Hands-off Interactive Storytelling in Cinematic Virtual Reality

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Abstract

This is a research by creative practice that aims to explore a form of hands-off interactivity in cinematic virtual reality (CVR). The proposed model for interactive storytelling is based more on intuitive reactions than on conscious decision-making, enhancing diegetic and, thus, narrative immersion. The initial hypothesis states that hands-off interactivity can allow a user to experience a diegesis in which they can avoid being "pulled-back" from the immersion, an interruption of the story produced by the consciousness of explicit interaction and extra-diegetic interfaces. To achieve this, this project uses immersion, spatial storytelling, and dramatically-motivated soundscapes to facilitate and encourage navigation through simultaneous acoustic and dramatic spaces in one immersive environment. Using this setup, the interactive storytelling takes place as users are presented with two simultaneous storylines with their respective protagonists, which happen to be interdependent, influence each other, and are part of one integral story. Users would then be able to freely navigate and alternate between the two storylines – being influenced by strategically designed visual and acoustic diegetic stimuli – and thus play an active role in getting to make sense of the narration. This way, users generate inputs with organic movements around the fixed axis in which CVR uses are placed.

This research is strongly focused on creative practice, the generation of creative outputs, and the analysis of the procedures and production workflows, to understand what are the creative and technical challenges for the proposed type of interactive storytelling. The project is also faced from an interdisciplinary approach that, while centred in a filmmaker's perspective, makes a critical integration of concepts and techniques from other relevant disciplines to approach the expressive challenges proposed by CVR as an experimental medium.

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Acknowledgements

Declaration

I declare that this thesis is a presentation of original work and I am the sole author. This work has not previously been presented for an award at this, or any other, University. All sources are acknowledged as References.

Fragments of the work in this thesis and portfolio were presented in ACM IMX 2020, in the Demo Presentation "Hands-off Interactive Storytelling; Intuitive Agency in an Immersive Cinematic Film", https://doi.org/10.6084/m9.figshare.12479222.v4

Chapter 1

Introduction

1.1   THE CONTEXT: TOWARDS POST-BROADCASTING MEDIA

Media has changed. Our relationship with media has changed; the ways we see it, we use it, and the ways media perceives *us*. From newspapers to radio and television, media consumption drastically changed after the spread of digital technologies as means of accessing content and information. While digitality has affected media production in many ways – costs, interconnectivity, speed, storage, etc. – one of the biggest changes lies in the audiences. *Consumption* now appears to be a relative term, since audiences and publics are not limited to only consume what they are fed, but have more abilities to curate, select, and customize what they consume. Moreover, they have become participants in the production of media and content, whether by being more directly involved with what they consume or by generating their own content and making it available by not-broadcasted platforms on the internet.

Participation and interactivity, enabled by digital technologies, have become one of the keys of media communication, translated into the exploration of the many different ways and degrees it can be applied to the formats we have known for years, and to the experimentation and generation of new formats, made possible by the increasing appearance of interactive and immersive technology. With Virtual Reality, the pioneer of digital immersion, we are seeing the development of Cinematic Virtual Reality (CVR), Augmented Reality (AR), and Mixed Realities (MR), all under the umbrella of what is known as Extended Realities (XR). Similarly, in many spheres of life, Interactive Media (IM) has already spread and been assumed as the normal method of consumption: Social media allows a degree of direct communication with content producers; smart TVs and similar devices facilitate the curation and personalisation of whatever we prefer to consume, individualising our own experiences and our tastes; the versatility and interconnectivity of our digital devices – what is known as *the internet of things* – provide us constant and malleable access to our preferred media. These are only a few examples of ways how the usage of digital interactivity has already been adopted in our daily lives in the western hemisphere.

Interactive technologies have existed for a decades: The first video game, SpaceWar, was developed in 1962 and it was short after that VR became a research subject for developers. In the next couple of decades, while the video games industry boomed in the 80s to then become one of the most profitable in the world. Today, the advent of digitality has facilitated

media production to evolve into interactive media and has made it the standard, well beyond the use of video games. While most of our media is now interactive, then how is that our films and television contents are not? Or at least not yet?

As a filmmaker, my interest in interactive storytelling resides in audio-visual media, particularly in how interactive and immersive technologies might continue to produce changes in our consumption of such media in our daily lives, and how they might affect the way we relate to content. Domestic entertainment formats such as television appear to be constantly changing, becoming more customizable in order to meet the consumer's needs. The age in which broadcasting media ruled our society has ended; the time when television and radio used to determine what we would consume, and would even be the references to organise our collective daily rituals so we could meet and watch certain shows, has given in to an adaptable, customizable, individualising media. This data-driven media is capable of establishing a dialogue with each user, to understand – to some extent – what our personal tastes and interests might be and to offer us more and more similar content. This relation is quintessentially interactive.

Post-broadcasting media – as it has been named by some media scholars, particularly Amanda D. Lotz (2007) – is defined by the agency gained by audiences, by a much more hands-on approach to the curation of a variety of formats and contents. Yet, the consumption itself still remains mostly *leaned-back*. For Helen Katz, "TV viewing tends to be a more passive, 'lean back' experience, in contrast to the active involvement required of the 'lean forward' computer/Internet activity." (2010:63) She warned about the likeliness of attempting to merge the two types in the years following this comments. Today we can see that in interactive television (SmartTVs, Netflix, Amazon Video, and many other On-demand platforms), once we select the content, the act of "watching the telly" remains mostly the same – sometimes complemented by side-consumption of complementing content through our mobile phones or other devices. While the content is accessible to be curated, it isn't by itself interactive. For now.

Technology has reached a point in which the exploration of interactive film and television content is possible, and imagining it in "the living room of the future" (BBC R&D, 2018) seems feasible, if not immediately, in the short term. The fast development of immersive and haptic technology and its application into television devices might accelerate the leap into the next stage of interactive media in the following years. In the eventuality of this scenario, we practitioners have the possibility to explore and experiment with these technologies, in order to understand their potentially expressive means.

1.2   INTERACTIVE CINEMATIC VIRTUAL REALITY AND PRACTICE-BASED RESEARCH

This project is framed within this landscape, in the ongoing revolution of digital media and driven by the notion of interactivity. More specifically, it starts from the broad question of how to make cinematic stories interactive and allow the user to participate in it, and therefore, it is naturally placed in the field of interactive digital storytelling. Within this vast and diverse terrain, cinematic virtual reality (CVR) appears as a relatively unexplored and underdeveloped medium, and, in consequence, it presents a number of expressive and narrative challenges. According to Mateer:

> "(W)hile a formal definition of CVR is still being developed, the emerging consensus is that the term refers to a type of immersive VR experience where individual users can look around synthetic worlds in 360 , often with stereoscopic views, and hear spatialised audio specifically designed to reinforce the veracity of the virtual environment (as a note, there are presently no initiating studies or foundational articles that can be seen as seminal at this point). Unlike traditional VR in which the virtual world is typically generated through graphics processing and audio triggers in real-time, CVR uses pre-rendered picture and sound elements exclusively. This means that the quality of these assets can approach that found in high-end television or feature film." (2017:15)

From a filmmaker's perspective, cinematic virtual reality (CVR) supposes an ambiguous medium, that works with a camera and by doing so relies on a number of concepts, tools, and techniques common to the expertise of a filmmaker. Acting, cinematography, sound recording, *mise-en-scène*, directing, editing, all steps involved in the film production workflow are required in CVR. And yet, the aesthetic and technical differences are large enough to suggest the emergence of a different medium by itself, one that requires the development of its own narrative techniques.

The relatively unexplored characteristics of CVR presented it to be a suitable medium to experiment with the type of interactivity I wanted to work with: An interactivity that would allow to exploration of the potential of immersive media to generate dialogic responses for storytelling purposes; that might eventually evolve and be applied and furtherly explored with other immersive media, such as an AR or haptic technologies. This project aspires to be included among the already emerging research that explores the qualities of CVR, while also acknowledging the extensive work that remains to be done with this medium. Specifically, this research aims to experiment with an interactivity that would still allow the public to *contemplate* and be narratively immersed in the diegesis of the storytelling, without it becoming a game based on goals and achievements, but instead strongly focused on the narration, on the action of telling a story. In other words, a leaned-back interactivity, with which the spectator would interact without interrupting the flow of the story.

Under these considerations, CVR appeared as a suitable medium with the potential to respond to the preliminary key questions of this research: How to generate a dialogic relation between the film and the spectator without affecting the diegesis? How to ingest an input from the spectator into the system that would somehow affect the narration? How to make this input instinctive and reactive rather than conscious? An immersive medium like CVR, which involves direct physical contact with the spectator, is capable of obtaining immediate information from the spectator. This is under the understanding of immersive media as "multi-modal human-computer interaction where either a user is immersed inside a digital/virtual space or digital/virtual artefacts become a part of the physical world" (Hameed et al, 2020:3) to invoke the user's sense of 'being there' – what we call the feeling of presence. Head-Mounted Displays (HMD) operate in the first form of this definition, as a prosthetic device meant to be sensitive to the user's body actions in different ways, being the movements of the head one of the most instantaneous.

Henceforth, working with CVR has offered the possibility to explore at least two dimensions of the medium: First, the possibilities for an interactive language in immersive media, and second, the adaptation of film production techniques into this specific medium. Both dimensions are only possible to be approached from research based on creative practice, one that would generate outputs that contribute to the future development of expressive techniques in immersive media, whether in terms of interactivity or cinematic virtual reality, and that would be based on the application and adaptation of already existing expressive techniques, primarily from filmmaking, but also from other related disciplines. Research by creative practice appears not only as a methodological approach but as an epistemic perspective on the generation of knowledge. Indeed, creative practice – or Research through Design, as defined by Bowers (2012) – can be often understood as "research where the end product is an artefact – where the thinking is, so to speak, embodied in the artefact." (Frayling, 1993:5) While for some scholars this approach can generate tensions between theory and practice, it is important to note that creative practice doesn't exclude nor rejects theory as an integral part of research. Instead, while a relevant element in the discussion, theory underdetermines the creative and practical choices, which are more inspired by the observation and critical analysis of the objects themselves. As Gaver & Bowers illustrate, "it was by looking at specific examples of practice that we found guidance for our work and, in discussing exactly how those examples were relevant to us, began to develop our design thinking." (2012:40) In this particular project, the pursue of research by creative practice is driven not only by the generation of creative outputs, but also by the critical discussion and the analysis of the processes involved in such production, which are the main component of this thesis. In this sense, while this thesis is not meant to be a guidebook on how to direct on CVR, it aspires to provide useful material so future research can continue to explore the potential of this medium.

While CVR appears to be a medium on its own, exploring and developing expressive techniques for interactive is not entirely alienated from other audio-visual media that might be benefited from immersive and interactive advancements. It seems unlikely that cinema will ever move away from its traditional form, but televisual and multimedia consumption might be indeed more affected by the inclusion of interactive and immersive technologies, particularly in regard to the development of Extended Realities (XR) – which include Virtual Reality (VR), Augmented Reality (AR), and Mixed Reality (MR) – and their application in already daily used devices, like mobile phones and smart television, among others. The exploration in CVR is not disconnected from its XR relatives. In fact, it provides a field to explore the expressive potentialities of immersive and interactive media in general, and opens the window for further experimentation as the technology is improved.

1.3   RESEARCH QUESTIONS

This study is focused on the exploration of interactive narratives, more specifically of leaned-back and hands-off interactive storytelling. The notion of interactivity has been for long related to lean-forward formats such as video games, that require explicit interaction through a device – usually a remote control of a certain kind – and always on a conscious level in which users are aware of the decisions they are making and their effects in the narrative. Instead, this research aims to explore the possibilities of a leaned-back interaction defined by unconscious decision-making, through minimizing explicit interaction and focusing on implicit interaction and on the use of diegetic stimuli, enhanced by the characteristics of an immersive medium like CVR.

The main question driving this research is: how to develop hands-off interactive narratives suitable for cinematic virtual reality? Focusing on the "how", this question aims to find out about what are the creative challenges and considerations necessary to approach this specific type of interactivity. In this sense, practice-based research would be justified not only because of the possible outputs, but also – and regarding some aspects, mainly – because of the observation, analysis, and reflection of the process involved in the production of such output. In short, this research focuses not only on the generation of a piece but also considers the production process an object of analysis in itself.

A second main research question is focused on the narrative aspect of this project, involving the specific topic of instinct-based decision-making, which is approached as a general problem in the research, since it necessarily has to be tackled from different dimensions of the creative practice. This particular notion would define a very specific type of interactivity for a specific type of storytelling. Hence, it is a topic that needs to be transversally approached in the stages of writing, design, and direction, since it presents different challenges to each particular stage. In this sense, a second research question would be is it possible to propose instinct-based decision-making interactivity, and what are the conditions needed to facilitate it?

This research is centred on main three dimensions involved in the approach to this question, and therefore, to the research process itself. First, there's a technical dimension, related to ongoing developments and the uses of merging technologies into a common platform that would enable interactive narrative. In this sense, the BBC Research & Development Department's Object Based Broadcasting (OBB) (Smith et al, 2017), a platform that explores the possibilities of interactivity for television and related media, offers a suitable comparator for the development of this project, since it follows a shared larger goal of developing technologies so practitioners can test and use them creatively. The technological dimension of the question involves the exploration of how interactive technologies are merged with audio-visual ones, taking into consideration their specific characteristics, limitations, and potentialities. The specific research question related to this dimension is centred on the conception and design of an interactive storytelling suitable for CVR, and can be summarized in what are the technical and creative procedures to design the proposed interactive storytelling model for CVR? This question is mostly approached during chapter 3 of this thesis.

The second dimension is narrative, or how to adapt traditionally used narrative structures, grammars, and techniques into interactivity. This involves a theoretical discussion about the role of users in an interactive narration; their place in storytelling rituals and the boundaries of narrative structures, or how does interactivity affects the frequently one-sided nature of storytelling. In parallel to this discussion, approaching this dimension involves a practical approach aimed to critically adapt these traditional techniques, observe the work already done by interactive storytellers – mainly in video games – a experiment through creative writing to meet the expressive needs of the concept of interactivity, and considering the characteristics of the technology. This question is approached throughout most of the thesis in different aspects, which consider the adaptation of screenwriting format suitable for the specific requirements of the medium in chapter 3, the application of audio-visual and staged narrative techniques in chapter 4, and an evaluation of the previous steps and application of the results in a second iteration of the script in chapter 5.

Lastly, the third identified dimension is practical, referring to the production workflows and techniques, and involves the praxis of producing an interactive piece with particular characteristics due to its interactivity and its narrative purposes. In this sense, a specific question related to this dimension would be what are the practices, workflows, and production methods involved in the production of the proposed interactive film for cinematic virtual reality? This question is approached specifically from a film direction perspective, but also approaches – in a similar way to the narrative dimension – techniques and methods from other disciplines that seem more suitable to tackle certain specific challenges proposed by the medium, and it is mostly developed in chapter 4.

1.4   OBJECTIVES AND EXPECTED OUTCOMES

With these five research questions in consideration, the main objective of this research is to generate a prototype version of an interactive storytelling model in CVR, that includes the different stages of the creative production workflow. A second main objective would be aligned with the research question that refers to the experimentation and conceptualization of notions like instinct-based decision-making and hands-off interaction, aiming to generate a creative proposal to approach these notions through the different stages of the production, including writing, design, direction.

To achieve this, the three secondary research questions must be addressed interdependently, responding to objectives of their own. In this sense, each specific question has a corresponding specific objective, that is consistent with particular topics and challenges they involve. These secondary objectives are:

- To design an interactive model based on interdependent acoustic spaces in an immersive environment, that would facilitate hands-off interaction in CVR,
- To explore screenwriting methods through the generation of at least one dramatic script, in order to approach the narrative aspects of interactive storytelling, identifying key aspects that are unique to the media and others that are shared with other media such as film or theatre,
- To explore and develop directing and blocking techniques through the production of a prototype of the interactive story in CVR.
- To creatively explore and proof-test theoretically conceived notions for interactive storytelling, such as hands-off interaction models and instinct-based decision-making.

In terms of the generation of a portfolio, the outcomes of the creative work include:

- Two experimental dramatic scripts, specially formatted to meet the requirements of the interactive model,
- An interactive model conceived to meet the two main concepts of interactivity proposed in this project,
- And the production of an interactive prototype for CVR, that would allow application and experimentation of blocking and directing techniques in this medium and with the proposed interactive notions.

There are still relevant concepts and notions that are worthy of lengthy discussion and exploration throughout the development of this research project. Some of them are extremely relevant to the craft of storytelling and narrative techniques are adapted for interactive means. For instance, the discussion about the role of spectators in interactive narratives plays a very relevant part in understanding and designing the nature of storytelling through this new media. This has been an unavoidable topic in this research, and, while it has formed part of the

discussion involved in the design and writing, it deserves further and focused exploration as a central topic by itself.

Overall, this project is formulated as a research-by-practice and aims to, on the one hand, generate experimental creative outputs that are a fertile material to propose, on the other hand, an academic discussion around the procedures, challenges, and proposed methods techniques. This considered, the main contributions of this research can be summarized in three key aspects: 1) The notion of instinct-base decision-making, as a model to design hands-off interactive storytelling that enhances narrative immersion; 2) the development of dramatically-driven immersive soundscape, a strategy to make narrative use of immersive environments; and 3) the exploration of production workflow for interactive and immersive storytelling from a filmmaking perspective, that might aid other practitioners approach this type narrative media.

1.5   RESEARCH METHODS: CREATIVE PRACTICE AND SELF-REFLECTION

The research-by-practice methodology is strongly sustained on a permanent and nutritious dialogue between the production of creative outputs and the critical reflection on the process itself. As stated by Sullivan, practice-based research "'[involve] the identification of research questions and problems, but the research methods, contexts and outputs then involve a significant focus on creative practice." (2009:48) The structure of this particular research is based on the subsequent stages of the production of a creative project, which are underlined through the chapters of this thesis. The creative work involved in each of the stages was accompanied by a simultaneous analysis of the procedures and preliminary results of that particular stage, in order to generate useful feedback for future iterations and the following stages.

This type of methodology facilitates – and even encourages – a dynamic process in which the creative practice and the critical reflection feed each other. Or in other words, a fruitful tension between theory and practice. As defined by Lyle Skains, the outcomes of practice-based research "are intended to develop the individual practice and the practice of the field, to build theory related to the practice in order to gain new knowledge or insight." (Ibid) This constant feedback can cause the production of creative outputs to go back and forth, as some emerging observations could suggest useful changes to previous steps, as well as a better understanding of the notions that are being implemented.

This was particularly true during the stages of design and writing of the project, which took place simultaneously. This stage, for instance, involved working on three fronts at the same time: The conceptualization of the interactive notions to be applied, the design of the interactive device, and the writing of the story and its corresponding script. The exploration of

novel concepts that applied to these tasks demanded a nutritious interlinked relation between the three. In this sense, the critical observation of the challenges involved in each one usually required a revision of the other two.

The synergy between the creative practice and its critical discussion, however, had to be constrained within each stage of production, in order to keep the workflow of the overall project manageable. For instance, once the first stage – design and writing – was completed and it was decided to proceed into the second one – production – the observations that kept surging in regard to the previous stage had to be considered only as part of the critical discussion, as their application in the practice would have involved going back in the workflow, possibly resulting in a counterproductive measure. This, however, doesn't undermine the recollection of useful feedback. Quite the contrary, observations on work already done made during more advanced stages of the production are usually motivated by aspects that weren't considered initially and especially by challenges that appear in these next stages. While going back might have been counterproductive from the perspective of the creative practice, reflecting on previous stages provides insightful observations worth being considered in future iterations of this project or similar creative work.

The third stage – post-production – had similar characteristics to the second one, in the sense that the creative work was focused solely on the edition of the prototype and the critical observations of the results and of the previous stages.

The fourth stage of the project, evaluation of the prototype, was focused on making a revision of the creative practice and system-testing the most relevant aspects of the research in its dimensions defined at the start of the project and those that were integrated during its execution. As an evaluation method, system-testing is a concept borrowed from computer sciences, that refers to "a level of testing that validates the complete and fully integrated software product. The purpose of a system test is to evaluate the end-to-end system specifications." (Guru99, 2021) In this case, the fully integrated prototype comprises its technical functions as well as its narrative functionality, henceforth, the system test aims to evaluate both aspects. While the evaluation was centred on observing the performance of the prototype – equivalent to a software – on a functional level, a system test seemed the most appropriate way to approach this stage. However, it is necessary to note that, for the purposes of this research, the evaluation also aimed to test the key interactive, expressive, and narrative concepts on a functional level. Henceforth, the system-testing acquired some qualitative characteristics, to make it suitable for this project.

The system-testing consisted of the exhibition of the prototype and consultation to a small sample of participants, that formed part of a focus group. It also included interviews with two experts in the field. This evaluation aimed to observe:

- If the experimental notions of interactivity – hands-off interaction and instinct-based decision making – worked,

- If the design, direction, and general craft of the prototype worked, and
- If the general notions of the story were sufficiently communicated through the prototype.

This last stage was intended to produce a counterbalance to the self-reflection that is presented as the main body of knowledge in this thesis, counting with third parties that would check on the experimental notions and provide unbiased perspectives, in order to confirm and/or discuss what had been observed during the execution of the critical analysis of the creative practice.

1.6   THESIS STRUCTURE

The present document is structured following the workflow of the creative practice as it was originally intended. As it has been explained, the process itself involved a constant back and forth as a result of the synergy generated between the creative practice and the critical discussion, a chronological process that would have been confusing and, at some points, illogical as a narrative and academic structure. Instead, thorough description and analysis of each of the four stages are presented in chapters 3, 4, and 5, articulating the challenges faced from the practical perspective with its theoretic counterpart, and the correspondent discussion.

A literature review is presented prior to the chapters, which gathers concepts and existing literature about different topics and from different disciplines that are relevant to the project. Considering that the notions of interactivity proposed by this research are quite new, an extensive discussion on the definitions of interactivity is included in this section, illustrating how much of an open field it is, how it is still in constant development, and that there are several different understandings of what interactivity is. On the opposite, more traditional and canonical perspectives on storytelling are presented as well, mainly focused on the approaches that 20th-century structuralists applied to the study of narrative. The structuralist paradigm is heavily influenced by Aristotle's dialectic thinking, which he applied in his *Poetics*, a foundational text for the study of drama and storytelling. This same paradigm also influenced the development of film montage theories, particularly those of Sergei Eisenstein and other Soviet theorists. The structuralist view on narrative facilitates the identification of the different elements that take part in the act of storytelling, providing a useful field for practical experimentation. This section also includes the revision of definitions and expressive techniques from three different disciplines: Filmmaking, theatre, and video games. All three provided different aspects that were useful and necessary to approach different challenges of production of the prototype, sometimes appearing as alternative solutions to specific difficulties that one discipline could not approach. It was also necessary to make distinctions on concepts shared by two or the three crafts, but that are understood differently and many

times in complementary ways. Considering these three disciplines as part of the theoretical and practical approach to the project reinforces the interdisciplinarity of CVR, as well as emphasizing its properties as a medium by itself.

Chapter 3, titled *Creative Synergy: Writing, Concept, and Design for Hands-off Interactive Cinematic Virtual Reality*, is focused exclusively on the first stage of the project. As described earlier, this part of the process consisted of the parallel work on three fronts that nurtured each other along the way. This stage included most of the conceptualization of the key notions that have driven this research, as well as the design of the creative outputs. Besides defining a frame for concepts like hands-off interactivity and instinct-based decision-making, this stage involves the generation of more practical notions, such as the use of interdependent dramatic immersive soundscapes, which was one of the keys of the design, writing, and production of the prototype and the interactive model as a whole, and which theorization took place in this stage. In terms of creative practice realized for this chapter, it aimed to generate two products: The interactive model to be used later for the production to prototype, which was designed and built on Unity; and the first iteration of a cinematic script, in a format adapted to meet the requirements of the interactive model.

Chapter 4 is centred on the second and third stages of the project: Production of the prototype and its subsequent post-production. Both stages were approached as one analytical unit since they both aimed to the generation of one unique creative outcome: the proof of concept of the interactive CVR story *The Hunter & the Wolff*. Moreover, differently from the previous stage, the production workflow was mostly based on the conventions of film production, which made it less flexible to be affected by the critical reflection that took part in the process. Nevertheless, both stages involved relevant experimentation on specific tasks. The second stage, the production of the prototype, supposed mainly two challenges: The implementation of sound recording techniques suitable for this type of immersive setting; and the adaptation of blocking and directing techniques to interactive CVR. Both of these challenges involved the application of the concepts defined in the previous stage, as well as some relevant notions for VR storytelling, such as guidance, and how to make it meet the needs of this particular type of interactivity.

Chapter 5 refers to the fourth stage of the project: The evaluation of the creative practice's main outputs and of the theoretical concepts intended to be explored through them. This chapter is divided into two parts. The first one is centred on the consultation of third parties that conformed to the test-proof, in which external volunteers participated in a display of the prototype and semi-structured focus group, plus semi-structured interviews with two experts in the field of interactive media and storytelling, who also got the opportunity to see the prototype. The second part of the evaluation involved a continuation of the creative practice into the writing of a second iteration of the dramatic script, which intended to address

some of the most relevant observations made during the previous stages, in order to improve the narrative qualities of both the story itself and the format for which it is written.

A final section of the thesis is dedicated to the general Conclusions of the research and the creative practice. While each chapter has its own specific conclusions, this last section aims to respond to the research questions proposed earlier in this Introduction, as well as addressing the general and specific objectives of the overall project. By critically observing the validity and feasibility of the key experimental concepts, this section also proposes possible scenarios for further research, whether as a continuation of this project, or independent experimentation with some of its most relevant aspects, like the development of hands-off interaction models, instinct-based decision-making, dramatic immersive soundscapes, or any other.

Chapter 2

Literature Review
and Theoretical Frame

2.1   INTRODUCTION

The interdisciplinary nature of this research makes it necessary to gather a series of concepts and ideas that merge into one core, kickstarting topic: *Hands-off Interactive Storytelling*. To do so, the main theoretical frame is composed of four main bodies: Definitions of Interactivity, Narrative Structuralism, Considerations from Cinematic Language and Practice, and Considerations from other storytelling telling disciplines pertinent to this research, such as Theatre and Video Games.

The core practical approach to the project is based on the discipline of Filmmaking, from where were adopted conventional production workflows, the aesthetics relation with the camera, and the understanding of sound. This was complemented by two more theoretical bodies of knowledge: Narrative structuralism to approach the work with storytelling strategies, and a discussion on the aspects that define interactivity. The structuralist perspective was served of notions about interactivity in order for these to be incorporated in the craft of writing and designing the story and the storytelling device. Yet, during the practice, it became evident that it was going to be necessary to approach and tackle certain specific challenges from alternative and complementary disciplines, like was the case of Theatre and Video Games.

The theoretical and practical clash of these diverse perspectives resulted in two main notions that might be some of the key contributions of this research to the practice of interactive storytelling. These are Instinct-Based Decision-Making (IBDM) and On-Narration Interactivity.

2.2   DEFINITIONS OF INTERACTIVITY

It is necessary to distinguish the differences in a variety of interactive media, usually placed in the spectrum between video games and more cinematic formats. The debate between 'ludologists' and 'narratologists' – founded on the narrative and practical constraints of each discipline – has decreased in recent years, leaving room for the development of interactive media as a field of its own, which also seems to be slowly permeating into more traditional

media: "One challenge broadcasters face when providing immersive experiences is bridging the gap between traditional linear TV and digital content." (Zöllner & Jürgens, 2017:5)

There is little agreement on how to define interactive storytelling. Generally, it is founded on the tension between the agency given to the user and the author's narrative intentions (Mateas 2000, Jenkins 2002, Crawford 2005, Ryan 2009), or a *Free Will versus Determinism* conflict, according to Crawford, or a *Man versus Author* conflict. As in any interactive storytelling experience, the problem lies in the Interactive Paradox: "the integration of the unpredictable, bottom-up input of the user into a sequence of events that fulfills the conditions of narrativity – conditions that presuppose a top-down design." (Ryan, 2009:45) In this regard, most of the revised literature discusses interactivity as the ability to affect the storyworld from *within* – considering that most of the authors refer to interactive storytelling mainly in video games or similar media.

According to Ryan, "the combination of narrativity and interactivity oscillates between two forms: the *narrative game*, in which narrative meaning is subordinated to the player's actions, and the *playable story*, in which the player's actions are subordinated to narrative meaning." (Ibid) Certainly, as Ryan states, these two forms correspond more to a spectrum than to a binary categorization. Another way to understand this spectrum would be according to the objectives of the interactive story, which can oscillate between performing a series of tasks and accomplishing missions, to an intrinsically contemplative reception of the story.

Mateas provides an Aristotelian approach to interactivity, in which he applies some of the key narrative concepts developed by Aristotle in his *Poetics*. He makes the distinction between *Interactive Drama* and *Interactive Storytelling*: "In interactive drama, the player assumes the role of a first-person character in a dramatic story. The player does not sit above the story, watching it as in a simulation, but is immersed in the story" (2000:1). On the other hand, Interactive Storytelling would not necessarily involve a *player*, but a user that, without being involved in the story – or *storyworld* – has the ability to manipulate elements of it. This distinction is particularly relevant to this research since it is consistent with the formalists' approach to narrative, which allows understanding the components of storytelling in a rather independent manner and, hence, to understand which of these parts have a role in the interactivity and how they play that role. The theories from narrative formalism will be presented later in this section.

A different – but complementary – approach to the forms of interactivity is presented by Ryan in the form of her *Interactive Onion* (2011), where she defines a series of layers of interaction, defined in terms of depth according to the amount and type of agency that users have on the storytelling. These are the five levels:

- Level 1: Peripheral Interactivity. "The story is framed by an interactive interface, but this interactivity doesn't affect neither the story itself, nor the order of its presentation." (p.37) In this level, the user's agency is more focused on unveiling the story, and the interface tends to work more like a display than as a navigation device or an editor.
- Level 2: Interactivity Affecting Narrative Discourse and the Presentation of the Story. "On this level, the materials that constitute the story are still fully predetermined, but thanks to the text's interactive mechanisms, their presentation to the user is highly variable." (p.40) According to the formalist approach, we could say this level affects the *narrative discourse* or the way the story is told and delivered. We could say that at this level, the user has agency on the narrator or storyteller, but not on the *storyworld*. This level is the most likely to fit the characteristics of the present project.
- Level 3: Interactivity Creating Variations in a Predefined Story. "On this level, the user plays the role of a member of the storyworld, and the system grants him some freedom of action, but the purpose of the user's agency is to progress along with a fixed storyline, and the system remains in firm control of the narrative trajectory." (p.44) This type of interactivity is very common and popular in many video games like shooters, mystery-solving, adventure games, and whodunnits, where the user/character gets to interact with the *storyworld* in order to make the pre-defined story advance. This means that the player's agency is subordinated to certain actions that are conditional to the narration, without which the story would become stagnant, disregarding what other alternative actions might take place.
- Level 4: Real-Time Story Generation: "Stories are not predetermined but rather generated on the fly from data that comes in part from the system and in part from the user." (p.48) This level relies heavily on the dialogical nature of interactivity, in which the system resources to a number of different options stored as data, in order to be able to provide a different reaction to the user's inputs. This leads to having a program in which every run should be different and, therefore, replayable. This should work whether the user plays a character in the *storyworld* or remains in the narrative discourse layer, as long as the system is able to generate a dialogical loop between itself and the user, that is also able to tell a story.
- Level 5: Meta-Interactivity. "The interactor is not consuming the onion but rather preparing new ways to cook it for other users, such as designing a new level for a computer fame, creating new costumes for the avatar, introducing new objects, associating existent objects with new behaviors, and generally expanding the possibilities of action offered by the storyworld." (p.59) This level would be analogue to the Game Master's book of a Role-Playing Game, and the process through which the GM prepares the adventure for their players before they actually meet. A digital equivalency might be something like Minecraft, which offers a large range of possibilities, including the creation of environments, characters, and more organic elements. However, according to Ryan, "to constitute a genuinely 'meta' interactivity, this must be done by writing code and patching up the source, rather than by using tools internal to the game." (Ibid) She also argues that it would be only on this level where the user could become a coauthor, a notion that is somewhat arguable, considering that the user doesn't really tell the story nor participates of the act of storytelling, but rather prepares it elements beforehand so it can be told eventually.

Ryan is very clear that these layers respond more to a theoretical understanding of interactivity than to an aesthetic appreciation of it, meaning that, while the inner layers present

bigger creative and technical challenges, the aesthetic or narrative value is independent of them, but rather responds to the authors and developers' creative intentions.

Crawford's definition of interactivity, on the other hand, refers to it as a *conversation*: "A cyclic process between two or more agents in which each agent alternately listens, thinks, and speaks." (p.29). According to this, in interactive storytelling, the narration must contain several stimuli across its timespan to allow at least an equal amount of reactions from the user, where the term *reactions* summarizes Crawford's three steps of listening, thinking, and speaking, which he also clarifies are not to be taken literally, but rather as receiving the stimuli, processing it, and responding to it. In this sense, interactivity would be – loosely – determined by a series of reactions from both parties – therefore, a conversation; "don't make the mistake of confusing reaction with interaction. Reaction is a one-way process; interaction is a two-way process. Two people interacting are engaging in a series of reactions to each other. Reaction alone is only a subset of interaction, however." (p.21) Yet, he also points that the amount of reactions isn't enough to define the quality of the interactivity – whether between humans or in HCI – but rather "depends on the product, not the sum of the individual qualities of the three steps. You must have good listening *and* good thinking *and* good speaking to have good interaction." (p.30)

In terms of how to measure interactivity, Crawford defines three factors: speed, depth, and choice (p.37). *Speed* is easily defined by the capacity to generate fast responses between the two parties. By *depth*, Crawford means "penetrating closer to what makes you human." (Ibid) In other words, the objective is to make responses feel human-like and not just automated. Finally, *choice* "depends on the richness of choices available to the user" and is defined by the "the functional significance of each choice" (p.40), or the degree of in which a choice "satisfies users' desires, needs and interests" (p.41), and their "perceived completeness: the number of choices in relation to the number of possibilities the user can imagine" (p.40).

In simpler terms, "the absolute number of choices isn't important; it's the number of choices offered, compared to the number of possibilities the user can imagine" (p.41). For instance, if the number and specificity of choices hinder the speed and depth of the interactivity, then those particular choices are of no good use to the quality of the experience. On the other hand, if users are provided with a bounded number of choices but which results satisfy their needs and expectations within the story, and it does it promptly and deeply, then we could assume, at least in theory, that this is good quality interactivity. The challenge in this kind of storytelling is to guide spectators through the spatial story and be clear in terms of what most users do to make the story advance. This, again, is also a challenge in terms of providing them with the right choices: "The user should be able to make lots of dramatically interesting decisions. Conversely, the user should not have to make boring decisions." (p.53)

Finally, it is important to understand the characteristics of the media required to run interactive narratives. In this sense, we find a suitable perspective on interactive media on the notion of Object-Based Media (OBM), which is defined as "media which has the ability to reconfigure itself" by conceiving a "storyworld, or narrative space, that can be explored by viewers and could unfold in different narrations, illustrating different story aspects and points of view." (Smith et al. 2017:2) In other words, a concept that groups all media that allows interactive storytelling. OBM is also open to multimedia practices and displays. For instance, many of the researchers and developers in the field are thinking of "the living room of the future" – an ongoing BBC R&D project since 2018 – which is based on the internet of things (IoT) to integrate many digital devices into a multimedia, interactive, customizable televisual experience.

2.3   DEFINITIONS OF INTERACTIVITY: LEANED-BACK INTERACTIVITY AND ENVIRONMENTAL STORYTELLING

A more specific debate around interactivity is the paradox between narrative immersion and agency: How does agency affect the user's ability to perceive a story? This debate opens the discussion to what kind of agency users have over the experience and if that agency would undermine the diegetic experience of storytelling. For Mateas, "agency can be seen as a precondition for immersion; when a player's sense of agency is diminished, immersion is diminished." (2002:2) Certainly, Mateas is still immersed in a discussion that confronted ludologists and narratologists, and he is referring mainly to narrative in video games. In this regard, "a distinction should be made between ludic and narrative immersion. Ludic immersion is a deep absorption in the performance of a task. Comparable to the intensity with which a mathematician concentrates on proving a theorem, or a soloist performs a concerto. (...) [N]arrative immersion is an engagement of the imagination in the construction and contemplation of a storyworld that relies on purely mental activity." (Ryan, 2009:53-54) TV audiences are not players and agency is not a condition for audiences to be immersed in stories. On the contrary, it is the inclusion of agency in storytelling that apparently affects immersion.

Mateas provides a definition of agency as "the feeling of empowerment that comes from being able to take actions in the world whose effects relate to the player's intention." (p.1) Crawford mostly agrees with this definition, and stresses that the user's agency must have effects on the *storyworld*. (2012) For Ryan, on the other hand, interactive narratives face the challenge of reconciling the tensions between immersion and agency, since the latter would affect the former. (2011) As for immersion, Ermi and Mayra define it as "becoming physically or virtually a part of the experience itself" (2011:94) a definition that is quite generous, as it can be applied to narrative and/or environmental immersion. They also distinguish three different types of immersion: Sensory, challenge-based, and imaginative. "Sensory immersion can be intensified with better graphics and sound; challenge-based by engaging gameplay […]

and imaginative immersion as a 'game experience in which one becomes absorbed with the stories and the world'" (in Haahr, 2017:2)

As mentioned, the quality of interaction can be affected by the relation between the amount and purpose of decisions given to users and their dramatic effects on the story, whether on the *storyworld* or the narration. This is why Murray warns that "if, in manipulating the interface elements, the player does have an effect on the world, but they are not the effects that the player intended (…), then there is no agency." (in Mateas:1-2)

Another dimension of the *agency vs immersion* problem is what Murray approaches with the concept of *threshold objects*. These are devices that "take us across a symbolical and sometimes literal passageway." (2005:86) Murray and Ryan both criticize the real sense of immersion that these devices provide since, as a physical material object, they are also the material evidence and reminder that the *storyworld* is an illusion. They argue that interactivity that relies too much on the device that serves as threshold fails to provide an effective sense of immersion, since it would be the same object what pulls the user back from the story. While Murray refers specifically to physical devices – especially prosthetic devices, that are in any way attached to our bodies, such as controls or HMDs – on-screen non-diegetic interfaces have similar characteristics, in terms of, on the one hand, facilitating and allowing interactivity as they serve as a toolbox to affect the digital *storyworld*, while on the other, their usually non-diegetic and inorganic presence is a reminder of the nature of the immersion, and could even suppose a visual barrier. Moreover, the counterintuitive usage of these devices and interfaces suppose a process of learning, adaptation, and acquisition of the skills to properly perform the agency on the interactive narration. And yet, these same devices and interfaces are the ones that allow interactivity in the first place, which is the base for the paradox presented by Murray.

This is one of the issues that leaned-back and hands-off interaction schemes aim to attack; how to provide interactivity with little-to-none friction in terms of immersion, aiming to reduce the explicit, non-diegetic, and inorganic, presence of threshold objects and interfaces. The current technological developments point to opening possibilities to this kind of interactivity, with technologies like eye-tracking, or motion-sensing input devices like haptics-based technology, that could allow interactivity with little effort from users and little friction in terms of crossing a physical threshold.

The challenge, in these hypothetical scenarios, would be to create strong narrative immersions based on story elements and not relying upon the consciousness of the devices. In this sense, Ryan, Murray, and Jenkins all refer to amusement parks as the best examples of spatial immersion with very restrained interactivity, but that doesn't necessarily affect the immersion. This is based on the principle of *environmental storytelling,* (Jenkins) which can be observed in many video games based on 3D scenarios (i.e. *Call of Duty, Tomb Raider*), navigating maps (i.e. *Legend of Zelda, Chrono Trigger*), or a combination of both.

According to Jenkins, "environmental storytelling creates the preconditions for an immersive narrative experience in at least one of four ways: spatial stories can evoke pre-existing narrative associations; they can provide a staging ground where narrative events are enacted; they may embed narrative information within their *mise-en-scéne*, or they provide resources for emergent narratives." (pp.5-6) In other words, he argues that, while traditionally the elements of the story are spread and organized across a determined timespan, in environmental storytelling these same elements are spread and organized across a determined space. He defines *spatial stories* as "stories which respond to alternative aesthetic principles, privileging spatial exploration over plot development. Spatial stories are held together by broadly defined goals and conflicts and pushed forward by the character's movement across the map" (p.7) and note that "the organization of the plot becomes a matter of designing the geography of imaginary worlds, so that obstacles thwart and affordances facilitate the protagonist's forward movement towards resolution." (Ibid)

Figure 1: Screenshots from Battleship Potemkin, the Odessa Steps sequence. Here we can observe in a few images the variety of micronarratives that form part of the larger narrative. From left to right and top to bottom: the crowd runs down the stairs; a mother and her son are among the people; the Cossacks descend after the crowd; a woman is shot by the Cossacks once they open fire; a pram (that belonged to the shot woman) slides down the stairs out of control; another woman witnesses the whole scene. There are considerably more micronarratives that add layers of complexity and tension to this sequence. (Images have been cropped to fit the page)

Following this notion of storytelling, it would be possible to organize not only organic elements of the story, like objects, places, and characters around a space, but also – and most importantly – actions, which Crawford called *atoms* of the story and Jenkins calls *micronarratives*, which grouped together would constitute a full narrative. Jenkins illustrates this concept with one of the peak moments of the history of cinema: "We might understand how micronarratives work by thinking about the Odessa Steps sequence in Sergei Eisenstein's *Battleship Potemkin*" (Ibid). This Soviet film from 1925 is widely considered a masterpiece and a pivot in the development of film language, especially because of its use and application of

Eisenstein's theory of intellectual montage, which has influenced filmmakers ever since. The named sequence – probably the film's best known – presents a large crowd running down the large steps in the town of Odessa, escaping from the imperial Cossacks, who eventually start firing at the crowd. Jenkins refers specifically to the individualization of certain characters and events – or actions, or *atoms* – within the crowd, that are not necessarily linked to each other in a physical or pre-conceived way: We don't know if these characters know each other, or how close they are to each other in the huge stairs and among the large crowd. Yet, the parallel narration by which they are presented groups these atoms in one narrative context, grouping a number of micronarratives taking place in different spots of one map, to tell one, consolidated story.

This type of structure has a base in structuralist theories formulated by the Russian formalism movement and later developed into cinema by theorists like Lev Kuleshov or Eisenstein himself, who argued that montage, or cinematic storytelling, is an intellectual process that takes place in the audience's minds. Jenkins notes that "Russian formalist critics make a useful distinction between plot (*Syuzhet*) which refers to, in Kristen Thompson's terms, 'the structured set of all causal events as we see and hear them presented in the film itself,' and story (*Fabula*), which refers to the viewer's mental construction of the chronology of those events." (p.9)

According to this, if spectators are able to assemble a narrative through visual storytelling across a timespan, they should be able to "test and reformulate their mental maps of the narrative action and the story space" (Ibid). In this case, these pre-rendered assets are *micronarratives* (Jenkins, 2004), or smaller actions that conform to a full narrative. This way, audiences would be able to approach the full story by rearranging these micronarratives.

2.4   NARRATIVE STRUCTURES: RUSSIAN FORMALISM

Narrative can be defined, in maybe its most basic form, as "a perceived sequence of nonrandomly connected events" (Toolan, 1988:7), which can be complemented by saying that "the distinguishing feature of narrative is its linear organization of events." (Cohan & Shires, 1988:52-53) Both features are greatly influenced by the work of the Russian formalists at the beginning and middle of the last century. This school of thought, which focused greatly on the structural understanding and analysis of narrative and folktales, has many elements in common with the montage theories developed during the decade of the 1920s by Soviet filmmakers and theorists, like the one described above by Sergei Eisenstein. This is certainly not surprising, considering not only their co-nationality, but also the schools where their theories are rooted, usually coming back to Aristotelian poetics, and Hegelian and Marxist dialectics.

Cohan & Shires' observation about linearity is particularly relevant when discussing interactivity, considering that many interactive narratives are based on the feature of *non-*

linear storytelling. However, it is to be noted that the function of interactive storytelling is, matter-of-factly, to provide linearity – to organize in a timespan – to a number of non-random events, so to them to make narrative sense. As it will be discussed later, non-linearity in interactivity has more to do with the way the story is presented, providing the user with agency and responsibility – maybe even the authorship – to organize the fragments, or atoms, or micro-narratives. In other words, and paraphrasing the Russian director Andrei Tarkovsky, when sculpting events in time, users get to tell a story.

Back to breaking down notions of narrative, Russian formalists introduced the distinction between *story* versus *plot* – or *Fabula* vs *siuzhet*. Tomashevski, one of the most prominent formalists, says that "plot is distinct from story. Both include the same events, but in the plot the events are arranged and connected according to orderly sequence in which they were presented in the work." (1965:67) Prior to Tomashevski, Shklovski also notes that "the story is, in fact, only material for plot formulation." (in García Landa, 1990:2) In other words, arranging the plot is equivalent to organizing the story events in a timeline. The plot then becomes the responsibility of the storyteller or narrator. In the case of interactive narratives, while in some cases users can indeed interact with the *storyworld*, this interaction plays a part in the organization of the story into the plot. If users or players fail to contribute to the plot – i.e. when ignoring a mission and wandering away in a 3D platform video game like Tomb Raider – then the story itself will get stuck and won't be told unless the user resumes interacting with the plot.

Narratively speaking, interactivity would consist of the use of narrative techniques to generate a finished form. As García Landa notes, "the finished narrative is not only a sum of events: there are narrative techniques, the use of point of view and of the narrator, which change those events into something different." (p.3) The form, the verbal element, of the work, becomes an intrinsic, inseparable, and defining part of the narrative, as it makes it distinguishable from other plots of the same events – and provides the room necessary for adapting, re-telling, re-versioning, and re-making of stories.

An interpretation of Shklovski's definitions would state that the literary exercise falls almost exclusively in the application of the *siuzhet*, making the storytelling all form and organization, a responsibility that, as it is, concerns those who compose and communicate the narrative; narrators and storytellers, as it exempts the audience from the structural understanding of the narration. Tomashevski, instead, sees the *siuzhet* as a way to access the *Fabula*: the story is "the action itself", while the plot is "how the reader learns of the action," (in García Landa:5, Franzosi:519) which would make the Fabula accessible to the reader – especially an experienced one – and not only the composer. For Tynianov, on the other hand, the relation between both concepts is even more dynamic, as he states that "both *Fabula* and *siuzhet* are constructed by the reader as the reading process goes along, in perpetual reference to each other." (Ibid:6) Either way, all these definitions agree on the keystone notion that the

plot is the fundamental aspect of the story which links the *storyworld* to the reader, that without *siuzhet*, audiences wouldn't have a way to access the spread and unattainable elements of the *Fabula*.

This is of most interest for the field of interactive storytelling, as it discusses ways in which readers get to participate in the narrative, through either and both plot and *storyworld*. Interactive narratives get to play with ways to include users in the composition of the narrative, providing the possibility to manipulate some elements in this structural definition. If we were to follow Shklovski's point of view, interactivity would take place mostly in the realm of the plot, as he understands the organizational element as the ontological feature of narratives. However, it is the *Fabula* – which in this text is being called *storyworld* – that provides the symbolical, contextual, and ultimately narrational elements to the storytelling, which comes to justify why formalists call this the *story*. As Rimmon-Kenan notes, "the presence or absence of a story is what distinguishes narrative from non-narrative texts." (1983:15)

From perspective more set in interactive media, Ryan also contributes with a definition of *storyworld* (2009) that is particularly useful to separate the story's organic elements – mainly characters and environments – from the *siuzhet*, conformed by inorganic, narratorial, and technical elements like structure, plots, perspectives, as well as those involved with devices, interfaces and the means that provide agency to the user, the threshold that facilitates access to the narrative. For the purposes of this research, the notions of *Fabula* and *siuzhet* are being updated to *storyworld* and *narration*, respectively. The latter is being adopted mainly to distinguish it from *plot*, which is used in a more technical approach to refer specifically to a storyline within the context of screenwriting, while *narration* is taken from the distinctions made by French structuralists, in which narration refers to the actions performed to communicate a narrative, which is also a dimension of the *siuzhet*. Summarizing, for the purposes of this research, the dynamic relation between the *storyworld* and the *narration* would conform to a *story*.

These distinctions don't determine an exclusive way of directing interactivity, but rather provide conceptual definitions that help to understand the design and limitations of interactive devices and schemes. Indeed, approaching narrative structures in and combined perspective with Ryan's layers of interactivity could provide a series of theoretical ways to direct interactive storytelling, whether if it is more focused on the *storyworld* or the *narration* depending on the needs of the story, technical limitations and possibilities, and the type of interactivity. For instance, taking Mateas' definition, *Interactive Drama* – when the user plays a character in the story – would involve mainly an interaction between the player and the *storyworld*, while in *Interactive Storytelling* – when the user sits outside the *storyworld* – would mainly involve interacting with the narration. This is an alleged assumption for illustrative purposes since the creative possibilities seem to be rather open still. Either way, this understanding of complementary dimensions of the story should be extremely relevant for interactive

storytelling and for developers and practitioners, in order to consider the dynamic relationship between the means and the meaning, and that the devices we design are part of the *narration* itself and are meant to provide access to the Fabula, and only then, once the user is involved in this relation, there shall be a story.

2.5   NARRATIVE STRUCTURES: CHARACTER VS PLOT

Mateas' proposal of a Neo-Aristotelian theory for interactivity particularly focuses on the character-plot conflict as a way to generate narrative interactivity. He distinguishes two flows in the dramatic action, which he names *material* and *formal* causes. The formal cause takes many of the traditional elements and dispositions of the Aristotelian drama:

> "Characters required in the play are determined by the plot; the plot is the formal cause of the characters. The character's thought processes are determined by the kind of character they are. The language spoken by the characters is determined by their thought. The patterns (song) present in the play are determined, to a large extent, by the character's language (more generally, their actions). The spectacle, the sensory display presented to the audience, is determined by the patterns enacted by the characters." (p.2)

This would be the traditional arrangement in drama. Mateas' proposal aims to reverse this flow to make interactivity character-driven instead, which is the base for this *Material cause*.

In this bottom-up flow, the interactive drama would start with the player's intention instead of being initiate in the plot, which would generate the new causal chain: "By taking action in the experience, the player's intentions become the formal cause of activity happening at the levels from language down to spectacle. But this ability to take action is not completely free; it is constrained from below by material resources and from above by authorial formal causation from the level of plot." (p.3)
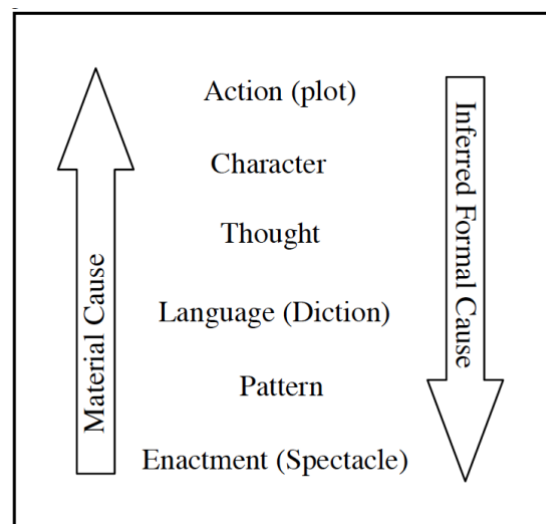
Figure 2: Mateas' Material and Formal Causes. 2000:2

Giving the player total agency over a character would generate a series of tensions – or lack of – with the plot. A purely character-driven interactivity would hardly generate the dialogical loop that Crawford states is the foundational stone of interactivity: It is this dialogue between character and plot what makes both elements interdependently evolve and change. The absence of one of the causes would undermine any form of interactive storytelling. On the

one hand, the formal cause alone would very likely become a traditional non-interactive narration, while a purely material cause would deprive the user/player of a sense of narrative purpose, turning the interactivity undramatic. Mateas himself warns against this, stressing that the tension between *player* and *plot* is necessary for the drama: "A player will experience agency when there is a balance between the material and formal constraints." (p.4) He also warns that "agency, however, requires that a plot structure be present to provide formal constraints. An open-ended story without a clear point of view may disrupt the plot structure too much, thus disrupting agency." (p.5)

As mentioned earlier, Mateas distinguishes between character-driven *interactive drama* and plot-driven *interactive storytelling*. Ryan has a similar distinction between *narrative games* – similar to Mateas' interactive drama – and *playable stories*, in which "the purpose of the player is not to beat the game, but to observe the evolution of the storyworld." (Ryan, 2009:46-47) While Mateas' efforts are mainly oriented to character-driven interactivity, his Neo-Aristotelian deconstruction provides a structuralist scope to interactivity, understanding it can be approached differently depending on the narrative aims and conditions. The notions of *interactive drama* and *playable stories* are particularly relevant for the scope of this research, since they provide a framework in which interactivity can be purposed to "induce a much more aesthetic pleasure than narrative games because the player is no narrowly focused on goals." (Ibid)

Both models – Ryan's and Mateas' – are based on the tensions between top-down (plot) and bottom-up (character) systems, and warn that it is in this tension where the type of interactivity is defined. They both agree that, while bottom-up systems could be suitable for games, which dynamic is more defined by goals and outcomes, interactive storytelling and playable stories require the presence of a plot, or top-down system, to establish the constraints of the agency: "If there's a drawback to bottom-up systems, it is the lack of closure of their output: without top-down authorial control, it is virtually impossible to create an Aristotelian curve of rising and all in tension, or a sequence of events that stops after a conflict has been resolved." (Mateas:52) These systems are, certainly, not exclusive. Moreover, it is

Figure 3: Snider, Grant (2014) Conflicts in Literature. Incidental Comics

precisely in the tension between the two is present in the narrative which defines the interactive experience.

Crawford notes that this tension is a reflection of an older dramatic conflict between *free will* and *determinism*, turned into a *man vs author* conflict: "Determinism in theology is analogous to plot in storytelling. The plot is the storyteller's predestined plan for the story's outcome Free will is analogous to interaction, for how else can payers interact without exercising their free will?" (2009:51-52)

2.6   CONSIDERATIONS FROM CINEMATIC LANGUAGE AND PRACTICE

Working with Cinematic VR supposes a number of challenges from a filmmaker's perspective. An interactive and immersive medium supposes a leap out of some of the grammars that define film language. Notions like framing, camera angles, camera movements, montage, etc., need to be – at the very least – reformulated in order to face the expressive conditions of immersive narrative. From a viewer's point of view, the camera doesn't behave as a frame anymore but rather like a threshold. A noted by Zöllner & Jürgens, "one of the main challenges which VR content creators face is to find the right balance between viewer agency and narrative guidance, as viewers step into a 360° canvas and have the freedom to choose where to look." (2017:3) This is a drastic shift in the nature of the camera as a narrator. For the filmmaker, this ontological leap alters many of the film grammars, and thus, the understanding of the relation between the camera, the dramatic space, and the viewers.

The 360º camera is a very different object from a regular camera. In order for the filmmaker to attempt to understand the cinematic properties of this particular kind of medium, it is necessary to establish the main differences between the two devices and the implications these have in each one's grammars. One of the key differences is that, while cinematic language has been developed for over a century and is currently standardized, CVR languages are in constant development and most of it is still experimental. There are numerous texts and sources that describe film grammars (Katz, 1991; Rubiger & Hurbis-Cherrier, 2013; Proferes, 2018, to name a few) while more and more research has been done on CVR in the last few years (Brillhart, 2015; Mateer, 2017; Passmore et al, 2017; Pope et al, 2017; Gödde et al, 2018; Probst et al, 2021, among others) there is already some theoretical ground to help establish some of the key differences between the two media.

Probably the first big difference regards framing. In films, "all aesthetic decisions concerning shot composition begin with the dimensions of the frame." (Rabiger & Hurbis-Cherrier, 2013:155) Framing constitutes the tool to create the basic expressive unit of films and, thus, the primary unit in filmmaking grammar. But in CVR, framing stops being a possibility. Even if the field of view of the VR viewer is constrained by the HMD itself, the expressiveness of the composition of the frame is lost because of the optical qualities of the CVR camera lenses

and because of the director losing the authority over the selection of the image. These two differences – the optical characteristics of the camera and the trespass of directorial agency – establish a radically different approach to the dramatic space between films and CVR.

While in films, "when we frame a shot we are representing a small portion of a larger environment" (Ibid:156), CVR is instead based on immersing the viewer into the said environment. The cinematic space is deliberately created through the relation between the shots that compose a sequence. This happens not only in terms of space; Images on the screen, "when combined in a sequence, give meaning that goes beyond mere words." (Proferes, 2018:4) The organization of shots in a timeline would be equivalent to the organization of space in time: "These shots are a development of the continuity system insofar as they are overlapping portions of a single space and only making sense in relation to one another. That is, they are used together to create a consistent spatial/temporal order." (Katz, 1991:121) Katz also explains that it is this "narrative logic and the visual connection between shots" that create a sense of continuous space. (pp.121-123) In other words, the perception of space in films is generated by how this is organized and presented in time, through montage, as a synthetic narrative unit: "Film commonly abridges space as well as time in the interest of narrative compression." (Rabiger & Hurbis-Cherrier:154)

This narrative capability has allowed films to "lie" about the relations between characters and space. It is also fundamental to note that framing is most often determined by the description of the human figure. In this sense, even wide, landscaping shots tend to be determined by the role the characters play in such a setting, which is usually presented through the relationship between a wide shot and a subsequent tighter shot that introduces the character – or a similar arrangement. The "lie" occurs when the location and the character are not actually together but are made to appear like they are. For instance, a wide shot of the Arizona desert could be followed by a shot of the street in a small town built in a set in California where the character goes into a saloon. In the editing, this spatial dissonance becomes irrelevant, as the truth is that in films "the subject is never separated from the location in either the narrative or the pictorial sense. The subject of a shot is often the subject *and* the location taken together, each informing the other and creatively inseparable." (Katz:239)

A second key difference between films and CVR has to do with the properties, characteristics, and even the role of the camera as an expressive device. This is very related to the previous point since it is the camera that allows framing. But the role of the camera in filmmaking extends beyond framing, making it a very versatile and complex creative instrument. Proferes describes at least six expressive variables that the film director must consider in relation to the camera: Angle, image size, motion, depth of field, focus, and speed. (p.36) Most of these variables are severely altered when working with a 360º camera. For instance, those related to framing, like angle and image size, disappear; motion is still a challenge that could be developed; depth of field, focus, and speed tend to be technically

determined by the properties of the lenses (CVR cameras can have a variable number of lenses, which affects the optics of each device) reducing the cinematographic range of possibilities that are commonly available for filmmakers.
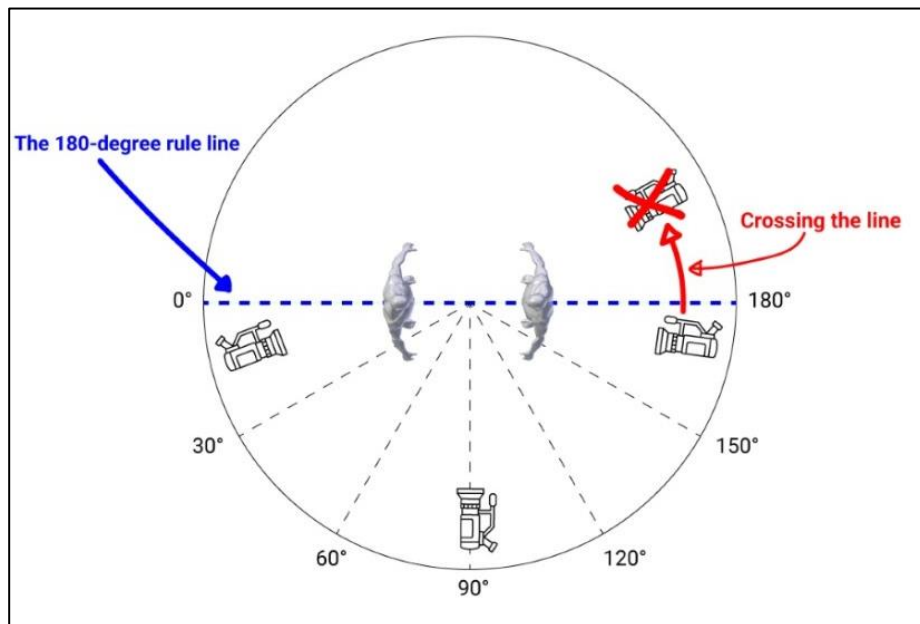
Fig.4: Illustration of the 180 degree rule, or line of action. It shows how the line of action is drawn between the eye-lines of the subjects, a line that determines the space that can be covered by the camera. It also shows how crossing this line alters the spatial relation between both subjects and of the camera.
Source: https://filmdaft.com/understanding-the-180-degree-rule-in-media/
(last visited 15th June 2021)

A third key difference is how the camera relates to the narrative space. It has already been established that in films this space is created through montage. However, in order to generate the narrative relations between shots – fragments of space – the director must create these by placing all the elements required in the production: camera, actors, stage, props, etc. There are standardized rules that are generally followed in terms of how to place the camera. It is understood that "no matter what you are shooting, the space before the camera has limits within which the action of the scene is confined." (Katz:229) These limits are not only determined by the frame, but also by the geometric relation between the camera and subjects that are being filmed. As Katz states, "to a large extent the spatial relationship of subject and environment is determined by the camera angle." (p.239) Camera angles are key to follow the characters, and "following the subject is the goal that many filmmakers consider primary." (Ibid) Being the camera is the means of transference by which the viewer becomes a witness, its relation to the space and the subjects must help the viewer makes sense of the space. The most common way to achieve this is following the *180º axis rule*, also known as *line of action*: "The 180-degree rule deals with any framed spatial (right-to-left or left-to-right) relationship between a character and another character or object. It is used to maintain consistent screen direction between the characters." (Proferes:4) In other words, a line is drawn across the subjects that take part in the scene; this line separates the space between where the camera should be in order to keep the geometric sense of space, as is illustrated in fig.4. There are

other similar rules, that can also get more complex and complicated as the *mise-en-scène* gets also more complex itself – more subjects, more actions, displacements, movements, etc. – and the blocking requires the director to cross the line, or to generate new lines, as long as it serves the expressive and narrative purposes of the piece. As Proferes says, "it is possible to *cross the axis* with impunity as long as we keep the audience constantly apprised of where the characters are in relation to each other." (p.6)

These fundamental and specific relations between the camera and the space don't apply to CVR. The 360º camera is technically more constrained and less versatile, having limited flexibility in terms of focus, depth of field, and speed. However, more than in its technical characteristics, the expressive qualities of the 360º camera seem to rest in how the elements around it are organized and in how they are related to the camera as a perspective. In this sense, there are two key concepts that are necessary to take into account: blocking and point of view.

Blocking can simply be defined as "moving and positioning actors and camera in relation to each other." (Rabiger & Hurbis-Cherrier:255) It also considers any other element that is relevant to the expressive purposes of the shot, like props, locations, etc. This concept is also used in theatre, meaning more or less the same, but instead of the camera, taking into consideration the stage, the audience, the venue, etc. The action of blocking can simply consider placing the actors in front of the camera – or on stage – but in it lies a potential to enhance and enrich the characters and elements included in the action. As Taylor said, "every word in the play will be said in some sort of action, and the way the words are said, even what they mean, must be modified by whatever that action is." (1996:125) Taylor refers specifically to theatre, but his statement can also be applied to filmmaking, where the meaning of a scene as it is written in the script can be modified by how it is blocked.

Perspective "determines *who* the viewer identifies with." (Katz:267) This is different from framing, which usually determines the level of involvement viewers have with characters on screen, but "are closely related and nearly always work together in any sequence." (Ibid) Films borrow from literature the terminology by which it understands the main three types of point of view: First-person, where we see the world through the eyes of the character – from a subjective perspective; Third-person Restricted, where the action is observed by the viewer as an ideal witness; and Omniscient, where the viewer has a holistic comprehension of the dramatic actions.

Chilean film scholar Vera-Meiggs (2010, 2013) adds more detail to these categories, identifying five different narrative points of view in films:

- Omniscient: As defined by Katz, most common in epic sagas, such as *The Lord of the Rings* trilogy (2001, 2002, 2003), *Lawrence of Arabia* (1962), or *Schindler's List* (1993);

- Third-person Distanced: A privileged viewer, at the same level as the characters, that witnesses the action from a dispassionate perspective, more involved with the actions than with the emotional development of the characters, most common in detective stories, adventure films, or whodunnits, like *Knives Out* (2019), or *Ocean's Eleven* (2001).
- Third-person Participative: Also a privileged, character-levelled viewer, who has a closer emotional engagement with the main characters, most common in coming-of-age stories, dramas, melodramas, or noir films, like in *Stand by me* (1986), *The Shawshank Redemption* (1994), or *Sound of Metal* (2019).
- First-person Indirect: The viewer witnesses the dramatic action sharing the character's subjectivity, seeing the world coloured by their gaze, but not directly from their eyes. This is common in films – or sequences – where events are not presented as objective or factual, but rather as subjective interpretations of such events, like in *Rashomon* (1951), *8 ½* (1963), *All that Jazz* (1979), or *Fear and Loathing in Las Vegas* (1998).
- First-person Direct: The viewer gets to see the world from the character's eyes, being possible or not to share their subjectivity. For Vera-Meiggs, this is more a technical category, that is rarely but purposedly used in films. This can be seen in the opening sequence of Fellini's *8 ½*, *The Russian Ark* (2002), or *The Blair Witch Project* (1999).

Proferes also makes a distinction between the subjective camera and the point of view shot. For him, the latter is "an *approximation* of what the character is seeing" and "contains the dynamics of the spatial relationship, thereby conveying an awareness in the audience that this is indeed what the character is seeing, but there is no shift in the voices." (p.37) On the other hand, a subjective camera allows the audience to "participate more fully in the *interior life or perceptions* of the character," (Ibid) allowing to see not only what the character is seeing, but what they are experiencing.

These points of view are versatile and films can use many of them – although not simultaneously. Alfred Hitchcock was particularly skilled to jump from one point of view to another, like in the scene in *Psycho* (1960) where the camera tracks Norman Bates to then take a non-human, high-angle position from the ceiling, or the famous shot from *Notorious* (1946) where the camera starts from a wide, high-angle shot of the crowded party, to then tighten the frame to a close-up of the keys in Alex Sebastian's (Claude Rains) hand.

Vera-Meiggs and Proferes' distinctions of first-person point views are very relevant when it comes to CVR, VR, and immersive storytelling in general, since the viewer gets to be transferred into a virtual environment and many times to embody a character, with whom they are expected to engage in different ways depending on the piece's purposes. This is a key characteristic of CVR, which separates it from the broader uses of point-of-view in film narratives. Narratives perspectives on VR have been only superficially explored so far, which only leaves the option to try to apply known concepts and methods from other disciplines, such

as literature, theatre, and filmmaking. Getting to understand how they work requires the acknowledgement of the conditions that define the relation between narrator and user. Since the user isn't separated from the *storyworld*, more distanced perspectives are, allegedly, more challenging to generate, reducing the scope of available points of view. However, the integration of the user in the *storyworld* comes to dynamize the possible narrative perspectives, by adding the second factor of embodiment into the equation. The presence of user in the immersive space can be embodied (or disembodied) in different ways, depending on the level of involvement in the story. While VR is characterized by facilitating a first person perspective, this can be subjective (determined by the subjectivity of a pre-written, embodied, character), objective (observes the world from an unaffected position, but still eye-levelled and acknowledged by characters and elements in the world), a ghost (eye-levelled and disembodied, unacknowledged by the world), or a fly-on-the-wall (an disembodied observer that can take unhuman positions, like flying), possibly among other types of presence.

These forms of embodiment are also combined with different types of narrators, like the ones categorized above. For instance, it would be possible to have an user embodied as an objective observer that also listens to an omniscient narrator, or an invisible observer – a ghost – that nonetheless follows a third-person narrator that belongs to the diegetic world – and so on. Some of these combinations are less feasible than others (a subjective presence with and an omniscient narrator seems tricky, to say the least) but the existence of these variables certainly dynamizes the possibilities for narrative perspectives in VR.

Blocking for CVR is also drastically affected by these complexities, and also by the impossibility to frame. Like in films, blocking must consider the camera, but its approach to the space is completely different. While the film camera gets to select fragments of space to be assembled together, the 360º camera unveils the space as a whole, placing the viewer not only in the camera but in the space.

2.7   ON CVR'S DEVELOPING GRAMMARS AND PRACTICAL APPROACHES

Without the ability to frame, immersive narratives must develop and rely on other methods to capture the viewers' attention. The notion of guidance is one of the keys to immersive and interactive narratives. It has been recently used to study how users behave in immersive environments with narratives purposes. (Gödde et al, 2018; Nielsen et al, 2019; Speicher et al, 2019) It is determined by the organization and disposition of the elements surrounding the camera – blocking – while the camera is in most cases left fixed at a point in the space.[1] Guidance is where blocking and environmental storytelling converge, the exercise by which the

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[1] This is not to say that camera movements are not possible in CVR. However, as a medium which practices are still in development, camera movements do suppose a challenge to explore the potential of immersive video.

director/designer uses the space to guide the user, with the objective of having a story being told.

VR and CVR are intrinsically interactive media. Indeed, "in the most traditional sense of the term 'cinematic', audience interactivity and agency are not included, which creates the need to redefine the term" (Zöllner & Jürgnes:3) within CVR. This supposes a first big challenge for filmmakers, since the technical characteristics of the camera don't only change the recording methods and the approach to the camera, but also how what is filmed relates to the user. The audience is reduced to one individual viewer, who gets to participate in the curation of the content. While in most traditional cinematic practices the film camera behaves as an extension of the eyes, in CVR becomes the extension of a whole self that doesn't necessarily limit themselves to observe.

There are still some cinematic qualities in CVR, and some of its characteristics are clearly distinguished from digitally created VR environments and interactivity. According to Mateer, one of the key differences between CVR and VR is that the former "limits the level of control users have within the environment to choosing viewpoints rather than interacting with the world itself" (2017:14), stating that "the inability of users to actually interact with elements contained within the virtual world is the primary difference between the two media." (Ibid) He then defines CVR as "a type of immersive VR experience where individual users can look around synthetic worlds in 360º, often with stereoscopic views, and hear spatialized audio specifically designed to reinforce the veracity of the virtual environment" (Ibid), and he notes that "CVR uses pre-rendered picture and sound elements exclusively" (p.15). Here, Mateer defines a technical frame in which CVR is developed, although he doesn't deepen in the definition of interactivity nor explains which elements of the *story* is the user expected to interact within an immersive environment, leaving both concepts relatively unsolved. Nevertheless, it is in these limitations where possible opportunities lie for the development of interactive storytelling in CVR. According to Mateas' Aristotelian approach on interactivity, "the only actions available are the actions supported by the material resources present in the game." (p.3) This principle is certainly possible to be applied in media different than video games, as long as we define and enable the right material resources within the capabilities of the media.

First, the incapability of current CVR technology to interact directly with the *storyworld* establishes a big constraint, but provides a framework to interact with other elements of the story. It's true that it seems impossible to affect the pre-rendered *storyworld*, but it is still possible to take a step back and affect the narration, or *siuzhet*; the way the story is to be told. As Mateer points out, one possibility is to alternate between viewpoints, which is a more structural component of the narrative. Despite the observer's position being fixed in a point, CVR still offers the choices related to following actions and characters in an immersive space, and supposes the possibility of alternating the viewpoint between different events that affect different characters; the user can choose to witness the story from "over the shoulder" of one

character at a time – a rather distanced perspective that allows just a fractioned part of the overall story and hopefully an emotional engagement with the character without embodying them.

Secondly, as it has already been commented, the approach to blocking for CVR must consider the user as a presence within the immersive environment. This doesn't necessarily mean the user constitutes an organic part of the *storyworld* – which depends on the type of story that is being told – but rather establishes the ground on which the blocking will be designed. Studies like those made by Pope et al (2017) and Probst et al (2021) have approached the challenge of blocking in CVR with the use of proxemics and a versatile use of distances from the point of view (viewer or user) for expressive purposes. The term proxemics was coined by Edward T. Hall in the 1960s and describes the social and personal space and how people perceive them. (Probst et al, 2021:1) The use of proxemics would help to solve the impossibility to frame, as "methods as shot sizes can be applied by choosing the right camera distances." (Ibid) Their approach follows the principle that "shots are scaled to the subject and related to one another proportionately," (Katz:121) which is adapted into the notion that proxemic distances "have similar meanings as shot sizes in filmmaking: extreme close-ups are used for intimate situations and full shots for a person in a greater distance." (Probst et al:1)

Probst et al propose certain grammars based on the distance between the point-of-view and the subject/object in the immersive space. From closer to further, these would be divided into circular regions that surround the POV: (1) intimate distance, (2) personal distance, (3) social distance, and (4) public distance. Each of these regions has its own functionality:

- intimate distance: embracing, touching or whispering,
- personal distance: interactions among friends or family,
- social distance: for interactions among acquaintances,
- public distance: public speaking. (Ibid)

These spatial relationships would not only serve for narrative purposes, but would also affect the sense of presence in the users, to the extent that too much closeness – characters positioned in the intimate distance – can generate aversive reactions and the feeling of being invaded. In their research, Probst et al found that different distances seem to be more comfortable than others, and that they can contribute to creating different types of relationships between viewer and subjects:

> The participants rate their sense of presence as having the highest for the personal distance and the lowest for the public distance. For comfort, the personal distance was assigned the best score. The test subjects felt least comfortable at the intimate and public distances. For the last question, the participants were asked to assess for themselves which video they were most attentive to. As with the other two categories, the personal distance was again rated the best. (Probst et al, 2021:7)

These two studies show that the use of proxemics has similar effects on users as shot sizes, and that they can be used for expressive purposes according to the narrative purposes of a story.

Thirdly, spatialized soundscapes can be used beyond their main goal of creating an even more immersive environment, and using them in a more dramatic fashion, similar to the use of sound in traditional cinematic formats. It is true that one of the primary challenges of VR and CVR is to manage spatial storytelling and guide users through it. Like Zöllner and Jürgens say, "with a 360° surrounding, content creators must offer interesting visual components no matter where the viewer looks. This opens up completely new ways of how to construct visual narratives" (p.8). Yet, the creation of dramatic soundscapes must be considered for such dramatic purposes. The use of sound could help to redefine the use of *off-screen* dramatic actions in a medium without a frame, like VR and CVR. It should be possible to use techniques like non-diegetic sounds and different relations between image and sounds – complementary, supplementary, parallel, and counterpoint – to create dramatic effects.

Finally, CVR's conditionality to use only prerendered assets – which determines its inability to affect the *storyworld* – is not a deterrent to being understood and used as Object-Based Media: media with the capability of reconfiguring itself by manipulating determined packages of assets within a content. Prerendered assets fit within this model as long as it is possible to manipulate them to affect the experience, in this case, the narration. While the *storyworld* is contained in pieces within the assets, OBM allows reconfiguring them, reshaping the experience depending on the conditions defined by the author. In this case, while the spatial environment is fixed, the same space can be experienced through several sound assets.

2.8 DEFINITIONS OF INTERACTIVITY: TRANSPORTATION, DISTANCE, PRESENCE AND SUSPENSION OF DISBELIEF

There are certain specific notions worth considering in order to have a deeper understanding of both interactive and immersive narrative, and how they meet each other in some media, like it is the case of CVR. These refer mostly to the conflict presented by the inclusion of the user in the narrative, moving away from their passive role as the receptor of the story. Specifically to CVR, the transportation into a virtual environment supposes an alteration of the distance between user and story, a sort of displacement into the mechanics of storytelling.

This displacement frequently generates a conflict between the character and the plot. Interactivity in virtual reality places the narrative's weight on the character – therefore, on the user – and over the plot. Mateas proposes a neo-Aristotelian theory "in which the roles and limitations of the user could be represented as a character in the drama". (Louchart & Aylett, 2001:508) This position presents a problem; as the authors point, "the dominance of plot

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requires mechanisms to force the user back into the desired action sequence without making this so obvious it breaks the sense of presence." (p.509) This also affects the emotional immersion within the characters' own world: if the interactive narrative strategy is focused on the character, as Mateas proposed, it would facilitate immersion into the virtual environment and provide more control over the character's perspective. However, on the other hand, less attention to the plot could undermine the emotional immersion, assuming this as one of the core objectives of a story.

The classical Aristotelian theory doesn't sacrifice one for the sake of the other. Aristotelian drama is defined by the principle of *distance*, through which we contemplate a story and identify with their characters through two core emotions: fear and pity. Let's remember that, according to Aristotle, the fundamental goal of drama is to learn. In this sense, the elements of Aristotelian drama are aligned for that goal: spectators identify themselves with the characters through the emotions of fear and pity so they can evolve emotionally to the point of catharsis, which culminates the process of organic learning. All elements are equally important, balanced, and complementary in order to achieve this.

Henceforth, according to the Aristotelian approach, the challenge for interactive and immersive storytelling remains in how to break the requirement of *distance* during the immersion and maintain the remaining elements of drama

To approach this challenge from a practical perspective, there are some key principles that must be taken into account in the production of virtual reality stories, focusing on CVR. These are *transportation*, *presence,* and *suspension of disbelief*. Transportation is defined as "absorption into a story (entailing) imagery […] and attentional focus" and an "integrative melding of attention, imagery and feelings" (Green & Brock 2000:701). Katz talks about the similar concept of transference, which in film is produced when the viewer "finds the images on screen more real than the space in the movie theater." (1991:240) In this sense, a person who is transported might be "less aware of real-world facts that contradict assertions made in the narrative" (Ibid) and may "experience strong emotions […] even when they know the events in the story are not real." (Ibid) Mateer also comments that transportation "is not unique to medium or genre and requires that the recipient be able to develop a compelling mental model of the narrative world and circumstance, including knowledge of character of subject." (p.17)

Presence would be how we "assess the level of transportation into VR." (p.19) It is defined as a state when "our awareness of the medium disappears." (Biocca, 2002) Heeter provides three definitions of presence: Social presence, in which other beings in the world react to you; Environmental presence, in which the environment reacts to you; and Personal presence, in which you as a user feel immersed in the VR world thanks to veridic stimuli and "sounds and images in the virtual world respond like the real world to your head movement." (1992:263-264) He also notes that only this last definition applies to CVR, since this media only works with pre-rendered assets. According to the structural concepts of this project, all

definitions apply to elements of the *storyworld*, yet, it would possible to affect environmental presence for dramatic purposes in CVR, through the manipulation of elements of the narration.

Finally, Colridge defines *immersion* as a "willing suspension of disbelief" – when a participant is immersed in an experience, they are willing to accept the internal logic of the experience, even though this logic deviates from the logic of the real world. (Mateas, 2000:1). This, of course, is closely related to what has been exposed about threshold objects, and how the design of the interaction must consider the devices that allow the transportation, in order to, at least, avoid device-motivated interruption of the disbelief.

2.9 ON THE NOTION OF GUIDANCE IN INTERACTIVE FILMS

Interactivity requires a key element: The user's engagement, which is produced once the narrative gets the user's attention. If attention is lost, then also is engagement, thus, interactivity itself vanishes.

The problem of attention is not really new in terms of storytelling. The first challenge of every narrator is to get their audience's attention, and then fight to keep it. In films, for instance, this is achieved through a number of techniques that include composition, eye lines, framing, conventions like shot-reverse-shot, tracking, and many more – some of which will be reviewed later in this chapter. In immersive media, however, calling the viewer's attention has a different dimension, under the premise that the user's received agency also grants them more possibilities to get distracted. Immersive media is interactive; it intrinsically relies on a minimum level of interactivity since, differently from screen narratives, it is the user the one who chooses where to put their attention, in a sort of an exercise of participatory editing. And this is particularly present in spatial storytelling, which is based on exploration, hence, users are encouraged to consider many simultaneous narratives. This is not only a challenge for filmmakers, but also for film spectators, who can often find themselves left "uncertain about how to read the 360 scene" (Passmore et al, 2017:8) and in instances when they are "not sure of where they should be looking." (Ibid:7) Yet, it has also been noted that users are fast learners, and that "they soon developed strategies which involved such things as scanning for focal points of interest, and making judgements about when it was OK to look around." (Ibid:8) This is particularly interesting to this research, since it makes it possible to hypothesize that, as we did with film language, we can learn to read a CVR language based more on organic and instinctive elements than on explicit instructions.

Consequently, interactivity in CVR presents very specific challenges in terms of capturing and keeping the user's attention and, by doing so, an engagement satisfactory enough so the intended story can be told (by users themselves). As noted by Nielsen et al, one

of the challenges lies in the narrative coherence of the interactive exercise, as they note that CVR lacks the cinematographic grammar to create a storyline:

> This inability to control the audience's attention naturally poses a problem when one aspires to create a coherent narrative since coherence is contingent upon "careful selection and presentation of actions whose causal and temporal relationships highlight an underlying plot" [Young 2000]. In relation to cinematic VR, the filmmaker can no longer rely on cinematography to show the audience the building blocks of the plot since the camera is identified with the user and no longer is under authorial control [Aylett and Louchart 2003]. (2019:229)

This intrinsic limitation of VR defines the challenge of how to provide guidance: How to offer the user a determined range of possibilities while also avoiding unnecessary distractions that could undermine the whole shared storytelling exercise. A paradox of VR is that it seems that its full potential lies in the capacity offered by a wide range of view, which also allows distractions and the temptation of navigation. In the ongoing process of exploring possible grammars for a CVR language, some practitioners lean towards one or other tendency: To concentrate the action in one section of the immersive space, or to make use of a wider space surrounding the user. As Passmore et al note in their article about 360 cinematic literacy, CVR director Jessica Brillhart "considers that there should be action going on all around the viewer, for which she developed the Probabilistic Experiential Editing; whereas Jaunt (a VR developer) generally recommend the main action should usually occur within 150 degrees in front of the viewer" (2017:1) Taking the visual range in consideration, Nielsen et al typified at least three broad, not mutually exclusive, options to manage guidance from a narrator's perspective:

> 1) progression of the story is halted until the user's head or gaze direction makes it reasonable to assume that important events and objects have been observed; 2) the system dynamically presents events and objects within the user's field of view; and 3) the filmmaker uses cues to steer the user's attention towards relevant events and objects (e.g., using mise-en-scène and sound). (p.229)

It is especially important to identify the nature of the cues within the narrative not only in terms of their utility as a guidance tool. As Speicher et al note, "visual cues used for guidance are typically considered to be either diegetic or non-diegetic, which informs the manner in which these cues are rooted within the narrative" (2019:2) This definition can also be applied to acoustic cues, depending on if they are organic to the *storyworld* or serve as part of the interface.

Studies by Nielsen et al (2019) and Speicher et al (2019) explore the possibilities to provide guidance from within the narrative world in cinematic VR, in other words, encouraging diegetic guidance. For this, Nielsen et al discriminate between explicit and implicit cues: "Implicit cues are likely, but no necessarily contingent upon bottom-up salience, whereas explicit cues are likely to cause voluntary, top-down shifts in attention." (pp.229-230) By this

definition, most non-diegetic guidance corresponds to explicit cues, in the sense that attention is being explicitly being called by the narrator. There are several examples of the use of these notions in interactive films, that could potentially be translated into CVR. In *Black Mirror: Bandersnatch* (2018), for instance, attention is called every time a decision is to be made, a decision that is more motivated by the narrator than by the users that actually make it, resulting in top-down driven guidance. There are many examples of this type of guidance in cinematic interactivity, like *Five Minutes* (2014), *Choices: An Interactive Story* (2015), *Puss in Book: Trapped in an Epic Tale* (2017), and many others. Explicit non-diegetic interactivity supposes an interaction not with the *storyworld* but with the interface, and in some cases – like in *Five Minutes* – it is straightforwardly proposed as a game, in which interactions also become tasks.

Nevertheless, some explicit non-diegetic cues do not necessarily suppose top-down motivated decisions. *Possibilia* (2014) works in a way that allows the user to switch between several timelines of one initial situation without forcing the user to make such decisions, but rather suggesting and making the possibilities explicit. This is a particular case of bottom-up decision-making despite being based on explicit non-diegetic guidance. However, it is arguable that the interactive device still supposes an obstacle to narrative immersion, since the display of options can become a distraction. As Nielsen et al point out, explicit cues can be a reminder of the mediated nature of interactivity. (p.230) Yet, the access to many simultaneous timelines also supposes participation in the act of storytelling, which marks a key difference from top-down systems in which decisions are still very ruled by the author.
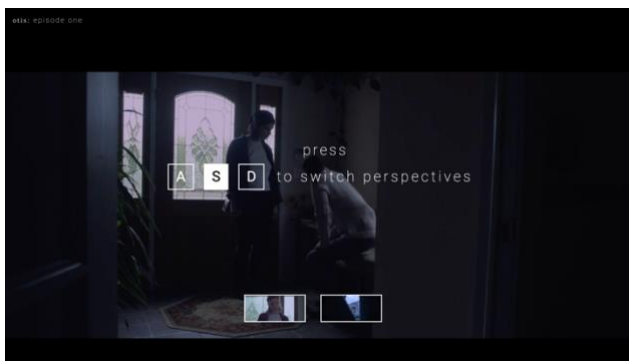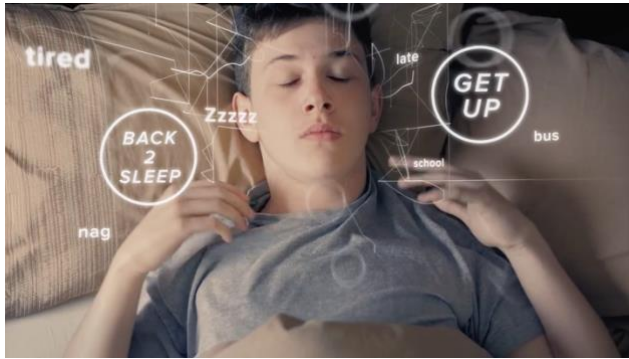

Fig. 5. Some examples of extra-diegetic guidance in cinematic interactivity. From top to bottom:
Choices: An Interactive Story (2015) Pace Media.
Possibilia (2014) dir. Daniels. Prettybird.
Black Mirror: Bandersnatch (2018) dir. David Slade. Netflix.
Otis (2017) dir. Casey Stein. Nukhu.

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Otis (2017) is a rather similar case. The short film directed by Casey Stein follows the perspectives of three different characters that simultaneously share the same dramatic situation. The device allows the user to shift perspective between the three by assigning one button to each. That way, anytime a button is pressed, we get to see one of these characters' plot. *Otis* is, in certain ways, the evolution of Mike Figgis' experimental film *Timecode* (2000) which had a screen split in four parts so that viewers could choose which one to look at. *Timecode*, however, had the hindrance of not offering options to discriminate one particular screen in any way, which could have made it confusing to watch, particularly in terms of sound design. What is interesting about *Otis* in terms of its interactive device is that it doesn't count with any non-diegetic interface between the *storyworld* and the viewer, like in *Bandersnatch* or in *Choices*, but instead, the device is limited to three buttons, similar to a TV switch. However, *Otis* doesn't offer particular guidance as to when users are more or less encouraged to make any decisions, other than the very moments in which characters meet and depart, which is different from *Possibilia* when every new timeline also suggests a new decision.

Holy Night (2019), also directed by Stein, uses the exact same device as *Otis*, but with a key narrative difference that the three plots never actually merge until the ending, when the merging is more symbolic than dramatic, in the sense that the characters/plots do not share any dramatic actions. This makes the plots considerably more disconnected than in *Otis*, where the shared events constitute the key beats in each plot and drive the story. In terms of guidance, there are two relevant aspects worth noting: On the one hand, a shared setting can help the user to place themselves in the story world, which also helps to avoid further disorientation. In *Otis*, all three characters start in different places of the same location, which is exposed to the user, while in *Holy Night* this never happens in a simultaneous way, having one key location that is visited separately by the characters. On the other hand, shared actions seem also relevant, since it provides dramatic orientation and serves as milestones in the narrative, before diverting characters after shared actions suggest a storytelling decision.

Most of these examples rely on explicit, non-diegetic cues, which are more suitable for on-screen media. There have been other experiments on interactivity that avoids explicit interfaces, attempting to erase the mediation between user and narrative. *Switching* (2003) by Danish filmmaker Morten Schjødt, was produced for DVD formats and presents a story that allows users to both jump in the timeline and the narrative space. It has three interesting characteristics: First, the user can switch back and forth time and locations at any moment they wish to. Second, the absence of an explicit on-screen buttons, making "the interface transparent" and film itself "a clickable object" (IMDB, 2003). It should be considered, however, that according to Murray's notion of threshold objects, the remote control used for navigation has the characteristics of an interface, even if it is not an on-screen one. Lastly, *Switching* has a circular narrative structure which repeats itself, hence, the story has no real ending and continues in its "circular universe" (Ibid). While not a key feature for the purposes of this

research, this is remarkable challenge to traditional Aristotelian structures, and shows how digital technologies facilitate the exploration of alternative narrative structures.

Immersive spaces, by allowing the user more direct access to the *storyworld*, also allow more direct access to diegetic cues. Speicher et al specifically focused their research on how much attention do users pay to different types of stimuli, both visual and acoustic, diegetic and non-diegetic. One of their key findings is that users welcome guidance, as it facilitates participation (p.8), while Passmore et al note that users tend to feel that navigation and exploration are facilitated by guidance "The ability to look around is linked to the users' certainty about what they should be looking at, and their attention to, and concentration on, story." (p.4) From then on, the question is what types of guidance are preferred.

Gödde et al identified five types of diegetic attentional cues in their study on cinematic conventions on CVR:

1. Gazes. Faces attract our attention (…)
2. Motion. Motion in a scene strongly attracts the viewers (…)
3. Sound. 3D sound is highly effective for guiding the viewer's attention. Mono sound sources can make the viewer search for the sound source. Sound is especially effective when combined with visual cues.
4. Context. The story itself can affect the expectations of the viewer and thus also his gaze. If there is anticipation that something is about to occur with a certain scene element, then it will most likely attract and keep the viewer's attention. By arousing and/or belying expectations, context-related cues can create suspense.
5. Perspective. The space and perspective can guide the viewer's attention. Just like in paintings, parallel lines are usually followed with the gaze to a vanishing point. Large, salient objects are usually tried to be captured as a whole. Objects very close to the viewer attract generally more attention than similar objects which are further away. (2018:5)

Brillhart has also taken timing into account, not as a stimulus by itself, but as an element that is necessary to consider when organizing the attentional cues and guide the viewer through immersive film that uses editing techniques and montage. She developed an editing technique she calls Probabilistic Experiential Editing, which aims to facilitate fluidity between cuts through the synchronic presence of relevant dramatic elements in the virtual space. In other words, "Element 1 is moving in the scene from left to right. The editor assumes that the viewer will follow element 1 with his gaze. After the cut to scene 2, the viewer is directly looking at element 2 (placed in the same spot where element 1 was before the cut)" (in Gödde et al:10) This requires quite a lot of editing choreography and, according to Brillhart, a very good understanding of rhythm: "understanding how long and why we stare at something before it

becomes too long. How much time do I need to reconcile a place before I decide that the Point of Interest is where I want to go?" (2015)

This understanding of timing is considerably more subtle than what is broadly advised by other authors, "to give around at least 20 seconds per shot for the viewer to orientate to the new scene, unlike traditional TV, where shots can be much shorter." (Passmore et al:3) Brillhart's notion of timing and editing precisely aims to avoid the need for orientation through hopefully instant recognition of what she calls Point of Interest, or simply put, "places in a scene where a viewer is likely to be looking." (2015) In this sense, timing lies on a swift and organic cut cued by the visual elements and their role in their surrounding environment. This does not mean that Passmore et al's advice is not worth following, but stated that it is possible to develop montaging techniques that could enhance CVR's inner qualities, instead of struggling against its limitations.

If we consider Brillhart's editing concepts, there is no reason why we couldn't also consider guidance tools to enhance the likeliness of it, understanding that "at least visual guidance is necessary if something is supposed to be seen by the viewer and not just by chance." (Speicher et al:9)

2.10   CONSIDERATIONS FROM OTHER STORYTELLING DISCIPLINES: THEATRE

Both Pope et al (2017) and Probst et al (2021) adapt the notion of proxemics from blocking in theatre rather than in filmmaking. While in films the space is a construction of fragments mediated by the camera and the editing, the feeling of presence that users experience in the immersive environment allows a more direct, less mediated approach to the space. It is true that there are experimental theories of montage in CVR (see Brillhart, 2015), but most of the dramatic actions still take place in longer shots that prioritize the reckoning and navigation of the virtual space.

In this regard, theatrical techniques seem to be a very appropriate approach to generate dramatic actions around the user/viewer, in at least two aspects that in films are mostly determined by the montage: The treatment of the space, and the treatment of the flux of the action. Certainly, both aspects have a lot to do with the movement of characters and other elements on stage.

Morrison (1984) compares the process of visualizing the theatre play to the one of visualizing a film, stating that, at least during this step, both disciplines have a common ground: "However much it may change or develop during rehearsal, the director has in his study gone through a process somewhat akin to making a film, telling a story through a series of pictures: sometimes a grand spectacle, sometimes a close-up." (p.80) Besides the key difference between live and recorded performances, this thought understands that there are moments in

the play in which the director might want characters to be closer or further to the audience, to establish different degrees of intimacy, in a different fashion and with different tools than in cinema, but with similar objectives.

One of the key challenges in theatre is, just like in CVR, to guide the viewer's attention. Morrison notes that the strategies used to direct the attention of the audience must respect the immersion in the storytelling: "As the picture must represent some degree of reality, these manipulations of the audience's attention must be unobtrusive." (p.81) This principle also applies in filmmaking, but its application differs from the tools used in theatre and immersive media, which is one of the main reasons to look at how theatre-makers approach blocking, and to see what can be adapted into the challenges of directing in immersive storytelling.

First of all, let's consider Black's five dimensions of the theatre director's labour, which can be divided into "three dimensions of the visual, physical reality; a fourth of movement in time and space; and a fifth of sound." (1991:111) These are:

1. Breadth, related to the stage geography; lateral positions from left to right,
2. Depth, also linked to stage geography; positioning nearer or further from the audience,
3. Height or elevation, when the stage or dramatic space has several levels, (p.114)
4. Movement, (p.119)
5. Sound. (p.124)

Of these, I am considering mostly points 1, 2, and 4. Regarding the use of height, there are interesting implications of this both in theatre and in CVR – Passmore et al (2017) include expressive effects of changing the elevation of the camera among their 360-degree video grammars – but due to the present nature of the project – as it will be described particularly in chapters 3 and 4 – I have chosen to prioritise the challenges regarding the other two dimensions of the space (breadth and depth). Sound, on the other hand, changes abruptly from a live medium like theatre to a recorded one like CVR, particularly considering that one of the key aspects of this project consists in the dramatic, non-naturalistic, acoustic intervention of the immersive space.
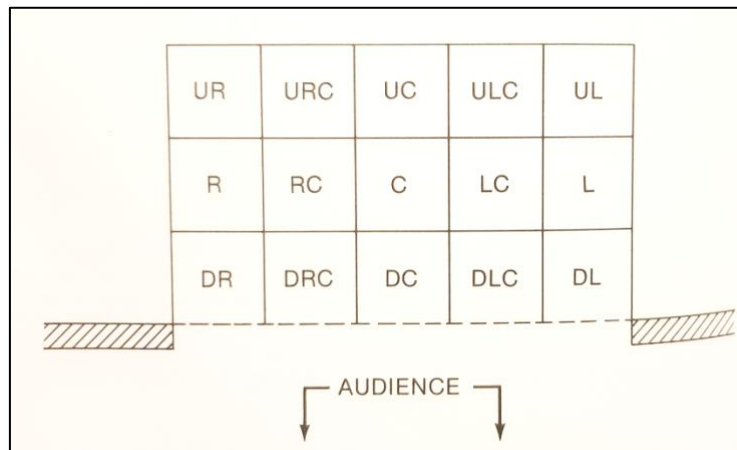
Fig. 6. Stage grid divided in 15 blocks as presented by George Black. The basic geography divides the stage breadth from Right to Left (facing the audience) and from Upstage to Downstage. According to Black, the strongest position in stage would be Downstage Centre (DC), while the weakest would be Upstage Left (UL). (p.112)

In terms of approaching the use of space, it is important to first acknowledge that "any part of the stage can be the point of focus, if the other characters on stage are clearly seen to be looking or listening – if the audience's eye has been directed there." (Morrison:95) This is a fundamental consideration towards understanding and using the dramatic space, that the dramatic space presents itself in full availability for expressive purposes. It is true, however, that there are some positions that are stronger than others, as Black argues in his understanding of the stage geography, where the stage is divided in a 15 blocks grid that determines the "relative strength positions" through the stage. According to this, the strongest position on stage would be Downstage-Centre, which is the closest to the audience and most central, following the principle that "the closer an object is to the viewer, the more emphatic is its position." (1991:113) However, while the stage has a predetermined geography, this can be manipulated according to the director's expressive objectives, and they can move the focus from one place to another.

Awareness of the geography of the expressive space – not only of the stage, but of every area that is meant to be used for this purpose – helps the director to make decisions on where and how to put the viewer's focus. This is the definition of blocking; placing and moving the action on stage to produce certain desired effects in the audience. In this sense, it is necessary to plan the blocking according to the stage geography and be aware of the different moments of the action. For instance, the entrance of characters into the dramatic space needs to be appropriate to the role of such characters in the moment of their entrance. As Morrison says, "entrances must be carefully positioned in relation to the audience: an upstage entrance provides an obvious strong entrance, especially if it faces the audience." (pp.93-94)

Characters' positioning on stage is not the only factor to determine their strength, but also how they are positioned: where and who they are facing, how much of their faces they show to the audience, from which angle, etc. Facing the audience or showing them the back

can change the focus: "The positions of the actors' bodies relative to the audience also affects emphasis and focus (…) When the actor faces downstage (full front to the audience), he or she obviously is in the strongest body position." (Black:114) According to Black, body positions in relation to the audience can be organised from strongest to weakest: Full-front, ¾ open, Profile, Full-back, ¾ close. (p.115) Following this, if a character is placed downstage, closer to the audience, but facing upstage to another character placed in the central row, who is facing the audience, it is likely that in a dialogue between the two characters, the focus will be placed on the character facing the audience, as they will be able to engage with their face. This example would be a rough stage analogue of an over-the-shoulder shot.

A more subtle example is the one used by Black himself. He notes that the dynamics or hierarchy on stage can change due to relative body positions: "When two or more actors occupy roughly equivalent stage positions (…) their relative strength is determined by their relative body positions." And he exemplifies that "when actor *A* is facing full-front and *B* is facing him or her in profile, *A*'s is the emphatic position, the actor in the stronger position is said to have *taken* the scene, the other to have *given* it." (p.116) On the other hand, when the actors' positions are equivalent, they *share* the scene.

Second to positioning, comes the blocking of *movements* on stage. These refer not only to the movement of the performers, but of everything that has some kind of visual effect on the stage. Black distinguishes between two types of movement: things that move *actually* – scenery, costumes, properties – and those that move *virtually* – lights, projections, etc. (p.119) Although most of these considerations apply to both types, for the purposes of this research, I am concentrating mainly on the former category. Movements drive the changes between different positions in order to vary the dynamics of strength are the essence of blocking in theatre. Like in films, it is crucial that these movements feel organic within the suspension-of-disbelief generated by the storytelling: "Movement on the stage is conditioned by theatrical reality: the actors are seen to best advantage whilst movement looks natural except in deliberate stylization." (Morrison:82)

Movement is one of the key elements to manipulate the focus of attention, as it tends to attract the viewer's gaze. This needs to be carefully taken into account, as it could produce undesired effects, such as stealing the scene from the main character in a particular moment of the play. While "movement on stage is immediately engaging; it is sometimes said to 'steal focus.' While this is not always the case (it may be the opposite, in fact), it is useful to think of movement as one of the most potent devices to attracting focus." (Black:119) This thought is complemented by Morrison's note about how "focus would seem to be more important than excessive realism, and movement must never seem fussy: the director's aim should be to have the minimum necessary moves." (p.95) The combination of movement and positioning across the stage grid can quickly move the emphasis from one character to the other.

Like with positioning, there are grammars of movement on stage that correspond specifically to the geography commented by Black – and that are detailed in his book. In this point, it is important to note a third key element of blocking on stage, which determines the *fluidity* by which movements and dramatic changes follow each other.

The fluidity of a play is related to rhythm and tempo, which, like in films, must be motivated: "The moves of a play make a strong statement, and must be motivated by a situation, relationship, or emotion: and the motivation must be discovered in the text, or must be in keeping with the action as a whole, and have some dramatic justification." (Morrison:81) At the same time, the lack of movements, or slowing their pace, can also produce significant expressive effects in the audience. Frenetic, spread movement would be more likely to generate confusion than focus. A constant, steady rhythm in the actions could generate a stagnant fluidity, despite being frenzied. Changes in rhythm and pace are also important to keep and manipulate the audience's attention, as they can produce variations in their emotional tensions and releases. In this sense, it is important to note that "in the theatre, action does not necessarily connote physical movement" (Black:54) meaning that the economy of movement and other devices can be just as effective to dramatic effects.

Morrison is particularly emphatic in saying that "only the text itself can reveal the tempo of a play." (p.107) According to him, the motivations for the actions – movements, positions, pace, and rhythm – must be found in the original text, otherwise they could feel unmotivated and be counterproductive for the purposes of the story. Based on the text's requirements, directors must be aware of the movements quality, shapes, tempo, and rhythm (Black:120) and consider movements like seating or standing, that affect the strength of the presence of a character on stage.

In order to be able to manipulate the fluidity of the play, Black makes a detailed description of the principles and conventions of stage movements (pp.120-121), where he characterizes:

1. *Single focus* or *emphasis*, when only one actor moves at a time,
2. "moving actor to cross *downstage* of another actor when *both are standing*" to emphasize the moving actor, (p.120)
3. Instead, when the stationary actor is seated, the moving actor crosses upstage,
4. Diagonal crosses are "inherently more dynamic than lateral or up-and-down stage moves" (Ibid)
5. "Straight crosses are generally stronger than curved ones, but curved crosses are more graceful" (p.121)
6. Punctuated moves are very emphatic: "A punctuated move is a cross that is broken, interrupted, or finished deliberately to coincide with a definite character impulse" (Ibid)

7. Pattern violations: "Any action that changes an established pattern is emphatic" (Ibid)
8. Counters: "Subsidiary move made by one or more actors to accommodate a more important move" "to support the principal physical action" (Ibid) and accommodate and *give* the scene.
9. Rhythm: It can be varied by changing tempo (or speed), shape (patterns movement), finish (softness or crispness), and quality (described in musical notation as staccato, legato, crescendo, etc.)
10. Open and closed turns, towards and away from the audience.

While most of these points refer to movements, not only the changes in timing, but also in the patterns and geometry of the movements have influence on the fluidity of action. The sudden change of a character steadily walking in a straight diagonal line across the stage, to a front walk directed to the downstage centre can produce a powerful effect in the audience and a change of focus. This is just a small example of how the fluidity is conditioned not only to the speed of actions and the manipulation of time – as it happens in films, according to some of the most influential montage theories and ideas, such as Eisenstein's and Tarkovsky's – but to great extent to the manipulation of the space. As stated, this constitutes a key similitude between theatre and CVR, as space appears as an expressive element that ought to be manipulated for dramatic effect. This differs from cinema, where space is mostly constructed by the editing, thus, appears to be subordinated to the manipulation of time.

The understanding of these key differences and similitudes might have a significant influence in the exploration of directing in CVR, which appears as a medium that, at least technically, can convey some aspects from video and others from theatre, particularly in terms of the relation between time and space, and how these could be manipulated.

2.11 CONSIDERATIONS FROM OTHER STORYTELLING DISCIPLINES: VIDEO GAMES

The world of video games has contributed to a very large extent to the development of interactive storytelling techniques and experimentation, and even more so when we take digital technologies into account. The video games industry has become one of the largest money makers around the globe and has set certain workflow standards when it comes to the design and writing of interactive stories, which involves certain considerations that are not present in other storytelling disciplines, and that refer particularly to how to include notions of interactivity in the craft and the standardized workflows.

It has already been stated that interactive stories don't tend to unfold unless they count on the user/player's input. Their design is strictly centred on this requirement; they are made so that players can *do* things: "Players blast enemy aliens, solve mysteries, race cars, and many other things, all of which require their input. Storytelling in games should involve a part of that input, either with the story itself being interactive or working with the interactive nature of the

gameplay." (Ince, 2021:9) This would be the foundational stone of interactive narratives, since from then on, the possibilities start to multiply. There can be many different ways to interact, which means there can be many different ways of including the user's input in the narrative. There should be, however, a tight relation between the game's nature and the type of story – similarly to what occurs with the use of different narrative perspectives and different genres. As video game writer Steve Ince notes, "the story must fit with the nature of a game's particular approach to interactivity (…) The approach to storytelling that works perfectly with one type of game may not work at all for another kind." (ibid:16)

As emphasized by Crawford (2005), a good part of the narrative engagement in video games lies in the relevance and quality of the decisions players must make. Ince (2021) goes more in detail regarding different types of choices, and how not only they affect the narrative, but also how each type of choice might suit a certain type of story better – or a moment in a story – and the type of engagement to generate in the player through them. He identifies seven types of choices:

> Moral Choice – These are the kind of choices where you are given the chance to do the right thing or not. For example, do you back up your friend when you know he's lying or do you tell the truth?
> Action Choice – These are choices between different courses of action. Such as, do you try and jump on the departing train or leap in a car and try to get to the next station first?
> Desire Choice – These are usually in the form of which things a person prefers. For instance, do you want lemon jelly or strawberry jelly?
> Worth Choice – How much is something worth to you? For example, if you're trapped at the bottom of a well that's filling with water, which is the more valuable – a case full of money or a rope that will save your life?
> Exploration Choice – These are choices that allow you to explore your environment. Left, right, north, south, open the door, climb the wall, etc. Making these choices will usually lead to new locations.
> Investigation Choice – Choices of this nature are those relating to finding clues or information. Do you talk to one character before another or vice-versa? Do you threaten someone or try to persuade them?
> Significant Choice – These are choices that have a long-term effect, perhaps through the whole of the game/story. For instance, if you break a family heirloom to get the key that's inside, your father may never speak to you again. If you find some other way to get it out the relationship remains good but you may have wasted precious time. (48-49)

A second key point is related to the effects these choices have in the story, which is generally traduced into changes in the structure. Branched structures are one of the most common approaches to interactive storytelling, and they suppose a challenge for writers as it is often hard to keep them under control and consistency. In fig.7 we can see three models – out of many, many more – of increasingly more complex branched structures. We can observe how, on the one hand, they still respect the regular convention of the three acts most commonly used by storytellers across disciplines and that unfolds itself in a timeline, and on the other, how they clearly map the possible routes that user will be able to follow.
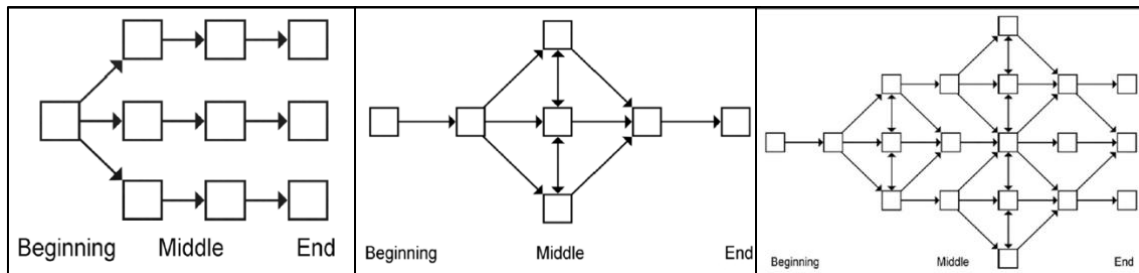
Fig.7. Different types of branching structures, according to Ince (2021). Each model demonstrates a type of structure that grows in narrative complexity. The first on the left (p.55) shows a story which structure is defined in the first part and divides into three, semi-independent stories. The second model (p.60) shows a controlled structure, in which decision resemble more of a maze, so that users must find the correct set of choices that will lead then to the ending. The model on the right (p.62) shows a significantly more complex structure that combines the two previous approaches.

Branching structures could be ever-expansive if, like in the first model, each decision would generate a new, differing branch, and could result in hundreds of possible endings. This "would be the ideal situation from a player's point of view – having complete control over the unfolding of the story – but the practicalities make it impossible to create." (Ince, 2006:51) More controlled branching, like in the second and third models, supposes a different challenge to the writer, but allows to keep the player linked to one main story arc, to develop journeys that can be similar to mazes, and to affect the extension of an act depending on the number of scenes – or *micronarratives*, as Jenkins (2002) calls them – that end up forming the act due to the player's decisions.

Certainly, managing any type of unfolding structure requires controlling the effects of the player's choices. Decision-making tends to be limited to a certain amount of possible choices, whether these are binary or from more options. Both Ince and Crawford emphasize that choices should allow the player to feel that their decisions matter, which means that the effects must be significant to the story and the characters. For instance, while usually binary choices tend to diminish the illusion of control, this can be avoided with significant, diverging effects.

A common tool to generate choices is the use of Boolean variables: "The best way to keep track of changes is to think in terms of true and false and use these values to switch on and off the things the players have seen or interacted with (...) Boolean variables have exactly this quality – they can only ever be true or false. If used in the right way, such a variable can represent almost anything you want it to." (Ince, 2021:66-67) Boolean variables allow the writer to build upon the

```
if(wilks_shooting == false)
{
    //Edwards launches straight into his first line of questioning with no pre-
    amble
    Edwards:      I heard that you witnessed the shooting.
    Wilks:        That so?    //Nervous, but puts on brave face
    Edwards:      Just tell me what happened!
    Wilks:        Get lost! I didn't see nothing!
    //Edwards looks angry – he should have handled it better
    wilks_shooting = true;
}
```

Fig.8. Illustration of a scripted dialogue for a video game. (Ince, 2006:76)

```
George is forced to distract the
hotel's desk clerk in order to get
the key to Khan's room, but when he
enters it he finds the killer is not
there.

There are a number of options now
available.

George can [[Hide]].

He can [[Call Nicole]] on the phone.

He can [[Call the Police]].

He can [[Sit on the bed]] and wait.
```

Hide

George hides in the wardrobe.

When the killer returns, George
bursts out, surprises Khan and is
able to capture him before he can
resist.

With the killer secure, George calls
Nicole to tell her the good news
then makes a call to the police.

Investigation complete.

Call Nicole

George uses the phone in the room to
call Nicole.

He explains that he's tracked down
the killer to the Hotel Ubu and that
his name is Khan.

Unfortunately, the killer overhears
this from outside the room and makes
his getaway.

George has failed to apprehend the
killer.

Call the Police

George calls the police and explains
the situation. They tell him they
are on their way and tell him to get
out of there.

He hears the killer at the door and
climbs out of the window and onto a
ledge where he is forced to wait
until the police arrive and arrest
Khan.

Sit on the bed

Because he's in this position, he's
unable to react quickly enough when
Khan enters and, on seeing George,
pulls out a gun.

The killer shoots him, gathers his
belongings and leaves.

George has failed to trap the
killer.

Fig.9. Illustration of a script for an interactive, branched narrative, from Ince, 2021:50-52

experience gained by the player through the navigation of the micronarratives, instead of just depending solely on the specific moment of the choice.

In terms of translating this into a script, scripting for video games or other interactive forms can differ from screenwriting formats used in films and television. Just as the story has to suit the medium, so should the format in which this is written. In the video game industry, for instance, scriptwriters have adopted elements from coding into their formats, mainly to adapt themselves to the language used by developers. In fig.8 we can observe how the dialogue is determined by the actions taken by the user/player: in the first line, it is stated what the conditions are, for Wilks (one of the characters) to avoid shooting. We can also see how certain elements from coding languages, such as brackets, curly brackets, equal signs, and semicolons are used according to the requirements of language. There are also elements like double slashes and italics that are used to add descriptions to the actions.

There can be approaches that are friendlier to the writer, as long as they consider decision-making and the consequences of those decisions into the script. In fig.9 we can see how the technical programming language hasn't been considered into the script, but instead, it has been somewhat adapted and simplified to make the options explicit. It also shows how each of these options unfolds independently of each other.

Just like in audiovisual industries (Film and Television, mainly), video games scripts are technical documents, written according to the technical requirements of the industry and/or the medium. Their main particularity is that these requirements can change more easily from one production to another, depending on the story, the design, and the playability of the game. However, there are still elements from the broader and universal discipline of storytellers that are applied, such as the use of acts, turning points,

character identification, narrative perspective, etc. Writing for video games uses the same raw materials as writing for other media, but approaches them with the tools that the medium and the industry require to make them work. This implies learning the technical language and the basics of how the story will be translated into the coding that forms the video game. This is mainly because making video games, like films, is mostly a collective enterprise, and requires the people that work in it to be able to communicate with each other efficiently. In this regard, a good part of the technical language used to write video games can be used for other interactive media, as it is based in computing languages and in similar principles, like already considering choices within the structures and the language.

Chapter 3

Creative Synergy:
Writing, Concept and Design for
Hands-off Interactive Cinematic Virtual Reality

3.1 INTRODUCTION

This chapter reflects on the creative process of writing a script for an interactive Cinematic Virtual Reality (CVR) story, titled *The Hunter & the Wolff*, an immersive, multi-plot adaptation of the traditional folk tale *Little Red Riding Hood*. This first stage of the project consists of its writing and design, two processes that have been interlaced, simultaneous, and have helplessly influenced each other. The part of the film production process that would normally be screenwriting became a symbiosis between writing and designing an interactive CVR model, where both pieces were specifically created for each other. This synergy arose as a need to approach the absence of a set of existing conventions for interactive cinematics in CVR. Moreover, the malleability of the medium allows the flexibility to constantly create and propose new formats and methods, such as is the case of this project. The lack of conventions also means creative opportunities to generate specific conventions for this project, that could hopefully be replicated by others if they prove to be successful.

This process has brought to surface the need to observe and reflect on how interactivity affects the craft of storytelling and how this craft should approach – and adapt itself to – the new conditions offered by interactive media. This project offered a good opportunity to approach the craft of writing from an experimental lens, and the availability to adapt and rise to the challenge of proposing a medium. This synergy is also why both creative processes are being assessed together.

The creative work has consisted in the simultaneous generation of two outputs: 1) an immersive, multi-plot script designed for the specific needs of 2) an immersive, sound-driven interactive CVR device, a design that aims to adapt cinematic blocking strategies and uses of sound to generate reactions and inputs in users, thus, to generate interactivity.

The questions leading this chapter are: How do we, as storytellers and screenwriters, approach writing for interactive media? How do we draw nearer to this new media capable of *reacting* to our audiences and allowing them to *change* our stories? To summarize in one question: from a storyteller's perspective, how do dramatic structures, systems, and strategies change when we have to consider the user as a dramatic element?

3.2 THEORETICAL FRAME AND CHALLENGES

Screenwriters and filmmakers have developed their narrative forms inspired by the traditional theatrical disposition and the fourth wall that separates the *storyworld* from the audience, that allows telling stories to a passive audience whose main commitment is to watch, listen and receive, restraining their participation to an organic receptivity.

In this traditional form, films – and later television – have become the biggest vehicle of stories of the 20th and 21st centuries. Film and television have transformed our ways of thinking and approaching reality and of telling stories and film language became the keystone of media literacy that is dominant and a given for most audiences in most countries in the world. Despite the attempts to break it and propose some kind of interactivity across history, the primary form of films, the one preferred by the audience and creators, remains the same. Precisely, this set of conventions is also at the starting point to explore and expand into other media and other narratives, particularly in the case of interactive narratives that don't count with such conventions, and that feed themselves from blending the boundaries set by other disciplines.

New, interactive technologies provide not one, but many ways for users and audiences to cross that screen, which now appears as a membrane that still separates the story from the real world but is thin enough to be permeated.

Then, how can we adapt our old, robust set of storytelling rules, that always considered the audience as a receptor, to this new context of fascinating interactive technologies and relations? As screenwriters, how do we adapt dramatic rules into cinematic interactivity? How do we push the boundaries of film conventions into interactivity?

Despite sharing a strong component of visual narrative, arguably inherited from film, interactivity presents a different landscape, where we find a different set of technological features that allow bilateral communication. Writing for interactivity must consider that landscape of technological intercommunication between author and audience. This has been the first main challenge of this research; to understand the technological possibilities, as well as its constraints and limitations.

A key idea for this chapter is the notion that writing for cinematic interactivity means writing for an interactive technology, for an interactive medium. Equally, writing for immersive media requires particular considerations that are unique to such type of medium. This, although seemingly common sense, is far from being exempt from counter-intuitive complications. The main challenge of working with interactive and immersive media is that it is still under design – and arguably, precisely because of its interactive nature, they might never be *fully* designed. This is different from cinema; despite its well-defined and established language, there have been several attempts for interactive films, but none have caught on with

the audiences. Yet, in this digital age, we seem to be witnessing the rise of new chances for interactive films and storytelling in general. For practitioners – particularly from a filmmaking background – interactive and immersive technologies feel like a brand new toy without much of a guidebook: we receive it with enthusiasm, we look at it and, at first glance, everything seems possible. But then its limitations emerge, both theoretical and practical. On the one hand, narrative theories haven't been approached consistently by developers, which have mainly been focused on the practical exploration of interactivity, of immersion, and sometimes in the combination of both. On the other hand, each medium provides a number of actions one can execute within interactivity, while also presenting specific boundaries and impossibilities. In the end, interactivity exists in a delicate balance between the set of activities allowed by the technological medium and the narrative objectives of the author. The interactive quality of immersive media transfers its inherent conflicts to these media as well. This is conflict determines our limitations as practitioners. This realization, although frustrating, is a huge relief, because boundaries help to set a framework: The landscape is not endless and overwhelming anymore, but rather defined. We know a little more about what we can and can't do. Hence, limitations bring opportunities. In the same way that early filmmakers developed a language within a frame and without direct sound, boundaries that defined film for the decades to come, screenwriters can explore the potentialities of the limitations of interactive technologies in order to tell stories.

Yet, what is the purpose of interactive storytelling? Plenty of literature approaches the topic of agency and the subject of immersion. Many researchers have been exploring how users can *play* – therefore *become* or even *embody* – the main characters of an adventure, which sets the mentioned paradox of interactive storytelling: the conflict between authorship and agency. Nevertheless, this particular creative project proposes that users do not necessarily have to be an organic part of the *storyworld* to interact with the story, but rather they can interact with the *narrative* – or siuzhet, the act of telling the story, as commented in the literature review. In other words, a model of interactive storytelling that allows users to tell themselves the story.

This idea is inspired by the dynamic of some analogue roleplaying games (RPG), particularly in one in which the main objective is precisely to tell stories. In *The Extraordinary Adventures of Baron Munchausen* (Wallis: 1998) players play storytellers, and the game itself consists of one player telling a story that is meant to be as fantastic as possible – in the fashion of the semi-fictional character in which this is inspired on – while the remaining members of the audience, all playing their own storyteller, are expected to interrupt the narration to add, correct or contradict details of the story, forcing the narrator to improvise and adapt their own story on the fly. It is an exercise in collective storytelling, a more narrative and more self-

conscious version of an exquisite corpse.[2] The game ends when everyone has told their story and the best one is chosen among the players.

There are two aspects of the architecture of this game that I find relevant to apply to an interactive storytelling proposal: First, it defies the binomial author-audience, which is what makes it interactive and makes it a roleplaying game. As in most RPGs, players are expected to have an initiative – or agency – and to exert it during the game, so it can affect the game master's (GM) original version of the story. It is also worth noting that the role of GM shifts from one player to the other as the game advances, also challenging the more traditional disposition of one GM and several playing characters (PG) inside one *storyworld* defined and commanded by the game master. Secondly, players do not play characters[3] but storytellers: they interfere with each other's stories from a narratorial perspective and not directly in the *storyworld*. Players do not affect the story from within but on the outside; they affect the way the story is being told. They can propose new characters and circumstances, but on a level in which it has to be bargained with the narrator and the rest of the audience. The story comes out as a result of a negotiation between the author and their audience.

This is an analog form of interactive storytelling based on the act of storytelling itself. It differs from other forms of interactivity – like most videogames – that are oriented to explore the notion of immersion into the *storyworld*, where players (or users) play characters and face the *agency vs narrative* paradox. In the case of *The Extraordinary Adventures of Baron Munchausen*, the story is the object of desire; it is the elixir, the treasure in the treasure hunting.

Challenging the dynamic between author and audience, and doing so by allowing users to participate as storytellers, is substantial element of this project, that is taken to propose a kind of interaction that works on a narrative level and is based on collective storytelling. In other words, facilitating agency on the narration instead of on the *storyworld*. This is what I'm calling *On-Narration Interactivity*.

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[2] The exquisite corpse, from the French *cadavre exquis*, is a creative method develop by French surrealists Yves Tanguy, Jacques Prévert, André Breton, and Marcel Duchamp in 1925, Paris. The technique consists on a collaborative collection of words and/or images that are assembled into one piece. Usually, each collaborator adds their part after only being allowed to see the last fragment of the previous part, but it can be adjusted to different set of rules.

[3] Actually, they do. Their own fictionalized characters are the protagonists of their own stories. However, characters do not necessarily meet within the stories and the game itself does not take part in the organic storyworld but in the narration.

3.3   HANDS-OFF AND LEANED-BACK

The proposal of an interactive CVR short film titled *The Hunter & the Wolff* started as an idea to take advantage of Virtual Reality (VR) to create a form of interactivity that wouldn't rely on using a control or remote, which was later identified as a proposal for a hands-off interaction model. Later it evolved into a project that involved several other relevant concepts, such as leaned-back interactivity, instinctive decision-making, spatial storytelling, object-based media, plot-driven interactive narrative, and on-narration interactivity. This chapter is the story of the core concept, of the incorporation and appearance of the secondary concepts that sustain the theory, and the story of how I, as a storyteller, attempted to approach interactivity for the first time.

Being a filmmaker and fascinated by the notion of interactive storytelling, the driving idea at the beginning of this research was to create an interactive cinematic experience, one that would use interactivity and give users some kind of agency but would still *feel* like a film. This intention introduced the concept of *hands-off* and *leaned-back* interactivity, that is, a kind of interactivity that wouldn't rely on a hands-on device as an interface to communicate with the medium or content. Hand-on interfaces are most common in video games and OBM, relying heavily on cellphones or similar devices to gather feedback from audiences and therefore use that data to affect the content. That is the case of *Accidental Lovers*, a Finnish interactive TV series broadcasted between December 2006 and January 2007, which relied on SMS messages to affect the story through audience polls (Ursu et al. 2008:128). Another reference from television is *The Truth About Marika*, a thriller produced by SVT, the Swedish national broadcaster, and The Company P, a production enterprise specialized in developing Augmented Reality Games (ARG). The overall design of *The Truth About Marika* is quite complex, since it had four narrative layers, from a linear television fiction drama (the least interactive) to a live-role-playing-game, in which users had to face real-life challenges proposed by the series' universe (the deepest level of interactivity) (Denward & Waern: 2008; Kocher, Denward & Waern: 2009). More recently, Netflix has released *Black Mirror: Bandersnatch* (2018), which became the first massively popular interactive drama. This episode is built in the form of a branched structure, in which the story will follow different paths according to certain decisions driven by the interactive device. Here, interactivity is provided by binary options that appear on the screen at certain times of the story. The story has several endings and it develops differently according to different choices, making it possible to watch it several times, becoming several stories in one. These experiences, despite being very interesting to study, require a hands-on and lean-forward kind of interaction in order to fully meet the authorial narrative proposal, which, from a traditional standpoint, felt too "gamey" for a cinematic experience.

There is, of course, a long theoretical discussion to rightly rebuke that last sentence, purposely delivered in a rather naïve spirit, to illustrate my initial drive. However, let's be clear to point that the kind of interactivity this project is interested in is indeed far from the

mentioned examples. As previously stated, as a filmmaker I felt intrigued by the prospect of creating a type of interactivity that would *feel* as close as possible to watching a film, or series.

This purpose meant identifying some of the characteristics of the act of watching a film, hence the already mentioned hands-off and leaned-back attributes. The former can be described by the lack of devices that require the use of our hands to communicate with the medium. Leaned-back, on the other hand, is defined by the least possible corporal actions to generate feedback, hopefully, in this case, laying back in a sitting position, like when we watch television. To illustrate the opposite we can see Michael Cavazza's *Madame Bovary in the Holodeck*, an interactive storytelling experiment in which users get inside a holodeck – a digitally mapped cube composed of many screens that react to the user's actions (Cavazza et al, 2007). This is an example of a hands-off yet lean-forward interactivity. Again, far from a more cinematic-feel-like experience.

A third attribute of the kind of interaction this project aspired to is related to the type of decision-making and, synergically, to the flow of the story. Most interactive stories require responses from the user or audience to continue, which affects the story's fluidity and its timing. Time is one of the key elements of traditional storytelling, and especially in film, which is said to be the art of sculpting time (Tarkovsky, 1986). Manipulating time creates tension and suspense, and allows to create an emotional engagement with the audience. The need for responses from the audience deprives the author of the manipulation of time, therefore it could affect the story's flow and its emotional depth. This will be more thoroughly discussed later, but for now, it is meant to illustrate the mental process that triggered my curiosity about the nature of the decisions users make during interactive experiences. Specifically, I wondered what would be the point of hands-off and leaned-back interactivity if the story will still pause when an action from the user is required? More cinematic interactivity would, in principle, demand a more cinematic use of time, differently from VGs or experiments like *Accidental Lovers*, which relies on the timespan between episodes to gather the data that affects the story. Cavazza et al describe that one of the points to improve in their holodeck was the speed of reactions to make it more "natural", or actually, more *dramatic* – understanding that in storytelling things are generally not natural, but dramatic. This is also consistent with Crawford's conditions for having good quality interaction, where the dialogical nature of interactivity relies on prompt responses from all parties involved.

A hands-off and leaned-back interactivity would require instantaneous reactions to avoid any interruptions and delays in the story flow. Therefore, decisions should be immediate, and rely not on a reflective process – there wouldn't be time for that – but on – the story itself must provide the kind of stimuli that would force the audience to make instinctive and immediate decisions.

3.4 THE SOLITUDE OF THE RED RIDING HOOD

The Hunter & the Wolff is an immersive adaptation of the traditional folk tale *Little Red Riding Hood*. This version is set in one location, Grandma's house, and has kept the five original characters: the Grandmother (Grandma), Little Red Riding Hood (Ginny), the wolf (Wolff), and the hunter (Hunter) while reducing the significance of the role of the mother. It is also set in a fragment of the tale, from the moment the girl arrives at her grandmother's home when the wolf is already there.

The main purpose of reusing a universal tale is precisely because of its universal fame and its easily recognizable elements. When attempting to try a new medium, an emerging technology, and a new way to deliver the story, it seemed reasonable to keep at least one element that might feel familiar to users, even if the story has been adapted.

In this sense, the aim was to keep a recognizable and familiar structure of events, even if the story itself has been adapted from its original meaning to explore other aspects of the characters. The overall structure adapted from the original is:

1. The wolf devours the grandmother before the arrival of the Little Red Riding Hood,
2. Little red riding hood arrives at her grandmother's house to take care of her,
3. She notices the old woman is behaving oddly, although she doesn't realize she is the wolf in disguise,
4. The wolf proceeds to eat the young girl,
5. Alternatively, depending on the version, both women are rescued by a hunter.

This adaptation aims to explore two aspects of the tale that differ from the original: first, the subjectivity of the grandmother as a main character; to observe and expose the feelings and emotions of an older woman who is considered by her own family as someone who needs to be taken care of. Secondly, the sexuality of both female characters; their approach to desire, the taboos, and permissions of their opposite stages in life – the grandmother's reluctance to become older and give up her appetites and the granddaughter's inexperience and fears towards accepting her appetites against fulfilling the expectations of the those around her (particularly her mother).

As for the male characters – the wolf and the hunter – they are meant to be portrayed by the same actor: an adult man, at an age just between those of the two women, who personifies the realm of manhood and represents the object of desire for the sexuality of both grandmother and granddaughter. This is meant to be one ambiguous character, who conveys the beast/prince duality of masculinity in fairy tales. The character is first seen by the women as good, as an object of desire, to then be revealed in his ruse, trying to sexually devour the two women.

This approach to the characters builds up on complexity. They've become more tridimensional and have different agendas. They depend on each other but want to be freed from each other. They are complicated characters. Which, if the story is kept in this direction, makes it necessary to make a strong effort on developing a simple, approachable plot that would allow users to meet and know the character's inner conflict quite transparently.

So, considering the structure described above, these have been adapted into:

1. The grandmother is having an affair with Wolff before the arrival of her granddaughter Ginny,
2. Ginny arrives at the grandmother's house to reluctantly take care of her,
3. She notices the old woman is behaving oddly, although she doesn't realize it is because of the influence of Wolff,
4. After breaking the grandmother's illusions, Wolff/Hunter proceeds to break Ginny's,
5. None of the women are rescued, instead, they have to, on their own account, make a decision to face their newfound state of solitude.

Comparing both structures, it's possible to see that points 1 to 4 of the adapted version correspond to the same points of the original structure, while the last point maintains the idea of the rescue of the two women, but instead of counting on an external third character (the hunter), they have to face themselves and decide whether to save themselves or not. Then, the adapted version would be structured according to three pivotal moments or turning points, when the events force the characters to change the course of the action:

· 1st turning point: Ginny arrives unexpectedly as Wolff mysteriously disappears,
· Midpoint: Hunter arrives to give Ginny a surprise as we realize he looks just like Wolff,
· 2nd turning point and crisis: Ginny finds Hunter/Wolff cheating on her with her grandmother, which leaves the women confused, angry and alone.

This new version is also based on a traditional relational structure between characters: a love triangle. Despite being used and reused throughout history countless times, it is a simple and easy-to-spot plot, that is expected to help users realise what's going on between the characters and identify the plot.

The intention of exploring the character of the grandmother evolved into the realization of a common attribute to all of this tale's characters: each one is lonely. Little Red Riding Hood is sent alone into the wild, under the presumption that she has become of age to do so, only to demonstrate that she's not prepared. The wolf, as an antagonist as he might be, is also lonely and left alone in the wilderness, as if he wasn't able to share the same space with others. As mentioned earlier, the grandmother lives isolated in the woods by herself, despite her age and

her health condition. Like the grandmother, the mother and the hunter are traditionally circumstantial characters, of whom readers know very little. However, both of them are also presented in loneliness. The mother is an independent character, who, despite her unknown reasons and circumstances, establishes a distance between herself and the other two women with whom she has a family bond. Finally, even the hunter is alone, in his wandering through the woods – established as a dangerous place – doing a lonely job and forced to defeat the wolf all by himself.

This realization became the story's meaning, which also serves as a reflection of the solitude of Virtual Reality (VR) as a medium. Most VR, CVR, and many digitally interactive works tend to be individual experiences, performed in some degree of isolation, whether it is from other participants, from the real world, or both. One of the narrative objectives of this adaptation is to encourage users to face the loneliness and solitude of the two women from a very close position, and yet, because of the constraints of the technology and the design of the project, not being able to interact with them. There is a paradox of distance; users get immersed in the characters' intimate space, and yet are always incapable of sharing that intimacy. This deprivation makes, theoretically, the user just as lonely as the characters.

3.5   CVR, CINEMATIC AESTHETICS AND SPATIAL STORYTELLING

The initial impulse to work with CVR instead of more traditional screened formats responded to the possibility of obtaining an immediate reaction from users, that would necessarily react physically to the medium. These reactions can then be turned into feedback to be read by the system, deriving information about where the viewer is looking at and make some dimension of the story react to it, and then produce the dialogical loop that defines interactivity.

The mere concept of hands-off interactions supposes serious constraints and limitations. Quite literally, the conceptual inability to use our hands determines the type of interactivity and, considering the limitations of the technology, how deep the immersion into the *storyworld* can be. A hands-off interaction, by definition, wouldn't permit to embody a character – unless the story itself proposes a narrative with characters with very restrained movement or conditions, let's say, a paralytic or a kidnapped, tied person. Yet, these limitations wouldn't necessarily limit the immersion into the story.

As Mateer points out, in its current technological stage, CVR allows very restrained interactivity, like shifting from one point of view to other, but hardly allows any other organic interaction with the *storyworld*. This is a consequence of the required use of prerendered assets, or assets without a code, hence, that aren't susceptible to being programmed to react to any kind of user's input. However, CVR still counts with one of the major benefits of VR, enhanced by the use of stereoscopic view and, in some cases, improved sound mixing:

immersion. VR technology's main quality is the capability of sensorial transportation into an involving virtual environment of visual and acoustic stimuli. In this sense, we can hypothesize that the more involving the sensible environment, the more immersive and stimulating will be the experience for the user, hence, the more instinctive their reactions will be.

With these requirements, the challenge of hands-off interactive CVR would be to be able to generate a similarly organic reaction to those of the user, consistently with Crawford's definition of *quality of interaction*. (2005:40). An interactivity driven by instinctive reactions must doubtlessly consist of fast, hopefully instantaneous responses between the user and medium. This kind of responsiveness is key to create cinematic interactivity in which choices won't become a nuisance in the flow of the story.

On the other hand, CVR's current technological state implies technically limited capabilities to affect the *storyworld* – characters and environment. However, this doesn't necessarily mean that the interaction can't be *deep*. Crawford doesn't define the depth of interaction based on what is affected but rather by its "humanity" – whether if the interaction is with AIs or non-player characters (NPCs) – arguing that it should *feel* like human. In a cinematic interactivity like in this proposal, in which CVR as a medium doesn't allow us to interact with AIs or NPCs, the depth of the interaction could be defined by the organicity of its aesthetic stimuli: the *mise-en-scène* ("everything visible within the frame of each shot [that] gives each shot its meaning as does the way they are visually presented", adapted from the French theatrical concept that means "placed in the scene" [Rabiger & Hurbis-Cherrier, 2013:149]) must feel real and organic to facilitate the immersion. This is a fundamental premise for filmmakers, which is important to maintain in cinematic interactivity, where *choices* should be aesthetically incorporated in the organic structure of the *mise-en-scène*. Otherwise, interactivity itself could risk the diegesis by making choices explicit and affecting the depth and speed of the interaction, as well as breaking the principle of a leaned-back experience.

Let's just remind Ryan's concepts of *narrative games* and *playable stories*. In the latter, the purpose is not to beat a game but to observe a story (2009:47), a category that fits this project. Its essence is to still *feel* like a cinematic experience, for which flow and diegesis are key. This is why this project intended to exploit the aesthetic elements of CVR to drive the interaction, applying the principles of environmental storytelling described by Jenkins (2002) into the use of independent sound mixes across the immersive space.

Despite being articulated originally for videogames, environmental storytelling applies easily to CVR because of the immersive nature of the medium. One of the biggest challenges in storytelling in VR is how to guide the user through a surrounding space rather than just by framing, composing, and editing through a timespan, as it happens in films and videos. Many VR and CVR stories tend to focus the user's attention in a rather narrow field of view, usually set as the starting position of the story and remaining more or less fixed in the same area. This

can sometimes feel like a waste of the remaining space and, hence, of the immersive qualities of the medium. The application of Jenkins' notion of environmental storytelling would suppose better exploitation of the space by the creation and use of simultaneous *micronarratives* (p.7), atomized portions of a bigger, overall story, which put all together would make sense of the whole of it.

Following this principle, in this project, the story was composed of two sub-plots and several micronarratives. The two sub-plots are Ginny's and the Grandmother's, which take place simultaneously in the same space – Grandma's house – although spread through different rooms – bedroom, hall, and kitchen. As in any script, this one is divided into scenes. Each sub-plot's scene would be a unit, a micronarrative, confined to one of the house's rooms, while another unit takes place in another room. This way, the story's units are spread in space as well as in time, and it is up to the user how to explore these micronarratives, and to make sense of the whole story.

But how do we wander through this space from a fixed point? While moving across a virtual space is increasingly becoming a possibility in digitally generated VR, in CVR the user is still mostly constrained to a fixed axis, and to spin around it to navigate the space surrounding this axis. This doesn't seem enough to spatially isolate the micronarratives and explore them properly. Here's why I proposed the idea of exploring the *soundscapes*, through discriminating the spatial micronarratives by their own determined soundscape.

In other words, if this surrounding environment is divided into dramatic areas (portions of the space defined by a certain angle) in which certain dramatic events – micronarratives – will take place it should be possible to focus the user's attention in those areas through the manipulation of the soundtrack. This would mean giving the user some agency over the soundscape. Spatialized audio is a very important element in the construction of virtual environments because it provides a sense of space, it provides the illusion of a surrounding environment even if we fix our position inside the virtual world. The possibility to dramatically explore the space through its acoustic dimension could provide a deeper sense of immersion into the story dynamic. The design of the acoustic device will be discussed in more depth later in this chapter.

In narrative terms, as explained in the literature review, CVR supposes certain technological constraints that make it very hard to replicate a bottom-up model of interactivity like the neo-Aristotelian model proposed by Mateas. However, considering that one of this project's aims is to generate a cinematic-like experience, it is feasible to prioritize a top-down system with a plot-driven interaction, where users are subordinated to the authorship (this will be discussed later in this chapter where I develop the idea of *on-narration* interactivity as a form of agency on co-authorship). In this sense, CVR's limitations appear as an opportunity to explore a more leaned-back type of interactivity and ways to interact with narratives – *siuzhet*

– other than through bottom-up systems and character embodiment; interaction with dimensions of the story other than those belonging to the *storyworld*.

3.6 WRITING THE STORY AND WRITING THE MEDIUM

I would describe the process through which this concept was materialized as a symbiotic and even chaotic development that started with a very primary – and maybe even naïve – idea of working with interactivity in VR. It became very evident that it was necessary to understand the medium in order to write a story. As Ince states, "the story must fit with the nature of a game's particular approach to interactivity." (2021:16) After months of deepening into the subject, and once I started the stage of research by practice and started to produce the prototype, I encountered challenges and complications, both theoretical and practical, which were unfolded simultaneously and proactively.

The foundational stone was the intention to propose a better, more interesting use of space in a virtual reality environment, and play with the possibility of having simultaneous actions or events in different areas of the visual spectrum, so the user would be forced to make a decision and choose what to look at *while being aware* of being missing other events.

This seemed an interesting concept to trigger the exploration of interactivity from a filmmaker's perspective, both conceptually and practically. The description above is written in the terms I had at the time, when I was still oblivious of notions like micronarratives, playable stories, or top-down and bottom-down narratives. In fact, a more theoretical conceptualization of the project came up later. Instead, the first steps were, on the one hand, to test the concept's technical feasibility and, on the other, to come up with a story suitable to the concept, which meant starting to think about narrative structural characteristics of a hands-off interactive story.

This realization involved the technical exploration of some of the tools required to produce interactive media productions. This meant venturing into programming and coding. By learning to use software for interactive design – such as Unity – and participating in workshops on the subject of interactive storytelling, I was fortunate to share with other people with similar projects and ideas, which allowed me to become aware of the epistemological differences between the two realms – narrative and programming – which might potentially constitute an important barrier for screenwriters and filmmakers to attempt interactive storytelling.

However, while these differences exist, it is also possible to thrive by bridging these two scopes and exploiting the field of possibilities that emerge as a product of this gap. For instance, as discussed during the literature review, CVR still presents serious constraints for the user to wander into the virtual world and interacting hands-on with the *storyworld*, which can be

approached from its audio-visual qualities. Yet, programming software offers the possibility to find other ways to explore that space, so as to be able to exploit those constraints, a possibility that is beyond the capabilities of the film camera. In this sense, designing the medium while simultaneously writing the script affected, first, the dramatic use of the soundscape and, second, the dramatic use of the space and *mise-en-scène*. In other words, the creative challenges focused on a) how actions and characters are distributed across the surrounding virtual world, and b) how to use soundscape as an articulation between micronarratives and as a unifying element of the overall drama. This mechanism will be illustrated later in this chapter. For now, it is relevant to note how these fundamental elements of the interaction evolved from the synchronicity between script and design, between the craft of storytelling and the understanding of a new medium.

This is then reflected in the script through the organization of another factor, considerably more familiar to filmmakers and screenwriters: the manipulation of time. While Jenkins' idea of spatial storytelling can be a very appealing new field to be explored as a writer, the author himself exposes how in videogames the exploration of the virtual space is usually not restrained by time. This allows a deeper exploration and attention to detail. Yet, this proposed experience is still defined within the timeframe of a dramatic script. Moreover, it is based on the limitations of simultaneity and being forced to make decisions over the dramatic space. Traditional cinematic storytelling would find resources to manipulate time, generally through montage, tending to parallel editing – a classic "last-minute rescue" – or could find other non-linear structures, like flashbacks or *racconti* – showing one plot and then the other, despite happening simultaneously in the timeline. In this case, while formulating ways to facilitate spatial storytelling, there was also a need to manipulate time to reinforce simultaneity as well as the dramatic progression.

INTELINKED OUTLINE	
Grandma and Wolff are cuddling	Ginny and Hunter are discussing on the phone
Wolff leaves	Hunter arrives by surprise
Grandma runs into Ginny while looking for Wolff	Ginny runs into Grandma while hiding Hunter
Grandma tries to hide her affair	Ginny she tries to hide Hunter
Grandma hears Hunter – she believes he's Wolff	Ginny kicks Hunter out
She flirts with Hunter	She finds Hunter's present
Ginny finds them	Ginny finds Hunter being courted by her Grandma
Hunter/Wolff leaves	Hunter/Wolff leaves
Grandma starts to believe she's delusional	Ginny realizes she's losing her boyfriend
She decides to deny it	She decides to take him back

Fig. 10: Interlinked Outline, we can see the two plots' bullet-points and how the keep the synchronicity and balance of the dramatic development of both plots.

The script consists of two parallel plots: Ginny's and the Grandmother's, which we can see in the form of interlinked outlines in the figure below. Each plot consists of nine bullet-

points that balance each other respectively, while they also mark the turning points and the moments when the characters meet and depart.

An outline is a very common screenwriting tool, yet it was challenging to write two plots in this fashion, aiming to maintain the dramatic progression and structure for both characters and to write equally meaningful developments. Certainly, both plots are interdependent, influencing each other and forming part of one overall story. There are events in Ginny's plot that affect the Grandmother's and vice versa. There are also external events – embodied in the male characters – that affect both women, hopefully in a proportionate manner. All characters' internal struggles go around similar meanings: the topic of solitude and – particularly for the two women – the revelation of female sexuality.

In this sense, writing the story required the conception of both space and time manipulation: To give users the ability to explore space, while the author choreographs time.

3.7   HANDS ON: DESIGNING AN INTERACTIVE DEVICE FOR CVR

As described above, the design of the interactive model consisted mainly of the organization of the space, providing the user with a way to explore such space and guarantying the feasibility of the dramatic progression of the story – at least in theory.

Characters and actions – micronarratives – happen in one virtual world but are relatively disarticulated from each other until each micronarrative develops into the next. If the user were to choose to follow only one character through the whole story, there might be a risk to have an isolated plot and an incomplete story. Micronarratives must be articulated and linked to each other through their position in a dramatic space susceptible to being explored. Therefore, users must have some kind of consciousness of a larger world beyond each micronarrative, so that they would feel tempted to explore it. The soundscape provides that sense of a world, first through the construction of an acoustic environment, but mainly through the use of dramatic sound cues that dominate the development of the story over the interdependent micronarratives.
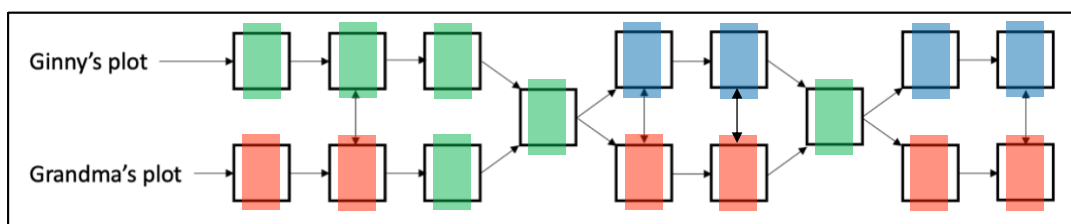
Fig.11. Diagram of the narrative structure of The Hunter & the Wolff. *Each square corresponds to a scene or micronarrative, and has been coloured to signal the location where it takes place – Red:Bedroom, Green:Hall, Blue:Kitchen. The unidirectional arrows signal the linear temporal direction of the story, while the bidirectional arrows mark the points where sounds cues can be heard in all the immersive space.*

In fig.11, I have illustrated the narrative structure for *The Hunter & the Wolff*, where we can see how micronarratives articulate to each other linearly in time and in space. While both plots unfold linearly, the simultaneity is illustrated by the parallel development. The merging micronarratives mark the points in the story when the plots merge both in time and space (which also divide the structure into thirds, following the three acts structure). The bidirectional arrows also mark the moments when sound cues can be heard in all of the immersive environment, linking parallel micronarratives together. The squares have been coloured to indicate where in the space each of them takes place – Red:Bedroom, Green:Hall, Blue:Kitchen – illustrating not only how the micronarratives are organized in time but also in space – as it will be developed in more depth in the next chapter. While the medium allows the user to switch between spaces and plots at any time, and not necessarily in the points marked in the diagram, this illustration shows how narrative structures incorporated notions of interactivity and spatial storytelling.

In more practical terms, the overall, unifying soundscape is reflected in the script through what I've called *cue sounds*, which are very specific sounds related to the organic environment and that have direct dramatic influence over the characters. While each micronarrative is distinguished by its own soundtrack – which allows users to isolate the micronarrative from any other external disturbance and, therefore, focus on it – these cue sounds form part of the larger structure of the story and are omnipresent; users will hear them despite the micronarrative they're following at a given moment.

a dark purple night gown. She combs her hair, joyful.	Don't say that! I'll compensate you, you know... Hunter, behave!... Hunter?
THE DOORBELL RINGS.	The phone call ends abruptly, but the DOORBELL RINGS immediately. Ginny goes back…
GRANDMA (singing) Mirror, mirror in the wall,	INT. LIVING ROOM

Fig. 12: Cue sounds. In this excerpt we can see how an overall sound is present in both micronarratives, having dramatic influence in the two plots.

In fig.12 we see an example of this principle. Stressed in yellow and caps we can read the cue "DOORBELL RINGS" relatively in the same line of each plot (Ginny's on the left, Grandma's on the right). This is a very short excerpt but long enough to notice that the actions going on are completely different for each character, yet the sound cue generates a reaction. These sounds have three key functionalities in the medium: dramatic, environmental, and interactivity-driver. They are dramatic because they generate reactions in the characters and keep the plots moving; environmental because they belong to the diegetic, organic world and hold the micronarratives together into one dramatic space; and they are the organic interactivity-drivers that are expected to stimulate users to *turn around* and *look the other way*. They are one of the main stimuli – apart from characters' movement and other elements of the blocking and *mise-en-scène* that will be discussed in the next chapter, focused on the actual production and making of the project – that are supposed to generate organic, instinctive reactions on users.

| GRANDMA (CONT'D)
… Ginny! What a surprise!

Ginny faces her, bewildered by her reaction.

            GINNY
    What d'ya mean 'surprise'?
    I've been here for a while now.
    Didn't you hear me?
    Here, I got you flowers.

Ginny hands her grandma a vase of flowers and goes back to the kitchen. Grandma then opens the door and sees no one behind it. | GRANDMA
… Ginny! What a surprise!

Ginny faces her, bewildered by her reaction.

            GINNY
    What d'ya mean 'surprise'?
    I've been here for a while now.
    Didn't you hear me?
    Here, I got you flowers.

Ginny hands her grandma a vase of flowers and goes to the kitchen.

INT. KITCHEN |

Fig.13: Interlinking dialogue. We can see that the first dialogue happens when both characters are in the same place, but right after they separate and start two micronarratives while the dialogue between the two continues.

Another example of the use of sound to interlink both plots can be seen in fig.13. In this case, characters establish a dialogue, each from a different micronarrative. It was interesting as a writer to make this dialogue, since the content itself has little to do with the actual actions of both characters. When writing dialogue, is not rare to find that the meaning is hidden in the subtext: characters rarely mean what they say. In this case, the dialogue is about the intention of both characters to pretend normality (it also has a secondary objective to introduce the character of the mother, to complete the cast of the tale). But it also works as a unifier between both micronarratives, it interlinks them and makes explicit that both characters' plots are components of a larger context.

Fig.14 illustrates how the two plots are organized simultaneously and shows, on the one hand, the moments where both plots merge spatially and, on the other, the sound cues that link parallel micronarratives. It also provides a visualization of how the two plots are intended to balance and – especially towards the end – complement each other.

This is then translated into the medium. The idea for the technology is simpler than the architecture of the story. It consists of a virtual reality space divided into three relatively

Fig. 14: Detailed diagram of the narrative structure of The Hunter & the Wolff. *This merges fig. 10 and fig. 11, illustrating how the micronarratives are organized through the parallel timelines how these are interconnected with cue sounds.*

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similar angles, set from the perspective of a first-person viewer in the centre of the space. The surrounding sphere is then divided into many acoustic environments as we wish – in this case, three. In fig.15 we can see an example of a virtual space divided into four acoustic areas, so that the viewer, placed in the middle, has the ability to distinguish what's happening in each of these areas independently.

In *The Hunter & the Wolff,* the virtual space is divided into three, which also has consistency with the environment: Grandmother's room, a Hall, and a Kitchen, which also provides a more instinctive and organic way to produce a mental map. In the script, most of Grandma's plot takes place in her room, and Ginny's in the kitchen, while the hall serves as a transition area where characters meet each other and transit. This has been simplified on purpose to facilitate following the plots, instead of making characters move across the whole space. I believe this would be interesting to test in the future, but it seemed fair to uncomplicate the device as much as possible to focus on the application of the soundscape instead of a more elaborated blocking.
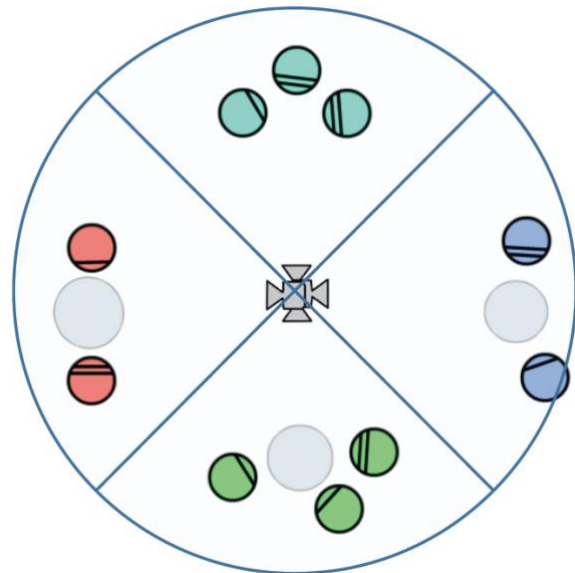
Fig.15. Diagram of a virtual space divided in acoustic sub-spaces, where different micronarratives take place.

This principle was applied in the design software (I used Unity, mainly because of its suitability to work with VR, requiring very little programming, and being a friendly software for people with little experience in coding) as illustrated in fig.16. Above, we can see a screenshot with four objects floating in space. The white pill in the middle is the camera and first-person viewer, surrounded by clearly identified digitally generated objects. Each of these objects has an audio file attached – as we can see by the speaker signs. Then, a script is attached to the camera so it can identify each object's audio file as it approaches the area assigned by angles. Each audio file can be heard as far as an angle of 45º to each side of the object, before it fades into the next one, making the transition as smooth as possible. Finally, as seen in the middle, the model is added a VR video – in this case, a camera test. In the bottom image, we can see a screenshot of the video running; we see the green cube from the perspective of the white pill. As the Point of View (POV) rotates around its axis, the audio tracks will fade into each other, allowing the user to hear each song.

At this point of the project, the device worked effectively, and the tests show promising results. There were still minor issues to fix, regarding the isolation of each audio track (fast and abrupt movements affect the fading, leaving the previous track dimmed down in the

background, which is very annoying and most likely could have negative effects in the immersion into the organic world). The application of an overall track still remained to be tested, as well as an environmental soundscape that would unify all spaces and micronarratives. In this stage, the biggest challenge was to make the transition from one sound space to the other work, while one overall track should have been significantly easier to apply.

One of the biggest challenges to be faced for the production stage was the sound design, recording, and postproduction, since four different soundtracks were needed to be produced and applied together.

However, most of the proposed goals were met in this stage of writing and design. Both the script and the interactive model worked independently and it seemed feasible that they would work interdependently. The synchronic application of both developments also met the principles of OBM, of being reconfigurable assets. One of the main objectives of this project is to produce an interaction on the fly, to generate storytelling capable of reacting immediately to instinctive, hands-off reactions from the user. The interactive model operates under that principle by giving the user the ability to explore between a display of acoustic assets in a certain dramatic space. It is true that the amount of agency given might be quite restrained, but we should always keep in mind Crawford's criteria about the quality of interactivity. In this sense, at this point, it seems that the tools given to the user should be enough to interact with a story also written specifically for this medium.

Fig.16: Stages of the design of the interactive model in Unity.

3.8   CONCLUSIONS: WRITING SO OTHERS CAN TELL A STORY

The notion that narrative and medium are inseparable is one of the key findings of this phase of my research. Writers should always be aware of the limitations, possibilities, and opportunities that the medium they are working with provides. The same can be applied to all other disciplines involved: Technicians and developers can be aware of the nature of a narrative and of how these new media can deliver stories in the best possible way. As a filmmaker and screenwriter, gaining conscience of the role that developers play and the challenges they face helps me consider them in my own tasks. While interdisciplinarity is not strange to filmmaking, understanding more about computer design aids to close the breach between the two disciplines.

In this particular project, the interactive device can indeed be quite simple from a programmer's point of view, but it is its application for storytelling – moreover, cinematic storytelling – which remained yet to be tested in the next stage of production. This is, I believe, a creative project that suited my current skills and abilities, and allowed me to play with interactive devices as I tried to apply my experience as a storyteller to them. I'm not a programmer, and I don't pretend to be one. But I'm a storyteller and researcher, and finding new ways to tell stories has been my goal as a practitioner and researcher.

Taking a step back from interacting with the *storyworld*, and focusing on the interaction with the narrative provides a different approach to storytelling itself. It provides agency over different aspects of the story, on the ways we tell it. In this sense, this device, despite being heavily authored, gives agency over the perception and reception of the story and how the user will organize the events in their mind as they experience it. This is why I claim that there is an interactivity in which writers can share some of the traditional aspects of the authorship (time, perspective, editing, space) with users, so as to have literal interactive storytelling; and interactivity based on telling stories. This is why I call this *on-narration* interactivity.

Lastly, both the device and the story met the requirement of being hands-off and laid-back. Users should be able to operate the interactive device in an instinctive manner and, hopefully, immersed in the story and in the environment where it takes place, instead of approaching them through a hands-on remote control.

Of course, the biggest challenge remained ahead in the production stage, where I would still have to be able to witness whether these ideas and principles were to give satisfactory results.

Chapter 4

Production of the Proof of Concept of
The Hunter & the Wolff:
Creative process behind a sound-based interactive film in CVR

4.1   INTRODUCTION

The present chapter addresses the technical and creative workflow of the production of the Proof of Concept of *The Hunter and the Wolff*, as well as the challenges faced during the whole production process, from pre-production to post-production, and specifically addressing conflictive dimensions such as blocking for spatialized narratives and the conception, design, and production of a dramatic-purposed soundscape.

The main objective during this process was to adapt standard filmmaking, practices, workflows, and production techniques into the craft of interactive cinematics in VR. To achieve this, the first step is identifying technical and creative challenges and needs that are specific to CVR production. In this regard, at the beginning of the production, there were two main disruptions to a more standardized filmmaking workflow: First, adapting blocking techniques from filmmaking to CVR to make effective use of space, and secondly, adapting sound production workflows to meet the acoustic requirements of the guiding device for the interactive narrative. These two disruptions go hand in hand. In fact, the sound-guiding device is proposed as a way to navigate the immersive space, which means that the blocking must be designed taking sound into consideration.

Each of these disruptions and the techniques used to address them are analysed independently – or as much as possible – and then observed altogether and considered in terms of interactive and dramatic language.

4.2   FILM PRODUCTION WORKFLOW IN VR

A starting challenge for this project was to assume the conditions and limitations of cinematic VR in comparison to standard film language. As observed during the Literature Review, the most significant challenge from a film language perspective would be the incapability to frame, which affects the technical and narrative approach to the space, and supposes a challenge in terms of driving the viewer's attention. This is also related to the technical and expressive differences between the film camera and a 360º camera, which differ in terms of optics,

versatility, and malleability. These drastic differences in approaching the space have a correlation in the approach to narrative time; while cinematic time is mainly generated through montage (see in Literature Review, Considerations from cinematic language and practice) in immersive narratives, time would rely on the flow of the many elements that compose the space, more similar to what happens in theatrical blocking than in films.

Despite its "cinematic" technical qualities, the truth is that CVR presents a fertile ground for challenges and experimentation from multi and inter-disciplinary approaches. There are researchers and practitioners that have explored editing and montage in cinematic VR (Brillhart, 2015), that are already trying to adapt filmmaking practices into immersive narratives (Passmore et al, 2017; Mateer 2017), that explore the properties of guidance (Gödde et al, 2018; Nielsen et al 2019; Speicher et al, 2019), and that observe the feasibility of theatrical techniques in immersive spaces (Pope et al, 2019; Probst et al 2021). All these authors have started their work from the necessity to approach the limitations of film language to fully convey the potential of CVR.

However, of these limitations, this project focuses more specifically on the challenge of navigating through space while fixed on an axis, blocking for CVR, and guiding the user's attention. The project is not concerned with editing or montage, despite these being very relevant topics for research and development.

The key narrative challenge in CVR is guidance: How do we guide the user through a dramatic space? I reflected in the previous chapter about the qualities of an immersive dramatic space. It is true that the main creative aim of this project remains to be the exploration of the use of sound to guide and navigate dramatic spaces in CVR. Yet, it is of crucial importance not only to consider the acoustic dimensions of the film, but also how to build a dramatic immersive virtual space.

One of the preliminary conclusions of this phase is that any dramatic navigation device – even if it is driven by acoustic stimuli and assets – requires a synchronic design and development of the dramatic space. In other words, the space must be suitable for the navigation device and vice-versa.

In terms of adapting cinematic narrative techniques into spatial and interactive storytelling, Nielsen et al understand four traditional filmmaking techniques that guide the audience's attention by eliciting curiosity and suspense: "cinematography (the process of capturing the scene using a camera), mise-en-scène (everything presented in front of the camera), sound (the auditory components of the film), and editing (the selection, coordination and joining of shots)." They also note, appropriately, that "Each of the four supposes a unique challenge in relation to *cinematic VR.*" (2019:229)

Indeed, each of these techniques supposes an individual challenge, and yet, because of the cross-disciplinary nature of cinema, they influence each other. This is exacerbated in CVR, since cinematic techniques meet new possibilities and requirements, like a more direct interaction with users and a more theatrical approach to blocking and the understanding of narrative space and *mise-en-scène*. However, this research doesn't consider the challenges of editing and cinematography, and focuses specifically on the use of sound to create an interactive, immersive and dramatic space.

One of the first obstacles was to conceive sound independently from the other three dimensions. It was quite hard to think about acoustic guidance and navigation without taking spatial narrative into account. The conceptual frame considers Jenkins' notions of spatial storytelling in immersive media, and how to facilitate narrative experiences in such spaces, meaning that acoustic navigation is but a means for such type of storytelling. Moreover, this project considered not only the design and testing of the tool, but also its narrative uses, differently from other recent relevant contributions to the field of CVR, like the ones made by Pope et al (2017), Gödde et al (2018), Speicher et al (2019), Nielsen et al (2019) and Probst et al (2021), to name a few.

In consequence, the proof of concept intends to test designs and proposals presented in the previous stage, and to provide a reflection and evaluation on such procedures. Within the spectrum of cinematic creative practices, this project focuses on direction practices, such as blocking, script interpretation, staging and *mise-en-scène*, all of which are affected by the disruption of notions such as spatial storytelling and acoustic guidance.

Spatial-narrative thinking greatly differs from traditional filmmaking. As Gödde et al note, "it turned out that planning and shooting a film in 360 degrees does not work the way it does in normal movies" (2018:3). In their research, they identify six major challenges for cinematic VR:

1. Guiding the viewer's attention to the relevant story elements,
2. Choosing the role of the viewer between an active participant and a passive observer,
3. Choosing the right place for the camera, the action and story elements, and what consequences this has for seated viewers,
4. Balancing spatial and temporal story density,
5. Rethinking Framing,
6. Rethinking Editing. (Ibid)

Of these six points, only the last one has been purposely left apart, while the other five were unavoidably influencing each other – editing is relatively easy to avoid, by just proposing a story based on one location and a continuous timeline. It is probably not a coincidence that guidance is listed in the first place, considering that the purpose of all the other points is to

facilitate that guidance, determining the relation between the story – or the act of storytelling – and the user.

Using them as a guide, each of the five remaining points had to be addressed as the process developed, either from a technical or narrative perspective, and sometimes from both.

The pre-production process consisted in adapting a traditional filmmaking workflow into the requirements of this project, being these mainly two: rethinking blocking in terms of an immersive 360º environment and finding the right techniques for sound recording of two simultaneous actions in three simultaneous narrative spaces.

These disruptions demanded more time to, on the one hand, explore and test sound recording techniques, from the most traditional ones using microphones such as booms and lavaliers, to more modern ones like the use of 360º microphones, immersive soundscapes, and binaural recording. It is worth noting that despite being an immersive film, dramatic navigation does not necessarily demand a naturalistic use of sound, since the idea is to navigate dramatic spaces by discriminating them acoustically. This might be considered an "anti-natural" or "counterintuitive" use of immersive sound, which development has generally aimed to recreate or even amplify the sense of being a *real* acoustic environment. However, like in cinema, this project conceives the use of sound for dramatic and expressive purposes, therefore, the aspirations for more realistic immersion have been relegated to prioritize the development of the navigation tool.

On the other hand, the approach to blocking required conceiving an immersive space of certain characteristics according to the scripts' demands; the construction of a house with three rooms that can be observed from a fixed point. This required a combination of film and theatrical approaches to blocking. On the one hand, blocking was still defined in relation to the central object that is the camera. On the other, the positioning, movements, and relations between the characters resembled a more theatrical approach to blocking. This combination of perspectives was necessary due to this being an impossible space, which had to be conceived especially for this story. In the aftermath, there were many issues that could have been studied and tested in more appropriate ways, even from the conception of the script and later in its interpretation into the blocking. Just as an example, the user's perspective – which is intimately related to the type of agency to be facilitated – was not addressed in the script, but rather assumed as a passive observer behind a fourth wall, ignoring notions of presence[4] and possible embodiment of the user in a virtual environment. Up to this point, blocking and *mise-en-scène* mainly deal with the application of the acoustic guidance tool, since this was the main issue identified from the previous stage. However, there were many other interesting issues that had a direct effect on the narrative that was identified but yet not properly addressed, some directly

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[4] Sanchez-Vivas and Slater state that "the common view is that presence is the sense of being in a VE rather than the place in which the participant's body is actually located" (2005:333)

related to the nature of the immersive medium, such as perspective, embodiment, and presence, and others related to the inability to frame – therefore, to guide through framing – that demands new strategies to, on the one hand, writing for immersive narratives, and on the other, to blocking for immersive narratives.

It is worth clarifying at this point that this proof of concept only considered the minimum production value to apply and test the proposed tools, focusing on Gödde et al's key challenges for narrative in VR. The production took place in a television studio, with the props explicitly mentioned in the script and without a properly built set. In this sense, there might be many other elements that traditionally form part of film production values to be considered besides the ones this research is focused on, such as art direction, cinematography, lighting, etc.

Of the three traditional production stages, the most affected was post-production, particularly in terms of sound. We have observed that the navigation device is based on the possibility of jumping between three different soundscapes in only one immersive video. This required the generation of seven sound mixes, which later were assembled with the video, assigning each mix to a portion of the immersive space. Spatialized acoustics allows spreading mixes through both the X and Y axis, which facilitates placing independent or interdependent sounds in specific spots of the visual spectrum, whether if they are above, below, to the left, or to the right. This first prototype uses seven interdependent mixes spread across the X axis, in order to test the concept. The design and production of this process are fully described in Appendix 2.

The next parts of this chapter will reflect on these production steps more thoroughly, first regarding cinematic techniques applied in the direction design, and then regarding how immersive narrative demands the creation of a mental architecture to facilitate guidance.

4.2.a   Relation between narrative space and the camera

There are filmmaking rules that indeed transcend into 360º cinematic narrative, such as continuity of sound over shots and editing (Passmore et al, 2017:3), a rule that is particularly relevant for this project. However, at the same time, immersive media also requires new languages to be developed that differ greatly from filmmaker's traditional storytelling techniques (Ibid:1). Both film and CVR meet in the technical possibility of being captured and produced through a camera. However, in terms of language, the absence of the limits of a screen in CVR comes to break two of the most fundamental attributes of film: the frame and the fourth wall.

Of the challenges for blocking in CVR, the impossibility to frame is probably the easiest to spot. Of course, we lose the close-ups and, therefore, a very important tool to guide the

spectator's attention to specific and sometimes small details. This becomes even more difficult considering the current state of technology; not only close-ups are nearly impossible to achieve, but also "long distance shots do not work well due to the low resolution of current recording and playback resolutions" (Ibid:3), setting another difficulty to block characters and objects too far from the camera.

Another important aspect of framing in film language is the importance of the out-of-frame or off-screen as a narrative and expressive resource. A common way to approach this in film is through sound, a principle that founds the proposal for an acoustic-guidance in CVR. 360º acoustic environments, such as binaural or virtual soundscapes, provide the possibility to feel surrounded by virtual acoustic stimuli. This, backed with a visual representation of such stimuli, provides the possibility to navigate this environment. Even if it is only around a fixed axis like in CVR, immersive acoustics provide a spatial architecture that uses all three vectors, while traditional cinematic acoustics regularly rely on a horizontal X axis (from left to right), despite the number of channels. In this sense, immersive acoustics could potentially provide very complex tools to explore virtual spaces and to develop spatial storytelling, whether cinematic or not, but especially CVR, considering its restraints.

On the other hand, human visual field of view is still limited in VR – actually, a headset tends to narrow it down from around 200 to 220 degrees horizontally with both eyes, to roughly between 100 and 120 degrees, depending on the headset. However, this is still much wider than standard screen media. Moreover, the natural field of view – exacerbated by the technology – offers the possibility of designing and managing stimuli outside the user's range of view. The user simply can't see the whole virtual environment at the same time, and yet, they should be able to hear everything going on around them and, in doing so, creating a mental architecture of the acoustic space. In other words, the user is able to hear what they don't see. This condition is a fertile field for the adaption of off-screen narrative in film language into an out-of-sight narrative in spatial storytelling: CVR provides the possibility to counterpoint visual and acoustic guidance, offering simultaneous and diverse stimuli to the user.

The absence of a fourth wall is one of the most complicated features in terms of narrative, since it supposes a big disruption concerning more traditional storytelling techniques: considering the spectator as part of the narrative. There is a lot to say in this regard, on how this feat should be considered as early as in the script, and in the Conclusions, discussing its more theoretical and philosophical implications, for instance, the spectator ceases to only spectate but becomes another kind of agent within the storytelling experience.

In this chapter, I'll be referring to how in CVR the camera becomes an embodiment of the user's presence, differently from film, where the camera is the narrator and a mediator between the spectator and the story, leaving them outside the *storyworld*. CVR requires the understanding that such mediation vanishes, facilitating the provision of agency to the user.

From a filmmaker's perspective, this changes the role of the camera itself and how it intercedes between author and reader, which affects the objectives of blocking.

One of the most interesting and defining aspects of doing research by practice is the constant dialogue between reflection and production, which also generates a certain loop of coming and going from one to the other to correct, improve, enhance or rethink different aspects of the process. For instance, it was only during post-production that I noticed that the role of the user within the story wasn't defined, and that their presence was just assumed as some kind of omnipresent ghost capable of going through the walls. This rather naïve assumption was probably rooted in the instinctive conceptions about traditional storytelling, in which audiences are immaterial receivers in the sense that they do not belong to the materiality of the *storyworld* or even, in most cases, of the narration itself. On the contrary, immersive narratives, whether analog or digital, rely on the embodiment of the audiences and their presence becomes material to the *storyworld*, the narration, or both.

Yet, at the moment of the design of the blocking, it focused mostly on the actors, assuming the camera as something that almost wasn't there, as it is traditionally understood in filmmaking.

Nevertheless, this allowed us to observe how the user's narrative presence or embodiment has to be addressed as early as working in the script, since it affects the blocking and the relation everything in the virtual environment – actors, props, scenery – has with the camera. As Gödde et al argue, "in VR, framing and camera position correlate with each other even more than in normal film" (2018:9), referring to the fact that camera position within the virtual environment might have more drastic consequences for the user's immersion than those of the film camera to the film spectator, where the camera operates as a mediator instead of as a threshold. Pope et al refer to this in their very interesting research about the application of theatrical blocking techniques in CVR. In their experiment, they asked different groups of actors and theatre directors to block a short scene specially written for the experiment. They describe:

> In all groups, the issue of direct address was discussed, even when it wasn't used throughout the scene ("Let's do something similar where this [the camera] is just another elf in the room," "maybe next time we'll pretend it's [the centre of the room] an elf"). Two of the groups specifically played with the idea that the viewer was "a spirit" and "invisible," in light of the disembodiment effect that 360-degree recordings on a tripod give the viewer who can't see their body when they look down. (2017:7)

We can see here how these groups critically questioned themselves about the use of the camera for dramatic purposes, considering different possibilities:

- Treat it as a character,

- Treat it as a diegetic prop,
- Ignore it – pretend it is not there,
- Treat it as an audience – placing chairs on both sides and therefore re-positioning a fourth wall, or
- Treat it as an observer and interact with it through breaking the fourth wall but also breaking narrative immersion.

Some of these limitations for CVR narrative – limited embodiment, limited presence, limited interaction with the space, characters, and props – might have been the motivation for Pope et al's theatrical approach. As Passmore et al describe, the CVR technical perspective still has considerably fewer features than a film camera, "there is generally no zoom or focus available, so that just leaves camera placement, along with devices, to try and get the viewer to attend to the content intended by the director" (p.5), which is why "the Jaunt guidelines recommend not to use close-ups in general, citing the Oculus guidelines that objects should not be closer than 0.75 m. Such advice is probably meant for situations where stereo 360 videos is viewed, but it is quite possible to get closer in monoscopic 360 without apparent eye strain" (p.6). Passmore et also refer to the user's presence through the camera but from a technical perspective, acknowledging aspects relevant to the feeling of embodiment, like camera height and distance from subjects and objects. Gödde et al also take into account "that many viewers watch 360-degree movies while seated" (2018:6), which affects both the blocking and how the threshold object is to be set in the real world.

The blocking of this proof-of-concept focused mainly on the positioning and transitioning of characters from one room to the other, to cause interest in the characters and provide visual guidance in the most balanced way possible. It was also intended to test proximity as a dramatic tool, moving characters further and closer to the camera at certain times. In this sense, in more intimate moments of the script – like the ending, when both women are alone in separated rooms – characters are closer to the camera to generate a more emotional engagement with them, by having the chance of seeing their faces from a shorter distance, as a way to substitute close-ups.

Another purpose of playing with proximity was to facilitate the focus on small objects or props, like the choker necklace Hunter gives to Ginny or the mirror in the Grandmother's bedroom. However, as previously referred by Passmore, this kind of dramatic intention tends to not work well in CVR and, as ratified by Speicher et al (2019), diegetic guidance tends to work better with bigger gestures than with small ones.

Probably one of the preliminary conclusions of the blocking regards the necessity to consider staging techniques from theatre and not only from filmmaking. As mentioned in the Literature Review, theatrical techniques approach the dramatic space as an element by itself, while in filmmaking, this tends to be constructed through montage. The immersive nature of

CVR would make the user's relation to the space resemble more to the theatrical approach, considering that the 360º camera operates as a threshold for the embodiment of the user in such a space. This kind of distinction makes it increasingly more evident that CVR might eventually stop being considered a derivation of cinema but a discipline by itself, since it requires different and diverse techniques for the construction of its own language and grammars, from the writing, through the next stages of blocking and post-production. We can see this in the limitations – from a filmmaker's perspective – identified by Passmore et al, but also in the opportunities explored by Pope et al, Speicher et al, Nielsen et al, and Probst et al, as well as in the obstacles and findings of this very project.

4.2.b   Blocking for a spatial and mental architecture in an immersive environment

A key factor of introducing users into immersive environments is providing an architecture of such a space. Placing ourselves in virtual environments is different from moving in a real one. Immersion still consists of mainly visual and acoustic perception through which we get to interact with the *storyworld*, but adds the possibility to also interacting through movement. This new ability to move within the *storyworld* affects many narrative elements, but firstly the mental construction of an environment they can see and hear but never touch or smell or taste. Moving is not the same as touching. Even if we can navigate through this virtual world and even interact with virtual objects through devices of diverse kinds, we never get to touch them. Despite being considered by some as the "ultimate empathy machine" (Milk, 2015) Virtual Reality headsets operate as a partial threshold, which only transports two and a half of our senses – sight, hearing, while 'moving' is only an illusion or simulation of touch, our ability to perceive our surroundings with our skin[5]. Even if we move our bodies oriented by our perception of the virtual world, the body itself still feels and perceives the real world.

The mental architecture of an immersive environment will always be in dissonance with the body's sensitive information. Haptic media users are defined by their dual presence: telepresence, or feeling present in the diegetic space, and mediative presence, feeling present in the physical space while maintaining awareness of the medium. (Szita, 2017:120)

This dissociation is absent in traditional screen narratives, where the threshold is less of a threshold in itself but a window, which allows us to observe the world on the other side but also keeps us outside of it. This fragmented spectator can only exist in the context of digital technology and constitutes a sort of post-human spectator, that relies fully on a prosthetic device – an extension of our body – to participate in the narrative.

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[5] There are, however, haptic touch technologies being developed, such as sensitivity gloves or haptic skin, although they are not yet broadly used. This kind of technology could greatly enhance the capabilities not only of virtual reality, but also of augmented reality and mixed realities, presenting new challenges for practitioners about their expressive potential and uses. It is only a matter of time before they start to be used in media like video games.

Despite this sensorial dissociation, "the sense of presence had a strong impact on the experience, while the ability to look around meant new skills had to be developed to try to make sense of 360 video" (Passmore et al:1), which leads to thinking this type of interaction is perceived as a new sensory experience, uncannily similar to real life but yet identified as *new*, and as such, it can be learned. Szita argues that, despite not being able to rely on muscle and skin sensitive information, "visual and sonic representations evoke haptic sensations" and that "the eye mediates the depicted images as textures, which spectators connect to their haptic memories." (p.118)

CVR has its own perceptive rules. In the previous chapter, I commented on Mateer's observations of the medium's limitations from a filmmaker's perspective, which are summarized in the impossibility of affecting the virtual space, or *storyworld*. This impossibility is one of the medium's defining attributes. CVR as a medium is, then, defined as a *storyworld* that can be partially perceived by our senses, but yet can't be affected by the user immersed in it. If the medium is the message, then establishing the architecture of the medium is equivalent to establishing the architecture of the message, in this case, the story.

Immersive and interactive storytelling requires users to place themselves in the *storyworld*; the threshold allows us to, to some extent, cross to the other side of the window. Content creators now "have the possibility of using a sense of space as a narrative tool. Like VR, theatre is a fixed-point 360º experience in which the audience is free to look anywhere, so expertise in theatre can inform VR cinematography." (Pope et al:1) Indeed, theatre practices can provide very insightful inputs on the use of narrative space and especially on how to address the user as part of it, a placement that carries a series of ontological and narrative issues. By inhabiting the narrative world, the user now has a role in the story; they have abandoned their seat in the cinema to claim some agency. Interactive narrators have to acknowledge this fact as a new starting point. As Gödde et al state, "a filmmaker needs to define the role of the viewer very clearly" (p.5) In CVR, one of the key decisions in this regard is the IVD – Initial Viewing Direction (Ibid:6) – through which the user will be introduced to the *storyworld*.

According to Gödde et al, IVD might determine the user's mental architecture of the narrative space for the rest of the story or, at the very least, the scene. The results of their research show that IVD is "accepted as the 'correct' viewing direction for both sitting and standing viewers, and the action is usually anticipated to begin there. Hence, the attention usually goes back to the IVD after the orientation phase, except when an attentional cue leads to a potential Point Of Interest (POI) somewhere else." (Ibid)

Brillhart takes this principle to the next step, to formulate what is maybe the first theory for a CVR montage. She realized cuts in VR should be "about going from experience to

experience instead of going from clip to clip. It [should be] like a ripple effect — like a drop in a bucket, and then a ring around that, and a ring around that. [The editing] was really about rotating those rings to corral people through the general idea of a story, or an experience. Then, I thought, if I know that [viewers] are going to be doing certain things, I can edit for that sort of experience. And that got me to Probabilistic Experiential Editing". (2015) This theory is discussed by Gödde et al, as they argue that "jumps in space and time break the immersion and the feeling of presence, since such experiences do not exist in reality." (p.9) However, this argument seems naïve, considering the evolution of film language itself and understanding that montage doesn't exist in real life either, but has become of common knowledge as it developed into a grammar. Brillhart's theory points in that way; instead of considering this asset a limitation, she sees it as an expressive opportunity. Gödde et al themselves observed how their users could learn VR navigation skills: "It can be assumed that people are getting more accustomed to cuts in VR and consider them less distracting and immersion breaking." (Ibid:10)

In other words, every cut requires a new IVD which, on the one hand, must be narratively linked to an eventual "Ending Viewing Direction", or EVD[6], of the previous scene and, on the other, supposes a new lapse of spatial reckoning at the beginning of the new scene, a readjustment of the mental architecture.

In *The Hunter & the Wolff,* there are no cuts, since it is based on simultaneity and spatial navigation. Yet, this simultaneity is what makes the issue of IVD extremely relevant and problematic, since there are two starting actions taking place simultaneously at the very beginning of the piece. Therefore, as narrator, deciding the IVD can hardly be taken lightly, since it could generate a predisposition to follow one story more than the other. If indeed the IVD affects the user's perception of the "correct" viewing direction, in *The Hunter & the Wolff* it could affect either the room that will be assumed as "the main location" or the character that would be followed and perceived as the "main character", determining the rest of the experience.

More concretely, in a virtual environment divided into three roughly 90 degrees spaces – plus a fourth blank space behind the user – organized from left to right as Bedroom, Hall, and Kitchen, where Bedroom and Hall contain starting actions, it makes narrative sense that the IVD would be placed in either of these two spaces. Fig.17 shows the opening moments in both the Bedroom and the Hall; while Ginny gets through the main door talking on the phone, Wolff and Grandma are lying in bed, unaware of the girl's arrival. Both actions are independent of each other, meaning any of them could mark an equally relevant IVD. However, how to prioritize? Starting in the Bedroom could determine a disposition to follow the character of Grandma or assume it as the main location. Starting in the Hall could generate a similar effect

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[6] I came up with this concept as a logic complement of the notion of IVD to be applied according to Brillhart's Probabilistic Experiential Editing, following the notion that cuts ought to be spatially consistent. In other words, in order to cut into a new IVD, the narrative in the previous cut should guide the viewer so that they would be placed in an EVD before said cut.
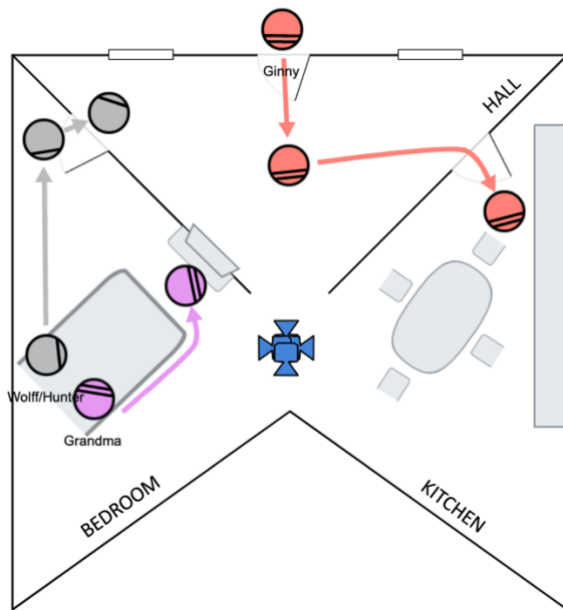
Fig. 17. Layout of the opening moment, with relevant actions in the Bedroom and Hall.

but this time with Ginny. Either option is legit and acceptable; what is interesting is the potential to determine the user's choices for what remains of the story. On the other hand, starting in the Kitchen, which is empty at the very beginning, could either misdirect the user to believe that's the starting point of the story and cause them to wait until something happens – therefore, to miss both of the opening actions and cause unnecessary disorientation – or to follow Ginny, being the Hall closer to the Kitchen than the Bedroom.

The relevance and influence of IVD in users' engagement with the story is one of the elements to be evaluated in this prototype, as well as with other questions related to the behaviour in the interactive and immersive space; how will users behave in this interactive dramatic space? Will they jump from one character or space to the other? Why? Evaluation ought to consider asking users about the relation between the IVD – and the first character they saw – with following choices and character identification, as well as consider tracking techniques to observe the users trail through the story. Based on the design and on the layout, there didn't seem to be a unique answer to determine the correct IVD, since every possible IVD seems likely to conditionate the user for the start of the storytelling experience. Then, the remaining – and new – question is how much are they conditioned and why.

In terms of the design, a possibility to balance the simultaneity of the two starting points is to alternate the IVD between them where there's a starting action; the Bedroom and the Hall. Some users (presumably half of them) would start in one space and the rest in the other, to then observe how much this influences their behaviour for the rest of the piece. These actions can be programmed so the IVD would be randomly selected by the app. For research purposes, it can be predetermined that roughly 50% of observed users will start in the Bedroom while the other 50% will start in the Hall.

The design of a mental architecture in VR or CVR involves the definition of the user's role in the *storyworld*. Being immersed in a virtual environment requires a quick recognition of the user's possibilities and boundaries, and more importantly, what is their own identity within this world. Like Gödde et al state, "making the viewer part of the scene is what utilized the full potential of VR, although there might be situations in which this is not wanted." (pp.5-6) Theirs and other studies have shown that the sense of presence is perceived as one of the most fascinating assets of VR as a medium. User's materiality and sense of presence have to be

considered so they have clarity about their own identity within the narrative. Users now can inhabit the *storyworld*, and for storytellers, there is more than one way to approach this embodiment.

Fig. 18. Wide screenshot of the opening moment, with Grandma and Wolff in the Bedroom and Ginny in the Hall (02'')

The user's ontological presence in the story is another important issue that should be addressed from the moment of writing. In *The Hunter & the Wolff*, however, the user's presence is undefined[7], since the issue was identified in a more advanced stage of the project. The result is a disembodied and immaterial presence, that is never addressed by the characters and exists in an impossible space between the rooms of this impossible house. For the characters, the user is simply not there, just like in films. In its current state, the user enters the *storyworld* as a sort of ghost, capable of moving between rooms, which lacks consistency with the story itself and doesn't belong to the narrative world. The user was – I would say, wrongly – conceived as a regular spectator on the other side of the screen, failing to recognize the immersive nature of the medium and its narrative potentialities.

Presence is potentially one of the most exciting aspects of VR and CVR narrative. The use of proxemics in theatre can be a useful tool to maximise the notion of presence, acknowledging the user as an active element in the space and in the narrative.

The work developed by Pope et al is instructive on the acknowledgement of the user's presence, providing a technical approach on the blocking of actors in theatre, with the awareness that the audience is present in the venue, opposite to cinema, where most of the times blocking aims to make the camera invisible for characters and audiences. In this approach, Pope et al emphasize the use of proxemics and interpersonal distance to generate

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[7] User's presence in the dramatic immersive space was considered in a late version of script, called *Wolf Hunting*, posterior to the production of the proof of concept and meant to address some of the findings. This is commented in more detail in Chapter 3.

more or less intensity in the user's reactions and involvement with the characters: "The theory that suggests that there are concentric circles of personal space around the body, like bubbles: intimate space, personal space, social space, and public space" (fig.19, right) while the "dimensions of these spaces differ according to the physical environment, culture and personality, we are sensitive to social violations of these boundaries and react to them." (Pope et al:2) This work is complemented by the one by Probst et al (2021), who also defined expressive categories based on proxemics to address the issue of framing in CVR – as seen in the Literature Review.
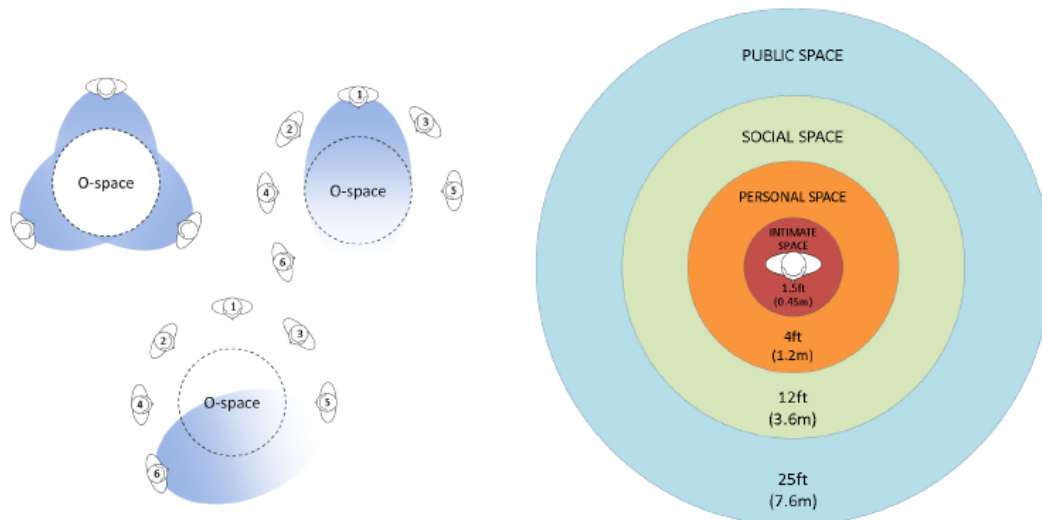
Fig. 19: Diagram of F formations (left) and Proxemics (right). Source: Pope et al:2

In this sense, although we can't use traditional framing grammars in CVR, there is a potentially powerful expressive tool in distance and depth, and actors and other dramatic elements moving in and out of the user's reach. Contrary to film, CVR blocking needs to acknowledge the presence of the camera. For instance, theatre blocking techniques use interpersonal distances in live performance and operates them on several levels (Pope et al:10):

- First, characters on stage,
- Second, between actors on stage,
- Third, between actors and audience, or the user, in CVR, and
- Fourth, potentially, between audience members.

This kind of approach to blocking also enhances dramatic interactivity; even if this is limited by technical limitations, increasing the feeling of presence by being able to integrate the user to the actors' blocking could also potentiate their emotional responses to the drama. In this sense, apart from proxemics Pope et al analysed the use of F-formations and actors' positioning towards the camera, by considering it an imaginary human being. This way, F-formations allow blocking the actor's body positions in reference to the user:

(M)aintaining lower body orientation with the audience keeps audience-members within an actor's F-formation. Lower-body orientation is more stable than upper-body orientation (movement of the head and shoulders) and is typically used as an indicator of engagement and interaction between people rather than the more fleeting upper-body orientation. (Pope et al:3)

In *The Hunter & the Wolff*, there is a deliberate intention to make dramatic use of distances, particularly by creating more intimate moments when characters are left alone in a room. Ginny and Grandma, as leading characters, have their "solos", moments of more intense emotional introspection, for which it was decided to place them closer to the camera. In fig. 20 we can see how the Grandmother is alone in her bedroom, in a position of about 45 degrees to her left, which facilitates seeing her face, brushing her hair in a moment of emotional satisfaction – this is her position closest to the camera, at 4,7ft, within that both Pope et al and Probst et al consider a personal space, suitable for intimate but invasive engagement. At the same time, Ginny is standing in the Kitchen, much further and at a straight angle in relation to the camera, for which is harder to see her face, and thus to establish a more personal relationship with.

Fig. 20. Proxemics of Grandma being closest to the camera (47'').

This blocking decision is intended to generate more emotional engagement with Grandma's moment, precisely by placing her and the viewer at a personal distance. That position in the bed's corner is often used throughout the story to emphasize this character's inner emotions and delusions. However, the difference in height could be an obstacle to generate this engagement, since Grandma is sitting and the camera is placed at a standing eyeline height of 5,6ft averaged between the heights of the actors.

Something similar is intended with Ginny in the Kitchen, when she is left alone and seats by the end of the table that is closest to the camera (5,9ft) facing the camera – although ignoring it, not acknowledging the user's presence. This way is easier to look at her face and recognize her emotions.

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Finally, the piece ends with both women in their respective positions closest to the camera, which is intended this way to recreate more emotionally powerful instances with the characters. It is also a final moment in which the women, affected by their romantic circumstances, face their inner sexual and emotional needs. It is a moment of narrative symmetry.

Fig. 21. Proxemics of Ginny in intimate moment in the Kitchen and Grandma and Wolff in the Hall (2'17'')

This kind of spatial configuration could help to develop interesting spatial grammars for immersive narratives, since they articulate a series of elements that are present in the dramatic space. I've focused this analysis on the blocking of actors – mainly because they drive the action and move around the virtual space, also facilitating guidance – although the positioning of props and staging elements was also determined by proximity and blocking criteria. For instance, each room contains at least one element that defines the room: The bed, the door, and the table, which also have a role in how characters should behave in relation to such elements.[8] As stressed by Pope et al, "spatial configurations in theatre are chosen to meet practical, narrative and technical demands simultaneously." (p.10)

Space becomes a canvas, and as such, the way information is organized in it becomes not only relevant, but part of the grammar. Unseld proposes the concept of Spatial Story Density (SSD) as the amount of story elements that are arranged in the space of a scene simultaneously. (2015) This means that spatial stories require a balance in the information contained in the spaces, in the same way, linear storytelling is founded on the principle of tension-and-release; the balance and dynamism of events taking place at a fast pace against

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[8] As it will be commented in Chapter 3, the central position of the door generated particular interest in viewers, especially those whose IVD was in front of it. It seems that the intrinsic qualities of the door also added to it becoming a focal point, because of the doorbell as an acoustic cue and the subsequent intrigue about who would come through ir.

moments of tension being built upon slower pace and moments of more reflexive contemplation. In other words, "with high temporal story density, narratives are fast paced, with high spatial story density, many narratives are happening simultaneously. Mental effort increases when temporal or spatial story density is high." (Gödde et al:8)

Fig. 22. Ending, Grandma and Ginny in her respective positions closest to the camera (3'15'')

Manipulating Spatial Story Density can be a key element in the construction of a grammar and building a relationship between the user – as an element of the space or not – in immersive narratives. The tension-release principle could maybe be adapted into a saturation-emptiness simile. For instance, SSD can be localized or be spread all around, depending on the narrative intentions and how the narrator expects to guide the user. This notion is particularly important in a project like *The Hunter & the Wolff*, based on simultaneity, and it should be considered from writing to directing.

Indeed, it is possible to observe SSD moving along the timeline. In *The Hunter & the Wolff* SSD is based on the characters' blocking and how they move from one room to the other, meeting and departing each other. For instance, moments of higher SSD take place when characters meet – either in pairs or all three. These moments also concentrate key beats:

- 2 characters, Hall (1'01''): Hunter arrives by surprise, making Ginny hide him in the kitchen.
- 2 characters, Hall (1'28''): Grandma unexpectedly finds Ginny in her house.
- 2 characters, Kitchen (1'42''): Ginny tells Hunter to leave.
- 3 characters, Hall (2'40''): Climax, Ginny finds Hunter/Wolff with Grandma.

These moments also accumulate tension, which is usually released when characters – either Ginny or Grandma – are alone in a room:

- 2 characters, Hall: Grandma unexpectedly finds Ginny in her house.
    $\Rightarrow$ 1'40'' Grandma goes to her Bedroom, gets immersed in her own delusion.
- 2 characters, Kitchen: Ginny tells Hunter to leave.
    $\Rightarrow$ 2'10'' Ginny stays in the Kitchen and finds Hunter's gift.
- 3 characters, Hall: Climax, Ginny finds Hunter/Wolff with Grandma.
    $\Rightarrow$ 3'18'' The two women go to separate rooms, and give an individual closure to their independent actions, assuming their sexual identities.

This way, spatial and time density are correlated: moments of higher spatial density are also the ones in which both plots tend to affect each other narratively, while moments of more independent character development correspond to a lower spatial density and serve to release the tension from previous more dense moments.

The spatial organisation and mental architecture of the virtual space is just one aspect of the narrative challenges of VR and immersive narratives. It will be addressed later in this chapter when I'll reflect more thoroughly on guiding devices and techniques, of which, as observed, the use of space is key. However, before submerging into it, I consider it necessary to address one of this project's particular features: the use of soundscape for dramatic purposes in an immersive environment, which supposed a series of problems and challenges both in the practical and technical dimension and in the theoretical approach to what is commonly conceived as *immersive acoustics*, a notion that was contested in order to propose instead more *dramatic-purposed acoustic design*.

4.3   FILM PRODUCTION WORKFLOW FOR SOUND-DRIVEN INTERACTIVE STORYTELLING

I've stated already that the interactive device in this project is based on the dramatic use of sound in an immersive environment. I emphasize the difference between a dramatic use of sound from an immersive one, which might seem counter-intuitive and could be in direct conflict with what has been so far considered one of the key features of immersive soundscapes.

Indeed, the development of visually immersive technologies like VR and CVR has been hand in hand with its acoustic counterpart. However, technologies like 360º sound recording or binaural acoustics have been even less explored than their visual equivalents: "The technical literature exploring VR's potential is somewhat ocularcentric, focusing on two dominant visual techniques: computer-generated imagery (e.g. 3D environments) and 360° videography (a.k.a. "cinematic VR"). Yet VR also affords virtual soundscapes via ambisonic." (Green et al, 2019:294). This doesn't mean, on the other hand, that there hasn't been any development at all. Quite the contrary.

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The development of immersive sound recording and reproduction techniques has mostly been centred on the creation or re-creation of immersive acoustic ecologies, to generate the feeling of being acoustically transported. As observed by Hong et al, "to create virtual acoustic environments with high ecological validity, it is essential to have a holistic understanding of recording and reproducing techniques with respect to soundscape evaluation methodologies." (2017:3) In other words, it has a naturalistic vocation; it has aimed mostly to create environments that sound natural.

This project proposes a very different use of sound in at least two approaches. First, in the same way it requires the construction of an impossible space, it also requires a sound design consistent with the spatial conception, which challenges a naturalistic approach in the sound design. If the objective of the spatial design is to be able to navigate different spaces, then each of these needs to have its own correlated acoustics.

In a more concrete way, each of the three spaces should have its own sound design. This was previously discussed as part of the overall design for the final production stage, despite not being applied during the proof of concept – in order to prioritise the main creative and research objectives of this stage of the process. For instance, part of the proposal included working different kinds of reverberance, different kinds of floor, background noises, and leitmotivs:

- Bedroom: low reverberance based on a very softened space, dried ambience, carpeted floor, and a clock's constant ticking, as a reminder of the pass of time, in tune with the character's (Grandma) inner conflict.
- Hall: slightly higher reverberance, wooden construction in general – including the floor – and the sound of the wind between the trees and a distant barking and/or howling – especially when the door is opened – to symbolize the ever-present presence of the wolf around the house.
- Kitchen: higher reverberance because of the kitchen's materials, tiled floor, wetter ambience, and a radio in the background, playing music and weather forecasts.

This design, of course, doesn't respond to what we could call a direct immersion, and in terms of sound recording and post-production, the main challenge is to achieve an immersive acoustic in each of these three spaces, which is difficult considering the recording techniques, as it'll be commented later.

A second difference is the use of sound regards its interactivity-related purposes. The sound-based interactivity device challenges a more naturalistic approach because, even in independent spaces, sound mixes are purposely manipulated to generate acoustic stimuli and induce a reaction in the user, guiding them for dramatic purposes. In other words, not only

there are three independent acoustic spaces but also they are intervened to make them dramatically inter-dependent.

This supposed a series of challenges and obstacles through all the stages of production, from the preproduction and design of the recording methods, production itself and, lastly, post-production, both in terms of traditional methods like editing and mixing and later assemblage into the interactive programme.

4.3.a   Production of sound as a guiding device

Sound recording was one of the biggest challenges in this project, considering the design requirements for the navigation device. The main objective in this matter was to obtain recordings that would allow to spatially isolate the assets in the mixing process. While the production process and its challenges are described in more detail in Appendix 2, in this chapter I reflect on the creative aspects of the proposal and its relevance for the interactive device.

It is worth remembering that, this being a proof of concept, one of the intentions of the overall process was to test different production techniques to then consider what would be the most suitable for a final short-film production, as well as to identify challenges, opportunities and obstacles. In order to do this, four sound recording techniques were considered during pre-production and then taken into production stages (for more detail, see Appendix 2), and all four were tested and then evaluated prior the editing and mixing process. These were:

- 360º sound recording with an ambisonics microphone,
- Localized space recording, with one boom microphone tracking each plot,
- Individualized lavalier microphones for each character,
- ADR and Foley recording.

In terms of the acoustic requirements of immersive spaces, recording with an ambisonics[9] microphone is probably the most suitable option, since it is a type of microphone that was created for these purposes. However, due to the requirements of this project in particular, which demanded clean, isolated assets from simultaneous actions, it wasn't necessarily the best option – at least with the current production conditions – since the spaces weren't independently recorded or acoustically isolated to facilitate the recording of clean assets.

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[9] Ambisonics is "a method of recording and reproducing audio of a sound field in full-sphere surround" (Hong et al, 2017:7) and an ambisonics microphone consists of 4 capsules organized in a tetrahedral array: "Together these four channels capture audio not only on the typical horizontal plane, but also in above and below the microphone, too. In other words, these microphones (ambisonics) record audio from every direction surrounding the microphone." (Virostek, 2017)

This option shouldn't be completely discarded, especially considering that the final product is to be delivered in an immersive medium. A more sophisticated production design that could meet the acoustic requirements of the concept from the start, could potentially help to obtain more immersive assets that can be used for interactive purposes. However, considering the production conditions and the experimental nature of this proof of concept, the objectives were set in designing three acoustically different spaces, for which the other three techniques seemed to be more appropriate to obtain a valuable set of independent assets, that could be later be reassembled in post-production. The biggest disadvantage of this second approach is that it required a quite sophisticated postproduction process to achieve a properly immersive soundscape in each of the spaces.

Moreover, in a more complete and specialized sound recording workflow, a variety of diverse techniques would likely be the best way to achieve an immersive and, at the same time, localized and dramatically purposed sound mix. As stated by Hong et al, "(w)ith its simplicity, it is evident that ambisonics is the leading recording technique for interactive spatial audio reproduction. On the other hand, conventional stereo and surround recording techniques can still be employed for specific applications, such as non-diegetic sound (or ambience) of the acoustic environment in soundscape studies." (p.8)

In this sense, the use of more complex microphone arrays – that include ambisonics – could offer more sophisticated and expressive postproduction possibilities: "Microphone arrays are very useful to capture a more complete sound field (depending on the number of microphones used) and could be used in postprocessing to further emphasize certain sound components, such as, speech from a noisy environment." (Ibid) As mentioned, four methods were used to observe which of them would be more suitable for the projects' specific requirements, but we could observe that these methods can be complemented if the recording is to be approached with a more thorough plan and a better understanding of the means to achieve a specific set of goals, which is something to take into account in future iterations of this concept.

Similarly, the process of sound postproduction also evolved from its first preconception, going through several subsequent iterations, as a product of trying different approaches, until reaching its current concept. This evolution was mainly determined by understanding the technical possibilities and then finding the most suitable ways to obtain the desired results, through the use of different techniques (This process is better described in Appendix 2). Sound postproduction possibilities for an immersive environment are certainly richer than for more traditional acoustic treatments, like stereo or 5.1. Immersive environments are suitable to test highly realistic deliveries, as the experimentation with spatial mixing, or binaural. Yet, this proof of concept was conceived on the significantly simpler idea of isolating acoustic spaces in a horizontal X axis, with a simplified technical approach through stereo mixing. This, certainly, involved the risk of decreasing the sense of immersion if the soundscape is not properly

achieved. As Sanchez-Vivas and Slater warned in their article about the consciousness of immersion in virtual environments, "anecdotal reports indicate that sound has a highly significant impact on presence, and one study showed that spatialized sound was associated with higher reported presence than either no sound or non-spatialized sound." (2005:334)

It was realized during postproduction that it was perfectly feasible to conceive a more spatialized mixing *within* each isolated space, to enrich the immersion in the film. And even that this could be achieved with the existing assets and a more suitable and thorough mixing process. This would have involved a different set of skills and a more developed conception early of the dramatic space, to reach a full potentiality and not just for the sake of the technical prowess. Henceforth, it also becomes a new element to be considered even from the writing stage and certainly during the design of the direction and the blocking.

Despite realizing these technical potentialities, the core idea of working on a horizontal (X) axis remained central, meaning that the seven mixes were aligned from left to right on an horizontal line (as it will be illustrated later). The mechanics of this interactive sound mixing – being able to instantly manipulate the acoustic perception with the direction of the head – remained untouched as the core idea of the whole project. However, the postproduction workflow suffered several changes. For instance, a second iteration consisted, on the one hand, in refining the mixing workflow, finding ways to adapt the traditional mixing process used in filmmaking to meet the requirements of this interactive 360º project. On the other hand, this iteration also allowed to correct some aspects of the original concept in terms of improving the dramatic use of space.

One of the most relevant corrections was rethinking empty spaces. Throughout the overall story, at least one of the spaces always remains empty, either because one of the three characters is absent (Wolff/Hunter) or two of them are interacting in one of the rooms. This supposes many moments of wasted, undramatic spaces and the risk of having the user missing out part of the action(s). Indeed, *Fear Of Missing Out* (FOMO, "a pervasive apprehension that others might be having rewarding experiences from which one is absent", according to Przybylski et al, 2013), which is usually understood as a risk and a liability of immersive drama, has been taken into consideration as an opportunity to enhance a dramatic engagement in the guidance device, a notion that will be commented more thoroughly later in this chapter, but that can be summarized in the intention of users experiencing FOMO as a consequence of their own decisions – being forced to choose between two or more paths – and not because of the lack of guiding elements in the dramatic space. In this sense, acoustically empty spaces in simultaneity with one or two dramatic spaces could presumably disorientate users, risking unawareness of dramatic actions.

This has been tackled with the notions of ON and OFF mixes. ON mixes correspond to the acoustic presence of elements and events that take place in the room where the gaze is

centred at a specific moment – and any sound relevant to the actions according to the script – while OFF mixes correspond to the acoustic presence of sounds in the next room, primarily dialogues and other relevant sounds. In a way, this mechanic is related to the notion of *on-screen* and *off-screen* diegetic sounds frequently used in traditional filmmaking. Once again, this conception of the acoustic space doesn't respond at all to a naturalistic approach; ON and OFF mixes conveniently alternate in terms of functionality, requiring the OFF mix only when a room is empty, strongly suggesting the user, through sound, to move to the next room.

This conception of ON and OFF spaces required the improvement of the workflow, adding more but also more specific steps in the mixing and a more unified understanding of the overall space, since now spaces, although still dramatically isolated, are more interconnected in terms of the acoustic environment.

The use of ON and OFF spaces demanded a third iteration of the sound postproduction workflow, which involved the creation of seven audio deliverables to be spread across horizontally, along the X axis, to improve the acoustic spatiality through the use of more manipulable assets. These deliverables were organized as it follows:

Room ON – Room OFF – Hall OFF L – Hall ON – Hall OFF R – Kitchen OFF – Kitchen ON

It is crucial to understand that OFF mixes are determined by the needs of each specific space. Each space is assigned ON and OFF mixes that are played continuously and simultaneously, but are mixed so they sound alternatively: They are always playing, but they turn quiet depending on the actions taking place in each room. For instance, Bedroom OFF corresponds to the sounds that come from the Hall, which is next to the right when we are looking in the Bedroom. Considering this prototype is still based on stereo mixing, this means that Bedroom OFF's sounds are concentrated on the right speaker – and also mixed according to spatial specifications, like lower volume and lower reverberation. This is why the Hall has two OFF mixes; one according to the room on each side. To illustrate, when
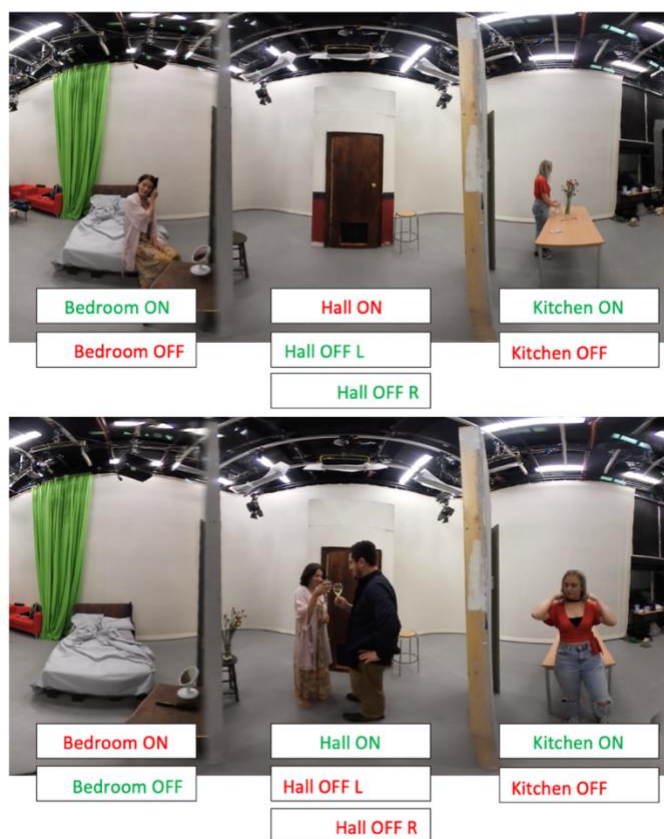
Fig. 23: *Each of the three spaces contains a number of mixes (either 2 or 3). The figure shows how each mix "activates" depending on the actions taking place on each space.*

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there are no actions taking place in the Hall, but there are in the other two rooms, if the user places their gaze in the Hall they will be able to hear the Hall OFF L mix on the left speaker (what is happening in the Room) and the Hall OFF R mix on the right speaker (what is happening in Kitchen). In fig.23 we can see how the different mixes alternate between them depending on the actions taking place in each space, and in fig.24, we can see an illustration of how, while the Hall is empty, different actions are taking place in the other two rooms, which we could still hear through the OFF mixes.

Hall OFF L:
Reveals sounds
in the Bedroom

Hall OFF R:
Reveals sounds
in the Kitchen
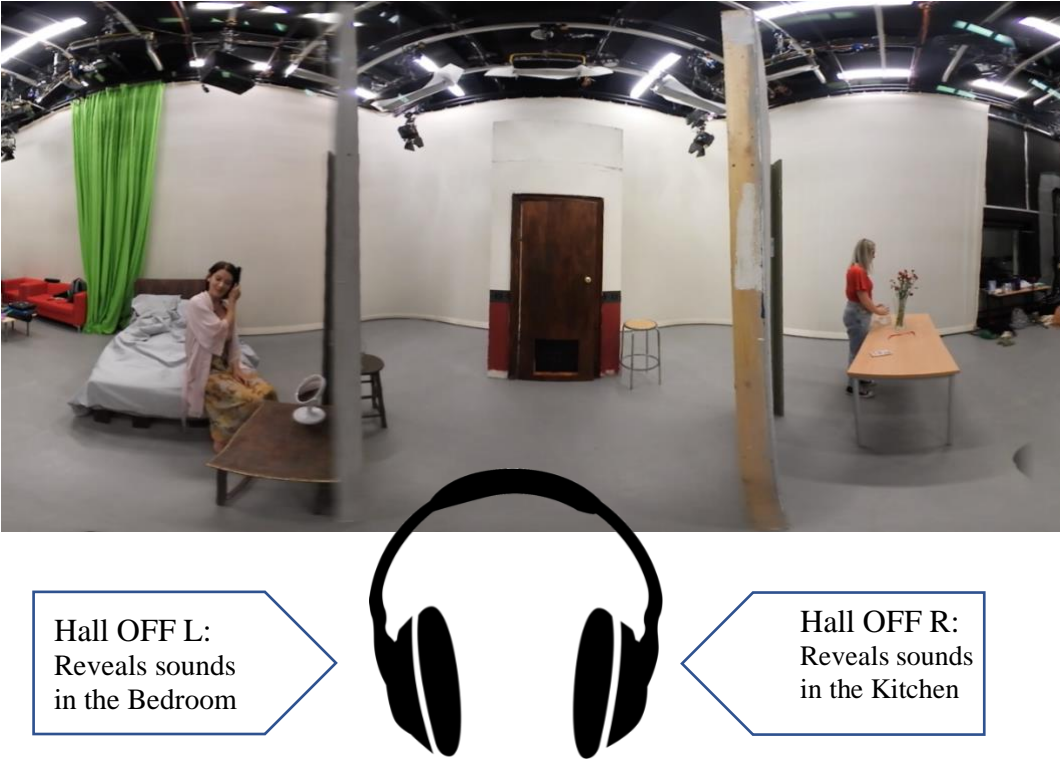
Fig. 24. Organization of sound deliverables: When a space is empty and no actions take place,
OFF mixes come into play and allow users to become aware of what is happening in the spaces next door.

This approach was chosen to provide the appropriate sense of spatiality to each mix, considering that an empty room and the noises coming from the rooms next door sound differently from the noises in the room. As mentioned, this also facilitates panning a whole channel whether to the Left, Centre, or Right. This way, the transitions between spaces also determine the transitions between soundscapes, since the mixes are attached to the rooms, and playing continuously since the beginning of the piece.

This last iteration enhances the construction of an immersive space with dramatic purposes, moving even further away from naturalistic immersion. OFF mixes operate in a strictly functional way, switching on only when acoustic guidance is required to stimulate the user to keep navigating the space in search of other dramatic actions. By doing this, also avoids unnecessary blanks in the timeline that could disorientate the user. Unlike many spatial storytelling designs that count with flexible timelines – and thus, facilitate space exploration without time constraints – a pre-rendered film like this one, which is also founded on the idea

of simultaneous storylines, can't generate delays in the pace of the narration, hence, it can't allow the user to be left without stimuli. Navigation and decision-making must be encouraged and disorientation reduced to a minimum.

If the acoustic dimension of this project has taken a particular prominence, it is because it is the main tool to provide guidance, the means through which the interactive environment and the user can establish a two-sided relation. The last part of this chapter focuses on the notion of guidance, and how it has been approached through the tools already described: the conception of a cinematic virtual space and a navigation device based on a dramatic use of sound.

4.4   BLOCKING AND GUIDANCE

In the specific type of interactivity I am exploring, guidance is a particularly delicate issue, since it has to be provided without breaking the illusion of freedom of agency nor the suspension-of-disbelief. Interactive narratives that rely on explicit and extra-diegetic[10] guidance usually offer an interesting exploration experience but run the risk of attracting attention to the tool itself, undermining the immersion in the story.

In this sense, extra-diegetic guidance, although sometimes fascinating by itself, can become an expression of Murray's threshold objects, which facilitates interaction while at the same time keeping the user from actually immersing. (2005)

In the Literature Review, specifically in the section about guidance in interactive films, I reviewed a number of examples to illustrate different ways to approach guiding stimuli, whether explicit or implicit (Nielsen et al, 2019), and diegetic and non-diegetic cues (Speicher et al, 2019). In *The Hunter & the Wolff*, which is proposed as an interactive storytelling following Mateas' definition (2000), the user is expected to meet the interactive device with the least possible friction in order to facilitate narrative and environmental immersion, through diegetic stimuli, presented in a rather implicit manner – meaning that they operate more as suggestions than by forcing a decision-making instance that would stop the flow of the narrative.

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[10] The definition of diegetic and non-diegetic is borrowed from film theory, as "we distinguish between cues that are causally rooted within the VE (diegetic cues) and cues that are external to this world (nondiegetic cues) [Bordwell and Thompson 2012]; i.e., diegetic cues are perceptible to other characters inhabiting VE, insofar as they are in a position that enables them to perceive the cues, whereas nondiegetic cues are only perceptible to the user." (Nielsen et al, 2019:230)

Two of the reviewed short films served as references for the design of this model: *Possibilia* (2014) and *Otis* (2017). In *Possibilia*, while the interface itself is explicit and hands-on, the access to many simultaneous timelines allows direct participation in the act of storytelling, the *siuzhet*, where the user gets to choose which of the many timelines to follow in whichever moment they decide, resulting in a bottom-up driven narrative. In *Otis*, on the other hand, the dramatic structure design is similar to *The Hunter & the Wolff*, in the sense that there are moments that are shared by the characters – and we get to see the same action from a different point of view, or even the same shot with a slightly different colour grading – and in some others, the characters follow their own plot.
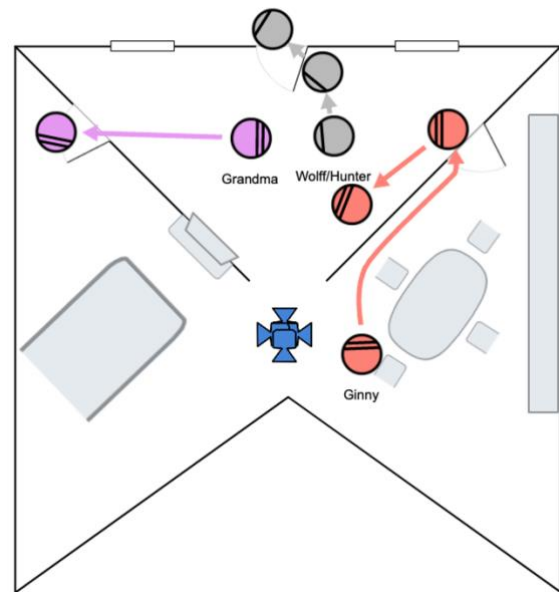
Fig. 25. Guidance by "off-sight" sound. At 02'52'', Ginny follows a sound cue to go from the kitchen to the hall.

In *Possibilia* and *Otis*, users don't have agency over elements of the *storyworld* (or, in the case of VR, virtual environment); they don't get to decide for the characters like in most branching narratives, or affect any diegetic element. Instead, they are able to manipulate the way the story is told, making them storytellers.

These two shorts share with *The Hunter & the Wolff* the level at which users interact with the narrative, and as such, users would face a display of options and have the freedom to navigate and make decisions without being forced by a narrator. In this case, the options would be the three rooms and the characters that move across them.

However, this supposes a challenge for the author as well, since providing the user with too much freedom "makes it increasingly difficult for filmmakers to show what is essential to the story, because what is depicted on screen influences the viewer's understanding of the narrative." (Speicher et al:1-2) Moreover, this is one of the intrinsic conditions of virtual reality's immersive nature, which as a medium is sometimes considered interactive by itself, under the premise that users have autonomy over their field of view (FoV). As Mateer noted, this challenge can be tackled with the adaptation of cinematic and directing techniques, in order to provide guidance using elements from film language.

The organization of these stimuli is realized through blocking. Techniques based in proxemics, as examined by Pope et al (2017) and Probst et al (2021), were used for orientation and guidance: "For example, high status characters tend to be given more physical space around them, tallying with findings that show that the person with the most speaking rights has

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more space around them" (Pope et al:3) and "rather than manipulating space in a fixed frame, such as close-ups and wide shots, actors can manipulate spatial relationships between one another in a way that is familiar in theatre and in everyday life." (Ibid) Positioning a character in a certain way can suggest they are to be followed, while still leaving an open option for other decisions.

In *The Hunter & the Wolff*, the main diegetic guidance methods were sound and movement. Through blocking, these elements were meant to motivate and potentiate each other – under the blocking principle that actions should always be motivated. For instance,

Fig. 26. Guidance through characters' movements. Layout of 01'40'', when each one of the two women depart to a different room.

sound cues and "off-sight" sounds (the immersive narrative equivalent to off-screen sounds) drive characters to move from one place to other. This is also the kind of stimuli that aims to suggest decision-making and to get the user's attention. For instance, in fig.25 we can see in the lay-out how, towards the end of the piece (2'52'') Ginny, who is in the Kitchen, is motivated by the sounds of clinking glasses to go to the Hall, where she sees Wolff/Hunter and the Grandma kissing. This resource used also on several occasions, for instance: Ginny and the Grandmother meet for the first time in the Hall after they both hear a doorbell (01'13''); The Grandmother hears Wolff/Hunter from her bedroom (02'23'', fig.27) and then meets him in the hall.

Guidance through movement is mainly used as a device to track characters as they move from one room to other. For instance, in fig.26, we see how at 01'40'' Ginny leaves the hall towards the Kitchen, leaving the Grandmother alone in the Hall. This movement is driven by the presence of Wolff in the Kitchen, who Ginny is hiding from Grandma. It also supposes a decision the user must make between staying with one character or leave with the other. Something similar happens at

Fig. 27. Guidance by Character's movements. Layout for 02'26'', when Hunter/Wolff leaves Ginny in the kitchen, departing to the hall. Simultaneously, the Grandmother is motivated by a sound cue to move from the bedroom to the hall.

02'26'' (fig.27) when Hunter/Wolff leaves Ginny in the Kitchen towards the Hall, and finally at 03'22'', almost at the end of the piece, when both women leave to separate rooms. All these

instances are specific points in the script that were conceived to propose a decision, and were brought into the blocking with this into consideration, but also in which most of the characters' own movements are driven by external factors and stimuli[11].

4.5   CONCLUSIONS

As a prototype, there are certainly many elements that would need further exploration and practice, but the overall review of the filmmaking experience leaves more than just a positive sensation about the possibilities of adapting cinematic narratives into CVR. Like cinema did early in its story, it seems excitingly likely that CVR can shake itself from its original sin of creating reality-like environments, and then develop into a narrative by itself. Precedents such as Brillhart's montage theories point in this direction, and so does the ability of viewers to quickly adapt to more instinctive grammars observed in previous research. As for interactivity, one of the key issues to be explored is the acknowledgement of the user as a part of the narrative and not only as a receiving end. Even in analogue media like immersive theatre, the user is not always expected to generate an input that drives the narrative, while in digital media, this seems to be necessary, otherwise, the point is just defeated and the narrative inexistent or is just non-interactive. This acknowledgement offers a great complication for storytellers, because the user now needs to be considered within the narrative and share, at the very least, some of the agency and privileges of the storyteller.

The production of this prototype allowed a first-hand exploration of some key challenges of filmmaking in virtual reality. It confirmed at least five out of the six main challenges identified by Gödde et al, as it also explored some of their expressive, aesthetic, and narrative potential.

Certainly, these challenges have to be approached interdependently. In terms of guidance, for instance, the design of blocking and *mise-en-scène* has to consider the role and agency of the viewer, as well as the use and prioritization of different stimuli, both visual and acoustic. The adaptation of "off-screen" sounds into "off-sight" ones seems to have been proved successful in at least two dimensions: a) provides a dramatic spatial orientation, letting the user know that actions are taking place and where, and b) provides stimuli that motivate users to make decisions and navigate the dramatic space.

In terms of visual guidance, the use of theatrical blocking techniques proved to be very relevant to integrate the camera into the dramatic space, understanding, in the set, the camera is also a sort of puppet of the user. Even in the most passive treatment of the user, which is to

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[11] An exception to this would be the actions driven by the Grandmother's delusion, when she hears the doorbell for the second time before meeting Wolff again in the Hall. This is, however, presented as an external stimuli from the Grandmother's perspective, that is shared with the user at that moment.

assume them as a "fourth wall" type of spectator in which they don't integrate the dramatic space, the use of proxemics affects the hierarchy of visual stimulations that are intended to drive the user's interactivity. This is particularly relevant in a design like this, where following a character can drive you away from one action into another one. This could suppose a grammar in which the relevance of characters and their actions might involve considering their movements and how they are presented in relation to the camera and other elements in the *mise-en-scène*.

Characters' movements are also relevant considering the importance of the Initial Viewing Direction (IVD), which tends to determine the user's initial choices. If in an IVD there is a character moving away, chances are that the user will probably follow this character, like was the case of Ginny's opening. On the other hand, when the characters are still, users would tend to make a quick exploration of the surrounding space, in the presumed safety that the character won't move yet. This also shows a sense of urgency that is quite determining in the decision-making process; when the story seems to be moving a little faster, there should be faster decisions, also motivated by fear-of-missing-out, in the conscience of the simultaneous actions.

The decision-making driven by this consciousness and the fear-of-missing-out can be manipulated – or at least suggested – by the balanced use of Spatial Story Density (SSD) and the tensions generated by the amount of simultaneous stimuli in determined moments of the story. SSD shares with montage theories – and storytelling in general – that stories are a sequence of tensions and releases. In the case of spatial storytelling, sequences of driving movements and sounds that incite users to make decisions should be followed by sequences of relative steadiness, that will allow users to orientate themselves again in the narrative space and, if desired, reconsider their decisions.

Beyond the specific conditions of this project, the production of this proof of concept has shown that immersive media – specifically CVR – requires and has the potential to develop its own expressive grammars. Aesthetically, it seems that the main aim of the CVR narrator would be to balance the stimuli directed to the user, in order to provide them with the moments and spaces to make narrative decisions. Despite being the elephant in the room, the incorporation of the user into the narrative is still the key challenge of immersive and interactive media, since creators can't longer hide behind a fourth wall and are being pushed to face the audience. Nevertheless, the adaptation and complementation of proved techniques from other expressive media are showing to be a fruitful enterprise

Chapter 5

Evaluating the outcomes of
designing, writing and producing
The Hunter & the Wolff

5.1   INTRODUCTION

This chapter focuses mainly on reflecting on the results of the stages that lead to the production of the proof of concept of *The Hunter & the Wolff*. This evaluation considered the different steps and elements that were being tested through the creation of the prototype and in the results of the creative output itself, of which the most relevant are: The incorporation of immersive and spatial elements into the screenwriting, the design of a dramatically-motivated soundscape as a guide within the immersive environment, and the notion of instinct-based decision-making as an interactive storytelling model.

The methods used in the evaluation involved, first, a system-test of the prototype, aimed to confirm the functionality of, on the one hand, the technical qualities of the prototype (random IVP, spatialized soundscape, spatialized mixing), and on the other, the key narrative concepts proposed in the model (hands-off interaction and instinct-based decision-making). A second method consisted of semi-structured interviews with two experts in the field of interactive storytelling, coming from different approaches to the subject. These semi-structured interviews also considered the experts' access to the prototype, which later determined the discussion in the interviews.

The third method consisted in the writing of a second iteration of a script for this interactive model, a creative output produced after critical reflection on the observed results, in order to incorporate some of the key findings back into the creative practice. The application of the findings of the proof of concept into the re-writing aims to deepen in the question established in the previous stage, of how to write for interactive narrative. This type of method supports the practice-led approach to this research, as it is more focused on the process and the production techniques more than on the result itself. In this sense, being able to nurture said processes with information generated by their own results meets the purpose of creative practice research, particularly in the case of on-development media, such as this.

The preliminary observations after the production of the proof of concept emphasize the importance of two notions that greatly disrupt the traditional filmmaking practice:

Immersion and Interactivity. Firstly, immersive media works on the basis of breaking the fourth wall and incorporating the user into the narrative space or world, what I've been calling the *storyworld*. *Presence* and *embodiment/disembodiment* are key concepts in this regard, and force us to think about how to convey the user's digital – and potentially narrative – existence into the storytelling. The second notion of interactivity refers to the agency granted to the user so they can affect the storytelling to a certain extent. Both types of media certainly intersect. While interactivity doesn't necessarily demand immersion into a *storyworld*, immersive media, ontologically proposes a minimum conditional amount of interactivity, granted precisely by the user's ability to navigate an environment and, thus, inhabiting it.

Notions like *guidance*, *spatial storytelling*, and *presence*, although being considered from the beginning, have been critically assessed during the production, a process that has provided new angles on them. For instance, the first iteration of the script was mainly centred on incorporating spatial storytelling and guidance, which resulted in the design of the sound-based guidance device that became the centre of the prototype development. On the other hand, the realisation of *presence* and *embodiment/disembodiment* as keys only became clearer during the production of the prototype, and presented a new challenge for following iterations. Therefore, a second iteration of the script was written after the production of the proof of concept, in order to creatively address some of the most significant challenges identified in the previous process. This iteration tries to specifically approach and incorporate the notion of embodiment/disembodiment, through considerably more direct recognition of the presence of the user, an acknowledgment that serves to the purpose of guidance through movement and blocking – or at least through the suggestion of actions in the script that could facilitate a stronger engagement with the user.

A second main evaluation criterion corresponds to the use of sound as guidance dispositive. The main aim in this regard is to confirm if the design of interdependent soundscapes within one immersive environment helps users to orientate and to navigate a space that has been conceived for dramatic purposes – in other words, to participate in spatial storytelling. This goes hand in hand with the third main element to be evaluated: the capability of interacting through instinct-based decision-making, aiming to see the extent to which users react instinctively and on the fly to aesthetic stimuli – in this case, particularly acoustic but also visual – to make navigational and narrative decisions.

In terms of the composition of the sample involved in the evaluation, this was composed of: volunteers (4) – from here on referred to as participants – who got to watch the prototype and participate in a semi-guided focus group, experts (2) from academia and the industry, who watched to prototype and responded to a semi-structured interview designed for experts in the field, and crew members (2) who answered a survey at the end of the production process, and another (1), the sound designer, who watched the prototype and participated of a semi-structured interview, counting a total of seven (7) people. There is a distinction made between

the feedback obtained from volunteers and the one from the crew member who watched the prototype, since it is understood that the latter were more informed about the project because of having taken part in its production, while the former were introduced to it at the moment of the consultation.

The consultation with volunteers took place between December 2020 and January 2021, and the interviews with experts later in March and April 2021. Participants were chosen considering the limitations imposed by the Covid-19 pandemic and the national lockdown, meaning that they were people I could access to considering the sanitary restrictions and that volunteered to help. They were all adults between 25 and 40 years old, male and female, with completed higher education and some previous – not extensive – experience with immersive technologies.

The consulted experts were Dr Mark McGill, lecturer in Computer Science from the University of Glasgow, specialised in virtual and mixed realities, and Steve Ince, multimedia fiction writer with extensive experience in interactive storytelling for video games, and author of the books *Writing for Video Games* (2006) and *An Introduction to Game Writing: A workbook for interactive stories* (2021), both of whom accepted an invitation to participate of this evaluation.

It is worth noting that this consultations took place during the Covid-19 pandemic, particularly during the second lockdown, which affected the original planification for the system test. Initially, this process contemplated a more elaborate setup in a highly controlled environment, and tracking and video recording of the participants' head movements in order to register and analyse the decision-making process. The sanitary measures hindered this plan in several ways: Impossibility to access the required equipment and facilities, need to apply social distance among the participants, limit the access to specialized facilities, and difficulties to share VR headsets among participants. In consequence, the consultations that took place consisted in simplified versions of this planification, in order to obtain sufficient data to evaluate the prototype and the key concepts behind its design.

5.2   WHAT BIG EARS YOU HAVE: SOUND AS AN IMMERSIVE STORYTELLING DEVICE

The following sections of this chapter describe the results obtained during the consultation previously described. Due to the characteristics of the sample, it is important to acknowledge that these results do not intend to describe the behaviour of the audience, but to provide qualitative feedback on specific creative goals proposed for this prototype.

The key proposal of this model is the alternative use of interdependent immersive soundscapes for dramatic purposes. The main fundament of this understanding of sound and

space is to facilitate instinct-based decision-making and a hands-off interaction scheme. Henceforth, this is probably the most relevant aspect to be evaluated. These are the aspects, both technical and conceptual, to be checked in the system test, which to observe the functionality of the interdependent soundscapes under the following criteria:

a) During the orientation process,
b) In the mental organisation of the space,
c) As guidance,
d) And as a driver of decision-making.

The original setup for this consultation involved a rather heavily controlled observation environment, which supposed a VR headset connected to a monitoring station that could allow the recording and tracking of movements around the axis and, hence, the decision-making process of the participants during the narrative. This would have been accompanied by a video recording of the process to support the tracking. The impact of the pandemic hindered this process, and the consultation had to take place under more rudimentary conditions that still allowed the minimum requirements to collect useful data. The process took place in home environments that were, however, adjusted to make the experience as safe as possible: An office chair – that would facilitate turning around an axis – in the middle of a room with no furniture in at least 5 feet of distance and no strong light sources pointing in the direction of the user. While this home-setup didn't allow a digital monitoring (because of the equipment available, considering that the Oculus Quest 2 cannot be monitored on screen), observational monitoring was still applied during each playthrough. Participants had the opportunity to go through two playthroughs. The first one was partial, and had two main purposes: To give the users the chance to get used to the VR headset – and identify any possible upsetting conditions – and to provide clear instructions and solve questions and doubts from the participants. The second playthrough was the one that was actually considered as a testing and was played in full. The questionnaire that followed was directed to the aforementioned playthrough. The focus group – driven by the said questionnaire, which is detailed in the Appendix 3 – consisted of four sections: Background and measuring previous experience with VR, technical usability and functionality of the narrative device, narrative and storytelling, and user's ontology in the virtual environment.

Overall, the results of the consultation were positive. People who participated in the consultation – from here on, participants – found that sound was a very important element within the narrative, that it helped them to place themselves within the immersive space, to re-orientate whenever they felt lost, to follow actions, and to make decisions.

First of all, the system test intended to see if the interdependent soundscapes would hinder the orientation process at the beginning of the film in any way. On the contrary, not only it didn't undermine this process; participants found it helpful to orientate themselves and to

facilitate the immersion in the story. This is maybe even more remarkable considering that participants weren't given a very detailed description of the prototype beforehand; they were only told to face forward until the end of the initial clock count as a way to have a referential starting point, and from then on they had the freedom to navigate as they wished. It was quite surprising how fast and swift was the orientation process not only in terms of the immersive space, but of understanding and adopting the navigation device.

> *"When the girl came in, I didn't think there was another room, but then I heard a noise, I turned and noticed there was more, and I thought 'I have to focus on this' (the girl)"*

> *"In the beginning, I struggled a bit to place myself, spatially. I heard a voice and then I noticed I had to look to one side where the scene was taking place. I heard a voice on the right side but I looked to the other side and I was a bit stuck with a scene that didn't have any noise, and then I looked at the other which was the one that had a voice. In the beginning, it was a bit confusing, but then I got the relation between sound and where to direct my attention."*
>
> *Participants.*

> *"What I immediately think of is the use of the audio in the scene. The doorbell rang and I instinctively looked over towards the door. I hear someone preparing the flowers, and I immediately look at them. I wouldn't say that was always entirely conscious."*
>
> *Dr Mark McGill.*

The fact that participants didn't have any problem adapting themselves to the navigation method shows that, as it was initially hoped, the interactive device relies on instinctive reactions to stimuli more than on establishing a set of instructions for users to be followed. Even with the rudimentary technical implementations of the prototype, most participants went through the orientation stage very quickly and got a fast glimpse of how the space was organised and how to move around it. One of the participants had more difficulties orientating, but they found aid in the soundscape design to overcome the initial confusion.

It is interesting that most of the participants declared feeling lost, or looking in the wrong direction, at some point of the narrative, but that this wasn't necessarily perceived as a bad thing, since, on the one hand, this was understood as a part of the dynamic of having to decide between two actions and, on the other, sound helped them to quickly re-orientate into the narrative.

> *"Yes (I felt lost at times), but that was followed by hearing something that called my attention."*

> *"I felt like I ran the risk of getting lost, but it was very easy to re-engage, so I feel that I didn't miss much."*
>
> *Participants.*

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In terms of guidance, once the orientation took place, the capability to mentally organise the immersive space translated into the desired navigational skills required to interact with the story, as the interdependent soundscapes – and how they swiftly leaked into each other – signalled participants of the simultaneous actions, even when they were focused on one of them, and in many occasions motivated them to peep into the other room to see what was going on. The very simple premise that one tends to direct depending on who's talking or when there's a new stimulus worked satisfactorily.

"I could hear something and my head went 'what's going on over there?'"

"One tends to direct the gaze to the person who's talking."

Participants.

Finally, for the most relevant aspect of this proposal, participants of the consultation made a good part of their navigational decisions in a rather instinctive manner. On the one hand, the fact that they had to make decisions on the fly, without time to stop to think about them, generated a sense of urgency – or Fear Of Missing Out, as I'll comment later – that made them feel more engaged not only with the environment but also with the story. On the other hand, some of the participants described their decision-making process as more-or-less conscious, since they did realise they were making decisions but not necessarily *thinking* about them.

"One is not thinking 'Oh, I'm thinking so I can respond', you rather follow the stimulus, you don't think why."

Crew member

"In the end I just let myself being carried by the sounds."

"It was very interesting because I could decide what to listen to more, what to pay more attention to. I could hear a rumour from the other side, I knew there was something happening, so I looked and the other action becomes a rumour, and that way I could decide what to follow."

Participants.

The observed influence of the soundscaping in the decision-making processes comes to confirm the initial hypothesis about the dramatic use of sound in immersive environments; that these artificial arrangements can be used to facilitate and suggest spatial storytelling, and that these diegetic stimuli incite users to instinctively react to the story and make immediate decisions that affect their experiencing of the story.

There were also unexpected findings that reinforce the soundscaping proposal, such as its utility to help users place themselves in the virtual environment during the orientation

process, and to re-orientate in the case that they feel lost in the immersive space at any given moment.

Yet, some of these findings deserve a deeper exploration in themselves, as the results show more complex dynamics not only in terms of the use of sound, but also of the relation between the many elements in the proposal, and how they facilitate interactive storytelling. In this regard, there are two very interesting areas that are worth observing. First, a more in-depth look at how participants articulated their decision-making process, and secondly, the emerging notion of Fear-Of-Missing-Out (FOMO) as a narrative strategy for this type of interactive storytelling based on discriminative decision-making.

5.3   WHERE ARE YOU GOING, LITTLE RED CAP?: DECISIONS AND SIMULTANEITY

It was expected that the criteria that each user would follow to base their decision would differ significantly from case to case, since the main objective of this type of interactivity is to be driven by quick and instinctive motivations. In this sense, apart from confirming the effects of the soundscaping design, the consultation didn't ask participants for any other specific reasoning behind their decisions, but explored how they evolved throughout the short film, as well as their diverse motivators.

Unsurprisingly, one of the predominant motivators was the initial viewing direction (IVD), which seemed to determine to a great extent which characters would each participant prioritise over the rest of the story. Let's remember that the IVD was assigned randomly by the system on a 50/50 probability, which is also the justification for one of the few navigational instructions participants received before watching the prototype: to stay fixed in the starting point until the beginning of the sequence.

Indeed, participants were inclined to prioritize either the Grandmother or Ginny, depending on their IVD. However, despite a predominant inclination to stick to their initial characters, the criteria for the decisions diversified significantly.

"I first noticed the girl in the red shirt and when I noticed there were more things going on, then I changed, and tried to compensate both sides. And at that moment I think I gave more importance to the man, who moved from one room to another."

"I tended to look at the bed anyway, because it was what I had in front of me."

Participants.

Indeed, the male character, Wolff, tended to generate a certain attraction, which is mainly attributed to two main reasons: being the character with the most mobility – which also implies moving between the three rooms – and being identified as the instigator and, hence,

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the most intriguing character. These characteristics are consistent with the impression by some of the participants that following Wolff would help to provide a better, or more complete sense of the overall story, while sticking to one of the women would limit this possibility.

"I switched to following the man because I noticed there was something going on with him."

"It called my attention that I was understanding the story (when following Wolff)"
Participants.

This is, certainly, within the scope of the concept behind the script, of having two simultaneous and interdependent plots within one story. However, it came as a surprise that participants would be inclined to follow Wolff instead of the women, who are meant to be the protagonists of their individual plots. In this sense, it is not only interesting because of the technical reasons that justify this decision, but also because of the narrative motivation to make better sense of the story.

One of the most important notions to be evaluated was the one of instinct-based decision-making, based on the premise that conscious decision-making, induced by explicit requests to the user to stop and think would generate a pull-back from the narrative immersion. Henceforth, more instinctive decisions, based mostly on immediate reactions to organic stimuli, would keep users immersed and, presumably, engaged. Primarily, users indeed found themselves not stopping to consciously think about their decisions (instead, conscious decisions had to be made on the fly) but rather following the stimuli, in this case, mainly the acoustic ones, although not exclusively, as they were also driven by the characters.

"I don't know how conscious I was (of the decision-making); it was more about acoustic stimuli that caught my attention. And, since everything happened so fast, the little consciousness I had was mainly not to get lost."

"I don't know if the sound is in the unconscious or the conscious. I felt directed to where the voice was."
Participants.

It is interesting how some participants described an inner dialogue between instinctive decisions and more conscious ones, and how their thinking process apparently complemented both. In fact, as part of the initial orientation, the discovery and understanding of the spatial dynamic seemed to have been part of the storytelling itself, as users were expanding the *storyworld* by finding fragments of the narrative. In this sense, the specific moment in which one finds that there is more than one action taking place at the same time seemed to be particularly meaningful as a revelation of how the storytelling works, as it reveals that decision ought to be involved in the process.

"The unconscious makes decisions before you do, and the conscious tells itself it is making those decisions. So, in that sense, I used both. There's a part of you that is watching it all and makes decisions in a different way without realizing and another one that's very conscious and says 'rationally I'm going to look at this.'"

"I followed the two women more because, while the lady was here, and the girl was there, I wanted to see how two things were happening at the same time, the two angles of the narrative."

"At some point, I rationally decided to look more at the girl."

<div align="right">

Participants.

</div>

The tendency among participants was to want to know about both sides of the story, while also realising this supposed a challenge and required some effort. However, they also seemed to have embraced the narrative mechanics, and seemed excited about their role in *telling the story by themselves*. What seems to be the most relevant aspect to this research is that, indeed, more instinct-based decision-making would not only avoid a pull-back from the narrative, but would encourage more immersion and engagement with it, precisely because of the possibility to explore and make sense of the story.

On the other hand, one of the experts noted that the absence of a tutorial or instructions on how to navigate and interact might be a deterrent for immersion and adaptation at the beginning of the piece, when the user – in order to originate an instinctive response to the prototype – is introduced to the virtual environment by their own devices.

"Where I think the problem may lay is in educating your audience; how they relate to this environment, what their role is, and the approach to interactivity."

<div align="right">

Steve Ince.

</div>

Indeed, due to the versatile nature of interactive media, and the absence of a general canon, different types of interactive media – video games are a good example of this – require tutorials and/or training instances so the user can adjust and familiarize with devices and mechanisms before jumping into the experience itself.

"So many interactive things require to use something with your hands; you're moving a mouse, you're using a control or something like this. And in most interactive films you get to a point when you are making a choice. So, I watched that (in this prototype), and I didn't know what I was supposed to be doing."

<div align="right">

Steve Ince.

</div>

It was an authorial decision to prescind a tutorial for the prototype itself, with the research purpose of observing how would users adapt to the conditions of the interactive device. However, after observing the results, and taking audiences into consideration, it seems

recommendable that future, more finalized iterations of this medium would include a tutorial that will help make the adaptation period more expedite, and thus, will aid users to generate quicker engagement with the narrative and organic elements of the story, for instance, characters.

5.4   FOLLOWING THE LEAD: GUIDANCE THROUGH BLOCKING AND VISUAL STIMULI

Certainly, sounds were not the only diegetic stimuli involved in the storytelling, and participants were well aware of it, as they declared to have made decisions based on other factors, mainly visual. As it is seen in chapter 4, the challenges to block an immersive environment of these characteristics were a strong consideration in the direction design, also as a way to see how these different stimuli – visual and acoustic – could work combined: if they would complement and balance each other, or if they would become a hindrance instead.

The initial observations show that, as it was intended, movement caught the participants' attention, maybe even more than it was originally desired. In most of the cases, the male character was identified as the main one because of having a higher frequency in movement and his more frequent transits between the three rooms. This has several interesting implications. First, it undermines the original narrative intention of making the female characters the protagonists of their own interdependent plots, but that tended to move less and remain in one or two spaces precisely to keep the plots separated. In this sense, it would become necessary to explore possible strategies to make the suggestion of these leading roles more emphatic, and develop blocking and directing strategies that would drive more attention to them. We know already that sound has proved to be very effective in this sense, so monologues, soliloquies, leitmotivs, extending the dialogues, or other dramatically relevant sounds could help. We also know that movement works in a very similar fashion, so making the characters move within the space they are already in could help to keep the attention focused on them. Finally, a more accurate and intended use of proxemics could be interesting to see how this affects the perception of the characters. Proximity has shown to be somewhat complex, since some of the participants declared to feel discomfort when they felt that characters were too close to them, even when they weren't in an intimate space according to Pope et al and Probst et al classification. The reasons for this were specially mentioned: invaded intimacy – in one or both directions – and losing field of vision, declaring that being too close to one character narrows the scope.

Another implication of Wolff being identified as a protagonist is that his more frequent movements made participants switch between spaces more often and, eventually, want to monitor two or more rooms simultaneously. This is a desired effect, that in most cases showed to be received as an interesting and engaging way to navigate through the storytelling. However, it also showed a bigger tendency to move around instead of creating a stronger engagement with one of the characters.

In this regard, it was commented by the experts that this could be because the length of the story doesn't allow enough time to get to know the characters better, and the need to have a general view of all of them before establishing a deeper engagement with one in particular. Indeed, for most participants, it was hard to identify or to assign a leading role based on character treats, and instead, they seemed to have followed them based on blocking directions and cueing stimuli, but overall, the relation with the characters seemed to have been rather shallow, while the interest was more centred in the navigation and the storytelling.

"I would want more information prior to that to enable me to make that choice [which character to follow]. (…) If I knew the characters and the plot more concretely, I could then fix on the one that I thought was more interesting."

Dr Mark McGill.

"It felt like it was over before I actually knew what was going on. It feels like I needed longer with them all (the characters)."

Steve Ince.

"I feel that the three characters had very powerful things, it was hard for me to tell which one had like the leading role. I had the feeling at some point that the girl was the lead, in other moments the wolf was, and in another moment the mother."

Participant.

This is indeed a possibility, considering that the narrative device in its current state actually demands more effort put into the navigation than in the engagement with the characters. However, it is also possible that this is also an attribute of the narrative device itself, considering its intrinsic characteristics and the purpose for which it was originally designed: to offer a type of interactive storytelling based on the exploration of the space, not necessarily focused in character engagement.

"For me, it was defined (the three spaces) and it made me constantly move between these three places."

Participant.

In this regard, participants did indeed engage with the mechanics of navigation and seemed comfortable with it, as they were able to balance between the impulse to monitor both simultaneous actions and follow one preferred character.

"I tried to balance between the two sides so as to understand what was going on in each side. But the first thing that called my attention was the girl, so I followed her more."

"The same happened to me (followed Wolff) but I also followed the girl."

Participants.

As we see, the IVD seemed to have played an important role in the choice of whom to follow, as participants assigned a prioritised role to the first character they saw, whether it was Ginny or the Grandmother. Participants who went through only one run of the prototype randomly started the story in one of the two IVDs. It was reported that half of them started in in the Grandma's bedroom and the other half in the hall, where Ginny was the first character to appear. It was also reported that one of the experts could experience both different IVDs, supporting the premise of how determinant this could be for the overall story. Indeed, the IVD seemed relevant not only in terms of proposing the first encounter with determined characters, but also by establishing a physical anchor point, objects where to come back, as it seemed to be the case with the red door in the hall. This is particularly interesting considering that, because of the rudimentary production of the proof of concept, there weren't many objects, nor props, nor many significant staging elements, and yet, the most visually attractive seemed to have had some gravitational pull. This might be worthy of consideration for more sophisticated productions and blockings, as an alternative, complement, or counterbalance to moving elements, such as the actors.

"I was following the man because he was present most of the time. When he wasn't, I looked at the woman that was combing her hair, but because she was the first character I saw."

"The door has an important place, because of the size, colour. It being in the middle already said something to me, and it was a type of bridge between the mother's room and the place inhabited by the younger woman."

Participants.

Overall, visual guidance through blocking techniques seem to have complemented the acoustic device effectively, as it suggested alternative stimuli and further decision-making, particularly in regard to which character to follow. On the other hand, the tendency to simultaneously monitor many rooms and actions seems to have been a dominant feature in the evaluation, suggesting that users have a deeper engagement with the mechanics of the story than with, for instance, the characters themselves. These could be caused by many reasons, and don't necessarily suppose a bad result in terms of storytelling, as it is feasible that the richest element in a story could be in the way it is told. However, this presents further questions regarding the blocking for this kind of immersive narrative: Would it be possible to suggest further engagement with characters using different, more visually appealing blocking techniques? Would spending more time with the characters strengthen an engagement with them before suggesting the exploration in the immersive space? If so, would that affect the tendency to monitor many simultaneous actions?

This also opens different possibilities to explore writing stories for this type of simultaneous immersive spaces. For instance, instead of having two simultaneous actions from the beginning, it would be interesting to start with one character clearly defined as the

protagonist, generate a stronger engagement with them, to then trigger a more spread spatial narrative; a dramatic structure with more similitudes to branched structures. A more character-centred narrative could also open the possibilities to further creative approaches to the use of dramatic spaces. For instance, as suggested by one of the experts, following the same three-rooms setup, the spaces could be fictionalized and not necessarily connected, as in three rooms that belong to different spaces and contexts.

> *"I think it was effective. I think I'd like to see this same setup but where the three different stages were different places entirely, disconnected and telling different parts of the story. Maybe that way you would get around the problem of building a mental model. I like this kind of setup."*
>
> *Dr Mark McGill*

> *"When you write a normal story, it's difficult to balance those things. When you are doing it in the slightest way interactive, it is more difficult. To me that is quite important; how you make these characters both interesting and empathetic, and at the same time very different as well. With this, the time goes off very quickly, because you trying to figure out 'what's going on over here' and that's it. You need something a little bit longer, because then people will get immersed and follow those characters."*
>
> *Steve Ince.*

In the end, blocking seems to be an effective complement to the more experimental use of soundscapes, and it shows potential to be furtherly explored, especially regarding different approximations to the narrative use of the different spaces. There is, however, still a lot to try in terms of the use of characters' movements within one space, proximity, and fixed focal points with props and scenery.

5.5   FEAR OF THE DARK: ANTICIPATION AND *FEAR OF MISSING OUT*

Spatial storytelling in immersive environments consists of the possibility to use the space for the author's narrative advantage and to find different uses to traditional strategies like anticipation, and new ones suitable for this type of narrative, like Fear Of Missing Out (FOMO), which is how I've named the use of the participants' desire to monitor two or more simultaneous actions, instead of choosing to follow just one.

> *"I felt like I was constantly missing something."*

> *"One tries to look, quickly, to the other side and then return to the main scene."*
>
> *Participants.*

This behaviour wasn't unexpected, as one of the purposes of this spatial storytelling strategy is to make participants aware of their options. However, it is quite interesting to see

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its frequency among participants, at least at some point in their experience. This tendency, however, shows also a potential inability to decide, which could mean that the device and/or story don't provide enough means to the users to feel confident enough about a choice, or about a deeper engagement with one specific character, which could be reinforcing an instinctive need to know the characters better and, thus, to look at everything that is happening, before committing to one or some of them.

> *"When you are looking at a scene and notice there are things happening behind you, when things happen simultaneously in both rooms, you feel like 'where should I be looking at?'"*
>
> *Participant.*

> *"I couldn't choose between the two scenes. I didn't have an opinion as to where should I focus on, and because of that I tried to focus on both, by glancing back and forth, and that's a bit distracting and a bit frustrating."*
>
> *Dr Mark McGill.*

A certain anxiety for having to choose was present in different degrees across participants. There was also a certain ambiguity in how this obligation favours the narrative interaction. Most participants declared that having to choose kept them alert and encouraged more engagement, and they found enjoyment in the navigation. However, the tendency to monitor both actions shows a certain level of inability to commit to a choice, to a character, and thus, a certain level of frustration showed up at certain moments of the story when a choice was forced, like towards the end, when the two female characters have separated epilogues.

> *"For the outcome, and when the truth is revealed, you don't know whom to look at; the one who triggers the situation, the victims of the situation. It became very difficult, because you wanted to follow everyone's reactions and you couldn't."*
>
> *Participant.*

> *"If you make it a very explicit choice where it cuts to another stage, or it switches to a different video depending on you're looking there or looking here, something that denies me the opportunity of being able to monitor both storylines simultaneously. So if I'm going to make a choice then I have to commit to that choice."*
>
> *Dr Mark McGill.*

Likely, this lack of commitment is more a product of the overall design of the story than of the interactive device itself. Most participants showed a good level of engagement with the device, but a shallower engagement with the characters, which suggests that they didn't get to know them deeply enough. This also supposes a need to balance both types of engagement so that users are more capable to react to the dramatic aspects of the story and not just to sensory stimuli. In this particular prototype, the results of the consultation suggest a need to increase engagement towards the characters.

Yet, participants did present a certain level of engagement with the characters. As we have seen, having them introduced and then following them – especially Wolff – generated a sense of anticipation, as well as expectations about what his role in the relations with and between the women could be. The notion of anticipation is interesting to be explored in more depth, as it could provide a better understanding of the mechanics behind the users' narrative choices.

Traditionally, anticipation is used to create a sense of expectation about events to happen – or not – in a story, so that readers and spectators get emotionally involved in the characters' fate. Aristotle relates this to the notions of mimesis and identification, through which spectators can see themselves reflected in the drama. More interestingly, he also defined how the climax, the ultimate cathartic release, ought to be achieved through increasing sentiments of fear and pity from the audience to the characters: Pity for the problems that afflict them, and fear for the threats that await them.

Therefore, the sense of anticipation is created when we expect that something is about to happen to the characters, that is directly related to their fates. In the more traditional versions of The Little Red Riding Hood, for instance, this sense of threat can be intuited from the moment the wolf tells the girl to take the long way through the woods, while he reaches the grandmother's house quicker. Folktales like these have contributed to generate a culturally spread image of the binomial wolf-girl as a predator-prey relation (although, let it be noted that in other tales the archetype of the wolf can also have positive connotations). These images and relations have become so rooted in our cultural narratives that they are part of our collective mind. Figures like the wolf become symbols that encapsulate narrative meanings and metaphors. As Bruno Bettelheim said, "the folk fairy tale, as distinct from more recently invented fairy tales, is the result of a story being shaped and reshaped by being told millions of times, by different adults to all kinds of other adults and children", (1976:150) and it is in this constant re-telling that their symbols and meanings become part of a common imaginary.

When we find these symbols in a story, like a wolf and a young woman in red, they give us something to expect, to anticipate. One of the main reasons I have chosen to adapt a known folktale instead of working with an original idea was to present the user with relatable archetypes, so they can find themselves quicker in the story (while hoping to aid to reduce the orientation period when entering the VE), and to fasten the process of identification with the characters and, thus, the sense of expectation. I hoped that the presence of a male character identified as Wolff and two female characters would set him as a threat to the women.

Despite my initial authorial intentions, participants didn't identify the characters as adaptations of Little Red Riding Hood, the wolf, and the grandmother, which is something I hoped would aid users to place themselves quicker in the setting of the story. Most participants identified the characters as "the guy", "the young girl" and "the mother". In a personal

evaluation of the script, I consider the adaptation was probably too obscure and wasn't entirely transparent regarding who these characters were. This is one of the reasons I wrote a second iteration in which some of the better-known elements of the tale were integrated. However, in the evaluation, not identifying the characters didn't seem to be a hindrance to the orientation and engagement with the story. On the contrary, participants seemed to be able to identify, if not the characters, their roles in the relational dynamics between the three. More interestingly, understanding the nature of the archetypical roles reinforced curiosity and engagement:

> "Several things were going on. It made my curiosity expand. I wanted to see what was happening to the mother that was looking at her mirror, which reminded me of children's tales; what was happening to the girl... I didn't want to miss anything. But at the same time, it put me in a situation where I had to define to whom pay more attention in one moment or another."
>
> *Participant.*

A very interesting and unexpected reaction was that participants assigned the role of the main character to Wolff, which wasn't the primary intention in the script – as I've explained, the prototype aimed to propose a conflict between Ginny's plot and Grandma's plot. However, there seem to be two main reasons why participants thought of Wolff as the protagonist: 1) His role as a link between the plots and as the inciter of conflict, and 2) him being the character that moves the most between the room, and thus, becoming a visual cue, while the women tended to remain in one space for longer periods.

> "The man (Wolff) is the one that generates the conflict (which could make him the main character)"
>
> "I followed the guy more because I thought he took the direction of the movement. I had an intuition that he was the nexus between the rooms."
>
> *Participants.*

> "The wolf is present in most of the actions, and is the one that threads the interactions between the lady and the girl. But, because the actions were separated between the lady and the girl, I wanted to see both actions."
>
> *Crew Member.*

However, assigning the protagonism to Wolff didn't mean participants felt more sympathy for the character. Instead, they understood his role as a villain, as a threat to the women and, ultimately, as a predator, hand in hand with assuming the women as his victims. Identifying these archetypical roles generates expectations on the character; allows readers and spectators to, to a certain extent, venture to guess possible outcomes based on the characters' natures. In the case of Wolff – or, as called by participants, "the guy" – being identified as a predator induces in spectators a feeling of fear, and the expectation that, at some point, he might hurt his victims. Fear generates a gravitational pull towards the character

or element when anticipation is set, which means users will very likely return to it throughout the story. This might explain in part why Wolff was seen as a point of interest.

Focusing attention on the threat is broadly common in cinematic narratives, particularly in parallel sequences, like last-minute rescues. A famous example of this is in Alfred Hitchcock's *Notorious* (1946), in the party sequence, when Devlin – the protagonist played by Cary Grant – is aided by Alicia – Ingrid Bergman – so he can sneak into the cellar to look for evidence against their common foe. The sequence is famously divided between the scene in the party and its counterpart in the cellar, while they are in the cellar, the director constantly returns to the party to show how the bar is running out of champagne, meaning that Alexander Sebastian – the antagonist – will need to get some more, anticipating that he might discover Devlin and Alicia. In this case, the director establishes a tension between the two scenes by turning the champagne bottles at the bar into a gravitational visual element.

Traditional linear films do this by sculpting in time – to quote the Russian director Andrei Tarkovsky – organizing the sequence of images linearly so they can build up in tension. Spatial storytelling should be able to apply this principle as well, but spatially, by proposing at least two simultaneous gravitational objects of which the viewer must be aware, but in separate spaces that exclude each other from the field of vision (FOV).

Current VR headsets reduce our normal peripheric field of vision, which tends to be between 200 and 220 degrees, to between 100 and 120 degrees, which allows creators – writers and directors – to "edit" inside and outside that FOV. This blind space should not be discarded, since it belongs to the VE and, thus, to the *storyworld*. This is an organic key difference with traditional theatres, where the space outside the stage is most of the time considered not to belong in the *storyworld*; the traditional understanding of a fourth wall. But as it has already been established, in immersive media it is the user the one who crosses the threshold, and potentially everything that surrounds them has narrative value. In this sense, "placing story elements at the blind spot can be used in terms of narration." (Gödde et al:7) Probably, one of the most exciting aspects of this blind spot – or space, considering that it uses around 260 degrees of the circumference – is that it is ever-changing: every time the user moves to re-assign a FOV, the blind space is also transformed, hence, giving the user editorial powers over the space.

From a cinematographic point of view, this is similar to the use of off-screen actions, that affect whatever happens on-screen, but that is up to the director to visually share it with the audience or not; the cinema spectator can't see all of the dramatic space, only what they are shown. Similarly, the VR user can't possibly look at the whole space at the same time, no matter how conscious they are of the elements and characters around them, which forces editorial decisions.

In this creative canvas, writer and director can propose simultaneous gravitational elements to cue viewers to look in a certain direction in one dramatic space, not only to suggest and force a decision to the user, but possibly to engage with them on a more participative level. A key difference with linear storytelling is that, in sequences like the one in *Notorious*, or those commonly known as "last-minute rescues", is that spectators are generally shown both parallel scenes, while in this spatial organization of the actions, the user is expected to choose one and miss the other. A hypothesis suggests that users, once they become aware of the simultaneous actions, will be tempted – or at least curious – to know what's happening in the blind space. This was confirmed during the evaluation when participants and experts agreed with this premise and said that they would watch the prototype again so they can know what happened in the spaces they couldn't see. Interestingly, during the consultation, some participants tried to constantly peep into the other rooms, because they didn't want to miss anything.

This Fear-Of-Missing-Out (FOMO) effect could potentially be one of the drivers of this type of spatial storytelling. Although not theorized as such during the writing of the script of *The Hunter & the Wolff*, it was still a desired consequence of the design of the story; to intentionally induce in the user a certain level of anxiety towards what they might be missing because of their decisions, and that might enhance the engagement to the scene.

This effect is driven by the interchange of relations between characters and their relocation across the narrative space, or spaces, in this case. Probably the clearest example of this is when two characters in one room depart to different ones and the user must decide whom to follow. Yet, this is not the only instance when this occurs. As soon as the user is aware of the simultaneity of

Fig.27. Alfred Hitchcock's Notorious, 1946, in the famous party sequence, while Devlin and Alicia sneak into the cellar, the camera keeps returning to the champagne to make the viewer aware that it is running out.

the actions, there is potential for the FOMO effect to be activated, especially if there's a sense of anticipation previously built. This was shown when participants seemed to have quickly adapted and developed a way to navigate using these notions of anticipation and FOMO.

"When I got what was happening in one place, and I could predict what was coming, then I switched to the other to try to make the same exercise."

<div align="right">*Participant.*</div>

"(The feeling of missing something) helps me to make decisions and get more involved in the story."

<div align="right">*Crew Member.*</div>

Overall, participants were also able to identify the mechanics and their own role in the narrative, understanding that missing fragments of the action was indeed intended and part of the storytelling experience. They commented about the possible variations of the story that could be told if watched again, and getting to see different actions, engaging with characters in different moments, and getting a different perspective on the events. This also led them to imagine possible variations in the meanings and interpretations of the story, depending on the narrative choices made each time.

"I think this is interesting because it would be interesting to see how the story would be if I watched the film again seen, or putting more attention to other parts I didn't see in the beginning. In the end, it shows how malleable the message can be."

"In the end, it is open to your interpretation. It invites you to watch it again and see the things you think you missed. And those details could maybe turn around what you interpreted the first time you watched it."

<div align="right">*Participants.*</div>

This also shows that participants were somewhat aware of their roles in this storytelling experience, as some of them realised that they were curating and editing their story as they were watching it. In the next segment, I will comment on the results regarding the role users have in interactive narratives, specifically in terms of their role as narrators, as was intended in this proposal.

5.6   ONCE UPON A TIME: WHO'S THE NARRATOR?

One of the key premises behind this proposal for interactive narrative is that, because of the constraints of the medium not allowing users to participate as characters or diegetic elements of the *storyworld*, instead, interactivity is based on users interacting with the narration, the *siuzhet*, a layer of the storytelling where the shape of the story is built, and the narrative is negotiated between the author – myself – and the user. In this sense, one of the objectives of the model is to provide the user with narrating capabilities, so they can become the final narrator of the story: something like providing the ingredients so they can prepare the recipe.

To measure this, one of the questions in the interviews asked users what they thought was their role in the narrative. It was interesting to see that their first instinctive reply was to assign themselves a more observational role, understanding that they couldn't interfere with the actions or influence the characters in any way. However, they quickly started to question their initial thought and expand the notion of an observer.

"(My role was to be an) observer."

"It is a different kind of spectator, more active. You are deciding to listen. The story, at least from one's perspective, you are going to tell it from what you decide to hear."

<div align="right">Participant.</div>

Indeed, participants reflected on their role as being somewhat more active: Despite being unable to be a diegetic part of the story, they realised that their decisions affected the way the story was being told. This is an extremely important result for this research, since it confirms one of the hypotheses and objectives of the experimental model, that interactive storytelling in a cinematic narrative is possible on a level in which users interact with the narrative layer of the story, and not with the diegetic one, the *storyworld*.

"I don't think it's necessary to make me feel like a character in the scene. I didn't mind the ambiguity of being a floating fly on the wall. I guess it depends on what you're trying to evoke, and how much you are trying to make me feel like I'm a part of the story as I'm watching what's unfolding."

<div align="right">Dr Mark McGill.</div>

"You go listening to what you want to listen to, so you are building a story."

"More than interacting with them (the characters), you interact with the story, making decisions."

<div align="right">Participants.</div>

Yet, participants also confirmed some of the observations made on the prototype after its production, which discuss the diegetic materiality of the presence in the immersive environment. This aspect is particularly unresolved, since there doesn't seem to be a correct formula to approach it. As I developed earlier in this chapter, regarding writing a new version of the script which would give the user an embodied presence in the immersive environment, this aspect generated a series of questions regarding the notion of narrative presence and embodiment. In the case of the participants, they weren't bothered by the lack of embodiment, as it didn't affect their sense of presence. Moreover, despite sharing some of my first concerns about the ghost-like presence, they also noted that this specific quality made them feel like a voyeur-spectator, somehow bringing back an aspect of the traditional notion of the fourth wall, which would separate characters from spectators – or users, in this case – but that in this type

of immersive narrative is somehow downgraded, precisely because of the immersion and the sense of presence. An illustrative way to describe this was comparing it to looking inside of a house from the outside, through a sound-proof window: the barrier is not a screen that separates two worlds, but rather a barrier within only one world.

> *"The format doesn't allow you to touch the characters, to intervene. We would have been like ghosts. I felt like a ghost-spectator."*

> *"It's like looking from a window (there's still a barrier), as a gossip. It plays with our morbid curiosity."*

> *Participants.*

This voyeuristic understanding of the role of the observer also raised some interesting and unexpected questions about ethical concerns on narrative participation. The limited agency played a role in reflecting on the possible reach of narrative interactivity. When asked if they wished to have more agency, participants gave very diverse answers, from feeling a physical need to walk around the space, to talking to the characters – actions that would place them within the *storyworld*, as diegetic elements – or to being able to choose the distance of the point of observation (the fixed axis), as a way to manipulate the intimacy with the characters. In this sense, there was an open debate – with little certainties – about the level of proximity to have with the characters during their more emotional moments. While some of the participants declared to prefer a more distanced positioning to observe the actions, others were more enthusiastic about getting involved. This is supposed an ethical questioning on at least two levels. In the first place, operating on the narrator's level, it would indeed be quite interesting to see how different users would approach the possibility to manipulate proximity and, therefore, their relation with intimacy, although maybe still functioning as a "ghost-observer", present but not embodied. Secondly, operating on a diegetic level, an eventual possibility to interact with characters within their environment – meaning, on their side of the fourth wall, or any of its variations – would propose an interesting device to observe users ethical approaches to difficult narrative decisions: to help the characters, to let them suffer, to let the tension rise, to support the hero or the villains, etc.

> *"Maybe, one as a spectator doesn't want to participate of certain scenes, so having the freedom of getting further or wanting to participate and get closer, I feel that being sat I could do it, I was a bit forced to be in the place."*

> *"This format pushes one to make decisions that can even be ethical. Like, do I get in this conflict or not? Do I get involved with the characters? Do I help the girl or not?"*

> *Participants.*

Many of these questions are most certainly raised on the hypothetical possibility that this type of interactivity could take place. However, these are still very genuine and relevant

concerns concerning the role of the user of interactive narratives, and how their ethical engagement with the story and its components is certainly different from what happens in more traditional formats, where the basics of ethical engagement have been discussed since Aristotle. However, it is still relevant to this research to consider the ethical reaches of narrative participation, and its possible effects in the engagement and narrative immersion, particularly noting that users seem to be very able to understand their role in interactive narratives like the one in this proposal, which could derive in a sense of validation as an active component in the act of storytelling. Or, like one of the participants declared: "The essential character could even be oneself, who is watching everything."

5.7   THE LIMITS OF *THE HUNTER & THE WOLFF*

At this point, it feels quite appropriate to reflect on the chosen medium and on its limits regarding the purposes of interactive storytelling, or even for storytelling in general, at least in its more traditional understanding.

We need to keep in mind that, despite the developments made during the last few years, VR and CVR are still in an experimental stage as media, and that it remains unclear what their future will be, how its consumption will evolve, and in which direction it will grow as an expressive medium. This being considered, there have been very significant changes in VR technology since I started this research, just as interactive storytelling has become a more common topic of discussion, especially after the release of *Black Mirror: Bandersnatch* in December 2018, and the adoption of the term XR to group immersive, interactive, augmented, mixed, and virtual technologies in general. Despite this, neither VR nor interactive cinematic narratives have had a breaking entrance into the mainstream despite existing as accessible technologies for a number of decades, which invites us to suppose that there are intrinsic limits to these broader understandings of the media, and their relation with the public. The evaluation of this prototype shows some impressions that are consistent with these more general observations: Participants declared that, overall, they found the medium and the narrative interesting, fun, and exciting, but that it wasn't relaxing, laid-back, and that they didn't know if they would incorporate it to their regular means for consuming stories.

This broader landscape doesn't at all excuse the possible limitations that *The Hunter & the Wolff* might have as a narrative medium, but provides a framework in which these types of narratives are being experimented with. The evaluation and reception of this prototype have, on the one hand, indeed provided very interesting feedback that invites to imagine possible improvements on possible future versions, and even to a deeper exploration of some of its specific aspects, like instinct-based interaction, or the dramatic design of immersive soundscapes. But on the other, there are also thoughts regarding aspects that might simply not be so easy to correct or to improve. There are, of course, aspects that heavily rely on

technological development. For instance, a fully developed version of this proposal for interactive soundscape would make use not only of the X axis, but of all the spatial coordinates. However, this would require, first, much more developed recording techniques and workflows, as well as a much more developed and complex postproduction design that would allow the flow of considerably bigger amounts of data. The successes of this prototype invite to theorise about the next step of this dramatic immersive soundscape, but this would require further evaluation and broader testing – possibly oriented to find out more about user engagement – of its technical feasibility.

> *"Yes (I agree that this proposal is very interesting for the narrative uses of sound in VR), but I feel we are in a very early stage of cinematics in virtual reality. Because it requires too much data, too much information, it is very heavy."*
>
> *Crew member.*

However, the medium itself presents narrative limitations that seem harder to overcome even with technological development. Interactive CVR seems to present ontological definitions that could be determining the nature of the storytelling exercise. If, on the one hand, the design effectively helps users to feel more immersed and engaged with the narrative, this engagement isn't apparently been shared with the characters. This doesn't necessarily mean that the immersive and interactive narrative is not effective, or that it is unsatisfactory, but that the medium responds better to a certain type of narrative than to others. Indeed, participants responded quite well to the medium, and interacted with the act of telling a story; they were able to understand their role as storytellers and engage with the narrative dimension of the story. However, the fascination and focus on that aspect could be limiting the depth of engagement with the characters and their development. In other words, the medium – or the chosen strategy – to tell this story is complex enough to also present complex, layered plots and characters. Since participants focused their energy on the medium, the medium presents itself as a constraint – not an impairment – to more diverse types of stories that require deeper engagement with the character. This should be taken into account if the authors, like myself, are looking for this type of narrative experience, so they can write, design, and block the story to generate the moments that will produce such emotional engagements with characters.

This could be argued by further creative practice, but it seems reasonable as a hypothesis that the procedures involved in the immersion would play the role of a double-edged sword, not only in its own materiality – like discussed by Janet Murray in the definition of threshold objects – but also in their mechanics for narrative engagement: the medium facilitates narrative immersion, but also defines certain boundaries to it.

Seen in a positive light, more than presenting obstacles, this type of observation could be helping to understand the frame in which the grammars for cinematic immersion and interactivity ought to be defined. In this sense, hands-off and laid-back interactivity is still interactivity, and it demands a certain level of agency from its users, which is translated into

attention on the object – whether material or narrative – with which users interact with. Arguably, in this case, the interaction would take place between the user and the narrative design, which serves to access the diegetic *storyworld*.

> *"For 360 video I'm not sure how much agency I want. I like the immersion of it, I like the feeling of being in the centre of this world with all the characters, but I still want my attention to be directed. I still want the story to be told to me. (…) I don't want to feel like I'm having to watch two rooms simultaneously to get the film story."*
>
> *Dr Mark McGill*

> *"One of the problems that you can face with games is that, if you don't make it clear what the player is meant to be doing, then you can lose them. You want to be subtle, but sometimes you lose some players by being subtle. In the subtle version, you are trying to make the player do their own working out."*
>
> *Steve Ince*

Most common narrative strategies aim to help the audience bypass the narratorial layer of the storytelling, turning the strategy invisible – or at least pushing it to the background – and by doing so, providing direct access to the *storyworld* and to the characters. One of the main authors to challenge this approach was Bertolt Brecht, who purposely tried to make the narrative artifact self-evident. In cinema, there are many examples of films that make the narrative strategy the most appealing asset of the story. We can think of Christopher Nolan's *Memento* (2000), or Lars Von Trier's *Dogville* (2003), as two examples of films in which the device is explicit and forms part of the narrative experience, also simultaneously operating as access to the characters while keeping a degree of separation, establishing a more intellectual relationship with the story.

This type of more intellectual perspective on the story is suitable for certain types of narrative that require a more distanced, maybe more neutral, gaze on the events. According to these observations, we could propose a new hypothesis that a medium such as this, defined by its own limitations, would be more suitable for stories that rely on complex narrational strategies, more distanced or intellectual engagement to characters, and relatively simple plots. Of course, as mentioned, this could be discussed by further creative practice, as well as technical improvement of the design itself.

5.8   THROUGH THE LOOKING GLASS: IMMERSION AND PRESENCE

It is quite curious how interactive cinematics seems to establish a certain distance between the user and the narrative, when interactivity generally aims to establish a tighter engagement between them, creating cracks in the fourth wall that separates the story from the spectator, and finding a way for them to have some level of participation in it. Yet, despite this initial

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understanding of interactive storytelling, the mechanics of crossing over the wall have proven to be significantly challenging and more complex. I have already commented on Janet Murray's concept of threshold objects and the paradox they suppose, of being both the portal and the barrier between users and immersion. In terms of narrative, it is often observed that immersion doesn't consider that users are becoming part of the narrative, whether if it is organically – as part of the *storyworld* –, mechanically – as an external narrator – or both.

Organic immersion would include the user in the *storyworld*, acknowledging their presence in it. This is very common in video games, particularly in the genre of first-person shooters and other first-person perspective-driven narratives. Virtual Reality games are also strongly driven by the principle of embodying a player or character. In CVR, instead, the limitations that define the format (pre-rendered assets, inability to reconstruct a virtual body or to freely move around in the virtual space, as seen in Mateer, 2017) make it harder to propose an organic narrative immersion. If, in a hypothetical CVR story, the user were to embody a character, his agency would be very limited, lacking a virtual body, thus, failing to inhabit the *storyworld* – unless there was a clever subterfuge to narratively justify the agency limitations. As it was noted by one of the experts – and has been stressed through this thesis – the story and the design of the interactive device are interlaced, as they define and support each other.

> *"If the story doesn't sit well with the interactivity of the game and the game design, or the game player, then it's gonna feel a little bit disjointed and disconnected from the game as a whole."*
>
> *Steve Ince.*

Not being able to provide an organic narrative immersion doesn't mean, however, that CVR stories are unsuccessful narratives. On the contrary, it is abundantly clear at this point that "presence is the strong experiential factor that makes people feel they are actually present in the scene" (Passmore et al:4) and that when watching CVR films most users feel, indeed, *presence* in the virtual world, even if they are not *embodied* in it. Actually, in some cases, users have reported to imaginarily have inhabited the virtual environment despite creators not explicitly having provided a virtual body. Users that watched *The Resistance of Honey* (BBC R&D, 2016) reported that, in a couple of shots "taken in the studio from above head height, near to a wall, of the seated Beeman in his studio" felt like "a fly on the wall." (Passmore et al:6) This kind of observation comes to argue in favour of the fast adaptability of users into immersive narratives.

I am calling this kind of immersion in which the user is not organically embodied in the *storyworld*, a *mechanic immersion*. As a writer, the main difference between an *organic* and a *mechanic* immersion is not necessarily that one has more interactive qualities than the other, but that the narrative *and* the user acknowledge the presence of the latter in the *storyworld*. There are many cases of interactive narrations that work without organic immersion, such as

the ones observed in the previous chapter – *Possibilia* (2014), *Choices* (2015), *Otis* (2017), etc. There are, of course, interesting exceptions, like in *Black Mirror: Bandersnatch* (2018), where, in many of the branched narratives, the main character acknowledges the presence of an external force that seems to be controlling his life. This Brechtian meta-narrative strategy supposes that the user is participating in the *storyworld*, even if it is in a not-totally-organic way, and if the user is not aware of their role as a narrator.

Immersive media, on the other hand, ontologically supposes the user's presence in the virtual environment, whether this is organically acknowledged or not. In *The Hunter & the Wolff*, it is not: The user is present in the environment, they can acknowledge that, but their presence is not acknowledged by the narrative; the characters ignore them and so does any organic or narrative element of the storytelling. In this particular case – although this is fairly common in virtual reality films – one of the main reasons for not acknowledging the user's presence in the absence of an embodiment. It could be because virtual reality is still a medium which language is in constant development and not properly expanded like other screen-based narratives, but the sense of presence that is expected to generate in users seems to be problematic. As Passmore et al note, "(t)he sense of presence was found to be both mediate and interfere with understanding the story." (p.8) On the one hand, it facilitates several possible narrative and interactive techniques to aesthetically and sensorially engage with the user, but, on the other, "(i)t seems that the sense of presence, and lack of embodiment, makes some users try to rationalize about their size in these close-up views – leading to a range of different perceptions. This effect was not apparent when viewers watched a screen-based version of the video." (p.6)

Indeed, the instinct to rationalize one's presence in a VE drives the need to measure one's agency, which could lead to an unsatisfactory experience and losing focus on the story that the author might be already telling: "when feeling presence, a viewer may expect more agency in the virtual environment. If this agency is restricted, like in a non-interactive 360-degree film, it can have a negative effect on the feeling of presence." (Gödde et al:4) Theoretically speaking, a disembodied presence would interfere with the user's rationalization of their own identity within the VE. In terms of storytelling, it also supposes a narrative inconsistency, because the audience is not on the other side of the fourth wall anymore, which would suggest that we can't address them as such, and we must acknowledge this somehow, as storytellers.

This is one of the relevant findings observed during the production of the prototype, in direct relation to what was previously written in the script of *The Hunter & the Wolff*, which allowed a critical revision of the same. As Gödde et al note:

> The role which a viewer plays in the scene is crucial for his or her experience of it. There are generally two possible situations:
> 1.   The viewer is only an observer with no connection to the scene

2. The viewer is part of the scene (p.5)

My main concern when I noticed this inconsistency wasn't the realization that the user in *The Hunter & the Wolff* corresponds to the first category, but that this was rather fortuitous, instead of being an intentional conscious and creative decision, which would have meant that there would be narrative devices to address the user's role – or lack of. It seemed to me that this new ontological condition could have drastic effects in the mechanics and, therefore, in the creation of meaning convened in the process of storytelling, and would later lead to being one of the main points to address in the second iteration of the script, *Wolf Hunting*.

Moreover, it seemed that it was an issue that must be addressed from a writer's perspective, since it is something that dramatically alters the relation between the author and the spectator, to the point that they cease to only spectate, to become something else. A more theoretical discussion about this point takes place in the Conclusions chapter of this thesis, as in the previous two chapters this was addressed around the design and the production. Here, it is relevant to discuss the challenge that a participant spectator supposes for a writer.

Both immersive and interactive media – and especially the former – aim to make the viewer participate in the scene, or even to make them feel part of the scene. Hence, as authors, we need to consider that, "if the viewer feels part of the scene, his role also needs to be considered in the story." (Gödde et al:4) This is not a trivial matter, for several reasons. I have mentioned Crawford's principles for good quality interactivity, the technical constraints of Murray's threshold objects, and the limited agency offered by a medium like CVR. All of which suppose very relevant technical aspects to be considered.

While for *The Hunter & the Wolff* most of these technical aspects were considered in the design, the viewer/user's role wasn't. They don't have any specific relation to the space nor the characters, to the point that they being present is irrelevant, similar to what happens in conventional film and televisual models. Their immersion is, then, a mirage or a ghost, able to observe and navigate, to interact with the mechanics of storytelling – which was one of the design's main purposes – but not to engage with the organic elements of the world. The user doesn't exist spatially, it has no virtual materiality, as contradictory as this sounds. While not being part of the purposes of this research, the creative work led me to realize the importance of the relation between embodiment and perspective in immersive narratives. Just as narrative perspectives place the viewer in relation to the story, embodiment plays a similar role but facing its own particular challenges and constraints, and can define the nature of a story. It would be interesting to speculate, for instance, what would be the effects in this story if the user was to be placed differently, if their presence was to be addressed by the characters, or even if they played a character. The creative exploration of narrative embodiment could possibly lead to develop the narrative potential of the feelings of presence, which is one of the most characteristic and recognized attributes of immersive media in general and of VR in

particular. Unfortunately, to the day, there isn't much work approaching the specific theme of narrative perspectives in VR, which on the other hand, opens the door to further research. On the other hand, there is a growing literature exploring the nature and effects of embodiment in immersive media, approaching the subject from different views and disciplines, from Paul Dourish's founding book *Where the Action is: The Foundations of Embodied Interaction* in HCI, through Mel Slater's perspective from psychology and neurosciences, to more recent theoretical and practice-based work across the field.

Nevertheless, the absence of embodiment doesn't mean that a mechanical interaction would not work out, or that it would not be useful to tell a story. On the contrary, evidence suggests that, despite the primary obstacles that users find to make sense of their virtual presence, they adapt quickly to the conditions of immersive video, even without interactive mechanics, but just as a disembodied witness. Slater & Sánchez-Vivas (2005), Brillhart (2015), Passmore et al (2017), Gödde et al (2018), among others, have found that, after a period of orientation and adaptation, users are able to set their attention in points of interest – "places in a scene where a viewer is likely to be looking" (Brillhart, 2015) – that grounds them to the narrative environment: "they soon developed strategies which involved such things as scanning for focal points of interest, and making judgements about when it was OK to look around." (Passmore et al:8)

Capturing the user's attention to a specific point of interest would be key to dynamically and narratively engage with them. It would also be a direct way to produce a spatial relation between user and environment. Pope et al, in their significant contribution experimenting with proxemics and theatrical techniques, suggest that acknowledging the spectator's presence and the distance – therefore, their spatiality – between them and the characters expresses the narrative function of all the participants involved in the environment, including characters and user. (2017:7)

In *The Hunter & the Wolff*, the user has no spatiality, no materiality, despite their presence in the virtual environment. *A priori*, this doesn't necessarily suppose an obstacle for the storytelling or the interactivity. However, this presence not only lacks virtual materiality but also narrative materiality. Arguably, one of the key differences between cinematic arts and scenic arts is that the former is meant to ignore the presence of an audience, while the latter makes a narrative use of the fourth wall. While in films actors must ignore the camera – in most cases – in theatre, even if the audience doesn't participate in the story, their presence is – it must be – acknowledged.

In immersive narratives, where users cross the fourth wall, the sense of presence could offer several narrative opportunities. A great challenge particular to CVR is the limited amount of agency that users have within the virtual environment. So, the question to us writers is; how to give users a narrative presence that is not restricted by their limited agency?

The writing of *Wolf Hunting* was strongly motivated by this problem, and the search for a solution consequently drove some drastic changes in this version of the folktale. Overall, this iteration is a creative response to the observations made during the critical reflection and the evaluation of the proof of concept.

Wolf Hunting is a new version of the original tale, instead of a second version of *The Hunter & the Wolff*. Here, a sexually empowered Grandmother is having an affair with Wolff, who then tries to court young, naïve, and eager Ginny only to be found by the old woman. Wolff then believes he is in control of the situation, capable of playing both women as he pleases, only to fatally discover in the end that he is actually the victim meant to be captured and devoured by the females.

```
INT. GRANDMA'S BEDROOM - MORNING

GRANDMA (early 60s) is sat at her dressing
table: she's looking directly at the camera,
which is the mirror. She is cleaning her face
and putting on some make up. She is flirty and
happy.

Behind her, in the bed they both shared, WOLFF
(40-ish) is waking up. He looks around and sees
her. Jumps out of bed and stealthily reaches
her from behind.

                    GRANDMA
        I can see you coming, you know?
               (points at the mirror)
        That's the trick with mirrors.

Wolff puts his hand around her neck and smells
her hair, seductively. As they flirt, Grandma
constantly looks at the mirror,
voyeuristically.
```

Fig.28. Wolf Hunting excerpt, beginning of Grandma's plot, page 1. She is immediately looking at the camera, acknowledging the user's presence, although without addressing them directly, yet.

The distribution of the space is identical to the one in *The Hunter & the Wolff*: Grandma's house is divided into a Bedroom, a Hall, and a Kitchen, and the user can navigate between the three, although they always contemplate it from a fixed point in the room, as if they were attached to an object.

At the very beginning of the Grandmother's plot, as seen in fig.28, she is sitting at a dressing table, putting some makeup on, looking at the mirror, which, in this case, is where the camera is. I intended to address the

```
                    GINNY
        Mum? When did you last come
        to visit Grandma? … Oh! … No, no!
        Everything's alright don't worry.
        It's just that the kitchen's a
        little messy, but don't worry,
        I'll clean it up, yeah… I will.
        Yeah, I'll tell her. Bye mum.

She looks at the table, thoughtful, then her
eyes look forward, straight to the camera,
acknowledging a presence. Then, she leaves to
the living room…
```

Fig.29. Excerpt from Ginny's plot, page 2. Ginny briefly addresses the user's presence by looking directly at the camera.

user as soon as possible, so that they immediately could understand their own materiality in the initial moments of spatial orientation. The user is in the mirror, or mirrors, understanding that there is one in each room. At first, this is addressed only by the Grandmother looking at the camera from a close position to it – to resemble a close-up and facilitating a clear view of the character's facial expressions – that acknowledges the user's presence, but still doesn't integrate it to the narrative. A similar action takes place in Ginny's plot (fig. 29) when she briefly looks at the camera – a mirror in the kitchen – at the beginning of the story, although there are key narrative differences, since the mirror is not explicitly addressed, like the one in the bedroom is. In both cases, the main function of this direct stare at the camera/mirror is to

provide materiality to the user; they have a presence in this world, and the characters – at least two of them – know it.

This follows a premise borrowed from theatre proxemics: "Direct address is a theatre term for an actor speaking directly to an audience member and breaking the imaginary fourth wall that exists between stage and auditorium in traditional proscenium arch theatre." (Pope et al:7) The theatre spectator has a material presence, and the performers can choose to give them a narrative presence, directly interacting with them.

In cinema, on the other hand, there are famous examples of direct address, like the ending scene in Alfred Hitchcock's *Psycho* (1960), where Norman Bates looks at the spectator while sharing his internal soliloquy, or *The Blair Witch Project* (1999), a rare first-person viewer, fake-documentary-styled film where the viewer shares the perspective with cameraman and characters constantly address and talk to him. A famous television example would be *The Peep Show*, a nine series sitcom produced by Channel 4 between 2003 and 2015, which makes unusual use of perspective; every shot is the point of view of one of the characters, which then cuts to another, and so on, giving the spectator the rare opportunity of having the characters talk to them, without really embodying any of them or counting with

Fig. 30. From top to bottom: Alfred Hitchcock's Psycho (1960), The Blair Witch Project (1999), Channel 4's sitcom The Peep Show (2003-2015), and the Netflix series House of Cards (2013-2018). A few of the rare examples of direct address in screen narratives.

an individual material presence. A particularly pertinent example for this second iteration of the script is the Netflix series *House of Cards* (2013-2018), in which the protagonist breaks the fourth wall now and then to directly talk to the spectator, even when in the middle of a sequence with other characters in the scene. Particularly distressing is the famous opening scene of the series, where Frank Underwood – the main role – kills a dog behind the back of the other fictional characters while talking (a moral argument) to the spectator, and thus making them not only a witness but an unwilling accomplice. These examples are rare and intentional, based on an authorial decision for narrative and/or aesthetics purposes, usually

consistent with how upsetting the effect results are. Differently from theatre, the cinema spectator doesn't have a material presence – we could say that the fourth wall is thicker – so assigning a narrative presence involves two degrees of distance from the original relation between spectator and narration.

The specific example of *House of Cards'* Frank Underwood is probably the most similar to what I intended to achieve in *Wolf Hunting*, where both female characters address the viewer not only by looking directly at the camera, but also by talking to them through it. On page 3 (fig.31) the Grandmother looks directly at the mirror and sings the famous quote from the Evil Queen in *Snow White*, "Mirror, mirror on the wall, who's the fairest of them all?" to then complain about the absence of a response, as a way of engaging with the user. This line also aims to inform – or at least suggest – to the user that they are part of the scene; they are the mirror, or maybe on the other side of it, and that the character of the Grandmother can see them.

```
Wolff dresses up just enough and leaves the
room. Grandma waits until he's gone and sits
back at the dressing table. She stares directly
at it with a very deep and intimidating glare.

BEAT

                GRANDMA
             (to the mirror)
        Mirror, mirror on the wall,
        tell me, who's the fairest
        of them all?

Grandma keeps on putting on makeup; she is
flirty and sensual. She touches her own skin,
throws kisses to the mirror, tries different
faces like she was posing for photographs.

                GRANDMA
        What? You're not
        saying anything?

She has finished her make up. Now she only
looks directly at the mirror, distracted, but
still addressing a presence in front of her,
although not directly.
```

Fig.31. Excerpt from Wolf Hunting, page 3 of Grandma's plot, in which she talks to the spectator as if they were the mirror.

Something similar takes place towards the end of Ginny's plot. On page 9 (fig.32), Ginny is left alone in the kitchen just after sending Wolff to, supposedly, eat the grandmother, and it is in that moment when she briefly talks to the viewer, "confessing" that she has been able to see them all along.

```
Ginny is playful and excited and impatient. She
walks around like looking for something to kill
the time with; when she suddenly grabs a large
kitchen knife and stops. Her eyes move to the
camera/mirror.

                GINNY
        You didn't think I would
        notice you, did you?

BEAT

Mesmerized by the knife in her hand, she starts
cutting a piece of meat.

                GINNY
        Well, I'm resourceful, d'you know?
        I'm not that young anymore.
```

Fig.32. Excerpt from Wolf Hunting, Ginny's plot, page 9. The girl addresses the user by looking and talking to them, and suggesting she has been able to do so all along.

On pages 8 and 9 of the Grandmother's plot (fig.33), she carries on a longer dialogue directed to the camera/user, in which she shares her emotional struggle, ending with the phrase "how else would you have ended up trapped in a mirror?" unveiling that she was the one who does it and, hence, that she might not be just the old lady from the traditional versions of the folk tale. Finally, on page 10 (Fig.33), in a joint scene, both women constantly peep at the mirror/camera/user, who serves as the witness, accomplice, and victim of the characters' crime.

This dramatic inclusion of the user in the scene aims to: a) facilitate a more narrative presence, b) to provide the user with a material presence by "embodying" the mirror, and c) to

make narrative use of the limited agency of CVR through a presence whose narrative asset is to be unable to participate, but only to witness.

As observed during the consultation of peers about their experience with *The Hunter & the Wolff*, participants could perceive themselves as being present in the scene, but were somewhat frustrated by their limited agency, and felt like they were witnessing the actions through a window. This paradox of CVR, being present but unable to participate, could also suppose a narrative opportunity, by assigning the user with a character – an individual who belongs organically in the *storyworld* – that is defined by these limitations. Granting the user with a more organic presence could increase the sensation of presence. As noted by Pope et al., "in virtual environments (VEs) people respond more strongly, measured by skin conductance, when they approach a humanoid figure than when they approach a cylinder of the same size." (p.2) In this sense, even if the agency is still limited, facilitating an organic presence and a closer intimacy with the characters could enhance the intensity of the feeling of presence. It is not yet the place to say if this is desirable or not – some of the participants in the consultation declared that they would have liked to have some agency regarding the distance between them and the characters, saying that sometimes they felt "too close" to them and that it felt awkward and more intense – but these strategies could propose ways for narratives that are unique and exclusive to immersive media.

```
She looks directly at the mirror. A steady,
persistent glare. Then she finally shows her
cleaned face. She seems in peace.

                GRANDMA
        Do you remember…
        all those times when
        I let myself be defeated?

She starts applying makeup again, starting with
her eyes.

                GRANDMA (CONT'D)
        When I let myself
        be eaten? Left behind
        like an old relic,
        a sack of skin and bones,
        the rotten remains
        of a woman that was
        never young nor
        beautiful.

Her eyes are ready. Her stare is now deeper and
more seductive. She shows her eyes to the
mirror.

                GRANDMA
        But you… You know
        the truth, don't you?
        Otherwise, how else
        would you have ended up
        trapped inside a mirror? Ah?

BEAT
```

Fig.33. Excerpt from Wolf Hunting, from pages 8 and 9 of the Grandmother's plot. She shares her emotinal struggle, creating an intimacy with the user, enhanced by the proximity to the camera and being the only two presences in the room. Then she suggests that she was the one who trapped the user in the mirror.

```
Wolff's face changes from delight to suffer.
Grandma bites him again and he complains; tries
to shake her off but he's immobilized by the
women. Ginny, behind him, looks directly at the
mirror, smiling and acknowledging it, then
bites him too. Grandma also stares at the
mirror occasionally, while biting Wolff again
and again, as he impotently resists and
screams.

                THE END
```

Fig.34. Excerpt from Wolf Hunting. Ending scene, where the women "devour" the wolf while constantly addressing the user by peeping at them.

5.9   CONCLUSIONS

Besides being able to identify and reflect on the limits of the medium, the system test of the proof of concept of *The Hunter & the Wolff* showed optimistic results regarding some of the original objectives of this project: exploring and developing a hands-off interaction model that would facilitate laid-back interactivity, as well as its narrative possibilities. In this sense, the

proof of concept shows the feasibility to keep on developing these concepts in future stages of research.

The key premise to achieve this was to propose a type of interaction that would bypass any explicit interfaces that would interrupt the flow of the story and generate a pull-back from the narrative immersion. There were three main aspects to be observed in this regard:

1. The acoustic-spatial arrangement of the virtual environment,
2. Instinct-based interactivity driven by diegetic stimuli, and
3. Users acquiring a narratorial role.

These three aspects are tightly interconnected by design, so it is fair to assume that their success or failure would affect them as a cluster.

The first of these, the acoustic-spatial arrangement, proved to be successful as a way to discriminate simultaneous actions and to navigate the virtual space. On the one hand, participants adapted very quickly to it despite not been given any instruction or orientation about it before watching the prototype. Moreover, they seemed to have adapted to it rather instinctively and organically, which sustains the hypothesis that diegetic stimuli effectively facilitate a more organic immersion, whether narrative or environmental.

Secondly, the success of this type of arrangement also suggests that practitioners can make more complex, dramatically motivated uses of acoustic stimuli in immersive environments, so to make the best of the surrounding space despite the reduced field of vision in HMDs. This doesn't mean that simultaneity is the only way to make use of this setup. Quite the opposite, it invites further experimentation in the use of this understanding of the tool.

Precisely, a direct exposition to diegetic stimuli – mainly acoustic, in this case – facilitated instinct-based decision-making, which in my opinion appears as one of the biggest accomplishments of the prototype. Despite the observed issues in the identification and engagement with the characters, the results show that participants were provoked and intrigued by the acoustic stimuli, just as it was hoped they would.

"I don't usually want to see a menu come out, I'd rather have very lightweight interactions, where I don't have to do very much in order to direct."

Dr Mark McGill.

This is the core instrument of the proposed interactive narrative that allows to bypass interfaces that usually operate as threshold objects and, by doing so, allow users to have more direct interaction with the story. Participants declared to have reacted to these stimuli and to have made their decisions based on them. They did, as well, comment that their decision-making process wasn't entirely instinctive, but rather driven by instinctive reactions to the

stimuli that generated further reasoning, but always in direct relation to the immersive environment and the elements of the story.

I should note that, despite bypassing explicit interfaces, this interaction still takes place in the narrative dimension of the storytelling, and users can't affect the organic components of the *storyworld*. This is interesting in terms of the structural understanding of the input/output loop of this particular device: Users make decisions driven by diegetic stimuli generated in the *storyworld*, yet their output affects the narrative layer, editing some of the stimuli – visual and acoustic – to be read next. This is because of the technological boundaries of CVR and doesn't hinder the interactivity, instead, it defines it.

Moreover, these limitations of the medium also define the extension to which the user can penetrate into the narrative. In this sense, their role in the loop, where they edit – to an extent – what they see and hear, is what gives them agency as storytellers, a role that participants were able to identify and to embrace, with diverse levels of awareness about it – which doesn't necessarily hinder the fulfillment of the role.

These three aspects are being considered as successes, and it is considered that their dramatic and technical possibilities should be furtherly explored in the future, possibly in combination with other techniques and maybe even in other media.

However, the technical nature of these accomplishments also allows identifying aspects that ought to be improved in the more expressive side of the prototype. In this regard, and related to the users' role as storytellers, participants showed a very clear tendency to monitor simultaneous actions instead of committing to a narrative choice, which undermined the depth of emotional engagement or specific knowledge about the characters they could develop. It is unclear at this point if this happened because of the characteristics of the medium – as discussed in the previous section of this chapter – or if this could be approached from the writing and direction of the story, providing more room and time for users to get to know and engage with the characters before inducing them to commit to navigational decisions.

In this regard, I believe there is a field to develop a more balanced and intentional approach to blocking. The use of notions like FOMO and anticipation to facilitate spatial navigation and storytelling could facilitate, if not deeper emotional engagement, better knowledge about the elements that form part of the story, so users can make more informed decisions, still driven by diegetic stimuli, but may be based in more than a reactive impulse.

In a similar way, there is a need for a more defined presentation of the protagonists, from a directorial point of view, again, so that users can identify them with more clarity, but also that they feel more guided to commit to them. The confusion between the characters that are introduced first (the Grandmother and Ginny) and those who tend to move more around

the environment (Wolff) has shown to undermine the purposes of the script, while also providing important insight on the importance of effective blocking to define the characters' hierarchy. Indeed, testers confirmed what previous studies had found, that characters and elements that move tend to catch the viewers' attention, while more interestingly for this research, they also showed that acoustic stimuli not only helped to place themselves in the virtual environment, but also motivated them to explore the space, proving to be a very relevant tool for guidance. While being a secondary conclusion, this emphasizes the potential of adapting proxemics and theatrical techniques into immersive media.

Overall, it was agreed that the aims of the technical aspects of the design were met satisfactorily, but that the implementation of this particular story can still be improved and developed, so as to get a better understanding of the narrative possibilities of the device.

"For the interactivity side of it, I liked the fact that the audio would help me focus on wherever I'm looking at any particular point. (…) I understood I can pick and choose where to look. But then it goes back to the problem of how to pick and choose. That was the big impairment for me."

Dr Mark McGill.

Chapter 6

Conclusions

6.1   BACK TO THE BEGINNING: ANSWERING THE RESEARCH QUESTIONS

The first of two main research questions were centred on the practical and creative aspects of the research, asking. This question intends to be strongly focused on the procedures involved in the craft of the product, for which a suitable answer needs to address the different elements suggested in the question itself.

The exploration of a hands-off interaction scheme was very suitable for CVR employed, since it also allowed the experimentation of expressive techniques in CVR. Its immersive characteristics – and its technical constraints – proved to be a fertile ground to generate a dialogical relation between the user and the system that would rely on a hands-off interaction. On the one hand, exploiting the immersive qualities of the medium to suggest and motivate navigational decisions facilitated and encouraged the design of a narrative setup that could spread different stimuli across the immersive space. This allowed the application of the notion of environmental storytelling and the avoidance of an interface that would establish a barrier between the user and the narrative immersion, which is one of the most remarkable achievements of this project: The conception of an interactive model that relies on diegetic stimuli to enhance narrative immersion.

In this sense, the notion of hands-off interactions, which were originally meant to respond to narrative purposes, also generated technical challenges, which constituted a fundamental part of the creative practice. The absence of explicit interfaces to drive interaction demanded alternatives to establish a dialogue between system and user. As an immersive medium, CVR provided a setting in which the user can have direct access to the *storyworld* and, hence, to the diegetic information contained in it. Replacing invasive and explicit information with more subtle and organic stimuli seems to be – at least in this stage of research – just as effective to guide the user through a narration.

It is true, however, that the storytelling techniques proposed in this project need to be refined and tested in further stages of research. Useful feedback obtained during the evaluation process points to the direction in which improvements should be made. However, from a technical point of view, the interactive model presented in the prototype should be able to suffice a platform for a leaned-back, hands-off, interactive storytelling. Moreover, it seems

feasible to think of more complex and spatialized use of diegetic stimuli – particularly regarding the use of more sophisticated dramatically-motivated soundscapes – in this narratively oriented immersive environment, one that could make better use of the properties of immersion and, consequently, to propose a more varied set of stimuli and more narrative possibilities.

On the other hand, the technical development of a hands-off interaction scheme in an immersive environment has had a direct correlation with the proposal of the narrative notion of instinct-based decision-making as a way to relate to interactive content. This addresses directly the second main research question – is instinct-based interaction possible and what conditions are necessary for its implementation? – which is also the narrative counterpart to the technical development of a hands-off interaction model. As mentioned, according to this model, an interactive narrative that relies on instinct-based decision-making can exist under conditions in which the user: a) has direct, unfiltered – with no extra-diegetic interfaces – access to the *storyworld*, in order to be able to direct their attention to characters and other dramatic elements, b) the diegetic stimuli, in combination with the dramatic progression of the story, suggest immediate reactions and, hence, choices to the user, and c) these reactions and choices work as system-inputs, in order to have a direct effect in the way the story will be perceived by the user, resulting in the dialogical relation that determines the presence of interactivity. CVR proved to be a very suitable medium to experiment with these conditions, mainly due to its visual and acoustic immersion, which facilitates the senses of transportation and presence in the user.

Considering that one of the main elements in both research questions is the focus on the processes and procedures, probably one of the most relevant contributions of this research is the interdisciplinary approach to work in CVR. The absence of standardized grammars in this relatively unexplored medium actually facilitated the use of creative freedom to face the different challenges set by the research objectives. While the main approach was mostly based on a filmmaker's production guidebook, these weren't sufficient to tackle some expressive aspects that were outside the scope of filmmaking. Moreover, there were tools and techniques traditionally used in filmmaking that were adapted to suit the model's requirements. The best examples of this are the adapted format for screenwriting, based on the simultaneity of parallel plots, and the adaptation of off-screen sound to propose a more dramatic use of acoustic spatiality and to drive interactive responses in users.

Yet, as much as the adaptation of these techniques produced satisfactory results, they weren't enough to cover all the challenges set by the project. While it is true that any interactivity in media relies on an HCI component, an element that was set from the beginning, I'm referring to expressive techniques applied not to the technical design of the model, but rather to its narrative purposes. Apart from filmmaking, this project demanded the use of theoretical frameworks borrowed from video games and theatre. The former was essential to

approach the writing of an interactive story, to understand the dialogic nature of an interactive narration and, thus, how to integrate the user into the act of storytelling itself. The latter, on the other hand, provided a fundamentally different understanding of the narrative space from the one used in filmmaking, and facilitated the blend of blocking techniques in order to meet CVR's expressive and technical conditions. In theatre, space appears as an expressive element in itself, where the characters and the user – in the case of immersive media especially – establish a relationship based on their placement, movements, and distances, while in films most of these are determined by the edition and their organization in time. In this sense, considering the spatial characteristics of an immersive video and the impossibility to frame, theatrical spatial blocking techniques, in combination with the use of the camera and the design of a dramatic soundscape, proved to be far more suitable for CVR.

This interdisciplinary approach to the creative challenges appears as one of the most fruitful results of this research, not only because of the blend of techniques and how they were critically observed, but also as an example of how research by creative practice can provide a very fertile methodological approach. Because of the hybrid characteristics of CVR, being open to the possibility of interdisciplinary solutions provided a more flexible attitude to the obstacles that kept showing up during the execution of the project. While this is not a direct output of this research, the production workflow and application of hybrid methods make a strong suggestion that interdisciplinarity and creative practice can be a suitable methodological approach to explore the expressive uses of the constantly emerging and developing media technology. Moreover, this type of interdisciplinary approach is consistent with the larger landscape of Media Convergence as an understanding of the current state of media production, in which a variety of disciplines can converge into one medium – like in this project – but also how certain contents can be designed to be shared through diverse media. In this sense, I hope this thesis contributes to motivate other practitioners to venture into interactive and immersive storytelling and the exploration of different artistic and narratives techniques in different types of digital and analogue media.

6.2   SPECIFIC RESEARCH QUESTIONS AND SPECIFIC CONCLUSIONS

The synchronicity between the narrative and technical development of this project has emphasized the thesis that narrative and medium are inseparable. Working in identifying the constraints of CVR provided a clear frame of the possibilities to develop the narrative techniques suitable for the medium. Particularly during the first stage of writing and design, gaining more awareness of the medium provided more clarity of what could and could not be written down in the story. As Steve Ince stated during his interview (2021), the story needs to sit well with the interactive characteristics of the medium, which is why – according to Ince – video games writers tend to work closely with developers. This certainly extends to all interactive storytelling, stressing, on the one hand, the interdisciplinary approach required to

create interactive stories and, on the other, that the limitations of a medium define the opportunities to develop the medium's grammars. These two principles are not unique to CVR; In filmmaking and theatre, for instance, writers are aware that work is not the final artwork, but only a step in the overall creation, therefore, it needs to be open for other artists to keep on working with and from it. At the same, good writers and directors know how to make the best of the medium's limitations, sometimes turning them into the most expressive and effective storytelling. An example of this is the use of off-screen in films, which sometimes results in the most intriguing and engaging moments of our favourite movies. (Rabiger & Hurbis-Cherrier, 2013:177-178)

While it is still very early to state which are the grammars of CVR, part of the work done in this project points in an optimistic direction. An example of using the medium's limitations is the simultaneity of dramatic actions across the virtual environment, which forces the director to consider all of the space and the possibilities to guide the user to navigate it. Related to this, rethinking the immersive soundscape for dramatic and interactive purposes also appears as one of the achievements of this project with the potential to continue to be developed into more complex and sophisticated iterations.

In terms of adapting narrative techniques, one of the emerging issues about interactive storytelling remains to be the emancipation of the spectator/reader as an active participant of the narrative (Rancière, 2008). While from a practical perspective, it has been possible to propose methods to enable narrative participation, the effectiveness of these remains an open question. Counting with clear definitions that allow us to differentiate between interactive games and interactive stories does not necessarily provide an evident creative route in which to develop narrative techniques. If interactive storytelling aims mainly to capture the user in a contemplative narrative experience – by comparison, the game involves tasks and achievements – then the notion of leaned-back interactivity explored in this project still appears problematic. According to the feedback obtained in the evaluation, leaned-back interactivity would still demand enough mental attention to be perceived as active, establishing a defining difference with other storytelling practices, like watching films, television, theatre, etc. These findings point in the direction that interactive cinematics – and storytelling in general – might be distinct from films, and that aiming for a fully leaned-back, relaxing, living-room interactivity might be futile, because of the intrinsic nature of interactivity. In this sense, assuming the role of the user as an active agent in the story would require that storytellers consider what their objectives are, what they expect to generate in the users, and what kind of engagement they main to create. However, considering that this research aims to test these notions on a conceptual level, this is worthy of further exploration, ideally through an audience study that would provide a more thorough idea of how users see and relate to this type of narrative.

On the other hand, the devices and techniques designed during this project have shown to be effective, at least in their design and primary goals. The guidance techniques – both visual

and acoustic – effectively motivated users to make quick decisions, whether they are unconscious, instinctive, or a combination of both. This appears as a defining feature of this particular model, and while it might not meet the aspirations of a leaned-back interactivity, it still provides a frame to work on a hands-off, interface-less, immersive storytelling, that exploits the potential of sensorial immersion for narrative purposes.

All of these findings, whether expected or not, intended or not, contribute to an ongoing characterization of CVR as an expressive medium, and to the continuing development of techniques and grammars that would define it as a medium on its own. Just like Jessica Brillhart proposed a theory for montage to fits the technical qualities of CVR, I believe some of the notions proposed by this project – like instinct-based decision-making, hands-off interactive schemes, and dramatically-motivated soundscapes – have the potential to be developed into cinematic virtual reality grammars – keeping the proportions of the respective achievements. Notions like off-sight actions and sounds, dramatically designed soundscapes, and instinct-based decision-making, are deserving of further development and have the potential to complement each other – and other techniques, such as Brillhart's – in order to keep developing the narrative possibilities of CVR and other immersive media.

6.3   FUTURE WORK

Due to the experimental nature of this project, and its focus on trying new concepts for interactive narratives, I identify at least three dimensions in which the work realized can be extended into future research.

First, and maybe the most evidently, the CVR model is still capable of further evolution. There are many dimensions of the production work that still need development. For instance, the concept for the dramatic soundscape that drives the spatialized acoustic stimuli was tried only across the X axis, while technically it is possible to also use the Y axis and potentially even the Z in non-cinematic VR. Conceptually, a more spatialized treatment of the dramatic soundscape could lead to more dynamic use of the stimuli for narrative purposes, with more sensitive sound cues coming from more specific places in the immersive environment. This kind of development would require a strong specialization in sound design, since it would involve developing specific and probably more complex recording techniques, as well as a much more sophisticated mixing and postproduction process.

Another aspect open to further experimentation is related to the storytelling itself, in terms of exploring more appropriate screenwriting structures for this medium and more refined directing and blocking techniques to transfer the writing into the *mise-en-scène*. In terms of the former, the adaptation of the screenwriting format has been an interesting contribution to the understanding of a more profitable use of the immersive space. However,

thanks to some of the unexpected but welcomed results of the evaluation, it has been observed that the approach to the narrative rhythm needs a much deeper knowledge of the expressive qualities of the medium. Just hypothesizing, it is feasible to think that immersive media are more compatible with theatrical techniques due to the relation between the storytelling and the space. However, an interdisciplinary approach is still encouraged, in order to develop the different aspects involved in this kind of project.

Overall, the proof of concept of *The Hunter & the Wolff* could evolve into a project with commercial purposes, although this would require more iterations to fully test the potential of its interactive, immersive, and storytelling concepts. While the prototype is being proved to be functional, its narrative possibilities still need more experimentation, both in the creative aspect but especially in regards to how this medium might relate to audiences. In this sense, further iterations should be oriented to, first, develop the current – and maybe more – expressive tools and to test its narrative effectiveness through an audience study or a similar approach. A first step has already been made through the writing of *Wolf Hunting*. Yet, to realize its final form, it would be necessary to explore other aspects of filmmaking that weren't approached in this project, such as cinematography, lighting, and staging, all of which could present different obstacles and challenges that are not yet within sight, and that could consequently offer interesting information about the craft of CVR, just as it happened in regard to the aspects included in this research.

A second dimension in which the results of this investigation could be developed is the application of some of the key concepts in other media. Being CVR part of a family of XR media, it seems feasible that notions like hands-off interaction, dramatic soundscapes, and instinct-based decision-making could be adapted to other types of immersion. Considering the conditions proposed in this project for the implementation of these concepts, it doesn't seem impossible to apply them in MR or AR, as long as we count with suitable technology. For instance, one of the main conditions for the functionality of instinct-based decision-making is the absence of explicit interfaces that could generate a pull-back from diegetic immersion. With appropriate haptic devices, it seems feasible to imagine MR capable of providing such conditions, in which digitally generated diegetic elements blend with real environments. Similarly, dramatic soundscapes could be developed into a purely acoustic dimension, relying on binaural sound mixing or similar acoustic immersive means, as a way to provide a soundscape to a specific real location – in a museum, for instance – or simply as an independent sound-based storytelling medium. The main challenge for this would be, as it was for this project, to find the suitable technology that would gather inputs from the user(s) in order to generate the necessary dialogue for interactivity to exist. Either way, the conceptualization of these notions and a successful proof of concept, open the possibility to further explore them, and to test their resilience in other media.

A third dimension in which this research could be extended corresponds to a more theoretical approach on the concepts that have been applied and on some of the ones that were challenged. Interactivity and Immersion suppose drastic transformations to the craft of storytelling as it has been historically conceptualized and performed. The evolution of the spectator/reader into a user/participant generates an ontological crisis in both ends of the relation. The emancipation of the spectator, as anticipated by Rancière (2008), into a more active role that is expected to have influence in the act of storytelling itself, also questions the traditional role of the narrator, as the one who transmits the knowledge contained in the Fabula. In interactivity, the narration seems to become a field of dispute for the authorship between the narrator and the user/participant. Certainly, this depends significantly on how much agency is given to the user, how much of the story is left to be told – and interpreted – by them, but even in the shallowest levels of interactivity – as defined by Marie-Laure Ryan (2011) – the narrator would be conceding narratorial abilities to the user, which appears as one of the main characteristics of interactivity. If the user can't have any influence in the narration, then there isn't any interactive storytelling, just a conventional, one-sided, transition of knowledge.

This form of accessing the story turns the participation in the storytelling into a sort of post-spectatorship, particularly if we consider the reliance on digital devices to be able to participate in this relation. Indeed, this dependency also appears as a defining attribute of interactive narratives, in which users require – in most cases – prosthetic devices to be defined as participants. This further opens up a post-humanistic perspective on the study of digital storytelling, which could also suppose a *Foucaldian* conflict, shaped by the tensions between gaining narrational agency by simultaneously relying on prosthetic devices that redefine and confuse the limits of the body as it is partially integrated into virtual environments.

These are just some of the theoretical and philosophical conflicts that emerge from the practical work with interactive storytelling. From my perspective, the rhythm of the creative research can result in a self-absorbent commitment, with little time to dedicate to these other relevant, latent discussions, probably more suitable for disciplines like media studies or philosophy – or both. Research by creative practice as a method indeed generates certain tensions with more theory-based approaches, although not necessarily making them incompatible. While the required flexibility of creative methods can clash with more rigorous workflows, it can also be tremendously nutritious as it allows the possibility to return and revise previous iterations and experiment with unconventional and sometimes eccentric concepts, tools, and techniques: "Methodological frameworks promise rigor but jeopardize the possibility for designers to invent ad hoc approaches, or draw inspiration from unorthodox sources, or take inexplicable imaginative leaps—all forms of a productive indiscipline that we see as integral to design practice." (Gaver & Bowers, 2012:42) This, however, can produce an imbalance in the effort to generate knowledge, since the creative work already demands enough attention and energy as it is, just in order to produce an output. Despite this, the

process that generated this research has convinced me that research by practice is an effective way to produce and generate knowledge, and that it is not only compatible with theoretical approaches, but that a complementary method could certainly elevate both perspectives. This project, for instance, aimed to generate a theory-based discussion around the creative process and the production methods involved in the creation of the output, instead of focusing solely on the results of the practice. This process was certainly not without difficulties, as it could have reached a deeper theoretical and even philosophical reflection on the elements and the transformations involved. I would have hoped to include a dimension of the research that would explore more theoretical concepts about the identity of the participant in an interactive narrative, which couldn't take place for different reasons, but mainly because of the need to focus on one dimension of the research, which in this case was the creative one. Nevertheless, the results produced by this research provide a richer field than the one I had at the beginning, when a theoretical discussion would have been mostly speculative and without a practical base. Indeed, as mentioned earlier, the possibility to analyse the outcomes of this creative practice from a more theoretical perspective is a very feasible possibility, and a very exciting one on a personal level.

Either way, it is to hope that these debates can take place starting from the reflection done on creative practice such as this project, which would also add more value to the disciplines that are focused on creativity and innovation.

Appendix 1

Scripts from
the interactive model
as applied in the Unity project

This section contains the scripts used in the design of the interactive model. They were written in the programming language C#. Their functions will be described at the beginning of each script.

Audio Sources

This script has the function to assign specific acoustic assets to different objects spread across the virtual environment. In this case, the seven mixes were assigned to three different object, assigned to each of the interdependent spaces.

```csharp
using System.Collections;
using System.Collections.Generic;
using UnityEngine;

public class AudioSources : MonoBehaviour
{
    public AudioClip firstAudioClip;
    public AudioClip secondAudioClip;
    public AudioClip thirdAudioClip;
    public AudioSource audio;

    // Use this for initialization
    void Start()
    {

        audio = GetComponent<AudioSource>();


        audio.PlayOneShot(firstAudioClip, 0.7F);
        audio.PlayOneShot(secondAudioClip, 0.7F);
        audio.PlayOneShot(thirdAudioClip, 0.7F);
    }
```

```
    // Update is called once per frame
    void Update()
    {


    }
}
```

Independent Mixer

This script generates an "instant mixer", establishing the extension of the angle in the space in which each mix can be heard, to then fade into the next acoustic space and it own mix.

```csharp
using System.Collections;
using System.Collections.Generic;
using UnityEngine;

public class IndependentMixer : MonoBehaviour
{//Allows real time mixing between three positions
 //Maps angle between camera and object to volume controller

    public GameObject kitchen;
    public GameObject hall;
    public GameObject room;


    public float angle;
    public float range;
    public float volume1;
    public float volume2;
    public float volume3;

    AudioSource targetaudio;
    AudioSource target2audio;
    AudioSource target3audio;
    // Use this for initialization
    void Start()
    {

        targetaudio = room.GetComponent<AudioSource>();
```

```csharp
        targetaudio.volume = 0;

        target2audio = hall.GetComponent<AudioSource>();
        target2audio.volume = 0;

        target3audio = kitchen.GetComponent<AudioSource>();
        target3audio.volume = 0;
    }

    // Update is called once per frame
    void Update()
    {/*

        */
        Transform target = room.transform;
        Vector3 targetDir = target.position - transform.position;
        float angle = Vector3.Angle(targetDir, transform.forward);
        if (angle < range)
        {
            volume1 = 1 - (angle / range);
            //AudioSource targetaudio = room.GetComponent<AudioSource> ();
            targetaudio.volume = volume1;
            //Set the volume of target audio to be the value volume1

        }

        Transform target2 = hall.transform;
        Vector3 target2Dir = target2.position - transform.position;
        float angle2 = Vector3.Angle(target2Dir, transform.forward);
        if (angle2 < range)
        {
            volume2 = 1 - (angle2 / range);
            //AudioSource target2audio = hall.GetComponent<AudioSource> ();
            target2audio.volume = volume2;

        }

        Transform target3 = kitchen.transform;
        Vector3 target3Dir = target3.position - transform.position;
        float angle3 = Vector3.Angle(target3Dir, transform.forward);
```

```
    if (angle3 < range)

    {

        volume3 = 1 - (angle3 / range);

        //AudioSource target3audio = kitchen.GetComponent<AudioSource> ();

        target3audio.volume = volume3;


    }


    print("angle" + angle);

    //print("volume"+volume);


    Debug.Log("volume1" + volume1);

    Debug.Log("volume2" + volume2);

    Debug.Log("volume3" + volume3);


  }
}
```

Random Number Generator

The Random Number Generator makes that the initial viewing position (IVP) can be assigned randomly between the two options that the narrative offers. This way, the user has a 55/45 chance of starting in either position.

```
using System.Collections;
using System.Collections.Generic;
using UnityEngine;


public class rotationStart : MonoBehaviour
{

  float cameraRotation;


  // Use this for initialization
  void Start()
  {

    Vector3 StartingPointA = new Vector3(0, -93, 0);
```

```csharp
        Vector3 StartingPointB = new Vector3(0, 0, 0);


        int RandomNumber = Random.Range(0, 10);
        //THIS IS THE LINE


        Debug.Log("RandomNumber" + RandomNumber);


        //Debug.Log is a warning light, writes whatever writing number is to the console


        if (RandomNumber <= 5)
        {
            gameObject.transform.eulerAngles = StartingPointA;


            //camera rotation needs StartingPointA
        }


        else if (RandomNumber > 5)
        {
            gameObject.transform.eulerAngles = StartingPointB;


            //camera rotation needs to be StartingPointB
        }


    }

    // Update is called once per frame
    void Update()
    {

        /*Vector3 newCamRot = new Vector3 (0, cameraRotation, 0);
        transform.eulerAngles = newCamRot;
        if(Input.GetKeyDown("a"))
        {cameraRotation = cameraRotation - 1;
        }
        if(Input.GetKeyDown("d"))
        {cameraRotation = cameraRotation + 1;
        }*/


    }
}
```

Two other scripts were used, but they were pre-fabs specifically written by the designer to make the system compatible with CVR. These were the OVRCameraRig and the OVRManager, that form part of the pre-fab object OVRCameraRig. None of these were altered in any way.

Appendix 2

Design and workflow of the
Acoustic Interactive device in
The Hunter & the Wolff

RECORDING

This appendix describes in detail the technical procedures and workflow by which the sound production for the proof of concept of *The Hunter & the Wolff* was realized. I consider it interesting to contribute the experience gained in terms of how to approach the challenge of recording sound in immersive spaces, but with mainly interactive purposes. The main objective in this matter was to obtain sound assets that could be spatially isolated in the mixing and post-production processes.

To accomplish this was complex because of the simultaneity of the actions in the filming set, which lead to sounds from one space spilling into the other two. This could be prevented if, for instance, actions in each space were recorded independently, an option that was assessed not only in regard of sound, but of the overall blocking. However, interdependency between plots and actions taking place in different rooms made, if not impossible, significantly harder to consider independent recording.

Thereafter, four sound recording techniques were considered during pre-production and then taken into production stages:

- 360º sound recording with an ambisonics microphone,
- Localized space recording, with one boom microphones tracking each plot,
- Individualized lavalier microphones for each character,
- ADR and Foley recording.

The first technique, 360º recording with and ambisonics microphone, proved to be definitely the best means to achieve an immersive sound. Ambisonics are generally flexible microphones, not only because they allow 360º recording, but also, and especially, because they produce flexible assets, that can be arranged in many different ways and also be decoded and reshaped: "a decoder can take one Ambisonic recording and 'output' the audio as mono, stereo, quad, 5.1 and much more." (Virostek, 2017) Its recorded signals can also "be used in any playback setups. It is capable of full surround, including height and depth from a single

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source in space." (Hong et al, 2017:7) However, even if these microphones are probably the best to creative an evocative and naturalistic feeling of immersion, this flexibility doesn't really allow isolating sound sources from each other. It is also truth that using ambisonics is not the only way to build a virtual surrounding soundscape (Boomlibrary, 12th February 2019), so, for the purposes of this project would not necessarily be the best option, unless each space were to be recorded independently, which is something to be considered in terms of direction design if a richer acoustic surrounding feeling is desired.

Fig. 35. Ambisonic microphone used during the recording, placed "behind" the camera, especifically in the blank space, which was later erased in postproduction.

However, this option shouldn't be completely discarded, especially considering that the final product is to be delivered in an immersive medium. Nonetheless, contemplating the aim of designing three acoustically different spaces, the other three techniques seemed to be more appropriate in terms of obtaining a valuable set of independent assets, that could be later be reassembled in post-production. The biggest disadvantage of this approach is that it requires a quite sophisticated postproduction process in order to achieve a properly immersive soundscape in each of the spaces.

In the case of this proof of concept, we designed a microphone array of 6 microphones: 1 ambisonics, 2 booms and 3 lavaliers, thinking of covering different ranges of space, from the widest spatialized 360º recording of the ambisonics, covering spaces individually with the booms (since there are no moments in which the three rooms are being used, the booms alternate between them depending on the blocking) and specifically located lavaliers to obtain mainly the dialogues by each character.

As expected during preproduction, spilling was the main problem to be faced, and yet, it wasn't as bad as it was first expected. Presumably, it could be even prevented – or at least softened – with a proper acoustic treatment of the space; creating a set, higher walls, better acoustic isolation in walls and floors, roofs – which would also contribute enormously to the creation of acoustic environments. Nevertheless, the assets obtained from the lavaliers constituted the main source of dialogue in post-production. Booms, on the other hand, produced useful assets only for scenes that concentrate most of the dialogue, since during the rest of the recording they suffered from spilling.

Finally, ADR and Foley recording concluded the production process. ADR covered every dialogue in the script plus one additional non-diegetic dialogue, in order to have a full range of

assets obtained through different recording methods and test their suitability during the mixing. Foley covered all the diegetic specifics, footsteps and movements, while a minor number of sounds were obtained from sound banks online, like the door being closed and open and the doorbell.

The recording didn't consider any other sound that those specifically demanded by the script, mainly keeping the spirit and original purposes of the proof of concept. More elaborated sound design that could include, for instance, a musical element, is expected to be considered more thoroughly in a future production, in the light of the conclusions resulted from this proof of concept, in order to have a better idea of the potentialities and limitations of this interactive design.

POST-PRODUCTION

Despite realizing these technical potentialities, the core idea of working on a Y axis remained central, and the mixing was finally done in stereo.

The sound postproduction evolved through several iterations. The original concept consisted of three sound deliverables; one for each space, comprehending all diegetic and non-diegetic sounds in a stereo mix, as it were designed for a traditional bi-dimensional screening. Each of these deliverables were to be attached to an invisible object in the tridimensional space created in Unity, and they would fade into the other according to the user's gaze – when the gaze turns away from a sound source and closer to the next one, the mixes would then fade out and in respectively.

editing	two protools projects: - dialogue - foley	*master pre-mix*	one master edited project, including the three spaces	*mixing & audio master*	three mixes within master project: - bedroom - hall - kitchen	*unity master*	import three audio deliverables in unity project & generate spatial fading between spaces and audio sources
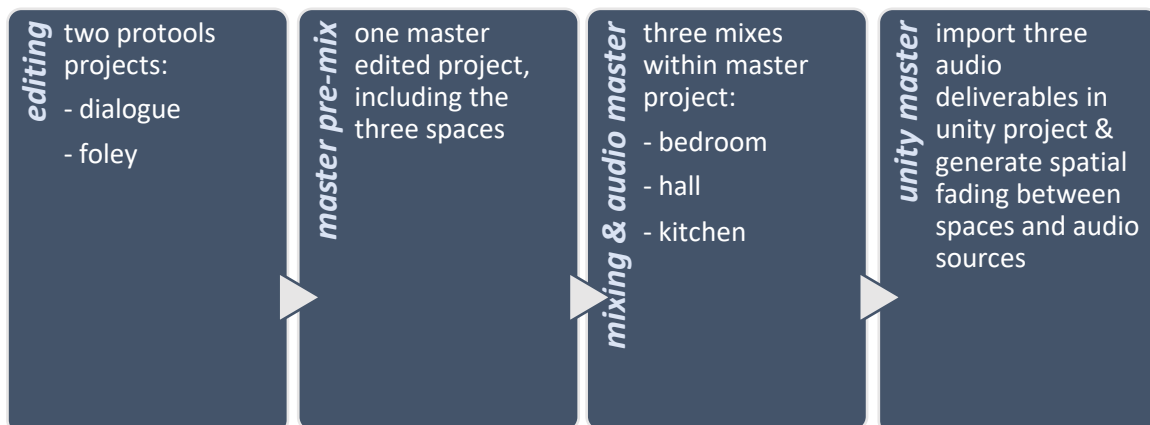
Fig. 35. Second iteration of the sound post-production workflow

Fig.35 illustrates this process, which adds two significant steps to the standardized workflow: the generation of independent mixes for each one of the three spaces in step 3, and then generate sub mixes from this previous mixes that will operate depending on the user's location. The seven final deliveries are organized across the immersive space on its Y axis, and

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their operativity will be explained and illustrated later in this chapter. In this stage, this is significant because it is a direct consequence of the requirements of narrative concept and the script; conceiving simultaneity during the process of mixing, taking into account that these multiple mixes do not correspond to scenes that are later arranged in a timeline, but to *scenarios* that take place simultaneous in one immersive space.

The final assembling takes place in a programming software, rather than in an editing one, in order to make the film able to react to the user's input, which would define this as an object-based project.

editing	*master pre-mix*	*mixing & audio master*	*deliverables*	*unity master*
two protols projects: - dialogue - foley	one master edited project, including the three spaces	three mixes within master project: - room - hall - kitchen	seven audio files: - room on - room off - hall off L - hall on - hall off R - kitchen off - kitchen on	import seven audio deliverables in unity project & generate spatial fading between spaces and audio sources

Fig.36. Final iteration of the sound post-production workflow.

However, the notion of ON and OFF spaces demanded a third iteration, which involved the creation of seven audio deliverables instead of three. This due to the necessity to improve the acoustic spatiality and facilitating more manipulable assets. Three of these deliverables correspond to the three ON mixes; those that contain every sound taken in count during the action that take place in each space. The other four deliverables correspond to the OFF mixes, which work under the presumption that sounds come from the room next door. As described in Chapter 2, if we were to organize these mixes spatially in a Y axis, it would look as the following:

Room ON – Room OFF – Hall OFF L – Hall ON – Hall OFF R – Kitchen OFF – Kitchen ON

As it can be seen in the final iteration of the postproduction workflow, this arrangement of the soundscape made it necessary to add a new step in the mixing process, in order to produce the final seven deliverables from the mixes from each of the rooms. This consisted basically in the discrimination of ON and OFF soundscapes in each room along the timeline, in order to enhance the presence of the other rooms in the OFF mixes – usually supported by panning this presence according to the origin of the sounds, to provide spatiality.

Appendix 3

Design and tools of the evaluation process

This appendix presents the tools designed for the evaluation and data collection used during this research. They consist of three instances: Non-anonymous interviews to crew members that participated of the production of the prototype of *The Hunter & the Wolff*, semi-guided focus groups with participants of the system-test, and semi-structured interviews with experts, based on the analysis of the prototype.

Part 1: Interview to Crew Members; Actors

This stage has as main objectives to stablish a procedure of how to approach the production of this kind of experience. In this sense, the production involves a series of challenges that make it different from a regular film shooting. Among them, we can find:

Main topics related to the format

- Treatment of space

1. How relevant was to your acting the spatial arrangement around a 360º camera?
2. What other considerations should the director have in terms of acting in a virtual environment?

- Treatment of time and synchronicity

3. How challenging was to approach two parallel and simultaneous plots from the acting?
4. What other considerations should the director have in terms of several simultaneous actions?

- Approach to the script and overall understanding of the story

5. Do you think the story is approachable and understandable?
6. Do you think each story makes sense independently?
7. Do you think the stories makes sense together?

Other relevant topics

- Folktale adaptation

8. Do you recognize the elements of the original folktale?
9. What elements do you miss?

- Character treatment; Approach to the female characters and their sexuality

10. What do you think about the approach to female characters in the overall story?
11. What do you think about the male characters?
12. Do you think these topics are relevant to the general public?
13. Are these topics relevant for you as a female/male actor?

Part 2: Semi-guided Focus Group

Brief:

This is prototype for an interactive short film in cinematic virtual reality. It aims the test a type of interactivity based on deconstructing the virtual environment using sound design. You will be able to navigate the virtual space and the soundscape will change depending on where you are looking.

To get you accustomed to the notion, we will play an orientation demo before the actual prototype.

Questions:

First section; Background

- Have you used VR before?
- Do you know what an interactive film is? How would you describe it?
- Do you have any experience working in the film and television industry?
- Which is your age bracket?
  (18-29, 30-39, 40-49, 50-59, 60-69, over 70)

First section; Interactive Device's functionality

- Did you identify the three rooms?
  Y/N
- Was it easy to adapt to a space with several rooms? Why?
  Y/N
- Was sound helpful to follow the actions?
  Y/N
- Did sound motivate you to make navigational decisions?

Y/N
- Did you feel at some point that you were looking at the wrong direction? Why?
Y/N

Second section; Narrative and Storytelling

- Could you identify the folktale in which this story is based? What elements could you identify?
- Who would you say was the main character?
- Which character did you follow the most and why?
- Did you switch from following one character to follow another? Why and when?
- Were you aware there were simultaneous actions going on? If so, what motivated you to follow one instead of the other?
- Was there any moment in which you felt like you were missing out?
- Did you get a full sense of the story? Would you watch it again to see the parts you didn't this time?

Third section; User/Spectator's Ontology

- Did you engage with the storytelling? Why?
- How conscious were you about the decisions you made to follow the story?
(In a scale of 1 to 5)
- Do you wish you could have been able to do more within the story? If so, what?
- What would you say was your role in this narration?
- How would you define this prototype? A film? A game? An interactive film? Other?

Part 3: Semi-structured interviews with experts

First section; Interactive device's functionality:

- Do you think the use of diegetic elements is effective to drive unconscious decision-making?
- Do you think the dramatic use of acoustic stimuli is an effective way to navigate through an immersive space, and that could potentially enhance spatial storytelling?

Second section; Narrative and storytelling

- Do you think parallel simultaneous plots and spatial navigation are interesting ways to propose an interactive story?

Third section; User/Spectator's Ontology

- Do you think this type of interactivity, which aims to avoid non-diegetic stimuli between the story and the user, facilitates narrative immersion?
- What do you think is the narrative role of the user in interactive storytelling? How do you think that applies in this prototype?

Fourth section; General questions

- How do you think this type of interactivity affects storytelling? What do you perceive as benefits and drawbacks?
- Any further comment and/or feedback?

Appendix 4

Ethics Documentation

The present section includes the forms and information sheets used during the execution of this research. These documentation was used in two instances. First during the production of the prototype of *The Hunter & the Wolff*, when all participants – actors and crew members – were informed of the academic purposes of the project and were asked to contribute with qualitative data, in the form of semi-structured interviews. The second instance was the evaluation of the proof of concept, when participants and experts were informed of the characteristics of the process and agreed to participate non-anonymously.

   The documentation is listed as follows:

- Production of proof of concept; Research ethics checklist
- Production of proof of concept; Information sheet,
- Production of proof of concept; Participant non-anonymous consent form,
- System-test; Research ethics checklist
- System-test; Anonymous research information sheet
- System-test; Anonymous research consent form
- System-test; Non-anonymous research information sheet
- System-test; Non-anonymous research consent form

UNIVERSITY *of* York

Department of Theatre, Film and Television
Ethics Committee

RESEARCH ETHICS CHECKLIST

This checklist is to be used **ONLY** for research by TFTV staff and research students where the work can be considered low-risk from an ethical perspective.

Completed Research Ethics Checklists should be submitted to the TFTV Ethics Committee for review, by email to tftv-ethics@york.ac.uk at least TWO WEEKS before the commencement of the research work for which ethics clearance is being sought, unless an alternative deadline has been agreed, in advance, in writing with the TFTV Ethics Chair.

All research student applications MUST be first discussed, reviewed and approved by their supervisor prior to their submission. Student applications should also copy their supervisor on the email submission.

Before completing this form, please consult the TFTV Research Ethics Guidelines, available on the TFTV Ethics VLE site and Research Ethics web pages.

SECTION 1: APPLICANT AND PROJECT DETAILS

Box 1A: Applicant Details

ALL applicants must complete this box.

Applicant Name	Tobías Palma
E-mail address	tgps500@york.ac.uk
TFTV Staff or TFTV Student	PhD researcher (student)

Box 1B: Programme Details

STUDENT applicants must complete this box.

Degree Programme of Study	
Supervisor name(s) and Email address(es)	

Box 1C: Research Details

ALL applicants must complete this box.

Research Project Title	The Hunter & the Wolff: Hands-off Interactive Storytelling in CVR
Project Start Date	8th May 2019
Project Duration	24th May 2019
Collaborator details (if applicable, names, email addresses and institutions)	
Funding source (if applicable)	

Box 1D: Other Ethics Reviews **ALL** applicants must complete this box.	YES	NO
Has this project been submitted to any other ethics or compliance procedures?		X
If YES, please provide details		

Box 1E: Conflicts of Interest **STAFF** applicants must complete this box.		YES	NO
1	Are any ethical concerns / conflicts of interest likely to arise as a consequence of funding source (with respect to your own work or that of other individuals/departments within in the University e.g. perceived or actual with respect to direct payments, research funding, indirect sponsorship, board or organisational memberships, past associations, future potential benefits etc…)		X
2	Does the Principal Investigator or any other key investigators or collaborators have any direct personal involvement in the organisation sponsoring or funding the research that may give rise to a possible conflict of interest?		X
IF YES to either question please describe these possible ethical concerns or conflicts of interest.			

Please complete Section 2: Research Summary

SECTION 2: RESEARCH SUMMARY

Box 2A: Research Outline **ALL** applicants must complete this box.	
1	**Aims and objectives of the research** Please provide the aims and objectives of the research, including the questions or hypotheses that will be examined.
	- To test technical procedures (blocking and sound recording techniques) for an interactive cinematic virtual reality short film production. - To obtain data from the participants about such procedures.
2	**Methods of data collection and types of data** Please outline how the data will be collected from or about human participants (e.g. face to face audio recorded interviews, anonymous online surveys hosted by Google Forms, telephone surveys etc.) Please give details of all proposed research activities and specify exactly what types of data will be collected for each activity (e.g. paper based notes, photographs, audio recordings etc.).
	- Mainly through qualitative methods, such as interviews and focus groups.
3	**Research Outside of the UK** Will you be conducting research outside of the UK? If so, specify where. Have you checked whether local ethical approval is required? Are there any different civil, legal, financial or cultural conditions that you need to be aware of? If so, please provide details of how you will ensure compliance with these conditions and/or regulations. See the University's guidance on conducting research outside the UK for further details: https://www.york.ac.uk/staff/research/governance/research-policies/guidanceoutsideuk/

Please complete Section 3: Participants

SECTION 3: PARTICIPANTS

Box 3A: Participant Summary

ALL applicants must complete this box.

1	**Recruitment of Participants** How many participants will take part in the research? How will they be identified and invited to take part in the study? Please give details for all activities described in Box 2A, Question 2. It is sufficient to provide estimated numbers. But, please provide details for each of the research activities described in the previous box.
	8 participants that have already being recruited through regular Crew and Cast calls.
2	**Anonymity** Will the data you collect from participants be treated anonymously or non-anonymously in any outputs (e.g. reports, assessments, research papers etc.)? If you intend to treat your data anonymously in the outputs, how will you ensure that anonymity is maintained? If you intend to treat the data non-anonymously, please explain and justify why a non-anonymous approach is appropriate in this work? Note that a **"privacy by design"** approach is required for **research activities**, whereby data is always treated anonymously in outputs unless there is a good reason to identify the participants.
	The data will be treated anonymously, although the names of the participants will be credited in the result of the production.
3	**Payments, reimbursements and incentives** If research participants are to receive any payments, reimbursement of expenses, or any other incentives or benefits for taking part in your research, please give details, indicating what and how much they will receive and the basis on which this was decided. Please also explain how you will ensure that you are complying with financial regulations.

Box 3A: Participant Summary

ALL applicants must complete this box.

4	**Obtaining Consent**		
	Please explain how voluntary informed consent to participate will be elicited from participants. If different groups are involved in the study (e.g. parents, children, staff), please describe the sequence of consent. Please give details for all activities described in Box 2A, Question 2.		
	Participants will sign a consent form in which the details of the data collection are stated.		

5	**Information Sheets**	**YES**	**NO**
	Please confirm that you will provide *all participants* with a Participant Project Information Sheet that is based on the template provided on the TFTV Research Ethics web pages.	**X**	

6	**Consent Forms**	**YES**	**NO**
	Please confirm that you will take written Informed Consent from *all participants* using a form that is based on the template provided on the TFTV Research Ethics web pages. Note that it is expected that explicit written Informed Consent is taken from all participants, unless there is a good reason to use verbal consent.	**X**	
	If NO, please explain in what situations and contexts you will take verbal consent and how you will manage and record that verbal consent has been taken.		

7	**Feedback**	**YES**	**NO**
	Will you be providing the participants with any feedback on their involvement? E.g. providing them with access to research papers? Note that it is generally expected that participants will have the option to receive some form of feedback on the work.	**X**	

Box 3A: Participant Summary

ALL applicants must complete this box.

	If YES, please explain how you will provide the relevant parties with feedback and when, e.g. by giving them access to the completed report by emailing them a pdf version of accepted conference papers. If NO, please explain why not.
	Access to the report, and written feedback if desired.

		YES	NO
8	**Dissemination and Distribution**	**YES**	**NO**
	Do you intend to disseminate or distribute your finished work anywhere?	**X**	
	If YES, please explain what you intend to do with the finished work? E.g. put on YouTube, submit to conferences etc.		
	Both the production and the data will be part of my PhD thesis. I expect to be able to show them in academical and industrial environments, in order to keep collecting data and feedback about my work.		

Please complete Section 4: Research Ethics Concerns

SECTION 4: RESEARCH ETHICS CONCERNS

Box 4A: Checklist of Research Ethics Questions **ALL** applicants must complete this box	YES	NO

1   Will the project involve conducting work that would typically require NHS Ethics approval?
 	
That is, will you be working with any of the following as participants, if recruited specifically due to their involvement with the NHS:
 	
   -   Patients and Users of the NHS,
 	
   -   Relatives or carers of patients and users of the NHS,
 	
   -   NHS staff?
 	
OR will you be using or accessing NHS premises or facilities as part of the work?
		X

2 Will the project involve conducting work that would typically require Her Majesty's Prison & Probation Service Ethics approval? That is, will you be conducting research with staff and/or offenders in prison establishments, National Probation Service (NPS)/Community Rehabilitation Companies (CRC) regions or within Her Majesty's Prison and Probation Service (HMPPS) Headquarters? OR will you be conducting research on HMPPS premises?		X
3 Will you be working with vulnerable participants (e.g. those under 18, people with learning disabilities, people with mental impairment due to health or lifestyle, people who are terminally ill or recently bereaved etc.)? Note that if you are unsure whether someone you would like to work with could be considered vulnerable under the circumstances, you are required to discuss your concerns with your supervisor and/or Ethics Chair. It is generally expected that any student working with vulnerable groups would submit a Full Research Ethics Clearance form.		X
4 Will you be discussing sensitive or potentially upsetting or distressing topics with participants?		X
5 Is it reasonably foreseeable that the work could involve causing physical or emotional distress to participants or researchers?		X

Box 4A: Checklist of Research Ethics Questions **ALL** applicants must complete this box		YES	NO
6	Is it reasonably foreseeable that the participants could disclose or discuss participation in illegal activities (e.g. drug use)?		X
7	Is it reasonably foreseeable that the participants could disclose confidential or sensitive information (e.g. financial data, sensitive organisational data)?		X
8	Will you be deliberately misleading the participants in any way?		X
9	Will you be filming or making recordings of people without their knowledge and consent (e.g. covert filming of people in non-public places)?		X
10	Will you be researching or discussing issues relating to terrorism or political extremism as part of your work?		X
11	Will you be collecting online data that has been generated by human participants (e.g. social media data) from closed, restricted forums (i.e. from closed communities or those that require approved membership to view, e.g. restricted Facebook groups)?		X
12	Will you be identifying anyone from online data that has been generated by human participants (e.g. social media data) from either open or closed forums (i.e. by including information that could make the individual identifiable, such as direct quotes or usernames)?		X
13	Could the work involve potentially damaging property and/or the natural environment?		X
14	Will the work involve animals?		X
15	Is it reasonably foreseeable that the work could result in any anticipated university/institutional risk (e.g. adverse publicity or financial loss)?		X

If you have answered "YES" to ANY of the questions in Box 4A: Checklist of Ethical Research Ethics Questions:

This Research Ethics Checklist may be insufficient to accommodate the ethical risks of your proposed work.

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Some lower-risk ethical issues can be accommodated without further scrutiny by the TFTV Ethics Committee provided that you agree to follow a process that is considered appropriate. These situations and processes are described on the TFTV Ethics VLE site.

IF there is a suitable procedure to manage this ethics issue, please complete Box 4B to provide further details of how you intend to manage the ethical issues associated with your proposed work.

Box 4B: Further Details
Complete this box if you answered "Yes" to any question in Box 4A AND there is an identified procedure to manage the ethical risks in this situation.
Provide details of the nature of the ethical risks that you identified by answering YES to questions in Box 3A and describe the process that you will follow to minimise the risks.

Alternatively, the associated risks of your proposed work may be sufficiently low risk that an appropriate approach can be agreed with the TFTV Ethics chair without requiring submission of the TFTV Research Ethics Clearance form. Your supervisor/module convenor may contact the TFTV Ethics on your behalf to identify an agreed process on a case-by-case basis. If your supervisor has discussed your proposed work with the TFTV Ethics Chair via email, please complete Box 4C: Case-By-Case Agreed Process.

Box 4C: Case-By-Case Agreed Process Applicants must complete this box IF they have answered "YES" to any questions in Box 4A AND there is no identified procedure to manage the ethical risks of the proposed work. Note, that most applicants will need to submit a TFTV Research Ethics Clearance form and this case-by-case process approach is ONLY suitable for work that can be considered low risk.		**YES**	**NO**
1	Have you or your project supervisor discussed the proposed work and associated ethical risks with the TFTV Ethics Chair via email?		
2	Were you or your project supervisor able to agree a process to manage the low risks associated with your proposed work?		

Box 4C: Case-By-Case Agreed Process	YES	NO
Applicants must complete this box IF they have answered "YES" to any questions in Box 4A AND there is no identified procedure to manage the ethical risks of the proposed work. Note, that most applicants will need to submit a TFTV Research Ethics Clearance form and this case-by-case process approach is ONLY suitable for work that can be considered low risk.		
IF YES to BOTH questions please provide further details of the anticipated risks of the proposed work and the process that was agreed with the TFTV Ethics chair. Please include dates of the email correspondence AND the name and email address of people involved.		

If the associated risks of your proposed work cannot be accommodated through an identified procedure or through a case-by-case agreed process, then you will need to submit an application to the TFTV Ethics Committee for review using the Research Ethics Clearance Form.

Please complete Section 5: Data Protection

SECTION 5: DATA PROTECTION

Box 5A: Checklist of Data Protection Questions **ALL** applicants must complete this box	YES	NO

1   Will you guarantee that you will inform all people whose personal and/or special category data that you are using:
 	
    • What data you will be collecting and why;
    • How you will be storing the data;
    • The legal basis under which you are storing the data;
    • When/if/how the data will be destroyed?
 	
Please note that using a GDPR Compliant Project Information Sheet will ensure you meet these requirements.
	X	

2 Will you guarantee that **IF** you use a portable device to collect electronic data you will transfer that data to your University Google Drive account or University Filestore as soon as possible after the interview **AND** delete it from your personal device?	X	
3 Will you guarantee that the data will **ONLY** be accessible to the project team **AND** that **IF** the project team extends beyond the University of York that you have consulted the University's IP and Legal team to ensure appropriate data protection safeguards are in place?	X	
4 Will you guarantee that you will **ONLY** use Google Forms OR Qualtrics to host online surveys that collect personal and/or special category data?	X	
5 Will you guarantee that you are collecting the **MINIMUM** amount of data necessary for the intended project?	X	
6 Will you guarantee that **IF** you are storing or accessing data from **OUTSIDE** the European Economic Area (EEA) you will access the data through your University of York Google Account connected to the University of York Virtual Private Network (VPN)?	X	
7 Will you guarantee to destroy all physical **AND** electronic data **EITHER** after your module marks have been ratified by the Board of Examiners **OR** 10 years after last requested access?	X	

Box 5A: Checklist of Data Protection Questions **ALL** applicants must complete this box		YES	NO
8	**IF** storing electronic data for 10 years after last requested access, will you guarantee to **EITHER** use a University Google Drive account **OR** an approved data repository service to store the data?	X	
9	Have you screened your project against the Data Protection Impact Assessment (DPIA) screening questions **AND** if required conducted a DPIA and submitted a copy to the Data Protection Officer for review?	X	

Box 5B: Further Details
Complete this box if you answered "No" to any question in Box 5A.
Provide details of the nature of the data protection risks that you identified by answering NO to questions in Box 5A and describe the process that you will follow to minimise the risks. Please note that if you are not compliant with the agreed procedures above, this application will be referred to the University Data Protection Officer for advice.

Please complete Section 6: Applicant Agreement

SECTION 6: APPLICANT AGREEMENT

Please mark your answer to each question in Box 6A: Applicant Agreement with an "X" or a tick in the appropriate column. Please note that you **MUST NOT** begin contacting participants **UNITL** you have received a response from the Ethics committee.

If you are a research student, please also have your supervisor also complete Box 6B: Supervisor Agreement and provide their signature overleaf.

Once completed, submit the checklist for review by the TFTV Ethics committee by emailing the checklist to tftv-ethics@york.ac.uk from the applicant's University of York account. The Ethics Committee will accept a typed/digital signature from the applicant if the form is returned by email from the applicant's University of York account, and similarly a typed/digital signature and responses to the supervisor questions if the supervisor is cc'd to that email.

Box 6A: Applicant Agreement **ALL** applicants must complete this box.		YES	NO
1	I will ensure that the research conducted for the above project will meet all the statements as expressed in this Research Ethics Checklist.	X	
2	I will ensure that all work related to the research will be guided by the University's ethical rules and regulations.	X	
3	I understand that I must not progress with this project until I have received confirmation from the TFTV Ethics committee that Ethics approval through this Research Ethics Checklist is appropriate for this project.	X	
4	I have included example Project Information Sheets and Participant Informed Consent Forms, as part of this Ethics application, if appropriate.	X	
5	I understand that I must adhere to the TFTV requirements for storing and using personal and special category data in compliance with the General Data Protection Regulation. Note that GDPR compliance guidance can be found on the TFTV Ethics VLE site.	X	
6	I agree to ensure that all payments made to personnel in relation to this project will comply with financial regulations.	X	

Box 6A: Applicant Agreement **ALL** applicants must complete this box.		**YES**	**NO**
7	I agree to report any changes to the above as soon as is feasible to the Chair of the TFTV Ethics Committee.	X	
Applicant Name	Tobías Palma		
Signed			
Date	8th May 2019		

Box 6B: Supervisor Agreement **STUDENT** applicants must have their supervisor complete this box.		**YES**	**NO**
1	I have reviewed this checklist in discussion with the student.		
2	I believe the Research Ethics Checklist is appropriate for this work and that no further Ethics approval is required.		
3	**IF** you have selected "No" in response to statement 2: I confirm that the student will submit either the Research Ethics Clearance Form for further ethical approval.		
Supervisor Name			
Signed			
Date			

UNIVERSITY *of York*

Department of
Theatre, Film and Television

Participant Information Sheet – Non-Anonymous Interviews

Project background

The University of York would like to invite you to take part in the following project: The Hunter & the Wolff, by PhD candidate Tobias G. Palma.
Before agreeing to take part, please read this information sheet carefully and let us know if anything is unclear or you would like further information.

What is the purpose of the project?

This project is being performed by Tobias Palma (tgps500@york.ac.uk), doctoral researcher in the programme PhD Theatre, Film, Television and Interactive Media by Creative Practice at the University of York. This research is being undertaken for the assessment of new film production techniques for interactive narratives in cinematic virtual reality. This is project is supervised by Dr Guy Schofield (guy.schofield@york.ac.uk) and Simon Van der Borgh (simon.vanderborgh@york.ac.uk).
The work that is being performed for the assessments within the module is being conducted according to restrictions that have been subject to approval by the TFTV Ethics committee. The Chair of the TFTV Ethics committee can be contacted on tftv-ethics@york.ac.uk.
For this research project, we are interested in testing blocking and sound recording procedures in the production of Proof of Concept, that will later serve to the design and production of an actual interactive cinematic virtual reality production. Your participation in this project will involve playing a role in the production, whether as part of the crew or as an actor, and then provide feedback that will serve as data, through an interview that is expected to last around 30 minutes.
Please note that to comply with the approved Ethics requirements of this work, we do not intend to discuss sensitive topics with you that could be potentially upsetting or distressing. If you have any concerns about the topics that may be covered in the research study, please raise these concerns with the researcher.
Your participation in this project is voluntary. If you wish, we will provide you with access to the Proof of Concept once this is finished. If you would like to receive access to these, you can indicate as such on the consent form.

Why have I been invited to take part?

You have been invited to take part because of your professional and artistic skills that are suitable for the production of the project.

Do I have to take part?

No, participation is optional. If you do decide to take part, you will be given a copy of this information sheet for your records and will be asked to complete a participant consent form. If you change your mind at any point during the research activity, you will be able to withdraw your participation without having to provide a reason. To withdraw your participation you need to ask the production management, personified in Tobias Palma, to destroy any documentation and/or data you might have previously provided.

On what basis will you process my data?

Under the General Data Protection Regulation (GDPR), the University has to identify a legal basis for processing personal data and, where appropriate, an additional condition for processing special category data.
Include if you ARE collecting PERSONAL DATA
Personal data is defined as data from which someone could be identified. For example, in this study we will be collecting your name and contact details, which are used for regular film production purposes, and your image in the case of actors.
In line with our charter which states that we advance learning and knowledge by teaching and research, the University processes personal data for research purposes under Article 6 (1) (e) of the GDPR:

- *Processing is necessary for the performance of a task carried out in the public interest*

Include if you ARE NOT collecting any SPECIAL CATEGORY DATA
Special category data is personal data which the GDPR says is more sensitive, and so needs more protection. In this study, we will not be collecting any special category data**.**

Include if you ARE collecting any SPECIAL CATEGORY DATA
Special category data is personal data which the GDPR says is more sensitive, and so needs more protection. In this study, there shouldn't be any need to collect any kind of special category data. If there should be, this will be informed beforehand by the researcher in charge, Tobias Palma.
Special category data is processed under Article 9 (2) (j):

- *Processing is necessary for archiving purposes in the public interest, or scientific and historical research purposes or statistical purposes*

Include in ALL information sheets
Research activities will only be undertaken where ethical approval has been obtained, where there is a clear public interest and where appropriate safeguards have been put in place to protect data.
In line with ethical expectations and in order to comply with common law duty of confidentiality, we will seek your consent to participate where appropriate. This consent will not, however, be our legal basis for processing your data under the GDPR.

How will you use my data?

Data will be processed for the purposes outlined in this notice.
Will you share my data with 3rd parties?

Yes. The following third parties will have access to your data for the following purposes:
Institutions such as the University of York and the BBC R&D will eventually have access to

the data for the development, study and analysis of new film productions methods that include interactive storytelling.

Your data may be used in my dissertation, research reports, publications and conferences. Anonymised data may be reused by the research team or other third parties for secondary research purposes.

How will you keep my data secure?

The University will put in place appropriate technical and organisational measures to protect your personal data and/or special category data.

Information will be treated confidentiality and shared on a need-to-know basis only. The University is committed to the principle of data protection by design and default and will collect the minimum amount of data necessary for the project. In addition, we will anonymise or pseudonymise data wherever possible.

Will you transfer my data internationally?

Possibly. The University's cloud storage solution is provided by Google which means that data can be located at any of Google's globally spread data centres. The University has data protection complaint arrangements in place with this provider. For further information see, https://www.york.ac.uk/it-services/google/policy/privacy/.

Will I be identified in any outputs?

Yes. Your participation in this interview is non-anonymous and therefore you will be identified in credits of the audio-visual product, in this case, the Proof of Concept. However, your name will not be identified in the analytical text that will follow the production, and you will only be mentioned as part of the crew/cast.

How long will you keep my data?

Data will be retained in line with legal requirements or where there is a business need. Retention timeframes will be determined in line with the University's Records Retention Schedule.

What rights do I have in relation to my data?

Under the GDPR, you have a general right of access to your data, a right to rectification, erasure, restriction, objection or portability. You also have a right to withdrawal. Please note, not all rights apply where data is processed purely for research purposes. For further information see, https://www.york.ac.uk/records-management/generaldataprotectionregulation/individualsrights/.

Questions or concerns

If you have any questions about this participant information sheet or concerns about how your data is being processed, please contact the TFTV Ethics Chair (tftv-ethics@york.ac.uk) in the first instance. If you are still dissatisfied, please contact the University's Acting Data Protection Officer at dataprotection@york.ac.uk.

If you have any questions about the project itself, please contact the producer Tobias Palma (tgps500@york.ac.uk) or project supervisor Guy Schofield (guy.schofield@york.ac.uk).

Right to complain

If you are unhappy with the way in which the University has handled your personal data, you have a right to complain to the Information Commissioner's Office. For information on reporting a concern to the Information Commissioner's Office, see www.ico.org.uk/concerns.

UNIVERSITY *of York*

**Department of
Theatre, Film and Television**

Participant Consent Form – Non-Anonymous Interviews

Thank you for your interest in this project. This project forms part of the doctoral research by PhD candidate Tobias Gabriel Palma. This stage of the project aims to collect data that will serve to design a procedure and a workflow for the production of interactive and cinematic virtual reality productions. You will be provided information from a professional position, according to the role you are playing in this production, that will be useful to design new tools for the next stage of this project and, in a longer term, other similar projects.

Please read the following statements carefully and tick the appropriate box:

	YES	NO
I have read the information sheet about this project		
I agree to take part in this project		
I consent to being interviewed for this project		
I consent to the interview being video recorded		
I consent to the interview being audio recorded		
I understand my right to withdraw and/or destroy my data from this project at any time		
I consent to be identified by name in the outputs from this project		
I am over the age of 18		

Participant Name:

_____

Participant Signature:

_____

Date:

___/___/_____

Researcher Name:

_____

Researcher Signature:

_____

Date:

___/___/_____

If you wish to be informed about the outcomes from this project, please provide your email address:

_____

UNIVERSITY *of* York

Department of Theatre, Film, Television and Interactive Media Ethics Committee

RESEARCH ETHICS CHECKLIST

This checklist is to be used **ONLY** for research by TFTI staff and research students where the work can be considered low-risk from an ethical perspective.

Completed Research Ethics Checklists should be submitted to the TFTI Ethics Committee for review, by email to TFTI-ethics@york.ac.uk at least TWO WEEKS before the commencement of the research work for which ethics clearance is being sought, unless an alternative deadline has been agreed, in advance, in writing with the TFTI Ethics Chair.

All research student applications MUST be first discussed, reviewed and approved by their supervisor prior to their submission. Student applications should also copy their supervisor on the email submission.

Before completing this form, please consult the TFTI Research Ethics Guidelines, available on the TFTI Ethics VLE site and Research Ethics web pages.

SECTION 1: APPLICANT AND PROJECT DETAILS

Box 1A: Applicant Details

ALL applicants must complete this box.

Applicant Name	Tobías G. Palma
E-mail address	tgps500@york.ac.uk
TFTI Staff or TFTI Student	PhD researcher (student)

Box 1B: Programme Details

STUDENT applicants must complete this box.

Degree Programme of Study	PhD in Theatre, Film, Television and Interactive Media by Creative Practice
Supervisor name(s) and Email address(es)	Dr Guy Schofield, guy.schofield@york.ac.uk Simon Van der Borgh, simon.vanderborgh@york.ac.uk

Box 1C: Research Details

ALL applicants must complete this box.

Research Project Title	The Hunter & the Wolff: Hands-off Interactive Storytelling in CVR – Prototype Testing
Project Start Date	10th August 2020
Project Duration	30th October 2020
Collaborator details (if applicable, names, email addresses and institutions)	
Funding source (if applicable)	

Box 1D: Other Ethics Reviews **ALL** applicants must complete this box.	YES	NO
Has this project been submitted to any other ethics or compliance procedures?		X
If YES, please provide details		

Box 1E: Conflicts of Interest **STAFF** applicants must complete this box.	YES	NO
1	Are any ethical concerns / conflicts of interest likely to arise as a consequence of funding source (with respect to your own work or that of other individuals/departments within in the University e.g. perceived or actual with respect to direct payments, research funding, indirect sponsorship, board or organisational memberships, past associations, future potential benefits etc…)	X
2	Does the Principal Investigator or any other key investigators or collaborators have any direct personal involvement in the organisation sponsoring or funding the research that may give rise to a possible conflict of interest?	X
IF YES to either question please describe these possible ethical concerns or conflicts of interest.		

Please complete Section 2: Research Summary

SECTION 2: RESEARCH SUMMARY

Box 2A: Research Outline

ALL applicants must complete this box.

1	**Aims and objectives of the research**
	Please provide the aims and objectives of the research, including the questions or hypotheses that will be examined.
	This phase of the research aims to test one of the outputs of my research by practice: a prototype for an interactive short film in cinematic VR. The testing would consist in two instances: experts and regular spectators.
	The main questions are:
	- Narrative effectivity; is the story communicated properly? - Effectivity of the interaction; is the interactive design suitable for storytelling? - Agency and immersion; how does the perception of narrative agency affect spectorship?
	The hypothesis is that a hands-off interactivity in cinematic narrative would produce a deeper narrative immersion and suspension-of-disbelief thanks to the use of diegetic stimuli to guide the interactivity?
2	**Methods of data collection and types of data**
	Please outline how the data will be collected from or about human participants (e.g. face to face audio recorded interviews, anonymous online surveys hosted by Google Forms, telephone surveys etc.) Please give details of all proposed research activities and specify exactly what types of data will be collected for each activity (e.g. paper based notes, photographs, audio recordings etc.).

Box 2A: Research Outline

ALL applicants must complete this box.

	The testing process will mainly consist on the display of the prototype to each of the participants and qualitative data collection after it. The main methods of data collection will be: - Semi-structured interviews with experts - Questionnaires with regular spectators Both tools will approach the research questions described above, referring to specific aspects of the prototype. Both activities intend to collect mostly qualitative data. In the case of the interviews, data will be focused on specific technical and narrative aspects of the prototype (i.e. effectivity of the interactive device, perception of the story, etc.) Data will be collected in the form of audio recordings and possibly in some cases through written questionnaires by email. In the case of the questionnaires to regular spectators, data will be collected in the form of electronic Google forms and video recordings that will track their movements in the virtual environment. In this case, most of the data will be qualitative, plus some quantitative information on the movement tracking that will allow further analysis on narrative choices made by the participants.
3	**Research Outside of the UK** Will you be conducting research outside of the UK? If so, specify where. Have you checked whether local ethical approval is required? Are there any different civil, legal, financial or cultural conditions that you need to be aware of? If so, please provide details of how you will ensure compliance with these conditions and/or regulations. See the University's guidance on conducting research outside the UK for further details: https://www.york.ac.uk/staff/research/governance/research-policies/guidanceoutsideuk/

Please complete Section 3: Participants

SECTION 3: PARTICIPANTS

Box 3A: Participant Summary

ALL applicants must complete this box.

1	**Recruitment of Participants** How many participants will take part in the research? How will they be identified and invited to take part in the study? Please give details for all activities described in Box 2A, Question 2. It is sufficient to provide estimated numbers. But, please provide details for each of the research activities described in the previous box.
	Experts will be selected from within the industry – particularly specialists in VR – and from the research field – mainly on interactive storytelling and OBM. Relevant institutions such as the BBC R&D, Bristol VR Lab, and universities are being considered. Around 5 interviews are being considered. Regular participants will be recruited through an open call to be disseminated mainly through the networking media of two relevant environments: university and York's filmmaking community. This stage has the complication of the current Covid-19 crisis, which supposes a series of obstacles regarding the display of the prototype, since it would involve participants sharing VR headsets. This stage would take place during Autumn term 2020, and I'm currently waiting for university directions in this regard. Around 10 participants are being considered.
2	**Anonymity** Will the data you collect from participants be treated anonymously or non-anonymously in any outputs (e.g. reports, assessments, research papers etc.)? If you intend to treat your data anonymously in the outputs, how will you ensure that anonymity is maintained? If you intend to treat the data non-anonymously, please explain and justify why a non-anonymous approach is appropriate in this work? Note that a **"privacy by design"** approach is required for **research activities**, whereby data is always treated anonymously in outputs unless there is a good reason to identify the participants.
	Regular participants will be treated anonymously. Experts will be asked if they prefer to remain anonymous or not, considering that the approach to this data consists on counting with inputs from relevant actors within the field. This would take place at the moment of signing the consent form, prior to the realisation of the interview.

Box 3A: Participant Summary			
ALL applicants must complete this box.			
3	**Payments, reimbursements and incentives** If research participants are to receive any payments, reimbursement of expenses, or any other incentives or benefits for taking part in your research, please give details, indicating what and how much they will receive and the basis on which this was decided. Please also explain how you will ensure that you are complying with financial regulations.		
4	**Obtaining Consent** Please explain how voluntary informed consent to participate will be elicited from participants. If different groups are involved in the study (e.g. parents, children, staff), please describe the sequence of consent. Please give details for all activities described in Box 2A, Question 2.		
5	**Information Sheets**	**YES**	**NO**
	Please confirm that you will provide *all participants* with a Participant Project Information Sheet that is based on the template provided on the TFTI Research Ethics web pages.	**X**	
6	**Consent Forms**	**YES**	**NO**
	Please confirm that you will take written Informed Consent from *all participants* using a form that is based on the template provided on the TFTI Research Ethics web pages. Note that it is expected that explicit written Informed Consent is taken from all participants, unless there is a good reason to use verbal consent.	**X**	
	If NO, please explain in what situations and contexts you will take verbal consent and how you will manage and record that verbal consent has been taken.		

Box 3A: Participant Summary

ALL applicants must complete this box.

7	**Feedback**	YES	NO
	Will you be providing the participants with any feedback on their involvement? E.g. providing them with access to research papers? Note that it is generally expected that participants will have the option to receive some form of feedback on the work.	**X**	
	If YES, please explain how you will provide the relevant parties with feedback and when, e.g. by giving them access to the completed report by emailing them a pdf version of accepted conference papers. If NO, please explain why not.		
	This test doesn't aim to measure any particular skill or quality in the participants, but rather looks for them to provide feedback on the prototype and to describe their narrative and immersive experiences. However, if requested, results will be shared with participants, sharing a report of the analysed data and the most relevant findings.		

8	**Dissemination and Distribution**	YES	NO
	Do you intend to disseminate or distribute your finished work anywhere?	**X**	
	If YES, please explain what you intend to do with the finished work? E.g. put on YouTube, submit to conferences etc.		
	Results will form part of my research thesis, for which are expected to be part of academic documents and events, such as conferences and publications.		

Please complete Section 4: Research Ethics Concerns

SECTION 4: RESEARCH ETHICS CONCERNS

Box 4A: Checklist of Research Ethics Questions **ALL** applicants must complete this box	YES	NO
1 Will the project involve conducting work that would typically require NHS Ethics approval? That is, will you be working with any of the following as participants, if recruited specifically due to their involvement with the NHS: - Patients and Users of the NHS, - Relatives or carers of patients and users of the NHS, - NHS staff? OR will you be using or accessing NHS premises or facilities as part of the work?		X
2 Will the project involve conducting work that would typically require Her Majesty's Prison & Probation Service Ethics approval? That is, will you be conducting research with staff and/or offenders in prison establishments, National Probation Service (NPS)/Community Rehabilitation Companies (CRC) regions or within Her Majesty's Prison and Probation Service (HMPPS) Headquarters? OR will you be conducting research on HMPPS premises?		X
3 Will you be working with vulnerable participants (e.g. those under 18, people with learning disabilities, people with mental impairment due to health or lifestyle, people who are terminally ill or recently bereaved etc.)? Note that if you are unsure whether someone you would like to work with could be considered vulnerable under the circumstances, you are required to discuss your concerns with your supervisor and/or Ethics Chair. It is generally expected that any student working with vulnerable groups would submit a Full Research Ethics Clearance form.		X
4 Will you be discussing sensitive or potentially upsetting or distressing topics with participants?		X
5 Is it reasonably foreseeable that the work could involve causing physical or emotional distress to participants or researchers?	X	

Box 4A: Checklist of Research Ethics Questions **ALL** applicants must complete this box		YES	NO
6	Is it reasonably foreseeable that the participants could disclose or discuss participation in illegal activities (e.g. drug use)?		X
7	Is it reasonably foreseeable that the participants could disclose confidential or sensitive information (e.g. financial data, sensitive organisational data)?		X
8	Will you be deliberately misleading the participants in any way?		X
9	Will you be filming or making recordings of people without their knowledge and consent (e.g. covert filming of people in non-public places)?		X
10	Will you be researching or discussing issues relating to terrorism or political extremism as part of your work?		X
11	Will you be collecting online data that has been generated by human participants (e.g. social media data) from closed, restricted forums (i.e. from closed communities or those that require approved membership to view, e.g. restricted Facebook groups)?		X
12	Will you be identifying anyone from online data that has been generated by human participants (e.g. social media data) from either open or closed forums (i.e. by including information that could make the individual identifiable, such as direct quotes or usernames)?		X
13	Could the work involve potentially damaging property and/or the natural environment?		X
14	Will the work involve animals?		X
15	Is it reasonably foreseeable that the work could result in any anticipated university/institutional risk (e.g. adverse publicity or financial loss)?		X

If you have answered "YES" to ANY of the questions in Box 4A: Checklist of Ethical Research Ethics Questions:

This Research Ethics Checklist may be insufficient to accommodate the ethical risks of your proposed work.

Some lower-risk ethical issues can be accommodated without further scrutiny by the TFTI Ethics Committee provided that you agree to follow a process that is considered appropriate. These situations and processes are described on the TFTI Ethics VLE site.

IF there is a suitable procedure to manage this ethics issue, please complete Box 4B to provide further details of how you intend to manage the ethical issues associated with your proposed work.

Box 4B: Further Details

Complete this box if you answered "Yes" to any question in Box 4A AND there is an identified procedure to manage the ethical risks in this situation.

Provide details of the nature of the ethical risks that you identified by answering YES to questions in Box 4A and describe the process that you will follow to minimise the risks.

Physical or emotional distress in participants: As state in the "Frequently Encountered Situations Procedures" document of September 2019, when asking people to go through a VR experience it is possible they will feel dizzy or disoriented, particularly in the case of people with little or none previous VR experience. To minimize the risk, the procedure contemplates:

- Participants will be asked about their experience with VR and will be warned of possible dizziness and disorientation.
- A short demo will be displayed before the prototype as a familiarisation activity with similar mechanics to the actual prototype, so participants have an adjustment period of 3 to 4 minutes, and so they can identify any possible discomfort.
- Participants can abandon the test at any time if they feel sick, dizzy or any discomfort.
- The prototype lasts around 3 minutes, which is considerably shorter than the 20 minutes that are advised as a maximum length.

Recording participants: The test could benefit from obtaining data about the participants' reactions, particularly from their navigation through the virtual environment, which can be tracked using a video and analysing the movements in relation to the story. The procedure in this case will be to as participants for their consent to be recorded, explain them the objectives and purposes of the recording, guarantee anonymity and that their images won't be showed to the public (since the movement tracking is what the experiment aims to record), and allow them to abandon the test if they don't want to be recorded.

Alternatively, the associated risks of your proposed work may be sufficiently low risk that an appropriate approach can be agreed with the TFTI Ethics chair without requiring submission of the TFTI Research Ethics Clearance form. Your supervisor/module convenor may contact the TFTI Ethics on your behalf to identify an agreed process on a case-by-case basis. If your supervisor has discussed your proposed work with the TFTI Ethics Chair via email, please complete Box 4C: Case-By-Case Agreed Process.

Box 4C: Case-By-Case Agreed Process		YES	NO
Applicants must complete this box IF they have answered "YES" to any questions in Box 4A AND there is no identified procedure to manage the ethical risks of the proposed work. Note, that most applicants will need to submit a TFTI Research Ethics Clearance form and this case-by-case process approach is ONLY suitable for work that can be considered low risk.			
1	Have you or your project supervisor discussed the proposed work and associated ethical risks with the TFTI Ethics Chair via email?		
2	Were you or your project supervisor able to agree a process to manage the low risks associated with your proposed work?		
IF YES to BOTH questions please provide further details of the anticipated risks of the proposed work and the process that was agreed with the TFTI Ethics chair. Please include dates of the email correspondence AND the name and email address of people involved.			

If the associated risks of your proposed work cannot be accommodated through an identified procedure or through a case-by-case agreed process, then you will need to submit an application to the TFTI Ethics Committee for review using the Research Ethics Clearance Form.

Please complete Section 5: Data Protection

SECTION 5: DATA PROTECTION

Box 5A: Checklist of Data Protection Questions **ALL** applicants must complete this box	YES	NO

1   Will you guarantee that you will inform all people whose personal and/or special category data that you are using:
 	
   • What data you will be collecting and why;
 	
   • How you will be storing the data;
 	
   • The legal basis under which you are storing the data;
 	
   • When/if/how the data will be destroyed?
 	
Please note that using a GDPR Compliant Project Information Sheet will ensure you meet these requirements.
	X	

2 Will you guarantee that **IF** you use a portable device to collect electronic data you will transfer that data to your University Google Drive account or University Filestore as soon as possible after the interview **AND** delete it from your personal device?	X	
3 Will you guarantee that the data will **ONLY** be accessible to the project team **AND** that **IF** the project team extends beyond the University of York that you have consulted the University's IP and Legal team to ensure appropriate data protection safeguards are in place?	X	
4 Will you guarantee that you will **ONLY** use Google Forms OR Qualtrics to host online surveys that collect personal and/or special category data?	X	
5 Will you guarantee that you are collecting the **MINIMUM** amount of data necessary for the intended project?	X	
6 Will you guarantee that **IF** you are storing or accessing data from **OUTSIDE** the European Economic Area (EEA) you will access the data through your University of York Google Account connected to the University of York Virtual Private Network (VPN)?	X	
7 Will you guarantee to destroy all physical **AND** electronic data **EITHER** after your module marks have been ratified by the Board of Examiners **OR** 10 years after last requested access?	X	

Box 5A: Checklist of Data Protection Questions **ALL** applicants must complete this box		YES	NO
8	**IF** storing electronic data for 10 years after last requested access, will you guarantee to **EITHER** use a University Google Drive account **OR** an approved data repository service to store the data?	X	
9	Have you screened your project against the Data Protection Impact Assessment (DPIA) screening questions **AND** if required conducted a DPIA and submitted a copy to the Data Protection Officer for review?	X	

Box 5B: Further Details

Complete this box if you answered "No" to any question in Box 5A.

Provide details of the nature of the data protection risks that you identified by answering NO to questions in Box 5A and describe the process that you will follow to minimise the risks. Please note that if you are not compliant with the agreed procedures above, this application will be referred to the University Data Protection Officer for advice.

Please complete Section 6: Applicant Agreement

SECTION 6: APPLICANT AGREEMENT

Please mark your answer to each question in Box 6A: Applicant Agreement with an "X" or a tick in the appropriate column. Please note that you **MUST NOT** begin contacting participants **UNITL** you have received a response from the Ethics committee.

If you are a research student, please also have your supervisor also complete Box 6B: Supervisor Agreement and provide their signature overleaf.

Once completed, submit the checklist for review by the TFTI Ethics committee by emailing the checklist to TFTI-ethics@york.ac.uk from the applicant's University of York account. The Ethics Committee will accept a typed/digital signature from the applicant if the form is returned by email from the applicant's University of York account, and similarly a typed/digital signature and responses to the supervisor questions if the supervisor is cc'd to that email.

Box 6A: Applicant Agreement **ALL** applicants must complete this box.		YES	NO
1	I will ensure that the research conducted for the above project will meet all the statements as expressed in this Research Ethics Checklist.	X	
2	I will ensure that all work related to the research will be guided by the University's ethical rules and regulations.	X	
3	I understand that I must not progress with this project until I have received confirmation from the TFTI Ethics committee that Ethics approval through this Research Ethics Checklist is appropriate for this project.	X	
4	I have included example Project Information Sheets and Participant Informed Consent Forms, as part of this Ethics application, if appropriate.	X	
5	I understand that I must adhere to the TFTI requirements for storing and using personal and special category data in compliance with the General Data Protection Regulation. Note that GDPR compliance guidance can be found on the TFTI Ethics VLE site.	X	
6	I agree to ensure that all payments made to personnel in relation to this project will comply with financial regulations.	X	

Box 6A: Applicant Agreement **ALL** applicants must complete this box.		**YES**	**NO**
7	I agree to report any changes to the above as soon as is feasible to the Chair of the TFTI Ethics Committee.	X	
Applicant Name	Tobias G. Palma		
Signed			
Date	22nd July 2020		

Box 6B: Supervisor Agreement **STUDENT** applicants must have their supervisor complete this box.		**YES**	**NO**
1	I have reviewed this checklist in discussion with the student.	X	
2	I believe the Research Ethics Checklist is appropriate for this work and that no further Ethics approval is required.	X	
3	**IF** you have selected "No" in response to statement 2: I confirm that the student will submit either the Research Ethics Clearance Form for further ethical approval.		
Supervisor Name	Dr Guy Schofield		
Signed			
Date	22/7/2020		

UNIVERSITY *of* York

**Department of Theatre, Film, Television and
Interactive Media Ethics Committee**

Participant Information Sheet –Anonymous Research

Project background

The University of York would like to invite you to take part in the following project: **The
Hunter & the Wolff, Hands-off Interactive Storytelling in Cinematic Virtual Reality.**
Before agreeing to take part, please read this information sheet carefully and let us know if
anything is unclear or you would like further information.

What is the purpose of the project?

This project is being performed by Tobías G. Palma (tgps500@york.ac.uk) who is a PhD
researcher in the programme of Theatre, Film, Television and Interactive Media by Creative
Practice at the University of York.
The work that is being performed for the assessments within the module is being conducted
according to restrictions that have been subject to approval by the TFTI Ethics committee.
The Chair of the TFTI Ethics committee can be contacted on TFTI-ethics@york.ac.uk.

For this research project, we are interested in understanding decision-making processes driven
by diegetic stimuli during a cinematic virtual reality short film. Your participation in this
project will involve watching a virtual reality short film with several simultaneous and
parallel plots, and answering a written survey afterwards. The whole session will last no
longer than 20 minutes. You will filmed while watching the short film, which will allow us to
track your movements and the decisions made through the story.
Before watching the short film, you will be shown a short VR piece in order to adjust to the
virtual cinematic experience.

Please note that to comply with the approved Ethics requirements of this work, we do not
intend to discuss sensitive topics with you that could be potentially upsetting or distressing. If
you have any concerns about the topics that may be covered in the research study, please raise
these concerns with the researcher.
Your participation in this project is voluntary. If you wish, we will provide you with access to
the report of the analysed data and the most relevant results. If you would like to receive
access to these, you can indicate as such on the consent form.

Why have I been invited to take part?

You have been invited to take part because we are aiming to recruit a diverse group
participants, and we hope you might be interested in this work.

Do I have to take part?

No, participation is optional. If you do decide to take part, you will be given a copy of this information sheet for your records and will be asked to complete a participant consent form. If you change your mind at any point during the research activity, you will be able to withdraw your participation without having to provide a reason. To withdraw your participation you need to let the researcher know you wish to withdraw at any moment up to 13th of November 2020, and all your data will be deleted as soon as possible.

On what basis will you process my data?

Under the General Data Protection Regulation (GDPR), the University has to identify a legal basis for processing personal data and, where appropriate, an additional condition for processing special category data.
For further information and definitions of personal and special category data, please go to:

- https://ico.org.uk/for-organisations/guide-to-the-general-data-protection-regulation-gdpr/key-definitions/
- https://ico.org.uk/for-organisations/guide-to-the-general-data-protection-regulation-gdpr/lawful-basis-for-processing/special-category-data/

Special category data is personal data which the GDPR says is more sensitive, and so needs more protection. In this study, we will not be collecting any special category data.
Research activities will only be undertaken where ethical approval has been obtained, where there is a clear public interest and where appropriate safeguards have been put in place to protect data.
In line with ethical expectations and in order to comply with common law duty of confidentiality, we will seek your consent to participate where appropriate. This consent will not, however, be our legal basis for processing your data under the GDPR.

How will you use my data?

Data will be processed for the purposes outlined in this notice.

Will you share my data with 3rd parties?

No. Data will be accessible to the project team and personnel associated with the Department of Theatre, Film and Television at the University of York only.
Anonymised data may be reused by the research team or other third parties for secondary research purposes.

How will you keep my data secure?

The University will put in place appropriate technical and organisational measures to protect your personal data and/or special category data. For the purposes of this project we will store data using secure University services provided by Google and the University Filestore. Information will be treated confidentiality and shared on a need-to-know basis only. The University is committed to the principle of data protection by design and default and will collect the minimum amount of data necessary for the project.

Will you transfer my data internationally?

No. Data will be held within the European Economic Area in full compliance with data protection legislation.

Will I be identified in any outputs?

No. Your participation in this research activity will be treated anonymously and you will not be identified in any outputs.

How long will you keep my data?

Data will be retained in line with legal requirements or where there is a business need. Retention timeframes will be determined in line with the University's Records Retention Schedule.

What rights do I have in relation to my data?

Under the GDPR, you have a general right of access to your data, a right to rectification, erasure, restriction, objection or portability. You also have a right to withdrawal. Please note, not all rights apply where data is processed purely for research purposes. For further information see, https://www.york.ac.uk/records-management/generaldataprotectionregulation/individualsrights/.

Questions or concerns

If you have any questions about this participant information sheet or concerns about how your data is being processed, please contact the TFTI Ethics Chair (TFTI-ethics@york.ac.uk) in the first instance. If you are still dissatisfied, please contact the University's Acting Data Protection Officer at dataprotection@york.ac.uk.
If you have any questions about the project itself, please contact the producer **Tobías G. Palma** tgps500@york.ac.uk or project supervisor **Dr Guy Schofield** guy.schofield@york.ac.uk

Right to complain

If you are unhappy with the way in which the University has handled your personal data, you have a right to complain to the Information Commissioner's Office. For information on reporting a concern to the Information Commissioner's Office, see www.ico.org.uk/concerns.

UNIVERSITY *of* York

**Department of Theatre, Film, Television and Interactive Media
Ethics Committee**

Participant Consent Form – Anonymous Interviews

Thank you for your interest in this project. This research activity will be used to understand decision-making processes driven by diegetic stimuli during a cinematic virtual reality short film. This is part of doctoral research.

Please read the following statements carefully and tick the appropriate box:

	YES	NO
I have read the information sheet about this project		
I agree to take part in this project		
I consent to my playing being screen captured and audio recorded		
I consent to the interview being audio recorded		
I understand my right to withdraw and/or have my data destroyed from this project at any time up to 13th November 2020		
I understand that my participation in this project will be treated anonymously		
I am over the age of 18		

Participant Name:

_____

Participant Signature:

_____

Date:

___/___/_____

Researcher Name:

Tobías G. Palma

Researcher Signature:

Date:

___/___/_____

If you wish to be informed about the outcomes from this project, please provide your email address:

_____

**Department of Theatre, Film, Television and
Interactive Media Ethics Committee**

Participant Information Sheet – Non-Anonymous Interviews

Project background

The University of York would like to invite you to take part in the following project: **The Hunter & the Wolff, Hands-off Interactive Storytelling in Cinematic Virtual Reality.** Before agreeing to take part, please read this information sheet carefully and let us know if anything is unclear or you would like further information.

What is the purpose of the project?

This project is being performed by **Tobías G. Palma** (tgps500@york.ac.uk) who is a PhD researcher in the programme of Theatre, Film, Television and Interactive Media by Creative Practice at the University of York.

The work that is being performed for the assessments within the module is being conducted according to restrictions that have been subject to approval by the TFTI Ethics committee. The Chair of the TFTI Ethics committee can be contacted on TFTI-ethics@york.ac.uk. For this research project, we are interested in analysing this particular type of hands-off interactivity in relation to instinctive decision-making processes driven by diegetic stimuli, and the navigation through the proposed narrative. Your participation in this project will involve watching an interactive virtual reality short film with several simultaneous and parallel plots, and answering a semi-structured interview afterwards, which can be either in direct or written. The short film lasts around 3 minutes and the interview should take about 30 minutes. Interviews will be audio recorded.

Please note that to comply with the approved Ethics requirements of this work, we do not intend to discuss sensitive topics with you that could be potentially upsetting or distressing. If you have any concerns about the topics that may be covered in the research study, please raise these concerns with the researcher.

Your participation in this project is voluntary. If you wish, we will provide you with access to the report of the analysed data and the most relevant results. If you would like to receive access to these, you can indicate as such on the consent form.

Why have I been invited to take part?

You have been invited to take part because I am hoping to count with feedback and comments from people who experienced in the field of VR production and/or interactive narratives, and such experience might be relevant for the development of this research.

Do I have to take part?

No, participation is optional. If you do decide to take part, you will be given a copy of this information sheet for your records and will be asked to complete a participant consent form. If you change your mind at any point during the research activity, you will be able to withdraw your participation without having to provide a reason. To withdraw your participation you need to let the researcher know you wish to withdraw at any moment up to the 13th of November 2020, and all your data will be deleted as soon as possible.

On what basis will you process my data?

Under the General Data Protection Regulation (GDPR), the University has to identify a legal basis for processing personal data and, where appropriate, an additional condition for processing special category data.
Personal data is defined as data from which someone could be identified. For example, in this study we will be collecting your name, profession and place of work, which are used to validate qualitative data regarding this creative project.
Special category data is personal data which the GDPR says is more sensitive, and so needs more protection. In this study, we will not be collecting any special category data.
In line with our charter which states that we advance learning and knowledge by teaching and research, the University processes personal data for research purposes under Article 6 (1) (e) of the GDPR:

- *Processing is necessary for the performance of a task carried out in the public interest*

Research activities will only be undertaken where ethical approval has been obtained, where there is a clear public interest and where appropriate safeguards have been put in place to protect data.
In line with ethical expectations and in order to comply with common law duty of confidentiality, we will seek your consent to participate where appropriate. This consent will not, however, be our legal basis for processing your data under the GDPR.

How will you use my data?

Data will be processed for the purposes outlined in this notice.

Will you share my data with 3rd parties?

Yes. The following third parties will have access to your data for the purpose of citation and further academic research.
Your data may be used in my dissertation, research reports and publications.
Anonymised data may be reused by the research team or other third parties for secondary research purposes.

How will you keep my data secure?

The University will put in place appropriate technical and organisational measures to protect your personal data and/or special category data. For the purposes of this project we will store data using secure University services provided by Google and the University Filestore. Information will be treated confidentially and shared on a need-to-know basis only. The University is committed to the principle of data protection by design and default and will

collect the minimum amount of data necessary for the project. In addition, we will anonymise or pseudonymise data wherever possible.

Will you transfer my data internationally?

Possibly. The University's cloud storage solution is provided by Google which means that data can be located at any of Google's globally spread data centres. The University has data protection complaint arrangements in place with this provider. For further information see, https://www.york.ac.uk/it-services/google/policy/privacy/.

Will I be identified in any outputs?

Yes. Your participation in this interview is non-anonymous and therefore you will be identified in my final dissertation, reports and publications.

How long will you keep my data?

Data will be retained in line with legal requirements or where there is a business need. Retention timeframes will be determined in line with the University's Records Retention Schedule.

What rights do I have in relation to my data?

Under the GDPR, you have a general right of access to your data, a right to rectification, erasure, restriction, objection or portability. You also have a right to withdrawal. Please note, not all rights apply where data is processed purely for research purposes. For further information see, https://www.york.ac.uk/records-management/generaldataprotectionregulation/individualsrights/.

Questions or concerns

If you have any questions about this participant information sheet or concerns about how your data is being processed, please contact the TFTI Ethics Chair (TFTI-ethics@york.ac.uk) in the first instance. If you are still dissatisfied, please contact the University's Acting Data Protection Officer at dataprotection@york.ac.uk.
If you have any questions about the project itself, please contact the producer **Tobías G. Palma** tgps500@york.ac.uk or project supervisor **Dr Guy Schofield** guy.schofield@york.ac.uk

Right to complain

If you are unhappy with the way in which the University has handled your personal data, you have a right to complain to the Information Commissioner's Office. For information on reporting a concern to the Information Commissioner's Office, see www.ico.org.uk/concerns.

UNIVERSITY *of York*

Department of Theatre, Film, Television and
Interactive Media Ethics Committee

Participant Consent Form – Non-Anonymous Interviews

Thank you for your interest in this project. This project aims to understand decision-making processes driven by diegetic stimuli in a cinematic virtual reality short film, and how this type of interactive design can be used for cinematic storytelling. This is part of doctoral research.

Please read the following statements carefully and tick the appropriate box:

	YES	NO
I have read the information sheet about this project		
I agree to take part in this project		
I consent to being interviewed for this project		
I consent to the interview being video recorded		
I consent to the interview being audio recorded		
I understand my right to withdraw and/or destroy my data from this project at any time up to 13th November 2020		
I consent to be identified by name in the outputs from this project		
I am over the age of 18		

Participant Name:

_____

Participant Signature:

_____

Date:

___/___/_____

Researcher Name:

Tobías G. Palma

Researcher Signature:

Date:

___/___/_____

If you wish to be informed about the outcomes from this project, please provide your email address:

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