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Translating Life Experience into Experiential Narratives Through Designing for Presence in VR

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Translating Life Experience into Experiential Narratives Through Designing for Presence in VR

Daniel Martyn Bacchus

A thesis submitted in partial fulfilment of the requirements of Sheffield Hallam University for the degree of Doctor of Philosophy

January 2025

Candidate Declaration

I hereby declare that:

1. I have not been enrolled for another award of the University, or other academic or professional organisation, whilst undertaking my research degree.

2. None of the material contained in the thesis has been used in any other submission for an academic award.

3. I certify that this thesis is my own work. The use of all published or other sources of material consulted have been properly and fully acknowledged.

4. The work undertaken towards the thesis has been conducted in accordance with the SHU Principles of Integrity in Research and the SHU Research Ethics Policy, and ethics approval has been granted for all research studies in the thesis, as shown in the table below.

Ethics Review Reference Number	Title of Research Study	Approval Date	Date of any post-approval amendments (if applicable)
ER5151391	Marcel Schreur VR Project	03/10/2017	
ER7573197	Ivanna Maszczak VR Project	11/01/2019	

5. The word count of the thesis is 58,038.

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Date	January 2025
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Abstract

This enquiry extends practical understanding of how designing for presence in VR may translate life experiences into virtual reality (VR) experiential narratives.

The enquiry includes collaborative research projects undertaken with individuals who shared their life experiences for translation into VR experiential narratives. Through their individual perspectives, they challenge complex, practical understandings of presence and enhance critical examination of how presence may be actively experienced through making and engaging with VR works.

This enquiry produced three VR experiential narrative works:

'Life is Beautiful. Always.' – A translation of the life experience of multi-disciplinary artist, Marcel Schreur; oral cancer and vascular dementia survivor. This work, co-designed with Schreur, translates physical characteristics of Schreur's condition into the embodied capacities of VR.

'I Look for Them' – Translates the life experiences of Ivanna Maszczak, a Ukrainian and survivor of the Soviet Gulag. This project considers appropriate VR design methods to translate Maszczak's life experiences in collaboration with her and supports the interpretation of a VR experiential narrative based on her experiences.

'Be That Ocean' – A work that re-visits collaboration with Maszczak to explore the embodied, responsive capacities of presence in VR to encourage affective, embodied relationality with Maszczak's experiences.

Presence is understood to be the central defining quality of embodied engagement with VR experience; where a sense of embodied self and agency becomes manifest through active engagement with the phenomenal capacities of VR. By exploring some of the core properties of VR that relate to presence through a review of contemporary academic research and active engagement with VR design, the enquiry examines how designing for presence encourages affective, subjective relationships with VR experiential narratives.

Through collaborative methodologies, the enquiry explores where collaborative VR design methods actively include collaborators in the production of VR works that translate aspects of their lives. This critically examines issues of authorship in the production of VR experiential narrative works and extends understanding of how VR can be used ethically as an experiential narrative platform.

The enquiry critically examines how strategies to design for presence in VR invite affective, embodied engagement with translations of my collaborator's life experiences, and where this encourages an embodied knowledge of their experiences in a way that is unique to VR. This yields insight into the nuances of designing for presence within VR experiential narratives. It contributes to knowledge within contemporary critical debates on the creative possibilities and ethical limitations of VR as an experiential narrative platform.

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Chapter One: Introduction

This PhD explores how designing for presence in VR enables the translation of life experiences into experiential narrative works, investigating the nuances of what VR uniquely offers as an experiential narrative platform. Through collaborative research methods, the practice explores how collaborator's life experiences may be translated into VR through designing for presence, exploring how the phenomenal and embodied capacities of VR facilitate affective engagement with experiential narratives that are based on aspects of their lives.

The PhD research developed alongside the introduction of new, affordable VR hardware and development tools in the early 2010s. The increased accessibility that this provided enabled researchers, interactive designers, and storytellers to experiment with what VR could offer as an experiential narrative platform. A new wave of experimental approaches to interactive digital storytelling moved away from the screen and into more embodied, experiential, and immersive paradigms. Some of the VR works that emerged in this first new wave of experiential narrative, including Milk and Arora's *'Clouds Over Sidra'*[1], BBC's *'Easter Rising: Voice of a Rebel'*[2], and Aardman's *'We Wait'*[3], raised interesting questions and some ethical issues concerning how VR experiences can engage audiences on societal and world issues and generate lasting impact. These include critique that followed Milk's notion of VR as 'the ultimate empathy machine'[4], which was criticised for the ways it seemed to sideline the active and relational components of VR experiential narratives that generate between participants and VR experiences, and may also trivialise the real-life contexts being represented through an overemphasis of the technical capacities of VR. I felt there was a gap here for further critical exploration of the participant's individual embodied subjectivity, their presence as it actively manifests in VR, as a core component in affective engagement with and critical understanding of VR experiential narratives. Immersive artists and designers were developing works that tested the functional limitations of VR, offering useful perspectives on how the embodied, phenomenal qualities of VR may be critically examined and experimented with. By drawing on this experimentation, I saw an opportunity for further practice-based exploration into strategies and techniques to design for presence through the embodied capacities of VR. By exploring the potentialities of designing for presence in the production of VR experiential narratives, this enquiry endeavours to contribute to contemporary critical debates on VR as an experiential narrative platform.

In my professional and academic practice as an animator, interactive designer, musician and educator in digital media and games, I have always been interested in ambiguous, non-linear, and experimental approaches to narrative design and how these leave a lasting impression on

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[1] Milk, C., & Arora, G. (2015). *Clouds Over Cidra*. Retrieved from Docubase: https://docubase.mit.edu/project/clouds-over-sidra/

[2] BBC. (2017, July 5). *Easter Rising: Voice of a Rebel*. Retrieved from Meta: https://www.meta.com/en-gb/experiences/pcvr/1386167224757449/

[3] Aardman. (2016, Dec 13). *We Wait*. Retrieved from Meta: https://www.meta.com/en-gb/experiences/pcvr/1248924088498899/

[4] Milk, C. (2015, March). TED. Retrieved from How virtual reality can create the ultimate empathy machine: https://www.ted.com/talks/chris_milk_how_virtual_reality_can_create_the_ultimate_empathy_machine

a user[5]. I saw an opportunity to extend my practice within the new approaches to narrative design that VR offered, critically examining what VR might be able to contribute to experiential narrative alongside other interactive storytelling platforms and critically exploring these ethical debates.

It was also around the 2010s that 'Immersive Design' began to gain currency as a new design discipline[6]. Here, practitioners working across disciplines including film, animation, games, and architecture, explored new areas of technological and disciplinary convergence and a synthesis of their respective design methods through immersive technologies. VR is core to this as, by donning a VR headset, designers are enabled to collaborate and design from within virtual worlds. This encouraged a new focus on what the user-centric, embodied qualities of VR offer to design disciplines. By drawing on immersive design, I saw an opportunity to develop my creative practice within these emerging technological and disciplinary contexts, using immersive design to synthesise my creative and research interests and to explore the potentialities of VR as an experiential narrative platform in practice.

I am also a drummer that plays rhythmically layered, complex, progressive music. When I play drums, especially during polyrhythmic sequences, I am often struck by the seemingly paradoxical experience of witnessing my body moving without a corresponding consciously willed decision to move my body. Rather than a cognitive procedure, the act of playing drums feels like an embodied, multi-layered (in that parts of my body seem to operate unconsciously and independently of each other), and rhythmic process. The activity of playing drums exceeds my rational comprehension of it. If I am too self-conscious about what I am doing, the immersion in the activity and my sense of flow[7] is broken and that is when I often make mistakes[8]. This is a key personal reference point in my approach to VR design. I endeavoured to explore this embodied potentiality in VR; where VR experiences invite novel apprehension of experiential narratives through its specific embodied capacities, providing an alternative to rational or retrospective interpretation of narrative experiences. This sets VR apart from other interactive platforms that may rely more heavily on what Marie-Laure Ryan calls 'the cerebral

[5] One of my earliest formative experiences of engaging with narratively led games was playing 'Myst' (Cyan, 2024) at primary school. It was the first time I remember feeling properly immersed in a game world. To be placed with little to no explanation of your purpose in a beautifully detailed and incongruently designed environment, led by your intuition to interpret the meaning of the world and your role in it through exploration and discovery, generated an experience that felt vast and boundless.

[6] AWN. (2008, October 4). *5D - The Future of Immersive Design*. Retrieved from Animation World Network: https://www.awn.com/event/5d-future-immersive-design

[7] This state can be elucidated through Mihaly Csikszentmihalyi's understanding of 'flow' (Csikszentmihalyi, 2008), pointing to moments when 'our consciousness intensifies, our self-consciousness disappears, and we perform at our best' (Sutton, 2025).

[8] In the words of multi-instrumentalist, Andrew W.K.; '…all I can think about is moving, and how I couldn't ever really move, and at the exact same time all I could think about is moving, and I thought about how I couldn't ever really move, but that when I move my body it's actually moving so that I can't even tell my body couldn't really move.' (W.K., 2006)

play of signification'[9], enabling experimentation with the unique embodied potentialities of VR in practice.

Understanding Presence in Virtual Reality

The practice-based approach to the embodied potentialities of VR found focus through a critical review of 'presence'; a well-established design term used to signify a sense of self and agency that manifests in virtual environments through the phenomenological and technical qualities of VR. Presence is the term used for the central and distinct defining feature of engaging with VR experiences; denoting where VR may elicit a subjective feeling of 'being there'[10] in a virtual environment and actively engaging with VR experience. Presence has featured in commentary on the embodied capacities of VR over several decades. However, in the past ten years it has begun to gain more traction. It has been variously employed across critical and design perspectives to discuss the experience of engaging with the technical, embodied and phenomenal capacities of VR. There have been a broad range of research approaches that attempt to define what a sense of presence is within VR experience, or how it may be measured using VR as a tool[11].

In contemporary academic research, the concept of presence is often explored and critiqued alongside other primary and interrelated aspects of VR experience, such as 'immersion' and 'embodiment'. It is important that this enquiry makes a distinction for presence alongside these related concepts to justify and situate presence as the focal concept for the practice-base enquiry. The Interactive Design Foundation makes a clear distinction between Presence and Immersion. Their definition of these concepts outlines that, whilst they are related in VR experience, 'Presence is about the user's perception and mental state' whereas 'immersion is primarily about the technology (the VR headset for example) and how effectively it can engage the user's senses to create a convincing virtual environment'[12]. These definitions suggest a clear demarcation between presence as a subjective quality of VR experience and immersion as a quality that depends on the objective properties of the VR technology.

The interrelationships between subjective and objective qualities of VR experience has been further explored by Mel Slater's presence research, in which he defines two interrelated qualities of presence in VR; Place Illusion (PI) and Plausibility Illusion (Psi)[13]. Slater uses these

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[9] (Ryan, 2016, p. 13)

[10] Weber, S., Weibel, D., & Mast, F. W. (2021). How to Get There When You Are There Already? Defining Presence in Virtual Reality and the Importance of Perceived Realism. Frontiers in Psychology.

[11] For examples, see:
Witmer, B. G., & Singer, M. J. (1998). Measuring Presence in Virtual Environments: A Presence Questionnaire. Presence: Teleoperators and Virtual Environments, 225-240.
Slater, M., Lotto, R. B., Arnold, M. M., & Sanchez-Vives, M. V. (2009). How we experience immersive virtual environments: The concept of presence and its measurement. The UB Journal of Psychology, 193-210.
Usoh, M., Catena, E., Arman, S., & Slater, M. (2009). Using Presence Questionnaires in Reality. Presence, 497-503.
Meehan, M., Insko, B., Whitton, M., & Brooks Jr, F. P. (2002). Physiological measures of presence in stressful virtual environments. ACM SIGGRAPH, 645-652.

[12] IDA. (2025, 12 16). What is Presence in Virtual Reality (VR)? Retrieved from Interactive Design Foundation: https://www.interaction-design.org/literature/topics/presence

[13] Slater, M. (2009). Place illusion and plausibility can lead to realistic behaviour in immersive virtual environments. Philosophical Transactions of The Royal Society, 3549–3557.

related concepts to separate subjective and objective qualities of presence, where PI relates to the 'sensorimotor affordances' of VR (such as its capacities to track head movement, or the resolution of the screen to display detailed images) and Psi is determined by 'the extent to which the system can produce events that directly relate to the participant'[14], by which he means events that a VR participant recognises and may subjectively respond to. In a review of this conceptual framework for presence conducted in 2022[15], Slater gives examples of qualities of VR that relate to Psi, which he describes are 'highly specific to the individual'[16]. Examples Slater gives include research that analysed a virtual concert scenario, in which participants reported issues with desynchronisation between the movements of a drummer and the audio, or the fact that the experience was set in the 1980s yet none of the virtual concert goers were smoking[17]. He also explains that a sense of plausibility in VR does not necessarily mean that VR experiences must be realistic, citing research that included a chess game with flying chess pieces. In this example, participants reportedly accepted flying chess pieces as a plausible component of the virtual world. They did not have a negative impact on a reported sense of presence. Slater explains that Psi 'requires deliberate design'[18]; where a more comprehensive sense of presence across Pi and Psi concerns how a designer works with the technical capacities of VR to create VR experiences that behave plausibly and subjectively engage the participant. For Slater, presence arises through how participants subjectively respond to the technical, immersive and designed qualities of a VR experience. He explains that a sense of presence is not deterministic and is significantly dependent on personal characteristics of the participant (such as 'prior experience [with VR], personalities, knowledge'[19] etc.). Following these distinctions between presence and immersion, this enquiry uses the term presence to focus the design territory of the practice-based enquiry on the subjective qualities of VR experience; denoting those subjective qualities of VR experience that may be experimented with through design experimentation with the technical components of the VR platform.

In his 2022 review of presence through Pi and Psi, Slater also identifies a third component of VR experience, 'the illusion of ownership over the virtual body that self-represents the participant'[20]. Labelled under the concept, 'embodiment', Slater describes this illusion as when some notion of the body can be transferred into virtual environments via 'visuomotor or visuotactile synchrony'[21] (by which he means where body movement is tracked and visually represented in VR, or a sense of physical touch corresponds to a visual phenomenon in a virtual environment). Slater situates embodiment as a valid, but not necessarily essential component of presence in VR, as he cites examples of presence research in which Pi and Psi occurs without embodied visual representations of the body. Kent Bye, host of the *'Voices of VR'* podcast[22],

[14] (Slater M. , 2009)
[15] Slater, M., Banakou, D., Beacco, A., & Gallego, J. (2022). A Separate Reality: An Update on Place Illusion and Plausibility in Virtual Reality. Frontiers in Virtual Reality.
[16] (Slater, Banakou, Beacco, & Gallego, 2022)
[17] (Slater, Banakou, Beacco, & Gallego, 2022)
[18] (Slater, Banakou, Beacco, & Gallego, 2022)
[19] (Slater, Banakou, Beacco, & Gallego, 2022)
[20] (Slater, Banakou, Beacco, & Gallego, 2022)
[21] (Slater, Banakou, Beacco, & Gallego, 2022)
[22] Bye, K. (2024, February 23). Voices of VR. Retrieved from Voices of VR: https://voicesofvr.com/

gives embodiment more primary focus in his 'Elemental Theory of Presence'[23], which includes 'Embodied Presence' as the illusion that 'you're actually there and your body is actually in those places'[24]. Bye explains that embodiment as a component of presence in VR became more prevalent as technologies developed to incorporate more of the body in VR experiences (such as advancements in head and hand tracking technologies in VR hardware). Contemporary examples of VR experience across art and entertainment are making use of these technological advancements to develop capacities for embodied interactivity and enhance a sense of embodied presence. Examples include Coven's 2024 game *'Masters of Light'*[25], that utilises The Meta Quest's hand tracking capabilities as the primary mode of interaction for the game. This game uses the hand-tracking capabilities of Quest VR headsets to motion track individual fingers, requiring players to make specific hand gestures that are represented by realistic virtual hand representations that match player movement. In Polymorf's VR art installation, 'Symbiosis'[26], room-scale VR technology that tracks the participant's bodies position and movement across a boundaried physical space is combined with custom-made costumes designed to encourage participants to embody a range of 'post-human or nonhuman'[27] characters. With the aid of the custom-made costumes, the characters this work invites participants to embody does not always correspond to normative human forms, instead experimenting with the body tracking capacities of the VR hardware to encourage a sense of embodied presence to transfer onto abstracted embodied representations. Following these technological advancements in embodied tracking and representation in VR, and the prevalence of their creative application in contemporary VR works, I regard embodiment as a valid and necessary component of VR design to explore within this practice-based enquiry into presence. Incorporating notions of embodiment within this enquiries critical exploration of presence in VR widens the scope of research, opens further opportunities for creative experimentation (such as into embodied representation, interaction and responsivity to the body), and ensures the enquiry keeps in step with continued technological advancements in embodied interaction on current and emerging VR technologies.

In summary, this enquiry regards presence as the central distinct quality of participant engagement with VR; one that can be said to encompass many of the salient features of related primary components of VR experience, such as the technical and immersive capacities of VR, and current advancements in embodied interaction. Following Slater's presence research, which gives primacy to participant subjective engagement as the main component of a sense of presence in VR, this enquiry uses presence as its core focus to frame its critical and creative exploration of the subjective qualities of VR experience through design. Through practice-based exploration of these subjective qualities of VR experience, the enquiry is enabled to

[23] Bye, K. (2024, May 13). Elemental Theory of Presence + Primer on Experiential Design & Immersive Storytelling. Retrieved from Voices of VR: https://voicesofvr.com/1389-elemental-theory-of-presence/

[24] (Bye, 2024)

[25] Meta. (2024, May 16). Masters of Light. Retrieved from Meta: https://www.meta.com/en-gb/experiences/masters-of-light/6784615031600264/?srsltid=AfmBOoo9OifyvidjV5QHuRgccdOOteYdehh7j8wOVvOurjS57-6Oqbpu

[26] Polymorf. (2025, December 16). Symbiosis. Retrieved from Polymorf: https://www.polymorf.nl/interaction/symbiosis/

[27] (Polymorf, 2025)

critically explore novel design approaches to encourage affective and relational engagement with VR experiential narrative works. It is the distinct emphasis on subjectivity within VR experience that presence affords, and its distinct centrality amongst related concepts in contemporary VR research, that frames this practice-based enquiry to explore how designing for presence in VR enables the development of affective, relational, lasting and impactful VR narrative experiences.

Research Enquiry Overview

This research enquiry investigates how strategies to design for presence in VR actively enables the translation of life experience into VR experiential narratives. To facilitate this, I have been fortunate to collaborate with two individuals who have generously shared their life experiences for translation into VR experiential narrative works:

Marcel Schreur is a multidisciplinary artist who has experienced multiple bouts of oral cancer and experiences vascular dementia.

Ivanna Maszczak is a Ukrainian who was arrested by the Soviet regime in 1948 and survived incarceration in the Soviet Gulag in the 1950s.

Both Schreur and Maszczak expressed a desire explore the phenomenal aspects of their experiences in VR, and how their affective relationships with their experiences could be collaboratively translated through VR design. Through collaborative exploration of their life experiences and individual perspectives, they contribute complex understandings of presence that enhance and challenge practice-based approaches to presence in design. This adds a valuable dimension to the enquiry into presence in VR. It provides a real-world context that challenges my own singular understanding of presence and practical approaches to designing for presence in VR.

The practice-based research consists of three VR experiential narrative works that were developed with Schreur and Maszczak:

'Life is Beautiful. Always.' – Developed in co-design with Marcel Schreur. This work explores how physical characteristics of Schreur's condition and its creative expression through his art practice may be translated into the embodied capacities of presence in VR.

'I Look for Them' – Developed in collaboration with Ivanna Maszczak. The work explores ethical VR design methods to translate Maszczak's life experiences in collaboration with her. It considers how presence in VR may enhance engagement with Maszczak's life experiences within representative experiential narratives.

'Be That Ocean' – A work that re-examines findings from collaboration with Maszczak in further exploration into the embodied and responsive capacities of VR to translate her experiences. My affective relationships with Maszczak's experiences developed in collaboration with her are further explored to examine where designing for formulations of embodied presence in VR may affectively translate these aspects of Maszczak's experiences.

The foundational context to approach designing for presence is explored through three experiential qualities of VR identified through the Immersive Design discipline:

Subjectivity – How VR enables a participant to take an active, subjective role in the interpretation of VR experiences.

Embodiment **–** Where the VR platform interactively engages the body, and how senses of embodiment in virtual space are established through VR design.

Responsivity – Where VR environments respond to embodied interaction, developing a relational sense of embodied presence within VR experiences.

By exploring presence through these three components of VR, the enquiry critically examines how they may be designed to encourage complex senses of presence to manifest during the act of engaging with VR. Through this, the enquiry expands practical understanding of presence as a subjective, emergent, and dynamic quality of engagement with VR experiences. This yields insight into how designing for presence in VR can encourage active, embodied relationalities with VR experiences, and further how this can be brought into service of the development of VR experiential narratives.

I employ collaborative methodologies to explore how translating life experiences into VR with the subjects of these works can enhance and challenge practice-based investigation into designing for presence. Within these collaborations, I examine practical and ethical design issues when translating another's life experience in VR to extend understanding of how VR can be used ethically as an experiential narrative platform.

By critically analysing the VR works created through this enquiry within the context of the existing design fields and works examined within the Contextual Review, I will examine where strategies to design for presence in VR may offer new creative opportunities to translate life experiences and ways to engage with VR experiential narratives. This contributes insight into design methods that utilise the embodied, phenomenal and emergent qualities of VR in the development of VR experiential narratives. This expands practical understanding of the implications of designing for presence in VR within the translation of life experiences, contributing to contemporary critical debates on the opportunities and limitations of VR to enable affective engagement with experiential narratives.

Structure of Thesis

Statement of Research Aims

This chapter states and contextualises the research aims of the practice-based enquiry.

Contextual Review

The chapter opens with an overview of 'presence' in VR, establishing the position this enquiry takes on the concept of presence within VR design.

This chapter then establishes the experiential narrative and immersive design contexts. Three capacities of the VR platform, subjectivity, embodiment, and responsivity, are positioned as core components of presence for further exploration within contemporary VR art and design practice.

A review of what some early pioneers considered VR would uniquely offer to artists and designers is considered alongside contemporary critical and design perspectives on the potentialities of VR to facilitate engagement with experiential narratives. This highlights some of the central debates on the functional limitations, creative possibilities and ethical considerations of VR as an experiential narrative platform.

The foundational context for the practice-based enquiry's approach to design for presence in VR is developed by examining examples of art and design practice that experiment with subjectivity, embodiment and responsivity in VR design.

The chapter summarises findings from the contextual review and identifies areas for further practice-based exploration into presence through VR experiential narrative. This outlines the challenges the research aims set for practice-based research and articulates where contributions to knowledge will be sought throughout the enquiry.

Methodology

This chapter establishes Frayling's *'Research Through/For Design'*[28] as the enquiry's main methodological framework. This is supplemented with elements of Sullivan's art-practice as research methodologies[29], incorporating the ways art-practice research methods explore the reflexive, practitioner-based, inter-relational aspects of engaging with presence within VR design.

The chapter describes the methods that are utilised by the practice-based enquiry to explore designing for presence within collaborative research. It then outlines some initial practical experimentation into presence, demonstrating the potentialities of methods that informed design approaches in the enquiry's main collaborative projects.

Translating Life Experience in VR Through Collaboration

This chapter describes the collaborative design projects with Schreur and Maszczak that underpinned the production of VR works across each project. This details where strategies to design for presence were explored across the perspectives my collaborators contributed to the enquiry and how ethical design-research practice in each context was maintained.

Exploring VR Experiential Narratives Through Presence Design

This chapter describes the methods that underpinned the development of the three works within this practice-based enquiry; *'Life is Beautiful. Always.'*, *'I Look For Them'*, and *'Be That Ocean'*. It overviews where methods to design for formulations of presence created embodied and affective links with translations of Schreur and Maszczak's experiences.

Discussion - Translating Life Experience Through Designing for Presence in VR

This chapter reflects on the methods employed to explore presence as it actively manifested across the practice-based enquiry. It examines the process of undertaking collaborative practice-based research; where working with my collaborators enriched and challenged design

[28] (Frayling, 1993)
[29] (Sullivan, 2005)

approaches to presence in the development of experiential narratives based on their lives. It discusses how practical approaches to design for presence enabled the translation of collaborator's life experiences, and where this contributes insight into contemporary debates on the creative possibilities and ethical limitations of VR as an experiential narrative platform.

Conclusion

The chapter outlines core findings from the enquiry, where collaborative methods to design for presence translated embodied and affective qualities of collaborator's life experiences into experiential narrative works in a way that is unique to the VR platform. It reflects on the value of undertaking collaborative research and Schreur and Maszczak and the richness they added to the findings of the enquiry.

Structure of Practice Submission

The projects developed through this practice-based enquiry, '*Life is Beautiful. Always.*', '*I Look For Them*', and '*Be That Ocean*' are made available as VR experiences or video walkthroughs.

All required files to run the three VR experiences are included in subfolders labelled with the project name inside the 'VR Projects' folder. All experiences have been developed to run optimally on PC and the Oculus Rift VR headset.

Video walkthroughs of all three VR experiences, labelled by project name, are available in the 'VR Project Videos' folder.

Statement of Research Aims

This PhD is led by the following research aims:

1. *To explore methods, strategies, and techniques to design for presence in VR by making new VR works.*

The enquiry aims to develop new VR works that yield insight into strategies to design for presence in VR. An analysis of VR works created through practice-based research investigates the methods employed to explore how formulations of presence are actively experienced through engagement with VR works.

2. *To investigate how collaborative VR design methods enhance practice-based exploration of presence in VR through collaborative engagement with the production of VR experiences.*

The enquiry investigates how collaborative VR design may challenge or enhance practice-based investigation into presence in VR. By exploring presence across perspectives within collaborative VR design, the enquiry critically examines how presence may be actively experienced by researchers and collaborators through making and engaging with VR works.

3. *To explore the potential of designing for presence in VR to translate life experience into VR experiential narratives.*

The enquiry explores methods to translate the life experience of collaborators into VR experiential narratives and where designing for presence in VR offers a novel contribution. This contributes new thinking to contemporary critical debates on the value of designing for presence in VR to encourage active and embodied engagement with VR experiential narratives.

Chapter Two: Contextual Review

This chapter first reviews current literature on presence in VR, establishing the gaps in knowledge to situate the research enquiry's further practice-based exploration of presence within experiential narrative design in VR. The chapter then overviews Experiential Narrative and Immersive Design, establishing the overall context to frame presence within the practice-based enquiry. Three core components of VR design are identified; subjectivity, embodiment and responsivity. These are used as a framework to examine the embodied, experiential and interactive capacities of VR and how they relate to approaches to design for presence.

An overview of some early formulations of VR provides a foundational context to critically examine the potentialities and limitations of designing for presence in VR across contemporary contexts. A review of critical perspectives on experiential narrative in VR highlights some core ethical considerations when VR is used to present non-fictional narrative accounts. The issues and opportunities outlined here establish the territory for a critical examination of designing for presence in VR in engagement with experiential narratives.

Presence in VR is positioned as a central concept within the research enquiry to develop a robust critical understanding of the embodied and phenomenal qualities of VR. A review of contemporary VR design practice focusing on the components of VR identified within Immersive Design (subjectivity, embodiment, and responsivity), develops a fuller understanding of how presence can be encouraged to actively manifest through VR design. This outlines some of the constraints and creative possibilities of VR for further exploration through practice-based research.

The chapter concludes by identifying the potentialities for practice-based research to explore presence in the design of experiential narratives. This establishes the main focus for the enquiry, investigating the implications of designing for presence in the engagement and interpretation of VR experiential narratives.

What is Presence in VR?

In current academic and design literature, presence is generally understood to denote the fundamental subjective feeling of 'being there'[30] within a VR experience; where a sense of your embodiment and agency to bodily interact in virtual worlds become manifest through active engagement with the specific embodied and phenomenal capacities of VR . Presence is a common feature in academic critical examinations of the unique capacities of VR experience. Whilst specific terminology and research methods differ across academic approaches to examine presence, presence is generally explored through a combination of technical, subjective and embodied qualities of VR experience (such as Kent Bye's 'Elemental Theory of Presence'[31] that includes examination of Active, Embodied and Emotional qualities of VR experience), and technical/subjective components of VR (such as Mel Slater's examination of presence through the interrelationships between 'Place Illusion'; a sense of being in a virtual environment that develops through technical components afforded by the virtual reality

[30] (Weber, Weibel, & Mast, 2021)
[31] (Bye, 2024)

system, and 'Plausibility Illusion'; a more subjective quality through which a VR experience can 'produce events that directly relate to the participant'[32]).

Lombard and Ditton have written extensively on the technological components and experiential factors of VR that have been highlighted across academic contexts to explain a sense of presence in VR[33]. They note that a sense of presence 'results from an interaction among formal and content characteristics of a medium and characteristics of the… user' and therefore 'will vary across individuals and across time for the same individual'[34]. These variable characteristics span various interrelated technical and subjective qualities of VR experience, such as 'form variables' like 'image quality', 'number of sensory outputs' and spatial sound, and subjective 'content variables' such as 'enjoyment', 'willingness to suspend disbelief', and 'prior experience with the medium'[35]. This highlights some of the complexity inherent in critically examining presence across research contexts. Presence is a multi-faceted and fundamentally subjective quality of VR experience; one that is dependent on a range of participant-specific factors and technical components of the VR platform and may also evolve as a participant continues to engage with VR.

To explore some of these variable factors of VR experience further, the following sections overview a selection of notable research approaches that examine technical, subjective and embodied qualities of engagement with VR to define or measure a sense of presence. This highlights some current thinking on the relationships between the technical capacities of the VR platform and the subjective manifestation of a sense of presence in engagement with VR. It considers the limitations in attempting to establish a definitive understanding of how presence may manifest in VR across individual perspectives and contexts; where critical examination of the complexity and contingent nature of presence may be lost through a reductive research methodology. This outlines some of the potentialities for new insight that the practice-based research methodology for presence design adopted in this enquiry; in its endeavour to critically examine presence as it actively manifests within and through embodied engagement with VR experiences.

Subjective Measures of Presence

Due to the centrality of the individual subject in the manifestation of presence in VR, numerous research approaches have attempted to capture and define subjective qualities of presence in VR experience, distinguishing them from more technical factors of the VR platform.

An early example of research into capturing subjective accounts of presence in VR is the presence questionnaire developed by Witmer and Singer[36]. Using two questionnaires; a 'Presence Questionnaire' (PQ) which 'measures the degree to which individuals experience presence in a [virtual environment]', and an 'Immersive Tendencies Questionnaire' (ITQ) which

[32] (Slater M. , 2009)
[33] (Lombard & Ditton, 2006)
[34] (Lombard & Ditton, 2006)
[35] (Lombard & Ditton, 2006)
[36] Witmer, B. G., & Singer, M. J. (1998). Measuring Presence in Virtual Environments: A Presence Questionnaire. Presence: Teleoperators and Virtual Environments, 225-240.

measures 'the capability or tendency of individuals to be involved or immersed'[37], Witmer and Singer endeavoured to develop a viable measure for presence that works across the subjective 'differences in the tendencies of individuals to experience presence'[38]. Findings from this research outlined several technological factors that may contribute to a sense of presence, including degree of control, perceptual fidelity, and naturalness of interactions. However, Witmer and Singer point out that they are unsure precisely how these factors combine to affect presence, nor does their method enable a full understanding of the 'presence construct'[39].

Witmer and Singer's approach to measure presence was noted by Mel Slater[40] to be complicated by the significant degree of subjectivity in the responses elicited by their questionnaires[41]. Slater suggested that measures of 'system immersion', a term he uses to refer to the technical capacity of VR to deliver 'a surrounding environment, one which shuts out sensations from the 'real world'', should be able to be measured independently of subjectively experienced presence through 'individual personal characteristics and experience'[42]. Slater developed this concept in a later paper in which he outlined the interrelated concepts of 'Place Illusion (PI)… the qualia of having a sensation of being in a real place' and 'Plausibility Illusion (Psi)… the illusion that the scenario being depicted is actually occurring'[43]. He uses these concepts to separate the technical components and subjective qualities of VR experience:

'PI is constrained by the sensorimotor contingencies afforded by the virtual reality system. Psi is determined by the extent to which the system can produce events that directly relate to the participant, the overall credibility of the scenario being depicted in comparison with expectations'[44]

Slater suggests that when both PI and Psi occur, participants will feel a sense of presence and respond realistically to VR.

In Slater's own applied research, presence is defined as 'the propensity of people to respond to virtually generated sensory data as if they were real'[45]. Investigating this further, Slater et al. conducted an experiment to ascertain whether presence questionnaires could distinguish between real and virtual experiences[46]. Research participants were asked to complete an object-finding task in a real office environment and in a virtual environment that simulated the same office (Figure 1, Figure 2).

[37] (Witmer & Singer, 1998, p. 230)
[38] (Witmer & Singer, 1998, p. 233)
[39] (Witmer & Singer, 1998, p. 239)
[40] Slater, M. (2023, December 4). Mel Slater. Retrieved from Mel Slater: http://www.melslater.me/
[41] Slater, M. (1999). Measuring Presence: A Response to the Witmer and Singer Presence Questionnaire. Presence: Virtual and Augmented Reality, 560-565.
[42] (Slater M. , 1999, p. 7)
[43] (Slater M. , 2009)
[44] (Slater M. , 2009)
[45] Slater, M., Lotto, R. B., Arnold, M. M., & Sanchez Vives, M. V. (2009). How we experience immersive virtual environments: The concept of presence and its measurement. The UB Journal of Psychology, 193-210.
[46] Usoh, M., Catena, E., Arman, S., & Slater, M. (2009). Using Presence Questionnaires in Reality. Presence, 497-503.

Figure 1: Still of real office environment in Usoh et al. (2009)[47]
Image removed for copyright reasons

Figure 2: Still of virtual office environment in Usoh et al. (2009)[48]
Image removed for copyright reasons

The hypothesis was that presence questionnaires should be able to pass a 'reality test – whereby… the presence scores should be higher for real experiences than for virtual ones'[49]. The findings of this experiment were inconclusive. Presence was scored only marginally higher for the real than for the virtual experience. The conclusion given by the paper was that the

[47] (Usoh, Catena, Arman, & Slater, 2009, p. 14)
[48] (Usoh, Catena, Arman, & Slater, 2009, p. 13)
[49] (Usoh, Catena, Arman, & Slater, 2009, p. 1)

utility of presence questionnaires 'is doubtful for the comparison of experiences across environments' [50]. However, more notably the paper also suggests that participants will 'relativise their responses to presence questions to the domain of their given experimental experiences'[51]. The researchers consider how questions concerning 'a sense of being' across contexts will be differently interpreted be research participants to make the question seem sensible in each context. This subjective relativisation seems to be compounded by some of the questions featured in the questionnaire, which requires participants to consider complex notions of the structure of their experiences, how they appeared 'as a reality', and how manifestations of presence are retained in memory in comparison with other life experiences. The argument is used within the paper to accentuate the point that the use of questionnaires to measure presence across contexts may not be an effective method. In addition to this, I would argue that this type of research limits understanding of the complexity of presence as it actively manifests in engagement with VR, as post-experience questionnaires may reductively frame and limit a participants capacity to explore presence as it is subjectively felt.

These limitations point to a fundamental issue in the endeavour to define or measure presence. The subjective nature of engagement with VR will always entail differences between individual research participants, as no two participants will experience VR in the same way either across contexts or within the same experimental setting. This issue will be exacerbated when questions concern elements of experience that are by their very nature subjective, intangible and non-generalisable, such as individual memory, experiential structure, and personal manifestations of presence. It is notable that, in another experiment[52], Slater outlines the doubtful utility of questionnaires as a measure for presence. Slater asks research participants a deliberately ambiguous and subjective question, 'How colourful was your day?', to highlight the fact that an abstract and subjective term such as 'colourfulness' cannot be objectively defined prior to the question being asked, nor can it be definitively identified via subjective responses to it. Slater uses this to argue that 'presence' is an equally subjective, abstract, and ambiguous term, and that post-experience, retrospective, subjective questionnaires are ineffective as a measurement method. This suggests gaps in knowledge calling for further research methods that enable exploration of presence in its active and subjective manifestation during VR experience.

Embodied Measurements for Presence

In contrast to post-experience and retrospective research approaches to examine presence, alternative research methods have sought to examine presence through embodied, physiological and behavioural factors of participant VR experience in active engagement with VR. These approaches endeavour to use embodied components of VR engagement to capture a reliable measure to explore presence across varied subjective participant experiences and VR engagement contexts.

[50] (Usoh, Catena, Arman, & Slater, 2009, p. 1)
[51] (Usoh, Catena, Arman, & Slater, 2009, p. 10)
[52] Slater, M. (2004). "How Colourful was Your Day?": Why Questionnaires Cannot Assess Presence in Virtual Environments. Presence, 484-493.

Meehan et al. sought to obtain a valid objective measure for presence by examining automatic physiological reactions to a VR experience that was designed to elicit a stress response[53]. The idea is that, by correlating reported presence in VR with a measure of the ways the body automatically reacts to a stressful situation, an embodied notion of presence in VR could be measured in way that is 'reliable, valid, sensitive, and objective'[54]. In this experiment, participants found themselves on the precipice of a deep virtual pit, whilst a measure of skin temperature, heart rate, and skin conductance were compared against results of a presence questionnaire (Figure 3, Figure 4).

Figure 3: Sideview of the virtual environment in Meehan et al. (2002)[55]
Image removed for copyright reasons

[53] Meehan, M., Insko, B., Whitton, M., & Brooks Jr, F. P. (2002). Physiological measures of presence in stressful virtual environments. ACM SIGGRAPH, 645-652.
[54] (Meehan, Insko, Whitton, & Brooks Jr, 2002, p. 645)
[55] (Meehan, Insko, Whitton, & Brooks Jr, 2002, p. 645)

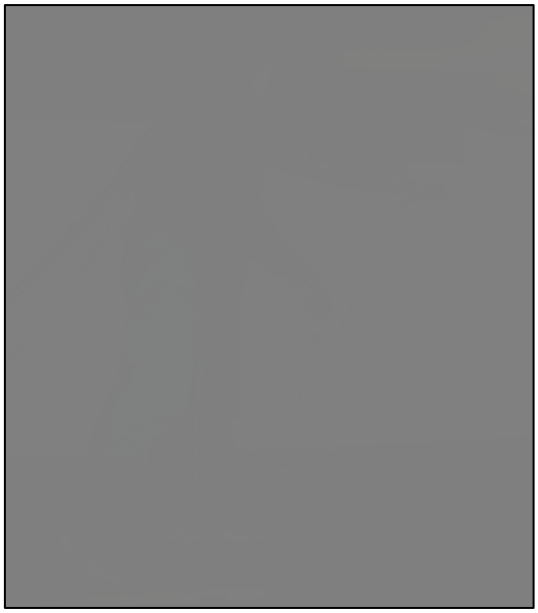

Figure 4: Participant wearing VR headset and measurement equipment in Meehan et al. (2002)[56]
Image removed for copyright reasons

Identifying a correlation between a change of heart rate and reported presence as determined by the questionnaire, the experiment concluded that a measure of heart rate satisfied the requirements for a measure of embodied presence. However, I would argue that the notion that a physiological measure can be used as a unified measure for presence is problematic. A failure to detect a change in physiological reaction does not necessarily mean that a participant did not feel present, but rather that they may not have felt stressed. It could also be suggested that this physiological measure for presence would be influenced by other subjective factors, such as the variable 'prior experience with the medium'[57] Lombard and Ditton suggested in their presence research which could arguably lessen a stress response to VR experience. This suggests that, whilst physiological measurement may be worthy indicator relating to a sense presence in VR, these embodied factors are still intrinsically entangled with subjective participant qualities of VR experience.

The idea of eliciting embodied or behavioural responses to stimulus in VR and the relationships this has to encouraging a subjective sense of presence has been taken up in further contexts. A notable example of this is Kilteni's experimentation into the 'psychological, behavioural and attitudinal consequences' of the transferral of body ownership onto virtual avatars with an appearance that suggests different cultural or ethnic backgrounds[58] (Figure 5).

[56] (Meehan, Insko, Whitton, & Brooks Jr, 2002, p. 646)
[57] (Lombard & Ditton, 2006)
[58] (Kilteni, Bergstrom, & Slater, 2013, p. 1)

Figure 5: Alternative body representations in Kilteni et al. (2013)[59]
Image removed for copyright reasons

This experimentation demonstrates a complexity in the 'behavioural and possibly cognitive' factors that lead to the transference of body-ownership and the impact this has on a sense of presence and self in VR[60]. Here, it is not just a sensorimotor transferral of body ownership onto a virtual avatar, but also an altered sense of the personality and behaviours that a participant may adopt to embody an alternative virtual self. This starts to speak to the ethical implications of representing and inviting embodiment of another within the design of VR experiences. Kilteni et al. refer to the 'empathy machine'[61] in the discussion of this experiment, suggesting that the adoption of different behaviours and attitudes whilst embodying a representation of a person from a different cultural background may indicate greater empathic understanding. However, whilst the experiment concludes that 'body ownership illusions towards virtual body representations can invoke substantial behavioural and possibly cognitive consequences when participants are embodied in avatars that differ morphologically from their physical bodies'[62], it does not address the ethical implications of inviting embodiment of another's perspective within a design context; such as the ethical issues articulated by Author and Journalist, Elvia Wilk[63], in response to Milk's VR as 'empathy machine'[64] concept. Wilk suggests that the 'empathy machine' concept for VR trivialises the life experiences being represented in VR by an overemphasis of the technical qualities of the VR platform and a rendering passive of the relational ethical dimensions between a participant's experience of VR works and the life stories they represent. Whilst Kilteni's research points to some important ethical implications of inviting embodiment of another in VR, it suggests a gap in knowledge suggesting more fulsome exploration of the complex role that these kinds of embodied interactions in VR may play on subjective engagement with VR experiences; investigating the creative potentialities and ethical dimensions in designing for affective and relational engagement with another's life experience through embodied presence in VR.

Section Summary

The literature reviewed demonstrated various ways that presence may be defined, measured or seen to manifest through subjective and embodied qualities of VR experience. It outlined

[59] (Kilteni, Bergstrom, & Slater, 2013, p. 1)
[60] (Kilteni, Bergstrom, & Slater, 2013)
[61] (Milk, 2015)
[62] (Kilteni, Bergstrom, & Slater, 2013, p. 8)
[63] Wilk, E. (2018, July 9). Trauma Machine: Rewiring empathy with virtual reality. Retrieved from Popula: https://popula.com/2018/07/09/virtual-reality-empathy-trauma/
[64] (Milk, 2015)

the interrelationships between technical components and subjective qualities of VR experiences that may lead to a sense of presence, such as the perceived realism of a virtual environment through technical/interactive components of VR and where this may catalyse a plausible and subjective sense of embodied presence. It also considered the relationships between subjective and embodied qualities of VR experiences; where presence may be explored through embodied responses to VR and where these responses suggest a subjective stance to VR experience, such as Kilteni's research into behavioural and cognitive responses to transferal of body-ownership onto virtual avatars. The literature review outlined the difficulties of obtaining a universal measure for presence across participant VR experiences and research contexts due to the inherently individual and fundamentally subjective positionality of a sense of presence in VR. It also began to suggest the ethical issues of embodying another's experience in VR and implications this has within the context of VR experiential narratives, such as Kilteni's mention of the 'empathy machine'[65] and Wilk's critique of this concept as a problematic reduction of the complex affective relationalities a participant has with VR experiential narratives[66].

The literature reviewed outlined several gaps in knowledge that suggest where practice-based research into designing VR experiential narratives through presence can invite affective engagement with another's life experience via an embodied and subjectively oriented perspective. The literature suggested an entanglement of technical and subjective qualities of VR experience, and a wider individual context that a participant carries into engagement with VR, that points to a complex and evolving understanding of presence in engagement with VR experiences. I argue that this complexity renders an endeavour to isolate and define a universal sense of presence problematic. Rather than constraining presence in this way, this practice-based enquiry into designing VR experiential narratives through presence will instead explore where subjective differences offer expanded understanding of the varied and nuanced ways presence may manifest across individuals and contexts. The enquiry aims to utilise reflexive practice-based research methods to challenge reductive or simplified understandings of presence in VR experiential narrative design; examining where designing for presence may catalyse or augment relational understanding of another's life experiences through VR design. Through this, the enquiry will examine where individual interpretations problematise unified notions of presence and reveal emergent experiential qualities through which new strategies to design VR experiential narratives through presence in VR can be further explored.

Within this enquiry, presence primarily denotes where a subjective sense of self and agency becomes manifest through active engagement with the specific embodied and phenomenal capacities of VR. Presence emerges through, validates, and is validated by the types of embodied interaction a VR experience offers. By experimenting with the embodied and phenomenal capacities of VR through designing for presence, this enquiry will explore where a sense of presence may provide a foundational experiential context to enable embodied and subjectively constructed VR experiences to unfold. Understanding presence as the central emergent quality of VR experience provides a lens for this enquiry to practically experiment

[65] (Milk, 2015)
[66] (Wilk, 2018)

with how designing for presence may enhance embodied and reflexive engagement with VR experiential narratives. This approach will provide the critical context to explore ethical issues in representing another's life experience in VR experiential narrative design; investigating the emergent relational potential of presence in collaborative engagement with VR design to ethically explore another's life experience in VR experiential narrative design contexts.

VR Experiential Narratives through Presence in Immersive Design

Building on the literature review on presence above, the next section reviews current perspectives on 'Experiential Narrative' and 'Immersive Design' to situate the overall design context for the research enquiry. Exploring contemporary perspectives on Experiential Narrative supports the enquiry to further investigate where active participant interaction through presence in VR contributes to the generation and interpretation of VR narrative experiences. The approach to exploring this in practice is supported by a review of current literature on Immersive Design principles and strategies for VR. This supports the enquiry to develop a framework to critically investigate the embodied, subjective, and experiential capacities of VR and where they enable active and critical engagement with translations of another's life experiences.

Experiential Narrative

Gordon Calleja defines experiential narratives within the context of video games design as a 'generated narrative that is grounded in the interaction between the player's cognitive faculties and the semiotic and mechanical qualities of the game environment'[67]. Referencing Wolfgang Iser[68], Calleja outlines the bidirectional and emergent nature of experiential narrative structures, emphasising their generation within a relational interplay between 'sign, code and mind'[69]. This involves interaction between both the '(cyber) textual properties of the text'[70]; indicating the types of interaction and the 'contextual frameworks' a designer builds into a game (such as the game's backstory, lore and world), and subjectively generated, experiential narrative qualities; such as what Salen and Zimmerman call 'their emergent complexity, their participatory mechanisms, [and] their experiential rhythms and patterns'[71] that emerge as a player explores and progressively reveals a sense of their character and their role through experiencing a game's world.

Expanding on the open-ended, contingent and participatory qualities of experiential narratives, Calleja provides theoretical cues for experiential narrative design[72] through which designers can encourage players to take part in an 'active construction of an ongoing story… through interaction with the game world's topography, inhabitants, objects, game rules and coded physics'[73]. By designing elements into a game world with what Calleja calls 'story-generation

[67] Calleja, G. (2009). Experiential Narrative in Game Environments. Proceedings of the 2009 DiGRA International Conference: Breaking New Ground: Innovation in Games, Play, Practice and Theory. p. 1
[68] Iser, W. (1991). The act of reading: A theory of aesthetic. Baltimore: John Hopkins University Press.
[69] (Calleja, 2009, p. 2)
[70] (Calleja, 2009, p. 2)
[71] Salen, K., & Zimmerman, E. (2003). Rules of Play – Game Design Fundamentals. Cambridge: MIT Press.
[72] Calleja, G. (2011). *In-Game: From Immersion to Incorporation*. MIT Press. (Calleja, 2009, p. 3)
[73] (Calleja, 2009, p. 5)

potential'[74] (which are often non-linear or 'optional' aspects of a game, such as interactable objects, or characters that are not central to the development of the game's main narrative arc), a player adopts a subjective 'narrative attitude' towards their experience of engaging with a game, building a 'mental construct' of narrative via the interactive and phenomenological properties of the interactive platform[75].

Whilst Calleja primarily focuses on the subjectively-generated, phenomenological and experiential potential of video games (where interaction is commonly limited to a screen and hand-held controller), I aim to extend these perspectives towards a critical examination of the enhanced and alternative potentialities to design VR experiential narratives through the embodied, phenomenological capacities of presence in VR design. Here, I aim to test where the notion of the 'experiential' in VR narrative design may encompass the enhanced embodied, phenomenal and subjective qualities of presence in VR; those that actively engage the body, encourage a sense of subjective positionality in virtual space and outline a potentiality to invite embodied or affective response.

Through this expanded investigation into the experiential in engagement with VR narrative experiences, I also aim to further critically explore generative understandings of narrative through VR design; where non-linear and subjectively generated narrative constructs form through the active, relational and affective potentialities of presence in VR. I aim to explore where designing for presence in VR may uniquely encourage a relational and affective relationship with experiential narrative contexts; where a subjectively-generated sense of narrative may emerge through the actively embodied and affective capacities of VR, rather than the more cognitive dimensions of narrative that Calleja investigates in games. By applying Calleja's conceptual understanding of subjective engagement with video games to practically explore these enhanced immersive and embodied qualities of presence in VR, I aim to extend understanding of where designing for presence in VR offers new opportunities to facilitate subjective and active generation of experiential narrative constructs.

Immersive Design

Practical understanding of the embodied, subjective, and experiential capacities of VR and other immersive technologies has been growing within the discipline of Immersive Design over the past decade. By reviewing findings on the potentialities of VR through Immersive Design, I will develop a practical contextual framework to further explore experiential narrative through the immersive, embodied qualities of VR.

The term 'Immersive Design' was coined by film production designer Alex McDowell during the 2008 conference *'5D: The Future of Immersive Design'*[76]. Bringing together practitioners from film, television, animation, interactive, gaming and architecture, McDowell discusses where new 3D visualisation and immersive technologies enable areas of convergence and new design methods. McDowell describes Immersive Design as a discipline that 'uses digital tools to design

[74] (Calleja, 2009, p. 5)
[75] (Calleja, 2009, p. 5)
[76] AWN. (2008, October 4). *5D - The Future of Immersive Design*. Retrieved from Animation World Network: https://www.awn.com/event/5d-future-immersive-design.

immersively in virtual space'[77]. By drawing focus on the immersive qualities of a design process (such as when an architect considers how an occupier experiences a building, or a games designer considers how game environments support narrative interpretation), McDowell considers how design strategies may be developed to draw central focus onto these qualities. McDowell explains that Immersive Design is an intuitive and creative 'world-building' process, primarily considering design from a three-dimensional, user-centric perspective. Design disciplines converge and collaborate in virtual space until the world being built 'becomes more and more material'[78].

The emphasis on three-dimensional, user-centric design within virtual space suggests VR as a central design tool. VR enables designers to immerse themselves in virtual worlds, enabling experimentation with how it feels to be bodily present within virtual environments and what novel potentialities there are to engage within them. Digital Experience Design strategist, Nick Hubbard, and colleagues provide a review of several years of immersive design research[79]. They outline three core experiential components of Immersive Design: designing for *embodiment*, enabling *responsivity* within VR experience, and encouraging *subjective* engagement[80]. These qualities are used to frame the critical and practical approaches to presence design VR within this chapter.

Hubbard's discussion of how subjectivity, embodiment and responsivity play out in VR experiences support to develop an understanding of presence as an active, embodied and emergent quality of VR experience. By utilising these components of VR in design, Hubbard describes how users are enabled to become co-creators of immersive experiences, rather than passive consumers[81]. Here, embodied interaction and meaningful responsivity (such as when immersive technologies track participant movement and respond in a recognisable and meaningful way) are key to creating immersive experiences that actively and subjectively involve the user. By incorporating meaningful embodied interactions and responsivity, Hubbard considers how designers can encourage an evolving relationship between users and immersive experiences that 'allows for layers of complexity and nuance in the "conversation"' users have with an immersive experience'[82]. Echoing some of Calleja's thinking on experiential narrative, Hubbard explains that this conversation 'should make space for the user to carve their own path through exploration and play', developing a more personalised, subjectively realised, and impactful user experience and a lasting impression that 'yields longevity and ongoing impact'[83].

[77] (AWN, 2008)
[78] (AWN, 2008)
[79] Gensler. (07, 06 2024). *Gensler*. Retrieved from Gensler: https://dxd.gensler.com/
[80] DiLeo, S., Hubbard, N., & Reese, B. (2023, May 23). *Rethinking Engagement: Strategies for Immersive Design*. Retrieved from Gensler: https://www.gensler.com/blog/rethinking-engagement-strategies-for-immersive-design
[81] (DiLeo, Hubbard, & Reese, 2023)
[82] (DiLeo, Hubbard, & Reese, 2023)
[83] (DiLeo, Hubbard, & Reese, 2023)

Immersive Design Principles for Presence in VR: Subjectivity, Embodiment, Responsivity

The 2008 *'5D: The Future of Immersive Design'*[84] conference panel *'Building Worlds – Designing for The New Frontier'*[85], chaired by Scott Fisher (a pioneer in the development of VR technologies for NASA in the 1980s[86]), provides useful case studies to explore designing for subjectivity, embodiment and responsivity in VR.

Discussing the VR work, *'Menagerie'*[87], developed for the Pompidou Centre, Paris in 1993, Fisher outlines the importance of embodied interaction and responsivity to build a sense of subjectively felt presence in virtual worlds. *'Menagerie'* features animal characters that respond meaningfully to the participant's presence in virtual space (see Figure 6, where animal characters flee from the VR participant as they approach them). Here, the idea of embodied responsivity extends beyond the base interaction VR provides (e.g. headtracking to look around and hand controllers to change position), to a relational understanding whereby the participant is invited to discover a sense of their character and agency to act and influence outcomes in the VR environment. Through an emergent understanding of character behaviours and their impact on them, the participant interactively develops a sense of presence as a narrative develops in the virtual world.

Figure 6: Animals flee from the participant in 'Menagerie' (1993)[88]
Image removed for copyright reasons

[84] AWN. (2008, October 4). 5D - The Future of Immersive Design. Retrieved from Animation World Network: https://www.awn.com/event/5d-future-immersive-design

[85] WBI. (2023, November 16). Building Worlds. Retrieved from World Building Institute: https://worldbuilding.institute/events/building-worlds

[86] Fisher, S., & Wenzel, E. M. (1988). Virtual Interface Environment Workstations. Proceedings of The Human Factors Society Annual Meeting.

[87] Fisher, S. (2015, March 5). "Menagerie" Virtual Environment installation at Pompidou 1993. Retrieved from YouTube: https://www.youtube.com/watch?v=ZKETFeraZFk

[88] *'Menagerie'* (1993): https://www.youtube.com/watch?v=ZKETFeraZFk last accessed 4th December 2023

Fisher discusses the potential for subjectively generated narrative in virtual worlds, quoting games designer Will Wright (original designer of the *'The Sims'* [89] game series) in a consideration that extends Calleja's comments on the importance of subjective engagement with interactive narrative experiences for VR; 'the player… charts their own path through the space of possibilities that exists in the game world and… writes their own story of what they've experienced' [90]. Tracey Fullerton discusses this further within the context of immersive experience, *'The Night Journey'*[91]. Fullerton discusses experimenting with the relationships between player interactions and storytelling in the design of this work, where she subverts common game design tropes (such as collecting items to progress a story) and repositions them as metaphoric content to encourage moments of reflection. This demonstrates a more nuanced link between types of interaction and the development of experiential narrative. Here, interactivity is not implemented as a challenge to overcome but serves as a central component in the development of narrative context within immersive experiences.

The above examples start to outline the potentialities of subjectivity, embodiment, and responsivity in experiential narrative through VR. Senses of embodiment, developed through interactivity and responsivity, are core to encouraging subjective relationships with VR experiences and an ongoing, lasting impact on the user.

The next section reviews perspectives on what some foundational formulations of VR would uniquely offer to artists and designers, and where aspects of these still appear in contemporary perspectives on the potentialities of engagement with VR. This identifies opportunities for further critical examination of the embodied potentialities of presence design in VR within contemporary critical debates on VR in experiential narrative contexts.

Foundational Formulations of Presence in VR Design

Fisher's development of VR for NASA shows how the idea of embodied presence in VR was understood within early formulations of VR still feature in commentary on VR today. Fisher and Wenzel's *'Virtual Interface Environment Workstation'* (Figure 7) claims to offer a multisensory, embodied, responsive VR experience through which 'a user can virtually explore a 360-degree… environment and viscerally interact with its components'[92].

[89] EA. (2024, January 26). The Sims. Retrieved from Electronic Arts: https://www.ea.com/en-gb/games/the-sims
[90] (WBI, 2023)
[91] Viola, B. (2023, November 17). The Night Journey. Retrieved from The Night Journey: https://www.thenightjourney.com/
[92] (Fisher & Wenzel, 1988, p. 91)

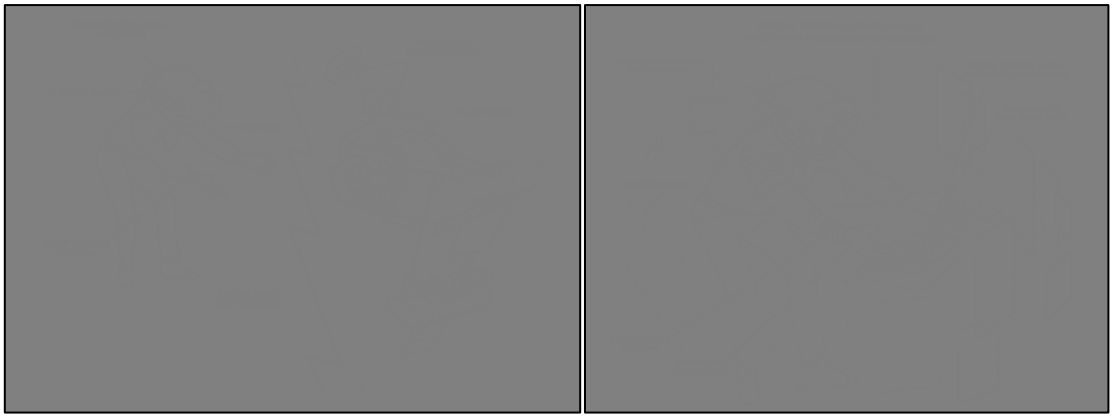

Figure 7: Diagram of Fisher and Wenzel's 'Virtual Interface Environment' (1988)[93]
Image removed for copyright reasons

The claim that participants can be viscerally or bodily transported to other worlds via engagement with VR has been core to how has been described since its initial conception. Morton Heilig, commonly known as 'The Father of Virtual Reality'[94], invented the *Sensorama*[95] in 1962, which is arguably the first known example of a VR technology. Heilig claimed that the *Sensorama* would generate a multi-sensory experience, transporting participants into an 'illusion of reality using a 3-D motion picture with smell, stereo sound, vibrations of the seat, and wind in the hair' (Figure 8)[96].

Figure 8: Morton Heilig's Sensorama (1962)'
Image removed for copyright reasons

[93] Fisher and Wenzel's *'Virtual Interface Environment' (1988)*: https://ntrs.nasa.gov/api/citations/19880014769/downloads/19880014769.pdf accessed 16th November 2023
[94] USC. (2023, August 4). Morton Heilig, Inventor of VR. Retrieved from USC School of Cinematic Arts: https://www.uschefnerarchive.com/morton-heilig-inventor-vr/
[95] Morton Heilig's *Sensorama (1955)*: https://www.researchgate.net/figure/Sensorama-the-first-virtual-immersion-system-the-technical-table-and-the-pictures-shown_fig1_321142137 accessed 16th November 2023
[96] (USC, 2023)

Expanding on the 'illusion of reality' that the *Sensorama* will offer, Heilig suggests that 'fresh and direct contact with the original sense elements'[97] will immerse a participant within experiences with a greater sense of richness, vividness, and immediacy, 'faithfully [reproducing] man's outer world as perceived in his consciousness'[98]. The *Sensorama* will provide the artist 'with a much wider palette of sense material… enabling him to mold them with precision into an aesthetic unity as he has never done before'[99]. Heilig seems to suggest that the enhanced, multi-sensory realism that the *Sensorama* offers will facilitate a stronger and more personal connection to the experiences being presented through it. Claims towards realism in immersive experiences such as this are an ongoing issue in contemporary VR design debates, touching on technical limitations in the endeavour towards photorealism and subjective responses to photorealistic design[100].

Building these claims beyond sensory realism, Heilig states that The *Sensorama* will enable artists and designers to touch new experiential dimensions that 'lie hidden in the subconscious of man', and to arrange multi-sensory experiences 'into forms of consciousness never before experienced by man in his contact with the outer world'[101]. Here, Heilig suggests that the *Sensorama* will be able to represent parts of reality that are normally excluded from human perceptual faculties, enabling an enhanced experiential means to develop understanding of scientific developments and current world issues and to facilitate cultural debate.

Elements of Heilig's claims can still be seen today within Zuckerberg's promotion of the Metaverse [102], one of the largest and most ambitious immersive platforms currently active. Zuckerberg claims that the *Metaverse* will be the next version an 'embodied internet'[103], primarily accessed through VR technologies that enables users to bodily interact in social, gaming and working spaces. Core to the Metaverse is what Zuckerberg calls 'a deep feeling of presence'[104]. Described as the 'defining quality of the Metaverse'[105], Zuckerberg claims that a sense of presence will enable a rich sense of social connectedness that is based on a shared feeling of being within virtual spaces with other participants. Being present within the Metaverse will offer a naturalness and vividness in virtual experiences, with the ability 'to convey the full range of human expression and connection'[106] that cannot be provided by screen-based interactive platforms.

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[97] Heilig, M. (1955). The Cinema of The Future. In A. Utterson, Technology and Culture: The Film Reader (pp. 17-25). Routledge. p. 242
[98] (Heilig, 1955, p. 251)
[99] (Heilig, 1955, p. 244)
[100] Stein and Ohler's paper on the 'Uncanny Valley' effect perceived when engaging with human avatars in VR provides an outline of some of these issues: Stein, J.-P., & Ohler, P. (2017). Venturing into the uncanny valley of mind—The influence of mind attribution on the acceptance of human-like characters in a virtual reality setting. Cognition, 43-50.
[101] (Heilig, 1955, p. 251)
[102] Meta. (2021, October 28). The Metaverse and How We'll Build It Together -- Connect 2021. Retrieved from YouTube: https://www.youtube.com/watch?v=Uvufun6xer8
[103] (Meta, 2021)
[104] (Meta, 2021)
[105] (Meta, 2021)
[106] (Meta, 2021)

Figure 9: Image from promotional material of the Metaverse (2021)[107]
Image removed for copyright reasons

A promotional video produced in 2021 attempts to demonstrate what the Metaverse will look and feel like[108] (Figure 9). However, it is not clear how the technologies currently available to access the Metaverse will be able to simulate the full range of phenomenal qualities that the promotional material demonstrates. Zuckerberg admits that this vision of the Metaverse does not currently fully exist[109]. However, his claims to naturalness and realism via a sense of social presence highlights central points of ongoing critical discussion on the phenomenological potentialities and limitations of VR, and core ethical considerations when designing new virtual worlds and embodied experiences.

Some of the critical commentary on the Metaverse that highlights this discussion on the potentialities of social and phenomenal presence in virtual worlds can be found in Matthew Smith's 2022 IEEE article[110]. The article highlights the low graphical fidelity of Metaverse avatar designs and environments, variously described as 'unimpressive' [111], 'clunky' [112] and

[107] 'The *Metaverse and How We'll Build It Together*': https://youtu.be/Uvufun6xer8?si=9iJh7zSHLXn2y7a1 accessed November 16th 2023
[108] (Meta, 2021)
[109] The video does provide some detail on how developments in VR technologies may be able to advance towards some of the technical interactions demonstrated, such as through advances in facial and hand tracking, or 'pass-through' mixed reality experiences where 3D forms and user interface components are overlayed onto a camera feed of the actual space the participant is in. However, in its current iteration this vision of the *Metaverse* is quite speculative.
[110] Smith, M. (2022, September 3). Why Is Meta's Metaverse Such a Misfire? Retrieved from IEEE Spectrum: https://spectrum.ieee.org/metaverse-meta-misfire
[111] de Luna, E. (2022, August 19). Twitter can't stop dunking on Meta's Horizon Worlds. Retrieved from Mashable: https://mashable.com/article/best-metaverse-tweets
[112] Baker-Whitelaw, G. (2022, August 17). Mark Zuckerberg's new Metaverse selfie is so bad people can't believe it's real. Retrieved from Daily Dot: https://www.dailydot.com/news/mark-zuckerberg-metaverse-selfie-horizon-worlds/

'soulless'[113], indicating significant limitations in capabilities of avatars to express emotional qualities or for levels of phenomenal detail in Metaverse environments. Smith suggests that a reason for this lack of detail in avatar or environment designs is due to a misguided attempt by Meta to drive adoption of the Metaverse before adequate technology was in place to realise Zuckerberg's ambitions for it. However, more serious consequences arise through limitations of Metaverse users to customise the appearance of avatars they embody in the Metaverse, and the lack of inbuilt safety measures in place to protect Metaverse users from misconduct and abuse in Metaverse worlds. Laura Bates writes of several experienced instances of sexual misconduct in the Metaverse[114]. This includes instances of what appeared to be children embodying avatars of women in their early twenties experiencing sexual advances and misconduct by avatars with voices that were unmistakably adults. Bates also cites a report by the Centre for Countering Digital Hate that found Metaverse users were exposed to abusive behaviour on average every seven minutes[115]. Rather than enabling the rich sense of social connectedness, Bates outlines the dangerous consequences that the experientially and representationally reductive and limited capabilities of accessing the Metaverse produces, which anonymises and therefore seemingly normalises our entitlement to each other's bodies, and can serve to hide and therefore enable exploitation and abuse.

This examination of early and contemporary formulations of VR raises core issues around the embodied and experiential potentialities that VR offers, such as bodily transportation and presence in virtual worlds, representative realism in VR design, and the ability to augment or enhance human perceptual faculties, that still hold currency in contemporary debates. The next section examines some fundamental design perspectives on VR that were developed during a wave of art and design research in the nineties. This outlines some foundational creative approaches to VR design that explore the phenomenological potentialities and limitations of VR in practice.

Early Design Perspectives on VR

Throughout the nineties, developments in the fields of computing, 3D graphics, and interactivity enabled one of the first waves of advanced VR hardware. This provided artists, designers, and researchers who had access to these technologies greater possibilities to experiment with the potential applications of VR, catalysing new avenues of research and development. It was around this point that VR in its current iteration began to emerge[116].

[113] Zwiezen, Z. (2022, August 17). Mark Zuckerberg's Soulless Metaverse Avatar Has Me Worried About Our Digital Future. Retrieved from Kotaku: https://kotaku.com/metaverse-meta-facebook-selfie-vr-zuckerberg-ugly-1849424613

[114] Bates, L. (2025, June 10). Misogyny in the metaverse: is Mark Zuckerberg's dream world a no-go area for women? Retrieved from The Guardian: https://www.theguardian.com/society/2025/jun/10/the-misogyny-of-the-metaverse-is-mark-zuckerbergs-dream-world-a-no-go-area-for-women

[115] CCDH. (2025, August 21). Facebook's Metaverse. Retrieved from Centre for Countering Digital Hate: https://counterhate.com/research/facebooks-metaverse/

[116] Between Heilig in 1955 and Zuckerberg in 2021 there are other scarce but notable examples of technological developments and speculation towards the potentialities of VR and related immersive technologies. See (Sutherland, 1965), (Krueger, Responsive Environments, 1977), (Lippman, 1980).

A cross-section of early critical examination into VR design can be found within projects developed through the Banff New Media Institute (BNMI) between 1995-2005. The trans-disciplinary approach to VR design at the BNMI, incorporating academic, technological, and artistic perspectives, provides a foundational design context to consider the relationships between technical and phenomenological qualities of VR and how this enhances understandings of presence. Their work critically examines how technological innovations create new ways for design practice to explore aspects of human experience, such as embodied relationships with the environment, representation of the experiences of others, and the ethical use of VR in design.

Within the theme, *'The Material Known as Data'*, artist researchers explored the unique materiality and qualitative elements of engagement with VR. Char Davies and John Harrison developed new 3D imaging techniques to problematise realist representation within VR; what Davies describes as a 'striving for mimetic representation in 3D digital imaging' that forces an artificial perspective that is not based on the subjective experience of the human body'[117]. Harrison and Davies developed new technological methods to introduce layered translucency within 3D assets. This design approach offered an alternative to the rigid, striated, and inflexible aesthetic common to representational 3D environments commonly seen in VR design at the time. Harrison and Davies reference the 1993 iteration of *'Microsoft Flight Simulator'* as an example of this, which is shown here alongside example of Davies' work (Figure 10, Figure 11).

Figure 10: 'Microsoft Flight Simulator (V5.0)' (1993) [118]
Image removed for copyright reasons

[117] Davies, C. (2005). Landscapes of Ephemeral Embrace: A painter's Exploration of Immersive Virtual Space as a Medium for Transforming Perception. Plymouth: PEARL. p. 25

[118] *'Microsoft Flight Simulator (V 5.0)'* (1993): https://www.myabandonware.com/game/microsoft-flight-simulator-v5-0-1zs/play-1zs accessed 26th October 2023

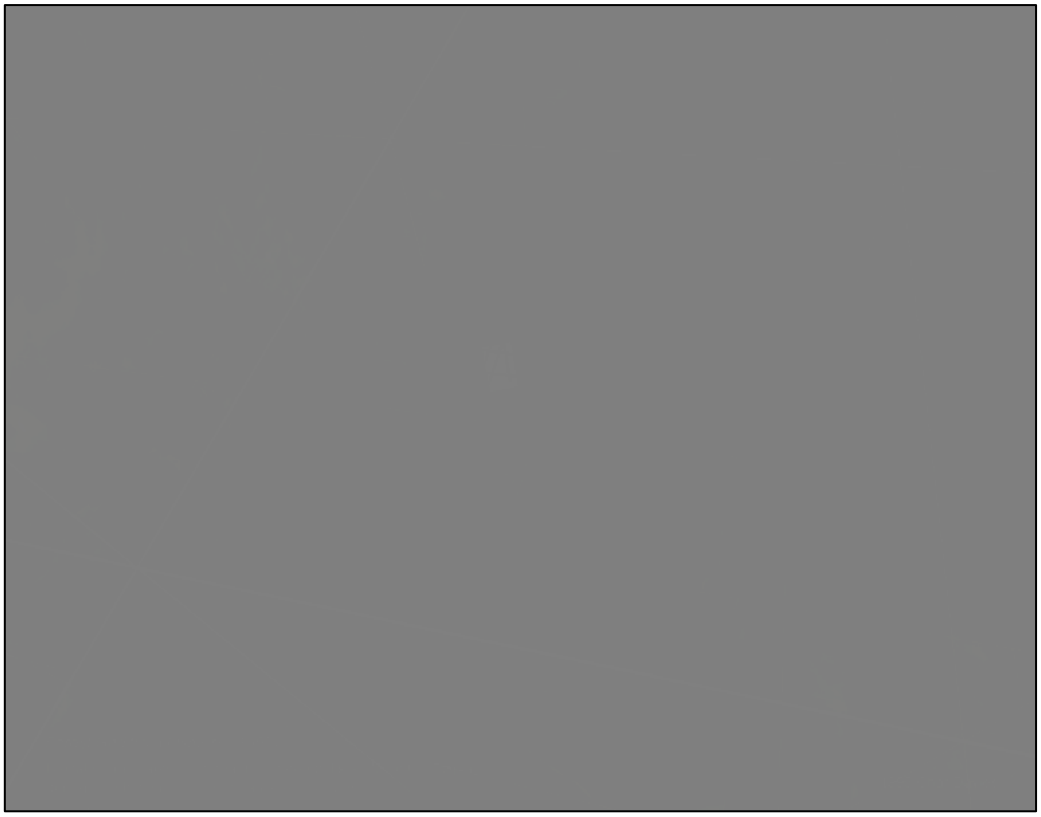

Figure 11: Char Davies' 'Osmose' (1995) [119]
Image removed for copyright reasons

Harrison and Davies challenged the assumption that the world around us and our experience of it can be wholly described in geometric, mathematical terms. This excludes the richness of subjective experience, encouraging what Richard Coyne describes as a will to control, manipulate, manufacture, dissect, reduce and enframe [120]. Their approach encouraged designers to rethink the creative potentialities of VR design, developing a deliberate visual and experiential ambiguity that would enable VR participants 'temporarily transcend their habitual perceptions in order to experience more fully – or more freshly' [121]. This offers valuable conceptual cues to challenge approaches to realism within the translation of life experience in VR; suggesting an abstracted design focus on embodied or subjective qualities, rather than endeavouring towards literal representations of events that may delimit their potential interpretation.

The BNMI theme, *'Becoming Machine / Staying Human',* considered 'the relationship of the body… to technological interfaces that mediate and redefine it' [122]. It provides a useful context to examine experimentation into designing embodied interaction within VR experiences. Within this theme, Myron Krueger [123], discusses the potentiality for perceptual adaptation within virtual environments, pointing to a 'slippage' between vision and proprioception and a

[119] Char Davies - *'Osmose'* (1995): https://www.immersence.com/osmose/ accessed 26th October 2023
[120] Coyne, R. (1995). Designing Information Technology in the Postmodern Age: From Method to Metaphor. MIT Press. p. 66
[121] (Cook & Diamond, 2012, p. 114)
[122] (Cook & Diamond, 2012, p. 309)
[123] Krueger, M. (1991). Artificial Reality II. Addison Wesley.

'general plasticity of the sensory-motor system'[124]. Kreuger examines this through VR experimentation that deliberately mismatches a visually perceived limb positioning with where they are in actual space. Here, a sense of self-location 'starts to drift', which Kreuger uses to suggest that the sense of embodied presence in VR is 'something that's really very flexible and modifiable all the time'[125]. This suggests a sense of embodied extension into virtual environments and the malleability of embodied relationships within VR experience. Further suggesting the personal sense of embodiment VR can encourage, Kreuger considers the concept of virtual space as 'vital space'[126]. However, he notes that very little research had been done on the emotional impact of such embodied experiences at the time. Despite that, he points to an interesting dimension of the potentialities for embodied extension into VR as a way to create meaningful embodied relationships with VR experiences.

VR works developed at BNMI offer examples of cutting-edge technological innovation of its time. They start to demonstrate some valuable cues for practice-based research to address contemporary issues VR experiential narrative design I will explore in this enquiry, specifically:

- Issues of representation in the design and interpretation of VR experiences; where I will explore appropriate methods to translate the life experiences of research collaborators into VR works through designing for presence and critically examine how these works are subjectively engaged with.
- Understandings of extended embodiment in VR; how VR enables embodied extension into virtual environments and where this may encourage personal and impactful connections with the content and context of VR experiential narratives.

The next section examines critical perspectives on the capacities of VR as an experiential narrative platform. This outlines where the design methods and strategies I will employ within this enquiry can address contemporary ethical debates on the capacities of VR to translate life experience into experiential narratives.

Critical Perspectives on Experiential Narrative in VR

The first Oculus Development Kit was released in March 2013, which is one of the first times an accessible and reasonably affordable VR headset was made available to consumers and designers. Following this, contemporary critical commentary on the novel contribution VR offers to experiential narrative started to formulate. John Pavlik suggested that, building on printed media and moving image, this iteration of accessible VR signalled a third stage of mediated storytelling[127]. Pavlik characterises this through a turn from 'storytelling' to 'story experiencing'[128], highlighting the immersive, embodied, and participatory qualities of VR and the unique ways it enables engagement with narrative. Pavlik highlights some of the potentially beneficial outcomes of this, where a greater sense of 'user presence' within VR experiences

[124] (Cook & Diamond, 2012, p. 404)
[125] (Cook & Diamond, 2012, p. 405)
[126] (Cook & Diamond, 2012, p. 405)
[127] Pavlik, J. (2018). Experiential Media and Transforming Storytelling: A Theoretical Analysis. Journal of Creative Industries and Cultural Studies, 46-67.
[128] (Pavlik, 2018, p. 51)

enables users to 'transform from passive audience members to active participants in a story'[129]. By enabling participants to be present and actively participate within experiential narratives, VR can catalyse an enhanced affective understanding and a more powerful and personal call to action on current cultural and political issues. However, Pavlik cautions that, as these forms of storytelling become more pervasive in society, or invasive within the body, there are ethical concerns about 'invasions of privacy, threats to security, commercial exploitation, harmful health effects, and misinformation'[130]. The next section explores some contemporary debates around these issues, outlining some of the issues on VR in experiential narrative I explore within this enquiry.

'The Ultimate Empathy Machine': Ethics of Representation in VR

Chris Milk, co-creator of the 2015, 360° video documentary on the Syrian refugee crisis, *'Clouds Over Sidra'*[131], raised ethical debates about the use of VR to phenomenally engage with cultural and world issues as he referred to VR as the 'ultimate empathy machine'[132]. Connecting empathy with presence in VR, Milk argues that VR allows a participant 'to feel present with the world you are inside and… with the people you are inside it with'[133]. Milk comments that 360° video in VR 'feels like real life, it feels like truth'[134], claiming that it provides a feeling of realism that encourages a more personal connection with experiential narrative accounts.

Milk's 360° video VR work has been positioned to catalyse action on urgent world issues[135]. However, the technological one-sidedness of the term 'empathy machine' seems to mechanise empathy, reducing it to a product of the technology rather than an active component of VR experience. Milk's comments seem to suggest a causal link between the technological components of VR and the affective and subjective qualities of VR experience, which has catalysed debate on the limitations and opportunities of VR to meaningfully connect with experiential narratives. A fulsome examination of VR's abilities to elicit empathy can be sidelined by a too heavy emphasis on its technological capacities, or a failure to appreciate the personal and epistemic boundaries of the VR participant's, or author's, perspectives. The 'empathy machine' can fail to acknowledge the relationships between participants and VR experiences, where the participant plays an active role in the generation of an affective, meaningful sense of narrative. As is shown through the debates that followed, this can severely limit critical examination of what VR can offer to facilitate engagement with experiential narrative accounts.

Author and journalist, Elvia Wilk, considers that the 'empathy machine' provides a 'disturbingly functional view of emotion, reducing compassion to a lever to pull'[136]. The conception of

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[129] (Pavlik, 2018, p. 62)
[130] (Pavlik, 2018, p. 62)
[131] Milk, C., & Arora, G. (2015). Clouds Over Cidra. Retrieved from Docubase: https://docubase.mit.edu/project/clouds-over-sidra/
[132] (Milk, 2015)
[133] (Milk, 2015)
[134] (Milk, 2015)
[135] It was used for this purpose when *'Clouds Over Sidra'* was shown at the 2015 World Economic Forum's Annual Meeting of New Champions (SDG, 2023).
[136] (Wilk, 2018)

empathy as passively manufactured through VR overlooks the relational moral dimension that manifests through active engagement with VR. This can trivialise the real-life contexts being represented, eclipsing the value of the active experience with the allure and novelty of the VR platform[137]. Furthermore, claiming to authentically re-produce another's experiences may serve to validate pre-existing prejudices. Adi Robertson explores where such a functional and reductive notion of empathy can be re-directed to validate forms of bigotry[138]. The potential for this is demonstrated in the satirical VR film *'Extravaganza'*[139] (Figure 12), where a media executive tries a VR experience which glorifies crude gender and racial stereotypes. The puppet show aesthetic of this work seems to trivialise and reduce the complexity of the lived experience of the characters it portrays; rendering the people and the societal issues that these stereotypes represent into cartoonish entertainment (Figure 12: Still from 'Extravaganza' (2017). By placing the point of view on the stage from the perspective of the puppet characters (Figure 13: Still from 'Extravaganza' (2017), the work positions the participant's presence on the other side of the divide between the VR viewer and the individual being represented within the VR experience. This illustrates the potential powerlessness of the individuals the characters within the work represent to express their lived experiences, as they are forced to enact the mechanised display that the puppet show is pre-programmed to portray. The use of presence and the aesthetic choices used within this work highlights the potential for misappropriation of another's experience to represent them in a way that validates pre-existing prejudices, which Shaftel underlines as he explains 'This puppet show was clearly made for people like [the media executive], by people like him, and it's certainly not making the world any better'[140]. It also highlights the potential passive position that VR may set up for the participant, who is invited to uncritically absorb this representation of life experience as content without exploring the potential of VR to invite a relational moral dimension with the life experience being represented.

[137] Prince, C. (2020, June 15). The Danger Of Calling VR An "Empathy Machine". Retrieved from The Gamer: https://www.thegamer.com/chris-milk-tedtalk-vr-empathy-machine/

[138] Robertson, A. (2017, May 3). VR was sold as an 'empathy machine' — but some artists are getting sick of it. Retrieved from The Verge: https://www.theverge.com/2017/5/3/15524404/tribeca-film-festival-2017-vr-empathy-machine-backlash

[139] Shaftel, E. (2017). Extravaganza. Retrieved from Extravaganza: https://www.extravaganza.film/

[140] (Robertson, 2017)

Figure 12: Still from 'Extravaganza' (2017)[141]
Image removed for copyright reasons

Figure 13: Still from 'Extravaganza' (2017)[142]
Image removed for copyright reasons

Wilk explores the use of trauma to elicit empathy in VR experiential narratives; where VR 'conveys trauma as content' [143], deliberately inviting VR participants to embody representations of traumatic situations in order to elicit empathy. Wilk considers where this approach may create 'an aesthetic of misery'[144] that overrides the specificity of an experiential narrative context. Making suffering visible in this way may also enable the VR participant 'to expunge—or, better, forget—the privilege of being the seer rather than the (suffering)

[141] Shaftel's *'Extravaganza'* (2017): https://vrscout.com/news/vr-short-extravaganza-puppet-show/ accessed 16th November 2023
[142] Shaftel, E. (2024, August 21). Extravaganza. Retrieved from Ethan Shaftel: https://www.ethanshaftel.com/projects/extravaganza/
[143] (Wilk, 2018)
[144] (Wilk, 2018)

seen'[145]. Wilk describes that 'such a one-way understanding of empathy reproduces power relations rather than levels them'[146]. VR experience does not lead to real empathic response 'if it does not also lead one to consider the other as a separate person with agency and not just a facet of the self'[147]. Quoting film and video artist, Sandy Cioffi, designing VR experiential narratives should 'not just be about how I have more empathy for you. And it's not just about how I better understand me. It's that I genuinely believe there's a we'[148].

I will explore these debates through the collaborative context of this enquiry. Working in close collaboration with the subjects of the experiences I explore in practice, I will examine how translating their experiences through collaborative VR design may develop a shared understanding of their experiences between us. Rather than a one-sided, functional representation of their life experiences (what Cioffi describes as an 'extraction model' where a designer 'scoops up the material according to the story [they] want to tell, and use it to build a cohesive narrative'[149]), I will use collaborative design methods to explore where a shared sense of agency to create VR works reveals the most appropriate ways to translate their life experiences in VR. I am interested in examining more than the traumatic aspects of my collaborator's experiences; gathering a sense of the value their experiences hold for them and the specific manner that they desire to translate them. I will explore how methods to design for presence may translate the embodied affectivity that my collaborator's life experiences manifest to them. I will examine where this creates opportunities for me to explore relational affective qualities with translations of collaborator's life experiences through designing for presence, and how this may contribute to contemporary critical debates on the creative possibilities and ethical limitations to design VR experiential narratives.

The next section explores critical perspectives on the relational and transformative potentialities of VR experiences, supporting my approach to affective engagement with VR experiential narrative design through presence.

Relational Potentialities in VR Experience Design

Andrea Gaggioli explores the relational potentialities of VR experiential narratives by examining the personal and epistemological transformation that a participant actively contributes to through engagement with VR experiences[150]. He considers where this relational understanding of engagement with VR leads to richer and more inclusive perspectives within experiential narrative contexts.

Gaggioli considers how VR experiences can facilitate 'epistemic expansion through the (controlled) alteration of sensorial, perceptual, cognitive and affective processes' [151].

[145] (Wilk, 2018)
[146] (Wilk, 2018)
[147] (Wilk, 2018)
[148] (Wilk, 2018)
[149] (Wilk, 2018)
[150] Gaggioli, A. (2016). Transformative Experience Design. In A. Gaggioli, A. Ferscha, G. Riva, S. Dunne, & I. Viaud-Delmon, Human Computer Confluence Transforming Human Experience Through Symbiotic Technologies (pp. 97-121). De Gruyter. p. 97
[151] (Gaggioli, 2016, p. 97)

Highlighting the centrality of the participant's role in the generation of meaningful, impactful VR experiences, Gaggioli describes a transformative experience as a 'sudden and profound change in the self-world' with epistemic and personal dimensions that 'not only changes what you know, but also changes how you experience being yourself'[152].

The personal dimension of transformative experience concerns the capacities of VR to encourage the emergence of embodied meaning via disrupting a normative sense of self in virtual environments. This is elucidated through Keltner and Haidt's concept of awe; a sense of 'perceived vastness (something that is experienced as being much larger than the self's ordinary frame of reference)' and an 'inability to assimilate an experience into current mental structures'[153]. The epistemic dimension points to where the controlled disruption of self in VR consolidates into new understanding. Gaggioli references Mezirow's *'Transformative Learning Theory'*[154], where the participant becomes critically aware of 'how and why our assumptions have come to constrain the way we perceive, understand, and feel about our world'[155]. By becoming aware of these epistemic boundaries, Mesirow argues that it is possible to change knowledge structures 'to make possible a more inclusive, discriminating, and integrating perspective'[156].

Gaggioli cautions against the reduction of experiential narratives to pre-authored structures which could delimit the potential for meaningful, participant led virtual experiences; 'since any personal transformation has an inherent subjective dimension, it is not possible to know in advance how the experience will feel for the individual, before it is actually lived through'[157]. Rather, 'active involvement of the individual'[158] is central to the generation of meaningful narrative structure within VR experiences. Gaggioli connects presence to the generation of subjectively constructed and meaningful VR experiences; 'VR can be used to generate an infinite number of "possible selves", providing a "subjective window of presence" into unactualized but possible worlds'[159]. Through this, Gaggioli outlines the some of the capacities of presence in VR to enable active engagement with experiential narrative. Novel ways to apprehend VR experiential narratives are facilitated via emergent, embodied, and personal relationships with VR experience.

I will draw on this critical understanding of the relational capacities of VR experience in practice. By examining the interactive and responsive ways VR can encourage embodied, subjective relationships with VR experiences, I will explore new ways to actively engage with VR experiential narratives. I will explore the impact that experimentation into embodied presence has on engagement with my collaborator's life experiences; where, by challenging

[152] (Gaggioli, 2016, p. 98)
[153] Keltner, D., & Haidt, J. (2003). Approaching awe, a moral, spiritual, and aesthetic emotion. Cognition and Emotion, 297-314. p. 304
[154] Mezirow, J. (1991). Transformative Dimensions of Adult Learning. Jossey-Bass.
[155] (Mezirow, 1991, p. 167)
[156] (Mezirow, 1991, p. 167)
[157] (Gaggioli, 2016, p. 106)
[158] (Gaggioli, 2016, p. 106)
[159] (Gaggioli, 2016, p. 107)

expanded senses of embodied presence in translations of my collaborator's experiences, I may encourage a more personal, inclusive and integrating perspective within these contexts.

The next section builds on understandings of interactive embodiment by examining contemporary perspectives on embodied engagement with VR. This extends understanding of the implications of designing for embodied engagement within VR experiential narrative. It supports my practice-based examination into where the specific embodied capacities of presence in VR may encourage subjectively constructed and meaningful relationships with experiential narratives.

Engaging with VR Experiential Narratives Through Presence

Embodied Presence within VR Experiential Narratives

In '*Narrative as Virtual Reality 2'*[160], Ryan discusses where VR offers new potentialities for embodied, immersive engagement with experiential narratives over other interactive storytelling platforms. Ryan suggests that VR uniquely enables designers to strike on a deeper level than the purely cerebral involvement of the 'play of signification' of other storytelling platforms, enabling a deeper level of embodied engagement with narrative experiences[161].

Ryan examines the potentialities of VR to offer enhanced embodied and subjective engagement with VR experience by exploring parallels between engagement in actual and virtual worlds; 'the incorporeal participation of the user in VR can be termed world-creative in the same sense that performing actions in the real world can be said to create reality'[162]. In making this parallel Ryan seems to suggest that, whilst a participant is not physically present in a virtual world in the same way as the actual world, there is a sense of their embodiment carried into VR that is central to the creation of narrative experiences. This starts to suggest where the embodied capacities of VR builds relationally with a sense of the self already held by a participant, generating the potentialities for subjective relationships within VR experiential narratives.

Ryan explores this 'world-creative' potential of VR with reference to 'The Narrative Paradox' within interactive digital storytelling. Games Design Professor, Jouni Smed, and colleagues define 'The Narrative Paradox' as a 'conflict between the interactor's freedom of choice (or agency) and the author's control over the storyworld'[163]. It concerns where an immersive experience that enables actively involved to affect narrative as it unfolds may directly conflict with a design requirement for authorial control. Addressing this, Ryan points out that the emergence of narrative in VR is inevitable, even in the absence of a directed authorial context; when participants freely engage with a 'narratively designed game world, their discourse inevitably takes the form of a story'[164].

[160] (Ryan, 2016)
[161] (Ryan, 2016)
[162] (Ryan, 2016, p. 208)
[163] Smed, J., Suovuo, T., Trygg, N., Skult, P., & Hakonen, H. (2018). The Digital Campfire: An Ontology of Interactive Digital Storytelling. Modern Perspectives on Virtual Communications and Social Networking, p. 22
[164] (Ryan, 2016, p. 210)

The term 'narratively designed' could be applied quite loosely to VR, as even in abstract 'sandbox' style VR experiences in which there is no overt narrative arc, for example *'Cosmic Sugar VR Pro'*[165] (Figure 14), or VR puzzle game *'Squingle'*[166] (Figure 15), the phenomenal ways that they can be interacted with may be generative of narrative structure. This seems to be the intention of the designers of *'Squingle',* where the promotional material suggests personality traits for the environments and encourages the participant to discover narrative meaning through play; 'Liquid crystal levels are alive, mystical, and other-worldly… Grab the two revolving orbs and guide them through iridescent mazes… Will you discover the meaning of Squingle?'[167].

Figure 14: 'Cosmic Sugar VR Pro' (2016) [168]
Image removed for copyright reasons

[165] Lobser, D. (2018, November 30). Cosmic Sugar VR Pro. Retrieved from Steam: https://store.steampowered.com/app/560410/Cosmic_Sugar_VR_Pro/
[166] Outram, B. (2021, July 15). Squingle. Retrieved from Steam: https://store.steampowered.com/app/1439040/Squingle/
[167] (Outram, 2021)
[168] *'Cosmic Sugar VR Pro'* (2018): https://store.steampowered.com/app/560410/Cosmic_Sugar_VR_Pro/ accessed 26th October 2023

Figure 15: 'Squingle' (2021) [169]
Image removed for copyright reasons

Expanding on her point about narrative emerging through VR experiences, Ryan states that narrative is something 'people actualise when they represent their personal experiences from a retrospective point of view'[170]. It could be argued that the development of narrative via the retrospective interpretation of VR experiences that Ryan refers to distances the emergence of experiential narrative from active, embodied engagement with VR. However, Ryan points to where VR re-situates the generation of narrative within active VR engagement through her concept 'ontological interactivity'[171]. Here, the participant is understood as a 'first-person… individuated member of the world' that contributes to the generation of narrative through an active engagement that is stripped of a 'self-reflexive dimension'[172]. Ryan seems to suggest a relationality between an emergent sense of embodiment in VR and a narrative as it unfolds; 'being-in-a-world is a way to make this world flow out of the acting body, a way to create it'[173].

Ryan's comments position an embodied sense of presence as central to the development of meaningful and relational narrative experience in VR. Her notion of the world flowing creatively from the (inter)acting body in VR speaks to a processual and contingent understanding of the generation of meaningful VR experiences through embodied presence. Here, the distinctions between an embodied self and narrative seem to loosen as the potentialities for meaningful VR experiences are created within an emergent, relational zone between them. Ryan suggests that it is through a participant's emergent sense of embodied presence in a virtual world that is simultaneously generative of the content and structure of experiential narratives. I relate this to the personal and epistemic dimensions of Gaggioli's 'Transformative Experience

[169] *'Squingle'* (2021): https://store.steampowered.com/app/1439040/Squingle/ accessed 26th October 2023
[170] (Ryan, 2016, p. 164)
[171] (Ryan, 2016, p. 163)
[172] (Ryan, 2016, p. 164)
[173] (Ryan, 2016, p. 209)

Design'[174]; where, by challenging senses of embodied self through relational, embodied engagement with VR, a participant may generate a sense of experiential narrative that assimilates a broader personal viewpoint and a more inclusive and integrating perspective.

The next section explores the materiality of embodied, relational engagements with VR in more detail, building understanding of the potentialities in designing for embodied presence in VR to meaningfully engage with experiential narratives.

Affective Engagement with VR Through Presence

Lisa Blackman's writing on engagement with technology expand understanding of how affective, material qualities of VR experience emerge through emergent, relational senses of embodied presence. In her book 'Immaterial Bodies: Affect, Embodiment, Mediation'[175], Blackman critiques affective, material engagements with technologies, exploring how 'affects can be channelled or materialised' through relational engagements with technologies that serve as conduits for the 'circulation, transmission and embodiment of affective intensities'[176]. For Blackman, relational engagements with technologies are where affective, material experiences take form. This affective materialisation emerges through a primarily embodied mediation in which strict separations between cognition and affect are difficult to sustain[177]. As such, the affective qualities that may be registered through engagement with technologies do not presuppose an ideological or discursive structure which may delimit their relevance or meaning. Blackman describes this as a 'different way of knowing that is felt but perhaps difficult to articulate'[178], suggesting a particular way of embodied knowing that operates in an alternative mode to rational comprehension.

Thinking in terms of embodied engagement, or embodied knowing, provides a frame to consider how sense of embodied presence in VR enables affective engagement and understanding of experiential narratives. It suggests critical examination of the relational ways that presence manifests through active engagement with VR, generating meaningful and affective relationships with experiential narratives that are prior to summary retrospective interpretation. This extends Ryan's[179] consideration of narrative developing through an emergent sense of self in VR by emphasising the material qualities of relational, embodied VR engagements. It positions critical examination of the links between presence and the development of experiential narrative squarely within the material, embodied encounter with VR. It is through embodied engagement with VR experiences that a sense of narrative is affectively felt, before it is cognitively known. This is the unique potentiality that designing for presence in VR offers to experiential narrative, where a relational sense of embodied presence in VR becomes the primary conduit for meaningful and impactful experiential narratives.

The next section explores design approaches to presence in VR across academic research and design perspectives via the components of VR highlighted through immersive design;

[174] (Gaggioli, 2016)
[175] Blackman, L. (2012). *Immaterial Bodies: Affect, Embodiment, Mediation*. Sage Publications.
[176] (Blackman, 2012, p. 174)
[177] (Blackman, 2012)
[178] (Blackman, 2012, p. 4)
[179] (Ryan, 2016)

subjectivity, embodiment and responsivity. This builds practical understanding of opportunities to explore the multifaceted, embodied, affective and emergent qualities of presence in VR experience and its fundamental links to the development of experiential narrative.

Perspectives on Designing for Presence in VR Experience

'Presence' is a common term used within critical examination of the embodied and phenomenal capacities of VR across academic, art and design contexts. Presence has already been used across many of the references examined within this chapter:

- Zuckerberg's 'deep feeling of presence', the central defining feature of the *Metaverse*[180]. Zuckerberg suggests feelings of naturalness and realism through presence that raises core issues around the limitations of the embodied and experiential potentialities of VR.
- Pavlik's 'user presence' through which he suggests VR encourages enhanced affective understanding, better enabling participants to contribute to current societal and cultural debates[181].
- Milk's description of where VR enables a participant to feel 'present with the world [they] are inside and… with the people [they] are inside it with'[182]. Presence is a foundational concept leading to Milk's description of VR as the 'empathy machine'[183]. This raised significant ethical issues concerning where an emphasis on the technical potentialities of VR can trivialise non-fictional experiential narrative contexts, stifling examination of active participant contributions to affective understanding in engagement with VR experiences[184].
- Gaggioli's description of VR offering a 'subjective window of presence' into possible selves and worlds[185]. Here, presence is a relational term denoting where VR offers the potentiality for a personal and epistemological transformation via subjective, embodied engagement with VR experiences.

Ryan also considers presence, describing critically examining presence in VR as technological, psychological, and phenomenological challenge. Whereas a technological perspective on presence may explain how 'digital information systems can connect the user to a virtual world', Ryan suggests that the subjective qualities of presence requires a phenomenological perspective that is less easily quantified[186]. This suggests design experimentation into where active, phenomenal engagement with VR within a specific experiential narrative design context may encourage senses of embodied presence to manifest. Through this, designers may explore how presence encourages a subjectively constructed 'embodied knowledge' of experiential

[180] (Meta, 2021)
[181] (Pavlik, 2018)
[182] (Milk, 2015)
[183] (Milk, 2015)
[184] (Wilk, 2018)
[185] (Gaggioli, 2016, p. 107)
[186] (Ryan, 2016, p. 53)

narratives, and the design methods that may enhance this way of actively engaging with VR in practice.

The following sections explore presence in VR design via the Immersive Design principles identified above; subjectivity, embodiment, and responsivity. Examining where VR design experiments with these components of VR provides a context that I will explore further within this enquiry. In addition to reviewing design methods towards deepening an understanding of presence, these sections will also explore where engagement with presence build relationships with the content and structure of VR works. This builds understanding of the potential relationships between presence and experiential narratives in VR, outlining opportunities for me to practically and collaboratively explore the creative possibilities and ethical implications in translating life experience into experiential narrative accounts through presence.

Designing for Presence in VR Experiences

Subjective Engagement with VR Experiential Narratives Through Presence

This section reviews examples of VR practice that explore how formulating and augmenting senses of presence in VR can encourage the development of subjectively constructed experiential narratives. This starts to show some of the potential this enquiry develops in the potentialities of designing for presence VR to enable subjective engagement with translations of life experience in VR experiential narratives.

Laurel and Strickland's *'Placeholder'*[187], developed at the BNMI in 1992, critically examines how collaborative design methods with VR may explore subjectively constructed formulations of embodied presence within abstracted virtual representations of actual spaces. Their work examines relationships between embodied presence and subjectivity, where interpretation of VR experiences primarily formulates through types of embodied interaction VR offers. *'Placeholder'* experiments with this by providing different types of interaction that encourage the embodiment of non-human characters. This experimentation comments on how inviting different ways to subjectively engage with VR facilitates non-linear narrative structures, and the impact this has on the interpretation of experiential narratives.

The design of *'Placeholder'* experimented with the translation of subjective perspectives of the Canadian Rocky Mountains in virtual space. Laurel and Strickland considered how natural locations may be subjectively interpreted by human and non-human inhabitants. They designed experimental modes of interaction to enable participants to embody four animal 'spirit critters' (spider, snake, fish and crow (Figure 16))[188]. By merging with the spirit critters, participants are invited to adopt control schemes that encourage participants to feel they are embodying these characters. Through this, Laurel and Strickland explore the relational links between diverse subjective perspectives and the experiential structures that formulate across them.

[187] Laurel, B., & Tow, R. (2023, October 26). Placeholder Virtual Reality Project. Retrieved from Tau Zero: http://tauzero.com/Brenda_Laurel/Placeholder/Placeholder.html

[188] Laurel, B., Strickland, R., & Tow, B. (1994). Placeholder: Landscape and Narrative In Virtual Environments. ACM SIGGRAPH Computer Graphics, 118-126. p. 121

Figure 16: The 'crow' and 'snake' 'spirit critters' as they are encountered in 'Placeholder' (1993) [189]
Image removed for copyright reasons

The work features a non-linear experiential structure that is visualised by an 'allegorical map'[190] (Figure 17). This map visualises the various paths a participant may take through the work whilst also suggesting something of the subjective qualities that engagement as each 'spirit critter' may offer[191].

[189] *'Placeholder' (1993):* https://vimeo.com/27344103 accessed 26th October 2023

[190] Evans, C. L. (2018, December 1). Brenda Laurel's Placeholder: In dreams everybody flies their own way. Retrieved from Artlink: https://www.artlink.com.au/articles/4724/brenda-laurelE28099s-placeholder-in-dreams-everybody-fl/

[191] The path of the snake suggests a way of moving that is meandering and indirect. The fish have a more vertical path as they ascend or descend the waterfall. The spirals suggest where it may be possible for a participant to transform into another 'spirit critter' and continue their journey.

Figure 17: 'Allegorical map' of 'Placeholder' (1993) [192]
Image removed for copyright reasons

In emphasising the emergent and participant led narrative structure within the work, the allegorical map supports Laurel's description of *'Placeholder'* as a set of environments 'imbued with narrative potential'[193]. By modifying the types of interaction available to the participant as they explore, the work continually problematises senses of presence that emerge. This reawakens focus on where interaction encourages an active encounter with the work and where this builds a sense of non-linear narrative. Laurel and Strickland describe how the narrative potential of the different types of interactions, along with the personal 'memories and fantasies'[194] that manifest through them, form the unique character of the narrative experience that unfolds.

Rather than a realistic, representative environmental design approach, Laurel and Strickland explored what they described as 'evocative details' of the natural environments they worked within to endeavour to encourage subjective engagements with their work. They explored these details via collaborative experimentation with a Banff based theatre troupe, The Precipice Theatre Society. Laurel and Strickland explained that this collaboration served to 'tease out the fundamental affordances of each space' they experimented with[195]. Co-creating with the troupe as they improvised performative responses to natural sites as 'spirit critters' revealed evocative, subjective, and evolving experiential qualities of these sites. These qualities were translated into VR and incorporated within a non-linear experiential structure. For example, Laurel and Strickland note the acoustic properties of natural sites that were translated into spatial audio qualities that evoke changing senses of spatial depth, self-location, and to position spirit critters. The troupes use of candles within a cave environment generated

[192] *'Placeholder'* allegorical map: https://www.artlink.com.au/articles/4724/brenda-laurelE28099s-placeholder-in-dreams-everybody-fl/ accessed 30th October 2023
[193] (Laurel, Strickland, & Tow, 1994, p. 124)
[194] (Laurel, Strickland, & Tow, 1994, p. 124)
[195] (Evans, 2018)

a 'flickering darkness' that created a fluctuating sense of spatial scale and the proximity of cave boundaries. Recorded vocal responses from the troupe provided 'fragments of narrative'[196] that supported a non-linear narrative structure. These ambiguous impressions of the virtual spaces invite ambiguous interpretation of the VR experience that unfolds.

Evaluating the ways in which the troupe embodied various animal characters supported the development of what Laurel called 'smart costumes'[197]; types of embodied interaction that suggest the specific perceptual and experiential characteristics of the four spirit critters. Laurel and Strickland note where this highlighted 'new ways in which people could play in the environments' and what types of interaction facilitated such play[198]. They purposefully excluded visual representations of the body and instead suggested alternative senses of embodiment through interaction. This included filters to the character's voice, graphical overlays applied to visuals[199], and different modes of interaction to enable movement[200].

Laurel notes that the smart costumes that were implemented 'immediately and strongly influenced participants' behaviours'[201]. They explain that their experimentation into alternative formulations of embodiment in VR sought to problematise issues around body and gender in the realm of the senses[202]. This suggests where challenging embodied presence enables experimentation with the relationalities between a participant and VR experience and complicates egocentric human perspectives. *'Placeholder'* begins to demonstrate how VR design can affect subjective engagement with experiential narratives through alternative modes of embodied interaction, complicating experiential narrative structure and generating new personal perspectives. They start to suggest where interpretation of VR experience is primarily affected by the embodied interactive capacities of VR.

Building on this, the next section reviews experimental approaches to embodied presence in VR, exploring the links between embodied presence and the interpretation of experiential narrative.

Embodied Presence in VR Experiences

This section reviews examples of VR practice that explore where embodied interaction in VR encourages senses of embodied presence and subjective engagement with VR experiences. This outlines some of the territory that this enquiry develops to explore where subjective relationships with translations of collaborator's life experiences can be encouraged through senses of embodied presence in VR.

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[196] (Laurel, Strickland, & Tow, 1994, p. 124)

[197] The 'smart costumes' features a custom-developed belt worn below the waist to inform direction of movement, a handheld piece of flexible plastic called a 'Gripee' that tracked hand movement and enabled simple manipulation of virtual objects, and a microphone that enabled communication with virtual characters (Laurel, Strickland, & Tow, 1994, p. 123)

[198] (Laurel, Strickland, & Tow, 1994, p. 124)

[199] The snake featured an infrared filter simulating the infrared sensing pit organs of rattlesnakes.

[200] The crow required participants to flap their arms like wings.

[201] (Laurel, Strickland, & Tow, 1994, p. 126)

[202] (Laurel, Strickland, & Tow, 1994)

Gromala and Sharir's *'Dancing with the Virtual Dervish: Virtual Bodies',* premiered at the Banff Centre for The Arts in 1993, experiments with senses of embodied self, body representation and interaction in VR, and the potential impact this has on subjectively constructed VR experiences. Described by Gromala as the 'first artistic VR artwork concerned with embodiment' [203], it combines embodied interaction with large-scale abstracted representations of Gromala's body to explore how VR problematises the sense of inhabiting our own body whilst in virtual space[204].

Gromala relates the design of this work with a technologically mediated experience of her own body whilst undergoing surgery; 'when, awake during surgery, I watched my own viscera being altered and manipulated on a large screen in a research hospital's surgical theatre'[205]. For Gromala, this raised questions of the place of the body in simultaneously subjective and technologically determined positions. Gromala and Sharir experimented with this dual positionality by exploring performative, embodied potentialities within a virtual space that includes large-scale representations of Gromala's body. Performing improvised dance in VR in response to this expanded and relocated representation of Gromala's body, Sharir explores senses of embodiment in overlapping actual and virtual senses of his own body. He notes 'as the dancer/choreographer is both in the physical/performance space as well as in the simulated virtual/cyberspace, I have experienced physically and spiritually intertwined senses of embodiment and disembodiment'[206]. He describes embodiment in VR as a 'world of possibilities' that is based on the potentialities for embodied engagement in VR. He notes that, when designing for VR 'one must create a world open to user interactions… a non-linear, open-ended, almost fragmented composition'[207].

Performance Technologies Professor, Johannes Birringer, questions the level of embodiment *'Dancing with the Virtual Dervish'* invites. Birringer suggests that Sharir's performative experimentation in VR represents more of a 'distressed, disoriented body experience'; a reaction to a state of disconnection from the body rather than an enhanced sense of embodiment[208]. Sharir is also critical of the embodied VR experience, commenting on a sense of disembodiment in a virtual space that does not carry over the fullness of his actual body. As he cannot fully lose the sense of the 'body [that] remains in the physical realm', he experiences a paradoxical 'sense of disembodiment [that] cannot be disconnected from the sensation of embodiment'[209]. Sharir notes that this problematises the embodied VR experience, leaving an

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[203] Gromala, D. (2023, November 27). Dancing with the Digital Dervish. Retrieved from Gromala: http://gromala.iat.sfu.ca/New/dervish.html

[204] TransformingPainTV. (2010, November 5). Dancing With The Virtual Dervish. Retrieved from YouTube: https://www.youtube.com/watch?v=EIQw_QTshLU

[205] Gromala, D., & Sharir, Y. (1994). Dancing with The Virtual Dervish: Virtual Bodies. Virtual Reality Software and Technology, 321-328. p. 321

[206] (Gromala & Sharir, 1994, p. 322)

[207] (Gromala & Sharir, 1994, p. 322)

[208] Birringer, J. (1998). Media and Performance: Along the Border. Baltimore: John Hopkins University Press. p. 374

Birringer's comments are also reviewed in: Dixon, S. (2006). A history of virtual reality in performance. International Journal of Performance Arts and Digital, 23-54.

[209] Moser, M. A., & Macleod, D. (1996). Immersed in Technology: Art and Virtual Environments. Massachusetts: Massachusetts Institute of Technology. p. 284

open question on the phenomenological potentialities and technical limitations of VR[210]. Sharir's research outlines that, whilst there are technological limitations in the sense of embodiment that VR may offer, there are nonetheless creative potentialities for experimentation where embodiment leads to formulations of presence and how this opens up possibilities for subjective relationships with VR experiences. This is an area of VR design I will explore this further through practice-based research, experimenting with how a participant's sense of their own embodiment may be augmented through interaction in VR and where this subjective engagement with experiential narratives.

Further exploring embodiment and sense-making in VR, Julieta Aguilera's doctoral thesis, *'Mindfulness and Embodiment in the Design of a Synthetic Experience'*[211], explores where embodied interaction forms the basis of metaphorical understanding of immersive experiences. Aguilera's work demonstrates how specific types of interaction can encourage expanded senses of embodied presence in virtual space, connecting presence with the metaphoric interpretation of immersive experiences.

Drawing on concepts including Lakoff and Johnson's 'embodied metaphor'[212], Aguilera's research explores the central idea that embodied interaction is already imbued with potential metaphoric meaning[213]. Through this, Aguilera examines how embodied interactions develop and structure subjective understanding of immersive experience. Her practice concerns where immersive technologies invite embodied engagements with scientific discoveries that, due to the scientific apparatuses used to extend or abstract human access to reality, are not available to unaided human perception, e.g., representations of the cosmos on a vastly macro scale.

Aguilera explores a model that integrates 'the whole multi-sensory… body into the experience with an understanding of its biases and constraints within the inhabited environment'[214]. This includes four design research criteria:

'(1) why and how is spatial depth conveyed with vision and sound,

(2) why and how is presence conveyed,

(3) why and how is the body tracked to be coupled with the synthetic experience so as to give a sense of embodiment to the experience, and

(4) why and how much of the scope of the virtual space covers the perceptual field presented to the human body'[215]

Aguilera invites an expanded sense of embodied presence by tracking body movement to elements of virtual environments. Aguilera explains that coupling the body to the motion of

[210] (Moser & Macleod, 1996)
[211] Aguilera, J. (2019). Mindfulness and Embodiment in the Design of a Synthetic Experience. University of Plymouth: PEARL.
[212] Lakoff, G., & Johnson, M. (1980). Metaphors We Live By. University of Chicago Press.
[213] Lakoff and Johnson show this through reference to metaphors that use physical experiences to express more subjective or abstract parts of human experience. For example, falling in love, or grasping a concept (Lakoff & Johnson, 1980).
[214] (Aguilera, 2019, p. 111)
[215] (Aguilera, 2019, p. 160)

virtual objects is a way to 'confirm or characterise' presence, suggesting that parts of 'the environment are part or an extension of one's own body structure'[216]. Exploring this potentiality, Aguilera's *'Big Bang Tunnel'*[217] experimented with embodied relationships with abstract theoretical concepts of the beginnings of the universe on micro and cosmic scales. She experimented with how a sense of expanded embodiment can be facilitated through interactive particles in virtual space that responded to the participant body position and movement. The physical dynamics of particles representing celestial bodies suggested differences in density and force relative to the size, movement and proportional scale of the participant. Aguilera suggests that incorporating virtual camera motion over point of view tracked by a VR headset encourages a suggestion of weightlessness as the perspective is altered by the simulated physical dynamics. The participant is not visibly represented in this work, their presence is suggested by the role they play in a complex physics simulation. This non-representational approach to embodiment in VR encourages exploration of the ways embodied interaction effects the virtual environment, expanding the perceived sense of embodiment into virtual space.

Aguilera discusses the unique capacities of VR and other immersive platforms to engage the body as cognition emerges; 'The potential to focus on a more transient, unique and interactive manner, opens up an experience to embodied spatial and temporal explorations'[218]. This outlines a processual and emergent, rather than fixed and linear, understanding of meaningful embodied experience in VR. It suggests design exploration of subjectively constructed VR experiences within the active embodied encounter with VR. Aguilera shows this can be particularly effective within VR experiences that translate aspects of reality that are normally excluded from the individual human perceptual frame.

Experiential art collective, Marshmallow Laser Feast (MLF), extend Aguilera's work in this context, examining the capacities of multi-participant VR experiences to 'probe the world beyond the limits of human perception'[219]. Barney Steel (Creative Director of MLF) speaks to the capacities of VR to do this as he discusses the differences between explaining a concept and where VR offers an embodied experience of it. Speaking to the latter, Steel suggests that VR offers a personal experiential context to relate to abstract concepts that would normally be excluded from human experience. MLF explore this in their work '*We Live in an Ocean of* Air', exhibited at The Saatchi Gallery in 2018[220]. Where Aguilera's work encouraged metaphoric understanding via an expanded sense of embodiment in VR, *'We Live in an Ocean of Air'* work extends this by including an abstracted, emergent body representation through a generative, responsive, and participatory work.

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[216] (Aguilera, 2019, p. 172)
[217] Adler. (2023, August 24). The Universe: A Walk Through Space and Time. Retrieved from Adler Planetarium: https://www.adlerplanetarium.org/explore/exhibits/the-universe-a-walk-through-space-and-time/
[218] (Aguilera, 2019, p. 114)
[219] Mediale. (2020, December 8). 'The Tides Within Us' interview with Marshmallow Laser Feast | Human Nature | York Mediale 2020. Retrieved from YouTube: https://www.youtube.com/watch?v=eO28znCLu-Q
[220] Saatchi. (2018, July 12). Salon 009: We Live In An Ocean Of Air. Retrieved from Saatchi Gallery: https://www.saatchigallery.com/exhibition/salon_009__we_live_in_an_ocean_of_air

'*We Live in an Ocean of* Air' incorporates VR, live motion capture, and a plate to detect participant's breathing to invite embodied interconnections between breathing and natural ecosystems. As participants inhale, they appear to breathe in floating particles which flow through an emergent representation of their vascular system. As they exhale, this embodied representation integrates with a wider network representing a giant sequoia tree and surrounding ecosystem. Participants are led through a series of perspectives that experiment with differences in scale, including standing before the giant tree and then travelling through the microscopic networks that comprise it (Figure 18).

Figure 18: Participants within Marshmallow Laser Feast's 'We Live in an Ocean of Air' (2018)[221]
Image removed for copyright reasons

The use of breath, described as 'a meditative respiratory exercise in synchronicity with a giant tree'[222] is a crucial rhythmic element to support an emergent, embodied relationship with the VR work. This rhythmic responsivity creates an abstracted body representation, disrupting egocentric, human perspectives by merging the represented body with the surrounding virtual environment. This suggests an expanded and inter-dependent embodiment as a sense of embodied presence merges with an evolving particle simulation. Steel explains that the underlying concept of *'We Live in an Ocean of Air'* is that 'there is no such thing as an individual'[223]. The work challenges notions of isolated beings within what is understood as an interconnected, mutually dependent, living planet by inviting a sense of embodied presence within what Steel describes as 'a nest of ecosystems'[224]. This embodied presence is

[221] Marshmallow Laser Feast (2018): https://cariki.co.uk/blogs/the-green-road/we-live-in-an-ocean-of-air-review last accessed 27th November 2023
[222] Fabbula. (2023, August 24). Marshmallow Laser Feast- Focus #3: We Live in an Ocean of Air. Retrieved from Fabbula: https://fabbula.com/artists/we-live-in-an-ocean-of-air-by-marshmallow-laser-feast/
[223] WinkBall. (2018, December 11). We Live in an Ocean of Air. Retrieved from YouTube: https://www.youtube.com/watch?v=8WVN8lchIVI
[224] (WinkBall, 2018)

fundamentally linked to the emergence of meaning the work, manifesting through a processual and relational, embodied, and rhythmic responsivity with the dynamics in play.

The above case studies demonstrate the potentialities of VR to explore expanded senses of embodied presence through interaction and bodily representation. This seems to be the most effective when a sense of embodiment manifests through VR dynamics that are abstracted from or exceed the frame of the body. Becoming aware of how a virtual environment responds to their body invites an emergent understanding of the potentialities for embodiment in virtual worlds and, with it, an active and creative role in the progression and interpretation of VR experiences. Applying this to the design of experiential narratives through presence in VR, I will explore how expanded senses of embodied presence in VR may be experimented with to enable affective, embodied engagement with collaborator's life experiences. This will build practical understanding of the capacities VR offers to actively and affectively engage with VR experiential narratives.

The next section expands on approaches to designing responsivity in VR through embodied interaction. This builds understanding of the links between embodied presence and the interpretation of VR experience.

Affective Relationships with VR Experiential Narratives through Embodied Responsivity

This section reviews examples of VR practice that explore how embodied relationships with VR experiences can be enhanced through designing for embodied responsivity in virtual environments. This further outlines the design territory I contribute to in this enquiry, exploring where responsive virtual environments encourage senses of embodied presence that invite affective, relational understandings of translations of collaborator's life experiences.

Chelley Sherman's VR work, *'Das Is'*, created for OpenIDEO's 2016 *'Art of Dying'* event[225], experiments with embodied responsivity in VR to explore affective relationships with the experience of death and memory. She experiments with where an emergent sense of embodied responsivity in VR creates a relationality whereby 'narrative becomes bodily-felt'[226]. Sherman explains that, starting with the sense of disembodiment felt as a participant begins to engage in VR, participants are encouraged to bodily engage with responsive virtual environments to find an alternative sense of expanded embodiment and, through it, a subjectively constructed interpretation of the VR experience[227].

Within *'Das Is'*, the participant is guided by spatial audio cues to move between a series of overlapping virtual environments via portals that are activated by moving the VR headset towards them. The work challenges participant positionality and spatial depth through implausibly overlapping virtual spaces, multi-layered geometric shapes and fragments of human forms occluded by moving light sources. It also features spatial audio components with

[225] DreamLogic. (2023, November 30). Dream Logic's The Art of Dying. Retrieved from Dream Logic: https://www.dreamlogicart.com/the-art-of-dying

[226] Sherman, C. (2023, August 30). Das Is. Retrieved from Chelley Sherman: Space Is The Place: https://www.spaceisthe.place/das-is

[227] Sherman, C. (2018, April 23). Reimagine: Identity of Self @IDEO. Retrieved from Vimeo: https://vimeo.com/266211454

changing rhythmic qualities that seem to correlate with the pace of the physical dynamics in play (Figure 19).

Figure 19: Still from Sherman's 'Das Is' (2016)[228]
Image removed for copyright reasons

Sherman deliberately chose not to include body representation in her work, instead using responsivity to encourage an extended sense of embodiment into the environment. Through this, Sherman describes how participants 'not only play a role in the landscape but become it in response to the auditory stimulus and visceral visual movement while roaming endlessly though space and time'[229]. The interplay between visual and audio components encourages an evolving sense of embodiment as the participant tunes into their emergent dynamic and rhythmic qualities. Furthering some of Sharir's exploration on the paradoxical sense of embodiment/disembodiment in VR[230], Sherman uses these responsive qualities to experiment with the lingering sense of the actual body that persists within a VR experience. She considers how a new, expanded sense of embodiment may emerge within the abstracted responsive dynamics that take place where the body should be; 'realising that the thingness that was you is gone but still feeling the phantom bodily sensation of fragmented space passing through the body'[231]. Sherman suggests that using VR in this way 'allows you to swim in illusion… to find possibilities to shift concrete structures of perception'[232]; where VR encourages extended senses of embodiment in a relational, emergent space that is generated between a visibly absent but persistently felt self within virtual environments.

By inviting ambiguity and encouraging open-ended interpretation through embodied interaction in VR, Sherman endeavours to complicate participant relationships to death and memory, catalysing critical discussion rather than authoring a definitive presentation of the

[228] *'Das is'* (2016): https://www.spaceisthe.place/das-is last accessed 30th November 2023
[229] (Sherman, 2023)
[230] (Gromala & Sharir, 1994), (Moser & Macleod, 1996)
[231] (Sherman, 2023)
[232] (Sherman, 2018)

work's themes. This demonstrates an alternative to dictatorial or reductive narrative design approaches to experiential narrative engagement and structure. I will explore this further within the collaborative context of this enquiry; where embodied responsivity facilitates active embodied engagements with the translation of collaborator's life experience in a way that invites embodied and critical interpretation and enhances subjective relationships with another's experience.

The responsivity offered by *'Das Is'* focuses on participant position and exploration, but the components that make up the virtual environments do not modify their behaviours in response to participant interaction. Exploring responsive dynamics within the components of virtual environments (such as the responsive physics dynamics that suggested a sense of embodied presence in Aguilera's work) may enhance the potentialities for senses of expanded embodiment to relate with VR experiences. Demonstrating this, Char Davies' 1995 work, *'Osmose'*[233] and the following 1998 work, *'Ephémère'*[234], premiered at the National Gallery of Canada in 1998[235], incorporate a combination of custom embodied interaction hardware and responsive VR dynamics to explore where VR experiences may lead to a 'dissolution of boundaries between inner and outer; intermingling of self and other… through revealing inter-relationships within the world'[236]. Using embodied interaction to elicit responsivity within individual components of VR environments, the works present abstract explorations of the interrelationships between the body and nature (Figure 20).

[233] Davies, C. (2023, September 1). Osmose. Retrieved from Immersence: https://www.immersence.com/osmose/

[234] Davies, C. (2023, September 1). Ephémère. Retrieved from Immersence: https://www.immersence.com/ephemere/

[235] Davies, C. (1998, June 26). Char Davies: Ephémère. Retrieved from National Gallery of Canada: https://www.gallery.ca/whats-on/exhibitions-and-galleries/char-davies-ephemere

[236] (Davies, 2005, p. 271)

Figure 20: Still from Davies' 'Ephémère' (1998)[237]
Image removed for copyright reasons

The design of *'Osmose'* and *'Ephémère'* is in part informed by Davies experience of extreme myopic vision. Davies translates her way of perceiving through VR design via a deliberate use of low-resolution, translucent graphics that soften or occlude more sharply defined objects in response to where the participant is looking. The conceptual underpinning for this aesthetic is to disrupt visual clarity and encourage an embodied re-focusing that evokes a processual, subjectively constructed relationship with virtual space. Davies explains that, when visual acuity is softened through a de-focused field of view, 'perceptual attention is redirected… to what one "feels" all around… to an awareness of one's own subjectively embodied presence inhabiting space'[238].

Explaining how her experience of myopia informs her VR design, Davies expresses the importance of the disruption of habitual perspectives to encourage a fresh 'encounter with the world', and to 'develop ambiguity in order to evoke rather than illustrate'[239]. By drawing on her own life experience to develop a VR design aesthetic, Davies intends to encourage a subjective relationship with her work to emerge through the embodied VR experience. This is a core strategy I will take within the collaborative context of this enquiry. By engaging in VR design with collaborators, I will identify which aspects of their life experiences may be translated into the responsive, embodied capacities of VR. Developing an understanding of the affective significance these aspects of life experience hold for my collaborators informs how

[237] Davies' *'Ephémère' (1998): https://www.immersence.com/ephemere/ last accessed 30th November 2023*
[238] (Davies, 2005, p. 266)
[239] (Davies, 2005, p. 42)

they may be translated through designing for presence to invite subjective relationships with experiential narratives based on aspects of their lives.

Navigation in Davies' work is facilitated via a custom-made vest that enables participant movement through participant balance and breathing[240].

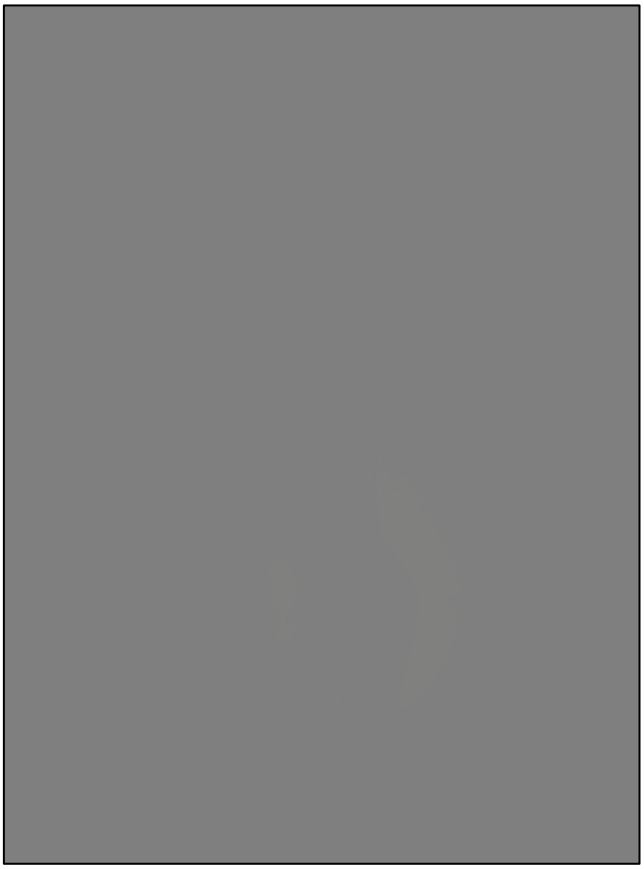

Figure 21: An 'immersant' engaging with Osmose (1995)[241]
Image removed for copyright reasons

Davies deliberately avoids the use of conventional control devices such as handheld controllers to encourage a more 'intuitive visceral process… [of] interacting in virtual space'[242]. As an automatic bodily function, breathing offers an embodied relationality with virtual space as well as providing a means to explore. Similarly to *'We Live in an Ocean of Air'*, the rhythmic quality of breath enables embodied responsivity between the participant and the work. Davies explains that the intention of this control scheme is to 'provide viewers with a sense of being in a profound and fluid relationship with these virtual realms… with a greater sensitivity to 'being-in-the-world'[243].

[240] Inspired by buoyancy control in scuba diving, participants navigate through multi-layered, vertically arranged virtual environments by breathing in to ascend, breathing out to descend, and affecting direction of movement by subtle adjustments to their centre of balance (Figure 22).
[241] Davies' *'Osmose'* (1995): https://www.immersence.com/ephemere/ last accessed 30th November 2023
[242] McRobert, L. (2007). Char Davies' Immersive Virtual Art and the Essence of Spatiality. Toronto: University of Toronto Press. p. 24
[243] (McRobert, 2007, p. 24)

This sense of embodied relationality with VR is further enhanced by environmental components that respond to the body. Davies utilises positional and movement data from the vest to affect environmental responsivity, such as objects that transform in response to participant proximity or recede from participants view[244]. Through these approaches to embodied interaction and responsivity, Davies' describes her intention for the work is to encourage 'a channel for communion rather than control'[245]. The relationship that is established here is contingent and emergent; an evolving relationship of sense and place-making where embodied interaction and the dynamic virtual environment intersect.

Sherman and Davies' approaches to non-linear experiential structure, and their participant focused approaches to embodied responsivity, provide useful case studies to examine where embodied, responsive interaction in VR can lead to subjective relationships VR experiences. By experimenting with embodied presence to encourage subjective relationships with their works, they challenge reductive approaches to the experiential narrative structures in VR. Their work starts to demonstrate the potential for the emergence of experiential narrative through an evolving sense of embodied presence in VR I will explore further in this enquiry. By exploring where embodied responsivity modifies and re-engages a sense of presence in its active manifestation, I will examine where embodied relationships with VR experience continually evolve to encourage subjectively constructed experiential narrative structures. I will explore where this may invite interpretive ambiguity within VR experiential narrative contexts, problematising summary authorial conceptions of experiential narratives and inviting critical discussion on the embodied and personal participant relationships with them. Through this, I will explore alternative methods to translate life experience into VR experiential narratives; where active formulations of presence in VR enables affective, embodied relationalities with experiential narrative contexts.

Summary: Exploring Experiential Narratives Through Designing for Presence in VR

Within this chapter, I reviewed foundational and contemporary understandings of how the concept of presence may be defined, and where it has been critically explored across research perspectives. By examining contemporary examples of VR art and design practice, I examined the technical capacities VR offers to immersive designers to design for presence in the development of experiential narrative works. This highlighted central critical and ethical debates concerning how VR design may approach translation of life experience into experiential narratives[246]. Key issues from these debates included:

- How a sense presence may be understood to manifest through engagement with the technical capacities of VR, and issues concerning how research approaches define and measure presence may be limited by the subjective differences in the manifestation of presence across participant engagement and research contexts.

[244] In addition to this, '*Ephémère*' also features a dynamic temporal structure which adds additional layers of cyclical change. A combination of day/night cycles and overlapping, longer seasonal cycles, affected through changes to lighting, colour and 3D forms, adds an additional sense of continual transformation.
[245] (McRobert, 2007, p. 86)
[246] (Wilk, 2018)

- Issues of representation in the translation of life experience through VR design; how translations of life experience through designing VR experiential narrative works includes the perspectives of those whose experiences are being translated.
- Personal and epistemic boundaries between VR designers and the subjects of experiential narrative works; where VR design may critically explore the possibilities and limitations of relational understandings with aspects of another's life experience in experiential narrative accounts.
- How the specific embodied and phenomenal capacities of VR may elicit subjective, affective engagement with translations of another's life experiences, and the ethics of encouraging embodiment of another in VR within this context.

Critically reviewing these debates across the literature reviewed outlined the following gaps in research that will be addressed by this enquiry:

- Where practice-based research into designing VR experiential narratives through presence may enable a designer to creatively and critically explore the nuanced differences between senses of presence across subjective perspectives. Where this broadens the scope to investigate the potentialities for subjective engagement with VR experiential narratives through designing for presence.
- Where collaborative VR design methods may critically investigate the relational and affective links between research collaborators and the translations of their life experiences that emerge in collaborative practice-based VR design research.
- Where active engagement with presence in the process of designing VR experiential narrative works may invite affective and critical engagement with another's life experience via an embodied and subjectively oriented perspective.
- Where critically exploring the affective, relational links between senses of embodied presence and translations of another's life experience in VR experiential narrative design research may develop new insight into VR design strategies to translate another's life experience in VR. Where this examines and tests ethical practice in the translation of another's experience through collaborative VR design research contexts.

Through collaborative VR design, I will critically explore appropriate methods for collaborator's to actively and creatively engage with the development of VR works that translate their life experiences. This will enable critical examination of VR as a design tool to translate life experience with collaborators. Conducting practice-based research across the experiential perspectives of my collaborators will provide valuable territory to challenge authorial control in the development of VR experiential narratives. Creative contributions from my collaborators will problematise my interpretation of collaborator's life experiences and the methods utilised for its translation through designing for presence in VR. This will challenge the practice-based research to find appropriate ways to establish a shared understanding of collaborator's life experiences and to facilitate its translation into VR works. This aims to critically address debates around where designing VR experiential narratives can actively include the perspectives of the subjects of the works in their development (where Wilk suggests the consideration of 'the

other as a separate person with agency' in the design of VR experiential narratives[247]) and facilitate affective engagements with experiential narratives based on their lives.

To develop this approach in practice-based research, I reviewed examples of VR that explored how designing for embodied presence facilitates subjective and relational connections with VR experiences. Through the examples reviewed, I developed an understanding of presence as a complex, multifaceted, open-ended and foundational component of VR experience. The examples reviewed outlined experimentation with a range of components of VR experience that relate to this practical understanding of presence, including:

- Where abstract approaches to virtual environment design evoke ambiguous interpretation, rather than endeavour to illustrate or definitely represent a sense of presence within actual places.
- Exploring where types of embodied interaction to encourage and challenge senses of embodied presence in virtual spaces, and where this encourages subjective engagement that is generative of non-linear narrative structures.
- Designing for embodied responsivity in virtual environments to develop expanded senses of embodiment and facilitate relational, affective engagements with VR experiences.

This practical experimentation was most effective when VR designs purposefully complicated senses of presence that develop through active, relational engagement with VR experiences. It is in this relational zone, where active formulations of presence emerge and are challenged within VR experiences, that this practice-based enquiry will focus its experimentation.

I aim to develop understanding of how designing for presence in collaborative research can facilitate, complicate and enhance relational engagements with translations of my collaborator's life experiences. I will explore where this enhances the capacity to explore the potentialities to design for presence in the translation of collaborator's life experiences. I will build on methods to design for embodied interaction and responsivity in VR to create opportunities for me and collaborators to actively and creatively engage with translations of phenomenal and affective qualities of their life experiences. Through these collaborative methods, I will explore where engaging with formulations of presence through design enables subjectively constructed experiential narratives to emerge. This will develop understanding of the complexity and nuance of the emergent properties of presence within the design of VR experiential narratives. It will contribute to contemporary design perspectives on the limitations and potentialities of VR as an experiential narrative platform; showing how designing for presence creates opportunities to collaboratively engage with the translation of life experiences and facilitates phenomenal and embodied engagement with experiential narratives in a way that is unique to the VR platform.

[247] (Wilk, 2018)

Chapter Three: Methodology

This enquiry broadly aligns with Sir Christopher Frayling's *Research Through/For Design* methodologies[248]. Whilst there have been various applications of Frayling's methodologies since their original formulation[249], they are employed in this enquiry as a methodological frame to identify where knowledge claims are obtained *through* collaborative practice-based research and as they are embodied *for* VR works created. Frayling's methodology provides an appropriate frame to explore presence as it actively manifests through VR design, and through this where translations of life experience in VR design may be ethically and reflexively explored within collaborative research contexts.

This section outlines where *Research Through/For Design* methodologies frame an iterative design structure that, due to its examination of context-specific, emergent and affective qualities of collaborator's life experiences, does not necessarily have pre-defined design stages. It frames the reflexive practice-based methods used to enable critical engagement with evolving and deepening relationships between presence and translations of my collaborator's life experiences, and where collaborative VR design facilitates affective engagement with developing VR experiential narratives across the enquiry.

Research Through/For Design

Frayling first introduced the *'Research Through/For Design'* methodologies in his 1993 paper, 'Research in Art and Design'[250], in which he articulates the different ways that knowledge claims can be sought in the complex process of undertaking design-based research and the artefacts that are created through it. In a 2015 provocation on *'Research Through Design'*[251], Frayling outlines a perspective on practice-based research that acknowledges where 'a linear, logical approach to research isn't working. It doesn't map onto… a complicated, unpredictable, messy world'[252]. Frayling draws focus on the way that contributions to knowledge are created within active, non-linear, and unpredictable design processes. Frayling emphasises that research through design is 'a particular way of thinking, and a particular approach to knowledge'[253], itself generative of new knowledge and a specific means to articulate it.

Since its introduction, there have been various differing applications and interpretations of *'Research Through/For Design'* across research disciplines. This has catalysed several methodological comparative reviews that seek to explore where discipline-specific applications relate to each other and how fundamental components of *'Research Through/For*

[248] (Frayling, 1993)
[249] Isley, C. G., & Rider, T. (2018). Research-Through-Design: Exploring a design-based research paradigm through its ontology, epistemology, and methodology. In C. Storni, K. Leahy, M. McMahon, P. Lloyd, & E. Bohemia, Proceedings of DRS2018 International Conference, Vol. 1: Design as a catalyst for change. Limerick: Design Research Society.
[250] (Frayling, 1993)
[251] RTD. (2015, June 4). *Provocation by Sir Christopher Frayling Part 1: Research Through Design Evolution*. Retrieved from Vimeo: https://vimeo.com/129775325
[252] (RTD, 2015)
[253] (RTD, 2015)

Design' can be identified across them[254]. Isley and Rider suggest that a central issue in understanding the paradigmatic foundations of *Research Through Design* is due to a lack of acknowledgement of the ontology and epistemology that this methodology is founded in[255]. They explain that this may be due to its widespread adoption across research disciplines that draw upon different philosophical foundations to orient *Research Through Design* in different ways[256].

Addressing this, Boon et al. engaged a community of researchers from across academic disciplines to identify core common core themes of *Research Through Design*[257] that this enquiry draws from. Boon's findings outline several useful methodological principles to frame this enquiry's approach to examine presence in VR experiential narratives via *Research Through Design*, the methods used, and where knowledge claims are sought. These are:

- **Knowledge** – How is knowledge used and generated in RtD? What forms does knowledge take?... What is the generated knowledge about? How specific is this knowledge and how to make it transferable to other contexts and disciplines?[258]
    - How is presence felt and recognised through designing VR works? What forms of knowledge about presence in VR experiential narrative design emerge through collaborative design practice? How can this knowledge transfer to other VR design contexts, or be applied to wider strategies to design VR works?
- **Designer/Researcher** – How do the ideals, mindset, and skills of designers/ researchers play a role in a RtD process? To what extent do these characteristics affect the outcomes of RtD? What roles do designers/researchers take in RtD projects?[259]
    - How do the ideals and mindset of the researcher impact on the process of translating life experience through designing for presence? How might this affect collaborative VR design research and what steps can be taken to critically and ethically address this?
- **Process** – How do design and research activities relate to each other in an RtD process? How are these activities structured and temporally arranged in RtD practice? What are effective tools and methods to structure and document RtD activities?[260]

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[254] For examples of these, see:
Chow, R. (2010). What Should be done with the Different Versions of Research Through Design. In C. Mareis, G. Joost, & K. Kimpel, Entwerfen, Wissen, Produzieren (pp. 145-158). Bielefeld: Transcript.
(Isley & Rider, 2018)
Boon, B., Ehsan, B., Singh, A., Wegener, F. E., Rozendaal, M. C., & Stappers, P. J. (2020). Grappling with Diversity in Research Through Design. In S. Boess, M. Cheug, & R. Cain, Proceedings of DRS2020 International Conference, Vol. 4: Education (pp. 139-152). Brisbane: DRS.
Galdon, F., & Hall, A. (2022). (Un)Frayling design research in design education for the 21Cth. The Design Journal, 915-933.
Godin, D., & Zahedi, M. (2014). Aspects of Research through Design: A Literature Review . In Y. Lim, K. Niedderer, J. Redström, E. Stolterman, & A. Valtonen, Design's Big Debates - DRS International Conference 2014 (pp. 1667-1680). Umeå: DRS.
[255] (Isley & Rider, 2018)
[256] (Isley & Rider, 2018)
[257] (Boon, et al., 2020, p. 144)
[258] (Boon, et al., 2020, p. 144)
[259] (Boon, et al., 2020, p. 144)
[260] (Boon, et al., 2020, p. 144)

    - How do VR design and collaborative research activities (e.g. interview or co-design processes) relate to each other in a design process?
- **Artefacts** – What roles do artefacts play in RtD (e.g. as demonstrators, physical hypotheses, future proposals, or boundary objects)? What kind of artefacts are used in RtD (e.g. dynamic – static; tangible – intangible; finished – unfinished; high/low fidelity)?[261]
    - What roles do VR works play in design and collaborative research contexts? Where are they used to advance enquiry aims and progress collaborative research? How do they embody outcomes of practice-based research?

These methodological principles frame the main areas of critical investigation and reflexive research practice within this enquiry; where practice-based research is impacted on by both the researcher and collaborators, where knowledge claims may be sought within the process of undertaking collaborative VR design research, the relationships between the practice-based research process and the research outcomes, and where research outcomes embody knowledge claims and contribute new insight into experiential narrative design through presence in VR.

The next section examines additional perspectives on *Research Through Design* to situate this broad methodological frame with the methods employed within the enquiry. It also further considers some of the limitations of Frayling's *Research Through/For Design* methodology that arise for this enquiry due to the utilitarian design context that Frayling applies it to. Addressing these, the enquiry incorporates elements of Sullivan's 'Art Practice as Research' [262] methodologies to enable richer exploration of the contingent and affective qualities of presence that may emerge through collaborative and reflexive practice-based research.

Methods to Translate Life Experience Through Designing For Presence in VR

Drawing on the methodological principles of *Research Through Design* outlined above, this enquiry employed VR design and critical examination methods (such as procedural generation[263] and 'the implied player'[264]) to enable manifestations of presence to articulate themselves in the act of making and engaging with VR works. These methods enabled application of *Research Through Design* methodological principles to VR design practice; facilitating critical exploration of the non-linearity and reflexive potential of VR design and enabling critical exploration of the contingent, subjective and embodied qualities of presence through the act of engaging in practice-based VR design research.

Applying these design methods to collaborative research, the enquiry explored where affective relationships with translations of my collaborator's life experiences manifested whilst actively making and engaging with VR works with collaborators. Supporting this approach, Godin and Zahedi emphasise the specific ways *Research Through Design* emphasises a design researcher's

[261] (Boon, et al., 2020, p. 144)
[262] (Sullivan, 2005)
[263] Short, T. X., & Adams, T. (2017). *Procedural Generation in Game Design*. Routledge.
[264] Aarseth, A. (2007). I Fought The Law: Transgressive Play and the Implied Player. *Proceedings of the 2007 DiGRA International Conference: Situated Play*

capacities for imagination and projection into uncertain research outcomes within the process of undertaking design research, which builds what they call 'competencies to deal with not-knowing' and 'a constant realignment of the construction of artefacts…to better tackle complex design problems'[265]. This is a valuable component of *Research Through Design* that this enquiry draws from, supporting where ongoing critical reflection of collaborative VR design research deepened understanding of appropriate and affective methods to translate collaborator's life experiences and where VR works that translate the life experiences of my collaborators emerged within and through them. Godin and Zahedi's interpretation of *Research Through Design* supported to frame where new knowledge about designing VR experiential narratives through presence can be sought through ongoing critical reflection of the active and contingent ways presence manifests in engagement with developing translations of collaborators life experiences in VR works.

Regarding the products of design-research, Frayling states that, when conducting research *for* a design artefact, the artefact itself stands 'not just [as] the instantiation of the idea, it is the idea'[266]. Where the primary outcome of a design research process is a design artefact in which 'the goal is not primarily communicable knowledge in the sense of verbal communication', then the specific knowledge claims are 'embodied in the artefact'[267]. This understanding of where knowledge claims are found through engagement with products of design research supports how new knowledge about presence can be found through critically engagement with the active, embodied experience of VR works created through this enquiry. Drawing on these principles, they enquiry aimed to examine how critical engagement with VR works created through this enquiry yield ongoing experiential insight into where formulations of presence facilitate affective engagement with translations of collaborator's life experiences.

However, despite the focus on the experience with a research artefact that Frayling's *Research For Design* frames, many of the examples Frayling gives tend to emphasise utilitarian qualities of such design artefacts (such as an artefact's material qualities or its intended functionality). In his examples, Frayling applies his methodologies to design problems in which there is a pre-defined and intended research outcome; where *Research Through/For Design* strategies document the design-research process to complement and enrich the efficacy of the outcomes of design research. As such, drawing on his methodology alone does not adequately frame the more uncertain, contingent and affective qualities of presence that this enquiry seeks to critically explore through active engagement with collaborative VR experiential narrative design research.

Addressing this, the enquiry synthesised Frayling's design methodologies with Sullivan's 'Art Practice as Research'[268]. Sullivan describes a 'visual knowing'[269] research methodology; an experiential kind of knowledge claim within art-practice research that this enquiry draws from. Sullivan uses 'visual knowing' to explain how the experience of critically engaging with the

[265] (Godin & Zahedi, 2014)
[266] (RTD, 2015)
[267] (Frayling, 1993, p. 5)
[268] (Sullivan, 2005)
[269] (Sullivan, 2005)

process and outcomes of practice-based research changes knowledge structures. This is an aesthetic process of self-realisation and a particular way of undertaking practice-based research[270]. Sullivan describes how art-practice researchers are positioned to undertake this kind of research, as through their experience as art practitioners, they are equipped to explore how the materialities of artworks suggest their development and affect their interpretation[271]. Sullivan's 'visual knowing'[272] complements Blackman's discussion of the embodied knowledge that emerges through affective engagement with VR[273]. By combining Sullivan's reflexive, critical stance to the process of engaging with practice-based research with Blackman's embodied knowledge that emerges through critical engagement with VR, this enquiry uses felt, affective response to VR works as the critical ground to explore different manifestations of presence within the process of translating life experience with my collaborators.

Taking cues from these combined methodologies, this enquiry explored how critically engaging with senses of presence in VR works offer invitations to actively and affectively engage with translations of my collaborator's life experiences. Actively and critically engaging with VR works enabled a critique of the phenomenological boundaries of presence and a deeper understanding of where new knowledge claims about VR experiential narrative design are situated within them. Sullivan describes the potential of the knowledge claims that emerge through engagement with practice-based research to 'resist fixities' and 'relish incompleteness, because that signifies that something still lies ahead'[274]. Rather than offering definitive explanation, this type of knowledge claim gives rise to more questions as a core and valued part of the research. Supported by Blackman's discussion of the contingent, relational and affective qualities that embodied engagement with VR can encourage (the different ways of knowing that are felt but difficult to articulate[275]), this enquiry draws critical focus onto the particular ways that embodied engagement with VR translations of my collaborator's life experiences through presence catalyses new knowledge about VR experiential narrative design. This enabled me to challenge reductive understandings of presence or representative approaches to experiential narrative in the translation of life experience. It positioned active engagement with VR design as a site of ongoing critical discussion of how life experiences may be translated through presence in VR.

Generating Active Formulations of Presence Through VR Design

To enable active, embodied examination into presence VR design research, the practice-based enquiry adopted 'procedural generation' design techniques. Commonly used within games

[270] (Sullivan, 2005)

[271] Sullivan outlines this by referencing David Hockney's claim that some of the European Masters may have used lenses to help draft their paintings, which arose when he recognised a similarity in the line work of 19th century artist Jean-August-Dominique with the work of Andy Warhol (Sullivan, 2005). Sullivan suggests that it was Hockney's experience as an artist that equipped him with the practical-theoretical knowledge necessary to identify the use of this method and make this claim.

[272] (Sullivan, 2005)

[273] (Blackman, 2012)

[274] (Sullivan, 2005), Greene, M. (2002). The Arts and Social Justice. In P. Sahasrabudhe, *Art Education: Meaning Dimensions and Possibilities*. Keynote Addresses. The 31st InSEA World Congress (pp. 21-25). New York: Columbia University.

[275] (Blackman, 2012)

design[276], 'procedural generation' is where content for interactive experiences is generated by computer programs according to parameters developed by the designer. These methods are commonly used to generate large-scale content. For example, the processes that underlie the generation of navigable solar systems filled with visitable planets in '*No Man's Sky'*[277]. Procedural generation often produces semi-randomised results, where designers factor in degrees of control by adjusting parameters that determine procedurally generated content (for example, a parameter for the number of forking branches on a procedurally generated tree). These parameters can be manipulated to generate new outputs each time an interactive experience is run, resulting in unique procedurally generated experiences each time experiences are engaged with.

I adopted these design techniques to experiment with how they enable non-linear experiential structures and unpredictability in how active formulations of presence may be encouraged to manifest through VR design. In *'Life is Beautiful. Always.'*, I used procedural generation to explore how the emergent qualities of procedurally generated virtual environments could translate the uncertain and contingent physical characteristics of Schreur's experience of a transient ischaemic attack (TIA). I experimented with how procedurally generated virtual environments affected a sense of embodied presence, and how this may translate how Schreur's sense of presence is challenged through his experience of a TIA.

This experimentation was further developed in in *'Be That Ocean'*, where procedurally generated virtual environments were augmented through embodied participant interactions (such has the position, direction and speed of movement tracked by the VR headset). I explored where the responsive links between embodied interaction and procedurally generated virtual environments encouraged expanded senses of embodied presence to actively manifest. Through this, I examined how senses of embodied presence that emerge in responsive, procedurally generated virtual environments encourage active engagement with translations of affective qualities of Maszczak's experiences of transportation to the Gulag camp at Magadan.

The 'Implied Player'

Critically examining the affective, embodied qualities of presence as it actively manifests through engagement with VR works created a dual positionality whereby I simultaneously adopted 'VR designer' and 'VR participant' roles. This dual positioning drew on Espen Aarseth's 'implied player'[278]; a method whereby a designer imagines how a player encounters games to better understand the varying conditions for their engagement. Adopting the 'implied player' within VR design enabled active and critical engagement with presence in VR design research. Combining this method with the non-linearity and unpredictability of procedural generation in VR design created critical encounters with VR where I could not precisely predict how the conditions for engagement would emerge. This positioned me as an active participant in a generative VR experience with the capability to modify generative dynamics in response to

[276] (Short & Adams, 2017)
[277] HelloGames. (2023, 12 14). *No Man's Sky*. Retrieved from No Man's Sky: https://www.nomanssky.com/
[278] (Aarseth, 2007)

moments of affective engagement and senses of presence within them. This method enabled a deepening inter-relationality with practice-based research and a particular way of experimenting with presence as an emergent quality in practice. It enabled opportunities to engage in the complex and nuanced 'conversation' with VR work that Hubbard referred to in his immersive design strategies[279]. This active, critical exploration of presence in VR to encourage emergent relationships with translations of collaborator's life experiences generated insight into how presence enhances 'personalised, subjectively realised, and impactful '[280] relationships with VR experiential narratives.

The 'implied player' also extended to collaborators within the enquiry. By inviting collaborators to engage in iterations of practice as implied players, the enquiry examined the embodied, subjective relationships that form between them and translations of their life experiences in VR. This critical examination was conducted in several ways; in conversation whilst collaborators were engaging in design iterations, whilst collaboratively making VR artworks, and during post-experience interview. Examining how research collaborators engaged in VR developed methods for them to creatively contribute to the translation of their life experiences through VR design. Post-experience interviews deepened understanding of where translations of collaborator's life experiences subjectively resonated with affective qualities of their lives. This enhanced the work's capacities to translate and embody affective qualities of collaborator's life experiences through design.

As the primary focus of this enquiry is within the capacities to design for presence in the translation of life experience in collaboration with subjects of these works, the scope of the 'implied player'[281] method was restricted to that context for this enquiry. This more securely defined the scope of the enquiry to examine how the practice-based research methods employed enabled creative agency for my collaborators to contribute to the work's development, and where they effectively enabled the collaborative translation of their life experience into VR works through design.

Design Diary

In one example of *'Research Through Design'* Frayling describes 'action research', where a diary records a step-by-step iterative process of practice-based experimentation and demonstrates where new knowledge claims are found within the research process[282]. Drawing on this, I used a design diary to enable ongoing reflexive commentary of the development of the practice; documenting my understanding of where translations of my collaborator's life experiences can be facilitated through designing for presence in VR.

A reflexive approach to the design diary drew on Sullivan's 'practitioner-based strategies grounded in reflexive thought and action'[283]; where documentation of practice-based research reveals the inter-relationships between a researcher, the research process, and the wider

[279] (DiLeo, Hubbard, & Reese, 2023)
[280] (DiLeo, Hubbard, & Reese, 2023)
[281] (Aarseth, 2007)
[282] (Frayling, 1993)
[283] (Sullivan, 2005, p. 110)

context in which practice-based research takes place. Adopting a practitioner-based, reflexive approach to design documentation requires a continual self-critique and an open criticality of theoretical or methodological approaches, primarily acknowledging 'the positive impact of experience as a necessary agency to help frame responses and to fashion actions'[284]. A focus on the experiential qualities of the VR design process through a reflexive, experience-based design diary captured commentary on the multi-faceted, material, participatory, and creative contexts of VR design research. It enabled a critical view of the deepening and nuanced understanding of presence in the translation of life experience as it evolved across the research process.

By recording ideas that emerged through ongoing study of relevant theoretical texts, the diary also recorded where progressions in the practice related to a developing epistemological standpoint on presence. This enabled examination of where theoretical perspectives catalysed creative ideas and were critically explored in the process of making and actively engaging with VR works.

To maintain reflexivity within the VR design research process, diary entries were primarily captured during research activity, e.g. collaborative research sessions, during VR development, or whilst engaging in wider contextual reading. Entries included a combination of creative ideas, illustrative sketches, annotated transcripts of interviews and quotations from wider reading. This enabled a multiple view showing the simultaneous development of epistemological and practical understandings of presence, where theory implicitly informed practice and where collaboration influenced the creative direction of the practice-based research. See Appendix E: Annotated Examples from Design Diary for annotated examples of the design diary, detailing their structure and use within the practice-based research.

[284] (Sullivan, 2005, p. 110)

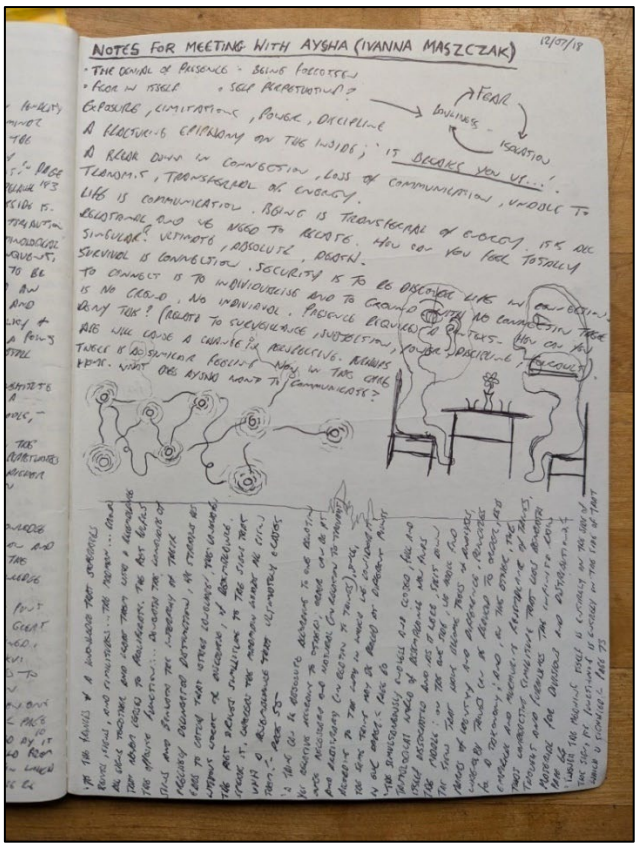

Figure 22: A design diary page showing creative notes, sketches and quotations from wider contextual reading.

Iterative Design

The design diary enabled me to identify where design iterations emerged through the practice; where unrecorded micro creative decisions manifested into macro iterations of VR works that were documented within the diary. This approach to iterative design drew on Sullivan's strategies for identifying knowledge creation in the act of undertaking practice-based research. Sullivan outlines where knowledge creation 'is recursive and constantly undergoes change as new experiences 'talk back' through the process and progress of making art in research'[285]. Sullivan notes the embodied nature of these research strategies, where the artist-researcher's experience of engaging in practice-based research is an evolving part of the research process. These methodological principles drew the focus of iterative design onto the design milestones that emerged through engaging with VR, where insights crystallised through critical affective engagements with VR design iterations.

This method also structured critical examination of where iterations of VR designs were presented to collaborators for review. It examined where collaborator's engagement with VR design iterations informed the further development of VR design research, and where research materials manifested through collaboration (for example further testimony, illustrative sketches to support design development or new VR artworks).

[285] (Sullivan, 2005, p. 110)

Translating Life Experience Through Collaboration

Responding to the debates raised by Cioffi on ethical approaches to VR experiential narrative design (where a designer must 'consider the other as a separate person with agency', rather than 'scoop up the material according to the story [they] want to tell'[286]), this enquiry required reflexive and ethical methods of working to enable a shared understanding of collaborator's life experiences to emerge through collaborative practice. These methods are employed to enable collaborators to take an active and creative role in the translation of their life experiences in VR; exploring where VR experiential narratives based on collaborator's lives hold a sense of affective significance for them in the way they translate their life experiences.

Through these methods, I aimed to critically examine the potentialities and limitations of using VR as a collaborative tool to translate another's life experiences into VR works. In doing so, the practice comments on what such works can plausibly and ethically claim when presented as VR experiential narratives that translate their life experiences, addressing contemporary issues of representation in the design of VR experiential narratives with collaborators.

Co-Design

To formulate the basis for collaboration, it was important to break down any perceived hierarchy between me and collaborators. This enabled the research process to be as open and exploratory as possible; to allow understandings of presence be challenged by collaborative research on an equal basis without being led by theoretical perspectives or prior knowledge of the technical capacities of VR. This non-hierarchical approach to collaboration formed a basis for a reflexive critical examination of presence in practice.

The methodological approach to facilitate collaboration drew on Villari's 'Action Design'[287]. Villari relates 'Action Design' to Frayling's 'Research Through Design'[288], where design-based research includes a reflexive dimension as part of the process. Villari suggests an iterative design structure in which a cyclical process of problem definition, data collection and analysis leads to active and evaluative components that give rise to further research questions.

[286] (Wilk, 2018)
[287] Villari, B. (2014). Action Research Approach in Design Research. In P. Rodgers, & J. Yee, *The Routledge Companion to Design Research*. Routledge.
[288] (Frayling, 1993)

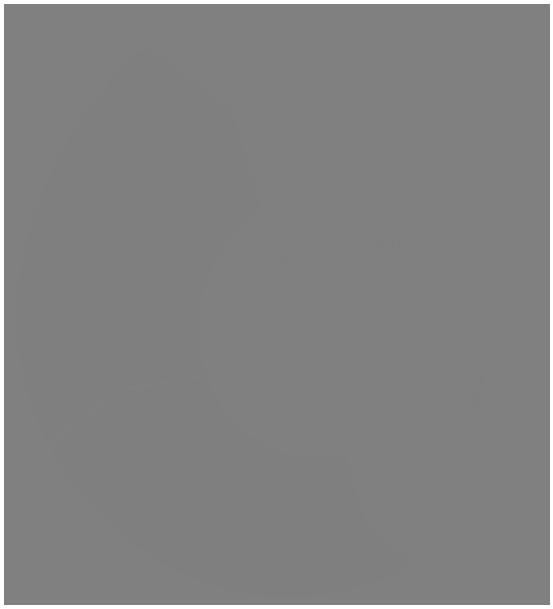

Figure 23: Spiral diagram of Villari's iterative Action Design method (Villari, 2014)
Image removed for copyright reasons

Adopting this approach, reflexive insight gained from collaborative encounters (evidenced through outcomes of practice and the design diary) supported to understand where formulations of presence manifested in developing works and informed the direction of further practice.

Villari describes Action Design as a situated, participatory practice that blurs the boundaries between the researcher and collaborators[289]. Sanders and Stappers emphasise this non-hierarchical boundary blurring in their research on co-creation in design[290]. They emphasise the value of collective creativity across all those involved in the design process. This includes what they describe as a 'fuzzy front-end'[291], emphasising the chaotic nature of co-design, and the value of incorporating diverse perspectives in design research.

[289] (Villari, 2014)
[290] Sanders, E. B.-N., & Stappers, P. J. (2008). *Co-Creation and The New Landscapes of Design*. Co-Design, 5-18.
[291] (Sanders & Stappers, 2008, p. 5)

Figure 24: Sanders and Stappers' co-design diagram (Sanders & Stappers, 2008)
Image removed for copyright reasons

Sanders and Stappers explain that this design process is particularly useful 'to determine what is to be designed and sometimes what should not be designed'[292], as collective creativity works towards what the outcomes of co-design should be. This enquiry drew on the 'fuzzy' approach to co-design in the exploratory stages of collaboration, enabling collective creativity to determine the design criteria that led exploration of presence within the practice. As understanding of collaborator's life experiences became more nuanced, and the appropriate methods to explore them through designing for presence became clearer, the projects worked towards more singular VR works that translated collaborator's life experiences and embody knowledge claims.

Interview

I drew on Paul Gill's overview of interview research methods to enable the enquiry 'to explore the views, experiences, beliefs and/or motivations of individuals'[293]. Gill describes the value of this research method is to 'provide a 'deeper' understanding [of research topics] … where detailed insights are required from individual participants. They are also particularly appropriate for exploring sensitive topics'[294]. I supported this through Bevan's phenomenological interview method that 'applies questions based on themes of experience contextualization, apprehending the phenomenon and its clarification'[295]. This method 'employs descriptive and structural questioning as well as novel use of imaginative variation to explore experience'[296]. By employing these interview methods, I obtained detailed insight into affective and personal aspects of collaborators life experience. This enabled the enquiry to examine and practically translate phenomenological details and affectively felt significances of collaborator's life experiences into VR designs. These methods also provided a framework to

[292] (Sanders & Stappers, 2008, p. 5)
[293] Gill, P., Stewart, K., Treasure, E., & Chadwick, B. (2008). Methods of data collection in qualitative research: interviews and focus groups. *British Dental Journal*, 291-295. p. 292
[294] (Gill, Stewart, Treasure, & Chadwick, 2008, p. 292)
[295] Bevan, M. T. (2014). A method of phenomenological interviewing. *Qualitative Health Research*, 136-144. p. 136
[296] (Bevan, 2014, p. 136)

build a relationship of trust, enabling collaborators to speak openly about their life experiences and collaboratively explore how they may be translated through VR design.

At the start of each project, I employed an unstructured interview method[297]. This was to encourage openness in initial collaborative sessions and not to imbue the project with preconceived theories or ideas that may have led the enquiry in a particular direction. Gill explains the unstructured interview method is useful when 'significant 'depth'… or a different perspective… is required' [298]. An unstructured interview method developed a depth of understanding of collaborator's life experiences. It allowed collaborators to lead the experiential context of the practice-based project, which helped to establish a non-hierarchical research relationship and a foundation of trust.

As the collaborative projects progressed and tangible approaches to the translation of life experience through presence emerged, the interview method switched to a semi-structured approach. Gill describes the value of the semi-structured interview method is to 'help to define the areas to be explored, but also allows the interviewer or interviewee to diverge in order to pursue an idea or response in more detail'[299]. This enables a degree of flexibility that 'allows for the discovery or elaboration of information that is important to participants but may not have previously been thought of as pertinent' [300]. The semi-structured interview method enabled collaborative sessions to draw focus onto designing for presence within translations of collaborator's life experiences. This enabled collaborators to creatively engage with the progression of the practical enquiry and to discuss enquiry aims (such as how formulations of presence in VR support the translation of their life experiences) more directly. The semi-structured approach maintained flexibility that allowed collaborators to diverge from practical exploration in VR as appropriate. This enabled collaborators to offer further material related to their life experiences, which deepened the relational links between designing for presence in VR and the translation of their life experiences.

Ethics

A research information sheet was drawn up for collaborators outlining the structure and aims of the research. A signed participant consent form was obtained. This ensured a that all research participants understood what would take place and explained their rights throughout and after the enquiry. Collaborators reserved the right to end collaborative sessions at any time. The form stated that additional sessions would be scheduled as necessary at a time that suits collaborators.

Whilst it was not explicitly included in the research information sheet, both collaborators requested that they were joined by a friend during initial stages of the projects. For Marcel Schreur, this was a mutual colleague who introduced Schreur to the enquiry, Dominic Green[301]. As Schreur introduced Maszczak to the enquiry, Maszczak requested that Schreur was present

[297] (Gill, Stewart, Treasure, & Chadwick, 2008)
[298] (Gill, Stewart, Treasure, & Chadwick, 2008, p. 291)
[299] (Gill, Stewart, Treasure, & Chadwick, 2008, p. 291)
[300] (Gill, Stewart, Treasure, & Chadwick, 2008, p. 291)
[301] Green also supported both projects by capturing video and audio recordings of collaborative sessions. He was also a valuable critical friend throughout the enquiries conceptual and practical development.

during initial sessions. This provided an additional layer of assurance and security for collaborators at initial stages of the research process.

The information sheet stated that images and audio, screen capture of VR experiences and transcripts of collaborative sessions would be taken. Signed permission for use of these during and after the enquiry was obtained. Research collaborators reserved the right to request that data is not published for any purpose and to determine whether data may be retained for further research purposes. Copyright for all research material is jointly owned by the researcher and project collaborator.

Ethics approval to begin collaboration with Schreur was obtained on 03/10/17.

Ethics approval to begin collaboration with Maszczak was obtained on 11/01/2019.

The next chapter overviews some practical experimentation into presence through VR design that was undertaken prior to the main collaborative research projects. These demonstrate some initial experimentation with the design methods employed by this enquiry that set a practical foundation to engage with collaborative research.

Initial Experimentation into Designing for Presence in VR

Prior to engaging in collaborative practice-based research, I developed three experimental VR works that explore presence through embodied interaction, responsivity, and procedural generation. These works served as examples to demonstrate my initial practical experimentation into designing for presence in VR to Schreur, who related aspects of them to his own life experiences. This provided a good foundation to begin to explore the translation of Schreur's life experiences by engaging in collaborative design experimentation into presence in VR.

'Valéry Lights' – Senses of Embodiment in Virtual Environment Design[302]

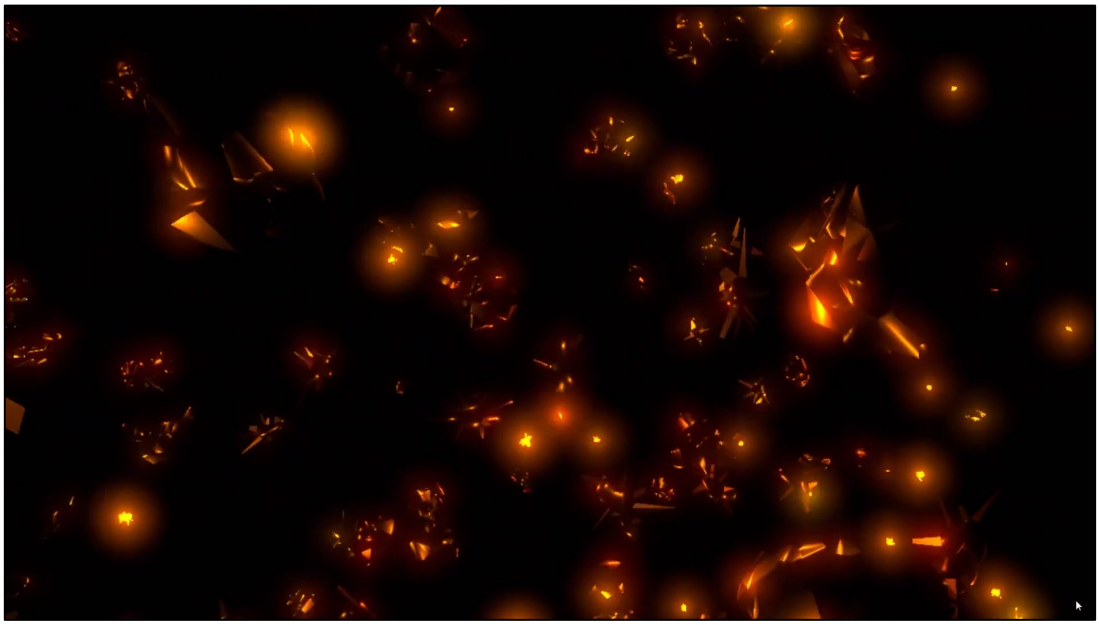

Figure 25: Still from 'Valéry Lights'

This experiment produces varying visual and sonic qualities within virtual space through procedural generation techniques applied to spatial audio and 3D forms. I was exploring how generative visual and audio qualities spatialise virtual environments, which may encourage a sense of presence in relationship with generatively evolving environmental components. Through this, I tested the potential of procedural generation as a reflexive practice-research method; examining my embodied encounters with procedurally generated virtual environments to see how they may catalyse senses of expanded embodied presence. This experimentation also yielded a set of technical procedural generation processes that I continued to develop throughout the enquiry.

[302] The name for this experiment came from the following passage in Valéry's 'Monsieur Teste':
'In his head, where behind his closed eyes curious forms of rotation occurred – developments so various, so free, and yet so controlled – lights, like those of a lamp carried by someone walking through a house whose windows could be seen in the darkness, like far off festivities, or fairs at night: but which might change into railway stations and savagery: if one could approach – or into frightful calamities – or truths and revelations' (Valéry, 1973, p. 43)
The passage struck me as illuminating my intentions for this prototype. It highlighted the work's potentiality to create momentary, fragmentary visual or sonic forms, the fleeting instability of these forms, and of an uncertainty in the potentiality for the accompanying felt response to the work.

This experiment started to demonstrate how a relatively simple set of initial generative parameters can build into complex, unpredictable and highly variable virtual scenes. It demonstrated the potential to generate an uncertain sense of flow and positionality within virtual space through the dynamism and contingent spatial relationships within the evolving virtual environment.

In *'Valéry Lights'*, the environment is populated with polygonal forms with semi-randomised values for position, direction of movement, rotation, and velocity. These have a reflective black surface rendering them initially invisible against the uniformly black space. Warm orange lights are procedurally introduced to move through the scene with a varying light intensity. These pick out details from the reflective surfaces of the moving objects, revealing a swarming, tumultuous activity as 3D forms move, orbit and collide with each other. The uncertain sense of depth and movement within space as objects are illuminated at varying proximities, partially occlude each other, or form windows or pathways into space develop a varying complexity in the virtual landscape. Sound emitters are introduced and move according to the same randomised physical parameters as the 3D forms. These produce varying harmonic, rhythmic and spatial qualities, enhancing the sense of spatial depth and dynamism within the scene.

Sounds were chosen for their contrasts in tone, tempo, breadth and overall quality. This included the sounds of traffic, water trickling, a jazz improvisation on saxophone, the murmur of a small crowd of people, wind blowing against a microphone, and cymbals. These offered the possibility for a range of differing qualities, including quiet, intimate, close, loud, distant, echoing, cacophonic, chaotic, harmonious, dissonant, rhythmic/arhythmic/polyrhythmic qualities. Processes that fluctuate the pitch and speed of the sounds were applied. This seemed to influence the overall felt pace and tension of the work, making the work feel more woozy or urgent despite no simultaneous changes to the speed or momentum of the visual objects. There was an experiential link between the visual and audio components that gave the experience a holistic sense of harmony; a flowing coherency that overlaid the individual dynamics in play. Due to the abstracted nature of the spatial audio and visuals and the changeable sense of flow, the experience seemed to continually challenge the perceived spatiality and temporality of virtual space. The changes in these environmental qualities invited continual exploration, encouraging me to turn my head and re-evaluate my position in relation to the proximity of the virtual dynamics. This demonstrated some potential to experiment with presence by disrupting spatial or temporal interpretation of space and inviting focus on a dynamic process that resists the formulation of presence into an established state.

By adjusting the parameters for the generative properties of components, I experimented with creating contrasting senses of virtual space; from confined and cluttered spaces, to sweeping, expansive dynamics in much deeper, wider space. I noted that these thresholds could also be adjusted in response to participant interaction, which would offer an additional layer of variables to experiment with an evolving sense of expanded, embodied presence as the VR work runs.

‘Rhythm/The Room Falls Away’ – Embodied Responsivity with Virtual Spaces

In this experiment, the participant is placed within a small room where they are required to maintain a repetitive motion of drawing their hands together and apart again to keep the room in place. Ceasing this movement caused the room to fragment and float away.

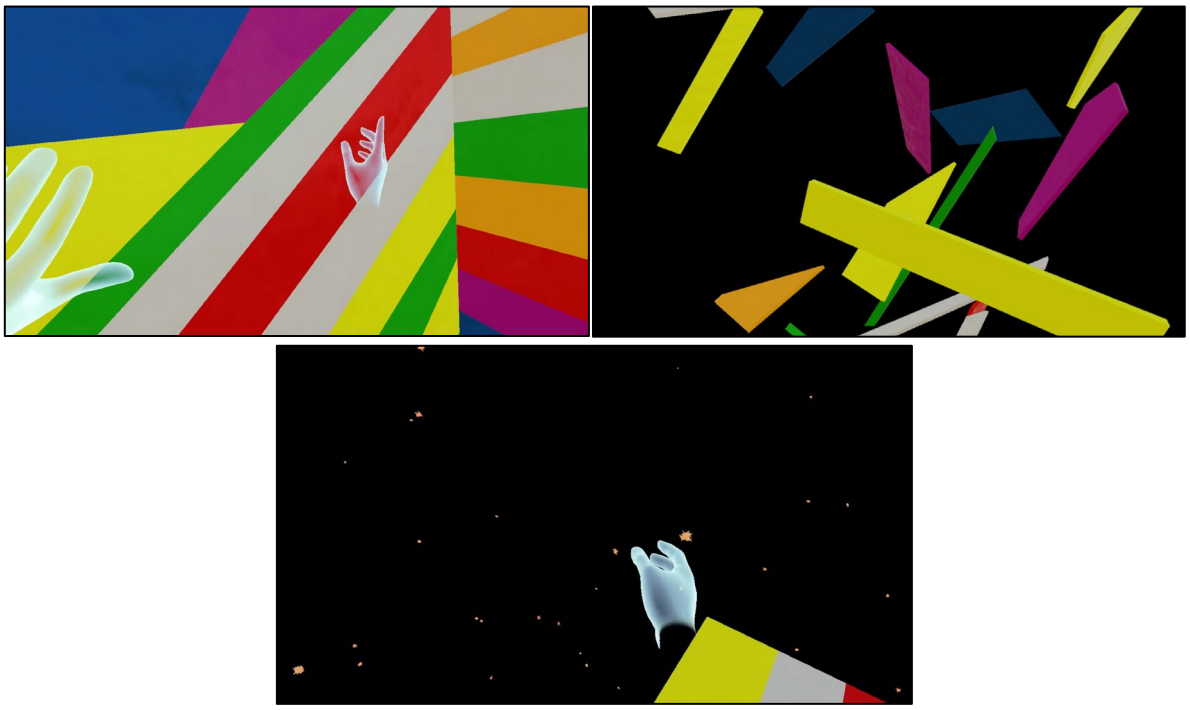

Figure 26: Stills from 'Rhythm/The Room Falls Away’

This work explored the potentialities for encouraging a rhythmic, responsive relationship between participant movement and the virtual environment. I was experimenting with the possibility of movement encouraging a state of rhythmic harmony between an embodied sense of presence and the environment, and a sense of spatial fragmentation if this is disrupted[303].

Whilst experimenting with rhythm was an avenue I felt had potential and one I returned to in later work, I did not find this experiment particularly effective. The relationship between movement and the effect it had on the work was not clear enough. There was no visual or audio response to movement in the work to facilitate an embodied connection. The use of the stock avatars to represent the hands in the virtual space also felt distracting, as their supposed representative function as hands felt divorced from my own.

[303] I had Char Davies’ VR works, ‘Osmose’ (Davies, 2023) and ‘Ephémère’ (Davies, 2023) in mind here, specifically her use of breath as a rhythmic quality to enact movement in virtual space.

'Serene Velocity VR' – Subjective Positionality in VR [304]

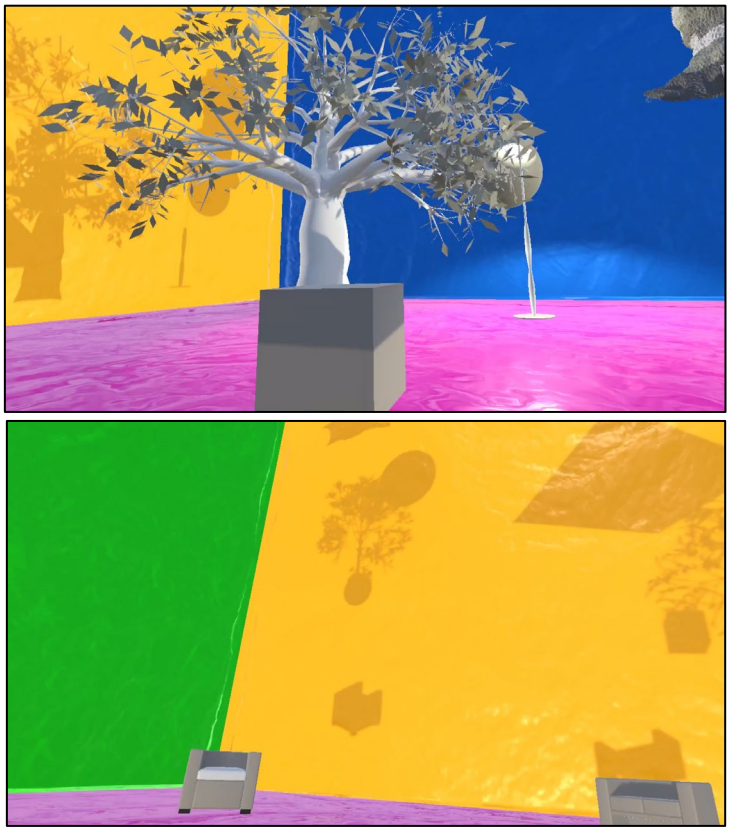

Figure 27: Stills from 'Serene Velocity VR'

This experiment rapidly transported the participant between two initially identical spaces. I was exploring the potential for developing a sense of presence in two or more places simultaneously. It is not initially obvious that the participant inhabits two spaces due to their identical appearance. However, as paired objects between the spaces start moving at differing rates of speed, they appear to shimmer as their relative positions diverge, resulting in a growing discordance as the divergence becomes more extreme. The overlapping patterns created an illusory third space, and in doing so I felt I returned to a new sense of stability; a presence that exists between spaces. This seemed to challenge my sense of presence as realisation occurred that I did not inhabit a single, fixed point, offering opportunities to reconsider my sense of presence within the VR dynamics in play. I noted the potential that this demonstrated to experiment with challenging a participant sense of presence once it had been previously established, which may result in a greater focus on presence as it actively seeks to re-manifest itself in virtual space.

Summary

The three VR works outlined above demonstrate initial experimentation into presence, suggesting cues for continued practice-based research in several ways:

[304] This prototype was inspired by Ernie Gehr's 1970 experimental film of the same name (Gehr, 1970). In Gehr's film, the effect of simultaneously adopting two positions within a long hallway is achieved by adjusting the zoom of a fixed camera at regular intervals.

- Where procedural generation applied to visual and audio qualities of virtual environments elicits an evolving sense of flow and spatiality and encourages senses of embodied presence.
- Experimentation with procedural generation and embodied responsivity; where this elicits and challenges embodied relationships with virtual environments.
- How dynamic environmental and interactive qualities may create rhythmic and harmonious relationships with virtual spaces.
- Issues in representing the body in virtual spaces; where this causes a perceived distancing from the subjective sense of their own body.
- The potentialities of problematising what may be considered an anchored state of presence and where this may encourage critical focus on presence as it actively seeks to re-establish within virtual environments.

The practical foundation that this experimentation offered to the collaborative projects is overviewed in next chapter; outlining where these methods were developed upon to enhance capabilities to translate life experience from within the two collaborative research contexts.

Following this, chapter five describes the VR works created through collaborative design experimentation into presence in VR; outlining the design methods employed to create VR works that translate my collaborator's life experiences into VR experiential narratives.

Chapter Four: Translating Life Experience in VR Through Collaboration

This chapter overviews the VR design methods used to collect and translate accounts of life experience within collaborative research with Marcel Schreur and Ivanna Maszczak. It outlines the methods employed to facilitate effective and ethical working with Schreur and Maszczak. It describes how collaborative research enhanced and progressed the enquiry; where methods to design for presence were challenged and experimented with in each research context, and through this how methods were discovered to translate the experiences of my collaborators into VR experiential narratives.

Project #1 – Collaboration with Marcel Schreur

This section describes the collaborative development of *'Life is Beautiful. Always.'*; a VR experience co-designed with multidisciplinary artist, Marcel Schreur, who experiences vascular dementia.

A summary description of the final VR work contextualises the collaborative project.

The section describes the opportunity collaboration with Schreur offered to the research enquiry. Co-designing in VR with Schreur enabled me to critically examine the complex ways presence may be understood from the perspective of his life experience. I explored where collaboratively designing for presence in VR with Schreur may translate his life experiences into an experiential narrative work.

This section is structured through a series of 'critical encounters' with Schreur; iterations that describe the collaborative activities that took place and how they informed the development of the research. This enables critical examination of how co-designing for presence in VR translated Schreur's life experiences, and where insight into the design of experiential narratives through formulations of presence in this project developed.

Summary Description of *'Life is Beautiful. Always.'*

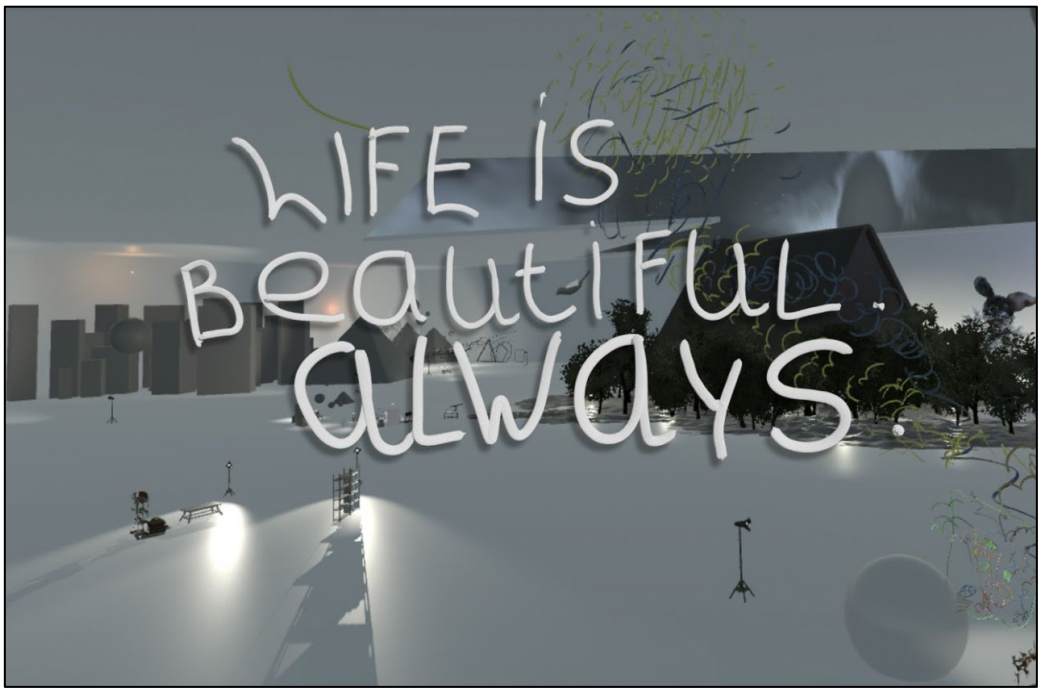

Figure 28: Promotional still for 'Life is Beautiful. Always.' VR work

'Life is Beautiful. Always.' is a VR experience that explores translation of Schreur's experiences of vascular dementia as he describes and expresses it in art-making through co-designing for presence in VR. Within this collaborative project, I examined how translations of the physical and affective characteristics of Schreur's experiences can be actively engaged with through collaborative experimentation with the embodied and phenomenal capacities of VR.

'Life is Beautiful. Always.' is one of Schreur's mottos; articulating his outlook on life through the variable and sometimes contested ways he is able to engage with life experience.

The VR work features three vertically arranged environments. The first invites the participant to orient themselves to VR and introduces the interactivity available to navigate the work.

The second environment features a large scale, open planned space with several navigable areas. These feature biographical components (including audio clips of Schreur discussing his life experience and art, photogrammetry scans of Schreur's artwork and items from his studio), new VR artworks made by Schreur, and VR designs that were developed during collaboration. This space invites the participant to discover details about Schreur's life and approach to communicating his life experiences through art-making. As the experience progresses, changes within the environment begin to limit participant agency to explore, translating an impairment of Schreur's perceptual and cognitive faculties. These changes build in intensity, reaching a climax where the participant falls through the floor and descends to the third environment.

The third environment features procedurally generated VR dynamics that abstractly translate Schreur's experience of a TIA. After a semi-randomly determined length of time, a path emerges that leads back to the second environment. The experiential structure then becomes cyclical; participants may choose to explore the second space again before moving down to

the third. When they feel they have completed the experience, participants may remove the VR headset.

Introduction

I met Schreur in June 2017 on the recommendation of a friend and colleague, Dominic Green, who had attended a presentation I gave on design perspectives on presence. Green recognised that Schreur and I were exploring similar themes in our respective art and research practices; where I was formulating a plan to critically examine presence through practice-based VR research, Schreur was using art to explore the experience of a physical and mental condition that challenged his sense of presence in his life. Schreur had not been using 'presence' to explore his experiences before our collaboration. However, as I explained my practical approach to presence in VR to Schreur, it became a shared concept to guide our collaboration across the research project.

Through Schreur's description of his experience of vascular dementia[305], we recognised a life experience through which his ability to feel present was frequently contested. Schreur described periods of his life where he was unable to retain long-term memory, recognise his surroundings, or his friends and family. He described it as the feeling of 'a thousand bees buzzing in his brain'; a confusion that prevented him from perceiving where he was, processing what was happening or forming lasting memories. This had a significant negative impact on his physical, mental and emotional wellbeing. However, Schreur also described where his experience offered him a clarity to explore presence without an expectation of what presence should feel like. He described moments in his life that felt completely novel, where he felt uniquely present with an encounter with some aspect of himself or his environment. His retrieval of these moments of clarity in presence form much of the conceptual exploration in his art practice. His artistic reflections on these moments provided him with an opportunity to explore fundamental components of presence, such as his understanding of his body and environment, and the impact when his relationships with these are challenged.

I recognised that Schreur's retrieval of these aspects of his life experience offered a valuable lived perspective on presence that, through practice-based collaboration, challenged and extended my practical exploration of presence. Through designing for presence within the context of Schreur's life experience, I examined where aspects of Schreur's life experience could be translated into an experiential narrative work.

'Critical Encounters' with Marcel Schreur

The subsections below outline a series of 'critical encounters' with Schreur. These do not cover every research encounter with Schreur, as additional ad hoc communication via email, text, telephone and less formal meetings took place as the project progressed. They describe how the collaborative research supported the progression of the practice-based enquiry, yielding

[305] More detail on Schreur's medical history and his experience of vascular dementia can be found in this Times article: Hooper, M. (2019, May 28). Marcel Schreur, the man who came back from the edge of dementia. Retrieved from The Times: https://www.thetimes.co.uk/article/marcel-schreur-the-man-who-came-back-from-the-edge-of-dementia-qdc5gxj65

insights into the development of methods to translate Schreur's life experiences through designing for presence in VR.

See Appendix A for a summary table of collaborative research activities.

Developing Co-Design Methods

The first collaborative session took place in the VR Lab at Sheffield Hallam University. We explored how Schreur could use VR as an art-making tool to communicate his life experiences and co-design VR artwork. I demonstrated the three examples of VR experimentation overviewed in the previous chapter, to which Schreur offered commentary relating to his own life experiences.

Schreur Explores his Life Experience and Art Practice Through VR

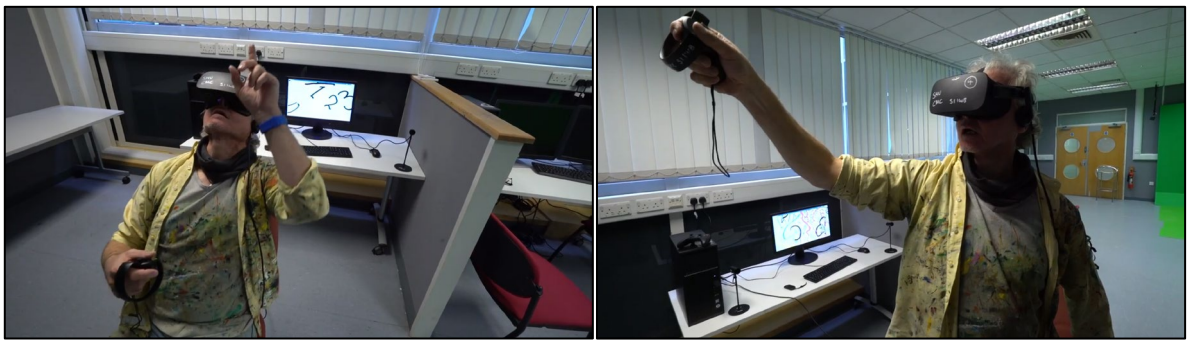

Figure 29: Marcel Schreur working in VR - 06/10/17

I introduced Schreur to the VR drawing app, 'Quill'[306]; a VR art making tool that uses hand-controllers to build 3D models in a blank, infinite, three-dimensional space. Schreur used this to demonstrate his art practice. I recorded what he said and made observations in the design diary.

Schreur demonstrated an abstract approach to VR art making in which simple figures, symbols and forms emerged spontaneously as he explored 3D space. Whilst he worked, I noted comments from Schreur:

''I didn't know what I was going to do, but now I've made that and that's okay…'

'We have numbers; 1, 2, 3, 4, 5. A, B, C, D. Language and form. And one continuous line. It's all hidden in there, and it's all part of a process. I see two dots, so I draw a line, and now I have a smile. And that makes me smile…'

'I see a head, a fish's head. So, here's the eye and the fin. Sometimes it looks like nothing. You can't even see a fish. But from a different perspective something starts to become clear. You add to it and you make it beautiful.'

I noted Schreur's art making in VR was an experimental, emergent and experiential process. Recognisable details are revealed to Schreur as he explores and makes marks in virtual space. On experiencing the work he produced in VR, I found that it invited exploration, encouraging

[306] Meta. (2016, November 28). *Quill*. Retrieved from Meta: https://www.meta.com/en-gb/experiences/pcvr/1118609381580656/

me to view the forms he had created from different perspectives to creatively reveal details and recognisable 3D forms within it. This exploratory, creative approach to making and encountering art in VR suggested something of his life experience; whereby perceptual details and what they represent to Schreur are frequently contested and transform during times when his perceptual faculties are challenged.

I recognised some conceptual overlap between Schreur's emergent, exploratory approach to art making and my ideas on using VR design to explore presence as an active, emergent property of VR. The relationship between Schreur's art making process and his perceptual faculties also started to suggest how his life experiences may be translated in VR works. I made the following notes outlining the potential to draw on Schreur's VR art making in ongoing practical experimentation:

- Translating Schreur's embodied exploration of VR into procedurally generated virtual components.
- Using embodied responsivity to investigate how exploration in virtual environments reveals and transforms structural and aesthetic quality.
- Integration of abstracted symbolic and biographical elements from Schreur's art into VR experiences.

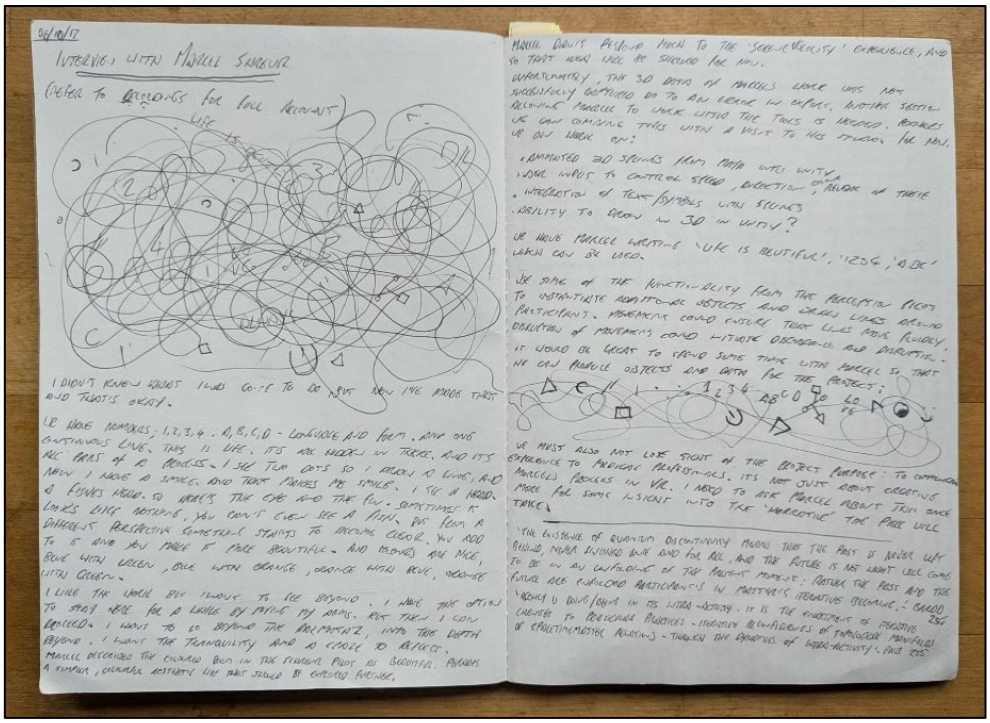

Figure 30: Diary entry from co-design session with Schreur, 06/10/17

Schreur Responds to Initial VR Experimentation

I demonstrated my three initial practice-based experiments into presence in VR to gauge their impact on Schreur and the potential to explore them further through collaboration.

On *'Serene Velocity VR'*, Schreur noted that it was 'a very good reflection of my experience of the period with thousands of images per second going through my mind and as if a thousand bees were buzzing in my head'. He noted the 'profound impact' of the experience, outlining

the raw, visceral impression the experience had on him. This started to suggest methods to translate aspects of Schreur's experiences through the confronting and kinetic visual and spatial VR design dynamics I was exploring in this work.

Schreur commented on the 'sudden change of circumstances' that the experiential qualities of the work elicited for him. Schreur related this to an incident he had experienced earlier that week where he found his 'coordination and abilities were compromised', which he described as 'a changed reality whereby the active real world and its "demands" that I created around me [did] not change speed'. This 'sudden change in circumstances' extended my thinking towards challenging senses of presence by affecting the agency for embodied interaction in VR; where this may challenge formulations of embodied presence and invite an embodied refocusing onto responsive environmental components. The distinction between an 'active real world' and the subjectively 'changed reality' that Schreur experienced suggested potential to experiment with contrasting experiential dynamics within different phases of the work; where this may translate the variable perceptual and cognitive capacities Schreur experiences, and when presence is challenged within them.

Examining Schreur's Art Practice to Translate Life Experience

Photogrammetry Capture of Schreur's Studio and Art

At this session, I generated photogrammetry assets of Schreur's studio and his art. The photogrammetry process involves a detailed photographic capture of hundreds of close-up images of Schreur's works, then generating 3D models from them. This process immersed me Schreur's work, which enabled a detailed exploration of their aesthetic and conceptual content. The boldness of colour, organic quality of the line, layered complexity, juxtaposition of components, stark expressiveness and hidden details are all elements I identified as inspiration for a developing VR aesthetic. I also captured sections of Marcels studio environment[307] for potential inclusion within the VR work.

[307] Objects captured included a chest of drawers with a large array of brushes and artists equipment on top, a shelving unit with various small sculpture works and other experiments, a grandfather clock that has been in Marcel's family for generations, and a pair of wooden clogs placed on top of a pile of cushions.

Figure 31: Photogrammetry capture of shelves, clogs, cushions and a grandfather clock from Schreur's studio in 'Life is Beautiful. Always.'

'Isolation VR'

I examined Schreur's artwork, *'Isolation'*, in which I recognised a dynamism that I could explore in VR by extending my experimentation into evolving visual and audio environmental components in *'Valéry Lights'*. The painting also reminded me of Deleuze and Guattari's description of 'rhizomatic figures'[308], which I was researching at the time of this collaborative session. The idea of the rhizome, a network of evolving multiplicities that resists definitive categorisation, interested me as a potential theoretical model for presence. Deleuze and Guattari's rhizome spoke to me of the contingent, evolving and relational qualities of presence in VR design, and where my felt relationship with Schreur's life experience became more nuanced and complex as we continued to them through co-designing for presence together.

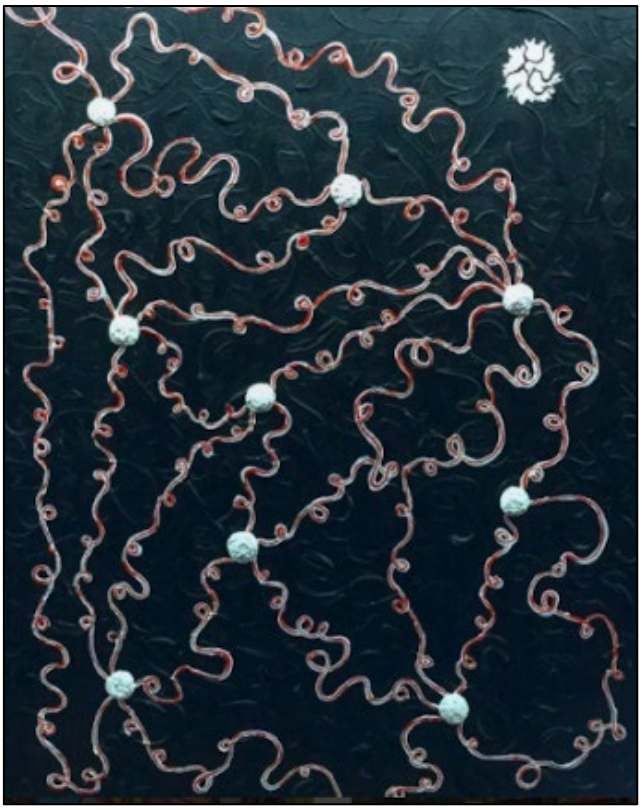

Figure 32: 'Isolation', Marcel Schreur
Reproduced with permission from Marcel Schreur

I asked Schreur to explore virtual space by moving his body within the 'Quill' VR app. By converting Schreur's actions into motion data, I applied his motion to a brush stroke that paints itself within virtual space. After random intervals, an orb appears on the stroke. I found that this elicited a spatial and durational quality in virtual space as the line progressively builds a 3D form and a sense of depth into the scene.

[308] Deleuze, G., & Guattari, F. (1994). What is Philosophy? Verso Books.

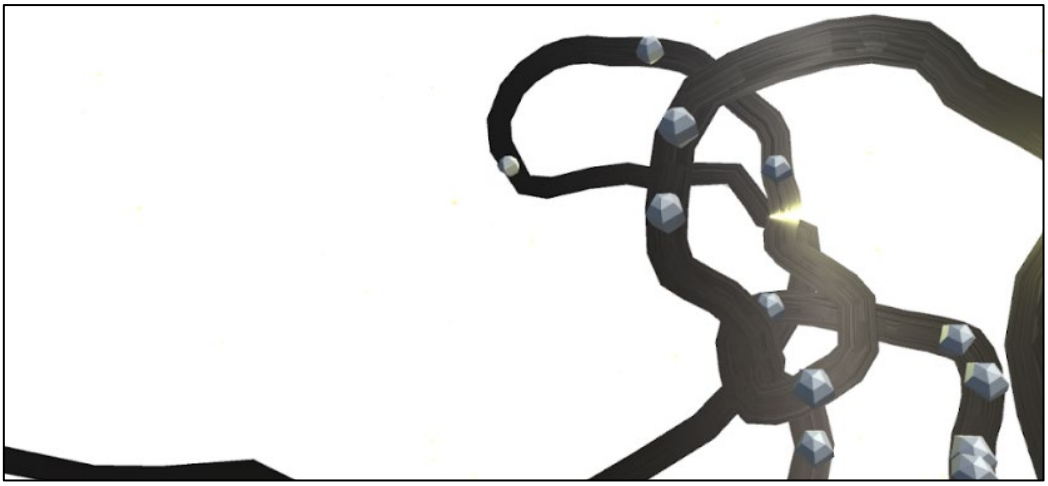

Figure 33: Still from 'Isolation' VR experiment

A sound emitter placed at the beginning of the stroke produced a low humming sound. I introduced the sound of a bell chime with a randomised pitch to emit from the orbs as they appear. The addition of the bell chimes over the spatially modulating hum revealed the potential to combine layered audio qualities and generate modulating audio landscapes. I felt my body tune in to the rhythms from the chiming orbs, creating an uncertain pulse and repetitive quality that contributed to an expanded sense of embodied presence that the modulating hum elicited in virtual space.

'The Chaos Event'

I developed another experiment, called *'The Chaos Event'*, that built on the spatially disrupting qualities of *'Serene Velocity VR'* that Schreur and I noted. I was exploring where removing embodied agency to navigate virtual space may challenge and draw focus on presence as it attempts to re-establish itself across other experiential components. The removal of agency was combined with abrupt, abrasive qualities that disrupt audio and visual components. This explored the potentialities for problematising felt relationships between embodied interaction and dynamic virtual environments to translate the 'sudden change in circumstances' where Schreur's perceptual and cognitive faculties are challenged.

This experiment featured a series of white platforms that can be navigated between. These are positioned amongst some enlarged abstracted forms from Schreur's VR artworks, some photogrammetry assets, and the randomly chiming orbs from *'Isolation VR'*.

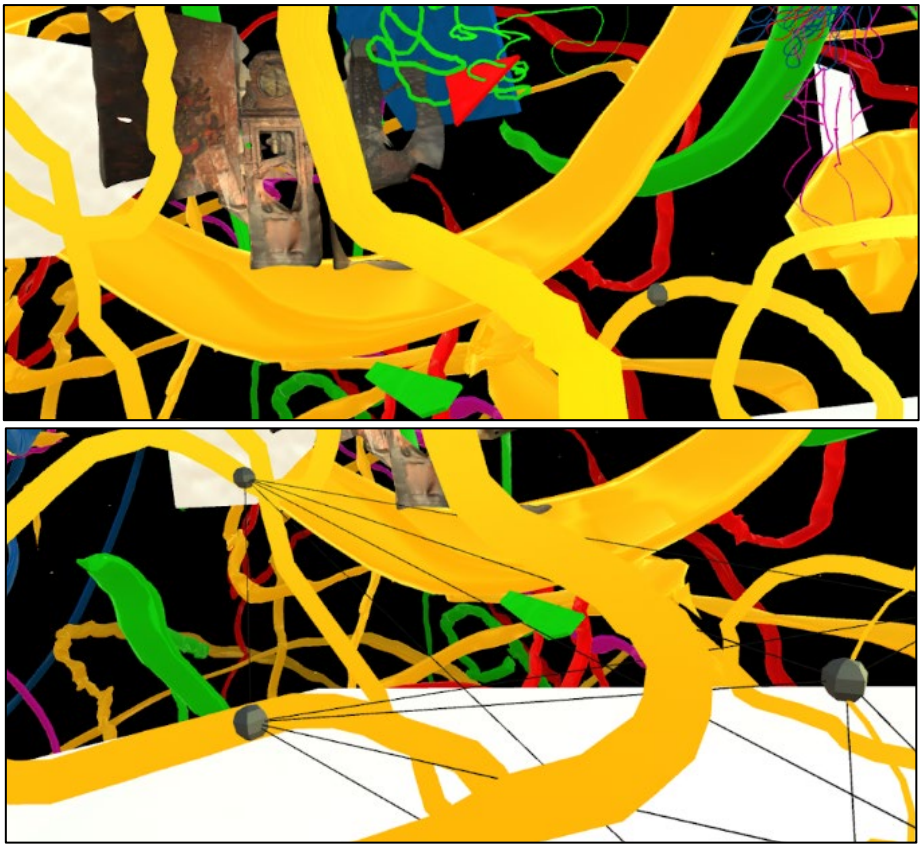

Figure 34: Stills from 'The Chaos Event'

This is the first experiment that featured agency to navigate in virtual space. I chose not to use hand controllers as I felt that the requirement to manipulate controls presented an unnecessary barrier to encouraging an embodied VR experience. Instead, I developed a 'gaze-based' navigation system[309] where, by focusing the centre of view on an orb floating in space, you are transported to the orb's location. This is a commonly used VR control scheme[310] that provides a mode of interaction that is unhampered by the use of hand controllers. It also enables accessibility for participants who may not be able to use hand controllers.

One of the most prominent dynamics in this experiment was developed through a technical process that splits and randomly repositions 3D object polygons to create a jagged, fragmented form. I fortuitously discovered the potential of this technical process through accidental misplacement of some C# code, which presents an interesting example of where designing through procedural generation can yield unexpected and fruitful results. I developed a process that randomised the position of individual 3D polygons but mistakenly set the code to run continuously. The cumulative effect transformed the 3D model into a violently fracturing and growing mass of jagged polygons. It eventually caused polygonal fragments to engulf the scene, obscuring the view and disrupting a sense of spatial depth.

[309] Zeleznik, R., & Schulze, J. (2004). *Look-That-There: Exploiting Gaze in Virtual Reality Interactions*. Computer Science.

[310] This type of navigation control scheme is commonly used in VR games, for example *'Lands' End'* (ustwo, 2024) and *'Kira'* (BullyInnovation, 2017).

I recognised an analogy between the chaotic domination of the virtual environment this effect produced with the disorienting loss of cognitive function that Schreur described. The fragmenting effect it produced struck me in a confrontational way and I felt my sense of presence challenged as I was progressively engulfed by it. This started to suggest a link between presence and the affective qualities the work encouraged me to feel. I started to recognise the potential for the translation of physical characteristics of Schreur's life experience, and their affective impact as he describes them, into procedurally generated VR dynamics.

To experiment with this further, I incorporated disruptive post effects onto the headset view. By adding an enclosing vignette, the space began to feel oppressive and claustrophobic as peripheral vision was increasingly obscured. A pulsing blur effect restricted perceptual focus into the scene and caused me to momentarily question my own visual clarity.

Figure 35: The vignette begins to envelop the participant in 'The Chaos Event'

I also experimented with modulating spatial audio qualities. I modified the script that introduced the chiming orbs in *'Isolation VR'* to make them appear on top of each other, clanging together in a layered, dissonant way that built in intensity the longer the script ran. This created a disjunctive experiential contrast; a sudden and harsh change in rhythm that disrupted the previously flowing and subtly modulating embodied relationship I felt through spatial audio.

Figure 36: The grandfather clock beginning to fragment, the chiming orbs begin to collide

Translating Life Experiences Through VR Dynamics and Non-Linear Experiential Structure

In this session, Schreur offered commentary on the confrontational, disruptive VR dynamics I had developed in *'The Chaos Event'*, relating them with his experience of perceptual and cognitive impairment:

> *'As perception decreases, sound gets more intense. The world gets smaller. Negatively, claustrophobic. You spiral down. Sometimes discord comes out of the blue. It is unpredictable at times. The timing is important. Discord can happen very suddenly...'*

Schreur's comments on the affective qualities he felt in this work highlighted a growing relationship between the developing VR designs and the translation of his life experience. His comments offered creative cues for developments of the dynamics featured in this work, including:

- Experimenting with building intensity through layered spatial audio.
- Accentuating visual post effects to close down peripheral vision and intensify feelings of claustrophobia.
- Surprise, sudden changes to agency to disrupt an anchored sense of presence.

Neither Schreur or I were satisfied with the environment structure or aesthetic of *'The Chaos Event'*. Schreur described a desire to feel 'a sense of space… Need to be part of a broader space. A bigger landscape'. I documented similar dissatisfaction with the environment layout and aesthetic in my diary. The swirling, coloured brushstrokes felt cluttered, limiting a sense of spatial depth rather than encouraging exploration. The small white platforms felt arbitrarily placed and did not facilitate exploration in a meaningful way.

Schreur preferred the comparatively uncluttered space of '*Isolation VR'*. He noted that the broader, less populated space enabled a greater sense of depth. The moving visual and audio components provided clearer opportunities to interpret his relationship with virtual space. We agreed that the generative environmental components in this work were more effective in enabling a sense of embodied presence to emerge in virtual space through the contingent ways they could be engaged with.

'Circle of Life': Identifying an Experiential Narrative Structure

Schreur produced a VR artwork, *'Circle of Life'*, through which he described a process of cognitive impairment and a slow return to a more stable state. Schreur described the work to me as we viewed it in VR:

> *'…[it] can bring you right down to the pits. But ultimately, when you are down at your lowest point, you start working your way up. Flying back into the turbulence, and you know how to deal with it better. It's a circle isn't it?... You are back into the turbulence of reality but not bogged down, we have learnt to fly in it'.*

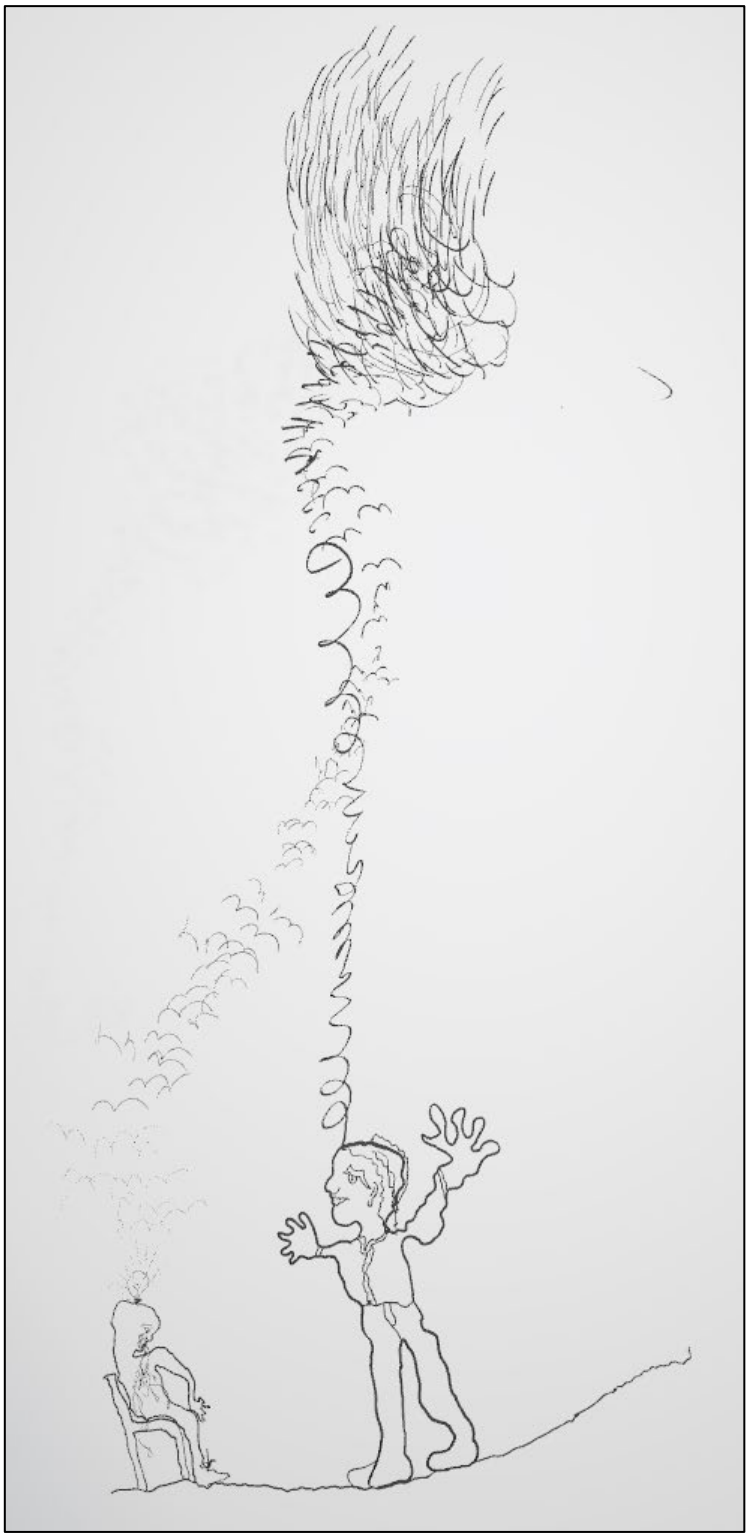

Figure 37: 2D render of 'Circle of Life'

Schreur described a cyclical process where, after a period of impairment where his ability to feel present is significantly challenged (what he called 'The Pits'), he eventually returned to a more stable sense of presence and a means to re-engage with life. This is a learning process for Schreur; an acceptance that these incidents will recur and a progressively enhanced

capacity to deal with them. Through this, I recognised a cyclical verticality that suggested an experiential narrative structure.

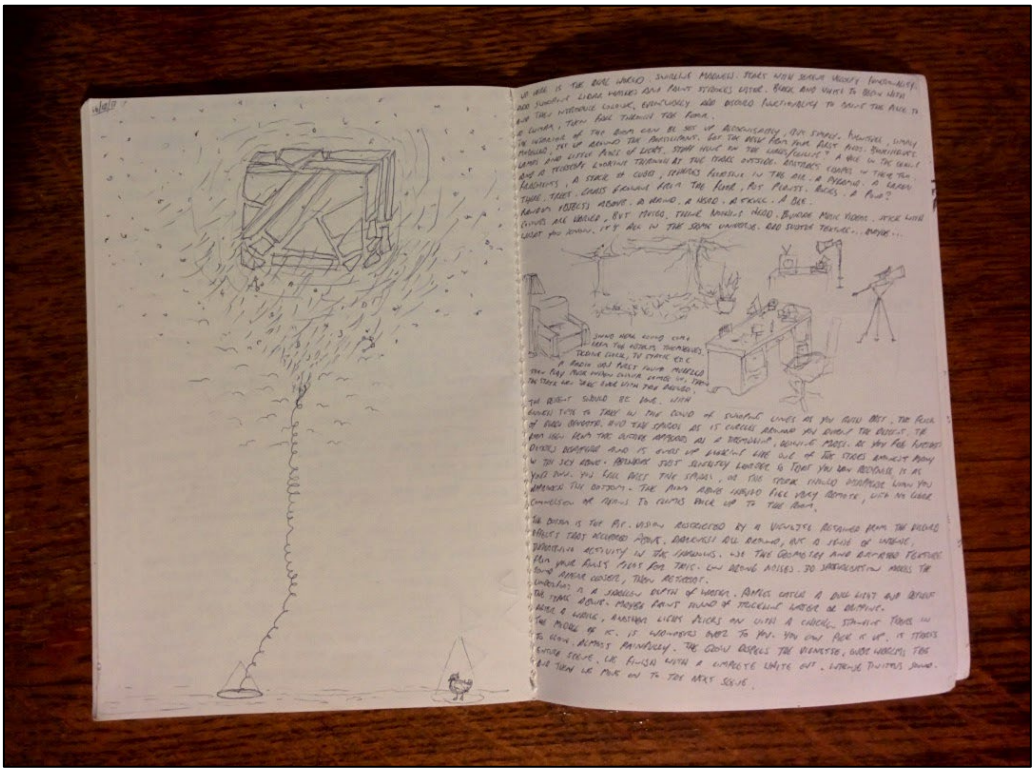

Figure 38: Making diary notes outlining plans for 'Life is Beautiful. Always.' experiential narrative structure

I made diary notes for an experiential structure that is composed of three vertically arranged environments:

- ‘Beyond the Glass Ceiling’ (Figure 39: 'Life is Beautiful. Always.' top level): A realistically designed space symbolising an idealised perceptual and cognitive capacity that contrasts with Schreur’s experiences.
- ‘Marcel World’ (Figure 40: 'Life is Beautiful. Always.' middle level): A space featuring some of the VR dynamics Schreur and I had co-designed to translate aspects of his life experiences.
- ‘The Pit’ (Figure 41: 'Life is Beautiful. Always.' bottom level): A dynamic and abstracted space that translates some of the more extreme periods of cognitive impairment that Schreur described to me.

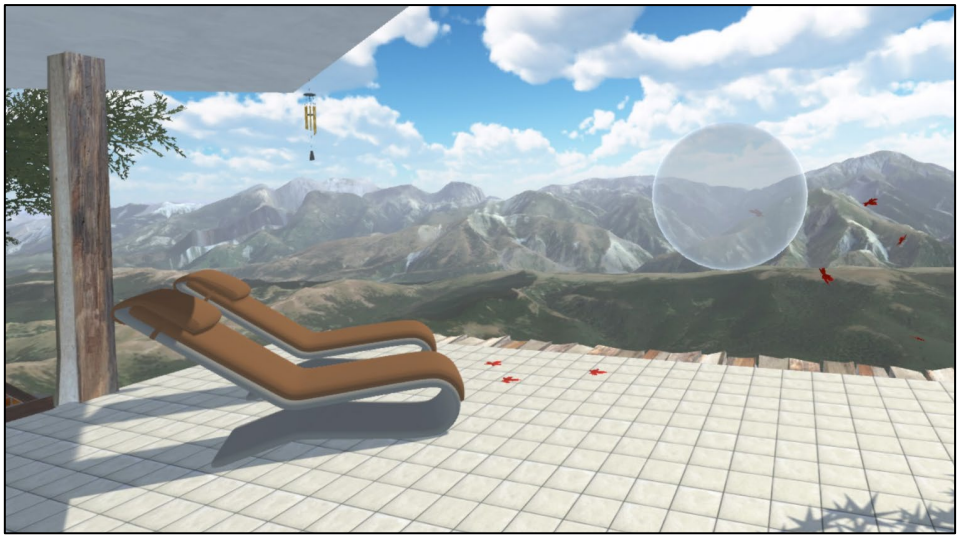

Figure 39: 'Life is Beautiful. Always.' top level

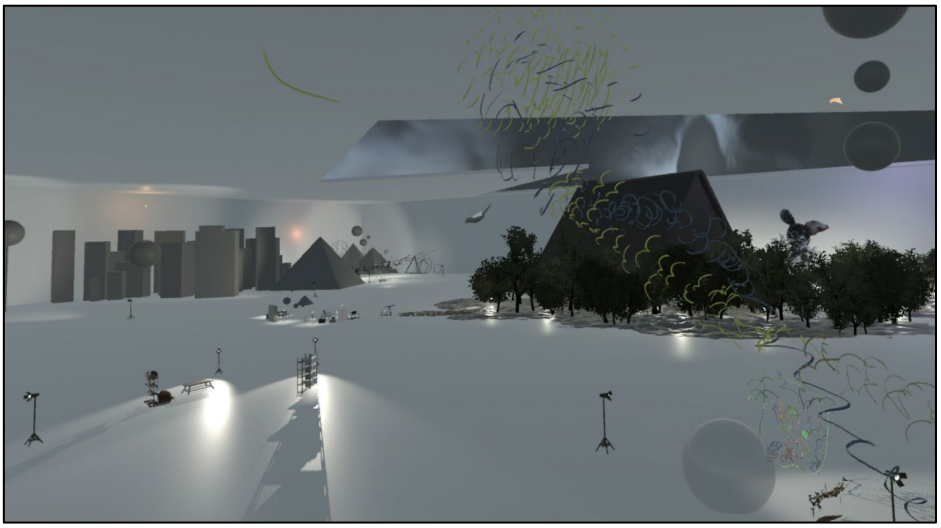

Figure 40: 'Life is Beautiful. Always.' middle level

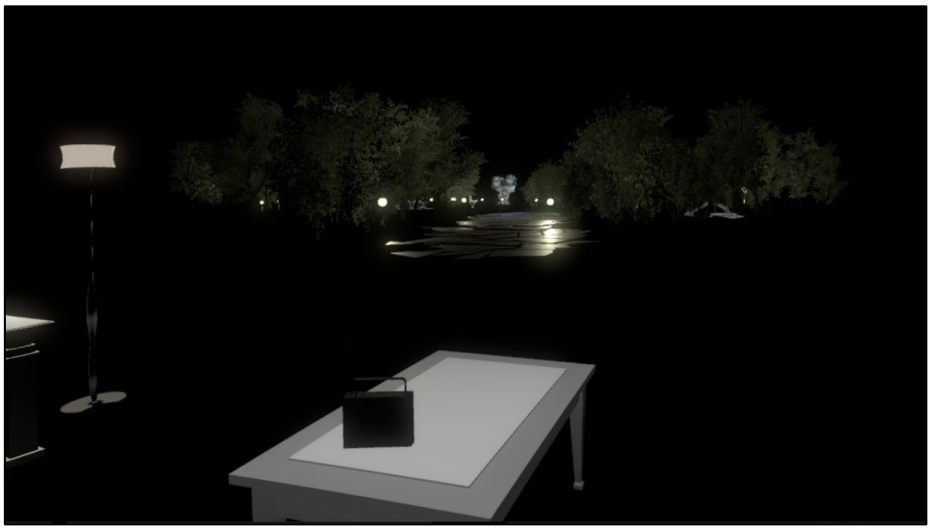

Figure 41: 'Life is Beautiful. Always.' bottom level

Translating Schreur's Experience of a TIA

In this session, Schreur read to me from his diary describing a TIA he had recently experienced. Schreur's writing focused on the physical aspects of this experience, including flashes of blinding light, tinnitus, loss of sense of balance and ground, overlapping and confusing sound, and a feeling of claustrophobia.

Schreur's focus on the physicality of the incident and the intensely problematised sense of presence he described provided useful material to challenge presence in VR design. I explored this by returning to experimentation with procedural generation I had begun in *'Valéry Lights'*; investigating where these design strategies could translate the disruptive physical characteristics Schreur described within a spatially multi-layered, dynamic VR design.

I incorporated movement data obtained from the VR headset, including the direction of head movement and movement speed, to adjust procedurally generated parameters. This enabled me to experiment with relationships between embodied interaction and responsive virtual environments and where expanded senses of embodied presence may manifest within them. I was exploring where this may translate Schreur's experiences; where embodied responsivity disrupted and augmented procedurally generated virtual environments in a way that related to how Schreur's relationship to space was challenged through his TIA. This created opportunities to critically examine where formulations of embodied presence through responsive interaction facilitated subjective, affective engagement with Schreur's experiences.

Summary

The 'Life is Beautiful. Always.' collaborative project demonstrated where methods of co-designing in VR challenged and enhanced practical understanding of presence. The perspectives on presence that Schreur offered from the context of his life experience developed understanding of the multi-faceted ways presence can be understood and actively manifest in VR experience. This enabled a broader scope to critically examine methods to design for presence in VR.

Creatively exploring physical and affective qualities of Schreur's life experiences with Schreur was a valuable way to explore how his life experiences could be translated through the embodied and phenomenal qualities of VR. By translating Schreur's experiences through methods to augment senses of embodied presence in VR design, I was able to critically examine where embodied interaction can contribute to the development of VR experiential narrative structures based on Schreur's life.

This project also began to demonstrate where procedural generation in VR design can problematise and bring critical focus onto the active manifestation of a sense of presence. It demonstrates how generative environmental design can establish a sense of presence, and the impact when presence is challenged through changing qualities of generative environments. The practice began to demonstrate how evolving spatial audio and visual qualities can encourage transforming embodied relationships with virtual spaces. Through these factors, the practical work started to show how these relationships can be designed to invite affective, subjective engagement with a translation of Schreur's life experiences in VR. This insight

provided an experimental foundation for further practice-based research in the next stages of the practical enquiry.

Project #2 – Collaboration with Ivanna Maszczak

This chapter describes the collaborative research project, *'I Look For Them',* undertaken with Ivanna Maszczak, a Ukrainian and survivor of the Soviet Gulag.

A summary description of *'I Look For Them'* contextualises the collaborative project.

The chapter begins by outlining the opportunities this project provided to the research enquiry. Whilst Maszczak had been interviewed several times about the difficult aspects of her life experiences, she felt there were affective qualities of her life experiences that she had not yet had an opportunity to explore or express. This suggested a new collaborative context to explore the translation of some of the affective and experiential qualities of her life experiences through designing for presence in VR.

Details of the collaborative project are described within a series of 'critical encounters' with Maszczak. These show where interview sessions developed an effective collaborative relationship, leading to new insight into how qualities of VR design related to presence encourage affective engagement with Maszczak's experiences.

Summary Description of *'I Look For Them'*

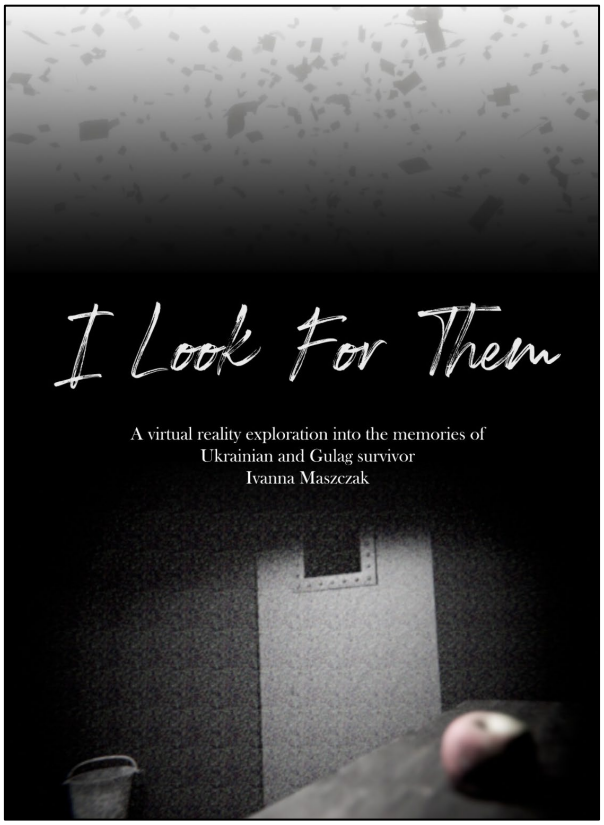

Figure 42: Promotional image for 'I Look For Them'

'I Look For Them' is the first of two VR works made through collaborative research with Ivanna Maszczak. This research project explored how details of Maszczak's life experiences, beginning with her arrest by the Soviet Regime in 1948 and ending at her arrival at the Gulag camp at

Magadan in 1949[311], could be translated into a VR experiential narrative work through design exploration into formulations of presence.

The title of the work comes directly from interview with Maszczak, where she described her life's work after her experiences in the Gulag to connect with and collect testimony of others who shared in similar experiences. It is one of the first excerpts of Maszczak's voice heard in the work.

'I Look For Them' begins with a 360° video of Maszczak's home. A voiceover narrative constructed from interview excerpts with Maszczak outlines the context of the VR work.

This leads to a navigable 3D environment containing three areas that translate parts of Maszczak's journey to Magadan; her initial interrogation, transportation via train across Russia, and stops at transit camps.

After this, a penultimate section translates Maszczak's transportation via ship across the Sea of Okhotsk. Exiting the ship onto the shores of Magadan initiates the final section.

The last section of the work, built primarily from spatial audio components, expresses details of Maszczak's description of her experiences in the camp. Spatial audio components build in volume, layering and intensity, culminating in a white out transition. This leads back to a 360° video of Maszczak at her writing desk, which remains until the headset is removed to conclude the experience.

Introduction

I met Maszczak at Schreur's studio on 12/07/2018. Schreur had recently met Maszczak and, on hearing her life story, suggested that we meet to discuss a potential collaborative project. During our first meeting, Maszczak read from her autobiography, describing her family's experiences leading to her arrest by the Soviet regime in 1948 and sentence to ten years corrective labour at a Gulag camp in Magadan, Siberia. Maszczak had been interviewed several times about her experiences by various organisations and was approached for further interviews during our collaboration, including by The Guardian[312], The Museum of Communist Terror[313], and LADbible[314]. I was concerned about what I could add to this already well-established historical context. However, Maszczak reflected that there were felt aspects of her experiences that, due to the context of previous interviews that focused on the traumatic aspects of her life, she had not had the opportunity to share. Maszczak said, 'I can tell you everything, but I cannot tell you how I feel', expressing a desire to explore some of her affective relationships with her memories. I recognised an opportunity to examine how collaboratively

[311] Maszczak was born on 11th of July 1925 in Khorobriv, Ukraine. In September 1948, she was arrested for involvement with a Ukrainian Underground Movement. She spent eight months in interrogation in Kyiv. On 11th of April 1949, Maszczak was sentenced under article 54.2 and 54.11 for counter-revolutionary activity to ten years hard corrective labour. She served six years in the coastal Gulag camp at Magadan and was released in 1955.

[312] Delgado, K. (2019*). 'I longed for the moment you would write': the gulag penpals whose love lasted 60 years.* London: The Guardian.

[313] MOCT. (2022, February 15). *What was it like in the Gulag? Interview with a survivor*. Retrieved from YouTube: https://www.youtube.com/watch?v=XEaY1RCRgLk

[314] LADbible. (2023, April 23). *Ukrainian Woman On The Life Inside Gulag | Minutes With | @LADbible*. Retrieved from YouTube: https://www.youtube.com/watch?v=TYrQlUmJ2lo&t=4s

designing for presence in VR may enable a new perspective to translate the affective qualities of Maszczak's life experiences that she wanted to explore.

'Critical Encounters' With Ivanna Maszczak

The sub-sections below detail a series of 'critical encounters' with Maszczak. These do not cover all interactions with Maszczak during our collaboration, as we began to talk informally quite frequently over the phone (and still do at the time of writing) as a relationship of trust and friendship built between us. They outline the development of methods employed to facilitate collaboration with Maszczak, and where a complex understanding of Maszczak's life experiences through collaborative working with VR developed.

See Appendix B for a summary table of activity during critical encounters with Maszczak.

Establishing Appropriate Methods for Collaboration

These interview sessions took place at Maszczak's home. Maszczak shared anecdotes from her childhood, her family's involvement in the Second World War, her arrest and transportation to the Gulag camp at Magadan. I chose not to ask Maszczak to reflect on her experiences within the specific context of presence in VR. I felt it was more appropriate at this initial stage of the enquiry for Maszczak to lead interview themes and share her life experiences in the way she wanted to. Maszczak commented that she appreciated the fact that I listened rather than probing her on what she called 'special topics', the more traumatic details of her experiences. Maszczak chose to describe her life experiences in a way that differed from previous interviews, concentrating on environmental and affective details other than the popular context of the difficulties she endured. This was an important initial dynamic in establishing our collaborative relationship, supporting to build trust and an authentic, shared context to collaboratively explore Maszczak's experiences in VR.

Maszczak shared a book draft she was writing that included a description of her journey to the Gulag. It contained rich descriptions of the places she had visited, including a poetic and striking sense of the affective significance that these memories held for her. For example, Maszczak described an experience in a transit camp where she looked through a barbed wire fence to a section of the Volga and Samara rivers and watched steamer ships floating by. She used this experience to signify the freedom she had lost:

'We came out of the barracks, and then we looked at the wires, and on the shiny water belts of Volga and Samara Rivers. It seemed that we were within spitting distance from water, from twinkling lights of steamers, from the freedom…'

These descriptions provided valuable material to begin experimenting with VR environment designs. I identified a series of environments as a basis for practical experimentation:

- A holding cell where Maszczak was held during an eight-month period of interrogation.
- A transport wagon in which she was taken across Russia into Siberia.
- Stopping at transit camps during the train journey.
- A journey by ship across The Sea of Okhotsk.
- Arriving at the shores of Magadan.

See Appendix C for a full transcript of diary notes that informed initial environment designs in this work.

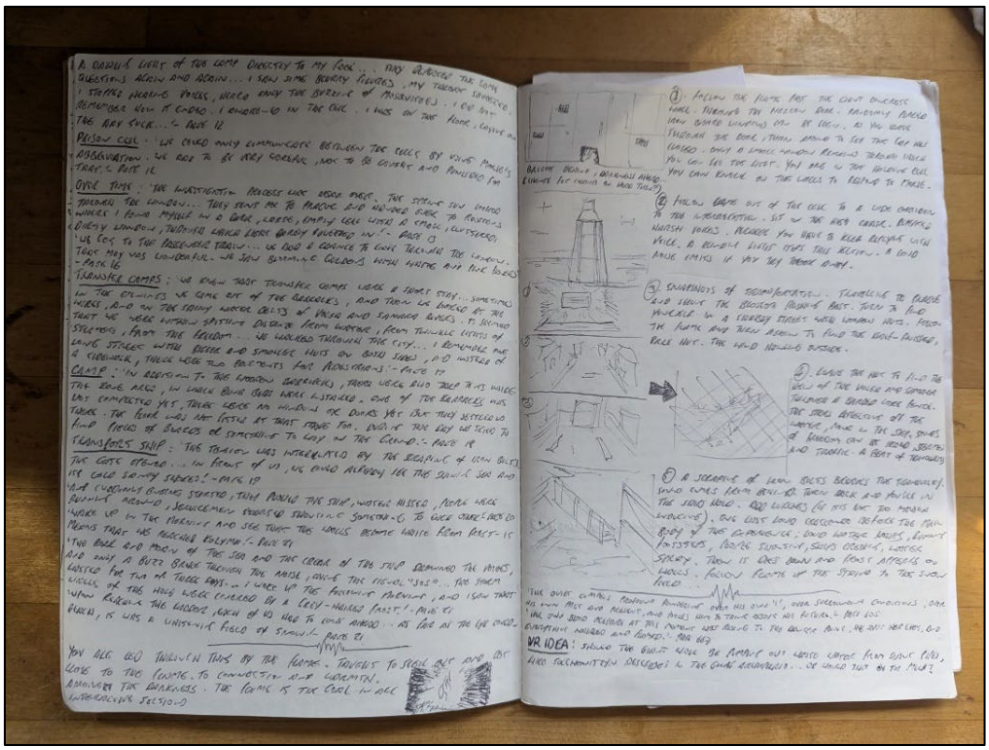

Figure 43: Diary page containing notes for 'I Look For Them' Environment Designs

I gathered 3D photogrammetry assets from Maszczak's home. These included Maszczak's writing desk, a shelving unit containing her historical archive, a map tracing her journey across Russia to Magadan, a diary kept during her incarceration, and her living room furniture. My aim with these was to experiment with suggested narrative links between Maszczak's present as suggested by photogrammetry and her past as it is translated into 3D environments. I aimed to subtly steer interpretation away from understanding environments as actual places and events Maszczak experienced in her past, emphasising their abstracted translation through Maszczak's recollection in the present.

Figure 44: Maszczak's writing desk and shelves as they appear in 'I Look For Them'

I scanned photographs of Maszczak at various ages, her family, friends and some landscapes of the camps at Magadan. I did not have a clear plan for inclusion of all the photography I gathered within practical experimentation. However, the process of documenting these photographs created a collection of visual reference to enrich my immersion in Maszczak's history. The landscapes from Magadan provided useful reference material for the design of camp environments.

Figure 45: A photograph of two of Maszczak's friends as it appears in 'I Look For Them'

Figure 46: Photograph of the Gulag camp at Magadan

Exploring Translations of Life Experience in VR Design

Maszczak reviewed VR environments that I had produced in response to previous interviews. She identified a representative quality within these environments that simulated further anecdotes. Through these, I continued to build a combined picture of their context and affective significance. Maszczak also offered several corrections to environment designs. For example, she noted that guard towers were not so well constructed, asking me to make them from pieces of wood with missing pieces. She also emphasised the featureless, enveloping whiteness of the snowy expanse she encountered on arriving at the shores of Magadan.

Figure 47: Early draft of a barbed wire fence and guard tower beyond

Maszczak created hand-drawn sketches to support virtual environment designs (Figure 48: A sketch Maszczak drew in response to draft work, describing a detailed view of the landscape from the transit wagon).

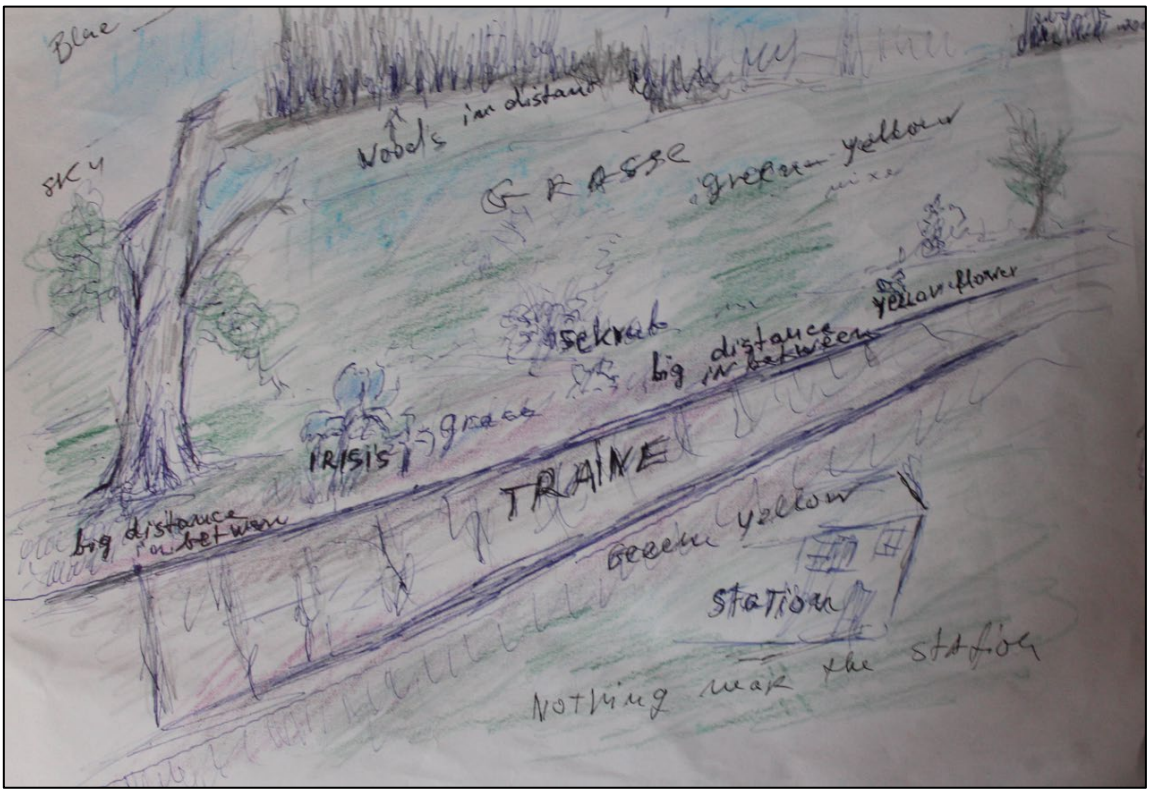

Figure 48: A sketch Maszczak drew in response to draft work, describing a detailed view of the landscape from the transit wagon

This was a useful progression in our collaboration, as Maszczak was now contributing specific experiential features and creative design feedback to inform practical development. This

enabled interview sessions to be directed towards the developing VR designs in addition to discussing the detail of her life experiences.

At this stage, I noticed a shift in emphasis in the collaborative context of the project in relation to the enquiry aims. There was a representative quality in the work that, as evidenced through the types of feedback Maszczak offered, she felt able to contribute to and desired to see in the final outcome. This steered the design direction of the project towards exploring how representative virtual environments may enable Maszczak's ability to collaborate with VR. I decided to continue working with Maszczak in this way as, although it necessitated a move away from concentrated critical exploration of designing for presence in VR, it enabled us to develop a richer shared understanding of her life experiences and strengthened our collaborative relationship.

As Maszczak and I continued to work in this way, I recognised that environment designs started to become compound translations of several of Maszczak's memories. Exploring this further, I took creative inspiration from Edward Casey's *'Remembering: A Phenomenological Study'*[315], specifically his writing on the fragmentary aura of memory; a quasi-narrative quality that forms through dispersed and disjointed details across several instances of remembering[316]. Casey's writing suggested a fragmented approach to VR environment design and narrative structure through which I considered the translation of Maszczak's memories. I started incorporating environmental details from across several experiences that Maszczak shared, which gave environment designs a fragmented, abstracted quality as these details were brought together within a single composition. This also elevated virtual environments beyond visual representations of singular places Maszczak had visited, which supported to invite a more ambiguous interpretation of the combined details they translated.

I started to consider my own subjective engagement with Maszczak's memories more closely. Maszczak had shared several hours of her recollections by this point, and I found that my understanding of them was imbued with an aura of their affective significance through the pace and tonality that Maszczak had shared them. I also recognised recurring details across Maszczak's experiences that emphasised their affective significance for her. For example, the blank, featureless and enveloping shores of Magadan that also signified the dark unknown that she was entering into. To help identify these, I transcribed audio recordings of interviews and underlined moments where Maszczak described the affective significance her memories held. This facilitated an additional iteration over the material I had gathered, strengthening my subjective impression of them.

[315] Casey, E. (2000). *Remembering: A Phenomenological Study*. Indiana: Indiana University Press.
[316] (Casey, 2000)

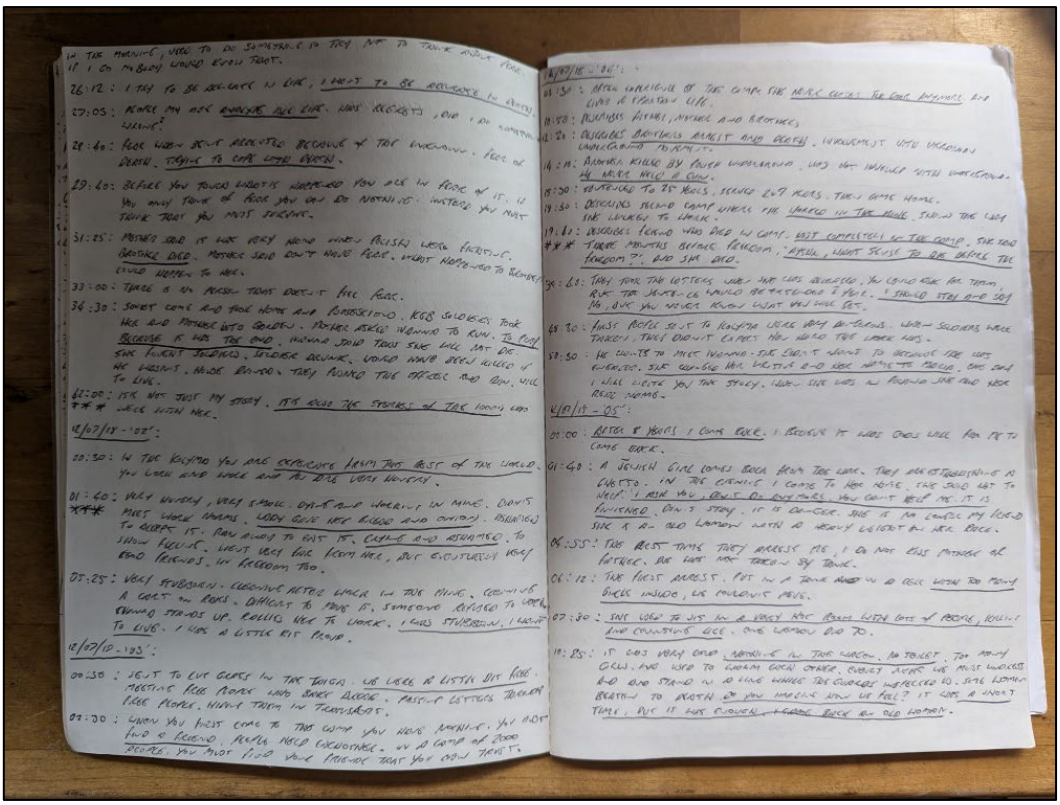

Figure 49: Design diary transcripts of interviews with Maszczak, with underlined sections that highlight the affective significance they hold for her.

Creatively responding to these elements of Maszczak's memories provided opportunities to consider how their affective quality may be translated into VR. I started experimenting with immersive and atmospheric qualities of VR environments, such as spatial audio, lighting, depth and proximity of environmental features to develop a sense of affective atmosphere within the environments. My aim was to explore how the aesthetic and atmospheric quality of virtual environments supports to establish an affective sense of presence within them. This also started to build a sense of narrative structure within the environments, as I began experimenting with contrasting atmospheric dynamics to lead through contrasting stages of the work.

Project Review

This was the final time Maszczak viewed the VR work. Unfortunately, Maszczak's eyesight had deteriorated such that she was no longer able to view the work with VR. I recorded a screen capture of the work for Maszczak, to which she offered a few minor corrections to environmental details. She suggested the removal of some footprints visible in the snow at the shores of Magadan, preferring the scene to look more uniformly white. She commented on the quality of the barbed wire fences, suggesting that in her memory 'they were not so perfect'.

She expressed a strong felt correspondence between the VR work and her memories, which she noted by saying 'this is real'. I felt that this marked a significant milestone in our collaborative work to translate Maszczak's experiences into VR. Whilst the environments I had designed were not representative of any specific real locations, Maszczak's comment suggested an authenticity in their function as affective translations of Maszczak's memories. I

felt that we had achieved a deep shared understanding of the specific affective and experiential quality Maszczak desired to convey. The effectiveness of the collaborative methods employed in this project was validated by Maszczak's comment.

In this iteration, I designed a central space that enabled access to the environments I had previously developed. This enabled a non-linear structure, as environments could now be encountered in any order. The central space was designed to look like a fragmented collision of details from across each environment and was structured to resemble the block of flats that Maszczak lived in. I made this correspondence explicit by including a 360° video at the start of the work that features scenes from Maszczak's home. I included audio excerpts from interviews with Maszczak's over this section, introducing the work and its context. Including 360° video enabled me to experiment with the contrasting aesthetic and experiential qualities of 360° video with 3D rendered virtual scenes; where transitioning between them affects presence via the ways they differently enable embodied engagement with virtual spaces.

Figure 50: Maszczak as she is encountered in the introductory 360 video sequence

I included a final section within this iteration that experimented with translating some of the details of Maszczak's experiences at Magadan. I was concerned with the appropriateness of translating these aspects of Maszczak's memories. Maszczak had deliberately moved away from the traumatic aspects of her life experiences (the 'special topics'), and I did not want to attempt to translate these difficult aspects of Maszczak's experiences. I instead endeavoured to explore fragments of environmental details she had offered, such as the denseness of the forest she worked in, or the distant sound of mining heard from the barracks. I made the decision to experiment with spatial audio rather than visuals. This moved the design process away from an overtly representative design approach and more towards an abstracted and ambiguous approach to VR design.

I returned to my experimentation with the interplay of layered, procedurally generated dynamics that I had previously explored in 'The Pit' section of *'Life is Beautiful. Always.'*. Experimenting exclusively with spatial audio challenged me to consider the generation of

spatial depth in new ways, as there were no overt visual components to spatially anchor the view within the scene. I designed several layers of spatial audio that procedurally generated according to semi-randomised parameters, including thresholds for the number of audio emitters, their position, movement, the sounds they play, their volume, and other audio effects such as reverb and low pass filters. I began experimenting with how the generative processes may facilitate moments of harmonic, dissonant and rhythmic qualities, and through them differing senses of spatial depth. I found there was an embodied, rhythmic and responsive quality to this experimentation that I felt I had not yet adequately explored within the research enquiry. The multi-layered, procedurally generated spatial audio presented new opportunities to explore the affective impact that rhythmic, harmonic and dissonant qualities had through formulations of embodied presence in virtual spaces. This practice-based experimentation formed the basis for more detailed exploration in the *'Be That Ocean'* project.

Summary

The *'I Look For Them'* research project demonstrated how VR can be used as a collaborative tool to explore and translate phenomenal and affective qualities of Maszczak's life experiences. Creating virtual environments representing aspects of Maszczak's life experiences that she recognised enabled her to creatively feedback into collaborative research. This supported to develop a fruitful collaborative relationship through which Maszczak and I built a complex and nuanced understanding of Maszczak's experiences and the affective significance they jointly held for us. Maszczak's detailed and intimate contribution to the development of this shared research foundation, and her trust in me to continue working in VR with her life experiences, enabled me to continue to explore the translation of the affective qualities of Maszczak's experiences in further practice-based research.

The decision to design in a more representative way left some of the core research aims on the capacities of presence in VR to translate life experience (particularly the qualities that enable expanded embodiment and responsivity) open to further research. This suggested further potentialities to explore translation of my affective understanding of Maszczak's life experiences into responsive, embodied VR experiences in the *'Be That Ocean'* project.

Project #3 – A Second Work Through Collaboration with Ivanna Maszczak

This chapter describes the practice-based research process for *'Be That Ocean'*; a second VR work made in response to my collaboration with Maszczak. I undertook further practice-based experimentation into the embodied and responsive capacities of VR to translate affective qualities of Maszczak's life experience into experiential narrative.

The chapter describes methods that were employed in the design of responsive, layered virtual environments that translate affective qualities of Maszczak's experiences. Procedural generation and VR design methods for embodied responsivity are experimented with to explore expanded formulations of embodied presence and non-linear experiential narrative structures. This reveals the potentialities for the evolving, responsive qualities of virtual environments to imbue senses of embodied presence with an affective quality. This presented new opportunities to explore translating affective qualities of Maszczak's experiences into VR experiential narrative through designing for presence.

Summary Description of *'Be That Ocean'*

Figure 51: Promotional image for 'Be That Ocean' VR work

The title for this project came from a passage in Georges Bataille's *'Inner Experience'*[317]:

[317] Bataille, G. (1988). *Inner Experience*. SUNY Press.

'Be that ocean… designates experience and the extremity to which it leads… A man cannot distinguish himself from others here in any way… "be that ocean," … makes man at once a multitude and a desert. It is an expression that summarises and makes precise the sense of a community'[318].

I connected this quote to Maszczak's description of her journey across The Sea of Okhotsk during a dangerous storm. Maszczak described how she briefly escaped the dark, overcrowded ship's hold and got up to the deck. Despite a considerable risk of severe injury or death, Maszczak chose to focus on the beauty of the sea; the enveloping dynamism of the refracted play of coloured light on the water as it rose up and threatened to engulf her and the ship. I recognised a parallel between Maszczak's experience and Bataille's writing. Maszczak stood in the face of the sea, choosing to immerse herself in its beauty whilst in the midst of an extreme, life-threatening event that may have consumed her and everyone who was with her.

'Be That Ocean' consists of two non-linear, procedurally generated experiential phases. Firstly, a series of five responsive virtual environments are procedurally generated in a random order, presenting abstracted translations of some of the affective qualities I gathered of the environments that were previously explored in *'I Look For Them'*:

- Interrogation
- Transport Wagon
- Transit Camps
- The Sea of Okhotsk
- The Shores of Magadan

In the second phase, new virtual environments featuring responsive spatial visual and audio components from across each of the environments in phase one are procedurally generated. This creates unpredictable configurations that merge the components of phase one, offering new perspectives to engage with their embodied, responsive qualities. The sound of ocean waves and post effects applied to vision build in volume and intensity, culminating with an enveloping sound of the ocean and a visual white out that brings this phase to a close. The experience then returns to the start of phase one and rebegins.

Introduction

In this research project, I wanted to avoid the use of directly representative environmental components that featured in *'I Look For Them'*. My aim was to explore translation of the affective relationships I had built with Maszczak's experiences through designing for formulations of embodied presence in VR.

I was interested in further developing the technical procedural generation framework from my exploration into spatial audio components in the final phase of *'I Look For Them'*. This started to suggest new possibilities to creatively experiment with the interplay between rhythmic and responsive dynamics in virtual space. Through this, I explored how these dynamics can invite

[318] (Bataille, 1988, p. 27)

expanded senses of embodied presence and facilitate relational, affective engagement with Maszczak's life experiences.

Unfortunately, due to restrictions during the COVID-19 pandemic, it was not possible for Maszczak to collaborate on this project through an iterative review process. I considered sending Maszczak video recordings of the work and conducting telephone review sessions. However, I decided that due to the subtle language barrier, potential issues with file sharing and the possibility of telephone interference, this method would more likely frustrate Maszczak rather than enable collaboration. Maszczak was aware that I was developing this work and gave permission to proceed.

Design Iterations

I began by returning to the interview transcripts and design diary notes from the *'I Look For Them'* project. I highlighted elements of this work that dealt with phenomenal aspects of Maszczak's experiences; elements that describe sounds, colour, or structural components of Maszczak's memories. I considered how they may feature as experiential qualities that engage the participant in an embodied way; using spatial depth and proximity, scale, pacing, motion and composition to engage the body and encourage an expanded and evolving sense of embodied presence. I referred to these qualities in my design diary as *'somatic glimpses'*; qualities of VR experience that offer ambiguous interpretation of Maszczak's experiences through the ways they dynamically engage the body. I listed these notes in categories according to the environments previously explored in *'I Look For Them'* (see Appendix D) and used them as design prompts.

I drew diagrams to compose these qualities in virtual environments. The design for these diagrams is somewhat reminiscent of Jessica Brillhart's VR storyboarding techniques [319]. However, whereas Brillhart's diagrams use framing and editing techniques common to filmmaking to craft experiential narratives with 360° video, my approach diagrams the dynamic interplay and potentialities for interaction across surrounding layers of depth in 3D rendered virtual environments.

[319] Brillhart, J. (2016, February 5). *In the Blink of a Mind — Attention*. Retrieved from Medium: https://medium.com/the-language-of-vr/in-the-blink-of-a-mind-attention-1fdff60fa045#.yqoswo449

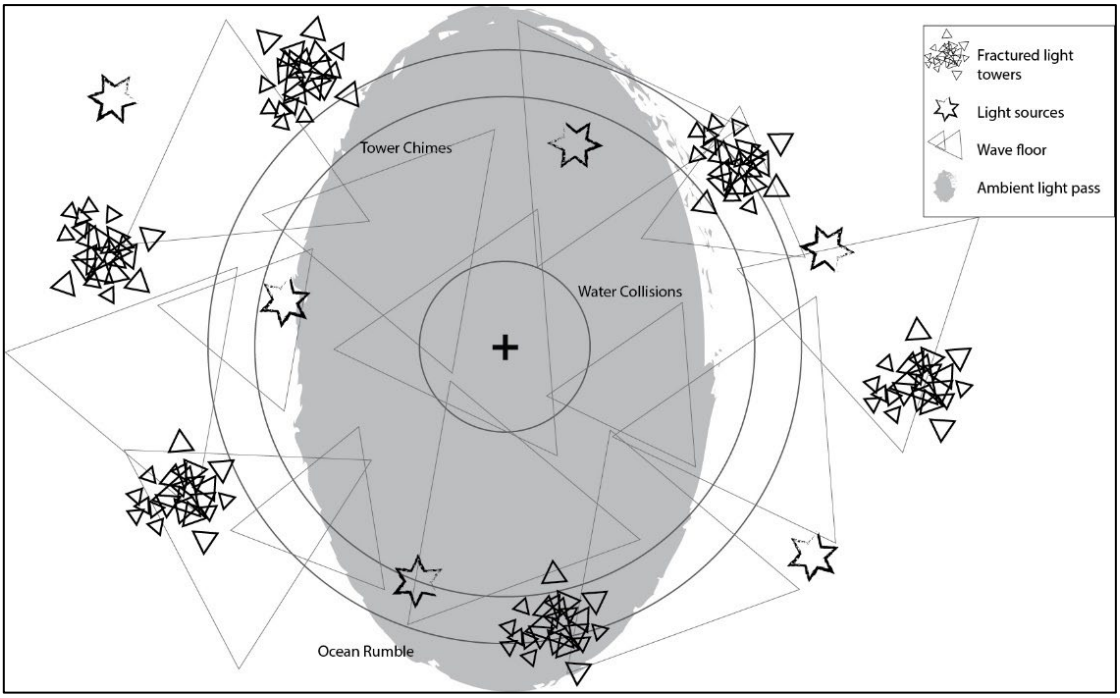

Figure 52: Diagram of the 'Sea of Okhotsk' environment in 'Be That Ocean'

The centre of these diagrams features a '+' icon representing the headset point of view, surrounded by three concentric circles that represent close, medium and long-range distances[320]. Dissecting spatial depth in this way enabled me to plan the proximity of environmental components and possibilities for where they may intersect. It provided a loose structural foundation to begin experimenting with the interplay between layered experiential dynamics through procedural generation techniques.

I created processes to determine the procedural generation and behaviours of environmental components. These included parameters for their position, movement, interaction and responsivity, lifespan, and progressive dissolution from the scene. I experimented with how their behaviours created possibilities for combined interaction and composition in the scene. This was a concentrated creative process that involved countless iterations of review, making micro adjustments to parameters, then repeatedly running the process to experience the result. In addition to changing the values of parameters that determined the procedural generation of environmental components, I also frequently returned to redevelop the parameters themselves. This was sometimes part of the creative process towards achieving a desired composition. However, it was also to address technical limitations, as I found that the combined introduction of environmental components exceeded the processing capability of the computer I was developing on.

Each iteration generated a subtly different composition and level of responsivity within the environment. Adopting Aarseth's 'implied player' method[321], I examined where parameters for responsive components enabled embodied responsivity without dominating the scene and

[320] The exception to this is the 'Transport Wagon' diagram, which features vertical lines to signify the depth of components that move horizontally through the scene and past the participant.
[321] (Aarseth, 2007)

distracting my attention from other environmental components. I considered where the interplay between structural components found balance, enabling more prominent environmental components to come to the fore whilst allowing others to build a coherent virtual landscape across layers of depth.

I considered where I felt the work developed a sense of embodied presence through the ways the environments responsively engaged my body. Through this, I considered where the work invited and affective embodied engagement that related to my impressions of Maszczak's experiences, such as a modulating sense of close confinement in in the interrogation environment, or a sense of a progression into a dark, unknown territory in the transport wagon. I started to recognise layers of experiential rhythm, dissonance and harmony that had an affective impact on my sense of embodied presence. I felt my body tune in to repetitive or pulsing visual and audio qualities, whereas more consistent environmental qualities created an experiential background that either harmonised or at other times felt obstructive or abrasive. Processes that included loud sounds or close-range changes to visuals broke experiential flow, causing me to feel a break in a sense of presence that invited my body to rhythmically re-engage with presence in its active reformulation. I found that these effects imbued my sense of presence with an affective quality which I experimented with further. For example, the potential to feel dwarfed by towering, water-like structures that procedurally built around me in The Sea of Okhotsk landscape. Developing this, I adjusted the parameters for height and proximity to accentuate their relative scale compared to the headset point of view. I accompanied their generation with a rushing water sound that momentarily washed over and dominated other audio layers if they appeared in close proximity.

Re-Configuring Procedurally Generated Environments to Challenge Presence Through Design

Once I felt the environments had developed the potentialities for senses of embodied presence and the affective qualities I was working towards, I developed further procedural generation processes to build new environments from their constituent parts in new combinations. This created new opportunities to experiment with the potentialities for embodied presence in non-linear experiential structures through the ways that procedurally generated environments built and replaced each other in unpredictable sequences.

I created a process that semi-randomly selected components from across each environment and composed them in a new configuration. This process featured its own parameters to ensure that components covered each layer of spatial depth and limited the number of components so the scene maintained a coherent composition. As I reviewed iterations, I recognised that the parameters that determined behaviours of individual components required adjustment to enable them to work together in new unpredictable compositions. Addressing this, I created further processes that changed parameters as they are introduced. This required me to examine the experiential flow of the work more holistically, as there were now several layers of randomisation and procedural generation in play that resisted a definite composition or experiential structure. I was experimenting with parameters across several procedurally generated components, searching for the potentialities for senses of embodied presence to emerge through harmonic and rhythmic qualities, or the possibility for presence to be challenged through staccato or dissonant disruption, whilst maintaining a sense of spatial

layering and coherency. Adopting the 'implied player'[322], I sought moments where compound environmental configurations encouraged affective senses of embodied presence and made adjustments to parameters to increase the likelihood of these.

I continued refining generative parameters until I felt that this phase reached a state that consistently created opportunities to engage with a sense of presence through embodied responsivity within a varied, multilayered and rhythmic experiential flow.

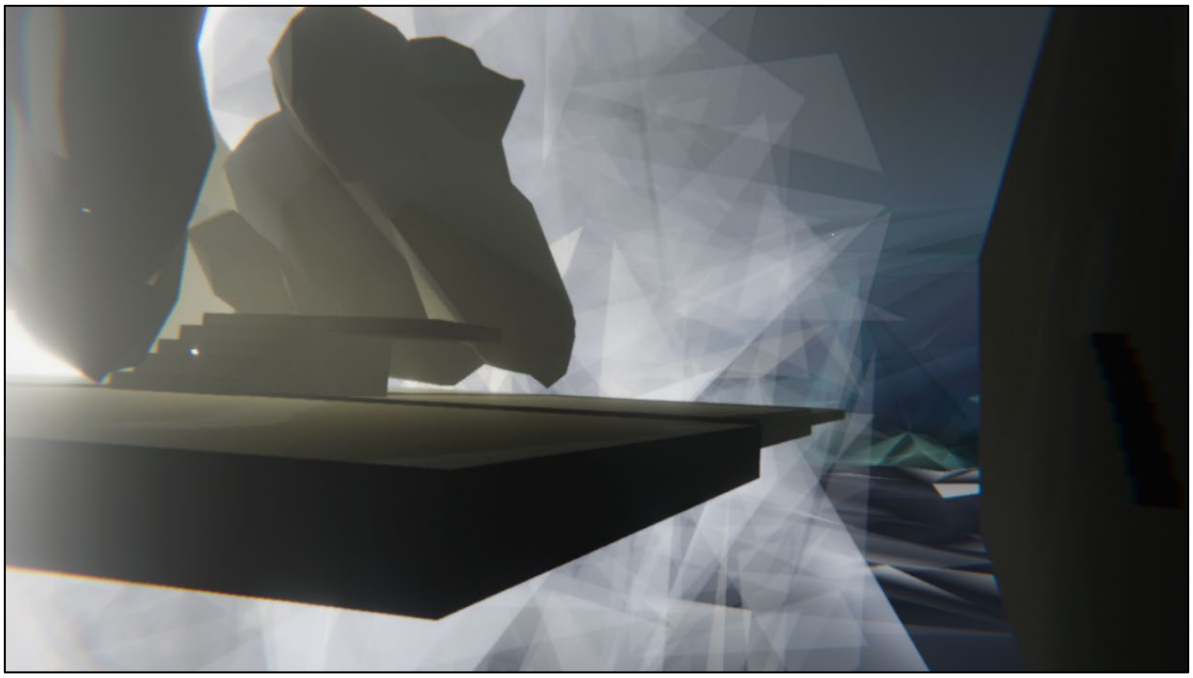

Figure 53: Components from the 'Interrogation', 'Transit Camp', and 'Sea of Okhotsk' environments create a combined scene

Formulating 'Be That Ocean'

I brought the two experimental phases together into a single experiential structure. The first phase iterates through each complete procedurally generated environment in a randomly chosen order. My intention is to allow this phase of the work to demonstrate the components that formulate each environment in their original context. This establishes understanding of the potentialities for embodied responsivity and presence, and through these invites interpretation their experiential narrative context. After this, the second phase that builds unpredictable environmental configurations initiates. I found that experimenting with the interplay between these two phases was an effective way to challenge formulations of embodied presence established in phase one, and to invite re-engagement with the works potential to encourage affective relationalities with Maszczak's experiences.

I wanted to accentuate the potentiality to challenge the sense of presence within phase two. My aim was for the work to reach a climactic moment that resisted an embodied equilibrium and left a sense of embodied presence in a problematised state, encouraging focus to remain on presence in its active manifestation. I created an additional layer of processes that progressively intensifies the interactions between environmental components. This included

[322] (Aarseth, 2007)

increasing the number of components (particularly close-range components), intensifying light sources, rates of movement and the impact of collisions between objects, and increasing the probability to introduce more disruptive, staccato components. Experimenting with these parameters was an effective way to identify the more confronting experiential components in the work, such as the speed of moving objects in the 'Transport Wagon' environment, or the bright, refractive light sources that feature in 'The Sea Okhotsk'.

Building on this, I programmed the random selection of components that build the transitions between the compound environments to become increasingly rapid. The disruptive quality of environment transitions became significantly intense as the tempo increased. This was especially effective as the rate of change and became so great that I was unable to acquaint myself with the possibilities for embodied responsivity. At this point, it becomes almost impossible to definitively establish a sense of presence in the work. I found that this disruption left my sense of presence in a problematised state, which I felt catalysed a reflective mode where I sought to gather my impressions of the embodied experience the work had presented to me and its connection to Maszczak's experiences.

Summary

The *'Be That Ocean'* project demonstrated how the affective qualities of Maszczak's experiences can be translated through designing for expanded senses of embodied presence in VR. It extended insight into procedural generation as a design method to explore presence in its active formulation in VR. It demonstrated where compound procedural generation processes create opportunities to explore the potentialities between dynamic virtual components and embodied responsivity in VR design, and where this enables reflexive analysis into the design of formulations of embodied presence.

The design methods used within this project enabled new exploration into how layered, dynamic virtual components generate transforming, rhythmic senses of experiential flow. The project demonstrated where these rhythmic qualities encouraged affective engagements with the body in virtual space, and where this invited a relational connection and the potential for ambiguous interpretation within a translation of Maszczak's life experiences.

Chapter Summary

This chapter described how collaborative research methods were employed across the practice-based enquiry to facilitate collaborative working with Marcel Schreur and Ivanna Maszczak. It showed where the perspectives Maszczak and Schreur offered through their life experiences challenged practical and epistemological understandings of presence, and where this significantly enhanced the enquiry's capacity to practically explore methods to design for presence within the translation of their life experiences. Through the VR design methods developed to translate Schreur and Maszczak's life experiences, the chapter showed how a relational, collaborative understanding of Schreur and Maszczak's experiences can be explored through the specific embodied and phenomenal capacities of VR.

The chapter reviewed where VR was used as a co-design tool to develop mutual understanding of Schreur's life experiences, to practically explore presence through co-making VR artworks,

and where translations of his life experiences could be experienced within non-linear experiential narrative structures. It showed where methods of co-designing in VR facilitated an iterative design process that led to the production of the *'Life is Beautiful. Always.'* VR experience.

The chapter showed how an unstructured interview method led to a detailed shared understanding of Ivanna Maszczak's life experiences. It outlined the use of VR as an environmental design tool to enable a representative translation of Maszczak's experiences, which stimulated memory and enabled Maszczak to creatively contribute to the VR design research process. It examined where collaborative working with Maszczak developed virtual environments that expressed some of the affective significance that Maszczak's experiences held for her, demonstrating the use of VR as a tool to translate affective qualities of her experiences into VR works.

The chapter then overviewed where the complex affective relationships I had developed with Maszczak's life experiences through collaboration formed the basis for the *'Be That Ocean'* research project. It outlined my further practical and critical exploration into how affective qualities of Maszczak's experiences could be translated through designing for expanded formulations of embodied presence in VR. It described my experimental use of procedural generation and embodied responsivity to explore methods to design for formulations of embodied presence in VR. It showed where these methods explored the affective relationships that can form with procedurally generated, responsive virtual environments that respond to the embodied interaction. Through this, the chapter reviewed the potentialities to encourage evolving and complex affective engagements with translations of Maszczak's experiences through VR design.

The next chapter describes the main VR works that were created through collaboration with Schreur and Maszczak and the design methods that underpinned their production. This outlines how the design methods to explore presence in VR that were developed through collaboration led to the creation of VR experiential narratives that translate Schreur and Maszczak's life experiences.

Chapter Five: Exploring VR Experiential Narratives Through Presence Design

This section overviews the three VR works generated through this enquiry*; 'Life is Beautiful. Always'*, *'I Look For Them'*, and *'Be That Ocean'*. It describes the design decisions that underpinned the development of these works; where they encourage formulations of presence that create embodied and affective links with translations of Schreur and Maszczak's experiences.

This chapter outlines each of the VR works in the sequence that they were originally developed. This facilitates a progressive view of how new insight into the methods to translate life experiences through designing for presence in VR developed across the enquiry.

'Life is Beautiful. Always.'

The three structural narrative components within *'Life is Beautiful. Always.'* are discussed in turn, outlining how elements of their design contribute to formulations of presence and translate aspects of Schreur's life experiences.

Top Level: 'Beyond The Glass Ceiling'

The first section of *'Life is Beautiful. Always.'* was referred to by Schreur as 'Beyond The Glass Ceiling'. This signified an idealised perceptual and cognitive capacity that contrasts with the variable perceptual and cognitive faculties that Schreur experiences.

Drawing on this, I designed the environment to feel fairly realistic and calming, encouraging a sense of presence to habituate itself to the experience of engaging with VR. Warm lighting, high resolution textures with vibrant colours, a subtle and pleasant audio landscape featuring gentle wind blowing, trickling water and birdsong, and a view into a mountain landscape beyond creates an atmosphere that allows the participant to gently orient themselves to VR. This aesthetic provided opportunities for experimentation with where presence may be challenged through contrasting aesthetic or experiential components later in the VR experience. The aesthetic for this section also drew from the design of a home screen that appeared when you first donned an Oculus VR headset (Figure 54: Still from one of the original 'Oculus Home' screens). Schreur frequently commented that he felt comfortable in that virtual environment, so I drew on some of its environmental qualities (such as the natural light and sound quality) in this design.

Figure 54: Still from one of the original 'Oculus Home' screens[323]
Image removed for copyright reasons

This environment introduces the gaze-based navigation control scheme, as it enables movement into a lift positioned in the centre of the space. The incongruent design of the lift matches the comparably desaturated and simpler textural qualities of the second stage of the work, introducing the aesthetic contrasts that will be encountered as the participant progresses to the next stage.

As the lift doors close, the sound of the lift activating is accompanied by an electronic glitching sound effect and flickering light source. These experiential qualities suggest a less stable virtual environment, signifying a move to an environment that translates Schreur's specific ways of experiencing the world.

[323] Oculus Home: https://www.vrvoyaging.com/wp-content/uploads/2022/05/com.oculus.shellenv-20220501-175301-edited.jpg accessed 10th July 2024

Figure 55: The lift in the top-most level of 'Life is Beautiful. Always.' with a gaze-based navigation orb in front of it

Middle Level: 'Marcel World'

Schreur named this level 'Marcel World', signifying the aesthetic and evolving experiential qualities of this stage translating his own ways of perceiving and experiencing.

This environment features a large sized, partially open ceilinged space. The fractured open ceiling shows an open, infinite black void beyond the interior. It suggests a sense of vulnerability, as the interior is exposed to the unknown outside. This outside view also suggests an inconsistent passage of time, as lighting and weather effects simulating transitions between night and day pass by at fluctuating rates. This disrupts temporal consistency, introducing an uncertain sense of time flow that suggests that the environment does not follow the same plausible realism of the upper level.

I segmented the large interior space into several navigable areas. These include a central area featuring a desk and lounge furniture, a garden with a building containing photogrammetry of Schreur's painting and sculpture, an area containing the *'Isolation VR'* work developed during the collaborative project, and a pathway containing VR artworks Schreur made. These areas provide biographical content (such as photogrammetry captures of Schreur's paintings and studio) and combine the different aesthetic qualities and experiential dynamics that developed through the co-design process (such as the spatial audio and visual components of *'Isolation VR'*, and the contrasting aesthetics between 3D rendered, photogrammetry and VR sculpted artworks).

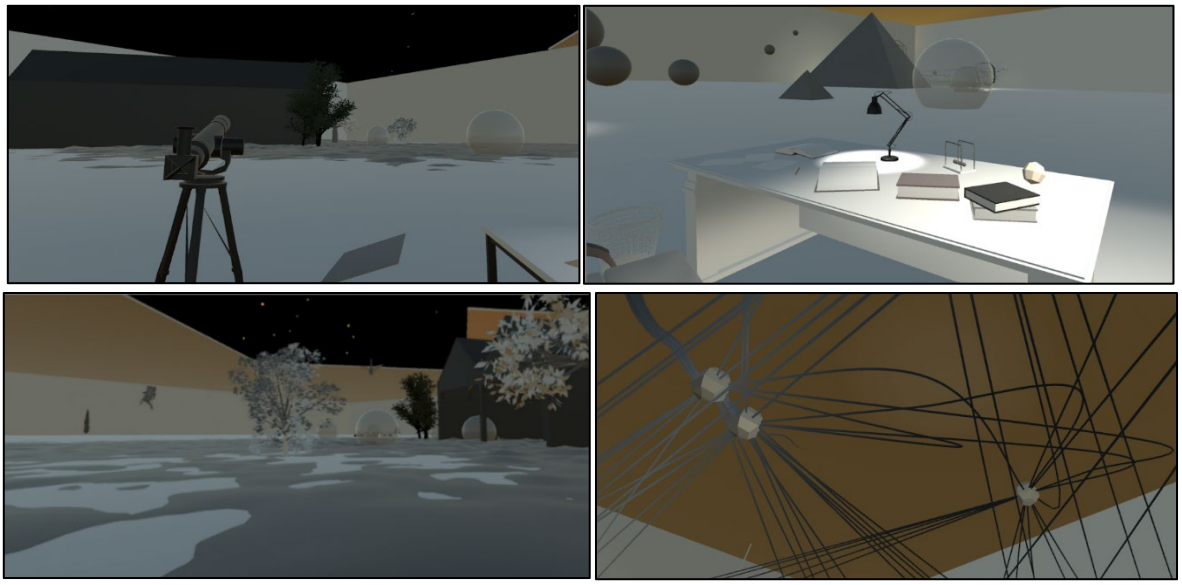

Figure 56: Development stills for 'Marcel World'

Environmental features in this space lack texture or detail; recognisable but generally non-specific. I wanted environmental features to maintain a degree of ambiguity in their interpretation, without any definite significance outside of their placement in virtual space. I accentuated this by adding abstract, implausibly floating shapes amongst furniture and other objects. This contrasts with the design of the top level, intending to challenge the potentially habituating effect of the comparably realistic design of that space.

I placed collections of objects within the environment that suggest construction and experimentation has taken place within it; a desk in the central space cluttered with books, scraps of paper and pencils suggesting structural planning, scaffolding stacked next to towering pieces of VR artwork, a table with 3D forms that feature in the *'Isolation VR'* work alongside the work itself. This suggests that the space is an imagined, experimental workshop. It suggests a past and ongoing life of the space, evidence of previous activity in an environment that is still in progress, and possibly unfinished.

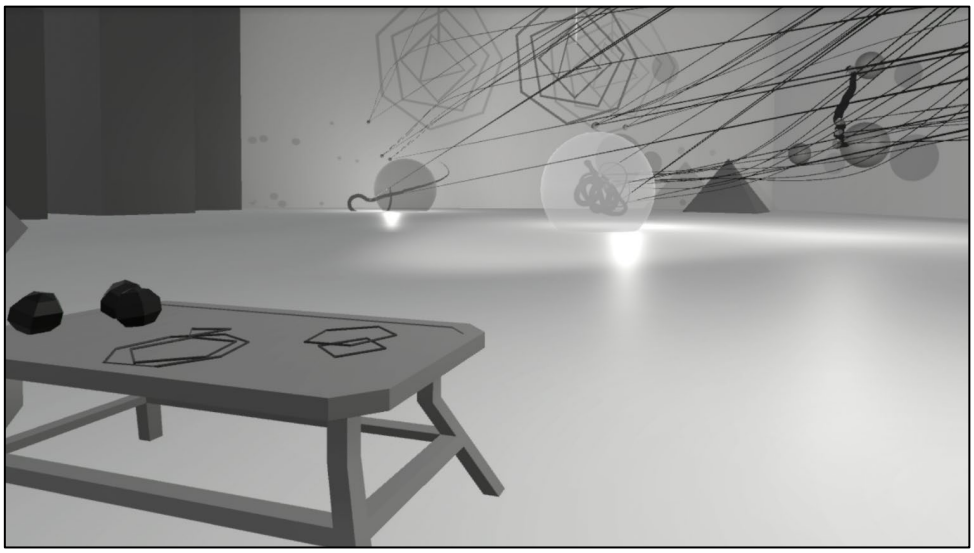

Figure 57: 3D orbs on a table alongside the 'Isolation' VR work

This gives the environment a sense of fabrication, distancing it from the illusory sense of plausibility that may accompany virtual representations of actual spaces.

I included environmental details that reference Schreur's life. Though not fully contextualised, their inclusion enabled a subtle sense of place and biographical context to the work. A building that houses photogrammetry captures of Schreur's art is loosely designed after a photograph Schreur's family home in The Netherlands (Figure 58) (Figure 59: The pond and trees outside the farmhouse on the right) (Figure 60: The virtual art gallery inside the farmhouse). The sound of chickens can also be heard outside the building. This relates to a story Schreur told of a particular moment of presence he experienced, whereby a chicken appeared to him with profound clarity amongst what was otherwise a state of severe impairment.

Figure 58: Schreur's family home in The Netherlands

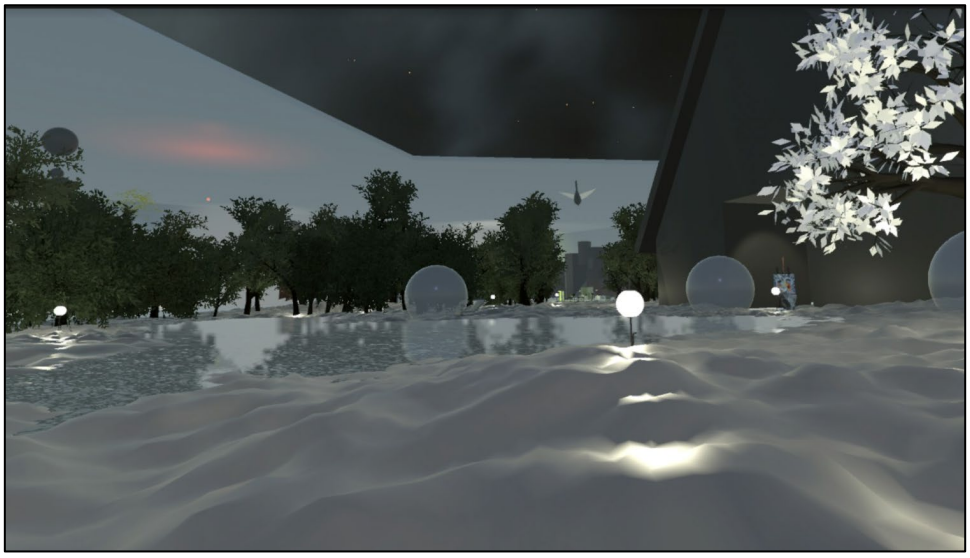

Figure 59: The pond and trees outside the farmhouse on the right

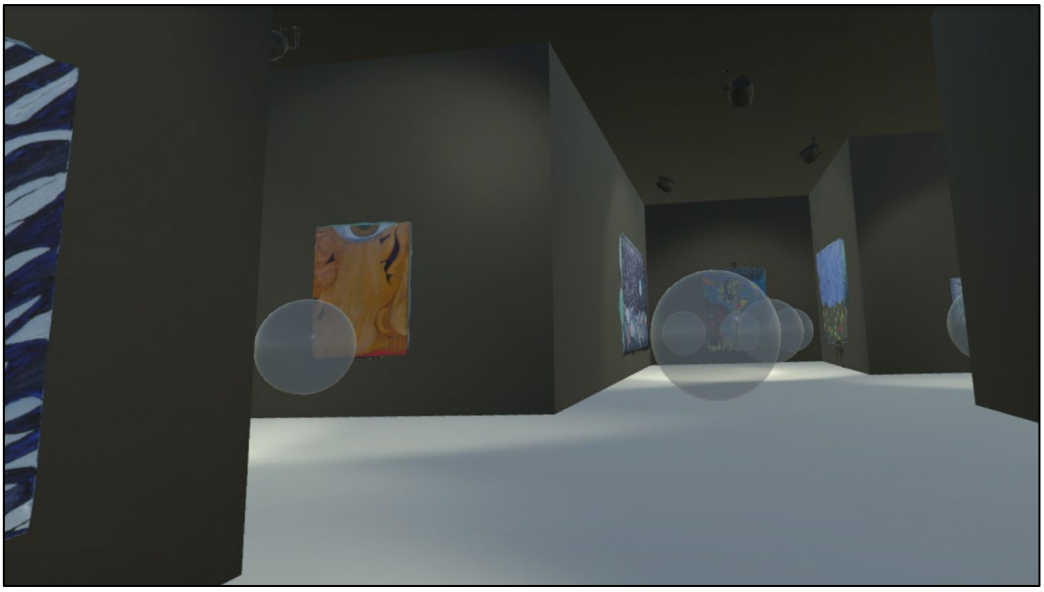

Figure 60: The virtual art gallery inside the farmhouse

Figure 61: Photogrammetry capture of 'Nowhere to Hide', Marcel Schreur, inside the trees

Clips of Schreur's voice commenting on his art practice and life experiences are placed throughout the environment. They offer subtle guidance to expand interpretation without being didactic. It also offers a subtle suggestion of Schreur's presence within the work, highlighting his creative and conceptual contribution to the work's development.

I placed photogrammetry assets taken from Schreur's studio around his VR artworks. The placement of Schreur's art materials around the VR works hint they may have been used to create the VR art. This is another quality of the environment design that suggests the artificial construction of this space. Schreur's art materials present an interpretive incongruity alongside the VR works that, in actuality, they were not used to create.

Figure 62: The table of art materials next to a VR work

I introduced responsive events that subtly transform the environment and affect the participant's ability to navigate as the experience progresses. The design of these drew on Schreur's comments on his differing capacities to feel present in space; including an inability to recognise differences in colour, perceptual impairment that cause issues with movement, and ruptures in short term memory that cause unexpected changes to environments. Translating these qualities of Schreur's experience into the work progressively challenges the sense of presence that this stage encourages to manifest.

I incorporated a process whereby, starting from a desaturated state, colour is subtly introduced into the environment. This created a slow, progressive, changing atmosphere; objects within the space are almost imperceptibly given a transforming vibrancy and visual impact. It reveals details that may have not been perceptible when they were first encountered, inviting another opportunity to consider their interpretation.

Figure 63: Still from inside the virtual gallery before colour is introduced

As the experience progresses, the environment slowly begins to be filled with obstructive grey blocks that appear only when the participant is not looking directly at them[324]. Eventually, blocks tower over the participant, obstructing the view into space. This begins to feel quite oppressive and limits agency to explore.

Staccato changes take place through events that disrupt the environment; books tumble off a bookshelf, objects on the central desk spill onto the floor, chairs slide across the space, a wardrobe collapses. These events only take place if the participant is not looking at them and are accompanied by loud sound effects. This may pull attention towards where the noise came from. It awakens presence to the wider environment, causing a sudden awareness of presence within an environment that is changing in unknown ways.

Finally, disorienting post effects applied to the headset point of view, accompanied with fragmenting 3D objects and abrasive audio components developed in *'The Chaos Event',* are used to completely disrupt the spatial visual and audio qualities of the space. I further accentuated the disruptive quality of these components with additional aesthetic changes; lights become dim, shadows lengthen, and a chromatic aberration obscures visual focus. I introduced a rapidly undulating tone that emits in random positions around the participant, distorting spatial audio. This eventually renders focus on the scene impossible, immobilising the participant and significantly challenging their ability to feel spatially present.

At its climax, the floor falls away and the participant descends through a dark expanse to the third stage. This event drew from some of Schreur's description of how a sudden impairment of his perceptual faculties feels:

'When you fall off the cliff edge, you know where you are going. You can see the ceiling above you… Black holes appear in the landscape… You fall into the abyss, this is a cataclysmic event...'

This sense of falling into an abyss was translated literally in VR. Falling into a dark expanse offers a striking challenge to a sense of presence, as the ground, spatial anchoring and agency to navigate is sharply removed. This challenge to presence continues into the third level of the work, creating potentialities for its active re-formulation within the abstracted, experiential qualities of the third stage.

Bottom Level: 'The Pit'

The design of this stage drew from a diary where Schreur captured the physical characteristics of a TIA he had experienced. I used procedural generation techniques to elicit and challenge formulations of embodied presence and, through this, to translate Schreur's experience of a significantly challenged sense of presence in his life.

An initially dark space is revealed to be full of unseen, uncertain movement through lights that shine through moving, black textured objects. I punctuated the environment with fragments

[324] A similar gaze-based method to cause changes to the virtual environment is featured in 'SightlineVR' (Solirax, 2013), in which a virtual environment transforms itself but only in areas that the participant is not looking.

of Schreur's VR artwork in bright contrasting colours[325]. These offer an ambiguous experiential narrative component that invites interpretation. Roughly halfway through this part of the experience, the words 'I love you' appear before slowly drifting away. This is the only linearly scripted event within this part of the experience. It is a message from Schreur to his wife within the VR work; acknowledgement of the presence of his wife that supports him through these events.

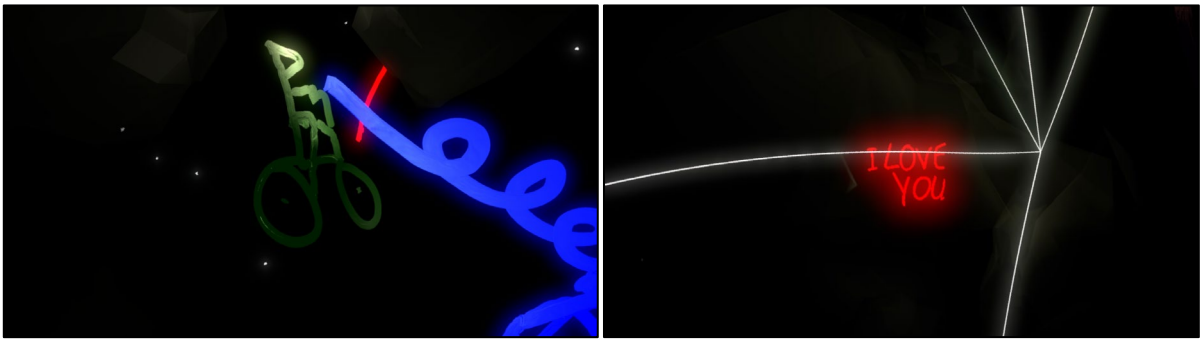

Figure 64: Symbols from Schreur's art in 'The Pit'

Procedurally generated spatial audio consists of a low pitched, undulating sonic landscape that is randomly disrupted by a dissonant, abrasive higher tonal quality. Amongst this layered sound, portions of audio capture from Schreur reading from his diary may be heard moving through the space and overlapping with itself. It is generally not possible to make out what Schreur is saying, which confuses an endeavour to secure narrative contextualisation through Schreur's voice.

Further disruptive staccato punctuation is caused through a randomly occurring, loud, enveloping static noise and fragmentation of 3D forms. This dynamic sometimes caused the framerate of the VR program to drop considerably. The result is that the seamless motion through the headset momentarily stutters. Whilst this is a hardware performance issue, I chose to retain it for the disruption of presence I felt that it creates. As visuals desynchronise with head movement, there is a small proprioceptive shift that destabilises spatial anchoring and a sense of embodied presence.

At the end of this sequence, a path through an environment that features landmarks laid out similarly to the middle stage appears. The intention is to encourage a slow re-introduction of agency and familiarity that offers a moment to reflect on the disruptive virtual dynamics that have just taken place. At the end of the path, the participant encounters a chicken (referencing the story Schreur told of his encounter with a chicken that catalysed a momentary flash of presence amidst a period of significant perceptual and cognitive impairment) that, when focuses on, initiates transportation back to the middle level.

[325] The numbers '1, 2, 3, 4', letters 'A, B, C, D' and fragments of some of the recurring symbols that appear in Schreur's work may be seen partially hidden within the dynamics that build the environment.

Figure 65: The chicken at the end of 'The Pit'

The work now enters a cyclical structure, as the middle level will eventually initiate another descent to the bottom stage, leading to a path upwards again. This cyclical, non-linear structure does not offer a conclusive ending and there is no indicator to remove the headset. My intention was to resist narrative closure, preventing a definitive summary experiential compartmentalisation of the work and inviting continued interpretive ambiguity.

Summary

'Life is Beautiful. Always.' demonstrates insight into where translations of Schreur's life experiences can be developed by designing for active engagement with evolving senses of embodied presence. It explores where methods to design for presence can invite the embodiment of physical and affective characteristics of Schreur's life experience. It demonstrates the potential of designing through procedural generation techniques to build complex spatial visual and audio environments that encourage an uncertain embodied relationality to virtual space. Through these design strategies, the work demonstrates where designing for and challenging formulations of embodied presence can develop experiential narrative structures, yielding insight into the relationships between presence and experiential narratives in VR.

'I Look For Them'

This section overviews the sequences that feature in *'I Look For Them'*; 'Interrogation', 'Transport Wagon', 'Transit Camp', 'The Sea of Okhotsk', 'The Shores of Magadan', 'Magadan', and the introductory 360° video. It highlights where these sequences translate aspects of Maszczak's experiences and where formulations of presence support their interpretation.

360° Video Introduction

Figure 66: 360° video still of the approach to Maszczak's home.

This section creates a thematic context for the VR experience. Beginning the work with a 360° video representation of the present indicates that the work explores Maszczak's reflections on her memories at her current stage in life.

This section introduces Maszczak's voice as a fragmented source of narration. Including short audio clips of Maszczak offers some narrative context and gently affects the affective significance of the work through her particular intonation. However, I chose not to include visible representation of her or any other visible human presence throughout the work. I felt that this would suggest a dictatorial quality that would limit the capacity for interpretation. Maszczak's voice is the only explicit other that features, suggesting her presence as a fragmentary guide through her now vacant memories. This imbues environments with a pastness that abstractly connects the VR work with the events that Maszczak describes. Maszczak's voice offers an indefinite window to these events, creating space to interpret the affective significance of the work and to consider the others described by Maszczak that are no longer present within it.

Interrogation

This section translates Maszczak's descriptions of being interrogated and held in a cell for long periods of time during the first eight months of her incarceration.

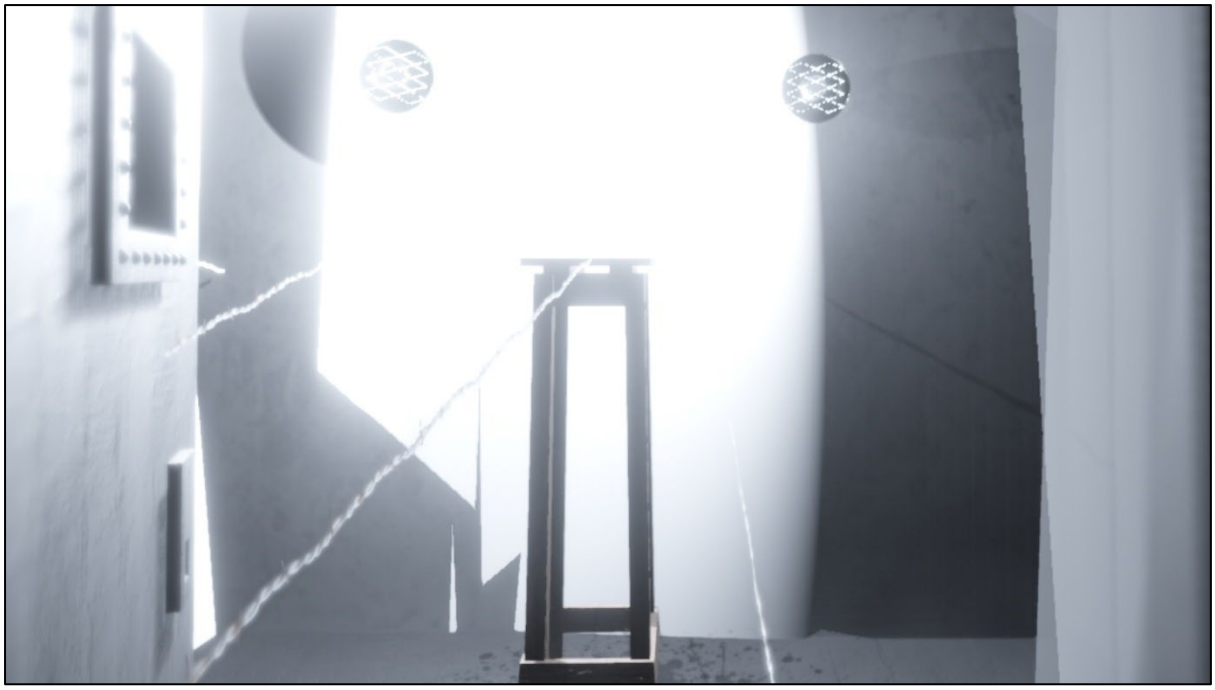

Figure 67: Light becomes oversaturated in an interrogation cell.

This section experiments with sharp experiential contrasts and changes in pacing to translate the uncertain and lengthy periods of time Maszczak spent in holding cells with the abrupt, unpredictable changes in her circumstances during interrogation episodes. It juxtaposes moments of stillness (including waiting in a long featureless corridor, a holding cell and a concrete courtyard, and standing in front of a very tall stool that she was required to sit on for extended periods) with sudden changes in pace through abrasive visual and audio effects and rapid environment transitions.

My intention was to build tension during moments of inactivity by positioning participants in confined spaces and using spatial audio to offer ambiguous senses of proximate activity beyond cell walls. These moments are disrupted by sudden disorienting bursts of dynamism via the addition of severe grain and oversaturation overlaying the headset view, a heavily distorted tone that overwhelms spatial audio, and rapid environment transitions that significantly disrupt spatial orientation and challenged a sense of presence. As the abrasive effects subside and reveal a new location, I felt a confused durational quality that suggests an uncertain length of time has transpired between transitions.

The disorienting effects intensify if the headset is moved over a certain speed threshold. This offered a further challenge to presence through responsivity, disrupting agency to spatially orient by visually exploring the environment. I found this to be uncomfortable and confrontational[326] and found I preferred to keep my head still rather than to look around. This added to the tension of the scene and related to its disciplinarian context. It builds on the previous experimentation into withholding agency to challenge presence in the transition between levels two and three in *'Life is Beautiful. Always.'*. However, in this instance the

[326] However, despite their affective quality, I needed to moderate their intensity from the point of view of accessibility. The work could not be so abrasive that it became unviewable for Maszczak or others.

participant retains agency to explore, but is encouraged not to via the intense experiential distortion that initiates if they do.

This forced focus away from the visual environment directed my attention to surrounding spatial audio beyond the cell walls, which drew from Maszczak's notes of what she heard in these environments; sounds of footsteps, tapping on walls, and a muffled suggestion of other human voices. This expanded a sense of presence into an imagined wider environment. Close sounds just beyond the walls suggested a presence of unseen activity that seemed to enclose space, building a sense of claustrophobia. More distant audio gave a suggestion of the wider prison complex. This suggested the uncomfortable sensation that I was not aware of my scale or positionality within the environment, contributing to a sense of isolation and a lack of agency to leave this space.

Transport Wagon

This section expresses the monotony of the train journey and a slow progression into a dark unknown that Maszczak expressed.

Figure 68: Looking through the wooden planks of the transport wagon in the final version of 'I Look For Them'

This section presents a dark wooden wagon with narrow gaps that offer a view to the landscape outside. Initially vibrant and full of colourful wildflowers, the exterior becomes progressively devoid of any notable environmental features. This directly draws on Maszczak's description of the landscape becoming more desolate as they progressed towards Siberia. It also ambiguously translates the progressive emotional state Maszczak described, as she was taken from her home and further into a dark, unknown territory. To accentuate this, I added a transforming colour grading effect, reducing the lightness and saturation of textures outside the wagon.

The total runtime of this section is three minutes, which I felt provided a balance to ensure the participant remained engaged in a relatively uneventful section whilst also conveying some of

the monotony of Maszczak's journey. At set intervals, the participant is moved to a different point of view within the wagon. This serves to re-engage the participant during the considerable length of this scene. It also seemed to extend the temporal quality of the section, suggesting that an uncertain period of time had taken place between points of view.

Transit Camp

This section conveys moments of stillness and calm, translating a point of reflection that Maszczak expressed whilst describing her experiences in transit camps.

Figure 69: Adapted design for the fences and guard towers in response to Maszczak's feedback

Maszczak became wistful during her recollection of experiences at transit camps, describing the freedom she had lost and the depth of the relationships she formed with other prisoners. In response to this, I designed a quiet and still landscape set at nighttime. The environment features a single path to a barbed wire fence. Offering the agency to explore slowed the pace of the work and offered a moment to reflect on the affective qualities of this environment.

This section features longer sections from Maszczak's narration of two particularly poignant stories in relation to her time at transit camps. In one, Maszczak described her view beyond the barbed wire at steamer ships that she could see moving down a river, using this to express the freedom that she felt close to, but could no longer attain. The other was of a moment of profound connection with another prisoner who offered Maszczak a piece of bread, a valuable and potentially lifesaving gesture.

I included these stories via extended narrative sections as I felt the emotional significance through the ways Maszczak recalled them was particularly impactful. The audio narration of Maszczak's voice takes central focus, which I found offered a powerful tonality and narrative context. It demonstrates some of the affective significance Maszczak's memories hold for her through the specific qualities of her voice, which I felt was important component to include in this collaborative and representative translation of Maszczak's life experiences.

The Sea of Okhotsk

This scene translates aspects Maszczak's transportation across the Sea of Okhotsk during a dangerous storm.

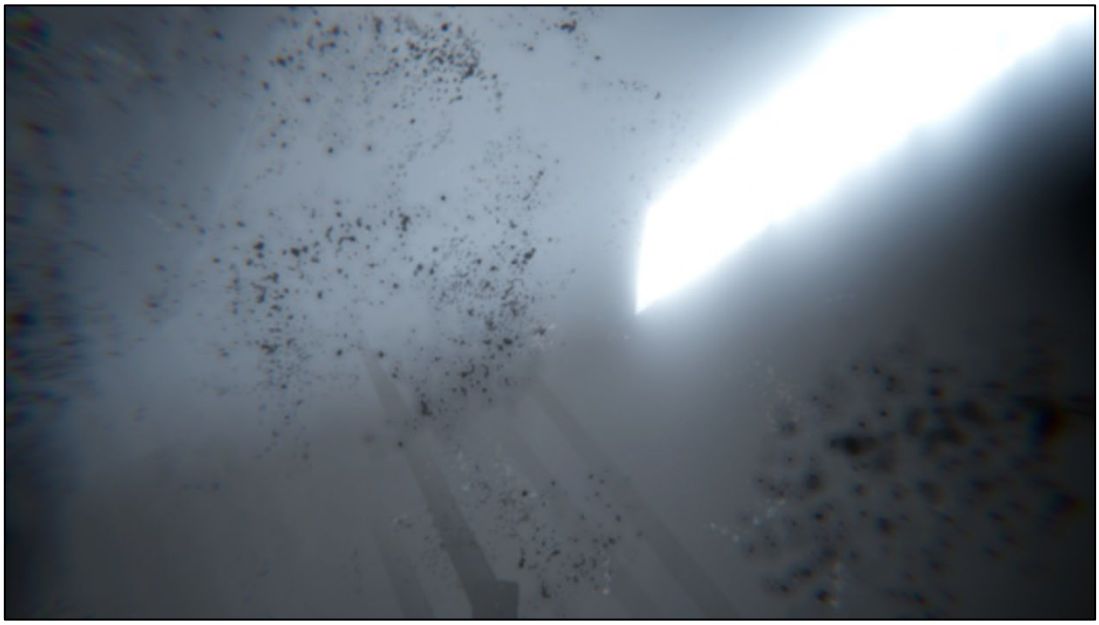

Figure 70: Water spray, bright light and chromatic aberration effects obstruct a view into the ship hold

This environment abruptly contrasts with the calmness of the transit camp scene. An abrasive metallic sound accompanies a transition to a violently rocking ship's hold, translating Maszczak's description of a loud scraping of iron bolts as the ship's hold doors were closed behind her. The movement of the ship causes a sense of unbalance that disrupts spatial grounding. This is exacerbated by a persistent water spraying effect and an overblown light source that obstructs the view of details within the hold. The sounds of waves continually hitting the walls, clanging alarms, and incoherent shouting is very loud, close and dissonant, preventing the participant from anchoring their presence within the scene through spatial audio.

This abrupt change in experiential dynamic and withholding of agency to navigate breaks the experiential flow and challenges a sense of presence. Through the continual environmental and audio disorientation, I intended to disrupt the participant's embodied equilibrium. The disorienting experiential qualities in this environment translate the chaos that Maszczak described during her voyage, where neither prisoners nor guards were able to control the situation they were in.

The Shores of Magadan

This environment translates Maszczak's description of her arrival at the shores of Magadan; a featureless expanse of white snow and a simultaneous awareness that she had arrived at a dark, unknown place.

Figure 71: Fog encloses the participant's view in 'The Shores of Magadan' environment

In contrast to the previous scene, this environment features stable environmental features to spatially anchor presence. There is a path to navigate into a snowfield featuring a dense white fog that obstructs the view into the wider landscape. Sounds of footsteps in the snow beyond the fog add a sense of unseen activity. These recede into the distance, combined with a progressively intensifying fog and lowering light levels that further occlude spatial depth. This invites an isolating quality, which I exacerbated by eventually withholding agency proceed further into the snowfield. I felt present in the snowfield, but also progressively alone and aware of a further journey into an unknown landscape. I decided not to offer resolution to that feeling, leaving the sense of isolation in an unknown place lingering as the scene eventually fades to black.

Magadan

This section presents an abstracted translation of some of the environments Maszczak described of the Gulag at Magadan; a dense forest where prisoners cut down trees, a courtyard enclosed with barbed wire fencing, a barrack interior, a holding cell, and inside a mine.

Figure 72: A flash of light briefly illuminates a barrack interior in the 'Magadan' section of 'I Look For Them'

This section of the work builds a series of virtual environments via the introduction of layered spatial audio components and sparse, silhouetted visuals. It experiments with where spatial audio can influence a sense of embodied presence in virtual spaces and imbue VR experience with contrasting and evolving affective qualities.

The section begins by cyclically transporting the participant across each of the environments at a slow, steady tempo. Visuals can only be seen for short intervals as a light washes across the scene and briefly illuminates them. This provides a brief, ambiguous interpretive context to the virtual environment. Similarly to the low resolution, desaturated aesthetic of level two of *'Life is Beautiful. Always.'*, I textured all objects uniformly black. This limits their representative fidelity and prevents visual detail from taking central focus.

Environmental transitions are signalled by spatial audio components that offer suggestions of activity within each space, such as the sounds of sawing wood in the forest, or wind blowing in the courtyard. As each cycle through the environments completes, I added further audio layers and environmental features; for example, further layers of wood cutting and more trees in close proximity to the participant view, or layers of wind audio and further guard towers to the courtyard scene. This builds a progressively densely populated environment which exacerbates the intensity and complexity of the experience. I found that adding audio layers caused the space to feel more confined. Similarly to the invasive, fragmented polygons that feature in *'Life is Beautiful. Always.'*, I felt confronted by the ways that the audio seemed to invade and disorient my immediate surroundings. I felt it beginning to overwhelm me and challenge my sense of embodied presence.

To punctuate this progressive, confrontational intensity, I programmed an event whereby a loud sound of a tree falling dominates the scene. This harsh staccato punctuation initiates a second phase of the work, whereby environment transitions are randomly selected at a progressively increasing tempo. As this happens, audio layers continue to increase in volume, which disrupts their spatiality and increases their confrontational quality. The increasing tempo

of environmental transitions built a sense of unease and lack of control within the scene. I also introduced several additional layers of dissonant droning audio, which I found added to the uncomfortable quality and further confused spatial audio. At the final moment of this part of the experience, I used a brightness effect to bring the work to a white out. At which point, all sound abruptly ceases.

I found that the structure of this section, whereby virtual environments are presented to the participant in sequence before being randomly re-configured in a second phase, provided a way to experiment with how their experiential qualities can be interpreted in different contexts and challenge presence through their varying compositions. This provided a basis for more detailed experimentation in *'Be That Ocean'*.

Summary

'I Look For Them' demonstrates how experiential and atmospheric components of virtual environment designs contribute to a sense of presence and translate affective qualities of Maszczak's experiences. It shows where a dynamism developed through evolving environmental aesthetics and experiential components can encourage qualitative experiential contrasts that influence or challenge presence and progress VR experiences. This begins to demonstrate how experiential structures can be formulated through presence to invite complex affective engagements with Maszczak's experiences.

'Be That Ocean'

This section overviews the environments and VR design dynamics that comprise *'Be That Ocean'*. It shows where procedural generation and techniques to design embodied responsivity in VR challenge and bring critical focus onto presence in VR, and where this encourages affective engagement with translations of Maszczak's experiences.

Phase One

The first phase of *'Be That Ocean'* builds a series of procedurally generated virtual environments in a random order. I chose to present environments in a random order rather than a definite structure to resist a linear narrative reading and to invite opportunities for experiential contrasts as they merge and replace each other.

The below sections overview the designs of each procedurally generated environment. Each section begins with a diagram that visualises the environment's composition and distribution of responsive components.

Introduction

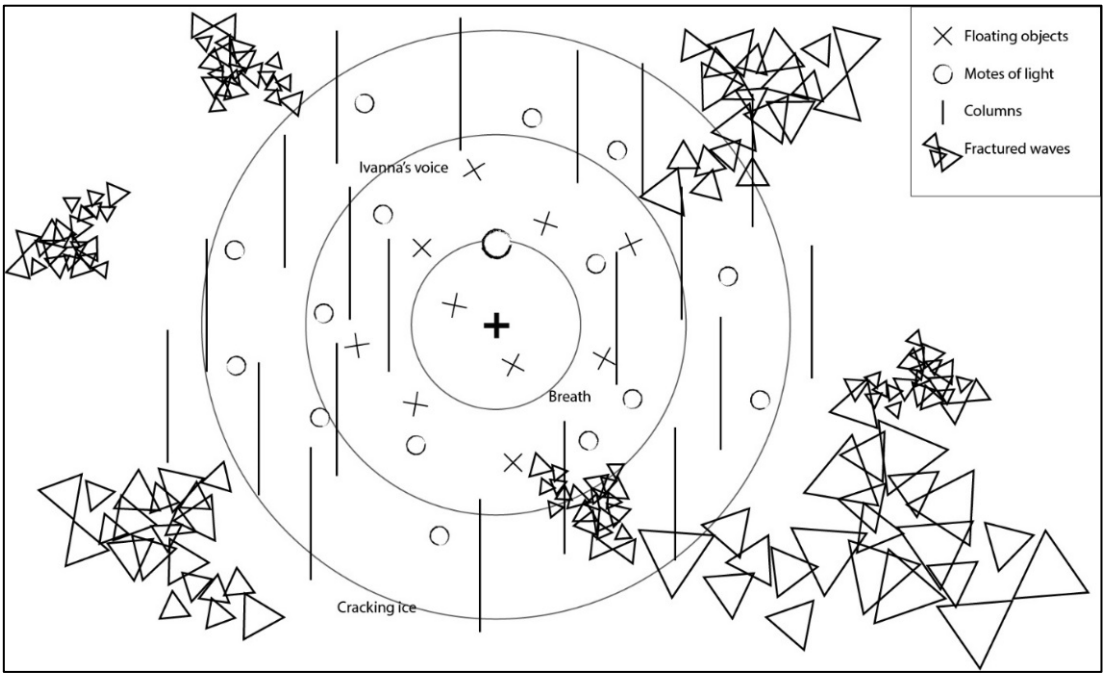

Figure 73: Diagram of the 'Introduction' environment in 'Be That Ocean'

This environment orients the participant to VR and begins to suggest some of the responsive qualities that the work will feature. It also ambiguously suggests some of the work's narrative context.

The section begins with a mote of white light reflected on an infinite water surface that extends into darkness. Focusing attention on the light causes it to emit a growing aura of light, accompanied by a rising, rushing sound. This introduces the interactive responsivity that features throughout the work. After focusing on the light for three seconds, additional motes of light and large grey columns begin to populate the space, creating a greater sense of depth.

Suddenly, an explosion of light emits from the mote and engulfs the scene. This abrupt interruption to the relatively tranquil experiential foundation reawakens the participant to their relationship with the virtual space. As the light recedes, procedurally generated, towering, wave-like forms appear descending into the depths below or rising above the point of view. They are illuminated by dim lights in the middle and far distance. This introduces a sense of more extreme horizontal and vertical depth. The light motes briefly maintain a sense of lateral orientation before they begin to extinguish, creating a sense of groundlessness. In the foreground, floating semi-recognisable objects (fragments of a stairway, an oil lantern, pieces of barbed wire fencing) move in a loosely synchronised way as if they are submerged in gently agitated water. There is no ground or horizon line to establish a sense of spatial anchoring or orientation within the space. Led by the wavelike physical dynamics, the participant becomes a floating, disembodied point of view. Through these experiential dynamics, my intention is to challenge a firm embodied relationship to virtual space and to encourage continued exploration to find spatial anchoring within the scene.

The sense of disembodied floating in space is accentuated by a subtle embodied responsivity, as head movement increases the undulating dynamic of surrounding objects. This can be recognised through parallax changes as the viewpoint continually shifts. Similarly to the responsivity featured in the 'Interrogation' scene of *'I Look For Them'*, I used head movement to introduce a responsive dynamic that frustrates an endeavour to definitively establish a sense of embodied grounding and presence in the virtual environment. This responsive component continues throughout the experience. It invites a subtle sense of shifting ground throughout the work and modulates the senses of depth offered through continual parallax perspective shifts.

Spatial audio is generated in layers from the central point of view. In the immediate vicinity there are layers of steady human breathing, which I found offered an intimate, embodied rhythmic quality that contributes to the overall pacing of this scene. Beyond these are overlapping suggestions of Maszczak's voice, distorted by radio static and multiple layering. Similarly to the use of Schreur's voice in *'Life is Beautiful. Always.'*, it is not necessarily possible to understand Maszczak. Maszczak's voice is not a source of audio narration, but a suggestion that the work abstractly expresses Maszczak's memories as recollected by her. In the far distance, a sound of cracking ice may cut through the audio landscape. This refers to Maszczak's description of the frozen shores of Magadan and may also be associated with the giant, slowly moving wave-like forms in the extreme distance. It suggests an environmental instability, subtly developing a sense that the work is in a continual process of deconstruction and transformation.

Figure 74: Still of the 'Introduction' environment in 'Be That Ocean'

Interrogation

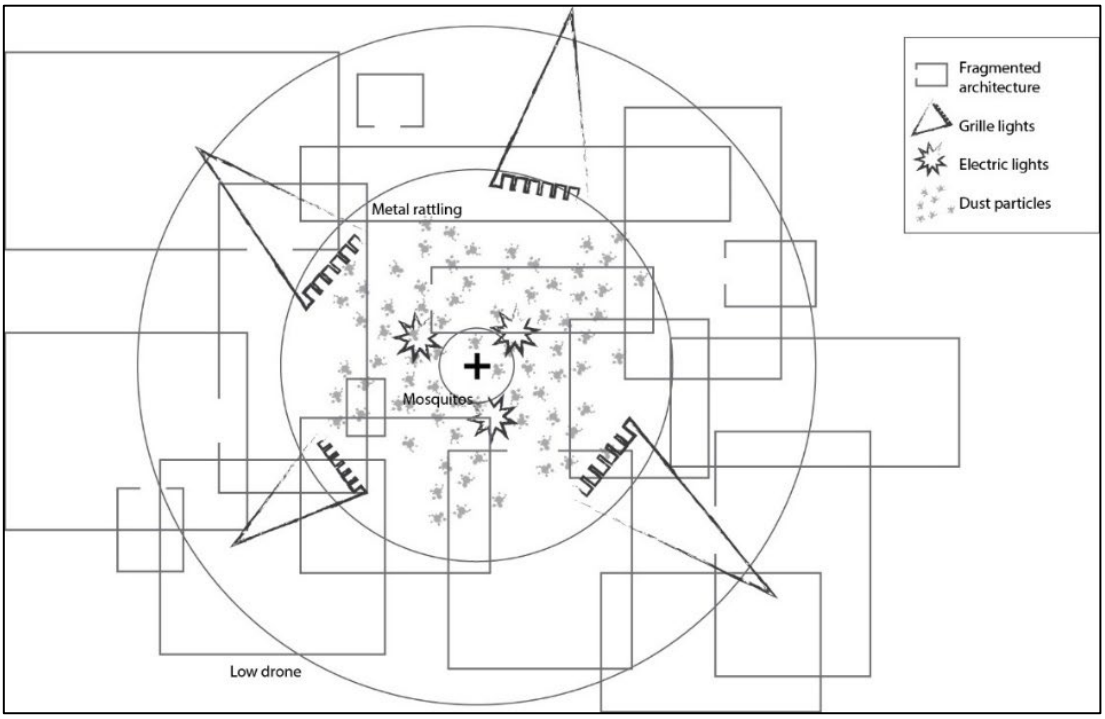

Figure 75: Diagram of the 'Interrogation' environment in 'Be That Ocean'

This environment draws on affective qualities from Maszczak's description of a period of interrogation; confinement, the perceptual blurring of times and places, invasion of personal space, harsh, angular metallic and concrete surfaces, and the uncertain presence of wider activity beyond cell walls.

This environment builds very rapidly. A view into space is obstructed by a confined interior built out of procedurally generated walls, doorways, and staircases. A fragmented, unstable floor is built from overlapping steps and low platforms. The scene is lit by dim, off-white lights that shine through square apertures of a metal grille. The light and shadow cast by these occluded lights incompletely illuminate and fragment the interior surfaces, creating awkwardly angled, momentary glimpses into the environment and obstructing definitive orientation in space. The light quality is further degraded by a dusty haze which blurs the view. This generates a constantly shifting and continually confining interior space of uncertain architectural structure. This is particularly effective during moments when the generative processes introduce a cell wall directly in front of the point of view, completely obstructing the scene. This procedurally generated environment is intended to frustrate a sense of presence and a definitive perception of the space the participant is in. It translates the perceptual blurring of times and places that Maszczak described of her experiences, where she was held for prolonged and uncertain periods before being abruptly moved to unknown places.

The environment features bright, white electric light sources that generate in random locations, casting jagged rays into the space and accompanied by a low, rumbling spatial audio that signals their position. The light and spatial audio invites the participant to find their source. However, if they look into the direction of the light source, the light and sound quickly recede. This responsive feature translates the unknown wider activity that Maszczak described. I found

it encouraged a feeling of the presence of something nearby which generated a sense of unease.

Sound design in this environment accentuates the confined atmosphere and uncertain structural configuration of the space by creating contrasts between dominant, intimate sounds with suggested activity beyond through more distant audio sources. In the immediate vicinity, a sound of mosquitoes can be heard buzzing past and through the point of view. The sound feels invasive and almost interior to the body. I found it encouraged a feeling of rapid unseen movement that disoriented attention and spatial depth. Beyond this, the sound of metal rattling and scraping against concrete may be heard beyond the interior walls. The harsh textural quality to this sound suggests rough, clumsy, possibly aggressive activity and invites a distinctly intimidating affective quality. A low undulating tone permeates underneath other spatial audio components. As sound emitters for this tone move around the scene, they begin to effect spatial qualities in different directions, invading personal space by blocking spatial audio in some areas and opening a sense of spatial depth in others. The movement and depth of these spatial audio components do not correspond to the visual environmental features, which I found caused a perceptual disjunction that further challenged my embodied relationship to the transforming virtual environment.

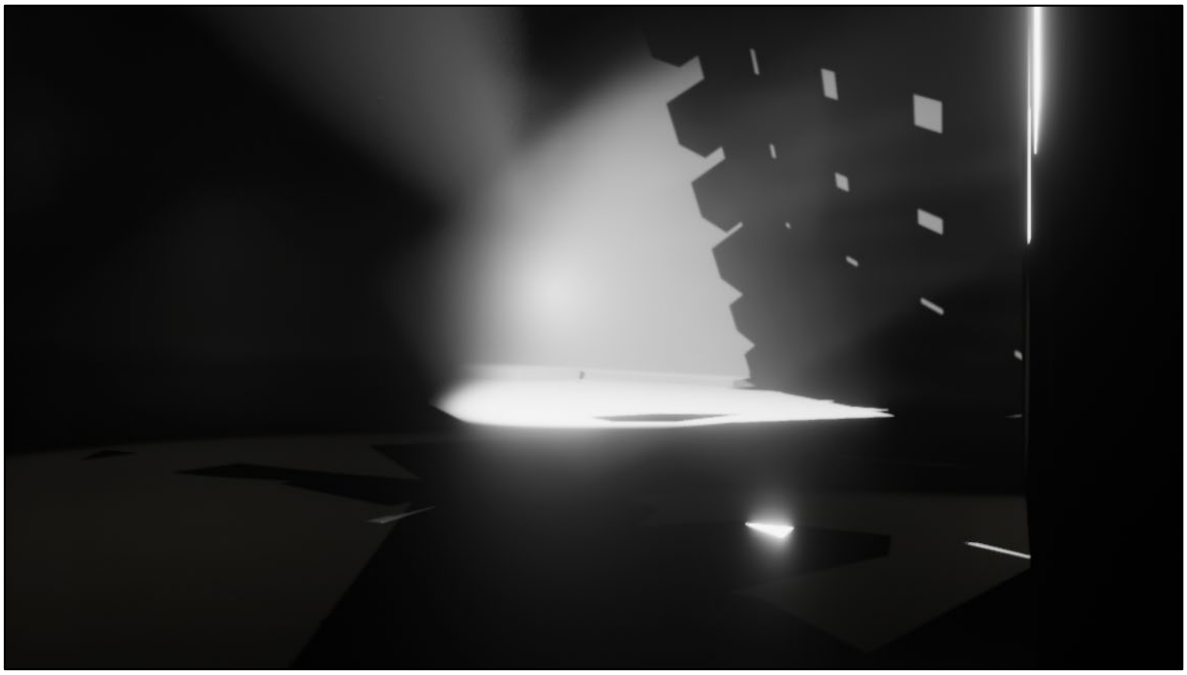

Figure 76: Still of 'Interrogation' environment in 'Be That Ocean'

Transport Wagon

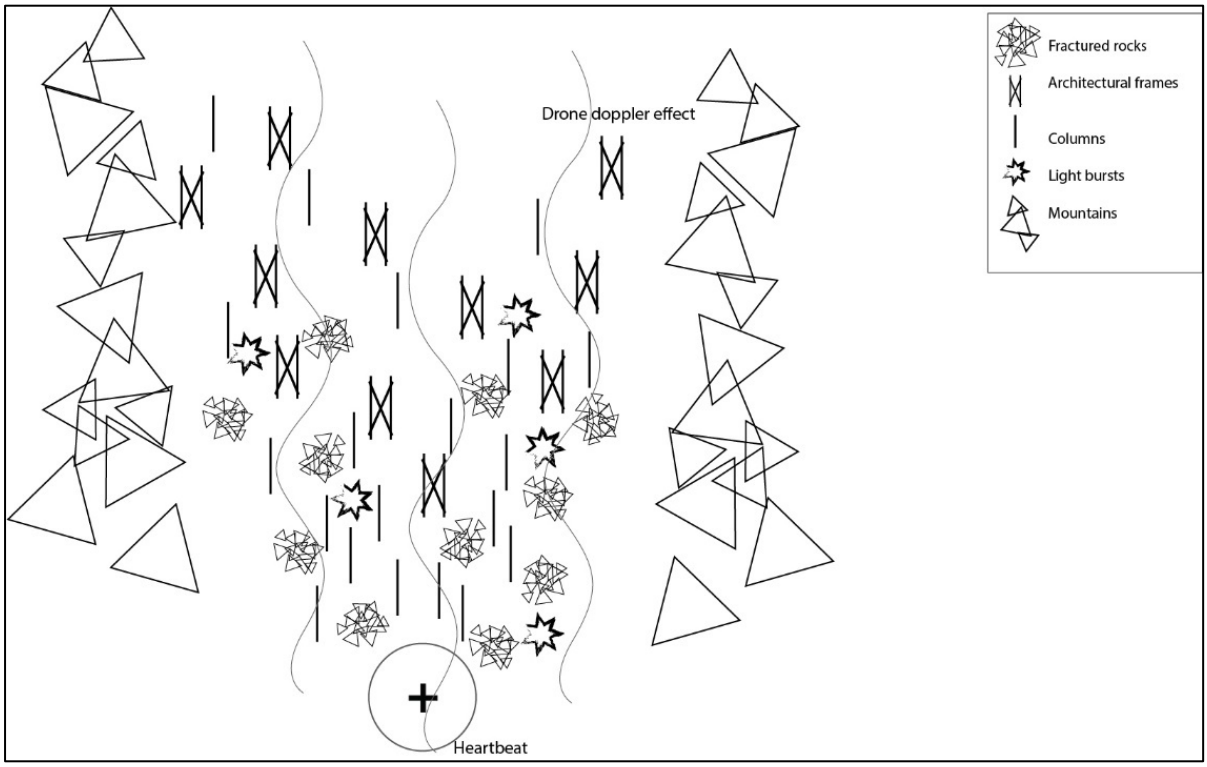

Figure 77: Diagram of the 'Transport Wagon' environment in 'Be That Ocean'

This environment translates some of the qualities that Maszczak described of her train journey across Russian and into Siberia; an extremely long, slow journey, fleeting glimpses of coloured flowers and light moving past the wagon, progressively diminishing landscape features, a sense of movement into a dark and unknown destination.

This environment begins with a rapidly approaching, low rushing sound. Following this, fragmented columns and distorted architectural frameworks approach the central point of view. This creates a sense of horizontal movement that is accentuated by a textured floor covered in moving shadows. A doppler effect applied to moving spatial audio playing the sound of wind or a low droning tone further accentuates the sense of movement. Beyond these components, larger, mountainous forms establish a horizon limit. This movement across layered spatial depths produces an extreme sense of parallax, giving the effect of movement across a vast, transforming exterior landscape.

Fragmented polygonal particles rush past in the immediate vicinity of the central point of view, sometimes moving through where my body should be within the virtual space. This produced an invasive quality, stimulating an embodied impulse that I should avoid them. It introduced the feeling that I was being threatened, possibly attacked, by what I was being led towards. It contributed to a sense of fear and unease towards the unknown destination of the transport wagon.

The moving landscape contains several responsive white and pink light sources that, when focused on, burst into a thick, hazy coloured light. These lights translate the colour that Maszczak described as she looked beyond the wagon to fields of pink and white wildflowers.

I placed a large, exaggerated light source at the horizon point that moving objects head towards. This appears as an implausibly large sun setting against a black sky, which silhouette objects as they disappear into it. As the environment progresses, this light source slowly diminishes, eventually reducing the environment to almost complete darkness. This diminishing light source is coupled with the progressive reduction of environmental components that pass through the scene. These dynamics translate the diminishing landscape and movement into a dark unknown that Maszczak described as she journeyed into Siberia. They transform senses of embodied presence in relation to the vast landscape to a more intimate, internal sense of loss as the landscape no longer offers features to spatially relate to it. It caused a sense of disembodiment in a virtual space that had no definite perceptual anchoring for me, and an awareness that I was not in control of where the experience was taking me. I accentuated this sensation by introducing a steady rhythmic beat, signifying train tracks, or possibly a heartbeat. This produced an internal rhythmic quality that I felt myself tune into through my own breathing and heartbeat, creating a marked sense of internal embodied movement with the scene.

Figure 78: Still of 'Transport Wagon' environment in 'Be That Ocean'

Transit Camp

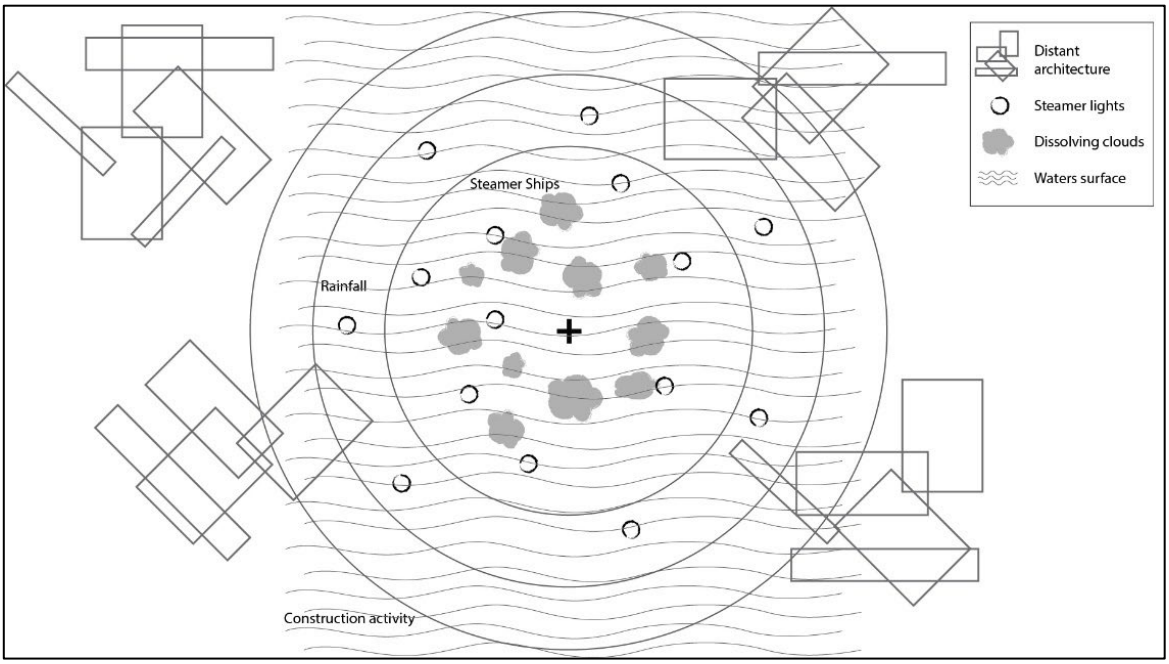

Figure 79: Diagram of the 'Transit Camp' environment in 'Be That Ocean'

This environment translates details of Maszczak's experiences at transit camps; quiet moments of pause in Maszczak's journey, a subdued sense of colour and distant life, a feeling of freedom just out of Maszczak's reach.

This landscape is introduced through dark, desaturated blue/purple/grey tones filling the sky. The sky is slightly brighter towards the horizon line, revealing large mountainous objects. A gently lapping water surface fills the ground, reflecting lights cast by several orange motes that glide just above the water surface. The view into distant space is obscured by randomised rectangular forms that populate the middle distance. A subtle sound of rainfall on thin metal and gently lapping water creates a subdued atmosphere and slows the experiential pace of the work. A quiet creaking sound of a steamer ship may be heard in the middle distance. Background audio is punctuated by occasional distant sounds that suggest construction work. This environmental composition abstractly translates the view Maszczak described through barbed wire fencing to the 'twinkling lights' of steamer ships on the Volga and Samara rivers. Through its slow pace and atmospheric quality, it expresses the reflective tone and subtle poignancy through which Maszczak recalled her memories of the transit camps.

If a light mote reaches a certain proximity to the central point of view, it is repelled and gently drifts away. This embodied responsivity translates the close but unreachable sense of freedom that the lights of the steamer ships signified for Maszczak. The rectangular forms in the middle distance also respond to the participant by dissolving if they are directly looked at. They translate the barbed wire fencing that obstructed Maszczak's view. Their dissolution enables an incomplete view to more distant depth layers, which is particularly effective when rectangular forms procedurally generate very close to the central point of view.

Figure 80: Still of 'Transit Camp' environment in 'Be that Ocean'

The Sea of Okhotsk

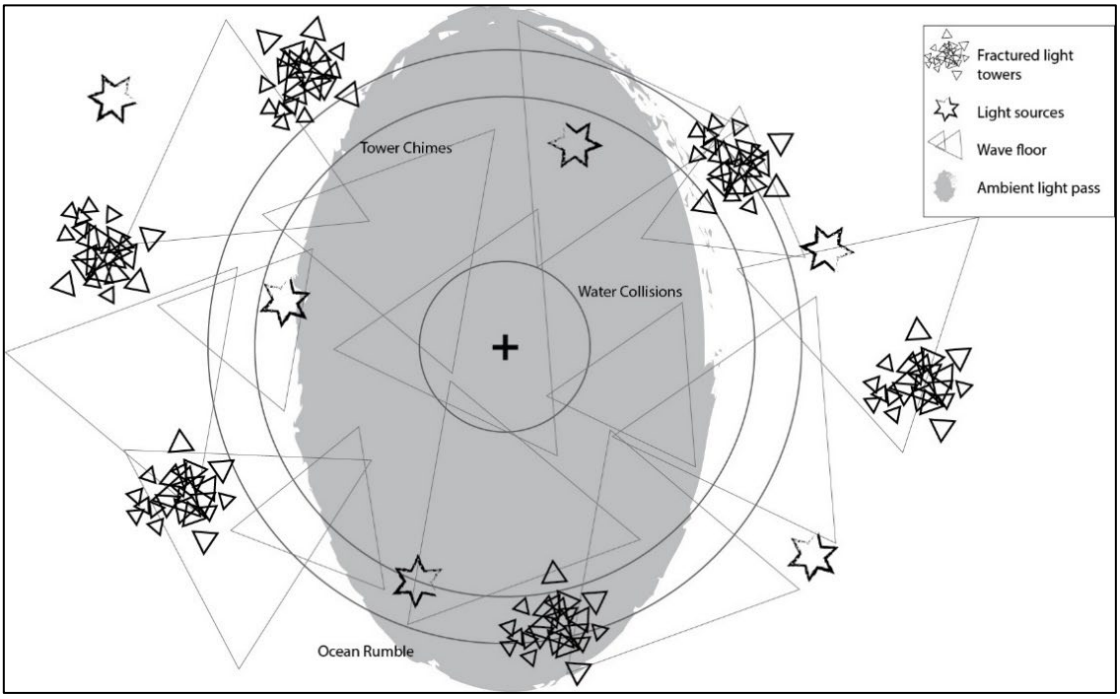

Figure 81: Diagram of the 'Sea of Okhotsk' environment in 'Be That Ocean'

This environment translates the dynamic, kinetic intensity of Maszczak's journey across The Sea of Okhotsk during a violent storm. It draws on Maszczak's description of the beauty of the light that refracted through the towering water that threatened to engulf the ship.

This environment introduces a dramatically undulating, reflective, uneven polygonal surface that fills the landscape. Large, fragmented, wave-like columns burst up from below, towering above the point of view before collapsing again. These components dwarfed my sense of

presence by their dynamic, moving and towering quality, translating Maszczak's description of the towering water that threatened to engulf the ship.

Bright coloured light sources are generated within the scene, mixing to create new colours and contributing to the refractive light quality of the environment. Additional washes of extremely bright light move through the landscape, causing an intense brightness that briefly envelops the view. The overall light quality is affected by a moving shadow cast by an occluded light source overhead, which adds a play of light akin to a light source shining through a disturbed water surface. The intention of these combined experiential qualities is to generate numerous potentialities for light refraction, mixing and movement across all layers of spatial depth. The dominance of these components translates Maszczak's decision to focus on the enveloping and dramatic beauty of refracted light during the storm, despite the life-threatening situation she was in.

A layered background rumble of fierce ocean waves is punctuated by a frequent dulled thud sound that emits from a random location, signifying waves hitting the hull of the ship. Further spatial audio layers of ocean waves move around the participant, affecting the sense of spatial depth as waves can be heard approaching and then receding from the central location. I felt my body pulled and moved by this enveloping audio quality which accentuated the dramatic, undulating feeling that the visual components encouraged to challenge my sense of embodied positionality and presence.

Heard above these audio components is a combination of high-pitched chiming tones that emit from the wave-like towers. These produce a modulating, dissonant, spatial chord that responds to movement to the headset through changes in tone and volume. I found this added an atmospheric wooziness to the environment that contributed to the affective quality of being washed around by the wave-like dynamics that procedurally formed this scene.

Figure 82: Still of 'Sea of Okhotsk' environment in 'Be That Ocean'

The Shores of Magadan

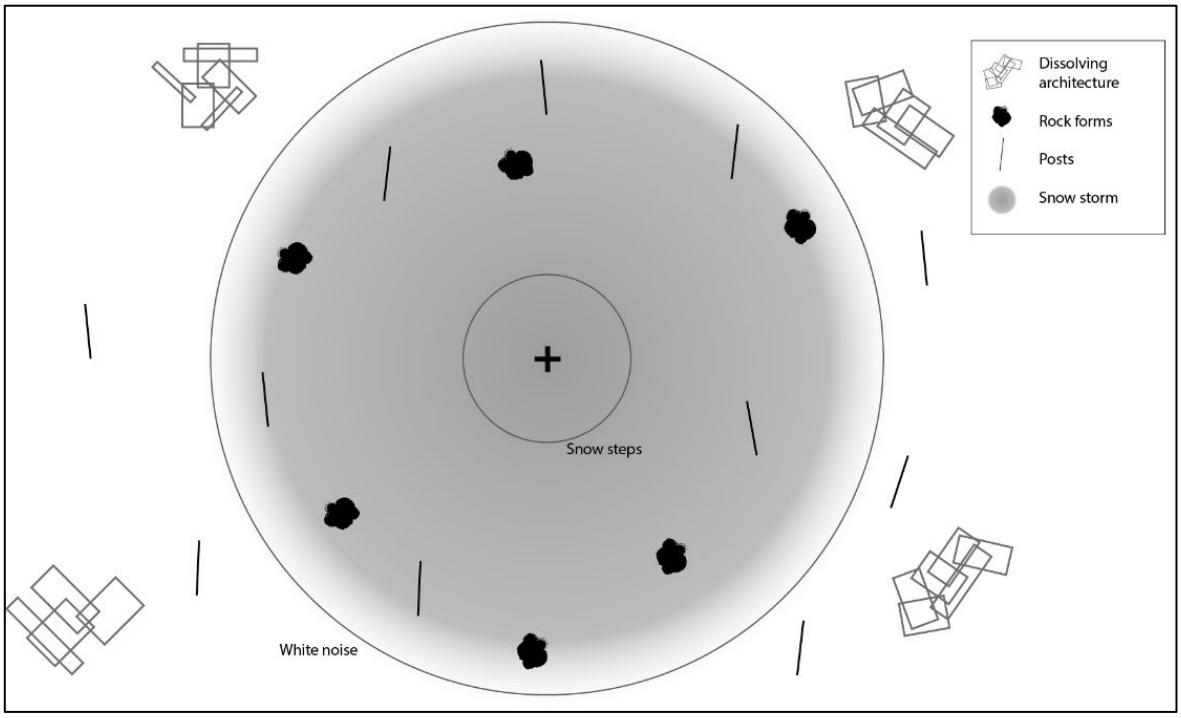

Figure 83: Diagram of the 'The Shores of Magadan' environment in 'Be That Ocean'

This environment translates the enveloping expanse of whiteness Maszczak described as she exited the ship and arrived at the shores of Magadan.

This environment engulfs the scene in an almost impenetrable white light and fog. A sense of ground is suggested by an uneven snowfield that extends into the distance. The horizon line can be vaguely seen via an almost imperceptible change in colour from white to grey/blue as the snowfield meets the horizon. A loud, consistent white noise fills the space completely, with no discernible source of its spatial emission. This is intended to disrupt a sense of spatial depth and build an oppressive, isolating quality. It translates the endless expanse of snow and the intimidating unknown that Maszczak described as she first encountered Magadan. This is a detail that Maszczak emphasised several times during our collaborative work together. The repeated emphasis of this detail is translated through the non-linear structure of the work, as the randomised processes are scripted to favour the introduction of this scene several times during the work's first phase.

Distant, indistinct environmental features generate if the point of view lands in their direction. This offers an ambiguous suggestion of progression in the landscape, signifying a slow journey through the snow to the camps. I accentuated this sense of progression by programming the sound of footsteps to play in the middle distance, suggesting the activity of others on the journey.

Figure 84: Still of 'Shores of Magadan' environment in 'Be That Ocean'

Phase Two

The second phase of *'Be That Ocean'* features additional layers of procedural generation whereby a selection of components from across each of the environments form new compound compositions. This enables exploration of where environmental components previously engaged with in phase one may be bodily engaged with interpreted in new configurations. For example, the introduction of the lateral dynamics in the 'Transport Wagon' environment within wider scale circular environmental compositions accentuated the confrontational way they affect a sense of embodied presence.

Responsive features also appear in new combinations, bringing critical focus onto the contrasting and varied ways that they challenge a sense of presence through the ways they affectively engage the body. For example, I found the combination of components across the 'Transit Camp' and 'Sea of Okhotsk' environments particularly effective, as the sense of presence alongside the sweeping, extreme scale and depth offered by the 'Sea of Okhotsk' is challenged by the angular, architectural components of the 'Transit Camp'. I took these findings back into the design process, accentuating the effectiveness of contrasting qualities through the parameters that determine how they are introduced.

The impact that responsive qualities had on my sense of embodiment within the work became the central focus of the design process. I was tuning in to a sense of finding and relinquishing my sense of embodied self within the work, which I related to how I thought Maszczak felt as she was being transported to Magadan. The complex process of adjusting layered generative parameters in the work developed these affective qualities through the ways that responsive components enabled brief senses of expanded embodied presence to manifest, then challenge it as the environment is regenerated. Through concentrated experimentation with the technical processes that underlie the generation of this phase of the work, I found

potentialities for a rich variety of layered rhythmic compositions that affectively engaged my body in different ways. This design method created continually refreshed opportunities to actively engage with the translation of Maszczak's life experiences. It also began to generate a non-linear sense of structure to the work through the ways that the senses of embodied presence invited a flowing and continually evolving affective quality.

The environmental transitions in this stage begin to initiate at a steadily increasing tempo. A loud bass sound accompanying these transitions adds impact, creating an unignorable experiential beat that awakens the participant to the challenged sense of embodied presence the transitions encourage. An enveloping spatial audio layer of ocean waves gets increasingly louder as the phase progresses, adding to the overall atmospheric intensity. At its climax, the ocean sound overwhelms spatial audio, which I combined with intensifying light sources to bring the visuals to a white out and completely obstruct senses of visual and audio layering and depth.

Ending the work by de-anchoring the body from virtual space in this way left a sense of embodied presence in a challenged state. I found this left me reflexively considering my embodied relationship to the work; creating space to consider the varied affective qualities that translating Maszczak's experiences through design experimentation into presence encouraged me to feel.

Summary

'Be That Ocean' explored how affective qualities of Maszczak's memories can be translated through procedurally generated virtual environments that encourage expanded formulations of embodied presence. Building on the initial experimentation into procedural generation in *'Life is Beautiful. Always.'*, it experimented with how procedural generation techniques can be combined with embodied responsivity to encourage complex, layered and transforming embodied relationships to Maszczak's experiences.

The work highlights how generative environments featuring layered, responsive visual and spatial audio components can invite an evolving sense of embodied experiential flow. Where *'I Look For Them'* started to show the potential to encourage evolving affective qualities through contrasting experiential components, *'Be That Ocean'* more comprehensively explored the potentialities to encourage and challenge senses of embodied presence to form non-linear, layered and affectively felt experiential structures. Through this transforming experiential quality, the work challenges the symbolic and affective significance of experiential components. This invites the potential for an evolving relational connection and opportunities for continued ambiguous interpretation of how the work translates Maszczak's experiences.

This yields insight into how active formulations of embodied presence in VR can facilitate engagement with experiential narratives, and to imbue VR experience with a sense of affective significance. It shows how this approach to non-fictional experiential narrative design in VR can leave a lasting embodied impact on the VR participant, creating opportunities to catalyse ongoing affective connection and critical reflection on the work's narrative content and themes.

Chapter Summary

This chapter reviewed how the VR works created within this enquiry developed understanding of how formulations of embodied presence facilitate affective engagement with translations of my collaborator's life experiences in VR. It charted the progressive understanding of the links between presence and the translation of life experience into experiential narrative as follows:

- *'Life is Beautiful. Always.'* began to demonstrate the potentialities of procedural generation to translate physical characteristics of Schreur's life experience through senses of embodied presence in virtual space. It explored how an abstract approach to virtual environment design can challenge relationships to virtual space and invite ambiguous interpretation of the work's significance. It explored how problematising the embodied agency to engage with the work can challenge presence and contribute to the formation of non-linear experiential structures.
- *'I Look For Them'* demonstrated how atmospheric and experiential qualities of virtual environments can influence formulations of presence, imbuing experiences with evolving affective qualities. It shows how these qualities of VR experience can be used to translate Maszczak's life experiences across contrasting virtual environments that invite potentialities for ambiguous interpretation within experiential narrative structures.
- *'Be That Ocean'* demonstrates how procedural generation techniques can be combined with embodied responsivity to encourage expanded senses of embodied presence and, through them, invite complex affective relationships with translations of Maszczak's experiences. It shows how layered, responsive components of virtual environments build complex formulations of experiential flow in VR experiences, creating a non-linear experiential structure to form through evolving, affective, embodied relationalities with the work.

The progression of the projects demonstrates where designing for embodied presence in VR provides opportunities for affective, evolving and relational engagements with translations of my collaborator's life experiences in a way that is generative of subjectively constructed experiential narrative structures. This shows where designing for presence in VR can invite an embodied knowledge of another's life experience, inviting the potential for affective connection and lasting impact within VR experiential narrative.

Chapter Six: Discussion - Translating Life Experience Through Designing for Presence in VR

This chapter discusses how the enquiry addresses the enquiry aims:

- *Designing for Presence in VR Experiences* discusses the methods developed to explore presence in VR through making VR works.
- *Reflections on Collaborative Research* discusses the methods employed to translate life experience into VR with my collaborators, and where this enhanced capacities to explore presence in VR throughout the enquiry.
- *Translating Life Experience into VR Experiential Narratives* discusses where the enquiry developed new insight into how designing for presence in VR can facilitate embodied engagement with physical and affective qualities of my collaborator's life experience in experiential narrative works.

Through this, the chapter discusses where the works address contemporary critical debates on the opportunities and limitations of VR in experiential narrative design; where VR can be ethically used as a collaborative tool to translate life experiences, and the capacities of VR to invite embodied and affective understanding of collaborator's life experiences through active engagement with VR experiential narratives.

Designing For Presence in VR Experiences

Throughout this enquiry, presence has been understood as a contingent and evolving quality of VR experience; one that could be challenged and augmented through design to encourage affective, embodied relationalities with VR experiences. The practice within this research enquiry presents new contributions to knowledge by demonstrating how designing through and for active, evolving senses of presence can invite affective and subjective relationships with VR experiential narratives.

Within the enquiry, I practically explored the relationships between the aesthetic qualities of VR experience and presence. I experimented with virtual environment design techniques (e.g. photogrammetry, abstraction in the design of 3D environments, 360° video and 3D models made with VR tools) and sound (e.g. layered spatial audio, disjunction between spatial visual and audio and contrasting audio qualities) to demonstrate how these qualities impact on senses of presence and encourage affective engagement with VR experience. I employed dynamic VR design strategies, such as procedural generation and interactive, embodied responsivity in VR, to enable exploration of where complex formulations of presence can be critically examined through the act of undertaking VR design research. This developed insight into the contingent and multifaceted ways presence actively manifests through the design of and engagement with VR experiences, and how strategies to design for presence enhance affective engagement with experiential narratives.

Design Aesthetics for Presence

I experimented with how methods of abstraction in VR design challenge the potential representative quality of virtual environments and encourage ambiguous interpretation of VR experiences. I was concerned with the possibly habituating effect of designing virtual environments with qualities that endeavour to resemble actual spaces (e.g. using detailed 3D models that endeavour to simulate real-world scenes, what Davies called the 'striving for mimetic representation in 3D digital imaging'[327]). I felt that this potential habituation to virtual environments would limit the possibilities to critically explore how presence actively manifests and can be challenged through active engagement with aesthetic qualities of VR design.

I first explored this in the second section of *'Life is Beautiful. Always.'*, 'Marcel World'. The low-resolution textures and angular approach to 3D design in that environment was unrealistic (in terms of comparison to real places) but nonetheless coherent and plausible. I felt that this supported to build a sense of a virtual world that was made through and for engagement with VR, which engaged ambiguous interpretation of the significance of environmental features in a more active way than if they were presented as reproductions of actual places. These aesthetic choices were developed further in *'Be That Ocean'*. There, a similarly angular approach to environment design was combined with dynamic lighting and a generative overlapping of environmental features to reveal, occlude and fragment environment design. This added an evolving dynamism to virtual environments that disrupted perceptual fidelity, which I found challenged spatial anchoring and further encouraged active consideration of the significance of virtual environments.

This abstract aesthetic was enhanced through the incorporation of environmental features that deliberately suggest that the work has been experimented on and constructed in VR. For example, where the 'Marcel World' section of '*Life is Beautiful. Always*.' features evidence of design experimentation in collaboration with Schreur (such as the table with 3D forms from the *'Isolation VR'* that appear alongside that work), or the incongruent design of the central space of *'I Look For Them'*, which features contrasting design details that feature elsewhere within the work. The incongruent placing of different aesthetic and interpretive qualities of virtual environments challenged the reading of environments as representations of actual spaces. It extends Davis's description of abstraction in VR design to 'develop ambiguity in order to evoke rather than illustrate'[328], encouraging ambiguous interpretation within the experiential narrative context of translations of Schreur and Maszczak's life experiences. This encourages a fresh encounter to interpret the significance of environmental features, supporting to build subjectively constructed relationships with the work's narrative content and themes.

The juxtaposition of the different aesthetic qualities between photogrammetry and 3D modelled assets also influenced subjective relationships with virtual environments. The photogrammetry process yields a high level of texture detail but also frequently entails errors, including holes in 3D forms, stretched or skewed textures, or jagged edges. I preserved these

[327] (Davies, 2005, p. 25)
[328] (Davies, 2005, p. 42)

errors as part of the design aesthetic. Their fragmented realism problematised their representative quality, especially when their qualities are emphasised in juxtaposition with comparatively cleanly modelled 3D assets. Photogrammetry assets feature within *'Life is Beautiful. Always.'* and *'I Look For Them'* (Figure 31: Photogrammetry capture of shelves, clogs, cushions and a grandfather clock from Schreur's studio in 'Life is Beautiful. Always.') (Figure 44: Maszczak's writing desk and shelves as they appear in 'I Look For Them'). My intention is for them to offer fragmented and ambiguous windows into Schreur and Maszczak's lives. The fragmentation of actual reality that photogrammetry offers accentuates the unreality of the virtual space, challenging subjective interpretation through their incongruent aesthetic.

A more directly representative approach to VR design was employed in *'I Look For Them'*. This created more representative environmental details that Maszczak recognised and could respond to, such as the weathered, broken quality of barbed-wire fences, or the pink and white flowers seen from the transport wagon. This representative design enabled Maszczak to creatively contribute to the work's development, which enabled us to develop understanding of the affective significance Maszczak's experiences hold for her. This led to insights that developed design aesthetic approaches in *'Be That Ocean'*, such as the focus on refracted light quality in the 'Sea of Okhotsk' section, or the enveloping, isolating whiteness on 'The Shores of Magadan'.

In addition to visual design aesthetics, experimenting with sound further enabled exploration of where presence manifests through engagement with VR works. Sound in VR generates a distinctly spatial quality that I found challenged my sense of embodiment and encouraged a more marked visceral embodied reaction to VR dynamics. This is particularly evident when spatial audio is placed within the VR headset position, which stimulates an internal sensation as though sounds are coming from within the body. An example of where this is demonstrated can be found at the end of the 'Marcel World' section of *'Life is Beautiful. Always.'*, where droning internal spatial audio disrupted a sense of embodied equilibrium before the descent to 'The Pit'. Another is in the 'Transport Wagon' scene in *'Be That Ocean'*, where a repetitive internal rhythmic beat could signify a train on the tracks, or a heartbeat.

Layering spatial audio with changing potentialities for movement created opportunities for transforming senses sense of personal scale and position within virtual environments that challenged a sense of embodied presence. Sherman and Davis both used spatial audio to augment senses of spatial depth across environments in their work[329]. I extended these approaches by incorporating elements of embodied responsivity to modify spatial and affective audio qualities as VR experiences progress. This created a multi-layered, transforming sense of embodiment that evolved subtly but affectively over time; a modulating spatial awareness that gives virtual spaces a sense of transforming life. This is demonstrated in 'The Sea of Okhotsk' section of *'Be That Ocean'*, where the sounds of approaching and receding waves offer differing senses of spatial scale that my body seemed to move with, and loud tonal sounds emitting from towering wave-like structures that dwarfed my sense of presence within the scene. Another is within the 'Isolation VR' experiment in 'Life is Beautiful. Always.', where

[329] (Davies, 2023), (Sherman, 2023)

Schreur's embodied exploration of virtual space was translated into moving spatial audio emitters that generated modulating embodied relationalities with spatial depth.

Combining sounds with different qualities (such as droning bass or high-pitched sound, tonally modulating sound, or more percussive, rhythmic and staccato sound) also imbued experiences with an affective quality that supported to generate evolving senses of embodied, experiential flow. I found this was particularly effective where flowing tonal qualities establish modulating senses of spatiality, combined with layers of rhythmic sound that the body tunes into. An example of this is in 'Marcel World', where consistent but subtly evolving chiming sounds permeate throughout the scene. These create differing senses of experiential pacing and flow, which subtly affected embodied and temporal relationalities with virtual space. Incorporating sudden contrasts to spatial audio dynamics also challenged and refocused VR experience onto a sense of presence. An example is in the transition to the 'Sea of Okhotsk' section of *'I Look For Them'*, where the sudden abrasive sound of scraping iron bolts significantly disrupts embodied relationalities to virtual space that may have established prior to this scene.

The use of Schreur and Maszczak's voice supported to build abstracted contextual narrative links with their life experiences. This is done most directly in *'I Look For Them'*, where extended sections from interviews with Maszczak support interpretation of virtual environments. Voice is used more abstractly in *'Life is Beautiful. Always.'*, where overlapping samples of Schreur's voice translate a confused perception of sound during his experience of a TIA, and *'Be That Ocean'*, where distorted samples of Maszczak's voice suggest her presence within the work. This use of voice extends Laurel and Strickland's use of the voice of spirit critters as 'fragments of narrative' in 'Placeholder'[330], using Maszczak and Schreur's voices to encourage ambiguous, fragmented connections to the context of their life experiences.

Expanding Embodied Presence Through Responsivity

The potential to explore strategies to design for expanded senses of embodied presence to translate life experience was first discovered in the production of 'The Pit' section of *'Life is Beautiful. Always.'*. Here, the unpredictable potentialities for embodied engagement with procedural generation created possibilities to translate the contingent and uncertain ways that the Schreur's experience of a TIA challenged his sense of presence. Procedural generation enabled ways to investigate designing for embodied presence in a non-linear and exploratory way. Employing the 'implied player'[331] method enabled me to critically explore how presence actively manifests within responsive, procedurally generated virtual environments that translate Schreur's experiences.

These design techniques were developed through methods that layered and reconfigured responsive environmental components. Sherman's *'Das Is'*[332] demonstrates some of the potential of these design techniques, where implausibly overlapping virtual environments accessed by moving the headset between responsive portals. I developed this approach in *'Be That Ocean'*, where several complex procedurally generated virtual environments that

[330] (Laurel, Strickland, & Tow, 1994)
[331] (Aarseth, 2007)
[332] (Sherman, 2023)

translate Maszczak's experiences build, recede and overlap in unpredictable configurations. The combined responsive features of these environments invite senses of presence to manifest, then challenge and refocus active engagement with presence as components across them overlap and disrupt each other. This afforded enhanced opportunities to experiment with how responsive features of virtual environments challenge senses of embodied presence and encourage evolving embodied relationalities with affective qualities of Maszczak's experiences.

Combining procedural generation processes with data from embodied interaction in VR (such as head position, direction and speed of movement) enabled me to critically investigate how embodied interaction encouraged an expanded senses of embodied presence within the work. These design strategies extended Aguilera's experimentation with embodied movement to inform the motion of virtual objects, which she explained encourages an expanded sense of embodiment to confirm or characterise presence[333]. Combining embodied responsivity with procedural generation enhanced the opportunities to explore expanded embodied relationalities with virtual environments, as it afforded types of embodied interaction that were generative of components within virtual environments. This practically expanded on the potential Ryan outlined of the 'world-creative'[334] qualities of engaging with VR experiential narratives through presence, where incorporeal participation with VR is generative of meaningful narrative experiences. Adopting the 'implied player' [335] was key to critically examining this design method. By actively interacting with parameters of unpredictable procedural generation processes, I developed critical understanding of where generative environments responded to my body and encouraged an expanded and evolving relational embodied connection to them. For example, the fragmented architectural components that form spaces of close confinement in the 'Interrogation' environment of *'Be That Ocean'* took on new meaning when combined with 'The Shores of Magadan' in phase two of that work. They became sparse, broken, man-made forms that accentuated a feeling of being lost in an expansive frozen wasteland, rather than their original context where they occlude spatial depth and encourage a claustrophobic sensation.

'Be That Ocean' also demonstrates where embodied responsivity can challenge and disrupt spatial positioning and the perceived boundaries of the body in virtual spaces. An example of this is in the 'Transport Wagon' environment, where fragmented polygons pass through where the body may be felt to be in an invasive and confrontational way. Another is in the 'Interrogation' section, where procedural generation processes can generate an impossibly small space for the body to inhabit. These design techniques expand on Sharir's comments on the paradoxical sense of embodiment and disembodiment felt when engaging in a VR work that cannot carry over the fullness of the body into virtual spaces[336]. Sherman also commented on this disrupting embodied potentiality when she described the 'phantom bodily sensation' that persists whilst responsive dynamics take place where the body should be[337]. *'Be That*

[333] (Aguilera, 2019)
[334] (Ryan, 2016)
[335] (Aarseth, 2007)
[336] (Moser & Macleod, 1996)
[337] (Sherman, 2023)

Ocean' demonstrates where utilising the creative opportunities and phenomenal limitations of embodied engagement with VR to challenge a sense of presence can be particularly effective to translate affective qualities of Maszczak's life experiences; emphasising the visceral potentialities and paradoxical senses of disembodiment within engagement with VR to encourage critical and embodied relationalities with these aspects of Maszczak's experiences.

Designing Experiential Structures Through Presence

Another key discovery was where modifying aspects of VR experience that contribute to formulations of presence can develop experiential narrative structures. Where Laurel and Strickland experimented with the formation of experiential structures through interactive embodiment of different characters [338], I extended this to explore where individual, subjectively constructed embodied relationships to virtual space can be augmented to formulate and progress experiential narratives.

I found that modifying the embodied components that relate to senses of presence provided experiential contrasts within VR experiences. I used these experiential contrasts to build structure and a sense of progression within experiential narratives. This is demonstrated within *'Life is Beautiful. Always.'* through the ways that agency to explore is invited in 'Marcel World' and then progressively withheld in the transition to 'The Pit'. This change in the capacity to explore the work causes a refocusing on the experiential potentialities to engage with it, signalling new embodied understandings of presence to manifest and encouraging fresh interpretation of its narrative significance.

'I Look For them' explored experiential structure through the ways that contrasting aesthetic qualities of VR experiences can elicit a changing sense of experiential pacing and dynamism to structure VR experiences. An example of this is the contrasts within 'The Interrogation' section, where periods of stillness are interrupted by abrasive, confrontational and uncomfortable dynamics. This created an unstable sense of experiential structure and an uncertain sense of temporality, as the work pulls you through a series of undefined environments, eliciting tension as it holds you in place for an uncertain length of time before thrusting you through the abrasive dynamics again. Another example is within the 360° video that introduces *'I Look For Them'*. As 360° video is a definitively representative medium, moving from this to an abstractly designed 3D environment re-engages subjective engagement. The 3D aesthetic does not directly represent real places and invites a greater degree of ambiguity in what it translates. Shifting to a navigable 3D environment also offers different possibilities to feel present in VR, inviting the participant to spatially reorient themselves through the agency to explore virtual space.

'Be That Ocean' further develops these techniques. The layered, generative features of this work demonstrate how presence may be continually challenged through virtual environments that feature varying capacities for embodied responsivity. This enables a continued focus on presence in its active formulation whilst also generating an unpredictable, non-linear experiential structure. The complex and varying senses of presence within the transforming and affective qualities of this work creates a non-linear experiential structure that presents

[338] (Laurel, Strickland, & Tow, 1994)

itself as a series of fragmented, inchoate memories; fragmented and overlapping embodied translations of Maszczak's experiences that invite ambiguous interpretation through the evolving senses of embodied presence they encourage.

This approach to experiential structure through challenging senses of presence is enhanced by methods I employed to resist narrative closure in the works. None of the works developed within this enquiry provide a conclusive summary ending. Through this technique, I intend for the VR participant to remain in an active contemplative state; offering a final challenge to presence where a lingering sense of the experiential qualities felt in the work are carried through as the headset is removed. This invites continued interpretive ambiguity, catalysing critical examination of the embodied experiential narrative structure that has developed through the encounter with the work.

These methods practically expand on Gaggioli's thoughts on the personal and epistemic transformative capacity of VR experience, where VR generates a 'subjective window of presence… into unactualised but possible worlds' [339]. They demonstrate how senses of embodied presence may be re-configured across VR experiences to encourage the actualisation of evolving and subjectively constructed VR experiential narratives. This highlights the value of understanding presence in design as an open-ended and contingent process. This may entail an element of incompletion in a summary understanding of positionality and embodiment within VR experience. However, this is core strength of this design approach. By withholding the establishment of a consistent, normative sense of presence, participants remain in a reflexive mode which encourages critical examination of their embodied relationalities with the work and its potentialities to elicit more personalised, inclusive and discriminating perspectives on the work's experiential narrative themes.

Reflections on Collaborative Research

The collaborative research projects were a valuable way to explore presence in VR within the context of translating another's life experience. They enabled the development of VR experiential narrative works that explored and embodied shared understandings of presence in VR. The projects demonstrate where emergent understandings of methods to translate collaborator's life experiences through designing for presence invited genuine affective engagements with collaborator's lives. These collaborative methods contributed to debates around issues of authorship in the design of VR experiential narratives raised by the critique of Milk's VR as 'the ultimate empathy machine' [340]. They provided a context to challenge technical and creative approaches to designing experiential narratives through presence in VR; enabling the enquiry to critically examine how VR experiential narratives can be ethically constructed, and how life experiences can be translated in a way that holds a sense their affective qualities for the subjects of these works.

[339] (Gaggioli, 2016, p. 107)
[340] (Milk, 2015), (Wilk, 2018)

Collaborating with Marcel Schreur

My collaborative work with Schreur was primarily done through co-design. Schreur's existing art practice and curiosity to experiment with VR provided a foundation to develop what Sanders and Stappers[341] referred to as collective creativity within co-designing for presence. This was an effective way to collaboratively explore translating Schreur's life experiences though presence in VR, as translation was facilitated primarily through Schreur's and my active experience of developing new VR works that creatively and conceptually explored aspects of presence in VR together.

Collaboratively examining Schreur's exploratory process of making VR artworks developed insight into where a sense of presence manifests for him in VR design. Through this, I developed VR design approaches to critically examine the manifestation of a sense of presence through active engagement with VR. An example of this is where Schreur described how emergent details in his VR artworks manifested for him, and how changing perspectives as he explored in VR challenged understandings of his spatial and conceptual relationships with virtual space. This informed my approach to developing evolving environmental details in 'Marcel World', such as the progressive changes to environmental features, and the introduction of objects that obstruct and problematise embodied exploration of this space.

Schreur used art making in VR to communicate his life experiences, which deepened my understanding of how they could be translated through methods to design for presence. My approach to this was enhanced by exploring how qualities within Schreur's existing painting practice could be translated into VR. An example of this is within the *'Isolation VR'* experiment, where I drew on the dynamic sense of movement I observed in Schreur's painting, *'Isolation'*, to explore how moving spatial audio and visual components affected a transforming sense of embodied spatiality. Schreur's art-making in VR also yielded insight into how his life experiences could be translated into experiential narratives structures. Schreur's *'Circle of Life'* VR work expressed a progressive and repeating process of cognitive impairment and a return to a more stable state. The vertical and cyclical composition of this work suggested a non-linear experiential narrative structure, which provided a basis to bring elements from across our collaborative work together into a single VR experiential narrative work.

Schreur's critical comments on design iterations yielded insight into how his life experiences could be translated through aspects of VR related to presence. An example of this was where effects applied to disrupt an anchored sense of positionality in *'Serene Velocity VR'* related to his experience of cognitive impairment; what Schreur described as 'a thousand bees buzzing in his brain'. Elements of this experimentation were brought forward into the transition to 'The Pit' section of '*Life is Beautiful. Always.*', where disruptive effects applied to the headset and internal spatial audio components obstruct spatial depth and challenged senses of embodied presence. As our collaboration progressed to a more semi-structured approach, Schreur provided critical feedback that related directly to a shared exploration into designing for presence in VR. An example of this is in our review of *'The Chaos Event'* experiment, where

[341] (Sanders & Stappers, 2008)

Schreur and I found that the composition of this work did not effectively enable presence to manifest through a sense of positionality and spatial depth.

The examples above show how co-design with Schreur facilitated genuine shared understanding where his life experiences could be translated through designing for presence in VR. Schreur described our collaboration as a 'meeting in the middle', signifying where his life experiences and art practice met my expertise in VR design to affectively and collaboratively translate his experiences in a new way. This evidences how co-design methods developed a sense of authenticity for Schreur in the ways it enabled him to actively engage in the translation of his life experiences. This demonstrates where the VR project addresses issues of authorship in the development of VR experiential narrative works based on another's life. It contributes insight into how co-designing through presence in VR creates a shared sense of agency to translate life experience in VR; approaching the development of VR experiential narratives in an ethical way that actively includes the subject of the work.

Collaborating with Ivanna Maszczak

Collaboration with Maszczak differed significantly from that with Schreur in that co-designing with Maszczak was not possible. Maszczak's engagement with VR was limited by issues with her eyesight which made using VR to experience work unfeasible. Exploring Maszczak's life experiences with her was primarily conducted via unstructured interviews, supplemented by examining her archive of documents that provided additional contextual and environmental details of her life experiences.

Employing an unstructured interview method [342] at the beginning of our collaboration developed a shared basis of trust and an understanding of the specific ways Maszczak wanted to collaboratively explore her life experiences. I did not have a definite idea for how VR could, or should, be used to translate Maszczak's experiences during initial meetings. So, working with Maszczak as she freely described her experiences provided a foundational context to understand how she would like to explore her life experiences through collaboration. Maszczak's comment, 'I can tell you everything, but I cannot tell you how I feel', suggested that there was an affective quality to her experiences that she felt she had not yet had the opportunity to adequately explore or express. This desire to communicate her life experience in a new way was emphasised when Maszczak explained that she appreciated the way we explored her experiences without focus on the 'special topics' (her term for more difficult aspects of her experiences that had already been covered through interview with various organisations), signalling that we were exploring her life experiences in a new way that she valued.

Using VR design to practically investigate this new way to translate Maszczak's life experiences with her was the central focus of this collaboration. Iterations of virtual environments were designed to hold a recognisable representative quality for Maszczak that enabled her to offer critical and creative responses (see Appendix C: Design Diary Notes Informing Environment Designs in *'I Look For Them'*, outlining details obtained from interview that informed initial VR environment designs). This provided the basis to employ Villari's reflexive and iterative 'Action

[342] (Gill, Stewart, Treasure, & Chadwick, 2008)

Design' method [343], through which Maszczak and I collaboratively developed a shared understanding of the affective qualities of Maszczak's experiences through reviewing VR works and how they could be translated through VR design. As I presented design iterations to Maszczak, I discovered where they enabled Maszczak to recall additional environmental details, which also often revealed some of their affective quality. For example, the importance in representing the featureless expanse of snow at the shores of Magadan to signify a step into a vast, dark unknown. Working with these qualities through an iterative VR design process built a complex understanding of how the affective significance of Maszczak's experiences could be translated into VR works. I engaged with design iterations as an 'implied player' [344] to examine how they invited a similar affective quality I felt as I explored Maszczak's life experiences with her.

The representative quality of this collaboration left detailed exploration of where Maszczak's experiences could be translated through the embodied capacities for presence in VR design open for further examination. However, it was an effective collaborative design strategy to develop a shared understanding of Maszczak's experiences. In development of *'I Look For Them'*, Maszczak and I built a lasting friendship through which she expressed a trust in me to hold the personal significance of her life experiences within further practice. Her permission to create a second work, *'Be That Ocean'*, was deeply impactful on me. I felt that this validated my position to continue to explore methods to translate Maszczak's experiences through designing for presence in VR in *'Be That Ocean'*.

My work with Maszczak further demonstrates how VR can be used as a collaborative design tool; developing and actively engaging with virtual environment design to enable a shared agency to explore and translate affective qualities of another's life experience. The effectiveness of this method can be evidenced with Maszczak's comment, 'this is real', on one of the final drafts of *'I Look For Them'*, indicating that we had reached an authentic affective quality in how the work translated her life experiences through VR. This expands the insight this enquiry contributes to contemporary debates on issues of authorship in the design of VR experiential narrative works; demonstrating additional collaborative VR design methods to enable inclusivity in the design of VR experiential narrative works based on another's life.

Translating Life Experience into VR Experiential Narratives

The VR works developed within this enquiry present contributions to knowledge by demonstrating where designing for formulations of embodied presence invite opportunities to affectively engage with and interpret translations of another's life experience. They highlight the intricacies of designing for presence in the translation of another's experience into VR works; where presence invites a contingent, subjectively constructed relationality with VR experiential narratives to generate complex, affective, embodied understandings of another's life experience. Through this, the works show how designing for presence in VR experiential narratives encourages an embodied knowledge of another's experiences, yielding the potential for lasting affective relationships with experiential narrative contexts.

[343] (Villari, 2014)
[344] (Aarseth, 2007)

'Life is Beautiful. Always.' demonstrates how physical characteristics of Schreur's experience of vascular dementia can be translated through co-designing for presence in VR. It demonstrates where co-designing in VR can develop experiential narrative structures that explore the variable ways presence may be understood from the perspective of Schreur's life experiences. It explores how techniques for abstraction in VR aesthetics can translate Schreur's variable perceptual and cognitive faculties, such as methods for fragmentation and incongruency in 3D environment design and evolving post effects to challenge perceptual fidelity, environmental stability and encouraging ongoing ambiguous interpretation of virtual environments. It showed where augmenting the agency to bodily engage with the work through changes to environmental features (such as the responsive introduction of virtual components that obscure the view and restrict agency to explore) progressively problematised a sense of embodied presence to translate where Schreur's capacities to feel present can be significantly contested in his life. It showed where the unpredictability of procedural generation with overlapping spatial visual and audio VR dynamics challenge embodied relationships to virtual space, encouraging a variable and problematised sense of embodied presence that translates where physical and affective aspects of Schreur's experience of a TIA disrupted his sense of presence. Through these VR design methods, *'Life is Beautiful. Always.'* begins to show how active engagement with a VR experiential narrative work invites embodied and subjectively constructed relationalities with translations of Schreur's life experiences.

'I Look For Them' demonstrates how VR design can collaboratively translate experiential and affective qualities Maszczak's experiences of arrest by the Soviet regime and transportation to a Gulag camp at Magadan, Siberia. The collaborative VR design methods employed in this project demonstrate where Maszczak's experiences can be translated into virtual environments that contain a representative quality that Maszczak could recognise and creatively contribute to. It demonstrated how collaboratively engaging with these environments developed understanding of the affective significance of Maszczak's experiences through the ways she related to them. For example, where engaging with a VR environment translating Maszczak's first encounter with the shores of Magadan elicited the affective significance of this moment for her as a step into a vast, dark unknown, or where exploring environments representing transit camps stimulated further memories of the profound connections she made with other prisoners. The work shows where translating affective qualities of Maszczak's experiences through evolving environmental aesthetics and dynamic virtual components develops qualitative experiential contrasts. It shows where these design features can influence and challenge presence and enhance embodied engagement with VR narrative experiences, such as where the transition to the 'Sea of Okhotsk' scene in this work introduces dynamics that disrupt embodied equilibrium to bring experiential focus on the dramatic, chaotic qualities of Maszczak's experiences. The insights and material gathered from this collaborative project also enabled further practical experimentation into translating life experience through designing for embodied presence in '*Be That Ocean'.*

'Be That Ocean' demonstrates how procedural generation design strategies combine with techniques for embodied responsivity to encourage complex and evolving senses of embodied presence that are generative of experiential narrative structures. Through these methods, the project further explored how emergent embodied relationalities with responsive virtual

environments can translate affective qualities of Maszczak's experiences, such as the sense of uncertain sense of time, space and position during interrogation periods, or the diminishing sense of self Maszczak felt during the long journey via transport wagon. It shows how the 'implied player'[345] methodology can be used as a strategy to critically examine how affective qualities of Maszczak's experiences actively manifest when translating them through procedurally generated VR works that respond to embodied engagement. For example, where a rhythmic, dramatic and undulating sense of embodied movement through procedurally generated spatial visual and audio dynamics, and the play of refracted light across reflective 3D forms that emerge in response to headset position translated the sense of being engulfed by the beauty Maszczak saw in the Sea of Okhotsk during a violent storm. The work demonstrates how layering procedurally generated, responsive virtual environments that translate affective qualities of Maszczak's experiences challenge formulations of embodied presence in unpredictable ways, and where this is generative of an emergent and subjectively constructed experiential narrative structure. This significantly advances experimentation into translating life experience through active engagement with emergent, evolving senses of embodied presence across the enquiry. It shows how actively engaging with VR experiences that generate virtual environments in response to embodied interaction can invite complex, evolving and affective relationships with Maszczak's experiences. It shows where designing for presence in VR can facilitate active engagement with VR experiential narrative works to encourage an embodied, affective knowledge of another's experience. This contributes to knowledge within contemporary critical debates on the creative possibilities and ethical limitations in designing VR experiential narratives. It demonstrates where designing for presence reveals some of the nuances of VR as an experiential narrative platform; where active engagement with subjectively constructed VR experiential narratives through presence develops understanding of another's experiences in a way that is unique to the embodied and phenomenal capacities of VR.

The practical approaches to designing for presence to translate life experience across this enquiry extends Ryans 'ontological interactive' concept of engagement with VR experiential narratives, where she suggests that a creative sense of narrative in VR experiences 'flow out of the acting body'[346]. By creating active, interpretive links with VR experiences through embodied interaction, responsivity and abstraction in VR design, the works encourage evolving senses of embodied presence which are generative of experiential narrative structures. *'Be That Ocean'* particularly exemplifies this method, where the transforming senses of embodied presence this work encourages is simultaneously generative of evolving affective qualities that construct a non-linear and embodied experiential structure. This outlines where design methods for presence in VR can invite creative apprehension of a sense of narrative that is primarily embodied before it is rationally comprehended. The approach to designing VR experiential narrative through presence that I developed within the enquiry presents an alternative to VR experiential narrative design methods that could be considered more representational in their approach, such as Milk and Arora's 'Cloud Over Sidra' 360° video

[345] (Aarseth, 2007)
[346] (Ryan, 2016, p. 209)

work[347], or Brillhart's methodologies for framing and editing VR experiences that draws on existing filmmaking techniques[348]. Whilst works like these have been shown to demonstrate societal impact[349], I would argue that that the methods used in their production have not fully explored the potentialities for genuine affective and embodied engagement that VR offers. The practice within this PhD enquiry makes a contribution here, demonstrating new insight into how methods to design for presence through the phenomenal capacities of VR can be utilised to invite relational, affective and impactful embodied engagements with experiential narratives.

The collaborative practice employed across this enquiry also presents contributions to knowledge on methods to ethically translate life experiences into VR experiential narrative works. Whilst there were different methods employed across collaboration with Schreur and Maszczak, both projects adhered to the fundamental requirement to maintain ethical and inclusive collaborative research methods that actively and creatively included them in the production of VR works based on their lives. The methods employed across the projects present a contribution to knowledge in this context, demonstrating the reflexive use of VR design methods to maintain ethical and inclusive collaboration across co-design and interview-based methodologies.

These methods of collaboration contribute to current debates on the ethics of designing VR experiential narratives, demonstrating a practical approach that extends Cioffi's requirement to develop a sense of the 'we', rather than the 'I' and 'you', when designing VR experiential narratives that involve the subjects of these works[350]. They practically demonstrate where VR experiential narrative design methods should consider the subjects of these works 'as a separate person with agency and not just a facet of the self'[351] by incorporating their agency to collaborate as a primary factor in the progression of the practice-based research. By establishing a non-hierarchical collaborative research framework that enabled Schreur and Maszczak to direct practice-based translation of their life experiences, the resulting works retained a genuine sense of the affective significance of their life experiences through the ways we found to engage with these qualities of their experiences in VR design.

The specific design methods that can and should be employed to translate life experience with collaborators will be by necessity uncertain at the beginning of a VR experiential narrative project. This relates to Sander and Stapper's 'fuzzy front-end' of co-design[352]. It requires time and sensitivity to understand how collaborators can and want to explore their life experiences and to determine the most appropriate methods to engage collaborators in the production of VR experiential narrative works. I recognised this requirement most acutely when beginning to undertake collaborative research with Maszczak, as I was initially concerned about what collaborating with her in VR could offer to the sensitive and already well-documented historical context of her life experiences. However, maintaining an openness to how Schreur and

[347] (Milk & Arora, 2015)
[348] (Brillhart, 2016)
[349] (SDG, 2023)
[350] (Wilk, 2018)
[351] (Wilk, 2018)
[352] (Sanders & Stappers, 2008, p. 5)

Maszczak wanted to engage in collaborative research enabled me to discover the particular aspects of their life experiences they wanted to translate and the ways they wanted to explore them through VR design. Whilst they had both endured difficult experiences in their lives, I discovered that there was a particular insight and value their experiences held for them that they wanted to explore further through our work together. Schreur was already exploring the unique value the perspective his life experiences had provided him in his art-practice and expressed a curiosity to explore further through VR design. Maszczak expressed a desire to explore the wider affective significance of her life experiences, rather than to repeat an account of difficult experiences she had covered several times through interview with other organisations. By letting these motivations lead the direction of the collaborative practice, I was able to explore a broader and richer account of Schreur and Maszczak's life experiences and discover appropriate methods to translate them into VR with them. This enabled the collaborative work to address Wilk's critique of where VR can 'convey trauma as content'[353], overriding the specificity of the experiential narrative context in order to elicit a strong emotional response. My approach to collaboration with Schreur and Maszczak enabled the works to translate interrelated physical, experiential and affective qualities their experiences in a way that they related to with a sense of authenticity. This led to VR experiential narrative works that invite complex embodied relationalities with their experiences. These works provide an enhanced critical context to consider how translations of complex phenomenal and affective qualities of their life experiences can be related to through active and critical collaborative engagement with VR.

On reflection of these experiences, I would argue that there is not a particular set of practical methods that can be drawn upon to undertake this kind of collaborative work. Nor does this enquiry endeavour to demonstrate a practical method that will be applicable to every VR experiential narrative project. If a designer holds too tightly to what they want to translate in VR experiential narrative and how it will be engaged with, then their work will likely not retain an authentic sense of the experiences they are endeavouring to translate for the subjects of their works. This is akin to Cioffi's 'extraction model' where a designer 'scoops up the material according to the story [they] want to tell'[354]. Above all, I propose that designers uphold a commitment to reflexivity in design to ensure inclusive and ethical collaboration, and to be prepared for the eventuality that this may draw a practical enquiry away from research aims or expectations of outcome.

By maintaining reflexivity to enable collaborators to creatively engage in the production of VR works, this enquiry demonstrates tangible examples of how VR experiential narratives can be effectively and ethically designed through genuine collaborative working. This relates to Sander and Stapper's use of collaborative design 'to determine what is to be designed and sometimes what should not be designed'[355], showing how collaborative VR design can lead to enhanced understanding of how life experiences can be ethically translated into VR works. The collaborative methods employed demonstrate the value of genuinely engaging with the

[353] (Wilk, 2018)
[354] (Wilk, 2018)
[355] (Sanders & Stappers, 2008, p. 5)

collaborator's perspectives to explore designing for presence in the creation of VR experiential narratives based on their lives. These design processes will be uncertain. But this enquiry demonstrates where they provide a more nuanced and enhanced approach to designing VR experiential narratives. It shows where designing for presence in VR provides a valuable perspective to explore how collaborator's life experiences can be ethically and affectively translated through the phenomenal and embodied capacities of VR.

Embodying Self and Other in VR Experiential Narratives

In addition to the contributions to knowledge this enquiry found through collaborative practice-based research strategies to translate life experience through designing for presence in VR, this enquiry also contributes to wider contemporary technical and ethical debates on notions of embodiment in VR and how that relates to accessibility in VR experiential narratives design. The question of accessibility in VR experiential narrative design is crucial in developing critical understanding of the opportunities and limitations for designing VR works that intend to offer some sense of embodiment of another's life experiences. It is important that a designer adopts a critical stance towards technical and ethical understandings of embodiment in VR when designing such works; how their sense of embodiment relates to the sense of embodiment they are designing for, how this impacts on their creative capacities to approach embodied translation of another's experiences, and how the works they produce can be made accessible to more diverse audiences.

Current debates around the potentialities and limitations of embodiment in VR have been highlighted variously above, including:

- Sharir's commentary on the open-ended artistic potentialities in a paradoxically and simultaneously embodied/disembodied sense of self in VR in relation to their performance art experimentation with Gromala's 'Dancing with The Virtual Dervish' VR work[356]; prompting questions on the technological and phenomenal limitations of a sense of embodied self in VR and how a designer may experiment with these in a experiential narrative design context.
- In critique of Milk and Arora's 360° video work[357] that represents another's experience from a fixed point of view that does not necessarily represent or include the VR viewer; suggesting that an uncritical approach to the active and embodied qualities of presence in VR may render the participant experience passive and limit the potential for a relational moral dimension with the subject matter of the work.
- Kilteni's experimentation with the 'psychological, behavioural and attitudinal consequences' of the transferral of body ownership onto virtual avatars that suggest different cultural or ethnic backgrounds[358]; demonstrating that even seemingly normative or habitual approaches to visible embodied representation in VR design can elicit behavioural and affective responses. Kilteni's research began to outline the complex role that embodied interactions in VR play on subjective engagement with VR

[356] (Gromala & Sharir, 1994)
[357] (Milk & Arora, 2015)
[358] (Kilteni, Bergstrom, & Slater, 2013)

experiences, and the ethical dimensions in designing for affective and relational engagement with another's life experience through embodied presence in VR.

- In criticism of Zuckerberg's Metaverse that highlights the potentially dangerous consequences of reducing and anonymising the represented self as an avatar in virtual worlds[359]; showing that reducing the possibilities to be visibly present and bodily interact in VR to a limited set of normative representations can anonymise and therefore seemingly normalise entitlement to each other's digital bodies, which in turn can enable exploitation and abuse.

The central question the enquiry addresses here is to what extent could or should a VR designer assume a level of understanding of a participant's potentialities to feel embodied presence in VR experiences, and how this may inform the translation of life experience to invite the participant to embody phenomenal and affective qualities of it in VR?

The question of improving accessibility to VR through advancements in hardware and design considerations is being continually addressed[360]. This enquiry does not challenge these valuable instrumental advancements in VR accessibility. Rather, it contributes to knowledge through design methods that translate life experience into VR experiences that problematise and invite critique on a sense of embodiment for the designer and wider participants in engagement with the works. The design methods employed within the collaborative VR design research enquiry (such as the use of procedural generation and the Implied Player[361]) were chosen for their capacities to challenge how a sense of embodied presence in VR may facilitate the translation of collaborator's life experiences; to enable myself as practice-based researcher to adopt a reflexive stance towards the sense of embodiment I was designing through and for, and where my expectations for a sense of embodiment in VR may be challenged by those of my collaborators. This in turn facilitated active, critical and creative exploration of embodied qualities another's life experience, resulting in VR works that continue to catalyse critical reflection on the variable senses of embodiment they offer within the context of my collaborator's life experiences.

Every VR experiential narrative designer will hold implicit assumptions of what it feels like to be bodily present in VR through their own experiences of engaging in VR works. They will also have their own unconscious expectations of what it feels like to be embodied with their own bodies[362]. It could be argued that these assumptions will inform design approaches to embodied presence in VR design, such as point of view, body or head height and degrees of freedom of movement. This in itself is not necessarily problematic, as in order to relate with another in the translation of life experiences into VR works, it is helpful to be critically aware

[359] (Bates, 2025)

[360] For example, see The University of South Carolina's Virtual Environment Accessibility Guidelines: UoSC. (2025, August 21). Virtual Environments Accessibility Guidelines. Retrieved from University of South Carolina: https://sc.edu/about/offices_and_divisions/cte/teaching_resources/virtual_environments/ve_accessibility_guidelines/

[361] (Aarseth, 2007)

[362] The notion of an implicit understanding of the body, its positionality and capabilities for movement has been explored from a variety of perspectives, such as Merleau-Ponty's notion of habituation to the phenomenal self (Merleau-Ponty, 2018), or Damasio's concept of neural body-mapping (Damasio, 2000).

of these underlying foundational assumptions in order to critically recognise the other as a separate person with their own agency[363]. However, ethical problems arise when VR experiential narrative works may uncritically assume that some sense of a participant's embodiment may be authentically transposed into that of another (such as the satirical reduction of another's experience that was explored in Shaftel's 'Extravaganza'[364]), or if the question of the limitations of embodiment and accessibility towards another's experience in VR experiential narrative design is not critically addressed at all.

The practice within this research enquiry extends considerations towards accessibility in the translation of another's experience in VR through collaborative design methods that actively challenge developing senses of embodiment in the design of and engagement with VR experiential narrative works. Through the methods employed in this practice-based enquiry that explore how embodied presence can be established and then challenged, I argue that both VR designers and participants are invited to become more critically aware of how they are enabled to access VR works, and how this mode of accessibility is critically related to the embodied experience of the other that is being translated in the works. This is demonstrated in several places across the works developed within this enquiry, such as how agency to explore and interact is progressively challenged in *'Life is Beautiful. Always.'* to translate Schreur's variable capacity to feel present in his life experience, or where the procedurally generated embodied responsive components in *'Be That Ocean'* continually problematise a sense of embodied presence, encouraging ongoing affective relationalities between the participant and phenomenal aspects of the Maszczak's life experiences that are being translated through them.

From a VR design perspective, the embodied interactions experimented with in across this practice-based enquiry facilitated an ongoing critical relationship with accessibility through VR design. They enabled me to creatively explore how different combinations of design strategies encouraged varying senses of embodiment, and to critically reflect on their embodied impact and relevance within the context of translating my collaborator's life experiences. Combining procedural generation design strategies with the Implied Player[365] method allowed me to step outside of the role of designer to critically consider the affective capacity of the senses of embodiment the developing works encouraged, and where this catalysed the creative and technical development of the collaborative practice-based research. These combined methods encouraged a continual critique of how I was enabled to access the work, where these methods of access could elicit embodied, affective response, and how this advanced my developing understanding of how Schreur and Maszczak's life experiences could be translated in VR. For example, where experimentation with procedural generation developed understanding of how Schreur's description of a TIA could be translated into dynamic environmental and responsive VR components that encourage and challenge senses of embodied presence in VR.

For the VR works themselves, it is through their methods towards non-linear experiential structure, and where parts of their generation are contingent on active, embodied modes of

[363] (Wilk, 2018)
[364] (Shaftel, 2017)
[365] (Aarseth, 2007)

interaction and responsivity that problematises a normative sense of accessibility and catalyses affective and critical relationality with the embodied experience of the other being translated. The most notable example of this within the practice of this research enquiry are the modular, generative processes that build the successive environments that translate aspects of Maszczak's journey to Magadan in *'Be That Oean'*; where responsive and procedurally generated environments encourage complex and varied notions of embodiment across a multi-layered and non-linear experiential structure. The narrative constructs that this work encourages are not linear or pre-plotted, but are rather generated through the relational senses of affective embodiment that the work encourages to form through the transforming ways it offers the participant embodied access to the work.

I do not suggest that this enquiry provides a set of practical methods to design and challenge notions of accessibility in VR that are relevant or appropriate to all VR experiential design contexts. As this enquiry has shown, each developing relationship with another's life experience in VR design is singular and comes with its own ethical requirements to earnestly undertake its translation into a VR work. This undertaking may reveal a variety of components of embodied experience that require different ways to creatively explore and critically examine practical notions of accessibility in engagement with VR. A designer must also consider the technical limitations of the VR platform itself to elicit a sense of embodiment, much like Sharir noted in his paradoxical sense of embodiment and disembodiment as a full sense of the body could not be fully carried over into VR[366]. These will limit what phenomenal qualities of another's experience can or should technically be explored in the design of VR experiential narrative works. I was sensitive to these limitations throughout the collaborative enquiry, choosing to focus initially on audiovisual phenomenal components of Schreur and Maszczak's experiences that could be translated through the spatial environmental and audio qualities of VR, before collaboratively developing from them to consider their affective and narrative potential. For example, the progressively reducing colours and environmental landscape features Maszczak described in relation to her journey towards Siberia that feature in the 'Transport Wagon' section of *'Be That Ocean'*, which progressed to signify the move to a dark and desolate unknown that Maszczak felt at this stage of her journey. By employing self-critical methodologies that challenge felt notions of embodiment in the design of VR works within these limitations (such as Sullivan's reflexive art-practice strategies[367], and where the 'Implied Player'[368] was employed in this enquiry), designers may be encouraged to examine where underlying assumptions about accessibility of VR works inform how they translate another's experience through VR design and where the potentialities for affective, embodied relationalities lie.

The endeavour within this enquiry was not to replicate Schreur or Maszczak's experiences, but rather to explore the potentialities and limitations of VR design to elicit senses of embodied presence that encourage critical, relational and affective access to their life experiences. From this, the resulting works stand as an open invitation to question how VR experiential narratives

[366] (Moser & Macleod, 1996)
[367] (Sullivan, 2005)
[368] (Aarseth, 2007)

enable access to embodied translations of another's experience, what the technological limitations of these modes of embodied access are, and how they advance understanding of another's experience in VR experiential narrative contexts. The works developed within this enquiry demonstrate various methods through which a sense of presence can be encouraged and challenged through VR design. Through this, they test the technical limitations of VR to enable and disrupt access to the work and how this may open critical reflection on how senses of embodied presence enable evolving affective relationalities with phenomenal qualities of my collaborator's life experiences. This advances understanding of the technical capacities of VR to enable subjective access to another's experiences in VR experiential narrative works; contributing insight towards the narrative potential of a sense of embodied presence in VR and where this may be generative of subjectively-constructed, non-linear and affectively felt narrative constructs.

Summary Table of Findings Across Collaborative VR Design Projects

Following the above discussion of findings obtained across the practice-based enquiry, the below table presents a comparative summary of research findings concerning the aesthetic and interactive components of designing for presence in VR across the works developed during this enquiry. The table summarises how developing design strategies advanced practice-based approaches to translating life experience into VR experiential narrative works, and how collaborative research methods were differently employed across each research project to maintain effective and ethical practice and progress the practice-based enquiry in each research context.

	Life is Beautiful. Always.	I Look For Them	Be That Ocean
Design Aesthetics: Environment Design	1. **Low poly, fragmented 3D models with low resolution textures:** *Results* - Designed to problematise the potentially habituating effect of engaging with virtual environments with qualities that resemble actual spaces. - Invites subjective interpretation of significance of environmental features. 2. **The work contains environmental narrative features that suggest a process of design experimentation in VR:** *Results* - Invites further ambiguity in the interpretation of significance of virtual environments, resists their reading as representations of actual spaces. 3. **Incorporation of comparatively realistic photogrammetry models within overall low poly 3D design:**	1. **Environments contain representative environmental features drawn directly from qualities identified through interview with Maszczak.** *Results* - Enhanced capacity to collaborate with Maszczak as she creatively contributed to the development of the environments through details that she recognised. - Served as an effective collaborative research strategy to explore finer details of Maszczak's experiences and develop an understanding of their affective significance. 2. **The central space contains overlapping environmental design elements from across all stages in the work, and is structured to resemble the layout of the block of flats Ivanna lived in.** *Results*	1. **Application of fragmented 3D design aesthetics developed in *'Life is Beautiful. Always.'* with enhanced use of procedurally generated and moving light sources.** *Results* - Further fragmenting environmental features, revealing and occluding depth, disrupting perceptual fidelity to challenge spatial anchoring and bring focus onto presence in virtual space. 2. **Development in the design of environmental qualities that were first identified and explored through creative collaboration with Maszczak in *'I Look For Them'*.** *Results* - Emphasis is placed on more abstracted and less figurative environmental qualities, such as colour and light.

	Results - Builds juxtaposition and incongruency in design aesthetic, interrupts interpretation of space with fragmented representation of actual spaces. - Suggests qualities of Schreur's life without being didactic in their narrative significance.	- Develops potentialities for inviting ambiguous interpretation of environmental narrative components through incongruency in 3D environment design. - Encourages an interpretive link between 360° video and 3D rendered components in the work. Suggests an unreality of 3D in comparison to 360° video, challenges the mode of interpretation as the participant enters 3D exploratory sections of the work.	- Moves away from the representative function of environments and further invites their ambiguous and affective interpretation.
Design Aesthetics: Spatial Sound	1. **Use of contrasts in spatial audio to generate differing senses of spatial depth and challenge senses of embodied presence.** *Results* - Spatial audio components placed inside the headset point of view created a sense of enclosed space, causing a refocusing on embodied positionality and translating Schreur's diminished relationship to his environment during the onset of a TIA. - Disrupts sense of embodied spatiality and challenges presence in virtual space. 2. **Use of moving and subtly repetitive spatial audio components to generate a modulating sense of spatial depth and underlying rhythmic quality.** *Results* - Imbues environments with a sense of moving life and offers opportunities for transforming	1. **Incorporating contrasts in sound quality and spatial dynamics generated by sound, such as the sudden overwhelming interruption of the scraping of iron bolts as the participant enters 'The Sea of Okhotsk' section.** *Results* - This disrupts embodied relationalities to virtual space and brings experiential focus back onto a sense of presence. 2. **Use of clips from interview with Maszczak throughout the work as sparse audio narration.** *Results* - Clips are chosen to suggest something of the affective significance of the environments for Maszczak. Adds an affective dimension to support interpretation of representative features of the work.	1. **Development of moving and modulating spatial audio components within *'Life is Beautiful. Always.'* and *'I Look For Them'*.** *Results* - Sound across the environments develop a much greater range of senses of spatial depth. - This builds on the capacities for spatial sound to challenge a sense of presence through spatial anchoring and imbues environments with a transforming affective quality, such as the enclosed, claustrophobic sensation in the 'Interrogation' section, or the towering and dwarfing wave sounds in 'Sea of Okhotsk'. 2. **Development of use of repetitive audio components, such as the thumping train track/heartbeat component in the 'Train Wagon' environment, or the**

	rhythmic and embodied senses of experiential flow within the work. **3. Incorporation of clips of Schreur's voice can be found throughout the work.** *Results* - Offers fragmented and ambiguous opportunities to interpret the significance of environmental features. **4. Use of overlapping clips of Schreur's voice in stage three of the work.** *Results* - Contrasts with previous use of Schreur's voice, which can no longer be made out with clarity. Disrupts interpretative reading of Schreur's voice and translates him diminished capacity to interpret speech during a TIA.	**3. The environments within final section of the work, 'Magadan', is built almost exclusively with layered spatial audio components.** *Results* - This begins to demonstrate the evocative potentialities of spatial sound to suggest ambiguous activity, senses of space, affective qualities and to develop experiential contrasts. - Technical development of this section *of 'I Look For Them'* was brought forward for further creative experimentation in *'Be That Ocean'.*	**human breathing heard in 'Interrogation'.** *Results* - Develops capacities for rhythmic audio qualities to evoke embodied relationships in space. - Demonstrates the effectiveness of incorporating rhythmic qualities with greater degrees of contrast to challenge and augment senses of embodied presence. **3. Maszczak's voice features as a very distorted and subtle element within spatial audio.** *Results* - This suggests her presence in the work without directing its interpretative significance.
Types of VR Interaction/Agency/Responsivity	**1. Incorporation of gaze-based navigation to explore virtual environments.** *Results* - This was chosen as it removed the requirement to use handheld controllers, which I felt added an unnecessary barrier to exploring the potentialities for embodied presence in the work and also limited the works accessibility.	**1. Continued use of gaze-based navigation to facilitate exploration of virtual environments.** *Results* - Selective use of gazed-based navigation further demonstrate its potentialities to provide experiential contrasts and pacing throughout the work; such as the freedom to explore the central section which is suddenly withheld when the participant enters the 'Interrogation' section, and the	**1. Significant development of environmental procedural generation techniques employed in stage three of 'Life is Beautiful. Always.' in combination with embodied responsivity.** *Results* - Parameters that determine the procedural generation of environments were developed to be in-part informed by embodied

	2. **The third section of this work 'The Pit' begins to explore the potential of procedural generation as a design method.** *Results* - Challenges and critically explores capacities to elicit a sense of presence in virtual environments. - Environmental components are generated in a non-linear and unpredictable way, challenging senses of spatial depth and problematising a sense of presence in this section of the work. - This translates the continuously problematised relationship with space Schreur experienced during his TIA.	single path that emerges in the 'The Shores of Magadan' section, which forces the participant to move inexorably into the dark expanse of white snow.	interaction through the headset (such as speed of head movement and direction of point of view). - This invites continued opportunities to develop expanded embodied relationships with virtual space, which challenges and encourages continued focus on affective qualities of embodied presence as environments transform in response to embodied interaction and exploration.
Experiential Narrative Structures	1. **The participant suddenly falls through the floor in the transition between stages two and three of this work.** *Results* - This demonstrates the impact of sharply removing agency to explore, which had previously supported development of an anchored sense of presence in space, to significantly problematise and direct embodied focus onto a challenged sense of presence. - This provides an embodied experiential contrast that signals different capacities to engage with the work across the experiential structure.	1. **The work features a contrasting use of 3D modelled and 360° video components across stages of the work.** *Results* - This merging of the definitively representative medium of 360° video contrasts with and emphasises the ambiguity of what the 3D rendered environments represent and re-engages interpretation. - Moving from 360 video to a navigable 3D environment offers different possibilities to feel present in VR, inviting the participant to spatially reorient themselves through the agency to explore virtual space.	1. **This work significantly develops on experimentation into layered, generative and responsive virtual environment design methods to create non-linear experiential narrative structures.** *Results* - Unpredictable configurations of procedural generated components from across the various environments featured in the work create new embodied responsive virtual spaces. - The differing senses of layered embodied responsivity these offer continually challenge a sense of presence, whilst also creating opportunities to develop a non-linear

	2. **Contrasts in environmental aesthetics across sections of the work invite differing interpretative readings.** *Results* - The comparatively realistic design of stage one contrasts with the low poly, low resolution aesthetic in stage two. This challenges the environment's representative function, inviting different way to interpret its content and structure. 3. **The work features a cyclical narrative structure in that the participant is led from stage three of the work back to stage two, starting an endless cycle between them.** *Results* - This is intended to resist narrative closure in the work, inviting the participant to stop engaging with the work when they feel they want to. - Thie encourages a sense of embodied presence developed in engagement with the work to remain as the participant chooses to exit it, encouraging a continued active contemplative stance towards the works affective capacities in relation to Schreur's life experience.	2. **The work starts and ends with 360° footage of Maszczak writing at her desk in her home with her back to the participant.** *Results* - The use of this 360° footage at the start of the work in conjunction with Maszczak's voiceover narrative contextualises the work's themes and introduces Maszczak's presence within the ongoing sparse narration that the work features. - Returning to Maszczak at the end of the work emphasises the experiential and interpretative contrasts between the 360° and 3D sections of the work. 3. **Similarly *to 'Life is Beautiful. Always.'*, this work does not feature a definitive ending as participants are invited to stay with this 360° footage of Maszczak until they decide to remove the headset.** *Results* - This again serves to resist narrative closure and offers a moment to contemplate the affective significance of the work.	and affectively felt experiential narrative structure. 2. **The process that creates the sequential procedurally generated environments within the work also advances experimentation into incorporating experiential rhythmic components to progress VR experience.** *Results* - Transitions between environments are accompanied by a beat that steadily increases in tempo as the experiences progresses. This rises to such a rate that environments start to transition before presence can be established within them. This brings the work to a climax that leaves participants in a state of significantly challenged presence, seeking experiential anchoring and contemplating the affective significance of the work. 3. **Similarly to the previous two works, this work does not feature a definitive ending and will continue to cycle through procedurally generated environments until the participant removes the headset.** *Results* - Resists narrative closure.

			- Due to its multi-layered, procedurally generated and non-linear structure, the work may not signal a definitive exit point at all and participants may not readily recognise its cyclical nature. This is the most impactful instance of all three works to retain a problematised state of presence and an embodied affective relationality with a translation of Maszczak's life experiences as a participant chooses to stop engaging with the work.
Collaborative Research Methods	1. **This work was developed on a co-design basis with Schreur, drawing on his existing art practice as a way to communicate his lived experience and enabling him to develop new works within VR.** *Results* - Effective collaborative research activities included: 1. Exploratory art making and co-designing works using the VR drawing app 'Quill'[369] 2. Examining Schreur's existing art-practice and the conceptual significance it held for him. 3. Interviewing Schreur as he explored virtual space, using this activity to explain his approach to art and its relationship to his lived experience. 4. Critical discussion on iterations of my VR designs made in response to interview.	1. **Co-design in VR with Maszczak was not possible due to health implications that made using VR with her unfeasible. Collaborative activity consisted mainly of recorded interviews with Maszczak in which she shared phenomenal and affective aspects of her memories.** *Results* - As my understanding of her life experience grew, I developed virtual environments in response to interview that held a representative function for Maszczak to recognise and creatively contribute to. - These collaborative methods enabled creative collaboration with Maszczak in VR, which stimulated Maszczak to recall further experiential details and their affective significance. - This process deepened by understanding of the circumstance of Ivanna's memories,	This work was not made in collaboration with Maszczak, although she gave me her permission to continue to develop work in response to my collaboration work with her on *'I Look For Them'*.

[369] (Meta, 2016)

	- These collaborative research methods were an effective means to explore Schreur's life experience with him through co-creation in VR, and to relate this directly within the development of a VR work that translated these experiences.	and also revealed strategies to translate their affective quality through evolving virtual environment design aesthetics, such as the calm and contemplative atmosphere of 'The Transit Camp' section of the work contrasting with the comparably dramatic section translating the voyage across The Sea of Okhotsk. - These collaborative methods enabled Maszczak and I to develop a shared affective understanding of her memories, which provided the groundwork for further development of *'Be That Ocean'*.	
Methods to Translate Life Experience	1. **Progressive abstraction in virtual environment design and aesthetics** Results - Translates Schreur's variable perceptual and cognitive capacity, for example the move from simply modelled and recognisable features in stage two of the work moving to more highly abstract and dynamic components in stage three. 2. **Modifying agency to navigate and explore the work to progressively problematise a sense of embodied presence.** *Results* - Translates where Schreur's capacities to feel present can be significantly contested in his life.	1. **Collaborative translation of virtual environments contained a representative quality that Maszczak could recognise and creatively contribute to.** *Results* - Collaboratively engaging with these environments developed understanding of the affective significance of Maszczak's experiences, which began to emerge in aesthetic and dynamic qualities of the work. - This set the research foundation for further practice-based experimentation into the translation of affective qualities of Maszczak's experiences in *'Be That Ocean'*. 2. **Begins to demonstrate where affective qualities of Maszczak's memories can be identified and translated into aspects of virtual environment designs.**	1. **Evolving procedural and embodied responsive components of the work are generative of affective relationalities that translate the complex affective relationships Maszczak and I collaboratively developed in relationship with her memories.** *Results* - Demonstrates new insight into where procedural generation design strategies combine with techniques for embodied responsivity to encourage complex and evolving affective relationalities with translations of Maszczak's experiences. 2. **Embodied responsive components translate affective qualities of Maszczak's experiences, such as the sense of uncertain sense of time, space**

	3. **Non-linear procedural generation and overlapping spatial visual and audio VR dynamics challenge embodied relationships to virtual space.** *Results* - Translates where physical and affective aspects of Schreur's experience of a TIA disrupted his sense of presence	*Results* - Translates relationships between representative and affective qualities of Maszczak's memories, such as the move onto 'The Shores of Magadan' signifying as a step into a vast, dark unknown, or our collaborative exploration of Maszczak's experiences at transit camps revealing contemplative and highly poignant memories of the profound connections she made with other prisoners.	**and position generated during the responsive environmental components of 'The Interrogation' section, and the play of refracted light across reflective 3D forms that emerge in response to headset position translated the sense of being engulfed by the beauty Maszczak saw in the Sea of Okhotsk during a violent storm.** *Results* - Demonstrates the potentialities to translate affective qualities of life experience through emergent embodied relationalities with responsive virtual environments. 3. **Transforming senses of embodied presence in this work are generative of evolving affective qualities that construct a non-linear and embodied experiential structure.** *Results* - Demonstrates where active, interpretive links with VR through embodied interaction, responsivity and abstraction in VR design can encourage evolving senses of embodied presence which are generative of experiential narrative structures. - This outlines where design methods for presence in VR can invite creative apprehension of a sense of narrative

			that is primarily embodied before it is rationally comprehended.

Exhibiting VR Works

During this enquiry I exhibited the VR works across several public exhibition contexts. This started to demonstrate the impact they have as VR experiential narratives to a broad range of audiences.

'Life is Beautiful. Always.' was invited to be exhibited at several events, including:

4. A 2018 exhibition at The Grace Gallery, Sheffield, hosted by Access Space[370].
5. *2018 Cambridge Festival of Ideas,* Anglia Ruskin University
6. *2018 Advances in Medical Education Conference,* Leeds Institute of Medical Education
7. *2nd Blue Cube International Art Festival,* Hangzhou, China
8. *2019 London Art Biennale*

Through discussing the experience of engaging with the work with visitors to these exhibitions, I started to get a sense of the ways it challenged visitor's senses of presence and, through that, encouraged reflexive consideration towards their own perceptual and cognitive faculties in relation with how the work translated Schreur's. I saw where this encouraged a more inclusive understanding on mental illness from within the context of Schreur's life experiences, stimulating discussion on the value of neurodiverse perspectives.

'Life is Beautiful. Always.' was exhibited as part of the *'Advances in Medical Education'* conference at The Leeds Institute of Medical Education. This was to invite a personal perspective on the experience of vascular dementia and to discuss its potential to elicit an empathic connection between medical professionals and patients. This exhibition began to demonstrate the impact of the work as an intervention that challenges epistemological frameworks concerning the experience of mental illness. It showed the works potential to generate a more holistic understanding of the life experience of patients that medical professionals treat and care for. This exhibition also demonstrated the potential wider research contribution that the methods and works generated by this enquiry can offer within a healthcare research context.

'I Look For Them' and *'Be That Ocean'* were exhibited together as part of a digital installation called *'A Thousand Voices'.* The name for this installation refers to Maszczak's narration in *'I Look For Them'*, where she explains the relationship the work has to the similar experiences that other prisoners endured; 'it is not just my story, it is the story of the thousands and thousands that were with me'.

The installation was first invited to be exhibited in September 2022 at Arrupe Hall, Mayfair by a Ukrainian church community that Maszczak is part of. Understandably, the war in Ukraine overtook the context and focus of this exhibition, particularly for members of the Ukrainian community that had invited me to exhibit the work. As such, discussion centred mainly around the wider world context that the work relates to and what those affected by the war were experiencing at the time of exhibition. I felt it was not appropriate to ask questions relating directly to this enquiry within this urgent and traumatic world context. However, through these

[370] AccessSpace. (2024, July 18). Access Space. Retrieved from Access Space: https://access-space.org/

discussions, I got an impression of the work's capacity to invite affective connection with Maszczak's personal experiences and its personal and intimate significance within the current context of the war in Ukraine.

Chapter Seven: Conclusion

This enquiry demonstrated how strategies to design for presence in VR can translate specific phenomenal and affective qualities of life experience into experiential narrative works. It showed how designing for presence in VR can encourage embodied and affective relationalities with translations of another's experience, inviting an embodied knowledge of another's experience that is unique to active engagement with VR. This expands practical understanding of VR in experiential narrative design, contributing to contemporary debates on the creative potentialities and ethical limitations of VR in experiential narratives, such as those raised by Milk's VR as 'ultimate empathy machine'[371] and surrounding critique[372].

By working collaboratively with Schreur and Maszczak, I developed practical understanding of how VR design strategies can be employed to investigate complex formulations of presence in practice. Designing for presence from the perspectives of their life experiences challenged my practical understanding of presence, creating a broader scope that enhanced investigation into presence design. This added a valuable dimension to my practice-based enquiry into presence in VR. It provided a real-world context that enabled me to consider presence on a wider scale than solely within the technical capacities of VR or my own singular understanding of presence. I explored where generative design methods[373] and abstraction in VR design complicates and brings critical focus onto presence as it actively manifests in the act of collaboratively making and engaging in VR works. By employing reflexive design methods (such as Sanders and Stappers' 'co-design'[374], Villari's 'Action Design'[375], and Aarseth's 'implied player'[376]), I explored appropriate collaborative VR design strategies that actively and creatively included Schreur and Maszczak in the translation of their life experiences. I examined where methods to design for presence enabled us to develop a shared understanding of phenomenal and affective qualities of their life experiences. Through this, I gained critical insight into the active, embodied and emergent capacities of presence in VR and where these can translate phenomenal and affective qualities of my collaborator's life experiences into experiential narrative works.

Working collaboratively in this way was critical in developing my understanding of where presence in VR encourages active, subjective and affective relationships with experiential narratives. It challenged me to undertake detailed critical examination of how I could relate to and understand Schreur's and Maszczak's life experiences through translating them in VR design. I developed practical understanding of where designing for presence in VR can translate the shared embodied and affective relationships with Schreur and Maszczak's experiences that we developed through collaboration. I created VR works that show how designing for embodied interaction and responsivity develops expanded senses of embodied presence in VR, and where this facilitates a relational engagement with translations of

[371] (Milk, 2015)
[372] (Wilk, 2018)
[373] (Short & Adams, 2017)
[374] (Sanders & Stappers, 2008)
[375] (Villari, 2014)
[376] (Aarseth, 2007)

another's experience that is generative of non-linear and subjectively constructed experiential narratives. This demonstrates where active engagement with VR can facilitate a particular embodied knowledge of another's experience. It contributes insight into the nuances of VR as an experiential narrative platform; demonstrating the capacities of presence in VR to facilitate embodied engagement with translations of another's experience in a way that is unique to VR.

Collaborating with Schreur and Maszczak was a personally transformative experience for me and has left a lasting and deeply valuable impact on my life. Their trust in me to translate their life experiences has been crucial to the richness of this enquiry and the multiplicity of perspectives on presence that it offers. This demonstrates Schreur and Maszczak's insightfulness and personal character, which are core to the ways that I was able to progress through this practice-based enquiry. Both Schreur and Maszczak have experienced significantly difficult circumstances in their lives. It is their remarkable, and sometimes traumatic, life experience that provided the basis for our collaboration. However, they both made it clear at the beginning of collaboration that our work should not focus on the traumatic nature of their experiences. Their life experiences have value. They recognised that this value was greater than the difficulties they had endured, and together we discovered how to translate this through our collaborative work on presence in VR. Schreur and Maszczak offer unique perspectives on what it means to be present in life and in VR; their experiences challenge and enrich understanding of what it means to perceive, understand, remember, and relate with another. Our work together presents an invitation to develop an embodied understanding of presence as an open-ended and fundamentally relational quality of VR experience; a quality that opens up the possibility for genuine affective connection with another and to appreciate value in a multiplicity of diverse experiences.

I am very grateful to Marcel Schreur and Ivanna Maszczak for their contribution to this PhD enquiry.

Further Work

The experience of undertaking this research enquiry, and the findings that it has yielded, have outlined several further opportunities for research that may build on the contributions to knowledge it offers and expand the enquiry's impact into broader research disciplines. These include expanding the critical analysis of presence whilst engaging with VR in broader research and public engagement contexts, conducting further experimentation into the embodied potentialities for presence with immersive technologies as technological advancements emerge, and applying the collaborative research and design methods used within this enquiry in broader collaborative research contexts.

Further Analysis of Exhibition and Research Engagement with VR Experiential Narratives

As the enquiry's focus was on findings obtained from within collaborative practice-based research, it was important that methods to undertake critical analysis into presence in active engagement with VR were framed within the collaborative research context. As such, it was not necessary to take a detailed, systematic approach to examine participant engagement with the works during exhibition of the works. This outlines opportunities for further enquiry into the work's wider potential affective impact across further exhibition, research and public

engagement settings. Applying the 'implied player' [377] method in broader participant engagement research contexts would widen the scope of research to consider how the works may be engaged with across a more diverse range of perspectives; enhancing understanding of the diverse ways that presence can manifest through wider critical examination of embodied engagements with VR works, and where this may yield further insight into how audiences may be encouraged to affectively engage with VR experiential narratives. I would like to expand understanding of how the VR works enable affective engagements with translations of collaborator's life experiences by taking a formal approach to recording and analysing participant embodied engagement and subjective responses to the works; observing where aspects of the work direct attention and hold engagement, formally analysing usability and accessibility of the works, examining where embodied access is challenged through design, and where relational affective and narrative themes may emerge through post-experience analysis of participant interpretation. This research would develop insight into the effectiveness of the design methods employed in their production in terms of widening accessibility and inclusion across broader audiences; developing understanding of the relational, embodied limitations and potential of the VR design strategies employed in the development of the works and where these may be expanded upon to engage with wider and more diverse audiences. This would develop the insight this enquiry offers into the unique capacities of VR as an experiential narrative platform in broader exhibition, academic research and participant engagement contexts.

This analysis could also deepen understanding of the broader impact that this enquiry offers in wider research contexts that were identified through the work's exhibition. Examples of where this potential broader impact was identified include where *'Life is Beautiful. Always.'* was presented at The Leeds Institute of Medical Education, in which medical researchers were interested to explore the capacities of the work to present a personal, lived perspective on the experience of vascular dementia and its potential to elicit an empathic connection between medical professionals and patients. Application of the 'Implied Player' [378] and post-experience analysis methods with researchers and participants in this context would broaden the scope of the research further; enhancing understanding of where the VR experiential narrative design methods developed can challenge epistemological frameworks of the experience of mental illness and develop sensitivity to the lived experience of the patients that medical professionals and students care for.

Another potential avenue for analysis of the works in wider contexts emerged from the invitation to exhibit *'I Look For Them'* and *'Be That Ocean'* with Ukrainian communities who were affected by the work's narrative themes in the context of the ongoing war in Ukraine. Conducting analysis of the impact of the work in this context would create further opportunities to challenge the ethics of approaching translation of life experience within communities that the work's themes hold acute and personal significance. Undertaking VR experience analysis collaboratively within these communities would provide opportunities for me to broaden understanding of the affective impact of the work, to challenge and enhance

[377] (Aarseth, 2007)
[378] (Aarseth, 2007)

my creative decision making to represent Maszczak's life experiences, and to consider how the work may relate to a broader range of personal lived experiences. This research would give me broader opportunities to challenge and develop my ethical practice when working collaboratively with the lived experience of research participants. It would also enrich my understanding of the design methods I developed in production of the works and the impact and appropriateness of their application in further VR experiential narrative design projects.

Further Design Experimentation into the Technical Capacities for Embodied Presence

The technical capacities to design for senses of embodied presence this enquiry revealed could be further developed by creatively exploring ongoing advancements in VR hardware (such as eye-tracking technologies or 'pass-through'[379] VR headsets that integrate real-time hand motion capture) and other wearable technologies (such as real-time wearable biometric sensors). This further research would enable investigation into where additional aspects of embodied experience in VR can be examined with broader technologies, and where engagement with these technologies expand the findings of this enquiry concerning embodied responsivity and affective relationalities with immersive experiences. Creatively exploring the expanded motion capture capabilities of new VR hardware will open up additional avenues to experiment with and challenge notions of agency, embodiment and accessibility in the design of VR experiences. Analysing real-time biometric data during participant engagement with VR experiences may also yield further insight into the works affective impact and identify aspects of the work that can be critically examined in post-experience analysis of participant interpretation.

This enquiry also opens up further opportunities to critically examine where implementing wider embodied metrics (such as real-time biometric data) may be combined with practice-based methods to explore procedurally generated and responsive components of VR experiences. I would like to experiment with where this may yield further potentialities for active, embodied relationalities with VR experiences; where real-time biometric data are made experientially manifest to be interacted with, and the potentialities of this to set up bidirectional feedback loops that encourage further expanded embodied, affective relationalities within VR experiences. This would open up further opportunities for practice-based research to consider how wider physiological or biometrics based manifestations of embodied presence in VR and other immersive technologies can be creatively explored; considering further how the body can be technologically mediated and represented in immersive contexts and how this enhances or augments affective engagements with the body. This research would also complement research opportunities to consider accessibility in immersive spaces through the ways it enables critical and creative exploration into alternative ways to represent the body and where biometric responsive components of immersive experiences may enable interaction with and through the body in real-time. The application of the design strategies developed within practice-based research enquiry across wider technologies and embodied data capture methods would also expand the potential to explore

[379] XRToday. (2024, November 29). What is VR Passthrough and How is it Shaping the Future of XR? Retrieved from XR Today: https://www.xrtoday.com/virtual-reality/what-is-vr-passthrough-and-how-is-it-shaping-the-future-of-xr/

the potentialities for embodied and affective impact in broader extended reality (XR) design contexts, such as live performance with motion capture, real-time rendered projection installations and virtual production technologies, and other technologies that enable real-time embodied audience interaction (such as 3D volumetric data capture).

Further Investigation into Collaborative Research Methods

Findings from the collaborative context of this enquiry also suggest further research into how the collaborative methods developed within this enquiry could be extended across multiple research subjects. Research in this direction have already been undertaken, such as Lindsay Seers' *'Care(less)'* VR project[380], which draws on the testimony of several research subjects on their experience of end of life support from the UK healthcare system, and XR studio, Anagram's[381], VR work, *'Impulse: Playing with Reality'*[382], that draws on numerous interviews to explore the experience of Attention Deficit Disorder[383]. The collaborative practice-based methods developed within this enquiry could extend these approaches by exploring how layered, procedural generation design methods afford juxtaposition and experiential overlaying of multiple research participant perspectives. This may reveal new ways to experiment with formulations of embodied presence through compound translations of life experiences across a wider multiplicity of perspectives. Working across multiple experiential perspectives further challenges notions of authorship as the generative work builds across several experiential contexts and transforms through layers of embodied responsivity. The collaborative context of a project such as this would also entail further consideration towards ethical research practice, such as how participants in such research are enabled to creatively engaged in the practice-based project, how research material may be ethically obtained and utilised in combination with material from other research participants, and how research participants may retain anonymity where appropriate.

Section Summary

The further avenues for research outlined above would enable me to further test the opportunities and limitations of the enquiry's research methods within broader research contexts. They would enable me to develop and enhance my research practice; to develop my creative and technical skill as an experiential narrative designer for VR and immersive technologies, to broaden my applied understanding of appropriate immersive design strategies in wider contexts, and to continue to challenge and enrich my capabilities to ethically engage with collaborative research projects. They would also support the continued advancement of my practice in step with technological developments and contemporary research in VR and broader areas of immersive design.

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[380] Fabrica. (2019, October 9). Care(less) by Lindsay Seers. Retrieved from YouTube: https://www.youtube.com/watch?v=oRJHSQ94PZo

[381] Anagram. (2024, July 30). Anagram. Retrieved from Anagram: https://weareanagram.co.uk/

[382] Anagram. (2024, September 12). Impulse: Playing with Reality on Meta. Retrieved from Meta: https://www.meta.com/en-gb/experiences/impulse-playing-with-reality/6468391126573976/

[383] Bye, K. (2024, April 4). #1378: Anagram's Mental Health Series Continues with Preview of "Impulse" Mixed Reality Story about ADHD. Retrieved from Voices of VR: https://voicesofvr.com/1378-anagrams-mental-health-series-continues-with-preview-of-impulse-mixed-reality-story-abou-adhd/

Appendix A: Table of 'Critical Encounters' with Marcel Schreur

Critical Encounter	Research Activities	Related Research Materials
06/10/17 – VR co-creation session #1	Schreur discusses his experience of vascular dementia and art-practice. He demonstrates his approach to art making through a VR drawing app 'Quill' (Smoothstep, 2024). I demonstrate three experimental VR prototypes which Schreur comments on in relation to his lived experience.	Three experimental VR prototypes developed within the enquiry prior to meeting Schreur: *'Valéry Lights'* *'The Room Falls Away'* *'Serene Velocity VR'.* 3D models of Schreur's VR art making.
17/11/17 – Visit to Schreur's studio	Schreur creates more VR artworks in response to themes we identify together through discussion of presence. I make 3D photogrammetry assets of Schreur's painting and sculpture works and parts of his studio to take into further VR experimentation. I develop further VR prototypes in response to finding from this co-creation session.	Photogrammetry assets of Schreur's painting and sculpture work: *'Isolation'* *'Surrender'* *'Starry Night'* *'Landscape'* *'Memento Mori'* *'Nowhere to Hide'* *Abstracts* *Various smaller sculptures* Photogrammetry capture of Schreur's studio; painting table, shelves displaying sculptures, grandfather clock. Further VR prototypes: *'The Chaos Event'* *'Isolation' VR*
15/12/17 – VR co-creation session #2	Schreur comments on prototypes developed in response to our previous meeting.	*'Circle of Life'* VR artwork made by Schreur.

	I consider where a VR work created by Schreur entitled *'Circle of Life'* suggests an experiential structure for a VR work that explores and consolidates findings from across the project so far.	
27/01/18 – VR co-creation session #3	Schreur reviews the experiential structure for *'Life is Beautiful. Always.'*. He reads from a diary he kept that documents a TIA he experienced. Schreur's TIA diary suggests physical/experiential qualities that I translate into a section of the VR work 'The Pit'.	Final section of *'Life is Beautiful. Always.'* entitled 'The Pit'. First complete draft of *'Life is Beautiful. Always.'* VR work.

Appendix B: Table of 'Critical Encounters' with Ivanna Maszczak

Critical Encounter	Research Activities	Related Research Materials
28/11/18, 10/01/19, 15/03/19 – Interview sessions with Maszczak #1	Maszczak provides detail of her arrest, interrogation, transportation to Magadan and her experiences in the Gulag. She offers me a collection of letters she received from another prisoner that feature additional environmental details of Magadan. I make transcripts of these interview sessions and take detailed notes of experiential qualities that could translate into VR content.	Photogrammetry captures: Maszczak's writing desk, a bookshelf containing her archive of historical materials, sofa and coffee table, a map tracing her journey across Russia to Magadan, a diary kept during her incarceration. Scanned photographs of Maszczak at different ages, her family and friends from Magadan, landscape photographs of Magadan.
18/04/19, 18/10/19 - Interview sessions with Maszczak #2	I present VR environments produced in response to the details gathered from interview sessions. Maszczak responds by offering corrective details, further contextualising stories, and hand drawn sketches to describe the places she remembers.	Draft VR environments depicting key moments in Maszczak's journey to Magadan; a holding cell she was kept in during interrogation, transportation via train, transit camps she was held at during the journey, crossing the Sea of Okhotsk via ship, arriving at the shores of Magadan.
24/02/20 – Final VR review session with Maszczak	I present another iteration of VR environments to Maszczak. Maszczak comments 'this is real'.	First complete draft of *'I Look For Them'* VR work

Appendix C: Design Diary Notes Informing Environment Designs in *'I Look For Them'*

Investigation Room: Barred windows of the room faced one of the side streets of Kenshtyn. The sun and fields looked amazing. I wanted to get closer and look through the grille, but I couldn't and only listened intensely to the noise from the neighbouring room.

Holding Cell: We entered a vast yard that leads to the house with the wide corridors and cells on both sides… The room was approximately 5x3m, with cement floor, a bed was chained to the wall. There was a chair and a table that were also chained. In the corner of the room, I saw a 'crib' which served not only for physical needs but also for washing'.

Interrogation: They said sit in a very high chair so my legs did not touch the floor. They lit a dazzling lamp directly in my face… They repeated the same questions again and again… I saw some blurry figured, my throat squeezed, I stopped hearing voices, heard only the buzzing of mosquitos. I did not remember how it ended. I awakened in the cell. I was on the floor, laying on the hay.

Prison Cell: We could only communicate between the cells by using Morse's abbreviation. We had to be very careful, not to be caught and punished for that.

Over Time: The Investigation process was near over. The spring sun looked through the window… They handed me over to the Russians where I found myself in a dark, large, empty cell with a small, cluttered, dirty window, through which light barely squeezed in. We got to the passenger train… We had a chance to look through the window. That May was wonderful. We saw blooming gardens of white and pink flowers.

Transfer Camps: We knew that transfer camps were a short stay… Sometimes in the evenings we came out of the barracks, and then we looked at the wires, and on the shiny water belts of Volga and Samara rivers. It seemed that we were within spitting distance from water, from twinkling lights of steamers, from the freedom… We walked through the city… I remember one long street with the bigger and smaller huts on both sides, and instead of a sidewalk, there were two pavements for pedestrians.

Camp: In addition to the wooden barracks, there were two tarp tents inside the zone area, in which bunk beds were installed. One of the barracks was not completed yet, there were no windows or doors yet but they settled in there. The floor was not fitted at that stage too. During the day we tried to find pieces of boards or something to lay on the ground.

Transport Ship: The tension was interrupted by the scraping of iron bolts. The gate opened… In front of us, we could already see the shining sea and its cold sandy shores. And suddenly engines started, they pushed the ship, water hissed, people were running around, servicemen started shouting something to each other. I wake up in the morning and see that the walls become white from frost. Upon reaching the ladder, each of us had to look ahead… As for as the eye could reach, it was a whitening field of snow.

Appendix D: Bullet-Point Notes for *'Be That Ocean'* Environments

Interrogation

9. Confined, dark, claustrophobic interiors. Continually shifting and morphing.
10. Bright, sharp, artificial, light and dark contrasting shadow. Illuminate or occlude surfaces and reveal the changing space.
11. Sounds of activity; footsteps on concrete, a metal door rattles, hard objects across a hard floor, breath, coughing.
12. Confused audio layers, incredibly close or distant and muffled.
13. The sound of a mosquito very close to the ear.
14. A disruptive low droning sound, woozy and uncomfortable.

Transport Wagon

4. Sense of continual movement. Parallax effect to create extreme depth.
5. Large columns and abstract scaffolding-like forms pass rapidly by. In the middle distance are ruptured rock forms. Beyond those, large block forms can be dimly seen in the far distance.
6. A blinding light on the horizon. Light levels progressively decrease.
7. Sound emitters travel alongside close objects, an airy droning sound that generates a doppler effect as they pass.
8. Moving light and shadow on the ground accentuate movement.
9. Areas of the middle distance are accented by bright white and pink lights.
10. A semi-regular, continual beating sound. A constant rhythm.

Transit Camp

11. A wide view of space. The horizon populated with abstracted architectural or mountainous forms.
12. A reflective water surface fills the ground and extends to the horizon. Orange motes move lazily around the scene, reflected in the water. Steamer ships.
13. Zig-zagging columns obstruct the view, responsive to participant gaze. Guard towers and fences.
14. Sound of rain falling onto a hard surface. A distant creaking sound of a steamer ship.

The Sea of Okhotsk

15. A pulsing, undulating, uneven polygonal ground fills the floor to the horizon, reflecting green/blue light in the sky.
16. A hazy white light emits from above, occluded by invisible organic shapes that cast shadows around the participant.
17. Columns of sharp, fragmented, reflective polygons tower around the participant.
18. Bright white, orange, green and rose-coloured lights spawn into the scene, reflecting off the environment.
19. Sound of waves at varying depths, mixed with foreground sounds of dull, impactful thuds.

Shores of Magadan

20. A gently uneven, white surface extends to the horizon.
21. Small grey columns and rock forms punctuate the scene, creating depth.
22. A thick white fog occasionally revealing a desaturated grey/blue sky.
23. White noise dominates the scene; footsteps add depth and suggestion of activity

Appendix E: Annotated Examples from Design Diary

The following examples demonstrate some of the strategies used to document and structure notes from collaborative research encounters, ongoing reflexive commentary, and other creative ideas throughout the research enquiry.

Example #1 – Meeting Notes with Sketches

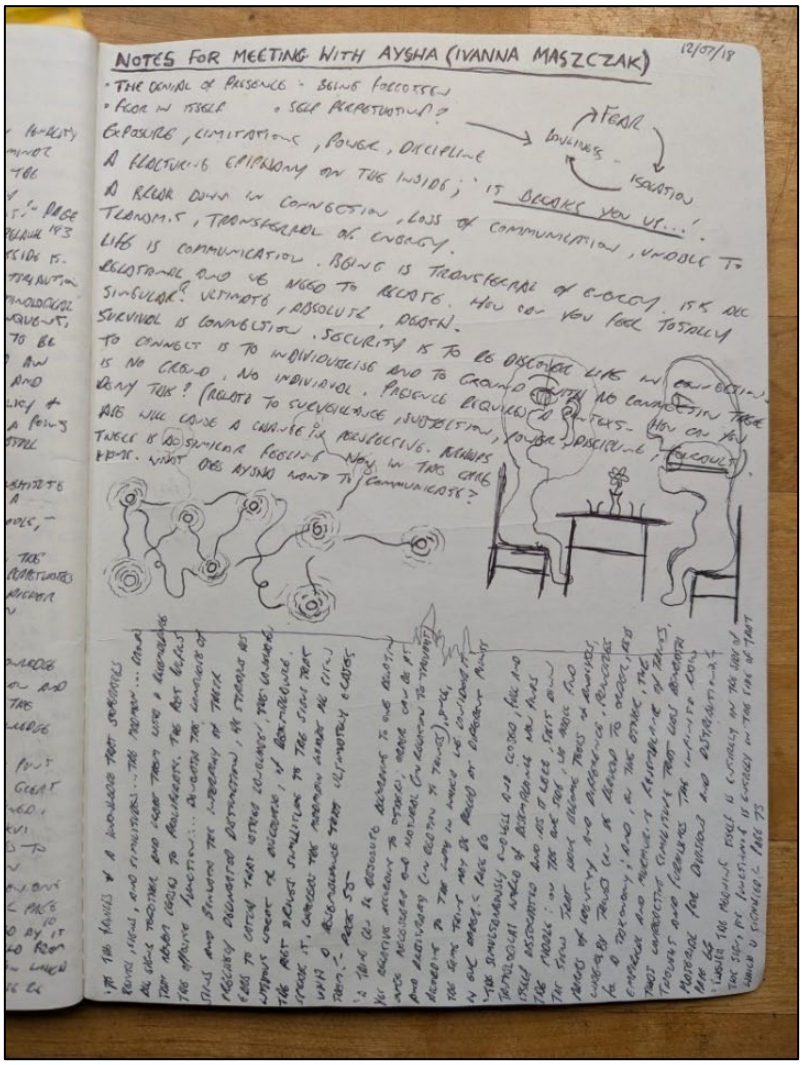

Figure 85: Design Diary Example #1

This example shows a variety of some of the common methods used to structure the design diary. The horizontal notes were taken during one of my first meetings with Maszczak, including words or short phrases Maszczak said and records of some of my conceptual impressions of them taken in the moment. For example, Maszczak's words 'it breaks you up' leading to some initial thoughts on a fractured or segmented environmental aesthetic. There are also a couple of sketches taken from some of Schreur's work, including his 'Isolation' work (Figure 32: 'Isolation', Marcel Schreur) and another of his paintings that explored a perceived difficulty to communicate with others. These were conceptual and visual references for me at this stage in the research, indicating a felt relationship between my impressions of the

conceptual significance of Schreur's work and notable moments in my first interviews with Maszczak. Specifically here is Maszczak's comment 'I can tell you everything, but I cannot tell you how I feel', which corresponded for me with Schreur's expression of isolation and inability to communicate the felt depth of his life experience in words.

The vertical notes are quotations taken from a book I was reading at the time, which at this stage was 'The Order of Things' by Michel Foucault[384]. Writing the notes vertically is a visual cue I used to distinguish my notes from the quotations. I did not take a definite methodological approach to recording book quotations and there was not always a direct relationship between what I was reading and the practice I was undertaking at the time. However, noting quotes directly alongside where I recorded the progression of collaborative research and my practice in this way sometimes helped me to visualise and understand some of the broader context through which my conceptual understanding of presence and VR design developed. In some cases, it prompted me to revisit sections from my wider reading as an aid to stimulate creative approaches to designing for presence in VR.

Example #2 – Notes From Co-Design Session with Schreur with Sketches

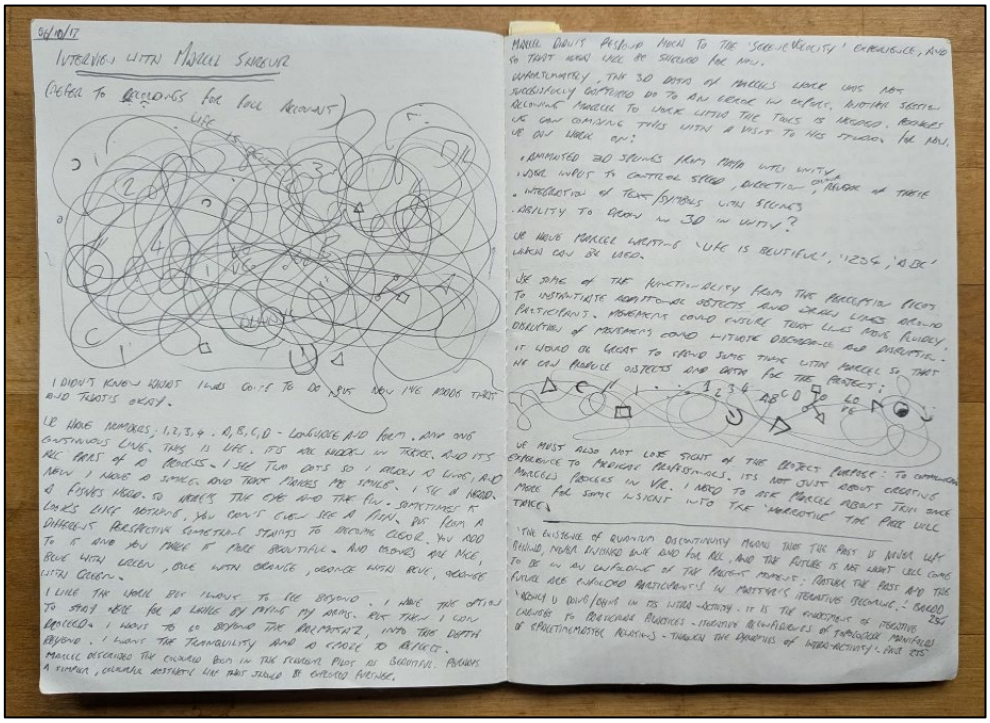

Figure 86: Design Diary Example #2

Here is another example of notes taken from a meeting with Schreur. As well as noting things Schreur said and my responses in the moment, I also sometimes made rough sketches of our experimentation with art making in VR as a way to visualise and remember some of the conceptual content of our interviews. In this instance, the sketch corresponds to Schreur's seemingly random expressive movement as he first began to explore mark making in virtual space, and where details began to emerge that he worked into and brought into more definite

[384] Foucault, M. (2001). The Order of Things: An archaeology of the human sciences. Routledge.

form. As well as a visual and memory aid, making these sketches served as another way for me to enact the dynamism of Schreur's explorative art-making in VR, which helped to catalyse initial creative experimentation into exploring the movement and abstract form of these experiments through practice-based research.

Example #3 – Concept art for 'Life is Beautiful. Always.' Narrative Structure

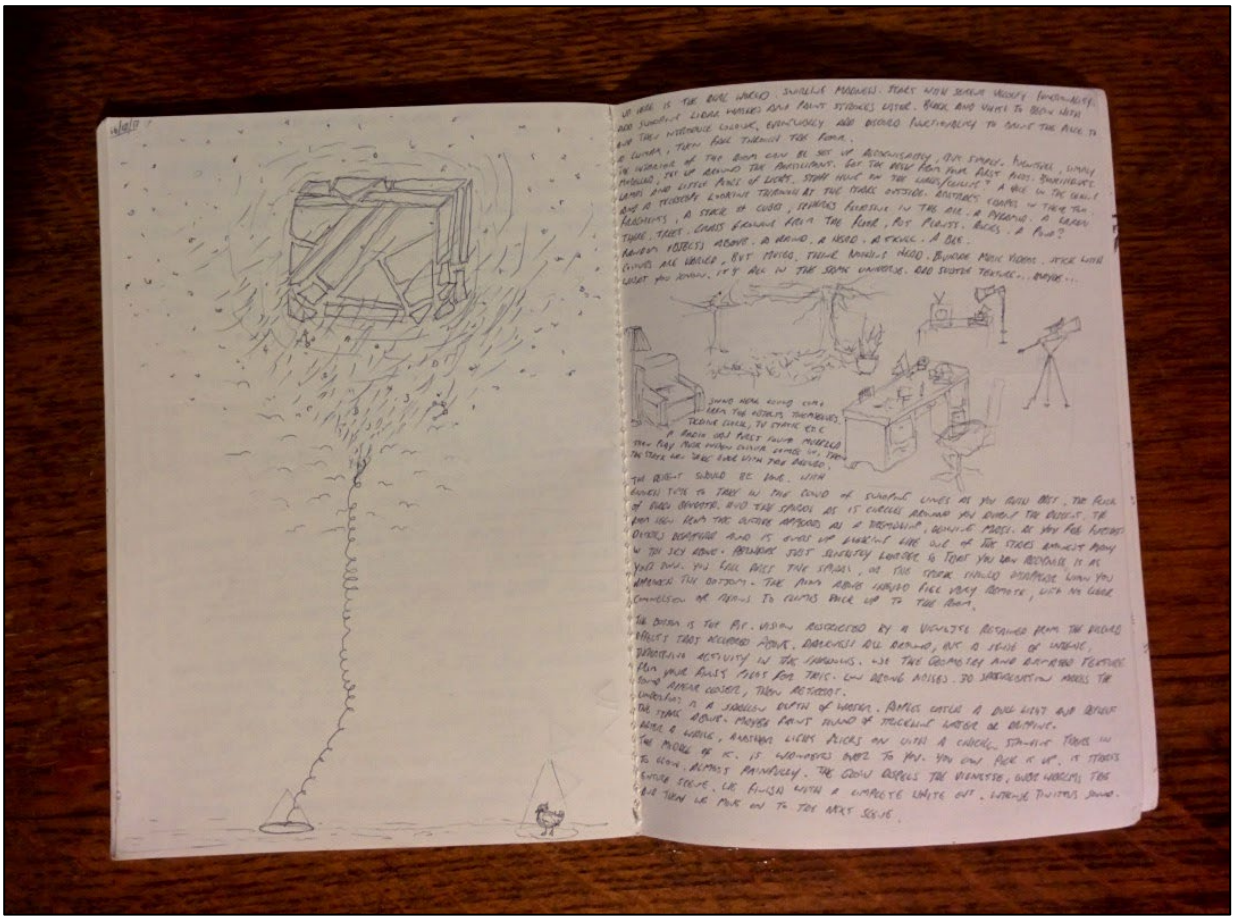

Figure 87: Design Diary Example #3

This example features some more definite concept art for the vertical, staged narrative structure of *'Life is Beautiful. Always.'* with an accompanying text that describes planned features within stages of the narrative structure of the work. It shows where more concrete aesthetic and structural decisions were made and recorded to guide the development of the design of that work. This concept leads directly on from Schreur's 'Circle of Life' VR work (Figure 37: 2D render of 'Circle of Life') that he made during a co-design session. Drawing from the vertical and cyclical structure of that artwork, I envisaged a VR experience taking place across three levels, each one translating different stages in Schreur's variable perceptual and cognitive faculties. The accompanying notes record some of my initial thoughts for environmental design features, such as the mixture of more definitely representative and abstracted forms in the middle 'Marcel World' stage; 'The interior is set up recognisably, but simply… furniture, simply modelled… with abstract shapes in there to fragment… a stack of cubes, spheres floating in the air, a pyramid…'. The notes also outline some of my initial thinking towards interactive dynamics within the work, such as notes on the design for 'The

Pit'; 'Vision restricted… darkness all around, but a sense of intense disturbing activity in the shadows… long droning noises, using 3D spatialisation to make sounds appear closer, then retreat…'.

Example #4 – Storyboarding Narrative Structure in 'I Look For Them'

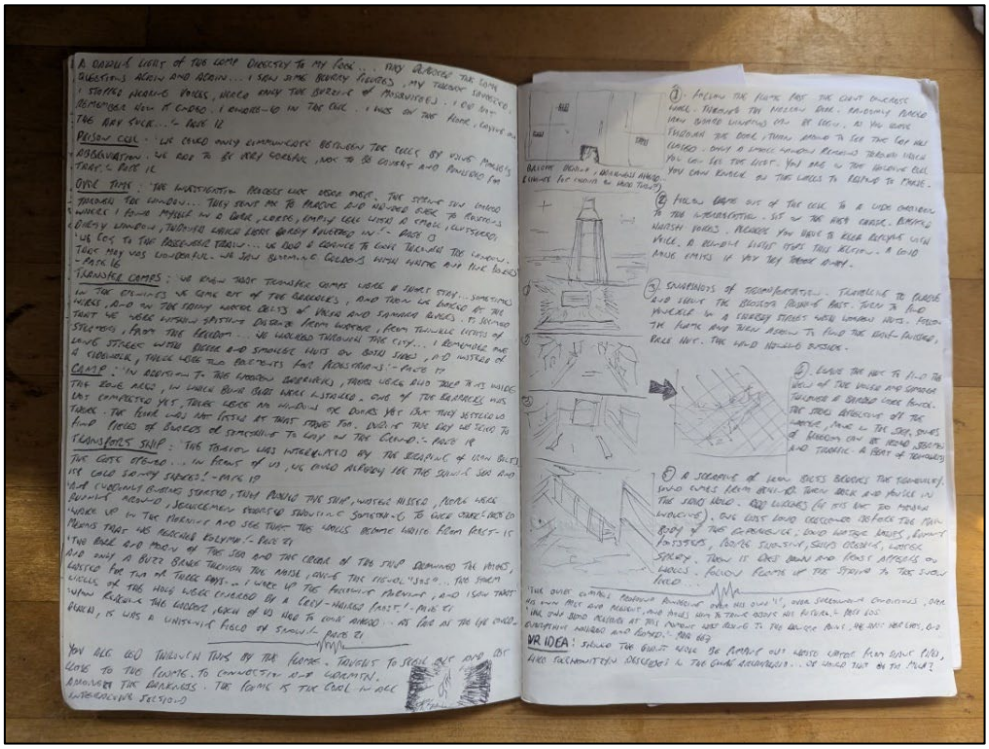

Figure 88: Design Diary Example #4

Here is another example of where more concrete experiential structure concepts were developed for *'I Look For Them'*. In this case, the notes take the form of a much more linearly structured storyboard to plot out successive stages that the participant encounters throughout this work; The main 3D hub space, 'The Interrogation', 'The Transit Wagon', 'The Transit Camp' and 'The Sea of Okhotsk'. A brief sketch for each section outlines one of the more dominant planned features of these sections, for example the high stool Maszczak was forced to sit on during her period of interrogation, or the bright colours visible through an aperture during Maszczak's transportation in a transit wagon towards Siberia. The accompanying notes expand a little on some initial ideas for environmental design features in each stage, for example in the 'Transit Camp';

> *'Leave the hut and find a view of the Volga and Samara through a barbed wire fence. The stars reflecting off the water, moving in the sky, sounds of freedom can be heard, steamers and traffic, a beat of tranquillity'.*

It is of note that in this example I took a much more 'storyboard' approach to the structural design of sections of that work, indicating a more linear and representative approach to Maszczak's description of her experiences and the phenomenal and environmental details that I chose to highlight. This is due to the representative nature of the work Maszczak desired to

see, which enabled us to more effectively creatively collaborate on the work's continued aesthetic development.

Example #5 – Handwritten Transcription of Interview with Maszczak

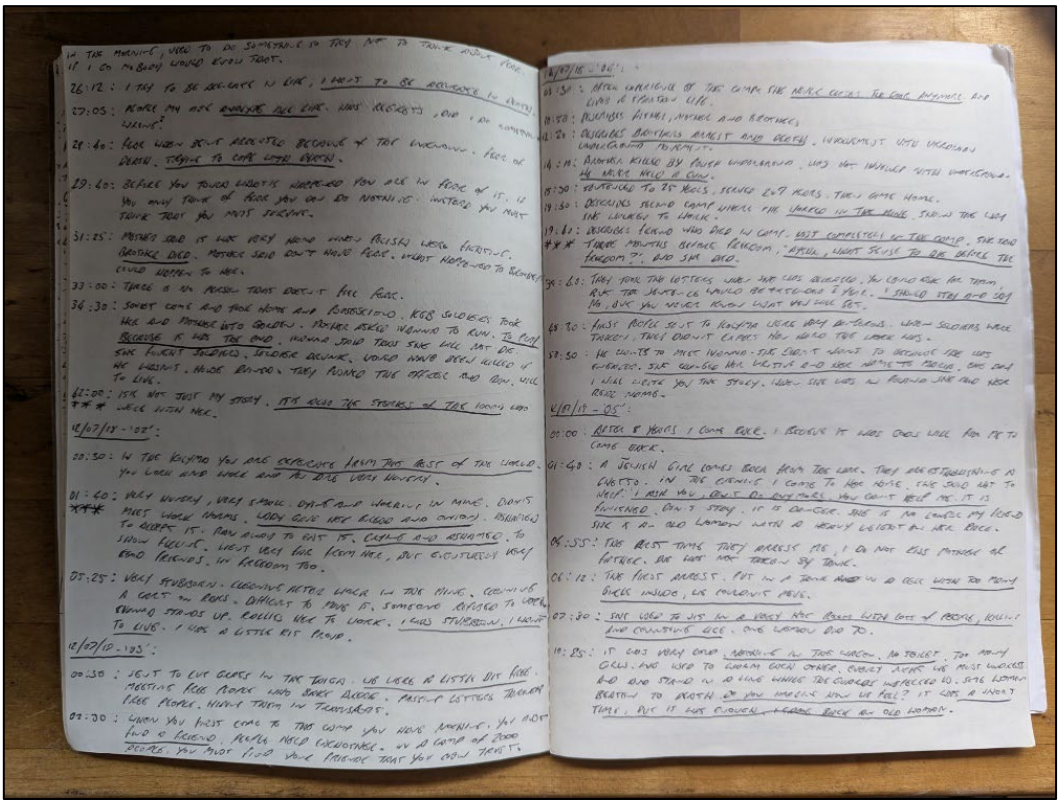

Figure 89: Design Diary Example #5

Here is an example of post-interview transcripts I made of a conversation with Maszczak. I preferred to write these by hand instead of typing or automating them as I felt that this method enabled a slowness and deliberation that brought me critically and personally closer to the subject matter. I also underlined sections that I felt were particularly poignant, or that specifically described environmental or phenomenal details of Maszczak's experiences. For example, Maszczak's words 'nothing in the wagon… do you imagine how we feel?' which I finally used as voiceover to punctuate the end of 'The Transport Wagon' section of *'I Look For Them'*.

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