but rather with being interpretively and sensually affective.

All evaluations of interactive artworks must, I suspect, raise questions about the type of audience that one is trying to attract. Participants' opinions in this

study were so varied that I was continually telling myself that I could not please everybody and this then led me to question whether there was anyone that I did particularly want to please. Although I was not able to definitively answer this question, the study did make me understand more about the possible character of the audience that each artwork attracted. This understanding would also play a part during the redesign of *Just a Bit of Spin*.

The results of this first case study have raised many issues and concerns for interactive art practice in general and my practice in particular. They have indicated that the play framework can be both an effective tool for the conceptual design of playful interactive art and a useful addition to formal user evaluations of this type of artwork. The play framework was shown to be an effective tool for clarifying the pleasures that each of the three artworks evoked and this then indicated several design directions for future versions of these works. These results would now be used for the next phase of the research, the redesign and evaluation of *Just a Bit of Spin*.

CHAPTER 8:

REDESIGNING *JUST A BIT OF SPIN*

8.1 The Aims of the Redesign

I began work on the second iteration of *Just a Bit of Spin* after I had already completed the case study described in the previous three chapters. Based on the results of this study my redesign was focused on improving the playability of the work and on doing so by designing more freedom of movement into its interactions. The redesign also aimed to increase the possibility that participants would feel the pleasure of creation. In making these changes I tried to find a balance between improving those aspects of the prototype that were not so successful while retaining those aspects of the work that were already working well.

There were many aspects of the *Just a Bit of Spin* prototype that people clearly enjoyed. The interactions within the artwork were easy to work out and this made people feel confident when they were playing with it. They enjoyed the tactility and toy-like nature of the interface and they liked the human-scale of an object that was not so obviously computer generated. They had fun controlling and playing with the speed of the voice and enjoyed mixing up the phrases. They had also enjoyed the political content and the humour. These results made me decide to continue using the wheel interface and to use a similar range of sound interactions. The wheel interface would, however, need to be completely rebuilt, as this version of the artwork would be exhibited in a public museum and consequently needed to be more damage proof.

Although there were some who had really enjoyed the political content of the work there were others who had some problems with it. One of the aspects of the political content that some people did not enjoy was the visual reference to the then current Prime Minister of Australia, John Howard. Some people seemed to disagree so much with his politics that they could not bear to look at his image. Others seemed to be annoyed that I was criticising him. Although I had found all of my phrases in speeches made by John Howard, I had actually not intended the work to be a criticism of him alone. The type of political spin that the work commented on was practised by most (if not all) politicians and by those on both sides of the political fence. I decided, therefore, to not use the images of John Howard in the redesigned version.

Before deciding what to replace these images with, I considered some of the other related aspects that people had not enjoyed in the prototype. One of the big criticisms of the prototype was that the work was too "blunt" and too "finite". People were sometimes bored by the work because they understood its message quickly and felt that it had nothing more to say. There were also comments that indicated that some people felt that the images were not related enough to the sound and were not a strong enough part of the work. In redesigning the images within the work, therefore, I aimed to connect them more strongly to the sound interactions and also to make them less blunt and more ambiguous.

Working with ambiguity was one strategy that I was using to see if I could make the work more playable. I saw ambiguity as being connected to play through the concept of freedom of movement (Salen & Zimmerman 2004: 304). Ambiguity, by definition, means that something has more than one meaning. If there is more than one interpretation of something then people are able to move between these multiple interpretations and having this freedom of movement might, I suspected, make them more interpretively playful.

Another strategy that I wanted to use to increase the work's playability was to increase its complexity. Adding complexity would hopefully work to stimulate more investigative exploration (Lieberman 1977:109). This was partly a reaction to comments that the work was too finite and also a response to indications that people were looking for more layers within the work. People had felt that they could not change or affect the prototype as much as they could the other two artworks and this seemed to be connected to their perception that this work was not particularly playful. The redesign, therefore, aimed to increase the complexity of the work and to do so in a way that would give people more of a sense that they were able to have an effect on it.

Increasing people's perception that they could affect the work was a strategy that could also result in more people experiencing the pleasure of creation and this was one of the key aims of this redesign. I was also hoping to achieve this by making adjustments to the sound interactions. Although the sound interactions were enjoyed in the prototype, particularly mixing up the sound phrases by spinning the wheel back and forth, this interaction was not as fun as it could be. Each time the direction of the wheel changed, a new sentence played from its beginning. This meant that if people mixed quickly only the first two or three words of a sentence were mixed together, often just I, you, we, etc. I felt that this interaction would have more interesting results if people could create a more meaningful mix of words from throughout a whole sentence. I was also hoping to add to the creative pleasure that people gained from the sound interactions by

improving the content and complexity of the accompanying animations. A final aim of the redesign, therefore, was to improve the sound interactions and the animations so as to increase the opportunities for people to experience the pleasure of creation.

The redesign process aimed to improve the playability of the artwork and to increase its potential to evoke the pleasure of creation. As we have seen in the brief discussion above, achieving these aims would involve making changes to many aspects of the work, including the sound, the animations and the overall structure. The next sections will deal with each of these elements in turn, beginning first with the design of the wheel and the case that would house it.

8.2 Designing the Case and Wheel

As this artwork was going to be displayed in a public museum context with very little supervision, the whole construction needed to be encased in a way that would reduce the risk of any damage to the artwork and also minimise any risk of injury to the general public. The designs for this case were, therefore, developed with input from the staff at the museum who were consulted about public safety issues. After viewing sketches of the proposed case design, museum staff raised concerns about whether fingers could get caught behind the wheel and whether the case could tip over. The case design was adjusted to reduce these risks and a full-size cardboard model of the case was then built (figure 19). This model allowed me to get a feel for the relationship between the case and the human body and at this point it was decided to make the case higher. Museum staff pointed out that the audience in the area of the museum that the case was to be housed was primarily adult and so they felt that the case should cater primarily to adult sizes. Even so, the case design was still useable by all but very small children who would need to be lifted up by an adult to be able to see through the wheel.

One of the issues that had arisen during the evaluation of the prototype was that people were worried about the flimsiness of the wheel construction. Their fear that they might break the wheel stopped them from interacting too vigorously with it and this interfered with their playful goals. Robustness was, therefore, very important for the redesign of the wheel, and the broomstick, wire and cardboard construction of the prototype was replaced with a steel shaft, hub and bearings and a laser cut acrylic wheel. I tried to accentuate further the toy-like feel of the original by choosing shiny black acrylic for this new wheel and by choosing bright red and white for the case colours. The case was built by a cabinetmaker who used lots of curved edges in his usual furniture designs. I

asked him to add some of these curves to the final version of the case (figure 19). The aim here was to continue the toy-like theme by making the case feel a bit like a jukebox or an old poker machine.

Figure 19: Cardboard model (left) and finished *Just a Bit of Spin* case (right)

Another criticism that some people had made of the prototype was that they felt that the 1950's style images did not match the late nineteenth-century technology of the wheel. These comments resonated with my feeling that I had not transformed this old technology enough. If I was going to make something that was a reinterpretation of an old animation device then I felt I should not do so half-heartedly. The new case design was, therefore, consciously more modern in style and materials. This feeling also drove me to consider making more use of the capabilities of the computer both in terms of the sound and the animations. I decided, after much deliberation, to take on board a suggestion made by one of the expert participants and to use a screen to display the animations rather than a paper wheel.

This decision to use a screen influenced the overall design of the case. The top section of the case was now made out of transluscent white acrylic so that the luminous screen could create a glow that would attract people to look through the slits of the wheel. Although I was using a modern computer screen I did not want to destroy the basic design of the old animation device and so the case design hid this screen within an enclosed section that had only a circular hole to

reveal the animations. These screen animations also rotated in response to the wheel turning, in much the same way as a paper wheel would have. The enclosed nature of the new case forced people to look through the slits to see the animations even though the screen technology meant that the slits were no longer needed to create the persistance of vision effect. Because the slits were no longer a necessary part of the design I briefly considered other arrangements of the wheel and the viewing slits. In the end, I kept the slits on the wheel for three reasons: they referred to the old animation device, integrated the interactions of hand and eye and encouraged close and focused attention.

8.3 Designing the Structure

The evaluation results had convinced me that I needed to make the structure of the artwork more complex if it was going to stimulate playful behaviour. Through this complexity I hoped to stimulate more investigative exploration (Lieberman 1977:109) and also to give participate more "to do" (Hutt 1985: 246). I had originally hoped to do this by creating two or three wheel objects but the high costs involved made this approach unfeasible. Instead I looked for ways in which I could add complexity to the content within the single wheel interface. My immediate approach to this was to try to come up with more paired word combinations similar to the forwards/backwards pair used in the prototype.

I looked at many different word combinations trying to find words that would connect with the wheel interaction as neatly as "forwards" and "backwards". After coming up with a list of possible words I then searched through the Prime Minister's online speeches to see whether any of these combinations produced interesting sentences. Two extra pairs of words were finally selected, hard/soft and something/nothing. I chose these pairs because they had interesting subtexts within the speeches and because I could easily relate them to the movement of the wheel. In the original version "forwards" related to spinning the wheel to the right and "backwards" to spinning the wheel to the left. Now I would also have "hard" when the wheel was spinning fast and "soft" when the wheel was spinning slowly. I related "nothing" to not spinning the wheel at all, this meant that "something", in contrast, related to the wheel being spun.

Fifteen phrases were then selected for each of these new words from the transcripts of the Prime Minister's speeches. As with forwards and backwards these phrases were carefully selected so that each phrase sounded like it could be meaningfully connected to the one before it, giving the impression that the

phrases were part of a whole speech. Each phrase was then also edited to remove any references to specific current events (see appendices 2, 3, & 4).

The final and most difficult part of this structural redesign was to decide how someone would then be able to navigate through these different pairs of words. I knew that I wanted the paired words to occur on three separate levels so that there was now a progression of things to uncover within the artwork. This was because I had noticed during the prototype evaluation that puzzling things out tended to shape the length of people's experiences. They often stopped interacting after they had solved some puzzle and I concluded from this that designing a puzzle-like thread into an artwork could work to maintain people's engagement. For this artwork that thread would be finding the three levels. The mechanism to move people between these levels would, I decided finally, be one of the interactions that had caused the most playful behaviour. This was the scratching or mixing interaction that occurred when people moved the wheel back and forth quickly.

The new structure of the artwork, therefore, now had three levels: fowards/backwards, hard/soft and something/nothing and people could navigate through these levels by scratching the wheel back and forth for a set length of time. Each of these levels also needed to be accompanied by a different set of animations and so the next phase of the design involved developing these.

8.4 Designing the Animations

The earliest concept of *Just a bit of Spin* involved the idea that people would be able to interpret two meanings from the animation, one meaning when they spun the wheel to the right and another when they spun it to the left. I had tried and failed to achieve this with the single paper wheel of the prototype, but changing animations was something that the new version was easily able to to do because it now used a computer screen. I quickly decided that I would have three animations associated with each level in the new version – nine in total. There would be two animations connected with the words in a level and a third connected to the level's scratch interaction. Having different animations for each of these aspects would, I reasoned, help to signify the different structural elements of the work and thus help people to figure out where they were within the overall structure.

I did not want to use the animations only to signify structure. I also wanted to make sure that they connected conceptually with the paired words at each level and that these connections had an ambiguity or openness about them. The openness of *Elysian Fields* was something that had seemed to provide room for

more personal interpretations and this, I decided, was part of the reason why people were more likely to connect with it emotionally. Similarly, I wanted the new animations in *Just a Bit of Spin* to be open to interpretation and to therefore leave room for interpretive play. I hoped that this would then result in it resonating more meaningfully with the audience.

I began this process by identifying the conceptual themes that were connected to each pair of words. Forwards/backwards was about progress versus chaos. Hard/soft was most obviously about strength versus weakness, but this pairing was also often used to imply that being soft was about being emotional or sentimental while being hard was about being impartial or detached. The something/nothing pairing was less obviously a binary contrast. These words were most often used to imply that an action was either being undertaken or conversely not being undertaken but in a way that avoided saying exactly what was or was not being done. I saw this level, therefore, as being about concealment and camoflage.

I wanted to keep the imagery within the work simple and I also wanted some kind of consistency across all three levels. I tried, therefore, to come up with a base-level idea for the images that would work to express all three of these conceptual pairs. The final solution that I arrived at was to use various fruit for all three. This decision was partly inspired by the connection between fruit and poker machines, which in their early days had used fruit imagery and thus had the nickname fruit machines. Poker machines also connected well with the new case design and when I discovered that some of the really old types had also had a wheel interface I was convinced that this was the right answer.

Poker machines were a hot political issue around the time that I was making this decision and calls were going out to reduce the number of poker machines in pubs and clubs. Newspapers were arguing that the government was partly to blame for the social ills that poker machines caused, being further compromised by the large amount of money that it garnered through taxes on gambling. This relationship between politics and poker machines would, I felt, give me an initial simple base-level interpretive connection between the fruit and the political message of the work. Also, the gaming system of poker machines was one that relied on the power of a false promise of winning and I thought this related well to the false promises of political spin. This connection between poker machines, fruit and the work's political content would, I reasoned, give people room to reflect on the more difficult interpretive connections that I then wanted them to make between each fruit animation and its related word and phrases.

The next step involved devising an appropriate fruit animation for each of the three levels. To represent the progress and chaos theme of the forwards/backwards level I chose to use an animation of a sprouting pear and to contrast it with an animation of a juicy red pomegranate being sliced up. To represent the emotional softness and hardness of the soft/hard level I contrasted a squishing raspberry with hard pineapples bouncing off each other. Finally, to represent the concealment and camoflage of the something/nothing layer, I contrasted peeled bananas and oranges with unpeeled ones.

Each of these levels then also had an animation that was designed to play during the scratching or mixing interactions. I tried to make these mix animations express the unspoken fears that seemed to be associated with each word pair. The mix animation for the forwards/backwards level, for example, reflected the way that going backwards was seen as such as scary option by having the pomegranate devour the pear. The mix animation for the hard/soft level reflected politicians' fear of being seen as soft by having the hard pineapple turn into a raspberry that then collapsed. The mix animation for the something/nothing level was not as strongly associated with a fear. Instead it tried to emphasise the camouflage and concealment theme of this level by showing a half-peeled banana with its flesh covered by orange peel. The associated animation then erased this banana, leaving behind a banana-shaped shadow. I wanted this shadow to suggest the fear of disclosure that lurked behind the something/nothing political phrases. Figures 20–22 show sample frames from each of these nine animations.

The first case study had revealed the affective power of sound and image combinations that connected with remembered bodily actions and sensations. I wanted to see if I could also work with this power in the new animations for *Just a Bit of Spin*. I therefore chose to use real fruit because it had qualities that I felt could very directly arouse memories in the artwork's audience. I particularly chose types of fruit that I thought had visceral sensory power either in terms of the juicy nature of their interior, the texture of their skin or the strength of their shape. These real fruit were filmed using stop motion animation techniques and this allowed me to animate actions such as cutting or squashing with no visible human agent. I could then set up a similar interactive relationship to that used in *Elysian Fields* and *Sprung!*, a relationship in which the audience member could take the place of the implied invisible human agent.
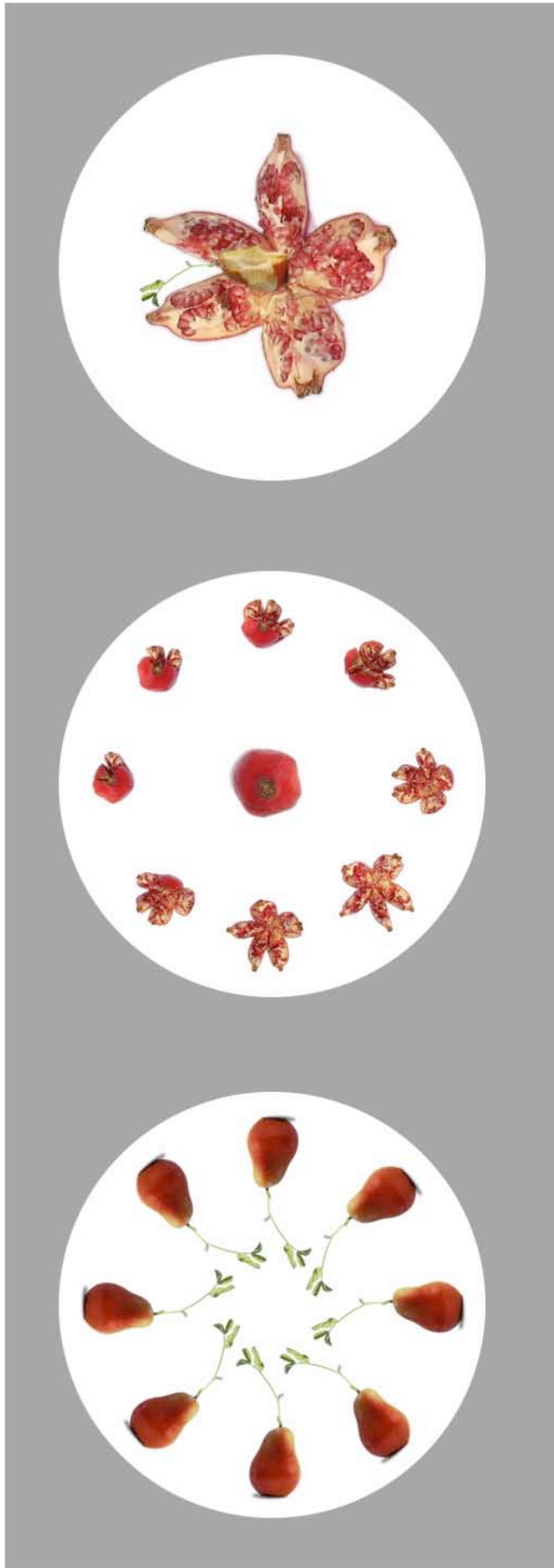
Figure 20: Images from the Forwards (left), Backwards (middle) and Forwards/Backwards mix (right) animations in Just a Bit of Spin

Figure 21: Images from the Soft (left), Hard (middle) and Hard/Soft mix (right) animations in Just a Bit of Spin

Figure 22: Images from the Something (left), Nothing (middle) and Something/Nothing mix (right) animations in Just a Bit of Spin

8.5 Designing the Sound

Sound was identified in the first study as the key element that produced the powerful affective connection between remembered bodily actions and sensations. In creating the fruit animations, therefore, I tried to find sounds that also had a visceral sensory power. I was not able to use as many of these sounds as I wished, due to some last minute programming constraints, and in the end only the three mix animations had sound effects. The sound effect of a human biting an apple accompanied the animation of the pear being eaten at the forwards/backwards level. The close-up sound effect of food squelching in a mouth accompanied the raspberry squash at the hard/soft level. The sound of fingernails scratching a human head accompanied the banana erasing animation at the something/nothing level. Each of these sound effects was purposely chosen because of its links to human actions. The idea was that these would be more likely to evoke memories of touch, taste and physical movement.

Now that the work had three levels, I decided to use two different voices instead of the single male voice of the original. There were a few reasons for this change. Firstly, I thought that changing the speaking voice at the same time as the level changed could help to signify that the work was in a new mode. Secondly, changing the voice might, I thought, stop people becoming bored too quickly with the repetitiveness of the sound. Lastly, I did not want to perpetuate the stereotype that all politicians are male and so I wanted to include a female voice. Two new voices were recorded, a male and a female. As neither of these two people were actors I tried to copy the approach that had worked well for the prototype and directed them to read the lines fairly neutrally without trying to imitate politicians. Both were recorded speaking the phrases from all three levels and so I was able to alternate between them as people navigated through the work.

The final and most important aspect of the sound redesign involved trying to make the scratching interaction more fun by making it possible for the audience to be more creative. Unfortunately, in spite of its importance, this was one aspect of the redesign that was not resolved to my satisfaction. Completing the new animation components took much longer than anticipated and, with the exhibition deadline looming, the programming of the interactions was compressed into a very tight two weeks. The final result was a series of scratching interactions that did not give the audience much more creative control than they had in the prototype.

The creative potential of the scratching interactions was also constrained by the needs of the new three-level structure. The scratching interaction was now

being used as a navigation mechanism and it was decided that nine consecutive short scratching movements back and forth would be the trigger for a change from one level to another. This interaction was accompanied by distinct changes in sound and image that were intended to help people understand that this interaction had a special purpose. These changes meant that the sounds that accompanied the scratching interactions were now very short in length and quite different from the main phrases in the spinning interaction. Although these new scratch sounds were different I still tried to keep them focused on the theme of each level. At the forwards/backwards level the sounds were just the single words "forwards" and "backwards", but on alternate scratches these were played in reverse. At the hard/soft level the sounds were short excerpts of only those sections of the phrases that used "hard" or "soft", for example, "hard hearted" and "soft headed". At the something/nothing level each scratch repeated either the phrase "saying something" or the phrase "nothing at all". These scratch sounds were each assigned a number and played back in an order that corresponded to the number of consecutive scratches that were made. This meant that the audience was now only able to play a set sequence of sounds and was not able to use the scratch interaction to mix the phrases as they had been able to do with the prototype. I suspected that this would mean that I would not fulfil my goal of increasing the audience's creative control over the sound.

8.6 Reflection on the Redesign Process

As I write this account, I am aware that I have only been able to convey the barest glimmer of the creative intensity that I was experiencing during the process of making *Just a Bit of Spin*. Although I now wonder at some of the decisions I made, at the time I know that I wrestled with each decision until an overwhelming cascade of reasons made it feel just right.

One thing that did not feel so right during this creation process was using the play framework as a design tool. I had found it very useful during the initial conceptual development of the artwork and had used it to help make design decisions. Now that I was trying to redesign the artwork, however, I could feel myself resisting its use. I was happy to take on board the design directions that the framework had revealed during the prototype evaluation but I was not interested in using the framework to help me make decisions. As I reflected on why this might be, I decided that it was an effect of the particular stage of design that I was at. The play framework was useful during the conceptual stage of development because that was a stage where I was dealing with the infinite nature of the design problem and the framework helped me to make the

necessary decisions that would define its boundaries. However, the play framework was not so useful at the redesign stage because at this point I already had a defined problem and what I needed to do instead was to reopen the work to the infinite so that there was room for some new design solutions. As a design tool, therefore, the play framework was useful for closing off rather than opening up possibilities and this was most useful during the early development stages of artwork creation.

Another aspect of my practice that I reflected on many times during this redesign process was how to take on board the results of the prototype evaluation and how to do so without losing my own artistic vision. The prototype had generated both positive and negative comments and at times these were completely contradictory. It was impossible to take on board every comment but I wondered how I should choose those that I did want to respond to. I was also worried that I might respond to idiosyncratic negative comments just because they touched a nerve and then ignore more common issues because they did not. In the end, I tried to remain true to my own gut feelings about the artwork. If a comment by just one person rang true for me then I would take it on board. Conversely, I would sometimes ignore points made by many people because following them would take the artwork in a direction in which I did not want it to go. Using evaluation in this way was something that made me much more conscious of the type of audience that I wanted to create art for. It also made me more aware of the peculiarities of my own design style and in so doing I believe strengthened my artistic vision.

The redesign of *Just a Bit of Spin* began with the twin goals of increasing the artwork's playability and increasing the potential for the audience to experience the pleasure of creation. These goals led me to then make a version of the artwork that was more structurally and interpretively complex. Did these changes end up having the effects that I had hoped for? In order to find out, the next stage of this research project involved evaluating *Just a Bit of Spin* when it was exhibited at the Powerhouse Museum in Sydney, Australia. This evaluation will be described and discussed in the next two chapters, beginning first with the evaluation methods and then the results. As we will see, some of the design decisions that I made succeeded, some did not and some had surprising and unintended consequences.

CHAPTER 9:

METHODS OF CASE STUDY TWO

Between November 2007 and February 2008 *Just a Bit of Spin* was exhibited at Beta_space in the Powerhouse Museum in Sydney, Australia. During this time a case study of the artwork was conducted that aimed to reveal whether the redesign of the artwork had resulted in the type of experiences that I had intended, particularly in terms of stimulating playful behaviours. I was also interested in evaluating whether the ambiguity within the work created a more playful space for interpretation.

This exhibition and case study of *Just a Bit of Spin* intersected with another CCS Beta_space research project, a comparative investigation of interactive artworks being conducted by post-doctoral fellow Dr Zafer Bilda. This project of Dr Bilda's had extremely similar data collection needs to my study and some of the evaluation data were, therefore, collected together. Dr Bilda acted as a sounding board for the refining of this second case study's evaluation methods but he did not influence which methods were selected. He was also the interviewer in nine of the fifteen evaluation sessions. This benefited the case study because it provided a different dynamic to those interviews conducted by the artist, perhaps allowing room for more honest answers from participants. Dr Bilda had no involvement in the analysis stages of the case study.

The data collection for the case study occurred over a four-week period from the end of November to early December 2007. This extended period involved three phases of data collection. The process began with four days of evaluations followed by three days of observation of museum visitors and, lastly, a final two days of evaluations. The period between the two stages of evaluation was also used to do some early analysis of the data. This generated preliminary theories that could then be investigated further in the later evaluations and thus allowed theories to be developed and explored over the whole course of the case study.

9.1 The Beta_space Installation of *Just a Bit of Spin*

Just a Bit of Spin was installed within Beta_space in the Cyberworlds exhibition at the Powerhouse Museum. This is an exhibition that tells the history of computer technology from its earliest days to the present. Beta_space is about two-thirds of the way through the exhibition, a small self-contained room accessed through a wide opening in the main exhibition corridor. The room is carpeted and has a

wall-height rear projection screen at one end. The wall opposite the entry opening has two 1.2 x 0.6 metre Perspex cases which contain changing exhibit posters. Just inside the entry is a permanent sign that explains the general purpose of Beta_space. The outside walls of Beta_space contain three Cyberworlds exhibits and there is another directly opposite the entry to the room.

Figure 23: *Just a Bit of Spin* installed at the Powerhouse Museum, Sydney

The contained nature of Beta_space places it outside the usual flow of the Cyberworlds exhibition and museum visitors must make a conscious decision to enter the space. The environment is very noisy, with most of this caused by Cyberworlds' most popular exhibit, an interactive dancing robot called Isaac. The noise from the music of the Isaac display combines with that of the others nearby to create quite a loud base of external noise. Any installation in Beta_space has, therefore, two initial problems to consider, how to attract people into the space and whether external noise will interfere with the ambiance of the installation. In this environment, installations do not, however, encounter the usual art gallery problem of having an audience who will not touch exhibit objects. The museum's visitors expect to encounter interactive content and the rest of Cyberworlds contains many interactive displays.

For this installation the *Just a Bit of Spin* case was placed central to and directly in front of the rear projection screen (figure 24). It was positioned about a metre and a half away from the screen so that people walking past the space would get a glimpse of it and hopefully be enticed to enter. A series of slides containing poker machine-like strips of fruit were projected onto the large screen behind the

case (see attached DVD). These colourful slides rotated every 30-60 seconds and were another device that was designed to attract people into the space. The projected slides provided the lighting for the rear and sides of the case. The front of the case was left dark apart from a spotlight on the carpet where visitors would stand to interact. The only other lights in the space were two small spotlights on the exhibit posters.
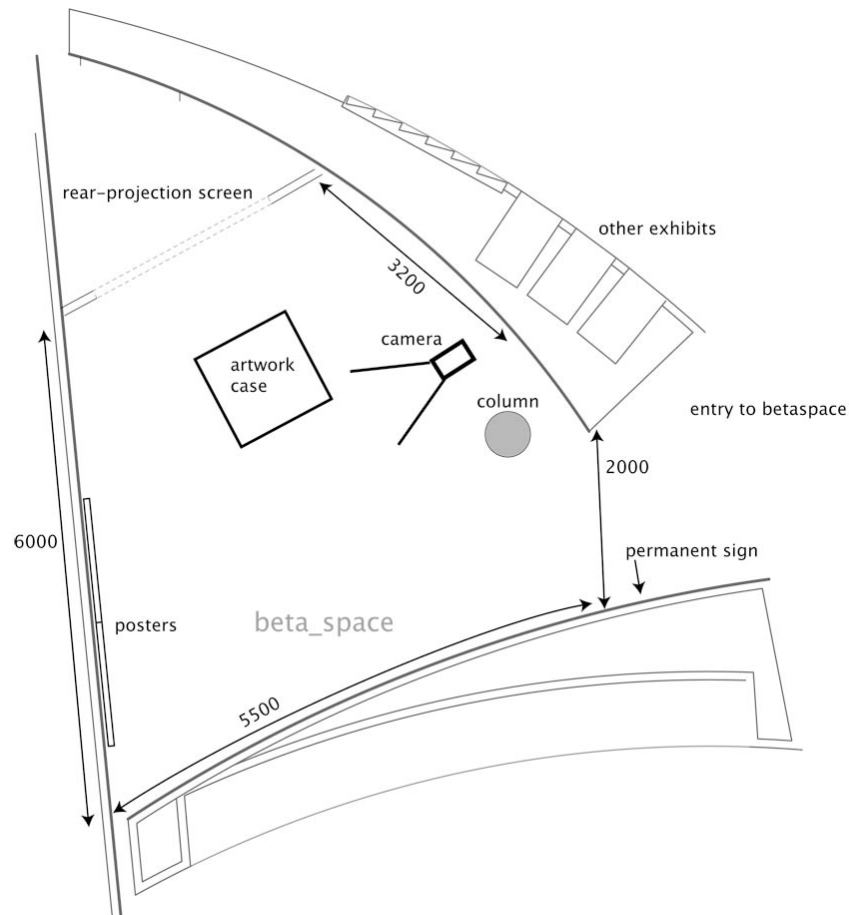
Figure 24: Floorplan of the *Just a Bit of Spin* installation in Beta_space

These exhibit posters were also designed to attract attention for they were the first things that people saw when they walked into the space (figure 25). The need to create a large point of interest on this wall had clearly influenced the Powerhouse Museum designers when they created such large display cases. Their large size also catered for the designers' expectations that the posters would contain information about the history and the technology of the exhibit. The installation posters were not, therefore, at all like the small black and white minimal labels found in art galleries. They contained nearly 500 words of text[1] with sub-headings for sections on "How it works" and "About the Research". The style of the

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[1] For the full text of the posters see appendix 10.

posters was inspired by pictures of old poker machines and this along with the rear-projected slides was designed to reinforce the poker machine references in the work.

Figure 25: The exhibit posters for the Beta_space installation

The case design of *Just a Bit of Spin* helped to get around the problem of the noisy installation environment. People interacting with the exhibit tended to lean quite close as they concentrated on watching the animation through the slits of the wheel (figure 26). This put them quite close to the speakers inside the case and, once the volume of the sound of the artwork was set at an appropriate level, the external noises were not too intrusive. I made a decision not to include any background ambient sound in the installation space. I did not want to add to the already chaotic soundscape of the museum and was concerned that anything loud enough to create its own ambiance would interfere with the content of the artwork.
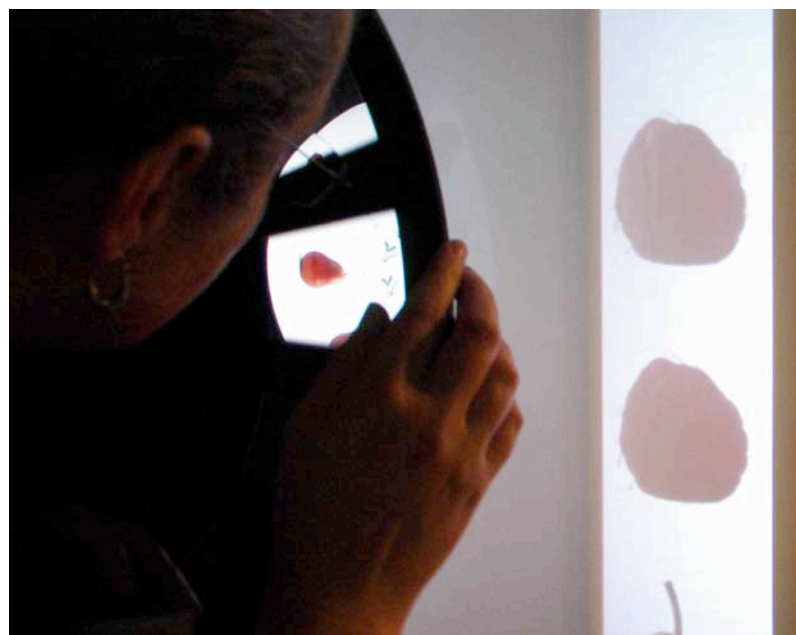
Figure 26: Participant interacting with wheel of *Just a Bit of Spin*

9.2 Selecting and Refining Methods

It was always intended that the results from this case study of *Just a bit of Spin* would be compared with the earlier case study of the prototype version. In order to facilitate this comparison, the methods of data collection for this second case study remained similar to those used in the first study and seven of the first study's participants also took part in this study. There were, however, some necessary changes made to the methods used due to the different contexts involved. There were also some changes made that arose from the conclusions of the first study, changes that aimed to improve the methods used.

While both studies captured video of each experience, this study did not augment the experience video with a retrospective report. This was because the enclosed case design of the final artwork made it impossible for a single camera to capture both the interacting body and the visual responses made by the work. It was feared that this lack of data would make it difficult for participants to recall their experiences in a video-cued recall session. In this second study, therefore, the retrospective report was replaced by an extended interview with questions that were designed to capture details of a participant's experience.

The two studies also both collected data via a written survey based on the play framework. In this study, however, the survey was redesigned so that it now had more of a question and answer structure and the answer interface was changed from being a simple tick or cross to a five-point scale. Where previously the researcher had read out a paragraph description for each category, now there was an attempt to encapsulate this information in one or two written sentences. The participants read these sentences themselves. This reduction in information meant that some of the more complex categories, such as subversion, needed to be covered by two questions. If more information was needed, participants were also able to ask the researcher for a longer explanation. These changes were sparked by a desire to make the survey take less time to complete and also to make it less researcher-driven.

In both studies the survey was followed by a question asking participants to elaborate on their answers. In the first study, however, this question directed them to only explain unusual answers that they felt needed explaining. In this second study participants were asked to explain *all* of their answers. This change aimed to increase the amount of interesting data that had emerged from these answers in the first study.

A final point of difference between the first study and this one was the environment in which it was conducted. The first study was conducted in a room

at a university. Although the room was set up to mimic an exhibition space, it was a much quieter, more intimate and more private space than the public museum space used for this second study. While we were not able to control the sound in the museum we did screen off the evaluation space in an attempt to make it feel more private and intimate. Being in a public space allowed us to evaluate not only a similar range of invited participants to the first study but also a range of general museum visitors. This ready-made audience also provided us with an opportunity to covertly observe people interacting with the artwork outside the evaluation context.

The next sections will detail the participant selection, data collection and analysis methods that were used within, firstly, the covert observation sessions and, secondly, the evaluations of the second case study.

9.3 The Observations

Three separate covert observation sessions were conducted of approximately two to two and a half hours each. Two of these sessions were on a weekend and one was on a weekday. All were conducted during the middle part of the day, as this was the busiest time in the museum. The observations were conducted after the first stage of evaluations and the observer in all three sessions was the artist (myself). These two factors meant that the observer was, firstly, aware of and looking out for issues that had arisen during the first stage of evaluations and, secondly, that she was very familiar with the artwork and thus aware of all of the interactive possibilities.

9.3.1 Participant Selection

The experiences of all people who entered Beta_space during the three days of observation sessions were noted. In total there were thirty experiences observed, roughly ten per session. Twelve of these experiences involved individuals. Of the other eighteen experiences, twelve involved pairs and six involved groups of three or more people. The largest group was a group of six school children. There were, in total, fifty-nine people who were observed interacting with *Just a Bit of Spin*. Approximately one-third of these were adult males, one-third were adult females and one-third were children under the age of sixteen. Approximately half the adults were judged to be under 35 years old.

9.3.2 Data Collection

The researcher was positioned just outside the exhibition space in a place where it was possible to see inside the room but where she was not obvious to the people

who were interacting. Although the wheel interface made it impossible for the researcher to see the images inside the artwork's case, she could hear the sound and, given her intimate knowledge of the work, could tell exactly which level of the work was being played. Data was collected on an observation sheet, noting the length of each experience, the number, age and sex of the people involved, how many and which aspects of the work were uncovered, whether the participants laughed, whether they read the sign and whether they played with slowing the wheel down (appendix 6). The researcher also made general notes about anything else of interest, for example, notes about the social dynamics of the group or of particular behaviours such as people dancing.

9.3.3 Analysis

The data from the observation sessions was compiled into a spreadsheet and common interaction patterns were noted. In particular I noted patterns relating to the extent of exploration of the artwork and the length of the experience. This data was then compared with similar information from the evaluation sessions.

9.4 The Evaluations

The evaluations took place over four non-consecutive days and in two stages. The first stage involved twelve evaluation sessions. Three of these evaluations were conducted by the artist and the remaining nine were conducted by Dr Bilda. The second stage of evaluations occurred two weeks later, after the covert observation sessions. This stage involved three further evaluation sessions. All of these second-stage evaluations were conducted by the artist.

9.4.1 Participant Selection

The evaluation sessions involved fifteen experiences in total (table 8). Of these, seven experiences involved a pair of participants and eight were individual. This made a total of twenty-two participants. Half of these participants were female. Ten were aged under 35 years old and twelve over, with the youngest being 20 years old and the oldest 48 years old.

Ten of these participants were recruited from the general public of the museum on the day of their evaluation. Recruiting the participants involved approaching people who were near Beta_space in the museum and asking them if they would like to take part. For ethical reasons children were not able to be part of the study and so people with children were not approached. All of the visitors who agreed to take part were at the museum with a social partner and

experienced the artwork in a pair. The ten participants of this group, therefore, equate to five evaluation sessions.

The other twelve participants were invited to take part. Eight of the invited participants were classed as expert because they were experienced in the creation of interactive or audio-visual works. Seven of the invited participants were classed as repeat participants because they had taken part in the earlier case study of the prototype for this work. All these invited participants were recruited via personal contact from the artist and were part of the artist's wider social network. Some were the artist's colleagues, some were friends of the artist's friends and some were either members of CCS or acquaintances of researchers at CCS. The invited participants mainly experienced the artwork as individuals. There were two paired experiences and eight individual, making a total of ten evaluation sessions with invited participants.

Table 8: Participant variables for Case Study Two

Participant	Expert	Repeat	Pair	Invited	Gender	Age
Film Designer	●	●		●	F	39
Researcher - IT				●	M	34
Animator, Graphic Designer	●	●		●	M	26
Journalist			●		M	44
Corporate Communications			●		F	44
Physician			●		M	32
Physician			●		M	33
Student - Bible			●		M	20
Student - Bible			●		F	20
Project Manager			●		F	45
Public Servant			●		F	45
Forklift Driver			●		M	24
Student			●		F	21
Web Designer	●			●	M	36
Film Editor, Screenwriter	●			●	F	41
Lecturer - Game Design	●			●	M	34
Sound Editor TV	●			●	M	45
TV Production	●	●		●	F	26
IT Worker		●	●	●	M	48
Lawyer		●	●	●	F	45
Film Editor	●	●	●	●	F	38
Researcher - Social Science		●	●	●	F	37

9.4.2 Data Collection

Prior to an evaluation, each participant signed a research consent form. The evaluation session then had four phases. First the participants were given

instructions to enter the space, to interact with the artwork as if they were interacting with any other exhibit in the museum and to leave whenever they felt they had had enough. They were also told that they would be interviewed about their experience afterwards. They then entered the space and were recorded on video and audio. The video camera was positioned to one side of the artwork so that it could capture any interactions with the wheel and also capture the participants when they were reading the poster (see camera position on figure 24 above). When participants were at the artwork, the camera took in their body from the waist up and captured the expressions on the faces of participants as well as their interactions with the wheel. Participants were on their own while they were interacting with the artwork. There was no camera operator and the entry to Beta_space was screened off to stop anyone else from entering. Any comments that participants made were recorded on a small MP3 recorder that hung on a cord around their neck.

The second phase of the evaluation involved a structured interview with twelve questions (see appendix 8). This involved one set of questions designed to encourage participants to express their experiences in different ways, such as, by explaining the work to a friend, describing their mood, or summarising their experience in three words. Another set of questions focused on participant interpretations of various aspects of the content of the artwork. These questions were designed to test whether participants had made any connections with the work at the level of meaning. Participants sat inside Beta_space while they answered these questions and could interact further with the work if they wished to illustrate their answers. The audio of these interviews was recorded.

During the third phase, participants filled out a written survey based on the play framework (see appendix 9). Participants rated each play category on a five-point scale from *"didn't enjoy"* to *"enjoyed a lot"*. The five evaluation sessions with the general public recruited from the museum ended here, as this was the maximum time that we felt we could reasonably expect them to commit to. The fourth and final phase of the evaluation was, therefore, only completed by the invited participants (ten of the evaluation sessions). In this phase we asked participants to explain each of the answers that they gave in their survey. Those participants who were classed as "repeat" were also then asked to describe the difference between their experience of this artwork and their experience of the prototype.

There were, therefore, three types of data collected during the evaluation sessions, the sound and vision of each experience with the artwork, the audio of the pre and post-survey interviews and the written survey data.

9.4.3 Analysis

The written survey data was collated in a spreadsheet and ranked to produce a list of the five play categories that were most enjoyed by the twenty-two participants. In order to be able to compare this data to the first case study a similar scale was used, with the "*enjoyed a lot*" answers being given a value of 2 and the "*enjoyed*" answers being given a value of 1. Comparisons were then made between the answers of participants classed as expert versus those of the non-experts. I also compared the answers of invited participants versus those recruited from the general public and the answers of the repeat participants against those who were experiencing the artwork for the first time. The overall rankings and particularly the answers of the repeat participants were then compared with the results from the survey in the prototype case study.

The experience videos were logged and any verbal data was transcribed. This data was initially also compiled in a spreadsheet. A table summarising each experience was then produced and common patterns were analysed. This analysis focused on the timing of various actions, such as when participants first mixed or how long they read the poster. It also recorded the patterns of interaction with the various levels of the work and the patterns of turn-taking amongst pairs.

The audio from the interviews was transcribed and the data was coded using the audio-visual analysis software *Transana*. The first group of codes were the predetermined topic and descriptor codes that have already been described in chapter 2 section 2.4.4. These were used to classify segments, where relevant, in terms of the type of experiential components that they referred to, what type of response to the work they indicated, whether they contained any thoughts or emotions or whether they indicated a misunderstanding of the artwork. There were also additional codes for each of the thirteen play framework categories and these were used to mark any segment that referenced or related to a particular category. Some of the questions from the interview were also given codes but these were used more broadly to classify any segment that related to their issues. Some of these codes related to meaning in terms of the images, the words or the work in general. Others related to the end of an experience, the words that were remembered and the differences that the repeat participants noticed between this artwork and the prototype. The second group of codes developed out of the process of coding and related to issues such as finding levels within the work, listening to the words, expressions of personal insecurity and references to information from the poster. The experience log data was added to the *Transana*

database and out of this some further behavioural codes were added, such as codes for when people played with slow speed, codes for when they played with mixing and codes for laughter.

The final stage of analysis involved taking the coded data from *Transana* and putting it into the mapping software *Tinderbox*. During the mapping process some of the codes with large amounts of data were divided into subgroups, expanding the detail within them. This particularly occurred for the codes of meaning work, meaning images and meaning words. A final result of this mapping process was the grouping of all of the significant coded data and the resulting conclusions under the two major themes of experiential pleasures and issues of interpretation.

9.5 Reflection on Methods

Although it is inevitable that to some extent the process of study will influence the experience under study, this project has tried to find methods that will have the least impact. In this second case study, however, some of the methods chosen did have an effect on some participants' experiences. For example, because the technology used to record the evaluation experiences was quite obvious, some participants seemed to be constantly aware that they were being recorded. This possibly constrained their reactions while they were experiencing the artwork. Two participants commented that the video camera, which was positioned quite close to the artwork case, made them feel self-conscious. One felt that way as soon as he entered the space. The other did not notice the camera until she became frustrated with the work and consequently less immersed.

The MP3 recorder placed on a cord around participants' necks also reminded them that they were under surveillance. Four of the participants who interacted in pairs gestured or said something during their experience to remind their partner that they were being recorded on the MP3 recorder and should be careful what they say. This behaviour was not seen during the first study, which had more obvious and perhaps even more intrusive recording technology. The key difference between the two studies was that in the first there was always a researcher present in the room while in the second participants were alone with the recording equipment. This suggests that these comments about the recording technology in this second study do not indicate a heightened sense of self-consciousness. Rather they can be seen as expressions of the conflict between participants feeling that they were alone in the space and at the same time feeling that they were under surveillance.

The redesigned survey had some aspects that did not operate as successfully as the first one. The category of sympathy was not explained well enough and

most participants' comments about this category indicated that they had misunderstood it and regarded it as similar to camaraderie. The data from this survey question was, therefore, not included in the final analysis. As sympathy was not a key pleasure in this work (whether misunderstood or not) this did not have a major impact on the results.

The survey's five-point scale was not judged to be as successful as the much simpler tick interface used in the first study. Making such fine distinctions made the survey take longer to complete and the process annoyed some participants. In retrospect, the earlier, simpler tick system put the focus more on *key* pleasures and that is what I was really interested in. The five-point scale gave a more nuanced view of people's pleasures but this made it difficult to judge what exactly was key for them. The *"didn't enjoy"* end of the scale was also not particularly useful. As in the first study, there were very few of these answers, suggesting that people, in general, are not keen to be negative in this context.

It is difficult to tell whether this study suffered from not using retrospective reporting as a method. The early comparative pilot study of methods had indicated that retrospective reporting collected richer data about individual experiences than thinking aloud or interview. The pilot did not, however, compare retrospective reporting to the new play framework survey method. The thirteen categories within the play framework survey stimulated people to talk in very detailed ways about their experiences in the first case study and the extended post-survey interview in this study did so even more. The first case study had also indicated that retrospective reporting was not as successful with pairs of participants. On balance, therefore, the lack of retrospective reporting in this study did not greatly affect the richness of the experiential data collected, given the type of participants involved and the additional methods employed.

This second case study collected a much larger pool of data than the first, as it involved not only more participants but also included observational data. Another factor that added to the complexity of the analysis of this data was the need to make comparisons with some of the data from the first case study. The key questions driving all of the analysis was whether the redesign of *Just a Bit of Spin* had succeeded in increasing the artwork's playability and its potential to evoke the pleasure of creation. As expected, the answers to these questions were complex and often intriguing. These results are the topic of the next chapter.

CHAPTER 10:
RESULTS OF CASE STUDY TWO

The findings from the *Just a Bit of Spin* case study at the Powerhouse Museum are grouped into two themes, those relating to experiential pleasures and those relating to interpretation. Before considering these two groups of findings, this chapter will first describe the general character of the audience experience of the artwork. This description has emerged from a close study of both the thirty observed experiences and the fifteen evaluation experiences. The observation sessions were important for revealing the broad range of possible audience experiences and the evaluation sessions provided insights into the range of thoughts and emotions behind these experiences. The chapter will use these insights in a discussion of the pleasures participants experienced with the work and the types of interpretations that these experiences generated.

10.1 Experiencing *Just a Bit of Spin*

There are so many factors influencing the audience experience of an artwork within a public museum context that it is difficult to describe any one experience as being typical. Museum visiting is usually a social event, shared with friends or family, and studies have shown that visitors' interactions within this social group can hold more importance for them than any encounters with exhibits (Kavanagh 2000: 150). Each visitor brings along their own "memories, interests and concerns" (Kavanagh 2000: 148) and when these variables are multiplied within a social group and added to the complex dynamics of social interaction it is clear that each experience will be unique in some way. In spite of these variables, however, common patterns of behaviour do occur when museum visitors interact with an artwork, and due to the wider cultural context shared between artist and museum visitor, there are also some common patterns of interpretation and affects that can be observed.

In this case there were four distinct groupings of behavioural patterns detected within the thirty observed experiences. The behaviour of the first group (4/30) can be described as *uninterested*. The people in this group entered the space and turned the wheel in one direction only. They only spent between 35–60 seconds in the space before leaving. The second group (10/30) engaged more with the wheel. Their behaviour can be described as *mildly curious*. Half of this group turned the wheel in both directions but none discovered how to mix to

another level. They spent between 1–2 minutes interacting with the work. The third group (10/30) were those who were observed to play in a more engaged way with the features of the wheel. Their experiences can be described as *playful and explorative*. All but two discovered how to mix and explored more than one level. They spent between 1-3 minutes in the space. The final group (6/30) were those who fully explored the work. Their behaviour can be described as *enthusiastic*. Everyone in this group discovered how to mix and fully explored at least two levels. Half of them explored all three. This fourth group spent between 3-8 minutes in the space and seemed to have the type of experience that most matched the artistic aims of the piece.

Although these behaviour patterns were also evident in the evaluation sessions, there were some differences between the experiences that were covertly observed and those that were recorded as part of a formal evaluation session. The fifteen evaluation experiences on the surface seemed interactively most similar to the fourth *enthusiastic* group of observed behaviours. Most of the evaluation experiences, however, were much longer than this fourth group and evaluation participants in general uncovered more features of the work. In the majority of the evaluation experiences (12/15) participants discovered how to mix and explored all three levels in a similar way to half of the people in group four. Their experiences ranged between 5 and 20 minutes in length and, thus, most were longer than the 8 minute maximum of group four. These differences in the focus and length of engagement can probably be attributed to the test situation, which, as we know, results in participants who are much more focused and attentive than the general museum visitor. Interestingly, this level of focus and attention did not necessarily lead to experiences that matched group four's observed level of enthusiasm. In spite of the participants' level of exploration and engagement, it is still possible to use a similar range of descriptors for the evaluation experiences: some were *uninterested*, some were *mildly curious*, some were *playful* and some were *enthusiastic*.

An example of an *uninterested* experience is that of a pair of Australian females in their mid-40s. One was a public servant and the other a project manager. They were visiting the museum with an elderly female relative who sat on a stool at the rear of the space as they interacted. The two women began, as many people did, by reading the sign thoroughly. They read bits of the sign out loud to each other and each asked at a different point, *"So, what do we have to do?"*. When they interacted with the work the public servant controlled the wheel for almost the whole experience. She very quickly worked out how to mix and found all three levels much more quickly than any of the other evaluation participants.

The two women did not make any verbal comments during this interaction. Having discovered all of the levels, the public servant began playing around with one of the stuttery sounds that the work would make if you slowed the wheel right down. The project manager seemed to get impatient with her at this point and asked, *"You finished?"*. She then took over control of the wheel and played a bit with the mix interaction. After a few seconds of watching her interact the public servant said *" I think that's it"* and they stopped after 5 minutes of interaction. In their interview the women could not recall any of the repeated words in the artwork. When asked to describe their experience these women talked about boredom and confusion and said the work lacked clarity.

An example of an *enthusiastic* experience is that of an English couple who were also in their mid-40s. The man was a journalist and the woman was in corporate communications. They began by both reading the poster in silence. Then the man started spinning the wheel and after a few spins recognised and repeated the word *"forwards"*. The woman then chuckled and said *"I think they are key messages"*. They each took turns at spinning the wheel, focusing at first on repeating the common words and then on trying to mix. The man was back in control again when the woman said, *"got to get the pear and pomegranate together"*, and they were able to finally mix to the next level. They then again concentrated on identifying the common words before mixing to the third level. The woman laughed or chuckled as each new feature was revealed. Towards the end they stopped taking turns and the man stayed in control of the wheel. The woman asked him to navigate to one of the previous levels: *"Shall we go to something again?"* He did this and played with this level a bit longer. She then seemed to get bored with the experience and said *"I think we've done all the fruit now"*. She turned to go while the man played on a little bit longer. When he stopped, he said *"that was fun"* and the woman laughed. Their whole experience lasted 7 minutes. This couple were able to recall all six repeated words. They described their experience as fun, interesting and thought provoking.

These two experiences are representative of the 'best' and 'worst' ends of the spectrum of evaluation experiences. They both involve participants who were recruited from the general public. While both couples were attentive participants and fully explored the work, one couple clearly enjoyed and valued the interactive experience while the other couple did not. So what additional factors could be causing these different levels of enthusiasm? One of my initial proposals in this thesis was that exposing people to more of the work could result in a greater level of engagement. The *uninterested* couple almost certainly explored more aspects of the work and spent longer than they would have if they were not

under scrutiny. However, this increased level of participation did not seem to result in any increased level of emotional and conceptual engagement with the work. The key factor that this couple seemed to be missing was some form of personal connection that might spark an interest in the artwork. The *enthusiastic* couple in contrast had a strong personal connection with the work and particularly with the concept of political spin because this related to the jobs they did. As the woman in this couple said, they *"do this kind of thing for a living"*.

Similarly, in the rest of the evaluations it was observed that any level of personal connection resulted in an experience that ranged more towards the enthusiastic end of the experience spectrum. The types of personal connections that people made with the artwork depended on their individual life experiences and interests. For example, some participants particularly related to the politics of the work while others knew about early cinema devices and connected with that. Some participants related the mix interaction to their knowledge of modern DJ practices while others were game players and connected with the game-like aspects of the work. These connections can all be described as relating to the content and physical form of the artwork. There was another level of connection, however, that was also important if people were to have an enthusiastic and engaged experience: a connection with art in general.

In the introduction to this thesis we discussed Bourdieu and Darbel's findings that the process of understanding and interpreting art requires knowledge of the culture, history and politics of the artwork and of the art world in general. Without this knowledge, they argue, the viewer is unable to decipher "the generic and specific code of the work" (1997: 69). Bourdieu and Darbel go on to point out that for those who have mastered the code there is a feeling of pleasure at deciphering an artwork (1997: 71). Conversely, those who do not have mastery feel displeasure and feel "unworthy" or "incompetent" (1997: 53). These types of feelings were sometimes evident in the participants whose experiences lay towards the uninterested end of the experience spectrum. For example, one of the two women who had the uninterested experience described above said as they finished their interview: *"I am not quite sure we were the best subjects"*. Another participant, a doctor from the USA, also expressed a feeling of incompetence saying: *"It just doesn't add up to me personally. I am a little thick …"*. Even those who had experiences that could be described as playful and who, when interviewed, came up with some interesting insights about the artwork indicated that they felt insecure about their interpretations. For example, one male student felt *"like I might be giving the most retard answer"*. All of these participants were those who were recruited from the general public. The invited experts, in contrast, rarely

displayed any insecurity about their interpretations. Their confidence came from their familiarity with the formal language and codes of the artwork. If they felt the work did not communicate its message successfully they would say so without questioning their own level of intelligence.

In general, evaluation participants spent much longer interacting with *Just a Bit of Spin* than they had with the prototype version of this artwork in the first case study. While in the first case study the duration of experiences had ranged between 2–5 minutes, the experiences for this second case study ranged between 5–20 minutes. The increased complexity of this version of *Just a Bit of Spin* seemed as intended to give people much more to investigate. Participants' experience of this work was most commonly described with the word *"fun"* (13/22). People described the work as being fun to *"play around with"*, said that they *"had a laugh"* interacting with it and that they *"had some fun"*. They found the images *"fun to look at"*, had fun mixing up the images and words and had fun learning how to change levels. They also had fun collaborating with their partner to work it out. These results strengthen the general impression that the artwork was quite successful as a playful interface.

10.2 Experiential Pleasures

When the play framework survey results from all participants were tallied they revealed that the key five pleasures of *Just a Bit of Spin* were creation, discovery, exploration, difficulty and captivation and subversion as equal fifth. These results differ from the five key pleasures of the prototype version, which had subversion as the top pleasure and also had sensation as a key pleasure. The prototype's results also did not include difficulty or captivation as key pleasures (table 9 below).

These two groups of results cannot, of course, be exactly equated, due to the different exhibition contexts, survey interfaces and participant make-up in the two studies. However, they do suggest some key changes in the character of the artwork, results that are also confirmed by the interview data. The second iteration of *Just a Bit of Spin* seems to have reduced the pleasurable power of both sensation and subversion. The reduction in subversion is particularly concerning, as this was intended to be the key pleasure. The counterpoint to this reduction was that there were some increases, predominantly in the pleasures of creation, difficulty and competition. These increases suggest that some of the redesign aims were achieved, in particular, those aimed at increasing the pleasure of creation. The next sub-sections will discuss each of these pleasures in turn and will use the

interview data to attempt to tease out the reasons behind these changes to the character of the work.

Table 9: Survey results from Case Study Two (left) and the prototype case study (right)

Just a Bit of Spin 22 Participants max score 44, min 0	
Creation	**30**
Discovery	**29**
Exploration	**28**
Difficulty	**25**
Subversion	**24**
Captivation	**24**
Competition	19
Sensation	18
Sympathy	*14[1]*
Camaraderie	13
Simulation	13
Fantasy	13
Danger	2

Prototype 15 Participants max score 30, min 0	
Subversion	**17**
Creation	**15**
Exploration	**15**
Sensation	**15**
Discovery	**14**
Captivation	10
Competition	8
Simulation	7
Difficulty	6
Camaraderie	6
Fantasy	5
Sympathy	4
Danger	1

10.2.1 Subversion

Based on the results from case study one it was anticipated that the subversive pleasures in *Just a Bit of Spin* would relate to two aspects of the work. Participants would get pleasure from hearing the way that the phrases within the work twisted politicians' way of speaking. Participants would also get pleasure from mixing up the phrases thereby adding their own particular twist to the meaning of the phrases. It was not anticipated that the experience of *Just a Bit of Spin* would provide opportunities for participants to feel like they were breaking the rules of the world set up by the work. However, because politicians are generally seen as respectable figures of authority, it was expected that participants might feel like they were breaking a societal rule by making fun of what politicians say.

Although the subversive pleasure that people experienced with *Just a Bit of Spin* was less than I had hoped for, it was still present in many experiences. For example, one person connected the subversive pleasure that she felt to being empowered by her experience:

> *... it was nice to be empowered ... to have some element of control over the politicians.*

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[1] The sympathy category was misinterpreted in Case Study Two and so will not be discussed here.

Three others described getting enjoyment out of the way the experience made them relate to language and its meanings in a different way and one person got subversive pleasure from her interactions with the fruit:

> *I like this innocuous piece of fruit being used in relation to these words, and this very serious monotone... I felt like there was a nice pattern to the fruit, and then that stuff I was doing was making it a bit more messy and mixing them up.*

Some of the intended subversive pleasures relating to language and meaning were, therefore, still experienced in this iteration of the artwork and the fruit imagery provided a possible new avenue for people to experience subversive pleasure.

The fruit imagery was also, however, connected to the reduction in subversive pleasure that people seemed to experience with this version of *Just a Bit of Spin.* The prototype artwork had made it obvious that the phrases being spoken came from the mouths of politicians by including images of John Howard (the Australian Prime Minister at that time). *Just a Bit of Spin* replaced this overtly political imagery with intentionally more ambiguous images of fruit. This made the work feel much less political, as the repeat participants indicated. One said that she felt that this new version of the artwork had less of a *"political edge".* Another commented that she did not feel like the spoken words were connected to anything real:

> *... it wasn't real stuff, so I wasn't [subverting anything]. Maybe if it was John Howard's voice, and I was making him say different things, that might've been subverting it.*

It was not just the change in imagery that made people connect the voices less with politicians. In this version I used a different person for the male voice and also included a female voice. While several people in the prototype test had thought that the original male voice might actually be a politician, there were no such comments for this version. The only comments made were about the character of the female voice or about how speed could make the male voice sound like a female. Perhaps, even today, most people still associate political discourse with a male voice and perhaps using both male and female voices also drew attention away from the work's political content by making people focus on gender rather than on the words spoken.

Another factor that seemed to draw attention away from the content of the sound was the increase in repetition now that there were three pairs of words instead of just one. Some comments (2/22) indicated that the repetition within the

sound made participants stop listening to the phrases being spoken. As one participant said; *"I stopped listening to the meanings...the words were so repetitive"*. Another said that she stopped listening to the words because she could not stand listening to such political talk: *"I've got this automatic switch where I just shut down and go – right they're talking rubbish"*. This shutting down did not seem to happen in the prototype, which had similar political phrases but only repeated the words forwards and backwards.

The increase in the number of repeated words was part of the greater structural complexity of this version of the work. In the prototype the repeated words had only one structural purpose. They made a connection between the phrases spoken and the direction that the wheel was turned. In *Just a Bit of Spin* the words connected to participants' interactions in a much more complex way while also acting as markers for each different level. Consequently, each individual repeated word now signified much more and participants were more focused on identifying these words. This focus was another factor that perhaps took attention away from the specific content of the phrases.

Another factor that seemed to take focus away from the sound was the increased amount of imagery in the work. The new images were intentionally quite simple so as to not distract people from their interactions with the sound. However, these new images on the luminescent screen proved to be very seductive. As one participant commented:

> *I found that I was paying an awful lot of attention to the images, and very little attention to the words.*

Another said:

> *For me it became really a background sound and I became much more immersed in the relationship between the physical action and the image.*

Comments like these suggest that the simplicity of the images was not very successful at keeping people focused on the sound and that it may have been a contributing factor that stopped people from registering the specific content of the phrases.

It is also possible, however, that this lack of focus was an effect not of the images gaining power but rather of the sound losing power. This idea is supported by some very interesting comments made by two of the repeat participants. In trying to describe the difference between the two versions of the work one participant commented on the neutrality of the voice:

So the voice is really neutral, you know, it doesn't sound familiar, I don't know who it is that's speaking, and I don't know who they're quoting, and I don't... yeah, and I don't know who they are at all ...

Another talked about the emotion in the voices in the prototype:

I think part of why I felt the other one was edgier, was because it sounded like they might have been activists as well, like kind of more you know, outraged ... less that kind of polished speaking voice, but more kind of ... more emotional kind of voices ...

What these comments indicate is that the sound in this version of the work lost impact because the timbre and tone of the voices did not signify that the phrases were being spoken by politicians and also did not signify any level of political fervour. The participant quoted above later said that if the voices had been more emotional she thinks she would have listened more to the sound:

If there was more emotion in the words...Then you're like oh, there's this distressed woman, oh there's this angry guy.

The emotionally neutral tone of the voices was, therefore, another factor that stopped people listening to the content of the sound and that obscured the political message of the artwork.

The reduced amount of pleasure in subversion that people experienced with this version of the work is, therefore, tied to changes in the content and character of both the imagery and the sound. Together these issues caused a reduction in the subversive pleasure of the work by making the work seem less obviously tied to politicians and by making people pay less attention to the content of the sound. If people are unsure whether the voices are politicians then they will feel less subversive playing with and changing the speed of the voices than they would if they were convinced that the voices belonged to political figures of authority. Lampooning such figures of authority breaks the societal rule that such figures should be respected. Also, if people are unaware of the specific words in each phrase then they will not notice that they are changing the meanings of a phrase and this will impede any pleasure they might get from subversively playing with meanings. Both aspects of the play framework category of subversion, the pleasure of breaking rules and the pleasure of twisting meanings, were, therefore, experienced less often. As the discussion above has shown, the reasons behind

these issues are complex and involve many aspects of the work, its sounds, its images and its structure.

10.2.2 Sensation

As with the prototype version, most of the sensual pleasure that people experienced in *Just a Bit of Spin* came from the physical action of spinning the wheel. For one repeat participant, however, the new harder and smoother material surface of the wheel interfered with this pleasure. She described the prototype version as being much more textural and tactile:

> *There was a sensibility about it, and a warmth about it, that this one doesn't have....It was cardboard, and had the little paper flaps or something. ... I kind of liked that, and it created a breeze, this doesn't have air movement with it as well.*

Another participant explained that although he enjoyed the physical side of the wheel interactions he got more enjoyment out of the effect they had on the work and this, he felt, related more to other pleasures:

> *The physical was purely the means, and yeah, it was fun, but I didn't score it the highest, because by doing that, that's the means to discovering, and ... and working it out, that's what was the enjoyable part.*

Others (4/22) were more negative, indicating in their survey that they did not enjoy the sensual aspects of the work. One of these participants explained that this was because she was worried about germs and so felt uncomfortable touching things in public places.

Although some people preferred the tactility of the prototype version others commented favourably about the robustness of this new version. The prototype was a quite flimsy construction and during the first evaluation several people had commented that they were worried that they might break it while they were interacting. This new version was much more sturdy and did not worry people in this way at all. One participant commented that this robustness made his experience feel *"seamless"* and contrasted this to his experience of other interactive works:

> *You know a lot of times, even in this Powerhouse ... they've got little interactive things [where] there's lag...You know it's a bit clunky and things may not work and you know if you be really wild with it, it will freeze up.*

He particularly appreciated the direct responsiveness of *Just a Bit of Spin*, as did another participant who commented:

> *I found this really sensitive, so you know, I could just like go to nothing, and it was still doing something, so that was really good.*

Where one comment indicates that a lack of robustness can inhibit play the other indicates that robustness combined with responsiveness encourages play.

The reduction in the amount of pleasure that people got from sensation appears to have been the result of three factors. Firstly, the surfaces and materials of *Just a Bit of Spin* seemed to be less enjoyable to touch and less stimulating. Secondly, the increased complexity in the structure of the artwork made some people focus on the work's reactions rather than on the physical side of their interactions. Finally, the exhibition context, for some, invoked social taboos about touching objects in public places. However, it was also evident that the increased robustness of the artwork worked in tandem with the work's responsiveness to encourage playful behaviour.

10.2.3 Creation

In the first case study the pleasure of creation did not feature as strongly as I had intended. *Just a Bit of Spin* aimed to increase this pleasure and, because the artwork was primarily a sound piece, it was particularly important that people enjoyed creating sounds. The play framework survey results indicated that this redesign was quite successful, with the image and sound aspects being either *"enjoyed"* or *"enjoyed a lot"* by most participants (18/22). Creating sounds received more *"Enjoyed a lot"* results (12/22) than did creating images (9/22) and this weighting towards sound was pleasingly in keeping with the intentions of the artwork. In their interviews people talked about enjoying controlling the speed of the sound, enjoying controlling the content of the sound and enjoying *"scratching"* the sounds. One participant described how for her this enjoyment was very much associated with her perception of who was speaking:

> *I enjoyed being able to manipulate and make ... the voices of the politicians, so that they could sound ridiculous if I wanted them to, by speeding up so fast, or slowing it right down, and it was almost as if I was playing with them, rather than they were playing with me ... usually they're untouchable and they can say what they like ...*

Others enjoyed continuously moving the wheel backward and forward to create mixed up sounds and were observed dancing around as they did so (3/22), gaining pleasure from the rhythmic pattern of the sounds they were making.

Overall, these results suggest that the changes made to the sound interactions were successful. There were also, however, some comments that indicated people wanted more from the sound. They enjoyed it but they wanted to have more creative control. One woman wanted to be able to have more control over mixing up the sentences:

> *It was kind of fun to play with it but you couldn't actually get them to say, or I couldn't get them to say, anything different ...*

And one man echoed a comment that was also made about the prototype:

> *I would have liked to be able to scratch properly. To single out a word and go back and forwards over it.*

These comments suggest that more fine-tuning is needed to really make the sound interactions as enjoyable as intended. Participants had control over the speed of the sound but did not have enough control over mixing up the content of the sound.

One of the factors that affected participants' control of the sound was the heaviness of the new wheel. As one of the repeat participants pointed out, the heavier acrylic wheel spun faster than the cardboard version in the prototype and this, combined with the new mix sounds that I had added, made it more difficult to mix at the level of individual words:

> *It's going so fast, it's got a torque to it, that it slows and goes back ... I didn't feel like I could get the sounds to go mweawm [mimics sound of slow speech], I could hear that, but I couldn't quickly get to the next word that was going in the other direction.*

This comment might also explain why people did not play with slow speed as much as people had in the prototype evaluations. In the thirty observed experiences only four involved people playing with slow speed. Three of these experiences were in the most enthusiastic group, suggesting that in *Just a Bit of Spin* the slow-speed interaction took time and attention to discover. The robustness and weight of the new wheel encouraged fast spinning and also meant that the wheel took much longer to slow down. In most cases people rarely let it do so until they were finished with their experience and consequently the slow-

speed interaction was often not noticed until after people had decided to stop playing.

Another factor that might have kept participants spinning the wheel fast was their enjoyment of the animations they were creating. Participants said that they got pleasure from being able to start, stop and control the speed of the animations. They also said they found some of the fruit animations more enjoyable than others. The two most popular fruit animations were the raspberry/pineapple and the banana/orange transformations. Participants described the pleasure they got from these animations in a way that indicated that they felt a real causal connection between their actions and the transformations. For example, one participant used the word "make" to describe the animation:

I really enjoyed when I realised that I could make a berry turn into a pineapple.

Another used the same language to talk about the banana transformation:

I liked making the banana disappear and turn into an orange.

Both of these animations only occurred when the wheel was being 'scratched' (moved quickly back and forth). These animations and sounds that were triggered during this scratching interaction were clearly enjoyed by participants, who often played with them by scratching continuously for 30–60 seconds.

Interestingly, the animations that were triggered during the normal spinning interaction did not seem to make participants feel like they had creative control. When participants described these animations there was a sense that the system had control not them:

I like seeing the berries squash and kind of watching that go around.

This animation was something that the participant *watched* happening rather than *made* happen, indicating that she did not feel as responsible for creating it as she did the berry/pineapple transformation, which she also described above. Perhaps participants felt more responsible for the scratching interaction because it took them longer to work out, their feeling of mastery arising from having something to master. It could also be that this feeling of creative control was linked to the more transformational nature of the scratch animations, which very obviously changed because of their actions. Also, once started, the wheel could spin without participants doing anything, whereas scratching needed their constant active

involvement and this might, therefore, have made the results of this scratching something participants felt much more responsible for. They could thus experience the pleasure of "being a cause" (Groos 1898: 296).

The animation that seemed to be the least successful in terms of creative pleasure was the sprouting pear animation. There were some comments that indicated that people thought this animation was beautiful but no one said that they had enjoyed creating it. This was an animation that for participants seemed to have a life of its own and spinning the wheel did not give them a sense that an action was being taken but rather that an action was being played out. These pear animations also did not have the same sensual quality as the raspberry animations. The glistening redness of the squashed raspberry made some participants recoil in disgust, with one saying that she thought it looked like *"meat"* or *"flesh"*. Although it made some people recoil, the sensual nature of these raspberry animations also fascinated them. The only sensual element that had been designed into the pear animations was the biting sound that occurred during the pear scratch animation. Interestingly, this was the one element from these pear animations that was particularly commented on, with one woman remarking that she had really enjoyed that sound. It seems that, as noted during the prototype study, sensual sound and image combinations work well to evoke the pleasures associated with play. These results also suggest that some of the animations will need to be redesigned if I want them to spark the pleasure of creation more effectively.

10.2.4 Difficulty and Competition

The increased pleasure in difficulty and competition that participants experienced was a result of the increased complexity in the structure of the work. With two extra levels to uncover, the work now had a more puzzle-like quality to it and working this puzzle out became a driving force of many of the experiences. Participants learned about the levels when they read the poster and, as this comment indicates, from then on the urge to find all three was usually strong:

> *Actually I only got halfway through the instructions and went 'oh there's three levels okay' and went back and kept playing until I got the three levels.*

Knowing that there were three levels helped provide impetus for exploration. It also helped shape the length of participants' experiences by giving them the confidence to complete their experience feeling like they had discovered everything within the work.

Another factor that helped with this sense of confidence was the fruit displayed on the large screen behind the case. There are five examples of people looking at this fruit and using it to identify elements that they had not yet discovered. For example, this excerpt from one couple's experience:

Male: *Each fruit relates to a particular word. So the raspberry is soft. The pineapple is hard. The pomegranate is backwards.*
Female: *Yeah ... What's this one? [She spins forwards] This is the pear ... Forward ... So the pear is forward...[she looks at large screen] We haven't got the banana ... Shall we get a banana?*
Male: *Yeah.*

The fruit seemed, therefore, to work successfully as markers for the levels. They also encouraged goal-driven exploration, thereby increasing opportunities for people to experience the pleasure of competition.

However, not everyone was able to achieve the goals that they set and if they did not they were less likely to experience enjoyment from competition. One couple discovered how to navigate between levels but did not understand the structural relationship between the levels, the scratching interaction and the different fruit animations. After a while this couple kept navigating to the same level and did not learn how to go anywhere else. Another couple identified a pattern of single fruit images within the first two levels they discovered. They then set themselves the goal of finding a matching pattern at the third level, which had two kinds of fruit on each screen:

Some of the goals that I set myself, I wasn't able to achieve, like I just wanted to get total bananas and pure oranges, and I couldn't do that, and that sort of frustrated me.

Such misconceptions about the artwork suggest that there might be some problems with the clarity of the interface. Both issues also highlight the need for the artwork to have strong and consistent patterns in order for people to be able to grasp the interface in the brief time that they spend with it.

But is it reasonable or even desirable to expect this artwork to have an interface that is clear to everyone? If it did, could that reduce the possibilities for experiencing the pleasures of competition and difficulty? One participant from the general public praised the work for not being too obvious:

It is good, it does take some discovery. It is not obvious. It is good, because you are not given too much information.

And one of the expert participants enjoyed the feeling that she had not worked everything out:

> *It was challenging, and I didn't feel like I worked it out, so I enjoyed that a lot, and I'd probably play with it again.*

These comments suggest that if the interface was clearer then perhaps these two participants would have enjoyed it less. Perhaps if you want people to experience the pleasures of difficulty and competition then you have to accept that not everyone will meet the challenges and goals that you have designed. If they could, then your difficulties would not be very challenging and your goals would not be very competitive. As with most design issues it is again a question of getting the balance right. The difficult issue, however, is to determine what the right balance is for this particular artwork. This would probably involve finding a balance that matches the type of audience that the artwork is aimed at and finding a balance that achieves the experiential goals of the artwork, with both of these factors being defined by the artist's intentions for the artwork.

At the time of creating *Just a Bit of Spin* I had only a broad concept of the audience it was aimed at. In my mind the audience would include those who were generally interested in art and specifically those interested in interactive art. I expected the audience to have some level of experience with computers and possibly to have played a computer game. I was also trying to make the work more appealing to the type of people who had described the prototype as being "too blunt". These people were the type of people who enjoyed working things out and I made the work more puzzle-like partly so that the work would appeal to them. Had this strategy worked? Three out of the seven repeat participants were from this group of people who had not really enjoyed the prototype because there was nothing to work out. In all three cases, these participants seemed to find this iteration more complex than the prototype and to enjoy it more because of this. As one of them said:

> *I think I probably felt with the other one, that it was limiting, you know? Because ... spend five minutes, oh yeah, work that out, you know, move on. With this one, I can spend much, much longer with it.*

Their increase in enjoyment came from the way that the new puzzle-like interface increased their chances of experiencing the pleasures of difficulty and competition.

Although these results do suggest that the balance of difficulty and competition was right for this intended audience, it should be noted that out of all twenty-two evaluation participants there was only one person who actually solved the whole puzzle. This person was a lecturer in game design and although he solved it, he still took some time to do so. I realised, as I nervously waited outside Beta_space listening to him interact, that he must most closely represent the audience I had actually designed this puzzle for. This was an audience far more expert in computers and computer gaming than I had consciously intended. I will need to consider whether this audience is too restrictive when designing further iterations of the artwork. If so, then the balance of difficulty and competition will need to be adjusted.

Another reason to adjust the balance of difficulty and competition is because participants' concern about solving the puzzle seemed to work against the experiential goals of the artwork. One participant was so focused on working it out that he did not really listen to the sound:

> I was spending a lot of time trying to work out the mechanics of what affected what, and so on, and I probably needed more time to then go "Okay, we've established this, lets now play with it and listen".

Another participant could not control the navigation and indicated that this interfered with her enjoyment of the artwork:

> I wouldn't think I'd get bored with it quickly, if I was playing with it, and had an idea of where I was going.

These comments are interesting because they both make the distinction that we have discussed in an earlier chapter, between the preliminary explorative stage of working out what an object can do and the next more playful stage of working out what can then be done with it. The comments suggest that the problem here might be that the challenges and goals in *Just a Bit of Spin* occurred mainly at the surface 'working it out' level and were not integrated within the content of the work which would have put them more at the playful level of 'what can be done'. Because the puzzles within the work were all at this surface level, trying to work them out took the focus away from the work's content and, therefore, away from the work's political message. This suggests that redressing the balance of difficulty and competition should involve making the surface-level interface easier while increasing the possibilities for goals and challenges within the content of the work. Although people might still not meet all of these challenges

or realise all of these goals at least in trying to do so they will be engaging with the political message of the work.

10.3 Issues of Interpretation

Interpretation was an important issue for *Just a Bit of Spin,* far more so than with *Elysian Fields* and *Sprung*. This was because, unlike them, it was an artwork that was trying to communicate a specific message. However, although it had a primary message, *Just a Bit of Spin* tried to provide room for more interpretive play than the prototype version was able to. As already discussed in chapter 8, I tried to achieve this through the ambiguity of the fruit imagery. However, these fruit animations were not totally disconnected from the content of the piece. Each was designed to convey the themes that politicians were expressing with each pair of words, and also at a base level they were designed to make a connection between poker machines and politics. Therefore, I was interested to see whether any of these meanings had been interpreted by the evaluation participants. I was also interested to see whether, as anticipated, the ambiguity would lead to more interpretive freedom.

There were three specific questions about interpretation in the evaluation interview. Participants were asked about the meanings they gained from the repeated words, about any relationships they saw between the words and the images and, finally, at the end of the interview they were asked about the overall meaning of the artwork. The next three subsections will discuss the results from each of these areas in turn and will be followed by a discussion of the role the exhibition poster played in helping or hindering these interpretive processes.

10.3.1 Interpreting the Artwork

The majority of the participants (16/22) gave answers that indicated that they had interpreted the intended primary message of the piece. Of the six who did not, four said that the artwork was just fun. The other two were the couple described earlier as having the most uninterested experience. This couple did seem to experience some of the work's intended resonances but their answers indicated that this was more from what they had read on the poster than something they had interpreted from the work:

> *To me they [the words] just seem flowery. As it says, it is a spin that is all it was. If it is political like it sounds, it is just to say that we want to do this but they were going around it in a very long way, using a lot of words.*

It is interesting that people did not seem to lie here. Even if they had read what the message was supposed to be, if they had not grasped the connection when interacting with the piece they did not say that they had. One participant, a student from Indonesia, said that yes the poster said it was political but no she did not get it. Another participant, one of the experts, said that she was aware the artwork had political connotations but that she had instead focused on the sensory aspects of her experience.

Of those who did get the primary message, the most common answers were those that matched the interpretation I had expected. These answers described the work as being about the meaninglessness of political spin. Two people extended this idea and commented on the way that this political spin created an illusion of movement. For example a social researcher said:

> They were ... using those words which make it sound like there's movement, but they weren't actually moving in what they were saying, they were just saying the same kinds of things.

This interpretation makes the intended connection between the nature of the animation device, which provides the illusion of movement, and the content of the artwork.

This relationship between the participants' interactions with the wheel and the political speeches within the artwork also sparked other interesting and less expected interpretations. One participant, a screenwriter, made a connection between her interactions with the structure of the artwork and the way she related to political speech in real life:

> On every level [of the artwork] you're trying to find the message in the level and so I guess that's about how you have to listen to politicians in that you don't listen to what they're saying because that's just the message that they want to get across so you almost have to listen through what they're saying.

Another woman who worked in TV production also made a connection between her interactions with the wheel and the hidden meanings within political discourse:

> You can go oh, I'm going in the opposite direction so is this the opposite of what is being said?... And it's not.
> I think it was trying to convey ideas about getting us to think about how things are said... and how that impacts on what is said.

The experience made her think about and question the oppositions expressed in politicians' speeches and she then, interestingly, extended this idea to think more broadly about language and meaning.

In general, then, the evaluation participants did not find it difficult to interpret the primary message of *Just a Bit of Spin*. As expected, most came up with interpretations that related to this message. However, for some participants the work also sparked more insightful and reflective interpretations. That most of these interpretations were made by expert participants might perhaps reflect their broader knowledge of and expertise in the interpretation of interactive art.

10.3.2 Interpreting the Words

In asking about the meanings people gained from the words within the work I was hoping to uncover any thematic resonances that might have developed from specific pairs of words. Each pair of words was an opposition: forwards/backwards, hard/soft and something/nothing. I had noticed, when editing the phrases, that politicians used these words to push a particular meta-level meaning: forwards/backwards was about the importance of progress, hard/soft was about not being weak and emotional and something/nothing was about giving the impression that action was being taken while at the same time avoiding saying anything specific.

Given the sound focus of the artwork, some of the answers here were understandably very similar to those about the overall meaning of the artwork. Many people (7/22) echoed their earlier comments and said the words were about politicians *"talking and saying nothing"*. Other answers indicated that it was quite common for participants to notice the way that one of the words in the pair expressed positive messages while the other expressed more negative messages. There were three comments similar to this one by a sound editor:

> *You spin in one direction, and often there was the positive spin and you go back to spin the other way ... you have got the negative spin.*

As we have already noted in the section above, this caused some people to then reflect on these oppositions and on the meanings of the repeated words. For example, this film designer questioned her reaction to the word "backwards":

> *You know, no one ever wants to go backwards so you're not programmed to going backwards but I kept wanting to go backwards to see why I felt like that.*

Other reactions to the words were less about content and more about the structure and interface of the work. A web designer focused his answer not on the meaning of the individual words but on the role of the words within the overall structure: *"Just different ways of putting spin on something"*. Similarly, two other people said that they saw the words, particularly those at the forwards/backwards level, as instructions for how to use the work.

These answers indicate a slightly disappointing lack of connection between participants and the specifics of the verbal content of the work. This is not altogether surprising given that we already know that participants were often not listening to the content of the sound. Some of the intended messages relating to the repeated words did finally emerge during the evaluation interviews. However, this did not occur until participants began to consider the possible relationship between these words and the animated images within the artwork.

10.3.3 Interpreting the Relationship between Images and Words

Participants' answers about the ambiguous relationship between the images and the words within the artwork revealed some of the resonances that I had hoped people would be able to obtain from the words alone. The relationship between the words and the images generated much discussion and in total the analysis identified 51 quotes of interest about this relationship. In contrast, there were only 26 quotes from the answers relating just to the words. This indicates that the ambiguous relationship between the words and the images in *Just a Bit of Spin* succeeded in generating discussion. The important question, however, is did this ambiguity also generate interpretive responses?

For quite a few participants it did not. Many participants from the non-expert group were completely puzzled by the images of fruit. A doctor from the USA expressed this common response:

> *I understand spin, meaning the spin of the disk and all that stuff. But what did the fruit have to do with it, and what specifically does the fruit have to do with political statements or language? It just doesn't add up to me personally.*

Similarly, many in the expert group did not see any relationship between the fruit images and the message of the work. However, the experts did not worry about this in the same way that those in the non-expert group did. Instead, they used their knowledge of the formal structures of interactive art to come up with a formal explanation for the fruit. For a web designer the fruit *"symbolised that it was going into a new stage"*. For a sound designer the fruit was *"a visual distraction, so you pay attention to the audio"*. An animator commented that he *"didn't really need*

or feel an immediate direct relationship" but that was a positive for him because *"these animations are so nice and simple and ... really beautiful and I think that's all you need in a way".* Coming up with a formal explanation for the fruit seemed, therefore, to make the experts less anxious about it. The non-experts were unable to do this and the fruit imagery left them feeling anxious and perplexed.

The non-expert group's level of worry about interpreting the fruit was something I had tried to avoid when designing the work. I had correctly foreseen that this type of worry could block interpretative reflection and had hoped that the poker machine reference would prevent this. I was hoping that some people would know the slang term "fruit machine", which referred to old style poker machines. However, only one participant, the game designer, picked up on the fruit's connection with poker machines. Most other people were not very familiar with poker machines. Those who were, associated poker machines with three images side by side and did not associate them at all with the type of circular fruit images that occurred in the artwork.

Although the intended poker machine references did not work on a visual level they did work on an aural level. Each change in level was accompanied by the sound of a poker machine paying out. Seven people correctly interpreted this sound as being associated with poker machines and *"hitting the jackpot"*. This sound also made people make comments about money, winning, casinos and cashiers. However, only one person, a film designer, made a connection between the sound and the political message of the piece:

> *It was the thought that you know that politics is our money really and ... the sound of the money and God they're so wasteful.*

That the overwhelming majority of the participants did not share the connections I made between the fruit imagery, jackpot sounds, poker machines and politics will have implications for future iterations of the artwork. If I cannot easily solve this problem by providing clues in the text accompanying the artwork then I might need to consider solutions that involve making changes to the content.

Another aspect that puzzled participants about the fruit imagery was that it did not seem to have a consistent pattern. One couple, a lawyer and an IT worker, spent a long time puzzling over the something/nothing level because this was the only level that had two kinds of fruit on the one screen. This couple were very pattern focused and during their experience also noted other differences in the types of actions that occurred during the animations. Another inconsistent pattern was noted by a participant who worked in TV production. She felt that

there was a quite literal connection between the hard/soft level and its fruit imagery but that there was a more philosophical one at the other levels:

And with the hard and the soft, I was probably associating that less with sort of philosophies about life ... and it was more about like you know, the soft berries compared to the harder pineapple.

This literal connection in the hard/soft level was the answer that most people gave when asked if they thought there was any relationship between the words and the images. However, there was no literal connection between the words and the images at the other two levels and the lack of consistency in this pattern clearly puzzled some people. Participants seemed to expect to find this literal connection and their focus on matching this pattern might have blinded them to the much more metaphorical connections that the other two levels had.

For some people, however, puzzling over the fruit did cause them to begin making interpretations. One expert participant, an animator, talked about the way that different fruits had certain *"textures and feelings"* for him and that these had added to his interpretation of the words. Another expert participant, a film editor, made a connection between the positive and negative character of the words and the fruit:

You're quickly shifting ... like that idea of ... cutting between two things ... like an angel and a devil character, like I don't know, but like in old black and white movies where they chop quickly between two things `cause they show the darker side of something, you see the darker side of the fruit.

Other participants made more explicit connections between their interpretations of the artwork and the fruit. For example the woman who had questioned the assumptions behind the meanings of opposing words thought about *"comparing apples and oranges"*. Similarly, another expert participant, a film designer, connected figures of speech involving fruit with her interpretation of the work:

A bad bunch of fruits and bad politicians ... Fresh fruit, fresh ideas ... Lemon, a bit of lemon in there ...

She, like some other participants, also saw the fruit as working in contrast to the words:

The fruit was beautiful and what they were saying was stagnant so ... For me there wasn't growth in the spin of the politicians but there was growth inside of the fruit.

Although most of these interpretations of the fruit were made by the expert participants some interpretations were also made by the non-experts. For example, one non-expert participant talked about how the mixed up fruit animations had signified mixed messages:

You've got a raspberry with a pineapple top on it ... and that ... signified the fact that the message of softness and hardness can get mixed and confused, and become something that really doesn't make any sense.

This last interpretation reflects one of the messages that I had intentionally tried to evoke with the fruit animations. However, many of the other interpretations quoted above were unexpected and indicate that the ambiguity that was intentionally designed into these animations did indeed allow for some interpretive creativity.

There was also evidence that participants were able to creatively interpret the more metaphorical meanings that I had intended the fruit to convey. Four participants talked about the way the forwards pear animation symbolised growth or creation and most of these also connected the backwards pomegranate animation with disintegration. One participant, a screenwriter, also understood the connection I was trying to make with the mixed up banana/orange graphic:

... they're talking about something and nothing and also about re-branding and so ... for me that was really about obfuscating and confusion and so the last image being the ... orange/banana in banana skin sort of made sense ...

These comments indicate that for some people the ambiguity of the fruit imagery did work to encourage interpretative responses. That many of these people came from the expert group suggests that their ability to initially solve the fruit puzzle with a formal explanation might have given them the freedom to then play more with their interpretations.

It was not only experts that were more able to interpret the fruit imagery. The other group that did so were those non-experts who had more enthusiastic experiences. The common connection between these two groups was that they both had a level of knowledge about the art world and a connection to the artwork. This made them both more willing and able to play with their interpretations of the work. As one of the experts said: *"The more I think about the*

fruit, the more I can talk about it". Those non-experts who were not so familiar with interpreting art were able to make literal interpretations but had difficulty making more metaphorical interpretations. As one of these put it:

> *I think you need to have a pretty like abstract sort of thinking and be able to approach this in that frame of mind to fully understand.*

Making meaning out of the ambiguous imagery in the work did require a level of creativity and imagination and some people were clearly more adept at this than others.

So, did the ambiguous fruit imagery successfully evoke more thoughtful and interesting interpretations of the work? As with our earlier discussion of difficulty and competition, measuring this success partly depends on the audience that the artwork hopes to attract. For the audience that the work was aimed at the strategy does seem to have been moderately successful. Participants did make some interesting interpretations of the fruit and because the ambiguity made it difficult to lock down the meaning of the work they were clearly more thoughtful. For some people (8/22) this lack of interpretive closure left them feeling *"frustrated"*, *"confused"* and *"curious"*. Others (11/22) described their experience more positively as *"thought provoking"*, *"intriguing"*, *"interesting"*, *"stimulating"* and *"engrossing"*.

10.3.4 The Role of the Exhibition Poster

The exhibition poster was another element that influenced the way that people interpreted the work. It was divided into four sections: a description of the intentions of the work, information about the technology within the work, information about the research project that the work was part of and instructions for how to interact with the work. During the first two evaluations we quickly discovered that these interaction instructions were not clear enough and so they were rewritten and put into point form to make reading easier. This revised poster was then used during the next ten evaluations (see appendix 10). For the final three evaluations an additional piece of text that explained the fruit imagery was also added to the intention section of the poster (see appendix 11).

This additional text was a response to indications that people were puzzled by the fruit imagery and were not seeing it as a reference to poker machines. The text explained the origins of the term "fruit machine" and so made a connection between the fruit in the work and poker machines. This new information did

make one of the five participants from these last three evaluation sessions less puzzled about the fruit:

> *Because you'd made a reference to the old style poker machines, then it was fine, it was kind of like well that's why... that's why it's fruit.*

However, another participant indicated that although the text told her that there was a connection between the two she did not remember that while she was interacting:

> *I read that first, then sort of went and played with it, and kind of forgot what I read there ... maybe I didn't really get that because I've never played with a poker machine, and certainly not a fruit poker machine.*

This response is similar to that noted earlier in our discussion of the artwork's meanings. Participants seem to only accept explanatory information if it connects with their personal experience of the artwork or, as in this case, their personal experience of the world.

The reasons that people gave for reading the poster were fairly similar. They wanted to know how the artwork worked and what they were supposed to gain from it. Participants particularly noted that the poster told them about the three levels in the work and that it taught them how to mix between these levels. One participant described the way this educational role of the poster relieved his initial anxiety even though he thought he could have worked it out anyway:

> *You feel a bit vulnerable walking into a space like this because it's kind of like you don't know what it is and you don't know what to do... So that [the poster] was like a bit of a crutch.*

Similarly, one of the repeat participants talked about how reassuring and comforting it was to have such a detailed poster, compared to the minimal information given in the prototype test. Another repeat participant, however, criticised the poster for being too long, saying that she would only *read the first three paragraphs, and then you've lost me."* So while the second version of the poster did seem to successfully inform people about the work, it could possibly have done so in a more focused and concise way.

These results suggest that exhibition signage plays an important role in helping people to interact with and interpret an artwork. Even if people can work out how to interact by themselves, exhibition signage can make them feel less

vulnerable and insecure. Although such signage is important, it does need to be kept to a minimum and to be carefully composed to make sure that key points about the artwork are communicated. However, communicating these key points is not just a matter of semantic clarity. If the relationship between the text in the poster and the artwork does not resonate with the personal experience of a participant then the message will not be accepted. Finessing the design of this relationship is, I suspect, something that can only be achieved through evaluation.

10.4 Reflection on Results

There were many aspects of *Just a Bit of Spin* that worked successfully. Experiencing the artwork clearly had a positive effect on many participants' moods and made them feel thoughtful and engaged. They also enjoyed the case design and found the animations beautiful and captivating. The majority of participants understood the primary message of the piece and described their experience as fun. This level of enjoyment, combined with the increased complexity of the artwork's structure made participants spend a lot more time playing with this work than they had with the prototype. Overall, *Just a Bit of Spin* was described as a more refined, complete and well thought out artwork.

However, as the discussion above has shown, there were some aspects that did not work so successfully. *Just a Bit of Spin* did not feel political enough, the poker machine references were too obscure, the fruit images were puzzling, the structure was a bit difficult to work out and the sound interactions were not as subversively creative as intended. Trying to resolve these issues will be a complex process and, as the discussion above has revealed, could involve possible changes to many interrelated aspects of the work, including the imagery, the sound, the interactions and the structure.

In making these changes I will need to pay attention to the aspects that were working as well as those that were not. For example, resolving the interpretive confusion about the fruit imagery will need to be done in a way that does not lose the benefits gained from its ambiguity. The results showed that people needed to have an overarching reason for the presence of the fruit imagery before they could relax and become, as intended, more creative and thoughtful with their specific interpretations. This thoughtfulness seems, however, to have been a consequence of participants needing to puzzle out the connections between the various elements of the work. Any changes made to the fruit imagery, therefore, will need to try to maintain a level of interpretive difficulty or else risk losing the potential for this type of interpretive play.

Finding a balance between simplicity and difficulty will also be required when solving the problems encountered with the structure of the work. The new three-level structure clearly provided many more opportunities for people to experience the pleasures of difficulty and competition. Working out the puzzle of these three levels, however, did not seem to make people engage more with the content of the work and, given that this is a content-driven artwork, it should have. The structure needs to be redesigned so that the areas of structural difficulty are more relevant to the content and because the main content is aural this redesign will probably, therefore, involve increasing the difficulty of the sound interactions.

I see the success of this redesign as being tied to the concept of "meaningful play" we discussed in an earlier chapter (Salen & Zimmerman 2004: 32). In order for a game to achieve this, Salen and Zimmerman argue that it is crucial for interactive "actions and outcomes" to be "integrated" into the wider context of the work (2004:32). This type of integration is also important to Polaine, who argues that, as with toys, playful interactive artworks are ones where:

> ... the challenge is not about trying to understand the interface to the work; at this point the interface is the work. (Polaine 2005: 5)

This concept is essential if one wants, as I do, to create an interactive work where the understandings and/or transformations that the work generates emerge primarily from the participant's interactive experience rather than from some concept that they might have read about in the artwork's descriptive signage. The difficult question, then, is how one designs for the pleasures of difficulty and competition in such a way that that their challenges and goals are integrated and, therefore, meaningful within the context of the work.

Rozendaal et al. make a distinction between goals that "emerge from an activity" and goals that are "imposed upon an activity" (Rozendaal, Reyson & De Ridder 2007: 183). They link goals that emerge during interaction to the creative and improvisational behaviour of the participant. Although such goals might be suggested by the properties and character of the interactive system, the participant plays a major role in creating them at the moment of interaction. Imposed goals, on the other hand, are those directed by the system itself and these are regarded as requiring focus and perseverance from the participant. Given the character of these two types of goals one might predict that creative emergent goals would be more associated with play. Rozendaal et al.'s study, however, found that the playful engagement of participants with a simple game

increased when they were given goal-directed tasks (2007: 191). In their study it was rare for participants to create their own goals.

As Rozendaal et al.'s study participants were all adult, it could be argued that this was a consequence of their adult preference for structured rather than improvisational play. It could, however, also be argued that this was a consequence of the game design itself, which in its simplicity might not have opened up much space for creative goal development. The results that we have seen in our study here and in the first case study suggest that the existence of a space for creative goal development hinges on both factors. The character of the participant plays a role, in that they need to be playful and to make a personal connection with an interactive work before they will begin creating goals. The character of the artwork also plays a role and some types of works were observed to be more open to goal creation than others. Works like *Sprung!* and this second version of *Just a Bit of Spin* were more strongly goal directed and for adult participants this led them to frequently focus intently on these system-directed goals alone. *Elysian Fields* and the prototype version of *Just a Bit of Spin* did not have such clear goals and this did lead some participants to create their own goals.

A common feature of all of the directed goals both in my works and in the games created for Rozendaal et al.'s study was that these goals were given outside the context of the work, either verbally or through signage. While this is a usual, and for more complex games a necessary, practice it might be that for the short audience participation times in a gallery context it would be preferable to keep such instructive goals to a minimum. In this second case study, participants were very focused on understanding and following these goals. Perhaps if a participant's first focus is on understanding the goals of another then play will not occur until these goals have been understood. Many adult participants, however, seem to like having goals to spark them off and to provide constraints for their behaviour. Finessing this relationship between directed and emergent goals, then, is a question of finding the right balance for the work in question.

The evaluation process of this second case study uncovered many unexpected things about the audience experience of *Just a Bit of Spin*. For example, I was surprised by the effect that the new gendered voices had on the political character of the work and by participants' lack of familiarity with poker machine iconography. I had not noticed the inconsistencies in the patterns within the imagery and I was intrigued to discover how pattern focused participants were. The most surprising thing, for me, was the realisation that getting participants to engage playfully did not satisfy my artistic intentions unless those participants

also engaged with the work interpretively. That interpretation and meaning are important for art is not by any means a new idea, but in terms of my own personal practice, interactivity had previously assumed a much greater level of importance. Developing this more accurate and detailed perception of what 'success' might mean in terms of my own artworks has, then, been a valuable outcome of this evaluation process.

The results from this second case study have also been valuable in terms of uncovering strategies for designing for play. They have strengthened the earlier finding that the play framework survey is a useful evaluation method and one that can elicit rich data about the pleasures involved in participants' play experiences. They have suggested that working with ambiguity can be a useful method when designing for play but that one also needs to pay attention to the patterns within an artwork. The results here have also strengthened the first case study's finding that the combination of interactivity and sensual sounds and images can be powerfully affective. Finally, these results have added to a growing realisation of the importance of robustness and responsiveness within a play experience. With the two case studies complete, it is now possible now to draw some overarching conclusions about the understanding that this research has developed in relation to strategies for designing for play and in relation to the exhibition and evaluation of playful artworks. These issues are now the focus of the next chapter.

CHAPTER 11:
DISCUSSION & CONCLUSIONS

This project has investigated the creation of play experiences within interactive art with the primary aim of uncovering some practical strategies for creating artworks that aim to stimulate play in their audience. The process of investigation involved three pilot studies, two case studies and the creation of four interactive artworks: *Elysian Fields*, *Sprung!* and two iterations of a work titled *Just a Bit of Spin*. In addition to producing artworks, this process has produced valuable insights and ways of understanding, relating not only to the design but also the exhibition and evaluation of playful interactive art. These findings will be useful for other interactive artists and also more broadly for any other creators, designers, evaluators and researchers who are concerned with playful interactive experiences.

The project has developed four strategies for designing for play. The first and key strategy is to use the play framework as a tool during the design and evaluation of playful interactive experiences. Through this use of the play framework three further strategies for designing for play have been developed. These are: to work with patterns and ambiguity, to combine interaction with sensual sounds and images and to focus on the robustness and responsiveness of an artwork. It is anticipated that these four strategies will be useful as tools for the creation, analysis and evaluation of playful interactions.

The project has also produced findings about the design of museum exhibition spaces for playful interactive experiences. The findings developed insights into the expectations and behavioural constraints of the exhibition audience and identified possible play preferences for either puzzle solving or sense making. These findings also suggested ways that exhibition signage could help the interactive art experience stimulate play. It was found that exhibition signage could help create the feeling of safety that is necessary before play will occur. Exhibition signage could also provide evocative cues and goals that would help shape and direct a play experience.

The final group of findings relates to the evaluation of the audience experience of playful interactive art. The findings suggest that in this context it is important to focus on the design of the experience of an evaluation session. It was found that training participants in evaluation methods helped improve their experience by reducing anxiety. Participant anxiety was also reduced by selecting

social couples and experts for evaluation. This reduction in anxiety created a more conducive environment for a play experience. It also helped the evaluation sessions create a more lively and thoughtful dialogue between participant and researcher. Perhaps most significantly, the project found that the play framework survey was a useful method for evaluating playful interactions.

This chapter will now discuss in detail the project's findings in each of these three key areas and will reflect on any future directions that they suggest. This discussion will begin with the findings and future directions that relate to the project's primary aim of developing strategies for evoking play experiences in an interactive art context. This will be followed by a discussion of the secondary findings and future directions relating to the museum exhibition of playful interactive art and the evaluation methods for this context. Finally, the chapter will conclude with a summary of these research outcomes and an outline of the project's future directions.

11.1 The Play Framework Revisited

A framework of thirteen characteristics of a play experience was developed during an early stage of this project. This play framework provided a way of thinking through and focusing on the experience of play during the process of creating an interactive artwork. It also provided a way of analysing and understanding the audience experience of a playful artwork. In this section we will revisit the play framework to reassess the definitions within the categories and also to assess its value as a design and evaluation tool.

11.1.1 Reassessing the Play Framework Categories

In both case studies, participants responded well to the play framework. They had few problems understanding the categories within the framework and they were generally easily able to distinguish between these categories. Their comments, however, have suggested that some changes would help refine the definitions of categories within the play framework. They have also helped to develop deeper ways of understanding the interrelationships between categories and in some cases have pointed out categories that might need to be reworked.

One connection that became clearer through the data from participant interviews was that between the categories of creation and exploration and the feeling of a sense of mastery or control. As one participant from case study two pointed out, it was *"having some control"* over what she created and the knowledge that she could *"master that"* that gave her pleasure. Conversely, another described how she had not felt that she had *"a lot of mastery"* over the

things that she was creating and consequently did not feel like she was *"making it do anything that was particularly exciting".* This participant also associated having some sense of control over what she was uncovering with the pleasure of exploration. For her, this sense of control was a defining element that enabled her to then distinguish between discovery and exploration:

> *I was thinking what's the difference between exploring and discovering ... I think maybe I guess the randomness – you could still be discovering stuff, even though you haven't necessarily set out to find it – or tried to find it ...*

These comments suggest that a sense of control is needed before participants can experience the pleasures of exploration or creation and that this sense is not so important for the pleasure of discovery.

Another connection that emerged was that between the pleasure of difficulty and certain other categories. One participant, for example, described how for him exploration, discovery and the pleasurable challenges of difficulty were all part of a sequential process:

> *... exploring, then discovering, and then challenging, you know, it was all part of the same process, and you know, the difficulty ... is finding out what it does, and that's challenging and enjoyable.*

Another participant connected difficulty and the pleasure of being challenged by it to captivation:

> *[Captivation is] kind of for me the same as being challenged or you know ... that was the captivating element.*

For one participant, then, the experience of exploration and discovery led to the pleasure of difficulty and, for another, experiencing difficulty then led to the pleasure of captivation.

The thoughtful reflection that is evident in these comments shows that participants not only accepted the play framework as being a relevant descriptor of their experiences but also found it thought provoking. In some cases this reflection led people to develop interesting interpretations of the categories that extended the definitions they were given by the researchers. For example, in the first case study, two participants talked about feeling camaraderie, not with another person involved in the interaction or with something within the work but rather with the artist:

I didn't feel camaraderie as such with the characters in the work but I felt a sense of camaraderie with the artist and thought .. .yes this is someone I can relate to ... so I enjoyed that feeling.

Another participant from the first case study connected subversion to the pleasure he had felt during his experience of *Elysian Fields* when he made the shift from his usual interaction mode of trying to work it out to a mode where he relaxed and just experienced it:

Elysian Fields doesn't seem subversive but I love that subversion of perception or perceptual modes and that's one of my favourite things to experience in any artwork so that's why I labelled that subversive.

Both these comments could be used to extend the definitions that were developed in chapter four. The second, particularly, seems to introduce a new quality to the concept of subversion. One aspect of the current definition of subversion mentions people feeling like they might be breaking the rules of behaviour set up by the work, but what this participant seems to have enjoyed was the way the work broke the rules of behaviour set up by his own expectations and practices.

A danger in further developing the definitions of each category, however, is that they might become overly defined and then be less likely to provoke these kinds of interesting participant-generated definitions. One of the most valuable aspects of the play framework was its ability to act as a tool for developing a common language between artist and audience. As the developers of an extensive resource on the affective aspects of sound point out, "in order to communicate a sensation you must have a word to describe it" (Augoyard & Torgue 2005: xvi). The initial definitions within the play framework gave participants a sense of what I, as the artist, meant by these categories. The participants' answers often then told me what these categories meant for them. The value of this application of the framework lies in its generation of a dialogue between artist and audience and to this end the definitions within each category must remain open to interpretation and development by both sides of this conversation. For Wright and McCarthy, in order to do this one needs to think not of creating categories but instead of creating dimensions. Dimensions, they suggest, will encourage participants to "change relationships and juxtapositions freely, to playfully engage with possibilities" and will thus encourage dialogue (Wright & McCarthy 2005: 22). Any development of the play framework should, then, consider not just changing its terminology from category to dimension but also consider further

opening out the descriptions of each pleasure so that they can present a spectrum rather than a single definition.

Although participants related well to the categories there were some that seemed to confuse them. Camaraderie and sympathy, for example, were regarded, particularly in the second study, as being confusingly similar to each other. In the second study this could be attributed to the poor wording of the description of the sympathy category. However, even in the first study, with its full description of sympathy, these two categories were sometimes regarded as similar. One participant, in explaining the pleasure she felt in relation to *"the world of" Elysian Fields*, said that:

> *... it was more than [camaraderie] but it wasn't something where I felt like I had to engage with another human being or something... your definition of sympathy went further than that so I just put that because yes I think I could say there was sympathy there ...*

Although this comment does indicate that the fuller description helped her to differentiate between sympathy and camaraderie, it does still show a level of confusion between these two categories. In order to remedy this, the definition of the category of sympathy will need to be developed further. This new definition might, for instance, include more examples inspired by Groos' original definition of aesthetic sympathy.[1]

Another pair of categories that seemed to confuse participants was that of fantasy and simulation. Fantasy appeared to be especially confusing and provoked a highly varied array of definitions. This was particularly evident in study two where the real but also fantastical animations of fruit challenged some people to choose between fantasy and simulation:

> *I guess they are from real life, but they don't ... well, when the berry turns into pineapple, that's not from real life. That was very enjoyable for me.*

For another participant, however, fantasy was not applicable because *"it's animation so ... it can be anything"*. Some quite personal responses to this category also occurred in the first study. One person classed their pleasure as fantasy because it reminded them of their childhood and another said it was because an artwork had taken her *"into another world"*. That the categories of fantasy and simulation provoke confusion is not necessarily a bad thing if this confusion then leads to thoughtful and personal responses. However, these two categories were

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[1] See chapter 4 section 4.2.1.

also the only two that frequently caused people to ask what they meant even after the definitions had been read out.

This level of questioning about the definitions of fantasy and simulation added to a suspicion I had that these two categories were not really about play. Although fantasy and simulation both feature in make-believe, which is an important pleasure of play, it was not clear whether my definitions of these two categories really captured this playful pleasure. This suspicion was initially sparked by debates within digital game theory over the importance of narrative within a game experience. Like some digital games theorists, my suspicion was that because my definitions focused on the representational aspects of fantasy and simulation these categories were more about the pleasure of aesthetic appreciation than about a play experience. The difficulty that people had separating fantasy from simulation within this context also suggested that perhaps these two categories should be combined. This new combined category, taking its lead from one of the participants' comments above, would then be about obtaining pleasure from the way an artwork took you into another world. This change would associate this new category much more strongly with Garneau's category of immersion and would, therefore, now be less about appreciation and more about experience.

The results of both case studies revealed just two instances where people felt that the play framework's categories were not able to adequately describe their experience. The first was when a participant described feeling a pleasurable sense of safety with a work. For her, this sense of safety stemmed from a lack of worry that *"there was something I wasn't kind of getting"* and this distinguished it from other works with which she had experienced more subversive pleasure:

> *I suppose I felt sort of quite safe because ... in the terms of that work I didn't need anymore stimulation or goal ... and I suppose with the sound and everything it was simple but complete enough.*

It is difficult to say whether this sense of safety warrants a new category in the framework. Feeling safe is an important precondition for play, as this is what separates it from the harsher and less enjoyable reality of normal life. It could be argued, then, that this pleasure is a precursor for play rather than an actual part of the play experience. This sense of safety would not, therefore, generate a new category in the play framework.

The second instance occurred when someone talked about feeling frustrated by a work. He was then not sure *"where to put that"* in his survey answers. His

partner suggested that he put it under difficulty but, as he explained, this would mean that he was giving both a positive and a negative response to this category:

> *... but I enjoyed the difficulty of it, so yeah it was enjoyable but there was some frustration in not being able to fully work it out.*

This comment indicates that there might be a problem with the design of the play framework survey interface, which was not able to accommodate such ambivalent responses. However, it does not strongly suggest that frustration should be included as a new category. The participant did indicate that the definition of difficulty encompassed his feeling of frustration.

The results of the two case studies have suggested several modifications that could be made to the play framework as initially defined in chapter 4. The strongest suggestions to emerge are those that give more depth to many of the categories within the framework. One of these suggested that having a sense of control was a precondition for the pleasures of creation and exploration but was unnecessary for discovery. Another indicated that the important processes of finding out what a work does and its associated pleasures of exploration and discovery were intimately linked to the pleasure of difficulty. Difficulty was also identified as being linked to captivation and this suggests that perhaps the definition of captivation should be expanded. This new definition would now include the feeling of captivation that might come from the intense concentration one experiences when dealing with something difficult. The definition of camaraderie, it was suggested, could be expanded to include feeling a connection with the creator of a work. It was also suggested that the definition of subversion should be expanded to include breaking the rules of not just one's culture or the world set up by an artwork but also the rules of one's personal behaviour patterns. In clarifying and refining the definitions and relationships within the categories, these suggestions will make the framework easier to understand and to apply.

Other suggestions to emerge from the two case studies indicate that some changes might need to be made to the number of categories within the framework. Surprisingly, no new categories emerged from these suggestions. This could be a result of the framework being based on six existing and well-developed theories. It could also be because the studies were focused on evaluating artworks rather than specifically evaluating the framework. Future work will involve conducting evaluations that are more focused on the framework itself. Such studies could help produce more robust solutions to the problems that were identified with the categories of sympathy, fantasy and

simulation. Without such studies it would be premature to propose any definitive solutions here. It is possible, however, to suggest that the categories of fantasy and simulation should be combined into the one category and that the category of sympathy should be renamed and more clearly defined.

The play framework describes the possible pleasures within the experience of the universal human behaviour play. As such, it encompasses the world of playful interactive art and also, potentially, the world of games or other types of playful interaction design. This project's focus on interactive art and the very broad range of types of play within it has intentionally influenced the category descriptions within the framework. In this broadness, the project has potentially created a framework that is much more widely applicable than the game focused frameworks of Garneau and LeBlanc. It will be interesting to discover through future research whether the play framework can also be usefully applied within these broader design contexts.

11.1.2 The Play Framework as a Design Tool

The play framework was used as a design tool during the creation of the two iterations of the artwork *Just a Bit of Spin*. It was found to be particularly useful during the conceptual development phase of the project, where it helped drive early decisions about the shape and form of the artwork. In this case, I selected a small group of experiential qualities from the play framework categories and used these to help spark the initial idea for the artwork. These chosen categories helped me to select and refine a single idea out of the jumble of rough concepts and strategies I had collated from my journal.

The framework also helped keep the early creation process focused on the specific experiential aims of the artwork. Once the initial idea had been developed I used the chosen categories to develop and maintain a clear definition of the experiential aims of the project. This definition was then used to test the validity of individual design decisions. I found that making difficult choices was made easier by questioning which of these choices would work to increase the artwork's key experiential pleasures. Through evaluation, the play framework also later helped to identify directions for a redesign.

The evaluation results for *Just a Bit of Spin* suggested that using the play framework to help shape design decisions could produce an artwork experience that more closely matched an artist's intentions. For example, the evaluation results for the prototype version of *Just a Bit of Spin* indicated that, as intended, subversion was a key pleasure in the work. I completed my analysis of the evaluation results for this work pleased that my experiential design aims seemed

to match participants' responses, but I also had a suspicion that there was something too obvious about the way that I had designed the work and that this made it less interesting. It was almost as if people were saying not "I felt subversive pleasure" but rather "I can see that you want me to feel subversive pleasure". This recognition of my intentions did produce pleasurable feelings but these were feelings that came from participants' belief that they had correctly interpreted a message:

> *I got pleasure out of the message that I felt it was giving, which I think was a subversive message about* Spin.

Their pleasure, therefore, did not result from their interactions, which was the effect I was trying to create.

This problem was solved to some degree in the second version of *Just a Bit of Spin*. However, the participants' lack of creative control over the sound in this work led one to comment: *"really the work was doing the subverting more than me"*. The issue here seems to be that this subversive quality did not emerge from the participant's experience, rather it was directed by the work. This suggests that when designing with the play framework in mind, an artist needs to be careful about the way that their chosen key pleasures are evoked by the work. It was perhaps my focus on increasing the strength of the key experiential pleasures that resulted in an overly directed experience. As with our discussion in the previous chapter about directed and emergent goals, the design solution to this problem lies in creating a balance between what is directed and what emerges only through interaction. This means that artists who are using the play framework will need to consider the balance and harmony between those experiential qualities that are directed by the work and those that could emerge more experientially through the dialogue between the participant and the work. Therefore, in using the play framework to drive design decisions the question should not just be whether a particular decision strengthens a key pleasure but in what way it does so.

The play framework was used intensively and usefully during the creation of the first iteration of *Just a Bit of Spin*. It was, however, found to be less helpful during the day-to-day creative decision-making of the second iteration. The framework played a major role in the evaluation results that drove most of the changes made during this redesign but it was no longer found to be a useful measure for making design decisions. On reflection, my perception was that this was because the play framework was a tool that helped to focus and define ideas.

In the early stages of a creation process, when faced with the infinity of possibility, this type of tool is particularly useful. However, in the later stages of project development, when faced with specific issues to solve, one needs to open oneself back up to the realm of possibility and in this case the play framework felt too restrictive. My experience of using the play framework as a design tool, therefore, suggests that it is most useful for conceptual development, for decision-making during the early stages of creation, for evaluation and for developing directions for the redesign of a work.

This research project has involved one artist only and so a possible future direction would involve testing these findings with other artists. Such a process might also reveal some different methods for applying the play framework within this context. It could also be interesting to evaluate the use of the play framework within other related creative contexts, such as with game designers or interaction designers.

11.1.3 The Play Framework as an Evaluation Tool

The play framework was used to survey participants during the evaluation sessions in both case studies. It was also used as part of the question structure in participant interviews. The framework proved to be a very useful method for comparing an artist's experiential aims with the actual audience experience of an artwork. The studies did, however, suggest some changes that might need to be made to the method that was used to apply it.

The play framework survey interface in each of the two studies was different and each had its strengths and weaknesses (appendices 6 & 9). In the first study, participants ticked a box next to a pleasure that they had experienced. They gave two ticks if they had experienced it strongly and a cross if they had experienced displeasure. It was this survey interface that the participant mentioned above felt was not able to accommodate both a positive and a negative answer for the category of difficulty. The second survey had a more representational scale, with five boxes positioned along a line. The first box was marked "enjoyed a lot", the third box "neutral" and the fifth "didn't enjoy". A sixth box, separate from this scale, was marked "not applicable". This second survey interface allowed for more varied responses and provided a greater possibility for someone to register an ambivalent response. However, as previously discussed, this second interface also took much longer to fill out, as it required more thought to make the fine distinctions that it demanded. Perhaps because of these fine distinctions, the second interface also caused people to register many more pleasure responses

than people had with the first and this made it more difficult to detect their key pleasures.

These issues suggest that any future use of the play framework as an evaluation tool would need to include a redesign of the survey interface. This redesign would involve both simplifying the survey interface and including opportunities for people to indicate neutrality, displeasure and lack of applicability. It was these values that made the survey less restrictive and that were important for clarifying participant responses. The representation used to capture these responses would also need to be redesigned with the aim of reducing the cognitive load required to understand and answer the survey.

In making these changes, the key focus should be the purpose the survey had within the whole evaluation process. This purpose was twofold. Firstly, the survey collected numerical data about the pleasurable aspects of participants' experiences and enabled a summary model of the collective nature of these experiences to be generated. Secondly, the survey introduced participants to the concepts within the play framework and made them think carefully about how these concepts might connect to their own experience. This thoughtfulness, as we have seen, was then reflected in the detail of the answers that participants gave in their post-survey interview and, because of this, over the course of the project this second purpose was revealed to be more valuable than the first.

A redesign of the play framework survey could, therefore, try to put more emphasis on this second purpose and consider changing the nature of the survey so that it had less of a focus on obtaining numerical results and more of an interview focus. Combining the survey and post-survey interview might be one way to achieve this and doing so might also help lighten the cognitive load of this method. As one participant commented, it would be easier for her to remember why she had ticked a particular box if she was able to fill in a survey question and then discuss it straight away. This type of quick response might help reveal the "grey areas and moment-by-moment decision making" that scale-based surveys are often criticised for not capturing (Wright & Blythe 2007: 68). There are, however, benefits that can come from having participants fill out the play framework survey completely before they are questioned. Participants have a chance to reflect on the whole range of possible pleasures and might also consider any interrelationships between them. They have a chance to reconsider their earlier answers if a later question causes them to change their thinking. There might also, I suspect, be something more uncensored, open and reflective about the type of thinking that goes on when a participant quietly fills in a survey and this could lead to them to develop and later reveal more interesting insights.

Another approach to redesigning the play framework survey and the post-survey interview could, therefore, involve keeping both elements separate and focusing instead on developing their ability to generate reflective experiences. This type of experience was not very successfully generated by the procedure and survey interface of the second study. This survey was, judging from the mood of some participants, a bit tedious to complete. This tedium stemmed, as we have already noted, partly from the complicated nature of the survey scale. It also, however, arose during the post-survey interview when participants were asked to comment on every answer. The question from the first study had only asked participants to describe unusual responses or things that they thought the researcher might have trouble understanding. This first approach seemed to more successfully generate a reflective evaluation experience. In retrospect it seems obvious that being asked to pick out and note things of interest would be more engaging than going sequentially through a list. The shape of the first experience was created and directed by the participant whereas the shape of the second experience was directed by the researcher. The first approach was also more conversational. Therefore, another future direction for the redesign of the play framework survey as an evaluation tool would be to focus on incorporating more methods that would generate reflective evaluation experiences and that would promote a lively dialogue between researcher and participant.

11.1.4 Summary: The Value of the Play Framework

The development of the play framework began with this project's aim to uncover practical strategies for designing for a play experience in an interactive art context. A survey of play theory uncovered a range of models of the pleasures of the experience of play and these were then synthesised into a framework of thirteen categories. The intention was to create a framework that covered the broad range of play types of earlier models while also having the depth of the more detailed models developed by later game designers. It is hoped that this thesis acts to define this new play framework and its possible applications in enough detail to be useful to other practitioners who wish to create works that stimulate playful behaviour.

The two case studies did suggest some possible modifications to the original definition of the framework. They suggested ways to expand the definitions of creation, exploration, difficulty, captivation, subversion and camaraderie. They indicated that the category of sympathy needed to be renamed and redefined. They also indicated that the two categories of fantasy and simulation needed to be combined and redefined. Future work on this project will involve focused

evaluations of the framework aimed at developing some more definitive solutions to these issues.

As it stands, however, the play framework did prove to be very useful as a design tool. It was useful for developing concepts, making difficult design choices and, through evaluation, for developing redesign directions. The project found that the play framework was not a tool for all stages of the design process. Its strength lay in the way it helped to focus, define and refine the experiential aims of a playful interactive project. This made it more useful as a measure for decision making during the early stages of the creation process. During the latter stages of the creation process it seemed to constrain ideas when openness was needed.

The play framework also proved to be very useful as an evaluation tool. It was particularly useful for helping to develop a dialogue between artist and audience. It was also an efficient method for generating detailed data about the playful aspects of the audience experience of an artwork. Different methods for applying the framework within an artwork evaluation were trialled during the two case studies. The results of these trials suggest some future directions for developing these methods. Future work will look at combining the strengths of the first study's method with those of the second. It will also focus on strengthening the ability of these methods to generate detailed and thoughtful participant reports.

11.2 Strategies for Designing for Play

Other valuable findings that have emerged from the use of the play framework within this project are those that have lead to the development of some further strategies for designing for a playful experience. The framework's use during the design and evaluation of the artworks in this project led to the identification of three relationships that had a key influence over the playful experiences engendered by these works. These relationships were those between patterns and ambiguity, sensation and action and responsiveness and robustness. The next sections will discuss the value of each of these relationships in terms of developing strategies for designing for play.

11.2.1 Working with Patterns and Ambiguity

As the second case study revealed, patterns and ambiguity within an interactive artwork can evoke playful behaviour because both give participants something to work out or puzzle over. Having this similar puzzle-like quality means that patterns and ambiguity can stimulate the pleasures of discovery, exploration, difficulty and competition. However, with one operating on a principle of

consistency and the other operating on a principle of inconsistency, patterns and ambiguity each have a different relationship to these four pleasures. Their different characters also mean that patterns and ambiguity do not always sit easily together.

The ambiguity in the second version of *Just a Bit of Spin* aimed to increase opportunities for participants to play with interpretation but it also sometimes seemed to work against the pleasures of play by challenging participants' strong desire to seek out and uncover consistent patterns. As one participant explained, her confusion over the fruit in *Just a Bit of Spin* worked against her desire to:

> *... see things that match, and things that are symmetrical, and for them to make sense, and for there to be a story ...*

Ambiguity, with the multiple interpretation possibilities it offers, necessarily makes it harder for an audience to lock down patterns. This makes it more difficult for them to experience the pleasure of knowing they have solved a puzzle and, therefore, reduces the possibility that they could feel the competitive pleasure of having achieved a goal or feel the pleasure of having overcome a difficulty. If participants are particularly focused on pattern recognition, ambiguity could easily be associated more with displeasure than pleasure.

In the second study, however, there were a group of participants who did gain pleasure from ambiguity. This group did so only after they felt they had worked out the pattern of the fruit. Their minds then stopped being focused on the goal oriented challenges of pattern recognition and they became more open and playful in their exploration of the meanings within the work. Working out the patterns of the fruit seemed to create a rigid structure that they could then play within. This process also, perhaps, provided that feeling of safety or protective frame that is necessary before play can begin.

Something similar to this feeling of safety is described by Sengers and Gaver, who note how important it is for systems that are ambiguously open to interpretation to give people "a license to reinterpret the system's behavior and its relationship to them" (Sengers & Gaver 2006: 104). One strategy they propose for doing this is to present a system as "alien" and therefore as likely to have a different and not necessarily correct interpretation of things. People will, therefore, possibly feel more comfortable about coming up with their own interpretations. If this licence is not given, then, they warn, people might "feel simply frustrated or confused" (Sengers & Gaver 2006: 104). Giving people something that will provide them with such a licence is perhaps even more

important in an interactive art context, where people often approach each artwork expecting there to be a single correct interpretation.

In the second case study, the group of people who had this sense of having a licence to reinterpret the fruit images within the artwork were those who felt that they had solved the puzzle of its structural purpose. This group were all experts and, although the purposes they proposed differed, each purpose related to the expertise of the person who proposed it. Gaver et al. point out that when a person makes such a personal interpretation they feel as if this meaning "belongs" to them (Gaver, Beaver & Benford 2003: 234). Perhaps this feeling of ownership over their interpretation resulted in this group of participants adopting a more conversational relationship to the artwork and it was this that led them to then playfully interrogate it further. As with Sengers and Gaver's approach above, this suggests that what is at issue here is the type of relationship that exists between audience and artwork and the status that each has within this exchange. For the expert participants in the second case study this was a relationship of expert to expert and this made their interactions more conversational. Conversely, the other participants seemed to adopt the role of a novice waiting to be taught something by an expert artwork and this made their interactions less conversational. The alien example above takes another approach to this relationship, positioning artwork and audience both as experts within their own world and yet novices within the world of the other. Again, this is a relationship that could evoke a conversation but in this case both sides of the dialogue are positioned as having much to learn from the other.

The process of pattern recognition can also be viewed in this way but it is a process that involves a different, perhaps less dynamic, conversational relationship. In interactive artworks this relationship usually involves repetitive interrogative processes of action and response and is, therefore, often less about an exchange of ideas and more about investigative interpretation. The main pleasure in this comes when one finally recognises a pattern and feels like one has reached a state of mutual understanding with the artwork, a state where both parties are speaking the same language. The key pleasures of the experience of pattern recognition, therefore, relate to the reaching of this final destination and are those of meeting the challenge of difficulty and of achieving a competitive goal.

The process of interpreting ambiguity, on the other hand, remains open-ended and does not have such a sense of final achievement. Its pleasures, then, relate more to the pleasures of the journey and so discovery and exploration become a more important part of this experience. Interpreting ambiguity can also,

as we have seen, be a creative act and it is because ambiguity also evokes the pleasure of creation that it can be such a powerful strategy for evoking play. This creative interpretation will not occur unless the audience feels that there is space or licence for them to act in this way and this feeling is contingent upon the relationship set up between artwork and audience. The character of this audience and in particular their expertise in the world of interactive art can help to develop such a relationship. If, however, one wants to achieve this with a wider audience, the artwork system will also need to be involved in developing this relationship.

As strategies, both patterns and ambiguity are useful for designing for play within an interactive art context. Designing with patterns is, in some ways, the easier strategy to implement, in part, because it makes use of the universal human drive towards pattern recognition. The type of pleasures that this experience evokes also satisfy the preference we know adult audiences have for play to be more rule-based. Designing with ambiguity, although more difficult to achieve successfully, can, however, result in more intense playful pleasures. This is because of the creative and improvisational nature of the play behaviour it produces. For an adult audience this type of play is often unusual and, therefore, more exciting. Working with patterns and ambiguity together, enables one to create a rhythmic relationship between the safe world of rule-based play and the headier world of improvisational play. However, it is important to remember that in trying to create the beat and tempo of these rhythms the idea is not that the artist is the composer and the audience is the listener. Rather, both artist and audience are musicians and the design needs to provide opportunities for them to jam together.

11.2.2 The Power of Sensual Sounds and Images

Another relationship that was found to effectively evoke the pleasures of play was that between sensual representations and physical actions. Aspects of an interactive artwork that could tie a physical action to a sensually evocative image and sound were found to be deeply affecting. This affect was particularly powerful if the three elements were all operating on the same semantic level, as they did with the footstep interaction in *Elysian Fields*. Together, these elements were able to evoke physical and experiential memories that were not only pleasurably affecting but that also made people relate to the artwork in personally resonant ways. Because they gave people such pleasure, these sensually affecting interactions became the elements of an artwork that people played with the most.

One of the key elements in this powerful relationship between sensual representations and physical actions was the sound that an action produced,

whether it was the footstep on snow sound in the first case study or the squelching raspberry sound in the second case study. As a 1960's study of children's play discovered, "auditory feedback" can be "more potent than visual feedback" (Hutt 1985: 231). The adults studied for this project also had powerful reactions to auditory feedback and it was found that memory played an important role in causing these reactions. Augoyard and Torgue describe this sonic effect as anamnesis or "the often involuntary revival of memory caused by listening and the evocative power of sounds" (2005: 21). The strength of this memory is, they point out, often the result of a combination of different sensory perceptions (Augoyard & Torgue 2005: 23). In keeping with this, the sounds that were found to be the most powerful in this project were those that had a tactility about them and that, therefore, could evoke kinetic memories. These sounds awakened memories of bodily movement and their associated sensations, such as the feeling of snow crunching underfoot or the liquid squelch of a raspberry against a pressing finger. Such sounds have a surface and a shape that we can hear (Ihde 2007: 68) and this gives them a tactility that we can also feel.

Another important element in terms of the intensity of this affect was not just that the sound could evoke kinetic memories but that this occurred at the same time as the participant's body was moved in a way that corresponded to these memories. Bodily movement is not only "engaging, fun and delightful" it is also one of the key ways we learn about the world and the knowledge that is produced is then "engrained" in our "kinetic lifestyle" (Sheets-Johnstone 2003: 414, 417). Bodily movement is also "experientially intertwined" with emotion to such an extent that "bodily feelings and feelings of emotion are divisible only reflectively" (Sheets-Johnstone 1999: 264). Therefore, we not only move our body in certain ways when we feel emotion but also, in moving our body, we can, through this engrained kinetic intelligence, possibly provoke memories of emotions and bodily sensation.

These ideas resonate with the concept of aesthetic sympathy we discussed earlier in chapter four (Groos 1901: 323) and also with a similar concept of embodied simulation that has recently been developed by cognitive scientists. Their research has found that "the same neurons discharge when an action is observed as when it is executed" (Freedberg & Gallese 2007: 199-200). Similar "mirror neurons" have also been found to discharge when we merely observe objects that afford action, such as objects that can be grasped (Freedberg & Gallese 2007: 200). Other research in this area has extended the idea of embodied simulation to include the sonic aspects of experience as well as the visual (Gazzola, Aziz-Zadeh & Keysers 2006; Keysers et al. 2003) and has connected it to

the production of sympathetic sensations (Freedberg & Gallese 2007: 201). Both observed actions and objects that afford actions can activate the "somatosensory cortices" and produce sympathetic sensations, particularly those sensations relating to "tactile stimulation" (Freedberg & Gallese 2007: 201). Freedberg and Gallese use these findings to explain empathetic responses to visual art and, likewise, these findings can help explain the affective power of auditory feedback that has been revealed in this project.

There is, however, another factor involved in the affective experience that we are discussing here. The research on mirror neurons described above is focused on the way the brain represents actions that are *either* "performed, heard or seen" (Keysers et al., 2003: 628). Here, however, we are interested in actions that are simultaneously performed, heard and seen within a representational context. As Penny points out, it is this combination of action and representation that can be particularly powerful in interactive works:

> ... the persuasiveness of interactivity is not in the images per se, but in the fact that bodily behaviour is intertwined with the formation of representations. (Penny 2004: 83)

The focus here is on the way that an action performed within an interactive work *produces* the representation that is then seen and/or heard. This relationship, then, is not just about a sympathetic reaction, it also involves the creative pleasure of being a cause. These pleasures are very much connected to the way the representational context puts a protective frame around the actions performed. Such actions are then disconnected from reality in a way that provides a space for play to occur.

Designing interactions that combine bodily actions with sensual audio-visual representations is, therefore, a very useful strategy when designing for play. This project revealed that sound rather than vision played a key role in evoking sensations. The success of this strategy was also found to be contingent upon participants feeling a sense of control over what they were doing, for without this sense of control they could not feel the creative pleasure of producing a representation. Perhaps the most important finding, however, was that this strategy was particularly effective and affecting when action and representation were intertwined in a tactile and kinetically meaningful way. This connection between action and representation tapped into participants' tactile-kinetic memories and their related emotions in a way that produced intensely personal engagement with the artwork. Thus, with this strategy one moves people physically in order to move them emotionally.

11.2.3 Responsiveness, Robustness and Creating a Playful Presence

A final strategy suggested by the studies conducted during this project involves the qualities of responsiveness and robustness. Unlike the previous two strategies, the focus of these qualities lies more with the character of the artwork than with the relationship between artwork and participant. Participants made explicit associations between responsiveness, robustness and playfulness and when these qualities were not evident there were indications that this inhibited play. The lack of robustness of the *Just a Bit of Spin* prototype, for example, was associated with people feeling too nervous to play. Also, the delay between releasing a spring and then hearing a bubble pop in *Sprung!* was seen as a lack of responsiveness that people indicated frustrated them and stifled play.

Responsiveness and robustness are important, not so much in terms of stimulating a play experience but more in terms of maintaining a play experience. Together they help give the artwork the playful character that it needs to become an active participant in the play experience. Consider for a moment the act of frolicking in an ocean with waves compared to that of frolicking in a flat calm sea. In the first scenario, the waves act to create a feeling of a responsive presence and this gives one something to play with. In the second scenario the sea with its lack of vitality requires one to be more personally resourceful in order to play with it and this is a much more one-sided relationship. Consider also the difference between playing with a sick puppy and one that is healthy. In the first scenario the puppy lacks robustness and vigour and so must be treated carefully. In the second scenario the healthy puppy can be wrestled with and will match your mounting excitement and joy with his own. The importance of these two qualities of robustness and responsiveness, therefore, lies in their ability to give the artwork a sense of animation and liveliness that positions the artwork as an active player or plaything.

In *Elysian Fields,* the way that the grass grew back after participants had crushed it had a responsive quality similar to the waves in an ocean. Participants identified this as something that created the impression of a responsive presence and that gave them pleasure. This pleasure was tied to a feeling of not having total control over the reactions within the work and it was this that gave the sense of there being another presence that one was playing with because the work felt as if it had a mind of its own. The pleasure of captivation was associated with this feeling and, for those who really connected with this work, so was camaraderie. Trying to create this sense of a responsive presence is, then, another useful strategy when designing for play. In order to do so successfully one needs to not

just match the relentless rhythmic quality of ocean waves but also perhaps to consider matching their variability, for it is this variability that will increase the perceived vitality of the responsive presence within the work.

The second version of *Just a Bit of Spin* was described as being robust, and participants connected this robustness to pleasurable feelings. Participants associated this robustness with being able to be *"really wild"* with their interactions and with the way the work was sensitive in its reactions, so much so that it was always *"doing something"*. Like the healthy puppy example, the artwork was strong enough to cope with the exuberance of playful behaviour and gave a sense that it was constantly matching this behaviour with its own responses. Participants connected this quality with the pleasure of sensation and in particular with the pleasure they gained from the bodily movements they made when they spun the wheel. One of the positive aspects of this robustness, in terms of stimulating play, was that participants did not feel constrained in their behaviour, both in terms of the vigour of their interactions and in terms of the type of interactions they needed to engage in to get the work to do something. This helped produce the sense of freedom that is an integral part of play.

This example also reveals another possible method for designing a responsive presence. Participants contrasted the responsive sensitivity of *Just a Bit of Spin* with interactive works that they described as freezing up or as having a *"lag"*. Such works, because of their lack of response or delay in giving a response, destroy any illusion that they might give of having a vital responsive presence. The breaking of this illusion can then cause that "collapse of the play spirit" that we spoke about in chapter 3 (Huizinga 1955: 40). Designing a work that responds sensitively to participants' interactions is, therefore, another way one can create the illusion of a playfully responsive presence.

A design focus on both robustness and responsiveness can help to create the conditions necessary for a play experience to occur. These strategies involve a focus on the character of the artwork and in particular on its sensitivity, vigour and variability and on creating a sense that the artwork has a will of its own. If these strategies are used effectively, they have the potential to create playful experiences that involve the intense pleasures of captivation, camaraderie and sensation.

11.2.4 Four Strategies for Designing for Playful Experiences

This project developed a play framework as a new tool for designing and evaluating playful interactive artworks and this tool was shown to be valuable within both of these contexts. As an evaluation tool, the value of the play

framework lay particularly in the way it helped facilitate a thought-provoking dialogue between artist and audience. As a design tool, the framework proved to be useful as a way to think about and focus the experiential aims of an artwork. The first strategy for designing for play recommended by this project is, therefore, to use the play framework as a tool for the design and evaluation of playful interactive works. The second strategy is to use both patterns and ambiguity to create a rhythm of investigative and improvisational puzzles within a work. The third is to use a combination of sensual representations and physical actions to tap into the affective power of an audience member's tactile-kinetic intelligence. The fourth and final strategy is to use robustness and responsiveness to help create an artwork that can become an active, vital and engaged participant in a play experience.

These strategies can help to create an interactive artwork that will more successfully stimulate play behaviours in its audience but it is worth stressing here that it is not being suggested that this will make a work more successful as a piece of art. The original hypothesis of this project was that stimulating play would lead an audience to be more engaged and to explore more of an artwork. The case studies have shown that indeed play does lead to more exploration and, potentially, to greater levels of audience engagement. However, that audience engagement is not necessarily an engagement with the meanings that the work is trying to communicate and for an artist this could be seen as an unsuccessful art outcome. As some of the case study results indicated, play can get in the way of reflective engagement with an artwork. Play can make an audience so focused on "what they can do" that they never contemplate the meaning of "what they are doing". Nevertheless, it is possible that such participants might reflect later, after the euphoria of play has subsided. The evaluations in this project were intentionally conducted directly after participants had experience a work. It would be interesting in future work to also conduct some evaluations several hours after a work had been experienced to see if further reflections develop.

11.3 Exhibiting Playful Interactive Art

The two case studies within this project involved the museum style exhibition of interactive art and both produced insights and ways of understanding relating to this exhibition context. These findings are focused around two areas, the design of exhibition signage and the influence of audience expectations and constraints. The next two sections will discuss each of these areas of focus and, in particular, their possible role in and impact on creating a space for a playful experience.

11.3.1 Exhibition Signage

There is a tension between the common museum practice of explanatory exhibit signage and the equally common desire within the world of interaction design to create interfaces that are intuitive and do not need any explanation. It was this tension that sparked the project's focus on exhibition signage and the conclusions that have been reached here reflect a growing acceptance that this tension is an unavoidable part of the exhibition of interactive art within a museum context. Such a tension is also evident within exhibition practice in general, particularly where art is concerned. One side of this debate argues that:

> Viewers who take only an intellectual interest in what they see are apt to be frustrated by installations that don't provide didactic labels. (Schaffner 2006: 157)

The other side argues that:

> Art is by contrast, a sensory experience and labels, however informative, cannot help viewers in their appreciation of art. They can actually hinder its experience. (Schaffner 2006: 157)

In the art exhibition context this issue, then, is often seen as being a tension between aesthetics and information.

This description of the two sides of this debate perfectly expresses two of the concerns that I had when composing the exhibition signage for this project (chapter 6 section 6.1, appendices 10 & 11). On the one hand, I wanted to make sure that the signage signalled enough about the artwork to allow a general audience to engage with its ideas. On the other hand, I did not want this information to close off any of the possible experiential pleasures that the audience could feel. I also felt initially that if I needed to explain my interface in order for people to engage with it then I would have failed to create a successful interaction design. I was aware, however, that some level of expertise with the traditions, history and context of the art world is often required before people can engage with an artwork. Without some form of signage to give them this knowledge, for many people artworks can be, as Vergo points out, "remarkably taciturn objects" (1997: 49). Interactive artworks like those created for this project also require another type of expertise for an audience member to be receptive to the experience. This is an expertise with interactive computer-based media. The audience's possible lack of expertise in either or both of these two areas does need to be considered when designing exhibition signage and some form of explanatory text is usually required to accommodate it.

The results of the first case study, however, made me relax about some of these concerns. As this study revealed, there were some audience members who expected and wanted to see explanatory signage and complained if it was not provided. There were also some audience members who did not want signage. These people, who were generally more expert and confident with interactive art, tended to ignore any signage unless they were confused and then they looked to it for information. This interactive art audience, then, read the signage when and if they needed it and the signage performed a useful role in terms of evening out differences in experience levels. Including explanatory signage should not, therefore, be seen as an admission that one has failed to create an intuitive interface. Considering the short amount of time that an audience will spend with an interactive artwork it is, rather, an honest recognition of and useful response to the different levels of expertise that can be found in the exhibition audience.

Another finding that emerged from the first case study was the role that signage could play in terms of preparing the audience to be receptive to the experience that they were about to have with the artwork. This is an important yet difficult task and one that concerns not only the exhibition signage but also the whole context of the exhibition installation. A strategy that interactive artist David Rokeby works with involves trying to encourage a dialogue in the mind of the audience member because otherwise, he feels, people focus just on the question "How does it work?" (Rokeby 2008). The *Elysian Fields'* signage with its sentence explaining the mythological meaning of the artwork title seemed to work to encourage exactly this kind of a dialogue. It provoked the "receptive and associative state of mind" that Schaffner feels can emerge from labels that aim to answer "Why is this exciting or profound?" not "What can this teach me?" (2006: 166). The difference between these two aims stresses again the importance of developing a relationship with the audience, one where the artwork and audience are positioned not as teacher and student but more as conversational equals. Well-composed exhibition signage can be used to start such a conversation.

There is another factor at work here, however, and it concerns the evocative quality of the writing itself. The value of this was revealed to me when I witnessed my supervisor, the artist Ernest Edmonds, presenting one of his artworks, *Port Hacking 4* (2004). This work involved very subtle changes to sound and to the shades of white that appeared on each half of a projection rectangle. Before showing the artwork, Edmonds asked the audience to consider the experience of being on a ship at sea in a fog and how this might cause you, once you relax into the experience, to notice subtleties within the texture of this fog and to hear sounds that might in the clear light of day be ignored. The sensual and

experiential nature of this image worked to give a profundity to my subsequent experience of the artwork that I know would not have occurred without it. Similarly, in the *Elysian Fields'* signage it was the three words "wondrous, sublime and peaceful" that gave people an experiential cue, preparing them for the experience ahead. In both cases, these cues only worked so well because they resonated with the actual character of the artwork. Audience members, as the second case study found, do not blindly accept information they read on exhibition signage. For these cues to be effective they must resonate with the audience's actual experience.

In the second case study a factor that seemed to work against the audience moving into this receptive and associative state was the goals that were suggested by the *Just a Bit of Spin* exhibition signage. These goals were useful in terms of quickly giving a shape and a purpose to people's experiences and did work to quickly stimulate goal driven play by giving people a rigid framework that play could then progress within. However, they also seemed to keep some people focused on discovering how to work the artwork rather than focused on the more playful goal of discovering what they could do with it. The problem here, as discussed in the previous chapter, lay partly with the way these goals were not well tied to the experiential aims of the artwork. Another issue was the way that these directed goals did not leave much time for more audience-driven goals to emerge. While it can be useful if exhibition signage gives the audience a goal to help direct their experience, it is important that these goals are carefully designed so that they open up experiential possibilities rather than proscribe them.

The design of museum exhibition signage is a process that will always involve trying to create a balance between saying too little and saying too much. It will also always involve a struggle to say the right things in the right way. The findings in this project indicate that well-designed signage can play a useful role in the exhibition of playful interactive art. Such signage can help produce resonant and reflective experiences and can help to stimulate play behaviour, both rule-based goal-driven play and associative improvisational play. In order to do so, exhibition signage needs to accommodate multiple levels of expertise, to provide evocative experiential cues and to suggest goals that can help drive an experience. Doing so is not a matter of pitting aesthetic demands against informational demands, it is about trying to create a text that can use information to help produce aesthetic experience.

11.3.2 Audience Expectations and Constraints

Another aspect of the exhibition context that this project has struggled with is audience expectations and the effect they can have on the experience of an

artwork. Participants in the case studies often voiced their expectations about the ways they should act in an art exhibition. These expectations seemed to constrain their behaviour and influence their experience. When these expectations are added to the behavioural constraints of the museum environment it is not inconceivable that their weight could interfere with participant's experience of play.

The museum environment of the Powerhouse Museum in Sydney, the setting for the second case study, was, unlike most art galleries, quite a playful environment with many interactive exhibits. Security guards and attendants were not particularly obvious and tended to patrol quite a large area every hour. This contrasts with the usual art gallery practice of placing a seated attendant in almost every room and especially in any room with an object that people might touch. The Powerhouse was also often full of children and during the daytime hosted large school groups. Their laughter and exuberant behaviour added to the playful atmosphere of the museum. The downside of all this audience freedom was the constraints that were then placed on exhibition design in terms of ensuring that no one could damage or be damaged by an exhibit. In this environment and in terms of play, then, the museum constrained the design behaviour of the artist more than it constrained the behaviour of the audience.

There was, however, one aspect of the Powerhouse Museum environment that did seem to affect participants' behaviour in a way that might have inhibited their play experience. Common to all museums and, Wright argues, particularly an art museum, is the feeling that one's visit is often like "a preparation for an unseen exam" (Wright 1997: 126). In trying to understand and interact with an interactive artwork, participants often feel like their intelligence is being tested and if they do not understand then there is a feeling of failure. Two participants from the second case study described the anxiety this pressure made them feel:

> Bernadette: *I felt less danger, more kind of ... kind of anxiety stuff, that kind of you know, would I work out, could I work this out, would I work this out?*
> Mary: *Would someone make fun of you, say your time was up?*
> Bernadette: *Yeah, and I'd feel like I'd failed.*
> Mary: *Yeah, and people watching you, performance anxiety.*

This connection between the museum visit experience and performance anxiety is not a new one. As noted in chapter one, since its inception, surveillance has been an implicit and explicit part of the museum institution, whether it is the stern gaze of museum staff or the inquisitive gaze of other museum visitors. A sign at the 1901 Pan-American Exposition even asked visitors to "please remember when

you get inside the gates you are part of the show" (Bennett 1995: 68). This feeling of being 'on show' and the performance anxiety that can result adds to the anxiety art museum audiences already feel around the perceived exam-like nature of an artwork. Such anxiety is not conducive to play because it can act to break down or hinder the formation of the safe, protective frame of play.

One result of this anxiety was the preference some participants expressed for artworks that were easily understood and that thus did not make them feel like they had failed. This preference also seemed to influence the way participants approached an artwork, with these participants habitually approaching artworks with a focus on making sense of the artwork both interpretively and in a sensual experiential way. These participants often creatively looked for connections between the world of the artwork and their own. Another group of participants responded to the perceived exam-like nature of the artwork experience more competitively. This group habitually approached the work more as if it was a puzzle to be solved and were very focused on uncovering the inscribed workings and message of this puzzle. The preferences and habitual approaches of both these sense-makers and puzzle-solvers influenced the type of interactive experience that they expected to find. They also had an effect on the type of experience that these participants would actually have with an artwork. This was most obvious in the first case study, which had three artworks with quite different characters. An artwork that suited the interaction approach of the sense-makers, like *Elysian Fields*, could frustrate those who were puzzle-solvers. Sometimes though, as already noted, it caused these people to shift their approach to the work, and when it did so it was powerfully affective.

Thus, the art audience approaches their experience of an artwork with a set of expectations about the character of that experience and with expectations about the way that they should engage with it. If these expectations are not met they may reduce the amount of time and effort an audience member is willing to put into a work. If these expectations are met, however, they can, as artist Sidney Fels notes, then lead an audience member to spend more time with a work and to explore it further (Fels 2004). In play terms, however, always meeting expectations is a design strategy that will not continue to pique the interest required to maintain a state of excitement. Fortunately, given the variable nature of the art audience, it is also a strategy that is very difficult to achieve. Nevertheless, when designing a playful interactive artwork, it is worthwhile to carefully consider the balance one is trying to create between the excitement of surprises and the comfort of expectations met.

There are no easy solutions to these issues surrounding audience expectations and constraints because both arise out of systems and entities that the interactive artist has little or no control over. The evolving practices of the museum environment and the museum audience are mostly formed independently of artists and their creations. Artists can, however, develop an awareness and understanding of these practices and this can then inform their designs. To this end, although the ways of understanding that this project has produced here are most significant in terms my own personal practice, they will possibly also be of use to other artists. To create an artwork with an awareness of the anxiety that an audience can feel when interacting, and with a greater awareness of the types of expectations they might bring to the experience, could hopefully help to create the kind of conversational relationship that seems ideal for a play experience.

11.3.3 Summary: Exhibiting Playful Interactive Art

The issues surrounding exhibition signage and exhibition audience expectations and constraints might be difficult to resolve but, as this project has revealed, there are some strategies and ways of understanding that can make the installation of playful interactive art less challenging. Exhibition signage can be used to help the artwork experience provoke audience reflection and stimulate playful audience responses. To do so it needs to provide information that communicates well with those who might have little experience of art and computer interaction. Such a text needs to be written with a focus on providing evocative and experiential cues that resonate with the artwork's character. The text also needs to suggest goals that can give a shape and a direction to the experience in a way that still leaves room for playful improvisation. If this text is well composed it might help alleviate the anxiety that an audience can feel when faced with the challenge of interacting with and making sense of an interactive artwork. It could also help the artwork to accommodate the different play habits of this audience, such as their preference for sense-making or for puzzle-solving. Dealing with the multiple variables that have been discussed here will, however, always be a balancing act and audience evaluation could play a major role in fine-tuning this balance.

11.4 Evaluating the Experience of Playful Interactive Art

Audience evaluation and specifically the evaluation of playful interactive art became another focus of enquiry within this project. This was because such evaluation methods were relatively uncommon within art exhibition practice and also because they were a new method within my practice. Perhaps the most significant reason for this focus, though, was the realisation that the context of

play required the development of new methods for evaluating its experience. We have already discussed in this chapter how some of the most valuable methods that were developed involved the use of the play framework as an evaluation tool. This section will now discuss three further areas that have led to the development of techniques for and ways of understanding the evaluation of the audience experience of playful interactive art.

11.4.1 Selecting Participants

The type of participants selected for a qualitative case study can have an enormous influence over the data that is produced and the study's subsequent findings. The approach taken to the selection of participants is, therefore, an important part of any qualitative study. This project's initial approach involved selecting a group of participants which reflected the wide range of ages and levels of expertise that would be found in any art gallery audience and which also had a balance of both genders. This approach was adjusted during the course of the project as it became clear that the study of a play experience within an interactive art context required some different participant selection techniques.

The first issue that arose was whether participant selection could take into account a participant's level of playfulness. This was because of the enormous impact that player attitude could have on the quality of a play experience.[2] It was quickly decided that attempting to determine a participant's level of playfulness before selection would involve behavioural psychology methods that were well outside the scope of this project. Instead, the approach taken was to include a question within the post-experience interview that was designed to reveal the play preferences of each participant. This question asked participants to describe what, if anything, they did in their life that they would describe as play. The answers to this question were interesting but ended up revealing more about people's definitions of play than their personal levels of playfulness.

The first case study did have a question that was unintentionally revealing of participants' different levels of playfulness and that was the question about which of the three artworks had made them play the most. This question was particularly revealing because the three artworks had very different characters and participants could use their different experiences of these characters to then describe their preferences. Tying participants' actual experience of a range of different play situations to a question about their play preferences can be, therefore, a useful technique for revealing the playful nature of participants' characters. These play experiences would not necessarily need to occur during an

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[2] See chapter 3, section 3.4.

evaluation session but if they did this would make it possible to usefully compare participant responses, as occurred in this project. This comparison helped develop insights into two types of playful character that were common within the first case study, puzzle-solvers and sense-makers. These character types were then used to help select the repeat participants for the second case study and gave researchers some pre-evaluation understanding of the type of attitude these particular participants would be bringing to the play experience.

Another participant selection technique that was found to be particularly helpful for the evaluation of a play experience was to select social couples and to let them experience the artwork in pairs. Although these couples did not always play well together, they were comfortable in each other's presence and could help each other through any confusion. The paired participants did not just exchange knowledge verbally they also discovered things about the artwork by observing the interactions of their partner. This lessened the possible anxiety that could be felt when interacting with an artwork and thus helped provide the feeling of safety that is necessary for a play experience. Certain artwork experiences were also found to be more pleasurable when experienced with another and this finding would not have been possible without the selection of paired participants.

A final effective technique was to include a select group of participants who had expertise in the creation of audio-visual media. Although the word 'experts' has been used to describe this group, perhaps a better word would be 'peers'. This group consisted of people I knew professionally and whose opinions I respected because of their expertise. The use of such professional opinions has a lot in common with traditional peer-based 'crit' sessions found in art and design schools. The knowledge that these peers had about their particular area of expertise, whether it was animation, sound design, interaction design, editing, performance or game design, gave them an enhanced sensitivity to the interactive art context. It was this sensitivity that made their opinions so valuable. While general audience members can and do point out areas of frustration or delight, peers are more likely to also reflect on the formal reasons behind these feelings. As we have seen several times in this project, these reflections are very helpful for developing future design directions that do not try to fix things that are not really broken. The use of experts for this reason has also been recently championed by Greenberg and Buxton, who argue that using experts can get around the potential for user evaluations to "quash potentially valuable ideas early in the design process, incorrectly promote poor ideas ... [and] misdirect developers into solving minor versus major problems" (2008: 112). The use of expert participants to provide peer critique was, therefore, a participant selection technique that helped

the findings of the case studies provoke informed and appropriate design directions.

As a participant selection technique the use of expert participants also helped create an atmosphere that was conducive to a play experience. Experts' knowledge of interactive art removed the anxiety that can be felt about interpreting interactive art and also seemed to make them feel less anxious about the possible added worry of taking part in an evaluation. This lack of anxiety, as we have seen in the results from the case studies, made the expert participants often more ready to be playful.

Another more hidden area of participant expertise also emerged during the study and this could be a useful area to explore further. The second case study included a group of participants who had also taken part in the first study. These repeat participants included those who were expert and those who were not. There was one recently developed area of expertise, however, that they both had in common, and that was an expertise with the processes involved in an evaluation session. This seemed to make both groups much more comfortable with the evaluation, and this level of ease seemed to also spark not only more discussion but also more playfulness. Participants' prior experience of evaluation techniques also seemed to help even out their varied skill levels with some of these techniques. Evaluation methods such as retrospective reporting are quite demanding and not all participants have the verbal or social skills to perform them well. Factoring in the development of a level of participant expertise in the 'doing' of evaluations might then be another useful strategy to explore in future.

An additional area of exploration would involve a rethinking of the definition of the art audience. Kaye and Taylor suggest that:

> ... including a wide variety of stakeholders, including non-users, can be a powerful tool in understanding aspects of the experience of technology use that are not apparent from just studying end-users. (Kaye & Taylor 2006: 18)

In the study conducted at the Powerhouse Museum it became apparent that there were multiple groups with a stake in the experience evoked by the *Just a Bit of Spin* exhibition. The general public who visited the museum was just one of these groups. Others included the museum's designers and curators, the installation teams, the security guards and the tour guides. These groups formed a community who 'lived' with the exhibit over the three months that it was installed at the museum. Each of these groups had an opinion about the exhibit that related either to their expertise at creating interactive exhibits or, in the case

of the security guards and tour guides, that related to their own experience of it and their daily observations of others interacting.

At the *Just a Bit of Spin* exhibition a young female security guard became a particular fan and said that she visited and played with the exhibit every time she was rostered to patrol that area. She commented that every time she went back to play with the exhibit she got more out of it. Had she been an evaluation participant, this security guard would have been able to provide a perspective that gave insights into the effects of having a much longer experience with the work. A final future direction in terms of participant selection, then, would be to consider the value of having such members of a museum workforce participate in an evaluation.

All of these approaches to the selection of participants for the evaluation of playful interactive art add to the quality and value of the data collected. Some, such as selecting social couples and working with repeat participants, do this by making participants less anxious and thereby more playful and open to the experience of the artwork and the evaluation. Others, such as having a focus on participant playfulness or using peers and exhibition staff as participants, do this by providing a range of different perspectives that can help the evaluation produce informed and appropriate design directions.

11.4.2 Designing for the Experience of Evaluation

During the second case study some participants found the process of completing the post-experience aspects of the evaluation tedious. This drew attention to the importance of designing for the experience of an evaluation and to the related idea that a tedious evaluation process might not be appropriate for a study that is evaluating play experiences. Similarly, some in the interaction design community argue that in order to evaluate affective experience "feedback-giving should be pleasant in and of itself" (Isbister et al. 2006: 1164). This feeling is echoed by Cockton who asks: "Can you measure fun with a boring instrument?" (Cockton 2006: 104). The implication of these arguments is that a fun or pleasant evaluation method might help a participant to provide data about their affective experience. Conversely, they also suggest that a boring or unpleasant evaluation experience could change a participant's mood to the extent that it might then adversely influence his or her answers.

There was no strong evidence in this project to show that a boring evaluation could remove or reduce the pleasure people experienced with an artwork and cause them to answer differently. It is possible, though, that the process of doing

the evaluation had some impact on the things that people remembered about their experience. As Kavanagh points out:

> ... exactly how we ask people to describe their experiences will have an effect on what they are able to remember ... Each memory can connect with and act as a prompt to the others, but it all depends upon the starting point and how it develops. (2000: 151)

The things that participant's remembered in this study were shaped by the evaluation methods associated with the play framework. Although the framework was beneficial because it kept participants focused on the detail of the play aspects of their experience, more thought could be given to the order in which the play framework categories appear in the survey because of the influence this could have over the way participants remember their experience.

In the second case study it seemed as though the order of the play framework survey questions did have an effect on participant answers. The survey interface and its associated interview fatigued some participants. The impression that then emerged was that as they became fatigued participants would give more sketchy and casual responses. The earlier questions within the survey, therefore, often generated more detailed answers and the later questions less so. This lack of detail might have been due to a change in what participants remembered or it could have been due to an increasing reluctance to communicate. Whichever of these is true, the lesson here is that participants need to stay interested and engaged in order to maintain a spirited evaluation discussion and that, therefore, the experience of doing an evaluation needs to be designed with this in mind. This focus on maintaining participant interest and engagement indicates that designing some playfulness into evaluation methods could be a worthwhile future direction.

There are some interesting current approaches to designing playful evaluation experiences that could be drawn on in the future. In a recent study, Ibister et al. used sculptural physical objects that were designed to express specific emotions, and participants moved these around while they were experiencing an interactive work (Isbister et al. 2006). Another playful approach developed by Wright and Blythe involved creating an interactive game interface and then using this to generate discussion and debate within an evaluation (Wright & Blythe 2007: 68). Interactive artist George Khut, on the other hand, used a playful evaluation method that involved participants using coloured pens and paints to draw a representation of their affective experience of his artwork over an outline of a human body (Jaspers 2008: 16). Participants were later interviewed and asked to

explain the representation they produced. These three methods involved a range of different playful pleasures from the pleasures of sensation, to those of competition and difficulty, to those of creation. These different pleasures were each appropriate to the evaluation aims of each study and it is this aspect of these three methods that is particularly important. Developing a playful method that is appropriate for the evaluation aims of this project will also involve ensuring that the playful pleasures involved in this method are appropriate to these specific aims. Ensuring this could, therefore, involve some future trial studies of possible methods.

Interactive artists are very focused on the experience that an audience might have with their artwork but, as the findings here suggest, they need to become equally concerned with the design of any audience evaluation experience. The processes involved in participating in evaluations can be tedious and this can have an impact on the data that is collected. Thus, in order to maintain participant engagement and interest, evaluations that wish to explore play might need to develop methods that can also evoke play. The play framework could play a useful role in this design process.

11.4.3 Reflections on the Practice of Evaluation

At the start of this project I was new to the practice of audience evaluation and was not entirely convinced that it would be beneficial to my art practice. I had three main concerns. The first was that the multiple opinions produced by the evaluation process might confuse or muddy my artistic aims for an artwork and produce the poor results usually attributed to the 'trying to please everyone' effect of 'design by committee'. The second was that the evaluations might not reveal anything more than could be gained from simply observing the audience interacting and might, therefore, waste time. Related to this was a third concern that the process of conducting and analysing the evaluations might take too much time and focus away from my creative practice.

Although the process of evaluation has proved to be beneficial, some of these concerns still remain. My concern about dealing wisely with criticism, for example, is a persistent issue within general art practice and, not surprisingly, is similarly persistent within evaluation. Dealing with this issue requires the constant development and assessment of strategies for synthesising and appropriating such criticism. Successful strategies will be able to overwhelm the possible paralysis arising from too much criticism with the innovative potential of a fresh perspective. A strategy that proved to be particularly successful in this regard was the development and use of the play framework as an evaluation tool.

This tool focused the perspectives collected during the evaluations and, perhaps most importantly, focused and recorded the perspective of the artist, enabling these two to then be compared. It thus acted as a filter to reduce the possible range of opinions and also made it easier to then synthesise these opinions.

The experience I have gained within this research has made me feel more comfortable dealing with the range of opinions that an evaluation can produce. I have also become more aware how my earlier fears have the potential to stifle any possibility that evaluation could transform my creative practice in innovative and valuable ways. Such transformations will only occur if one is open and willing to listen to the new ways of thinking these changes can produce. In this project, some of the most interesting and transformative moments occurred when my perspective most clashed with that of the audience, revealing insights into previously unconscious artistic assumptions and perspectives. Thus, my second concern that the evaluation would not reveal anything new was proved wrong.

The third concern, however, does remain a valid issue. Although the process of collecting data was quite quick, the process of analysis was very time-consuming. Analysis requires very different skills and a very different mindset to creative practice and for me this meant that both could not occur at the same time. It did feel, therefore, as though the evaluation process sometimes ate into the time I might usually spend creating artworks. This effect needs to be outweighed by the benefit that can be gained from evaluations, if they are to become a common part of my practice. A further future direction, then, would involve a focus on reducing the time needed to collect and analyse evaluation data.

11.4.4 Summary: Evaluating Playful Interactive Art

The focus of these findings, like those in the earlier section about the play framework, has been on developing evaluation strategies and methods that are appropriate for a study that aims to uncover insights into a play experience. This has led us, in both cases, to findings that emphasise the importance of pleasure and of creating a lively dialogue within evaluation experiences. The creation of pleasurable evaluation experiences can be encouraged not only by the careful design of the methods used but also by using social couples as participants and by training participants in the processes involved in an evaluation. On the other hand, the creation of a lively dialogue within an evaluation can be encouraged by making evaluation methods playful and by selecting participants who either through their expertise or habits can make an informed, particular and/or valuable contribution to the discussion. From a practical perspective, however, any development of new evaluation methods needs to also pay attention to the

demands they might make on an artist's time, for time-consuming methods are unlikely to become a common part of an interactive artist's practice.

11.5 Applying the Findings

The findings that have emerged from this project have suggested several strategies for the creation, evaluation and exhibition of playful interactive works. These strategies will be useful for both artists and curators who are interested in stimulating playful art audience experiences. It is also anticipated that these strategies will be applicable in other interaction design contexts, such as game design or museum exhibit design.

The findings suggest that those concerned with the design of exhibition spaces for playful interactive works should focus on creating an environment that sets up and maintains the frame of safety that a play experience requires. Exhibition signage plays a vital role in this and should be composed in such a way that it works to both frame the play experience and provide space for playful improvisation. In providing evocative cues that might encourage improvisation, the signage should focus on accommodating two types of audience play preferences, the preferences of sense-makers for interpretive and experiential play and the preferences of puzzle-solvers for more competitive rule-based play. Many audience members feel anxiety when confronted with an unfamiliar interactive system in an art gallery or museum. This anxiety can work to not only cause a collapse of the play spirit but also to prevent play from ever occurring. Alleviating this anxiety is another role that carefully composed exhibition signage can perform. Such signage would ideally work in harmony with the design of the space and the character of the work being exhibited.

The successful design of such playful exhibition spaces will be more likely if these design components are fine-tuned through audience evaluation. Audience evaluation can also help an artist or interaction designer fine-tune the experiential aims of their works. Conducting evaluations of playful experience requires one to use methods that will provide detailed data about play. In order to do this these methods will also need to be experienced as pleasurably playful by the evaluation's participants. The play framework proposed here is useful for surveying participants in a detailed way about the playful pleasures within their experience. It is important, however, that the framework categories are explained thoroughly during the evaluation process and that the survey interface is designed to reduce the cognitive load required to complete it. The play framework survey should be accompanied by an interview where participants are asked to note unusual or complex aspects of their answers. The play framework

should also be used prior to the evaluation by the artist or designer to develop a description of the experiential aims of their work. These aims can then be usefully compared to the participant responses. Allowing some participants to experience the work in a pair will help to alleviate the sobering effect that the evaluation environment can have on a play experience. It is also valuable to use 'experts' or 'peers' as participants as they are less likely to experience anxiety and can provide more detailed and focused design suggestions.

The play framework can also be usefully applied during the creation of playful interactive works. It should be used first during concept development to help define and focus the experiential aims of a work. Once these aims are developed they can then be used when making design decisions. It is useful to question whether a decision will help to strengthen the aims. It is also useful to consider whether a decision will work to direct the audience experience or will provide an opportunity for the audience to shape their experience. Creating a balance between directed and emergent experiential properties helps to maintain the rhythm of play. One useful strategy for creating this rhythm is to work with patterns and ambiguity. Consistent patterns help to stimulate investigative exploration while ambiguous qualities help to stimulate diversive exploration and an audience member who moves between these two states is playing. Their level of engagement with this play experience can then be increased by careful design of the relationship between action and representation so that it evokes tactile-kinetic memories. Their level of engagement will also be increased if attention is paid to the robustness and responsiveness of the work. These two qualities will give the work a character and vitality that will help it to maintain an active play relationship with the audience.

11.6 Concluding Summary

> Play surprises and delights us, moves us and transforms us. There is, after all, something playful about play. It is this exacting ambiguity that makes play so rich, and potentially so valuable ... (Salen & Zimmerman 2006: 85)

This project began with a desire to create interactive artwork experiences that could produce meaningful audience engagement. Play was chosen as the artistic approach to this and the research, therefore, aimed to develop practical strategies for designing for a play experience. After some initial theoretical research and pilot studies, the main research processes involved the creation of four interactive artworks and the conducting of two case studies. These studies evaluated the audience experience of the four works within an exhibition environment. As

expected, the primary findings that have been generated by this research relate to strategies and tools for designing for a play experience. However, the research also produced secondary findings about the exhibition and evaluation of playful interactive art.

Play did, as expected, work to increase audience exploration and engagement but that level of engagement was not always the "meaningful audience engagement" that was initially hoped for. It became clear that the variable nature of audience education, experience and attitudes would make it impossible to make any definitive judgements about this initial hypothesis. The project was, however, able to develop useful strategies that would help in the design, exhibition and evaluation of playful experience and some of these strategies did create opportunities for meaningful engagement. Although this focus on play is but one possible approach to the issue of interactive art audience engagement, it has proved to be a very useful way of thinking through many issues that are common to the design of all interactive art. These findings will, therefore, be valuable for artists and curators of interactive art and also for those within the general interaction design community, particularly those focused on the creation, evaluation and exhibition of playful interactive systems.

A major contribution to knowledge of this research is the new play framework. This framework is broader in scope and more detailed than previous work. Additionally, the project has developed and trialled methods for applying this framework within the design and evaluation of playful interactive artworks. This has resulted in the recommendation of four strategies to aid the process of designing for a play experience. It has also resulted in recommendations to aid the evaluation and exhibition of playful interactive works. These findings extend and develop previous work in these areas. The development of methods for evaluating playful interactive art is particularly significant as there is very little previous work in this area.

The research within this project has been practice-based and the artworks that have been produced are viewed as an important outcome of the project. The research process produced three artworks: *Elysian Fields*, *Sprung!* and two iterations of a work titled *Just a Bit of Spin*. The second iteration of the *Just a Bit of Spin* artwork is a particularly significant outcome both in personal practice terms and in terms of the artistic aims of the research.

Another important outcome of this project has been the development and testing of a framework of thirteen possible pleasures that can be experienced during play. This play framework arose out of a synthesis of the ideas of six theorists and, once created, became a tool that could be used within both the

design and evaluation processes involved in interactive art practice. Its value as such was tested during the process of this research. As a design tool, the play framework proved to be particularly valuable during the conceptual development of an artwork and it also proved to be very valuable when used to focus experiential design choices. As an evaluation tool it helped create a common language between artist and audience and thus provided fruitful opportunities for dialogue. The data collected from these dialogues were also found to be particularly useful for fine-tuning the creation of playful interactive art experiences. The first key strategy for designing for a play experience that has emerged from this research is, therefore, to use this play framework as a tool for both design and evaluation.

The research developed three additional more directed strategies for designing for a play experience and each involved a different set of possible pleasures. It was found that patterns and ambiguity could be used to create a rhythm between rule-based play and improvisational play and could produce the pleasures of exploration, discovery, difficulty and challenge. The combination of representation and action could be designed to resonate with the very personal emotional and sensual memories of the audience and could produce the pleasure of creation. Finally, a focus on the robustness and responsiveness of the artwork could give it a vital and playful character that could make it feel like an equal participant in the play experience and lead to the pleasures of camaraderie, captivation and sensation.

The research also developed ways of understanding and insights into the museum exhibition of playful interactive art. The design of exhibition signage was found to play an important role in reducing the anxiety of the audience and creating the feeling of safety that is necessary for play to occur. It was also found that well-composed signage could help shape and direct the play experience by giving the audience a resonant and evocative cue for their experience of the artwork and by suggesting goals for them to explore. Additionally, the research led to the development of a greater awareness of the museum exhibition audience's expectations and constraints and to the identification of a potential play preference for either sense-making or puzzle-solving.

A final group of findings involved the identification of methods that are appropriate for the evaluation of a play experience. It was found that this context required one to consider the playfulness of participants and to develop methods for ascertaining this. In this context, the use of social pairs proved to be useful for encouraging play behaviours and for reducing participant anxiety. This anxiety was also found to be reduced if participants had more experience with the

processes of evaluation. Such participant anxiety could be a barrier to play and the use of peers was another strategy that successfully reduced it. Because of their expertise, peers had an enhanced sensitivity to the interactive art context and this made their selection a strategy that helped the evaluations to produce informed and appropriate design directions. The second case study also suggested that museum staff might be another group with an enhanced sensitivity to the interactive art context and that they might, therefore, similarly be valuable as evaluation participants. Lastly, participant experience with evaluation methods was shown to have an impact on the data collected, indicating that attention needs to be paid to the design of this experience. Making the evaluation experience playful could help maintain participant interest and engagement and, thereby, help produce lively and thoughtful discussion.

Together these three groups of findings have also suggested several possible future directions for this research. One such direction would involve a redesign and evaluation of the survey interface of the play framework. Another would involve conducting a study aimed at developing the play framework descriptions so that the communication between artist and audience is improved and fine-tuned. This study would also include the testing of the framework as a design tool with other artists and also with other types of interaction designers. Lastly, research would continue into the four strategies that have been uncovered here and this research would also continue to search for other strategies for designing for a play experience.

A common thread in the project's findings was the need to create a balance and a satisfying rhythm between the opposing forces at work within all aspects of a play experience. Play is movement and this movement involves both action and response. Designers who wish to work with play must, therefore, consider the character and tempo of this movement and this involves both directing its rhythms and providing space for rhythms to emerge. Too much direction and the rhythms will become repetitive, replacing "the comfort of reunion" with the "enslaving reproduction of the same" (Augoyard & Torgue 2005: 97). Too much freedom and the rhythms will falter as they lose their vitalising spark of otherness. Maintaining a dynamic and lively rhythm within play is not easy but it is essential if one wants to successfully create a play experience. And it is here that play has the last laugh. For in order to maintain this rhythm one must, of course, be playful.

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APPENDIX I:

LIST OF PUBLICATIONS AND EXHIBITIONS ARISING FROM RESEARCH.

Publications:

Editing

Candy, L & Costello, B (Guest Editors) (2008) "Special Issue: Interaction Design and Creative Practice", *Design Studies*, November 2008, vol.29, no.6.

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Costello, B., Rothwell A., Macinnes A., *Play@beta_space*, interactive installation, *Powerhouse Museum* Sydney Sept-Oct 2005.

Costello,B., Gwilt I., *Elysian Fields* presented at the *Interactive Entertainment* conference 2005.

Costello, B., Macinnes, A., *Sprung!*, interactive installation selected for exhibition in the digital art section of the *Graphite* Conference July 2004, Singapore.

APPENDIX 2:

FORWARDS AND BACKWARDS PHRASES USED IN *JUST A BIT OF SPIN.*

Forwards:

One small step forward.

It has been a necessary step forward.

What is required is sober, sensible but forward-looking action.

It could involve some forward deployment.

Fortunately, we have a map forward.

So it will be an open process and it will be one that is forward looking.

We have gained added momentum as we move forward.

We have been willing to take positive forward-looking decisions.

It is an expression of our desire to go forward.

We are willing to stride boldly forward.

This does represent a way forward.

There is progress being made, this is a big step forward.

If you fast forward,

I think we should see this as a sensible move forward.

We can now move forward together.

Backwards:

This is a big step backward.

We are unhappy with this and we're not backward in saying so.

It is a recipe for stagnation and going backwards.

They are arguing for going backwards.

I think that is too backward looking.

Not only is it wrong, it gets the relationship completely backwards.

We can't stop, we can't go backwards.

We have bent over backwards and we felt we couldn't go any further.

But if we now down tools we'll end up going backwards.

You either keep going or you go backwards.

We must take advantage of what this offers or we slide backwards.

You don't overreact, but equally you don't take a backwards step.

We live in a world where if you try and stand still you go backwards.

They are going backwards.

I know that you are not backward.

APPENDIX 3:

HARD AND SOFT PHRASES USED IN *JUST A BIT OF SPIN.*

Hard:

I always work very hard.

Hard work is very hard to beat.

We have to work very hard to keep it that way.

I know it's harder for some than it is for others.

We have made a hard-headed assessment of our interests.

It's a hard judgment to make.

It often calls for hard choices.

I don't think we're seen as hard-hearted.

It's a hard balance to strike, but we try very hard to do it.

The easy thing would be to say well this is all too hard.

I've fought harder for this than anything else.

We're performing well because hard decisions were taken.

That's only fair to the people who work very hard.

They do a very good job in hard circumstances.

It has taken a lot of hard work and the hard work has been your hard work.

Soft:

Everybody has a soft spot.

This has exposed the soft underbelly of it.

It is not a soft-sell, it's quite the contrary.

We are strong and soft, all at the same time.

They don't really understand in their soft-headed way.

We could have gone soft on that.

But we have foresworn the soft option.

We're not going to become a soft touch and I don't think they expect us to.

I mean all this talk about us going soft on them, is wrong.

It is sending a message to them that we are starting to go soft.

If we continue to be seen as a soft option then this will magnify.

They think we can soften the edges.

I think they would go soft irrespective of what happens.

We need to send a powerful message that we are not a soft-touch.

I'm not soft-peddling and I'm disappointed to hear that they are.

APPENDIX 4:

SOMETHING AND NOTHING PHRASES USED IN *JUST A BIT OF SPIN.*

Something:

This is something that needed to be done.

I think we all wanted to do something about this.

I don't want it to be seen as the re-badging of something else.

That is not something I encourage people to do and it's not something I've done.

At least I stand for something.

That is something I've always believed in very strongly.

I'll have something more to say about that in the future.

We are asking them to give something back in return.

Others will say it was a trade-off for something else.

Well that's something for them to explain.

You say, do something.

It is too early for me to be saying yes or no to something like that.

It's not just something out there on its own.

It's something that will take a number of years to implement.

There would have been something unreal about my talking to you today without saying something.

Nothing:

They say nothing is ever enough when it comes to this.

Nothing could be further from the truth.

There's nothing at all to be gained by that.

Nothing is completely free and it oughtn't to be.

I know that frustrates people but there is nothing I can do about that.

There's nothing surprising about this.

Just for the record, I knew nothing about it.

I'm satisfied that they knew nothing.

We haven't talked about it because there's nothing to talk about.

I have nothing at all to hide.

Nothing can, will or should alter that fact.

There's nothing strange about any of this.

Nothing has changed, nothing will change.

That is the issue involved, nothing more, indeed, nothing less.

There's nothing at all we can do to stop this, nothing at all.

APPENDIX 5:

INTERVIEW QUESTIONS FROM CASE STUDY ONE.

1   Of the three works which did you enjoy interacting with the most?

2   Why? [find out their order of preference]

3   Which of the three works made you play the most?

4   Why? [find out which one made them play the least]

5   This is a sheet listing thirteen possible pleasures that you might have experienced during your engagement with each work. I'll explain briefly what each one means soon. Can you please put a tick the box next to any pleasure that you experienced in each work (note: there is a column for each work [make sure they understand which column is for which work]). If you think any of the pleasures were a key or strong pleasure for that work then put two ticks in the box. You may have observed some of the elements as present in the work but not got pleasure from them. If so, then don't tick the box. You may find that you don't tick anything for some works. If, however, you felt mild or strong displeasure from something then put a cross in the box (or two if particularly strong). I'll now explain each category. You can tick and cross the boxes as I am explaining or do it after I am finished. Please stop me if you don't understand anything.

6   Is there anything that you have marked on the sheet that you think might need explaining in order for me to understand why you ticked it? [query them about the specific meaning of any crosses]

7   Do you do any activities in your life that you would describe as play? If so, what?

8   Do you have any other comments you would like to make about the works?

APPENDIX 6:

EXAMPLE SURVEY SHEET FROM CASE STUDY ONE.

	Elysian Fields	Sprung!	Spin
Creation	✓	✓	✓✓
Exploration	✓✓	✓	✓
Discovery	✓	✓	✓
Difficulty		✓	✓
Competition			✓
Danger			
Captivation	X	✓	✓
Sensation	✓	✓	✓✓
Sympathy		✓	
Simulation	✓	✓	
Fantasy	✓	✓	✓✓
Camaraderie		✓ if with other person	
Subversion		✓	✓

APPENDIX 7:

EXAMPLE OBSERVATION DATA COLLECTION SHEET FROM CASE STUDY TWO.

OBSERVATION SHEET: BETA_SPACE JUST A BIT OF SPIN 1ST DEC 07

EXPERIENCE #: _2_

AM _____ AF _1_ CM _1_ [4] CF _1_ [8]

TIME IN: _12.21_

TIME OUT: _12.22 + 12.24_ but not level change

MIX? : YES ☑ NO ☐

LEVEL BEGIN: 1 ☑ 2 ☐ 3 ☐

LEVELS DISCOVERED: 1a ☑ 1b ☑ 2a ☐ 2b ☐ 3a ☐ 3b ☐

LAUGHTER? : YES ☐ NO ☐

PLAY WITH SLOW SPEED? : YES ☐ NO ☐

PLAY WITH FAST SPEED? : YES ☐ NO ☐

GENERAL OBSERVATIONS: Little girl first on own - she mixed a bit but not enough to change level

Brought mother back in + small brother

Mother did not read poster.
Quickly said - come on.
Held up small boy to look through slits.
Little girl stayed behind playing
& had to be pulled out -

(Girl did not read poster.

APPENDIX 8:

INTERVIEW QUESTIONS FROM CASE STUDY TWO.

1. Can you describe what happened when you walked into the space?
2. Imagine that you are trying to explain the experience of interacting with this work to friend of yours who hasn't seen it. How would you explain it?
3. The voices in the work repeat some words. Which words do you remember hearing?
4. What meanings were being expressed with those words?
5. Do you think there is a relation between the repeated words and the images you saw?
6. Did you know that there are three levels within the work? How many levels did you discover?
7. What mood were you in before you experienced the work?
8. What mood are you in now?
9. IF you think your mood changed after your experience, in what way would you describe this influence?
10. What made you stop interacting with it?
11. How would you describe your experience in three words?
12. What do you think the artwork is trying to convey?
13. [Do pleasure questionnaire]
14. Ask them to explain their answers to each item of the questionnaire.
15. Ask (a) of people who did not take part in prototype test and (b) of people who did:
    a. Do you do any activities in your life that you would describe as play? If so, what?
    b. How would you describe the difference between your experience of this work and your experience of the prototype in December last year?
16. Is there anything you would like to ask me?
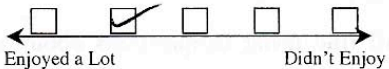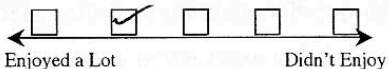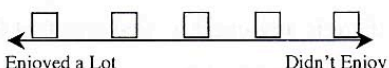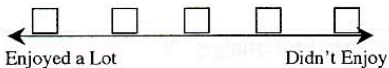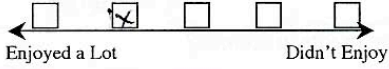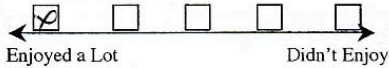
APPENDIX 9:

EXAMPLE SURVEY SHEET FROM CASE STUDY TWO.

What did you experience?

Below you will find a list of questions about some things that you might have experienced while you were interacting with *Just a Bit of Spin*.

Please read each question carefully and then place a cross in a box to indicate the amount of enjoyment you experienced with each aspect. The scale is from "enjoyed a lot" on the left to "didn't enjoy" on the right. The central box indicates neutral enjoyment. If there is any question that you feel is about an aspect that is *not at all* applicable to your experience of this work then put a cross in the N/A box.

Question	Scale	N/A
1. Did you enjoy creating images?	Enjoyed a Lot ← □ ☑ □ □ □ → Didn't Enjoy	N/A □
2. Did you enjoy creating sounds?	Enjoyed a Lot ← □ ☑ □ □ □ → Didn't Enjoy	N/A □
3. Did you enjoy exploring the work?	Enjoyed a Lot ← □ ☑ □ □ □ → Didn't Enjoy	N/A □
4. Did you enjoy discovering things?	Enjoyed a Lot ← □ ☑ □ □ □ → Didn't Enjoy	N/A □
5. Did you enjoy finding the work challenging to work out or understand?	Enjoyed a Lot ← □ ☑ □ □ □ → Didn't Enjoy	N/A □
6. Did you get any enjoyment from setting yourself goals and trying to achieve them?	Enjoyed a Lot ← □ ☑ □ □ □ → Didn't Enjoy	N/A □
7. Did you enjoy feeling like you were in danger?	Enjoyed a Lot ← □ □ □ □ □ → Didn't Enjoy	N/A ☑
8. Did you enjoy feeling mildly scared about what the work might do?	Enjoyed a Lot ← □ □ □ □ □ → Didn't Enjoy	N/A ☑
9. Did you get any enjoyment from finding the work captivating or mesmerising?	Enjoyed a Lot ← □ ☑ □ □ □ → Didn't Enjoy	N/A □

P.T.O Survey continues over the page…

10. Did you enjoy any physical sensations you experienced while touching, moving or hearing the work?	☐ ☑ ☐ ☐ ☐ Enjoyed a Lot Didn't Enjoy	N/A ☐
11. Did you get any enjoyment out of sympathetically sharing the emotions or physical actions of others?	☐ ☑ ☐ ☐ ☐ Enjoyed a Lot Didn't Enjoy	N/A ☐
12. Did you get any enjoyment out of perceiving something that mimics real life?	☐ ☐ ☐ ☐ ☐ Enjoyed a Lot Didn't Enjoy	N/A ☒
13. Did you get any enjoyment out of perceiving fantastical things that are not from real life?	☐ ☐ ☐ ☐ ☐ Enjoyed a Lot Didn't Enjoy	N/A ☑
14. Did you enjoy feeling a sense of friendship, fellowship or intimacy with someone or something else?	☐ ☒ ☐ ☐ ☐ Enjoyed a Lot Didn't Enjoy	N/A ☐
15. Did you get any enjoyment from subverting or twisting the meaning of something or from seeing someone else do so?	☑ ☐ ☐ ☐ ☐ Enjoyed a Lot Didn't Enjoy	N/A ☐
16. Did you enjoy feeling like you were breaking rules or enjoy seeing someone else break them?	☑ ☐ ☐ ☐ ☐ Enjoyed a Lot Didn't Enjoy	N/A ☐

APPENDIX 10:

EXHIBITION POSTER TEXT FROM CASE STUDY TWO.

Just a bit of Spin invites its audience to reflect on the spin politicians put on simple words, particularly those that politicians use to characterise themselves and, often by extension, us as a nation.

In the era of the sound bite, the blog post and the YouTube grab we have more access than ever to the present and past words of our politicians. Paradoxically as more and more of these words are able to be recorded and recalled there seems to be less and less value in what is being said. By interacting with *Just a bit of Spin* the audience is able to play with and transform a collection of phrases from such political speeches. The audience's creations will certainly be less bland and might even be more meaningful than the original spin.

This is a re-working of an early animation device known as a phenakistoscope. Spinning the disc in *Just a bit of Spin* will also trigger animation but in this version the animation is now driven by a computer and is accompanied by sound. A sensor called a rotary encoder records the direction and speed of the disc as it is spun and feeds this information into the computer. A program written in Max MSP then translates this information into images and sounds.

How it works
- Spin the disc in both directions and look through the slits to see the animation.
- By moving the disc quickly back and forth (like a DJ scratching a record) you can advance to the next level.
- There are three different levels to discover in the work.
- In each level the interaction is slightly different.
- Take your interaction clues from the words that are being repeated.

About the Research
Just a bit of Spin has been created by Brigid Costello a lecturer in interaction design at the University of New South Wales. This work is part of a PHD research project being conducted at the University of Technology, Sydney Creativity and Cognition Studios (CCS). The research project is focused on interaction design

and is investigating the use of play and exploration as a design tool for stimulating audience engagement.

A prototype of *Just a bit of Spin* was first evaluated in the CCS laboratory in December 2006. This new version of the work will now be evaluated in the public context of beta-space with the evaluation focusing on the changes that were made between prototype and finished work. In particular, the artist would like to know whether the changes have had any influence on the ability of the work to stimulate play and exploration.

APPENDIX 11:

ADDITIONAL POSTER TEXT FROM CASE STUDY TWO.

Artist's Statement

"The animations in Just a bit of Spin were inspired by old fashioned poker machines, which often had pictures of fruit on their wheels."

Brigid Costello Nov 07