THE INTERSECTION OF AFFECT AND MEANING WITHIN INTERACTIVE VIRTUAL ENVIRONMENTS

LIAM GIBBONS

The Intersection of Affect and Meaning Within Interactive Virtual Environments.

Liam Gibbons, Bachelor of Design (Games).

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Dr. Adam Nash.

School of Media and Communication, RMIT University.

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Contents

Abstract

In recent years, the interactive digital virtual environments found within video games have come to be understood as means of artistic expression. This exegesis establishes the nature of their design and reception as dynamic and indeterminate, in which the experience of the virtual environment is constantly being shaped and re-shaped by elements that exist in-between the designer, environment, and player. It is accompanied by a series of designed and freeform interactive virtual environments, which investigate how various levels of designer intent can intermingle with the memories, experiences, and values of the player to form a meaningful experience. Play-testing is used to illuminate how the meaning-making process occurs within interactive virtual environments, and an analysis of both player responses and the development process is used to speculate on the interaction between meaning and affect within interactive digital virtual environments.

Declaration

This exegesis contains no material which has been accepted for the award of any other degree or diploma in any tertiary institution, and that, to the best of my knowledge and belief, contains no material previously published or written by another person, except where due reference is made in the text of this exegesis.

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This research project has been approved by the RMIT Human Research Ethics Commitee.

Signed,

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Introduction

As a relatively new medium, video games have struggled for many years to obtain cultural legitimacy and widespread artistic acceptance. Scholars, critics, and players continue to ask: "are games art?", failing to raise the more pertinent question; "what can the rise of games tell us about what art can be?", as theorists like Walter Benjamin (227) did so many years ago. By positioning video games, and the interactive virtual environments found within them, as valid and exciting forms of artistic expression, we can not only design and develop a more varied, interesting, and rich body of work as a community, but we may also learn about what art can be.

It's in this spirit that this research explores the notions of affect and meaning within interactive digital virtual environments. As a designer working within the medium of interactive digital virtual environments, it is important for me to understand how I can engage my audience. Central to this understanding is how the designer/player relationship works within interactive digital virtual environments, and in particular how meaning is formed during the experience of exploring these spaces. As there are very few pieces of literature on this fundamental topic, this research hopes to further both my own understanding, and the understanding of the wider game design community.

I begin by establishing my understanding of what constitutes an interactive digital virtual environment, with a focus on how previous media have influenced and shaped their contemporary form. I then examine how meaning is currently

understood within game criticism, and use the lens of post-structuralism to include the player in discussions of meaning-construction within virtual environments. Finally, through affect theory, I examine what it means to interact with a virtual environment, and discuss the concept of an affect cycle in being useful for our understanding of the moment-to-moment experience of interacting with a virtual environment.

This is accompanied by project work which explores how the semiotic intentions of the designer, and the experiences, memories, and values of the player can intermingle to form a meaningful engagement with the work. The remainder of the exegesis is dedicated to the documentation of this project work, and includes commentary on why certain decisions were made, and what effects these may have had on the final product. The third chapter features heavy self-reflection in regards to the development and final form of the project work, as well as the responses of a group of play testers. I conclude this exegesis with speculation on what implications these responses might carry for this research, my own work, and the design of interactive virtual environments in general.

Chapter 1: Context

DEFINITIONS

To begin to discuss any media object, one must first attend to definitions. Throughout this exegesis, I use the term "interactive digital virtual environment" to refer to the individual works I have investigated and produced. I define interactive digital virtual environments as the designed, digital surrounds and conditions a user is contained in. These surrounds facilitate interaction with the virtual, and forms a complex feedback loop which affects and is affected by the non-digital. Although this definition could cover a multitude of mediums, I focus on the interactive digital virtual environments which appear in video games, which I consider the wider system of rules, objectives, obstacles, and challenges which may be contained within a virtual environment, but are not a necessary part of one.

Throughout this first chapter I will break down my understanding of the above definition, how we can critically examine virtual environments, and what it means to interact with one. I start with definitions for each of the key terms I have employed above, and compose a genealogy of virtual environments through art and video game history, in an

attempt to understand where they have been, where they might go, and how my work might fit in to this continuum. I will then present my understanding of the two key concepts I explore in the project work, meaning and affect, through the lenses of game criticism, post-structuralism, and affect theory.

I'll begin now by defining two key terms: *digital*, and *interactive*. For my purposes, the digital is simply the use of a computer to produce and present the virtual environment. The nature of digital media carries implications for both designer and player, which I will factor into my analysis of the project work later, but in the context I use it here, this definition will suffice. Interactivity, in the context I use it here, can be defined as the ability of a digital network and a human user to exchange data in real time. It can thus be posited that interaction in digital virtual environments can consist of "communication with other users, manipulation of digital objects, and navigation through a digital space of information" (Simons 79). These interactions can range from large-scale alterations to the layout of the environment, to moment-to-moment influences, such as the ability of the player to "change the point of view from which the information becomes visible", through the use of a virtual camera (Nusselder 36).

THE VIRTUAL

The term virtual is most commonly thought to refer to something that only appears to exist, usually in relation to the digital (Nusselder 33). From a philosophical standpoint, the virtual was initially understood to be synonymous with

Aristotelian potentiality, in which the effect was already contained in the cause- a tree is "virtually" present in a seed (Nusselder 33). It wasn't until the 1970's, and the philosophy of Gilles Deleuze via Spizona, that the *virtual* became distinct from the *possible*. He proposed that what's possible is realised according to a set of preconceived constraints, whereas the virtual is a completely new element of the world- an actualisation (Deleuze, "Bergonism" 98). Building from this, Pierre Lévy stated that the virtual referred not only to the imaginary, but the imaginary with the ability to cause effects (30). Lévy's philosophy focused heavily on the concept of virtualisation, describing it as a process of leaving the "here and now", and he quoted his predecessor Michel Serres to cite "imagination, memory, knowledge, and religion" as processes of virtualisation (28). Through Lévy's writing, we can see the virtual as not only pre-digital, but also as fundamentally entwined with the actual. He claimed that virtualisation is the process through which we come to share a reality: we externalise the personal (emotions, thoughts) and internalise the social (by listening to music, or reading a poem). In this sense, the very construction of society is through virtualisation (98).

If we accept that this is indeed the case, we can begin to see that all creative practitioners work with the virtual, at least in some capacity. Architects, for instance, may take a mental tour of the space they are designing, before they make it actual. However digital practitioners in particular need to consider the implications of the virtual on their work. It's important to realise that this is a space in which many things are now possible. Virtual architecture is no longer restricted by load-bearing supports, gravity, or shifting

lighting conditions, unless the designer makes it so. Virtual sound is not tied to a tangible source, so volume and distance are no longer issues to consider, unless the designer makes it so. There are things we can do in virtual mediums that we could have never done before, and unless practitioners within this field do not deeply consider this fact, the potential of this medium will never be realised.

VIRTUAL ART HISTORY

Also important to the virtual practitioner is the history of virtual environments, which doesn't necessarily begin with the introduction of computers. Various art and media historians have noted an attempt to create illusion and immersion within cultural works such as fresco and panorama painting, participatory theatre, and hypertext among other things (Grau 12). This history can tell us a lot about what has shaped virtual environments today, and can illuminate the various techniques and theories which can be used now to determine where they might be headed.

The concept of a virtual environment can be traced to as early as 60 B.C. With fresco painting, artists attempted to immerse viewers in the image-worlds they created, expanding their paintings beyond the traditional canvas to the walls and ceilings of their town houses and temples. These painted environments dominated the viewer's peripheral vision, enveloping them in an idyllic landscape, or a scene from Roman myth (Figure 1.1). These techniques developed into panorama painting, which typically depicted lively scenes designed to shock or delight an audience (Grau 6).

Fig. 1.1. Sandby, Paul. *Landscape Room in Drakelowe Hall.* **1793. [1]**

Around the same time, in the late 19th Century, a convergence of music, architecture, poetry, and dance was occurring in German theatre, foreshadowing contemporary virtual environments where digital sound and colour come together to form an experience (Wagner 32). Multimedia and participatory theatre evolved from this idea, and began to challenge the passivity of the audience with art that reacted to the viewer's presence. William Burroughs' notion

[1] Image courtesy of © Victoria and Albert Museum, London.

of hypermedia introduced non-linear narrative to the novel, and allowed the audience to navigate the work as they saw fit (Burroughs 339). This introduced the concept of agency to multimedia, which allowed the audience to influence and contribute to the narrative and aesthetic of works. Viewers became users. This challenged the divide between creator and audience, which eventually developed into very early computer games (Murray 430).

ENVIRONMENTS

Once virtual environments were digitised in computer games, the idea of a video game environment began to emerge. Video games constitute the intersection of player, rules, obstacles, challenges, and objectives we call *play*. The spaces this play occurs in are what I refer to as interactive digital virtual environments. Typically, these environments manifest as levels, arranged in a continuous linear or semi-linear order, marking player progression with a higher degree of complexity and variety in visual and auditory motifs. Virtual environments can also present spaces in which players are free to navigate at their leisure; these are usually called open world environments. Nintendo's *The Legend of Zelda* (1986) features a mixture of these environments: the player is free to explore an open world in-between moving through the linear dungeons required to progress. Virtual environments can also contain and facilitate the dynamics of a video game: the rigid labyrinths of Namco's *Pac-Man* (1980) ensure the strategic cat-and-mouse interactions that occur between the player and the games artificial intelligence (Figure 1.2).

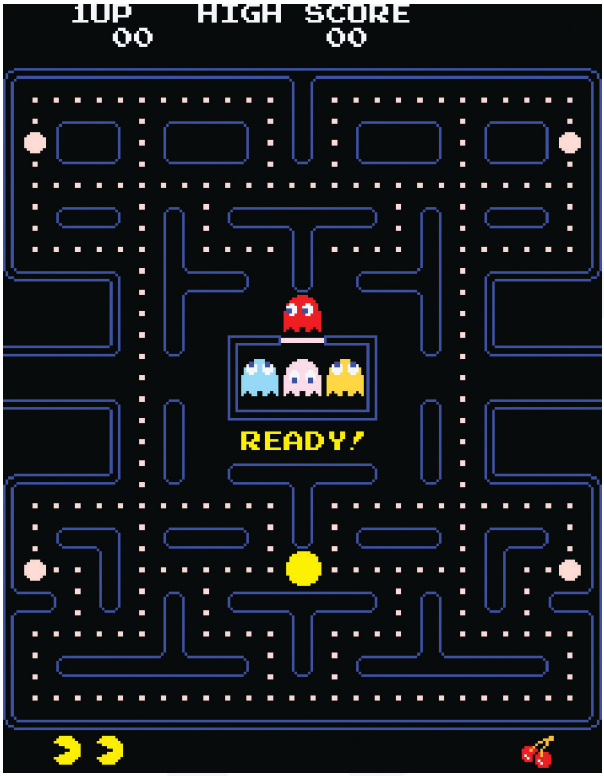


Fig. 1.2. Namco. *Pac-Man*. 1980.

Both as explorable spaces, and gameplay containers, virtual environments can also serve to reinforce narrative and atmosphere. The dark, hostile forests navigated during *Alan Wake* (2010) lie in stark contrast to the bright, idyllic town sequences, reflecting the duality of its alcoholic protagonist (Figure 1.3). Similarly, 1998's *Half-Life*, presented its narrative through props in the environment and dialogue from non-player characters. Video game levels can also serve to encourage a certain style of play, or to allow the player to

explore their own play-style, as in *Deus Ex* (2000), which introduced non-linear level designs that allowed for multiple approaches to each gameplay situation.

Fig. 1.3. Remedy Entertainment. *Alan Wake.* 2010.

Since then, designers have experimented with minimal interactive qualities; instead, players are asked to piece together the plot of these games by virtue of the environment design and placement of props within them (Figure 1.4). *Gone Home* (2013) is an excellent example of this. Set in an empty house during a heavy thunderstorm, the player is tasked with uncovering where their family is, and what caused them to leave. This is achieved by exploring the environment, examining its details and observing the location of certain objects. The plot of the game is literally assembled by the player, through hidden letters and impressions left by the designer of the environments.

Fig. 1.4. The Fullbright Company. *Gone Home*. **2013.**

Finally, as designers have been pushing the design of real-time 3D virtual environments, artists have been considering them as sites for art. Massively multiplayer online games, such as *Second Life* (2003), have housed many works, from audio-visual performance spaces to digital sculpture parks. These spaces highlight the status of virtual environments as post-convergent. That is, they are a medium that emerges after convergence has occurred (Nash, The Multi-User Virtual Environment as a Post-Convergent Medium, 5). As such, they contain all prior media, but are not reducible to them. This means that not only are these previous elements available to an artist working within virtual environments, but also the various techniques and theories already established by decades of art, design, and media practice. It pays to keep this in mind when performing an analysis of interactive virtual envrionments.

CURRENT METHODS

Many toolkits for analysing video games have been attempted over the years, though a distinct, universally accepted method is yet to form. Some approach games from a perspective of ludology (Malliet 1), while others examine them in terms of technical, aesthetic and socio-cultural layers (Konzack 1). Hunicke, LeBlac, and Zubek generalise video games into a phenomenological oscillation between mechanics, dynamics, and aesthetics, in which the designer produces mechanics, which give rise to dynamics, a nd eventually results in aesthetics in the player's mind (2). This is the toolkit I find most useful, especially in my analysis of virtual environments. In *The Art of Game Design*, Jesse Schell states that the game designer's responsibility is not to create a game, but to create an experience. The mechanics and dynamics of a game give rise to the experience in the player's mind, but these elements are not the experience itself. (Schell 12). Although fundamentally a game design analysis, these ideas can just as easily be applied to the study of virtual environments. The digital objects, colours, sounds, architecture, and movement of a virtual environment could be considered its "mechanics", which give rise to "dynamics", or interactions, and lead to the experience, or "aesthetics", in the players mind.

Indeed, it's important to consider who will be interacting with your work, and how they might do so. Richard Bartle's *Taxonomy of Player Types*, although primarily referencing massively multiplayer online role-playing games, is similarly adaptable (Figure 1.5). Bartle identifies four player types: achievers, socialisers, explorers and killers (145). These players interact with and act on both the virtual environment

and other players in different ways. My work tends to cater to explorers, as that is how I myself enjoy interacting with virtual spaces, which inevitably seeps into how I design them.

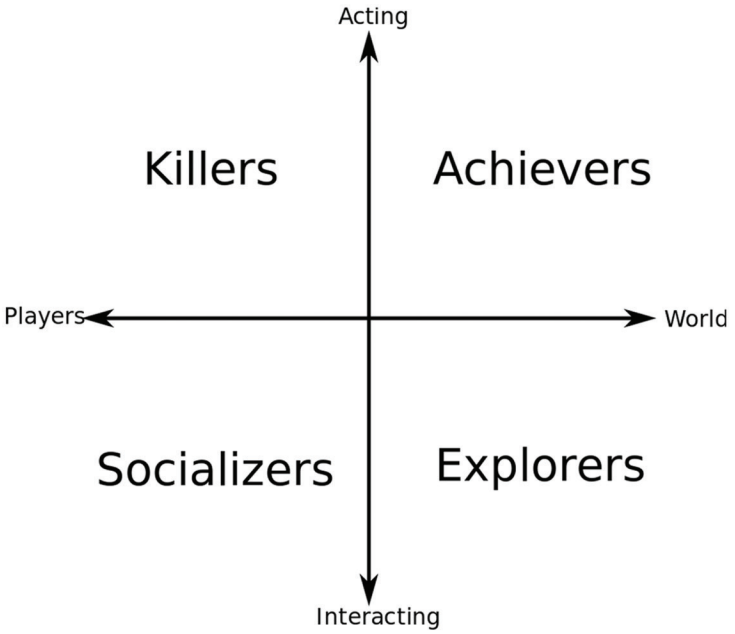


Fig. 1.5. Bartle, Richard. *Taxonomy of Player Types.* 2003.

MEANING

Because I like to take my time and explore virtual environments, I tend to pick up details left there by the designer. In this type of analysis, I tend to search for meaning. Meaning is the significance we ascribe to the signs and symbols we encounter in our lives. Within interactive

digital virtual environments, meaning can refer to both the significance of certain objects to the narrative (a blood stain on a wall means an injury of some kind) or to the gameplay (a breakable crate means more ammunition). In *Rules of Play*, Katie Salen and Eric Zimmerman state that meaning emerges in-between the player and designer. They suggest that meaning results from the player's cultural background, established social signs and symbols (a closed fist *means* "rock" in Rock-Paper-Scissors), and through hints from the designer (364). Often, the meaningful elements of a game will be representations of real world concepts, such as the notion of injury and physical condition being abstracted to the common health bar. This decision is generally made to bridge the logic of the real world with the logic of the game world, so the player has something to relate to in their navigation of the virtual environment and its systems. Representation may also occur at a larger scale, with game designers using the systems of gameplay to depict real-world processes, as in Ian Bogost's reading of *Animal Crossing* (2001) as a form of procedural rhetoric (267). Bogost argues that video games, and other digital media, express ideas and arguments through their rule systems, and the player's interaction with these systems. In the case of *Animal Crossing,* he sees the game as a model for debt, in which players are required to borrow money from a specific non-player character to progress. However, by applying this determinist framework to video games, Bogost seems to see meaning as arising from how a game is *designed*, rather than how a game is *played*.

Susan Sontag, in her essay *Against Interpretation*, argues that "it doesn't matter whether artists intend, or don't intend, for their works to be interpreted…the merit of these works

certainly lies elsewhere than in their "meanings"" (2). She suggests we should avoid "plucking a set of elements… from the whole work" in order to decipher it's true meaning (3). She claims we do this to understand art, to bring it under our control. If a work of art doesn't make immediate sense to us, it must represent something else: it must *be* something else. Instead, Sontag asks us to appreciate not only the content of works, but also the form. In this sense, the meaning of a virtual environment arrises not only from what has been intended by the designer, or the content, but also the experiences, memories, and values of the player, the hardware and software running the game, and even the real world environment the game is played in, or the form. Meaning occurs in the midst of all of this, and if what Sontag claims is true, the player is *just* as important as the designer in shaping the experience of an interactive digital virtual environment.

POST-STRUCTURALISM

It's important to note that this idea is not unique to virtual environments. Reader-response theory states the meaning occurs during the act of reading a text- it doesn't exist as a static, pre-determined element of a novel, play, or short story (D'Alleva 110). In this sense, there is no text without a reader. Similarly, the mid-20th century movement of post-structuralism saw meaning as dynamic and unstable, primarily dependent on the individual reader. It de-centered the role of the author in constructing meaning, focusing instead on cultural norms and, the viewer or reader (D'Alleva 130). This signalled a widespread shift away from the author, meaning, and interpretation in art, design, and literature discourses, as commentators focused on the reader as the

primary agent in constructing the experience of reading a text. Within virtual environments, this concept is even more explicit, as the dynamics of the environment literally do not exist without the presence of the player. The lenses of reader-response theory and post-structuralism shift the experience of a virtual environment away from just the designer's intentions: they position the player as a fundamental component in constructing that experience.

To analyse a virtual environment or video game is to search for meaning, whether that be an overarching narrative, a particular mood or atmosphere, or a certain emotional response. Given that the meaning of a text is not solely determined by the author, it stands to reason that the designer of virtual environments must consider the player's experience in the composition of their work. However, it's also important to consider *every* element that makes up a virtual environment.

BECOMING

To interact with a virtual environment is to participate in a system in flux. At a macro level, there is a constant, dynamic shift between emotion, meaning, perception, and interaction. At a micro level, input is modulated between data and display, and the resulting display is never completely pre-determined. This means that both the digital make-up of the environment itself, as well as the player's relationship to it, is constantly in motion.

Deleuze's notion of becoming is useful here. He saw identity as dynamic; constantly shifting between different states as it is influenced and shaped by surrounding forces (Sutton

& Martin-Jones 12). It is never at rest, it is never static, it is always in a state of becoming. In this sense, the identity of a player in a virtual environment is constantly being shaped by their relationship to that virtual environment. One never has a singular, static relationship with the environment; it was always moving between affective responses, such as disgust, wonder, fear, and calm, as different audiovisual elements and gameplay scenarios shape responses to the environment as a whole.

As the player's experience of a virtual environment is becoming at any given moment, it can be difficult for a designer to accurately determine how a player will react to their virtual environment. However, it is exactly this indeterminacy that makes virtual environments such an exciting and lively medium to work within. The player, as an active agent in the dynamic processes of affect, emotion, and meaning, leaves the designer to produce spaces that allow for a collaborative experience between two human beings. The interaction between designer, environment, and player constitutes a unique paradigm that needs to be considered by all practitioners working within interactive virtual environments today. The designer, at best, can attempt to guide and shape an experience that consists of forces generally beyond their direct control. A virtual environment is an unfinished product that doesn't become complete until it is engaged with.

If then a virtual environment is so dynamic, and the player is such an important agent in constructing meaning, the role of the designer in this system can seem a little muddled. This is

where affect theory can help us to account for the influence of the designer in a virtual environment.

AFFECT

The notion of affect emerged in the early 2000's through the feminist desire to "think through the body", and is generally thought of in the Deleuzean/Spinozist sense of capacities of force (Leys 442). Affect is characterised as being pre-verbal; an unformed intensity that occurs prior to language, and outside conscious thought (Barrett 64). Affects can be positive or negative, and can be thought of as precursors to emotion; helping to shape feelings, associations and verbalisation. Although the process of modulation that occurs from affect to thought, emotion, or language is not fully understood, it has been theorised that affect gives our experiences value by lending them a "quantitative dimension of intensity" (Leys 442). Affects are seen as pre-personal, intense forces between bodies that shapes how those bodies act and react within their environment. Importantly, these bodies do not necessarily have to be human: they can be anything capable of affecting and being affected (Deleuze, Spinoza: Practical Philosophy, 124). This means the term can include humans, animals, and art objects, such as writing, music, painting, and interactive virtual environments.

Because it is pre-language, affect is an important concept when considering both the creation and reception of art. Language, as a human construct, isn't the only way to communicate emotions, experiences, and ideas. If there can be a capture and release of affect between a human body and a work of art, it stands to reason that this process is worth investigating to help artists and designers understand how

their work might be received. Despite this, the consideration of affect has been a noticeable blind spot in art and design history discourses, and especially so in the history of virtual environments. I'm now going to briefly examine how affect might function in virtual environments, in an effort to understand the relationship between designer, affect, and player.

AFFECTIVE ENVIRONMENTS

I will begin with the ability of environments to affect their inhabitants. The notion of affective environments was explored thoroughly by the Situationists of 1950's Paris. In particular, the notion of the dérive is useful for an exploration of the unconscious forces which may influence navigation through an urban space. A dérive is essentially a casual walk, in which one allows themselves to be guided by the affects of the environment, usually dictated by the surrounding architecture or points of interest. The notion of a dérive is an useful one in the study of virtual environments, as it can give us an insight into how users navigate and are emotionally affected by designed environments. For instance, by performing a dérive through an open-world environment, such as *Grand Theft Auto V*'s (2013) Los Santos, one can begin to understand how the environment may be influencing the behaviours and emotions of the player. My own experiment in this environment showed me that I was generally drawn towards elements of contrast, such as a colourful texture or natural element in the midst of a dense urban centre.

Indeed, the entire practice of level design is based off these ideals. The principles of architecture can be used to affect players by crafting virtual spaces which confine, shelter,

or expose. Prospect and refuge space can encourage or discourage exploration, convincing players of danger or protecting them from it (Totten). Higher vantage points give players a sense of control over a space, affecting their relationship to that environment. Architecture can also be used to sculpt light and shadow, texturing a scene and affecting the player's sense of curiosity or apprehension. Furthermore, basic elements and principles of traditional design also affect the player's impression of a virtual environment, by emphasising or de-emphasising certain elements, or unifying or breaking the visual components of the environment as it is presented on the screen, as in Kentucky Route Zero (Figure 1.6).

Fig. 1.6. Cardboard Computer. *Kentucky Route Zero.* **2013.**

AFFECTING ENVIRONMENTS

As well as virtual environments affecting players, there is a long history of players affecting virtual environments. This concept has been present as early as *Space Invaders* (1975), in which players could shoot through pieces of the environment to gain a temporary tactical advantage (Figure 1.7). *Worms* (1995) brought a similar idea to it's multiplayer battle arenas, allowing players to destroy parts of the terrain to clear a path to opposing players. In *Red Faction* (2001), the projectiles of both the player and the enemies literally re-shaped the terrain with large holes and broken walls, and *Angry Birds* (2009) constructed it's core mechanic around the destruction of the games environments, as affected by the player. However, not all player affect in virtual environments is purely destructive.

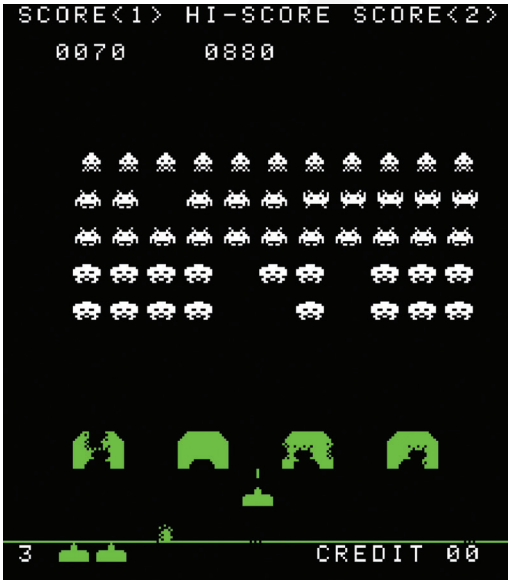


Fig. 1.7. Taito Corporation. *Space Invaders.* 1978.

Minecraft (2009) also played with a rearrangement of environmental elements, allowing the player to collect virtual dirt, sand, wood, and metals to construct new forms such as buildings and tools. Although the player's affect on these environments may be quite explicit, the idea also presents itself, albeit more subtly, in other titles. Games like *Half-Life 2* (2004) and *The Legend of Zelda: Ocarina of Time* (1996), required players to destroy or re-arrange elements of their environments to progress through their respective levels or to gain access to secret collectibles such as health upgrades or ammunition (Figure 1.8). *Ocarina of Time* also featured larger affects on its environments, utilising its time travel mechanics to allow players to alter environments in the past to open pathways in the future. Similarly, *Ghost Trick: Phantom Detective* (2010) required the player to "wind back" and pause time in order to manipulate environments to facilitate movement and NPC action.

Fig. 1.8. Valve Corporation. ***Half-Life 2.*** **2004.**

THE AFFECT CYCLE

Given that both virtual environments and the players who interact with them are capable of affecting one another, I propose that the nature of affect in this situation may be one of a cycle. Interactive digital virtual environments are not static: our experience of them is in motion, constantly changing from moment-to-moment. Their interactivity is comprised of perception, affect, meaning, and action, where the player perceives stimuli, is affected by it, and acts based on the meaning they attribute to that affect. *Silent Hill* (1999) for instance, used affect to scare players by separating their perception of audio cues like footsteps and radio static from their ability to act, by visually obscuring the source of these sounds with a thick layer of fog. The player is made aware of the presence of enemies, but is unable to see where they will approach from or what they specifically look like, leading to an affective response of fear (Carr n. pag). The affective, moment-to-moment experience of an interactive virtual environment is central to our understanding of them,as in designing an interactive virtual environment, the designer is narrowing the possibilities for the affects generated within that environment. When a player engages with said environment, they are both affecting and being affected by the environment, in an affect cycle that encapsulates designer intent, player intent, hardware, software, meaning, biography, and emotion. The player affects the virtual environment through an input device such as a keyboard or game controller, which the designed environment receives and responds to, based on the constructions of the designer, feeding back to the player who forms an emotional, meaningful response to that affect, which shapes their next

immediate input. Walter Benjamin described Dadaism as art that happened to you (Benjamin 238). To acknowledge the existence of an affect cycle is to acknowledge that not only is the art happening to you, but that you are happening to the art.

To demonstrate how the affect cycle might manifest on a mechanical level, we can look to *Katamari Damacy* (2004). In the game, players move the spherical 'katamari' around the environment, deconstructing the space by collecting props, and creating a larger and larger katamari, which in turn allows the player to collect bigger and bigger objects [2].

Fig. 1.9. Namco. *Katamari Damacy.* 2004.

Here the environment directly shapes and is shaped by the player's presence (Figure 1.9). The player begins each level as one of the smallest elements of the scene. As they begin

[2] In the context of the game, a "katamari" is a sticky ball which picks up objects smaller than it. The literal Japanese translation is "clump".

to move around and collect other objects, they slowly grow bigger, and are able to collect larger objects. Props that were once immovable obstacles or towering set-pieces transform into collectibles and rewards, directly through the players interaction with that environment.

An affect cycle is present on some level in all virtual environments, and indeed, I will examine one of my own work through this lens shortly. In this chapter I have defined the individual components that make up interactive digital virtual environments, and traced their genealogy through art and media history. I have investigated methods of analysing them, and in doing so reflected on how we might consider meaning within them. Finally, I have used affect theory to examine what it means to interact with a virtual environment. It's possible that the meaning of an interactive virtual environment is determined, at least in part, by the player and the experiences, values, and memories they bring to it, in tandem with the affective and meaningful intentions of the designer. The next chapter documents the production of a series of virtual environments which interrogate how meaning is constructed within those environments, and in particular how affect can both influence and be influenced by the meaning brought to the virtual environment by both the designer, and the player.

Chapter 2: Development

INTENTION

The original purpose of this project was to explore how the placement of 3D assets within a virtual environment could reinforce the narrative of a video game. For instance, the presence of a bottle of whiskey in an environment not typically devoted to drinking, such as an office, might indicate a drinking problem. However, this presumed that objects, virtual or actual, had a fixed, static meaning attached to them; implemented by the designer, received by the player. My research into meaning challenged this assumption, so focus shifted to investigating the meaning-making process within interactive virtual environments. Additionally, after reading into the work of Julia Kristeva, I wanted to examine what impact affect theory might have on our understanding of interactive digital virtual environments.

I planned to develop of total of twelve virtual environments: six completely filled with intention, six with the least amount of intention possible. The intended environments were primarily based on my own personal experiences and memories, whereas the freeform environments were assembled from a randomly-generated list of objects.

INTENDED ENVIRONMENTS DEVELOPMENT

Work began on the project work towards the end of the first semester. I began with the intended environments, as it was assumed that these would take the most amount of time to produce. I designed each of the six environments around a core theme: a house fire I experienced in young adulthood, unrequited affection, the experience of growing up, a meditation on the relationship between virtuality and actuality, a reflective space, and an exploration of temporality. For each theme, I developed a mood board to begin to define their aesthetics, and from those, a selection of concepts for each theme.

These initial concepts each explored some specific aspect of the experience I was trying to recreate. For instance, the house fire environment initially toyed with the idea of an autonomous avatar, as during the actual experience of the house fire, my body seemed to move without my mind realising it. I chose one concept per environment, and began sketching out layouts on paper (Figure 2.1). In general I tried to use every element I could to reinforce the meaning of that scene: the objects within it, the colour palettes, the sound design, the layout, the interactions, and so forth. As Schell said, I was attempting to shape an experience, rather than just an environment.

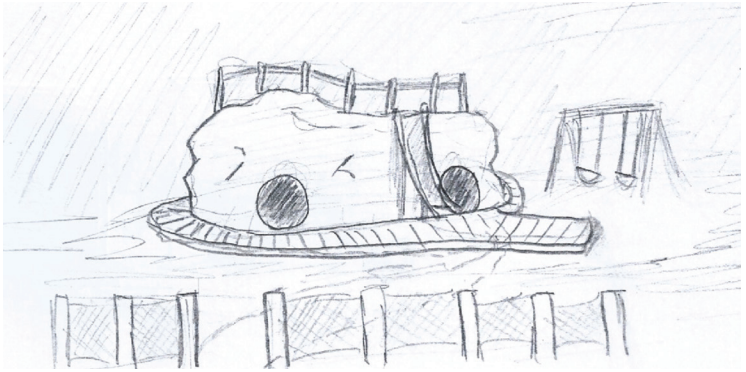


Fig. 2.1. First sketch of the playground environment.

Soon after, I began to block out the environments within Unity, making sure the environments would be functional and appropriately scaled. This simple process exposed flaws in the original on-paper designs which had to be fixed. For instance, in the unrequited affection scene, the slopes I had designed on paper proved to be too steep to navigate in Unity, so the layout of the path was changed to use jumping mechanics rather than ascension and descension to affect the player and compel a certain level of stress. The leap from paper to screen also presented some conceptual challenges. As I was working from my memory, I didn't spend too much time on the initial design sketches, assuming I could tacitly fill in the gaps during the digital production of the scenes. However, because they were my own memories, I was afraid that users would not feel a personal connection to the environments. To combat this, I modelled objects which I felt would be more generally meaningful, including objects in the backyard of the house fire environment which were never in the actual backyard (Figure 2.2). I found that this

made it difficult to produce an appropriately affective scene. Because it was so general, the emotional connection I had with the scenes evaporated, and I felt less compelled to apply the appropriate care and attention to the assets which would make them meaningful.

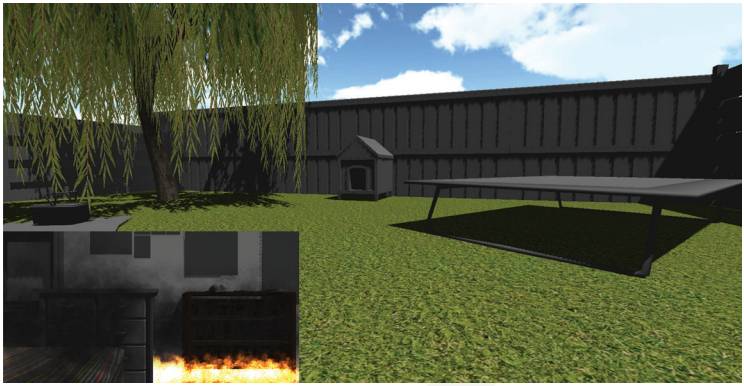


Fig. 2.2. Initial prototype of the house fire environment.

Instead, I switched to producing models and textures which reflected the real-world environments as accurately as possible. This involved actually visiting the sites and collecting photo and texture reference (Figure 2.3). This was so that my emotional relationship to these scenes would be maintained, and hopefully replicated, even subconsciously, in the environments. This was problematised when I found that most of the real world environments had changed or been altered over time. To compensate for this, I attempted to choose objects that were representative of my experience, rather than a direct recreation of it. Similar to the approach taken by *Gone Home*, it shouldn't matter that players may not have a specific meaning associated with these objects:

as long as the objects had meaning within the logic of the overall environments, they should be able to affect players.

Fig. 2.3. Reference photo for the playground environment.

Modelling and texturing the environments took the most amount of time. Because I was working on twelve virtual environments simultaneously, progress on each individual scene was sporadic. Nevertheless, I tried to continue to utilise each individual element of the environments to facilitate the intended affects, in collaboration with the meanings that each player would be bringing to the environments. To again reference the unrequited affection scene, the layout of the pathway itself was designed not only to facilitate challenging jumping manoeuvres, but also served to create a sense of visual restlessness as the plot of the environment progressed. Similarly, the various objects in the mirror environment were placed and textured specifically to hint at the meaning I had intended for the scene, including two versions of Veláquez's *Las Meninas* (1656), a painting

which emphasizes "pitting two realities against each other" (Bell 249) (Figure 2.4).

Fig. 2.4. The paintings of the mirror room.

After the modelling and texturing was complete, I continued to experiment with additional objects and interactions as the environments required. Initially, I was going to frame the house fire scene in two camera views, presented simultaneously (Figure 2.2). While this was an interesting approach, I didn't feel it implicated the player in the meaning of the environment enough. So instead, I showed only one camera view at any given moment, and forced the player to hit a keyboard key to switch between them, which caused a random object from the backyard section to disappear. This way, I was playing with the player's memory, as well as my own. Other environments underwent similar changes, as I added more objects to adjust to the player's presence or agency within the environments. Finally, as the play-testing sessions approached, I added some final touches to the environments. In particular, many of the other

environments were close to completion, but were missing one key component: sound. In most instances, sound design and music drastically improved the affective experience. Additionally, while most of the scenes featured very little player interaction, a few included some simple scripting to further encourage reflection and meaning construction. This included the highway scene, which featured a trigger at the end of the road which would restart the environment when the player entered it (Figure 2.5). This hinted at the idea of being trapped by time, and encouraged reflection by asking players to question if anything had changed in the environment since their last walk through it.

Fig. 2.5. The scene-restarting trigger of the temporality environment.

FREEFORM ENVIRONMENTS DEVELOPMENT

The virtual environments designed without intention proved significantly more difficult to produce. I originally compiled a list of 50 key words, with the intention of selecting six to build environments around. Soon after prototyping

them however, it became apparent that I was shaping the experience almost as much as I was in the intended environments. Not only had I selected the words myself, but I was also designing specifically to those concepts. For instance, although the concept of "asymmetry" had less meaning to me than a house fire, I was still shaping the experience for the player by attempting to adhere to that concept (Figure 2.6).

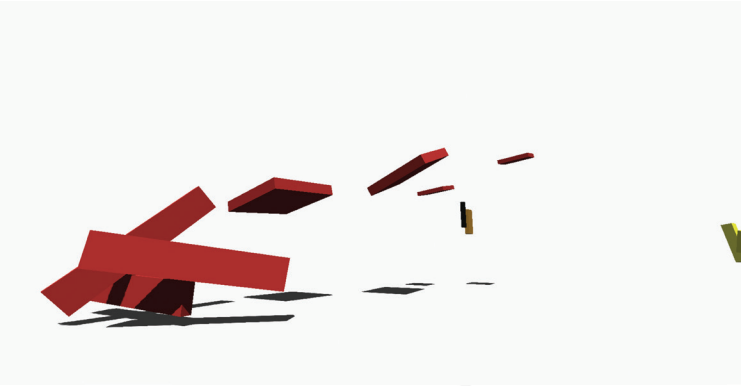


Fig. 2.6. Early prototype of an asymmetrical environment.

As a result, I adopted a new system. Using an random word generator online, I gathered a series of terms that had no observable relation to one another. I constructed scenes around groupings of these words: "gospel" and "snow" became the interior of a small church for instance, with a script generating snow particles (Figure 2.7). Although there was less intention involved in this design process, problems were still present. I was producing digital assets from the concepts in ways that made sense to *me*. For instance, I built the small church from the word "gospel", as this is

the association I have with that word. “Gospel “could have been represented in any manner of ways; as a church, as a looping audio clip of gospel choir singing, or even just the word “gospel” presented as a 3D text asset. Because of my exposure to certain cultural elements, I chose to represent “gospel” as a small church. Although tacit, it was still my personal interpretation of that concept.

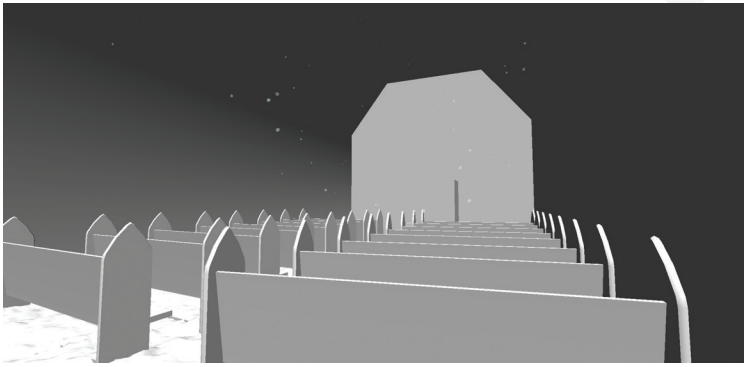


Fig. 2.7. An environment built around the concepts of “gospel” and “snow”.

The third iteration adopted a similar approach to the second, except this time, the only words that would be accepted into the environments were nouns. This was to ensure that the generated words could be directly implemented into the environments with as little association as possible. I modelled, textured, and animated the generated object, and that object only: including a fish did not mean including a river, for instance. This proved to be quite effective, and with the experience of the previous iterations, I was able to block out the set of six virtual environments quite rapidly (Figure 2.8). Of course, this method was still not perfect. Although

the nouns themselves were randomly generated, there was still some amount of personal association occurring. Modelling and texturing an "airplane" meant having to decide on a specific model of airplane, for example. Similarly, some words, such as straw, had multiple meanings, and I could select only one to represent. Although this method was not completely free of intention, it was the closest to it I could achieve.

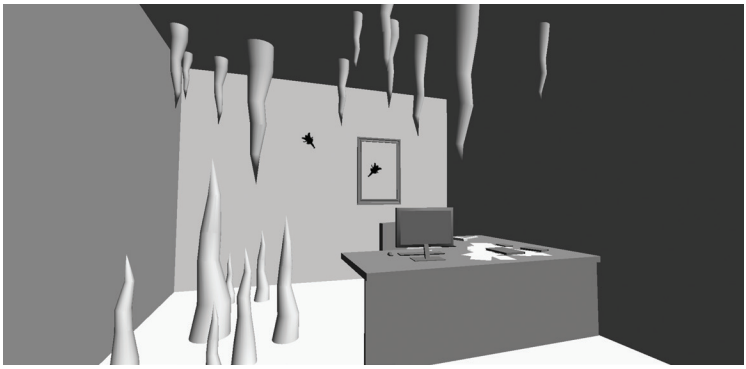


Fig. 2.8. An environment built from the words "office", "icicles", "frame", "clutter", and "fairies".

The virtual environments underwent further revision as the development process continued. After they had been blocked out and play-tested in Unity, it seemed to me that there was a certain level of similarity between each environment. I found that I had constructed each from a human-centred perspective, which meant adhering to gravity, ground-based movement, and a single camera view. Not only did this enforce a certain rigidity across the works, it also influenced their fundamental design and arrangement- another form of unnecessary association. I reconsidered each on an individual

basis, and attempted to think of the player's presence in the environments as that of a camera, rather than of a humanoid avatar. The aforementioned "airplane" environment was originally the interior of an airplane in flight, which the player could walk through in first-person. After experimenting with alternative ways of utilising the camera, the scene allowed the player to rotate their view around a small airplane, animated as if it were flying, surrounded by other 3D assets with various textures and materials. This meant players could view the other assets in the scene as they wanted to, and were able to draw their own associations between each of them, rather than being lead by the strict associations I had placed in there (Figure 2.9).

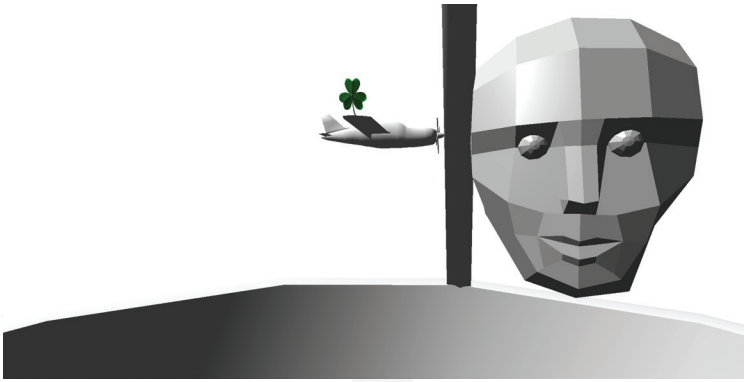


Fig. 2.9. The final "airplane" environment.

As the environments were being prepared for the participants, some finally touches were added. For the most part, this included adding ambient sound effects and more detailed textures: one of the environments was to be framed by a "lake", but I didn't find the default water shader provided

by Unity to be convincing enough. I instead replaced it with two planes; one a flat texture, another a semi-transparent photograph of rippling water, and animated the UV's of the water texture to move slowly away from the camera at an angle (Figure 2.10). I felt certain other scenes I needed additional elements, so I returned to the random word generator to expand the list of objects I could implement. This ranged from a looping audio file of frogs croaking in a "maze" scene, to the word "separate" instigating a complete redesign of the "office" environment, so that the player would be on one side of a large glass wall, with the remaining elements of the environment on the other.

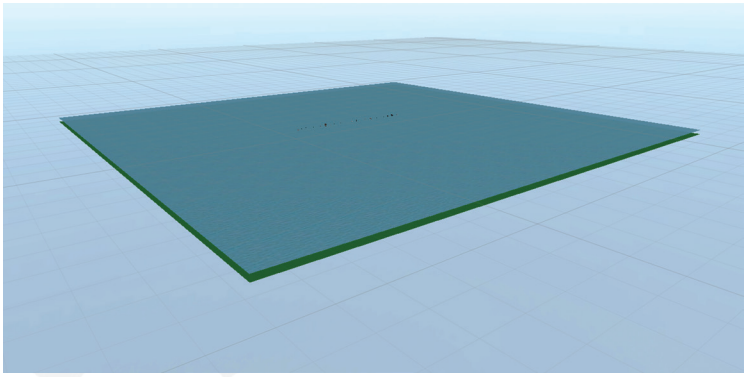


Fig. 2.10. Two planes to create the illusion of moving water in the "lake" environment.

QUESTIONNAIRE DEVELOPMENT

My method for tracing the meaning and emotional responses that the participants had drawn from my environments was a written questionnaire. Developing this questionnaire took some time, as the questions had to be kept as open as possible without being too broad, while also avoiding

leading participants to certain answers. Additionally, reference to specific elements in the scenes, such as a sound effect, texture, or asset placement, might highlight that element's significance within the scene, and cause the user to reevaluate the meaning that they had already constructed. For instance, if I asked the participants "What is the significance of the shattered pathway?" in the unrequited affection environment, which later turned into a documentation of a previous relationship (Figure 2.11), they might see the space completely differently to how they did before any outside influence.

Fig. 2.11. The shattered pieces of the relationship environment.

To resolve this issue, I decided to approach the questionnaire in an open manner. Instead of asking participants to choose from a list of answers I had already assembled, I gave them open text boxes which they could type into, using as much or as little space as they needed. This way, the only thing that would be influencing the participant's answers would be the environments, rather than the framing of questions

or the multiple-choice answers I had provided. The final questionnaire featured one environment per page, with one or two questions for each (Figure 2.12). The large amount of space in the text boxes was to encourage participants to go into as much detail as possible. When constructing the questionnaire, I rolled a 12-sided die to determine the order in which the questions would appear. This was to ensure that the order in which participants played the environments would not be the same order in which they answered questions about them, erasing any connections they had made between the works, and forcing them to treat each environment on an individual basis. The questionnaire was emailed to participants along with the environments, and they were asked to complete it only after playing through the environments, so the questions would not influence their experience of the works and their affects.

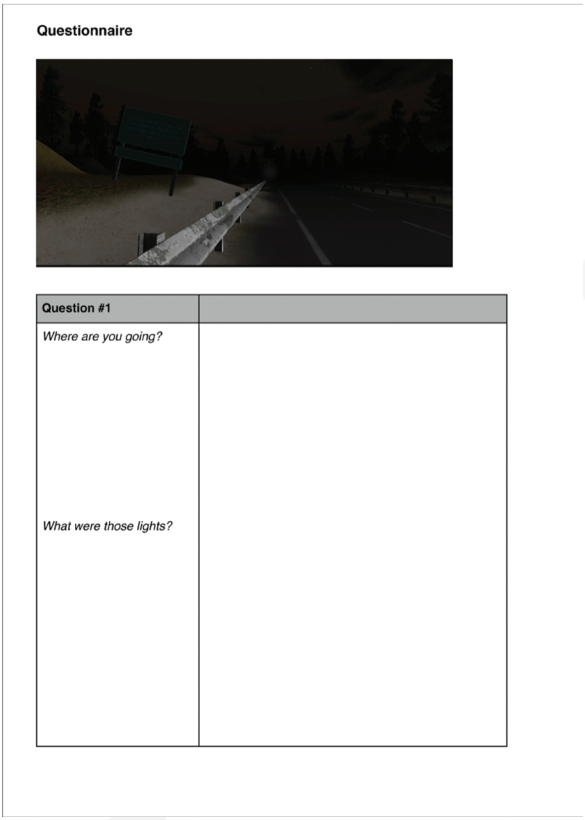


Fig. 2.12. A sample page from the final questionnaire

PARTICIPANT SELECTION

In order to collect the most generally representative group of responses I could, I allowed anyone between the ages of 18 and 65 to participate in the play-testing component of the research. A working knowledge of computers and interactive digital virtual environments was required to participate, as participants would be both playing through the environments without assistance, and utilising a PDF

to input their responses. To ensure participants would be suitable, I initially targeted students in digital media degrees at RMIT University, including those in the game design program. However, as these students were aged generally from 19 to 25, I expanded the invitation to online forums, and social media websites. I not only received responses from a broader range of ages this way, but also from a broader range of backgrounds, with some participants living in the United States, as well as Australia. Unfortunately, due to the restrictions involved with obtaining Ethics clearance, people aged under 18 years could not participate. This means that I cannot speculate on how a younger player might respond to the environments.

FINAL CURATION

After all twelve of the virtual environments were complete, I focused on presenting them in an easily accessible package. I created a menu screen with instructions on how to navigate between the scenes, which used two keyboard keys. These keys were chosen because they were not used for any other function in the environments, were far enough away from the other control keys that they wouldn't accidentally be hit, and because it made logical sense for *1* and *2* to represent *back* and *forward*. This initial screen required participants to hit the *2* key to access the first environment, to make sure they had understood the instruction (Figure 2.13).

Fig. 2.13. The instructions screen included with the environments.

As can be seen in Figure 2.8, I implemented a series of symbols to indicate which control keys would be used in each environment. I positioned these in the centre of the screen to make them clear and noticeable, and scripted them to fade out after five seconds, so they wouldn't obscure the participant's view of the scene. The environments were exported to Unity's web player build feature, so that participants could play through them in their own time, and the screen was forced to the resolution I had constructed the environments in, to make sure there weren't any unexpected discrepancies between the participant's version of the environments and my own.

Chapter 3: Analysis

PERSONAL OBSERVATIONS

This final chapter features my analysis of the project work, documentation of the participant's responses, and a reflection on both those responses and the implications they carry for my research into affect and meaning within interactive virtual environments.

To begin with, it's worthwhile noting that a set of common ideas seemed to emerge across the intended scenes as they developed. Many of the environments, including the house fire, relationship, and playground scenes, played with memory in some way. The relationship between my memories and the virtual environments was a fascinating one, as my imperfect memories may have led to a flawed representation of the actual locations or events. Conceptually, the construction of the house fire scene was particularly interesting. This scene explored the idea of one's past being erased through the destruction of material objects. The design, location and colour of the objects in this scene were based purely off my memory, as many of the objects that could be used for reference, such as photographs, were destroyed in the actual house fire itself. Because of this, I had no other reference

aside from my memory, meaning that the arrangement of the environment was directly influenced by the real world event it depicts.

Time was also a recurring motif, either implicitly or explicitly, in the intended environments. I believe this is because, for me, time has suddenly become a commodity: it is no longer an infinite resource that I can waste. This knowledge is constantly in the back of my mind, influencing my work implicitly. With no clear, anticipated next step after university, I can only look back, and this manifests in the intended environments as reflections on the major events in my life, and the backdrops to these events.

This sense of reflection also permeated throughout the rest of the intended environments. In these scenes, interaction was kept to a minimum so that the player's sense of agency would be complicated. In general, players are made to feel like visitors to these spaces, rather than active agents within them. This was done to place emphasis on the construction and arrangement of the environments, rather than on the mechanics or interactions more typically contained within a video game space. Reflection is often encouraged in other video games through the environment design, as seen in *Shadow of the Colossus* (2005). In this game, players are presented with "spaces without purpose" (Owens). A piece of abandoned architecture is placed within the world with no exposition, leading players to stop and try to decipher its purpose, if any. In my environments, players are offered similar spaces; dropped in with no explanation, and with very little agency to affect the world, all they can do is reflect on any meaning they happen to associate with them.

The freeform environments yielded a different series of observations. Because the nouns generated were so general, I had to carefully decide how to represent them within the virtual environments. The concept of an "office" is going to be different for each person, for example, and I could only build from my personal experience with that concept. Because meaning is so personal to each individual, the act of solidifying these generated concepts within the virtual environment forced a certain amount of association. For instance, the bicycle in the environment seen in Figure 3.1 was a specific type of bicycle. Its appearance was most likely

modelled on the bicycles I had seen or ridden in my own life. However, it was not a direct recreation of any of those individual bicycles, but likely an amalgamation of all of them.
Fig. 3.1. The red bicycle of the second freeform environment.

This displays how truly difficult it is to produce a piece of work completely free from intention or meaning. The artist is always going to be working from their own experiences, memories, cultural exposure, and values, and this is going to

leave an unmistakable mark on their work, whether implicitly or explicitly.

PARTICIPANT RESPONSES

A total of seventeen participants signed up to participate in the research, and of those, twelve returned questionnaires.

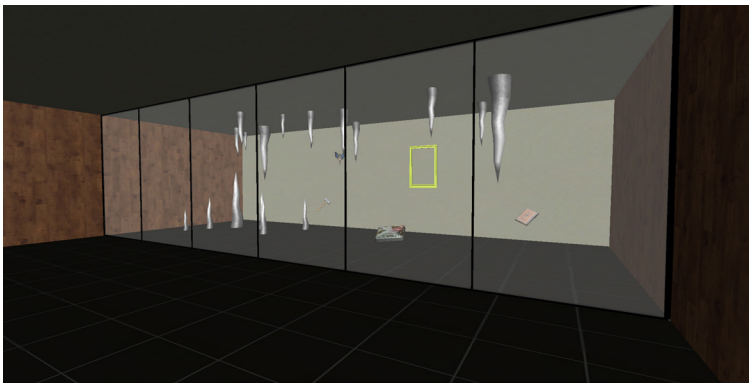
The most immediate observation I made is that overwhelmingly, respondents answered the questions as if there *was* a meaning present, even in the environments which had no intended meaning. However, this response was not always consistent. For instance, in the "lake" environment, 64% of participants drew some connection between the objects presented, ranging from a "childhood memory" to "they are all used in the treatment and maintenance of water". By contrast however, only 45% of participants saw an overarching connection in the "phone" environment.[1] Almost all of those responses referred to the objects being office equipment. Interestingly, in both cases, participants who responded positively to the idea of a connection between the objects in these environments were very selective in which elements they included in their conclusions. For example, in the "phone" scene, only the telephone and the calculator could really be said to have a strong association with an office. Aside from the objects themselves, the only differences between these two environments was the size of objects, and the way they were navigated. Could this have had an impact on how participants drew connections between the objects?

[1] In this chapter I refer to individual environments according to the objects I saw as most prominent. In this case, the sixth freeform environment featured a large telephone, so I referred to it as the "phone" environment.

Perhaps, given that the current state of virtual environments privelages a sense of realism in many of its aesethic elements. The differences in scale may have lead participants to assume the gigantic objects had no connection to each other, or themselves as players. In fact, this seems to be the case across all of the freeform environments. Only 36% of answers saw a specific meaning in the "airplane" environment, whereas 73% saw meaning in the "office" (Figure 3.2) scene. Interestingly, one participant even went so far as to invent an entire narrative for that environment, in which the fairy had escaped from the painting frame, caused some mischief, and had been contained within the glass doors. Similar to the "lake" and "phone" environments, all participants focused on either the fairy, picture frame, glass doors, or office soundscape in their responses, and completely ignored the book, cushion, spoon, and icicles.

In fact, the majority of participants went to surprising lengths to justify their responses, both positive and negative. Even when they saw no meaning in certain scenes, they just assumed it was their own fault. Participants would frequently respond that they "had no idea" or "couldn't think of any connections", indicating that they had assumed there was a meaning present, but they just couldn't access it. Alternatively, even if participants couldn't discern a conceptual meaning for certain elements of a scene, they were more than happy to offer a more practical meaning. For example, one of the questions in the "maze" environment was "what is the significance of the maze in this scene?". While most respondents stated that they didn't know the answer to this question, three commented that it was to "disorient the player" or to "separate the objects both visually and spatially".

These responses may be a result of their background in game design, as they are trained to look at virtual environments in a certain way, but it still assumes that the maze had a



specific purpose or meaning within the scene. Only one respondent stated that there was “no point to the maze”.

Fig. 3.2. The “office” environment, which the majority of participants saw a specific meaning in.

Although two of the intended environments were left to be open to interpretation, most of them had very specific meanings in mind. Interestingly, while the house fire scene was the most conceptually straight-forward from my point of view as the designer, it was by far the most misinterpreted environment; seen by most participants as an abstract representation of another concept entirely. Not a single participant saw the scene as a commentary on the connection between material objects and memory, or the pain of dealing with a house fire, as I had intended. 45% of responses assumed it was a comment on depression or another mental illness, where “everything can seem

fine on the outside but on the inside it's a different story", while the rest recorded no specific meaning. Although this deviates significantly from the meaning I had intended for the scene, there may still be some value in this response. In all likelihood, I *was* depressed after the house fire, and it's certainly not one of my most pleasant memories. Another participant interpreted the scene as a comment on "the fun and recreation of childhood being destroyed as adulthood sets in." While this answer was more relevant to the playground environment, it could also be true of this scene. The house fire occurred only relatively recently, when I was nineteen years old, and did mark an important turning point in-between childhood and adulthood. After the event, I started taking more responsibility for school and work, and really started to think about what I wanted to do with my life. This was all a part of that experience, and by extension, part of the environment which attempted to recreate that experience. In an article for the New Statesman, Ian Steadman describes cultural objects such as films, television, paintings, and video games, as orphans (Steadman). They are produced and set free upon the world, forced to navigate on their own. With these responses, I have been re-introduced to my orphans. They are starting to teach me things about myself that, in all honesty, I didn't consider until reading over these responses. This research became a unique opportunity to learn both about my work, and myself.

However, why was it that participants assumed this scene was abstract? Perhaps it was the lack of leading elements. Compare it for instance, to the relationship environment. The 3D assets there were selected to be emotionally resonant, especially when paired with the pieces of floating text. With

these assets in place, it was hard to miss what the scene was about. 73% of respondents were able to reconstruct the exact narrative I had intended in this scene in some detail, with the remaining 27% still seeing some kind of relationship forming, even if it was a more sinister one. This suggests to me that the construction of the scene was narrow enough to effectively present the narrative I had intended, and any discrepancies were on the part of the player and their own experiences or values. Interestingly however, all but one of the participants saw the playground scene (Figure 3.3) as calm, peaceful, slightly melancholic or nostalgic, and recognised it as a monument to the end of childhood and the notion of revisiting a space you were once familiar with. This environment included the least amount of leading elements in my opinion; it was literally just a playground in the park. It seems that most participants who saw that particular meaning in this scene were influenced by their own memories, with a few responses such as "I see a place where, as a teenager, I would have met some friends", or that the environment "reminds me of playing in the park near to my place". They also cited one key element in the scene that influenced their interpretation; many said the scene is "nostalgic, sombre" and that the "music plays into this". In this sense, the music could be considered the floating text of this environment: the element which most strongly contributed to a certain affect.

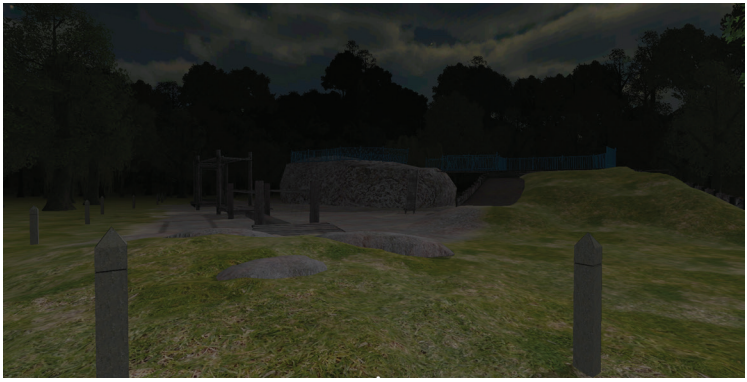


Fig. 3.3. The playground environment, which featured very few explicitly melancholic or nostalgic elements.

It's interesting to note that participants seemed to only be emotionally affected by the intended environments; mostly the relationship, playground, and the driving (Figure 3.4) scenes. This seems to indicate that affect is stronger than narrative, as even if there was no explicit plot in the environments, players were still affected by them. By a similar token, players were not emotionally affected by environments that they saw as having no meaning, or having one that they could easily grasp. It was only when they felt they understood the scene and what was happening within it, that they felt emotionally affected by it. This suggests that, as Ruth Leyes theorised (Leys 442) affect is deeply tied to meaning.

Fig. 3.4. The driving environment, which made participants feel a sense of loneliness or even menace.

BEARING ON THEORY

From the responses, I can state with some degree of certainty that participants might have felt an emotional connection to at least some of the environments presented to them. In this analysis, I am interested in how this connection was formed. As I established earlier, interactive virtual environments are a constant, complex movement between designer intent, hardware, software, affect, emotion, meaning, and player. Somewhere in that mix of elements, the participants felt something. As reader-response theory indicated earlier, it seems that perhaps the personal experiences of the participants influenced their reading of certain environments as much as my intentions; for instance, in the relationship scene, most participants saw the narrative as a romantic tragedy, but some suggested that it had sinister, even pedophilloic, undertones. Given that all participants played

through the exact same scene, in the exact same order, this suggests to me that players were relating the scene to some event in their life. This complicates the theories of those who would privilege the designer's intentions in their analysis of interactive digital virtual environments, especially when players didn't grab the intended meaning of many of the environments, or in some cases, completely invented their own.

However, this is not to displace the role of the designer completely. *I* had to be there to place the objects in the order they were placed in, *I* had to choose the exact words that were chosen, and *I* had to design, model, and texture the pieces of terrain and how the player would interact with them. The designer is still a part of this system, just as meaning is still a part of this system. However, it was important for me to realise that the player is also a part this meaning-making process. I found that part of the joy in navigating virtual environments comes from the freedom given to players to contribute to, decipher, or reject entirely the meaning placed there by the designer, should there be one. Virtual environments retain the authorial intent of prior media, but provide a space for players to have some agency in the conceptual, and sometimes literal, construction of the scene. I originally saw meaning as another form of narrative, when it is in fact an element often quite seperate to the intentions of the designer, even if those intentions do still have some influence.

So how does affect theory figure into these findings? As I established earlier, affect is a pre-personal force which shapes how a body acts and reacts within an environment.

The term "pre-personal" may seem to imply that meaning has no influence on the capture and escape of affect between bodies, but I believe these response show otherwise. We can see that the meaning people had associated with certain objects may have influenced how they were affected by them. For instance, several participants reported a strong emotion response to the last section of the relationship environment, which featured the words "we need to talk". It could be said that those participants may have heard those words before in their own lives, which meant they were affected by them more so than other participants. Similarly, participants were very selective, whether consciously or unconsciously, of the elements they used to construct their meanings. We could say that they were affected by those objects they selected, but not by the ones they ignored. But why were they drawn to those objects in the first place? I propose it is because of the meaning they associated with them; either the scale or position of them, which was an element of the design, or their own personal meaning in response to those objects. Affect and meaning interacted in these environments, influencing how the participants navigated, intellectualised, and emotionally responded to these environments.

As I established earlier, this is an extremely dynamic and indeterminate system. As such, it may be useful to examine how my earlier concept of an affect cycle might illuminate the processes which occured as players formed meaning and emotion in response to my work. I have chosen to examine the playground environment for this analysis, as most of the participants seemed to the strongest affective reaction to it. From my perspective, there were a series of elements that were specifically created to produce those specific affects.

The first-person, embodied perspective, the full moon and resulting lighting, the hard shadows, surrounding trees, calm soundscape, gentle, repeating music, and subtle animation, all served to present the scene as safe, solitary, and with a certain sense of melancholy. These elements were shaped by my own personal experiences, both in their explcit design and the implicit act of production, which influenced aspects like the form of the 3D models, the tempo of the music, and so forth. Once the player entered the environment, these elements were affecting them as well. How they affected the player was determined by their own experiences and memories with similar spaces in the real world, and the meaning they had attributed to them. At the same time, elements like the lighting and music were placing new meaning on the objects within the environment, as well as their arrangement, by providing a certain affective colouring. Because the player was able to explore at their leisure, their movement through the scene also shaped their reaction to it. For example, this exploration was based in part on how they were being affected by the environment; certain areas might have drawn them closer, others repelled them further away, as influenced by the meaning surrounding these spaces. This movement was also influenced by the hardware and software running the game: the fact they could jump might have led them to explore the stairs first for example, or if the brightness of their monitor was set to low, they might have headed for the most well-lit areas first. Similarly, they were now affecting their view of the environment by pointing the camera in a certain direction, which in turn shaped how they were affected by that environment. Had I included more interactive elements in the scene, such as the ability

to physically move objects, or perhaps change certain wall textures with a graffiti mechanic, these actions would have also affected the environment, and therefore the player's perception of it. This affect cycle, influenced by meaning, designer intent, hardware, software, and emotion, continued until the player exited the environment. This experience would have also influenced any further visits to the virtual environment.

I believe the above analysis displays how affect and meaning can intersect within interactive virtual environments, through an indeterminate affect cycle which is shaped by both the designer and the player. I will conclude this chapter with a reflection on what implications this system might have on both my work as a designer, and the practice of virtual environment design in general.

FINAL REFLECTION

The search for meaning is a very human one. As Sontag noted in *Against Interpretation*, we seem to have an in-built tendency to examine, pick apart and interpret works of art to uncover some kind of relatable narrative, intention, or meaning. This was evidenced in this research by the participant responses, which not only indicated they believed there was a meaning present, even when there wasn't one, but also in their tendency to select only certain elements of the environments to support their conclusions. Although this is partly because the questionnaire specifically asked them to describe a meaning in association with the scenes, "there is no meaning" was a perfectly valid response, yet very few of the participants chose to take it. This perhaps shows that

even in a completely random set of elements, people will still think they see an intended, constructed meaning.

Of course, I'm not the first person to present, study, or think about this idea. Countless others have investigated how meaning can function within art. However, what this tells me personally, is that meaning is a dynamic and fluid part of a larger whole, which works in tandem with affect and the player's memories, emotions, and values to form the experience of an interactive virtual environment. This is in sharp contrast to the view I held at the start of the research process. I saw meaning as a singular, static object, which was placed in a work by the designer, and transmitted directly to the player. If the player didn't get that meaning, it was because they hadn't played enough of the game, or wasn't intelligent enough, or just didn't get it. But why did I assume this? Certainly, the current state of video game design contributed; as I mentioned earlier, I enjoy exploring as much of a virtual environment as I can, picking them apart to see if there is anything to find. It's almost like solving a puzzle; trying to piece together various elements to form a larger picture. But what the results of this research has taught me is that you can't determine any exact response or interpretation from your players. I could never really determine whether the meanings that participants had gleaned from my environments were emotional reactions caused by my design work, or if they were the result of social conditioning on the part of the player's life experiences or memories of other video games. I'm left wondering how participants had been trained to interact and perceive my work, and how other game designers, including myself, could change this in the future.

I believe that my initial view of meaning within interactive virtual environments was tied to my own personal philosophy, as is all art. The connection between art and artist is personal, political, and philosophical. The meaning of life is a topic that almost everyone wrestles with at some point in their life. I personally wrestle with it constantly: I'm always searching for meaning in my day-to-day life. I ask myself how certain actions will effect my life or experience from this point on; I ask myself what meaning they have. More broadly, I believe that life has the meaning you give it. In all this chaos, we know nothing, not really. All we can do is make the best of what we have, while we have it. This world view inevitably seeps into my view of the virtual environments I both play and make. There is meaning there if you make it, influenced by the experiences, memories, and values of both the designer and the player. Although this may be true, there's a lot more forces at work, and the designer is but a part of what makes up the experiences of an interactive digital virtual environment. Finally, I also found that the creation of, and interaction with a virtual environment can say so much about both the designer and the player. Through the participant responses to my work, I began to consider ideas about events in my life which I never would have thought of before. Similarly, the players of an interactive digital virtual environment can incorporate, either explicitly or implicitly, the meaning they drew from that work into their wider view of the world itself.

Conclusion

This research explored the intersection of affect and meaning within interactive digital virtual environments. Over the course of the research, my understanding of the nature of meaning within interactive virtual environments shifted significantly. Whereas before I saw meaning as a static, pre-determined element of an interactive virtual environment, I now understand it as a dynamic, indeterminate result of the designer's intentions, the player's past experiences, the technology which is used to produce and present the virtual environment, and the movement of affect between these elements. It is hoped that this exegesis will be examined by other designers and critics within the field, and some value will be found in its analysis of the very basic forces at work in the experience of an interactive digital virtual environment.

I began with a chapter dedicated to my theoretical research, which was broken into three sections. In defining a virtual environment, I broke down the individual terms I used to describe the works I would be producing and analysing, and in doing so illuminated the various pieces, techniques and theories of both art and video game history which have influenced their contemporary form. In analysing a virtual environment, I discovered how we currently think of virtual environments, and how some of these methods don't seem to account for *every* element at work in a virtual environment. I began to consider the concept of meaning, and in my investigation into post-structuralism, saw that it may not be totally contrived by the designer, and in fact may occur in-between the designer and the player. Finally, in interacting

with a virtual environment, I proposed that interactive virtual environments are a complex, fluid system of multiple conceptual elements, both virtual and actual, which are constantly interacting during the experience of a virtual environment. This complicated my personal relationship to virtual environments, so I introduced affect theory to attempt to understand how the designer fits into this system, and considered how the idea of an affect cycle might be used to understand the moment-to-moment experience of an interactive digital virtual environment.

I then developed a series of twelve interactive virtual environments in an attempt to understand this system, and what influence I, as a designer, may be having on it. I produced six environments full of intention, and six which were comprised entirely of randomly-generated elements. After presenting these environments to a group of twelve participants, I discovered that, surprisingly, a couple of my intended environments were successful in transferring the meaning or emotional atmosphere I had intended for them. I speculated that this may be related to the individual participant's personal, meaningful relationship with the environments, and was tempted in part by their content, as designed by me. Less surprisingly, several of the works were wildly misinterpreted, and in the case of the freeform environments, participants went to impressive lengths to see meaning in completely random elements. I concluded my reflection by considering the implications of these results on my own work, and what impact my world view might be having on my work.

This research builds a foundation from which further investigation might be attempted. From here, it could be asked how the dynamic, messy system that comprises an interactive virtual environment could impact the design process. Could we design *to* this indeterminate system, and emphasize the intersection of affect and meaning?

In time, this research may seem redundant and obvious, but right now, it's vital to understand the fundemental processes at work during the act of designing and interacting with a virtual environment. Designers will hopefully be able to see that their influence on the reception of their work is a small part of a larger picture, including many elements that are beyond their control. Critics will hopefully be able to see that there are many elements at play in the experience of a virtual environment, and their contribution to the experience is just as important as the designer's. If we can understand the fundemental forces that influence the experential aspects of this medium, our ability to produce exciting, rich, and important works of art will only deepen.

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Contact

liam.c.r.gibbons@gmail.com

http://au.linkedin.com/pub/liam-gibbons/75/5b3/16